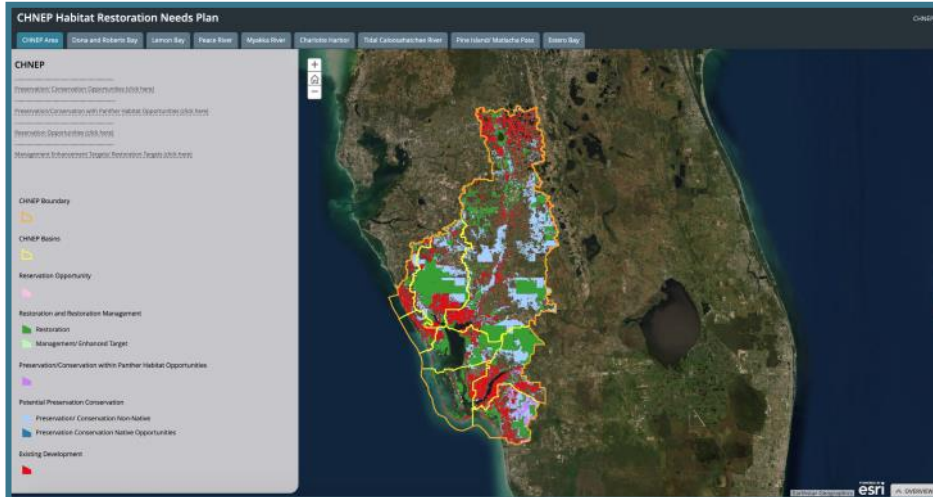
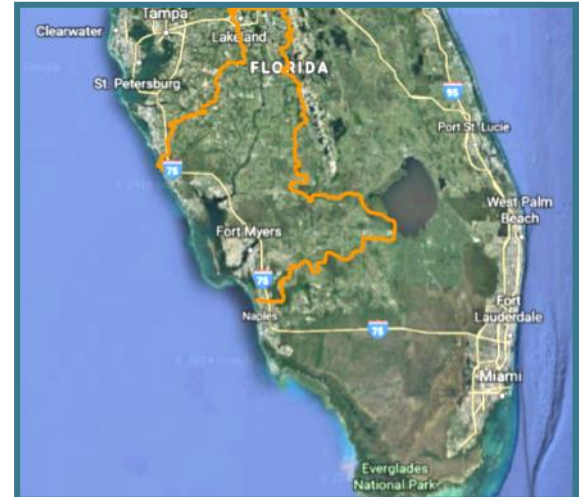


CHNEP Water Atlas Maintenance and Enhancements



WATER QUALITY IMPROVEMENT



Summary

The CHNEP Water Atlas is a web-based resource center providing both technical users and interested community members and policy makers with a one-stop shop to find local data on water quality, flow, and habitat to information about educational events and volunteer resources in Central and Southwest Florida. The site includes: up to date and historical data, trend analysis, historical maps and studies, water resource maps, and much more. It is a readily accessible way to find more information about local waterways.

The page is a resource that the Coastal & Heartland National Estuary Partnership (CHNEP) continues to provide for scientists, resource managers, elected officials, and the public to view and access local data through various user-friendly maps and charts. CHNEP provides the funding necessary to maintain and annually update the CHNEP Water Atlas and ensure continued access to water quality data, analysis, and other information. Outlined below are the newest additions and improvements featured on the CHNEP Water Atlas.

New Features and Future Additions

Habitat Restoration Needs (HRN) Interactive Mapping Tool: CHNEP Water Atlas users can view maps of strategic conservation opportunities and management/restoration targets from the Habitat Restoration Needs plan for the CHNEP area. These maps are presented interactively through a web-based application and divided by watershed basin for easy viewing (as depicted in the map above). Future work will include adding the freshwater Caloosahatchee basin to the interactive mapping tool and updating the map to load faster.

Visit the CHNEP Water Atlas at www.chnep.wateratlas.usf.edu

Location: CHNEP Area

Partners: University of South Florida Water Institute, Coastal Charlotte Harbor Monitoring Network, CHNEP Management Conference Members

Implemented: 2011-Present

Status: Ongoing

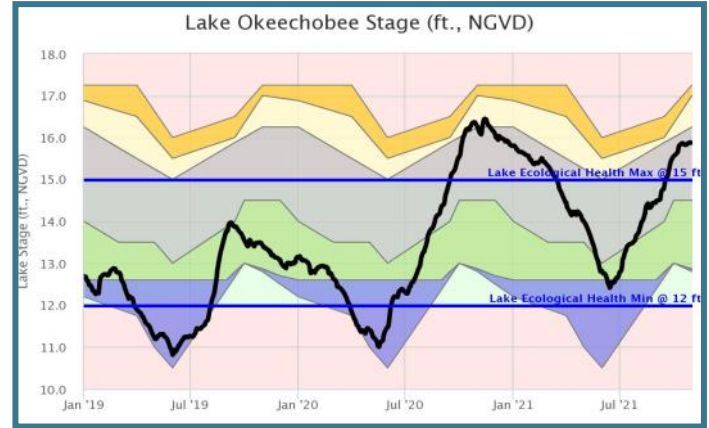
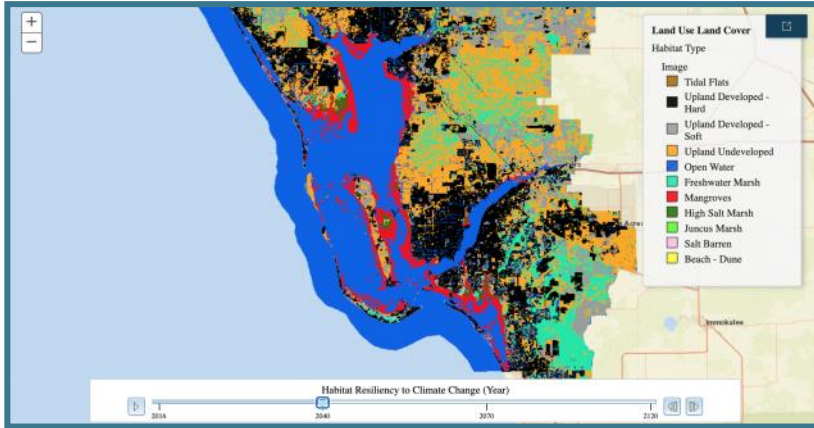
CHNEP Cost: \$56,000 Maintenance
\$27,670 Additions

Funding Source: Environmental Protection Agency

2019 CHNEP Plan Activity: 

Water Quality Improvement 1.2: Support uploading and archiving of data in standard, common public databases, including FDEP's database and the CHNEP Water Atlas.

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Habitat Resiliency to Climate Change (HRCC) Interactive Story Map: A climate change interactive map story has been added for users to take a closer look at what kind of impacts our waterways may experience given the most recent climate change and sea level rise science (left image). These maps show habitat loss and conversion to open water over time, as well as estimating the migration of various habitat to higher elevations as well as inland.

Lake Okeechobee Conditions: A recent addition of the Lake Okeechobee pages focuses on current lake levels and water quality conditions and trends and documents changes in flow from Lake Okeechobee into the Caloosahatchee River. This page includes background information on how the Lake and River are managed, reports, plans, and spatial datasets (right image). This new page will allow residents and water managers to easily access the status and conditions of this lake and its impacts to the Caloosahatchee watershed which partially falls into CHNEP's expansion area.

Seagrass Maps: The CHNEP Water Atlas now features seagrass pages that include current and historical aerial maps and seagrass acreages as well as data collected in the field and analysis to help users understand the importance of seagrass monitoring as an indicator of water quality and recovery. Seagrass pages are broken down by watershed basin for easy viewing and also include an interactive mapper.

Numeric Nutrient Criteria (NNC) Calculator: The FDEP Numeric Nutrient Standards specify region-specific and sometimes site-specific criteria also called Numeric Nutrient Criteria (NNC) to determine if a waterbody passes the standard. The site will soon feature the Numeric Nutrient Criteria (NNC) Calculator, which compares preliminary data on chlorophyll a (used to measure phytoplankton levels) as well as phosphorous and nitrogen levels in CHNEP waterbodies, using data from water quality samples stored in the Water Atlas database, to thresholds defined in the Florida Administrative Code (FAC). The NNC Calculator tool can be used to informally evaluate recent nutrient levels in selected waterbodies by comparing them to applicable state standards.

Water Quality Dashboard: A map-based dashboard will present the most recent water quality data for waterways in the CHNEP area on red-yellow-green dials. The dashboard tool will compare the most recent data against existing water quality standards to demonstrate if the results from the sample are good, fair, or poor. The dashboard will include nutrient levels along with water clarity and bacteria data.

Visit the CHNEP Water Atlas at www.chnep.wateratlas.usf.edu

CONTACT INFORMATION

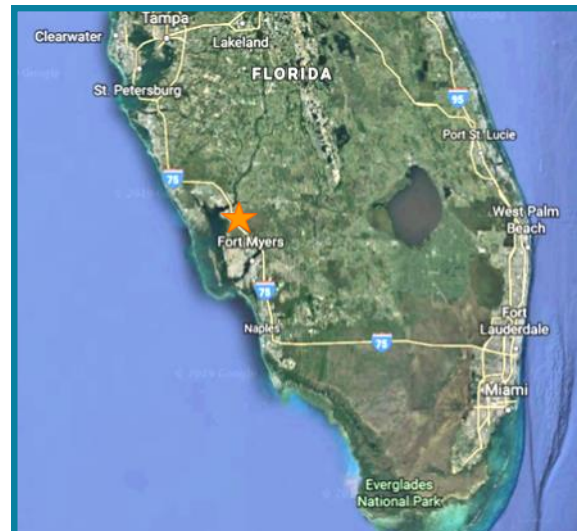
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Punta Gorda, FL 33950-4417
(941) 575-5090
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Charlotte Harbor Flatwoods Hydrological Restoration Initiative

HYDROLOGICAL RESTORATION



Summary

The Charlotte Harbor Flatwoods Hydrologic Restoration Initiative (CHFI) encompasses 80,000 acres of land including the Cecil Webb/Babcock Wildlife preserve, Yucca Pens Wildlife preserve, and numerous creeks that flow into the eastern Charlotte Harbor and Caloosahatchee Estuaries. This watershed has experienced economic impacts as a result of the Deepwater Horizon oil spill, along with other roadway and development impacts. These environmental alterations have increased pollution and hydrological degradation.

The goals of the CHFI are to enhance sheet flow and natural flow, improve water quality, restore groundwater recharge, reduce flooding, and enhance fish and wildlife. The initial steps to the restoration of this area involve collecting and synthesizing data using an integrated, three dimensional, hydrological model to determine the appropriate hydropatterns, timing, and quantity of water flows required to improve hydrological conditions and habitat.

CHNEP is funding the development of a science based, data driven, Strategic Hydrological Planning Tool that will provide guidance to resource management agencies related to the appropriate restoration and management of land areas and surface waters currently flowing through this area. This comprehensive approach of data collection, evaluation and planning will guide the success of this restoration project.

Location: Charlotte & Lee Counties, FL

Partners: Charlotte County, Southwest Florida Water Management District, South Florida Water Management District, and Florida Fish and Wildlife Conservation Commission

Implemented: 2020

Status: Ongoing

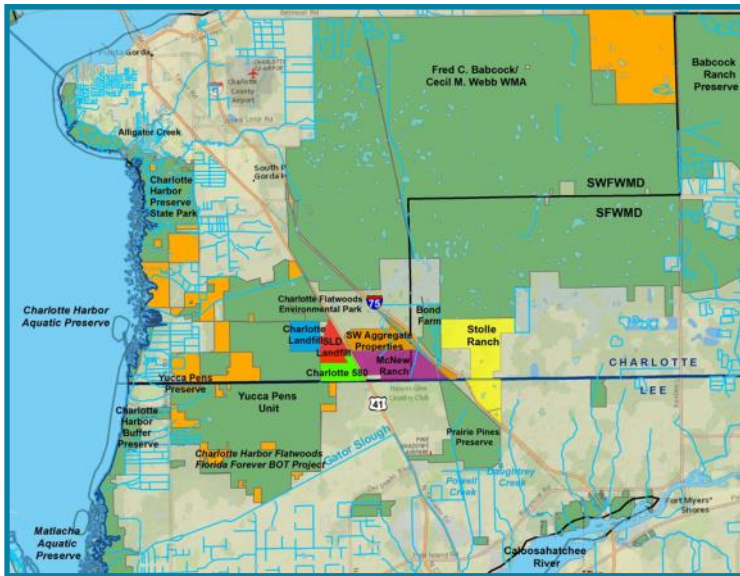
CHNEP Cost: \$573,060

Funding Source: Natural Resource Damage Assessment and Florida Department of Environmental Protection funds managed through CHNEP

2019 CHNEP Plan Activity: 

Hydrological restoration 1.1: Review existing data collection and identify gaps. Conduct data collection, modeling, and analyses of historical, current, and projected hydrologic conditions to identify needs and guide hydrologic restoration.

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South Florida Water Management District

Anticipated Results and Benefits

Flood Reduction:

Man-made alterations have created unnatural flood zones and dehydrated wetlands throughout this watershed. Creating a hydrologic model of flow patterns will determine which areas are of most concern and should be a main focus for restoration modifications beneficial to both public and wildlife.

Enhanced Fish and Wildlife Habitat:

The modeling of this watershed is a critical component to the development of a Strategic Hydrological Planning Tool to increase and enhance the surrounding habitat. Restoring this area will create marsh and wetland habitat for fish, shorebirds, turtles, and many other species.

Improved Water Quality:

Returning this region to its original state will allow for water to be distributed through a natural filtration system of aquatic vegetation and wetlands, resulting in improved water quality throughout the watershed.



CONTACT INFORMATION

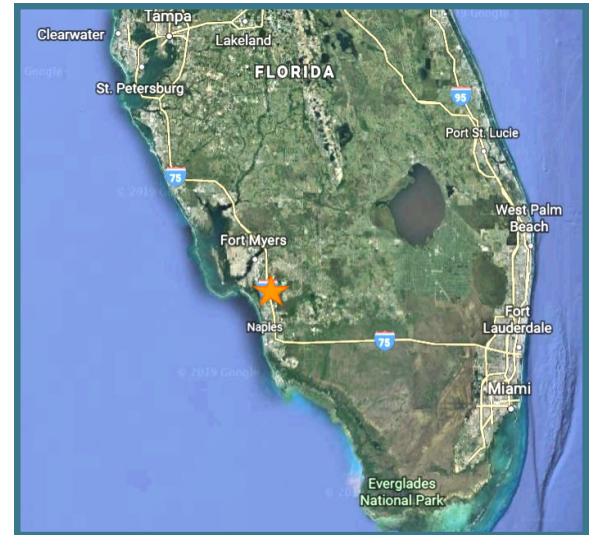
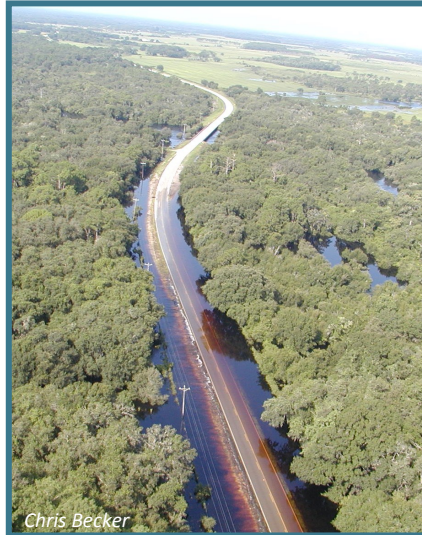
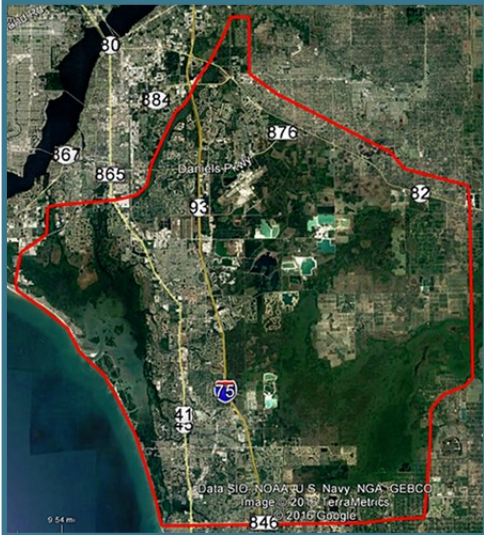
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South Lee County Watershed Initiative Hydrological Modeling Project

HYDROLOGICAL RESTORATION



Summary

The South Lee County Watershed is comprised of the Estero River, Spring Creek, and Imperial River watersheds, which flow into the Estero Bay Aquatic Preserve. Much of the native wetland habitats have been lost to agriculture, development, the installation of drainage canals, surface mining, and major roadways. These activities have significantly altered the historic flow of water from the southern region of Lehigh Acres south to the Corkscrew Sanctuary and southwest to Estero Bay. The surrounding wetland ecosystems are highly susceptible to over-drainage, flooding, habitat changes, water quality degradation, and climate change stressors. The rivers and creeks in this area experience significant flooding during storm events and very low flows during the dry season.

To address these concerns partners in the area came together to form the South Lee County Watershed Initiative (SLCWI), which aims to restore more natural water flows, improve water quality and environmental conditions, and increase natural water storage and moderation of flooding events.

CHNEP is providing funding for the development of a science-based, data-driven integrated surface/ground water hydrologic model that is capable of simulating both dry and wet season water levels and flows. It will fill data gaps and bridge the various modeling efforts in the area to build a regional watershed-scaled picture. This tool will be used by resource management agencies to guide appropriate restoration and management of surface waters currently flowing from the South Lee County Watershed.


Location: Lee County, FL

Partners: South Florida Water Management District, Southwest Florida Regional Planning Council, City of Bonita Springs, Lee County, Village of Estero, Bonita Springs Utilities, Florida Department of Transportation, Conservancy of Southwest Florida, Audubon Society, Corkscrew Swamp Sanctuary, and the Estero Council of Community Leaders.

Status: Projected for 2020

CHNEP Cost: \$195,296

Funding Source: Environmental Protection Agency, South Florida Water Management District

2019 CHNEP Plan Activity:  Hydrological Restoration 1.1: Conduct data collection, modeling, and analysis of historical, current, and projected hydrologic conditions to identify needs and guide hydrologic restoration.



Mike Kaplan

Anticipated Results and Benefits

Informed Decision Making:

This project will result in a coherent model that simulates both wet and dry season water levels and flows for the Estero and Imperial River watersheds. This will aid in identifying appropriate and cost-effective restoration projects for the area.

Improved Water Quality:

Restoration efforts conducted as a result of this project will improve the water quality of the individual rivers themselves, as well as the main waterways they flow into. Restoring natural flows will re-hydrate wetlands and allow them to provide their natural



Linda Wroble

Increased Aquatic and Terrestrial Habitat:

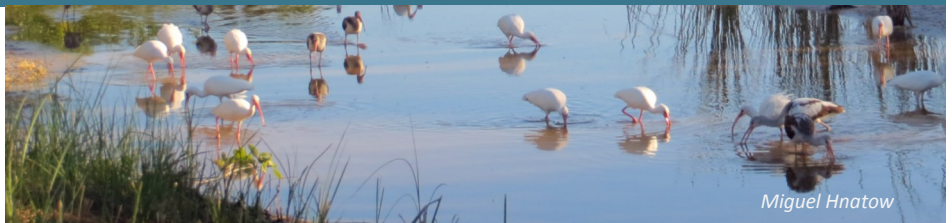
Re-hydrating wetlands will clean water before it moves downstream. This provides better habitat for fish and wildlife in the downstream areas and estuary. It will also increase natural water storage on land and allow aquifer recharge. Water flow will be rerouted from areas where it is doing harm to provide greater flood protection.



The Weather Channel

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326 W. Marion Ave.
Punta Gorda, FL 33950-4417
(941) 575-3385
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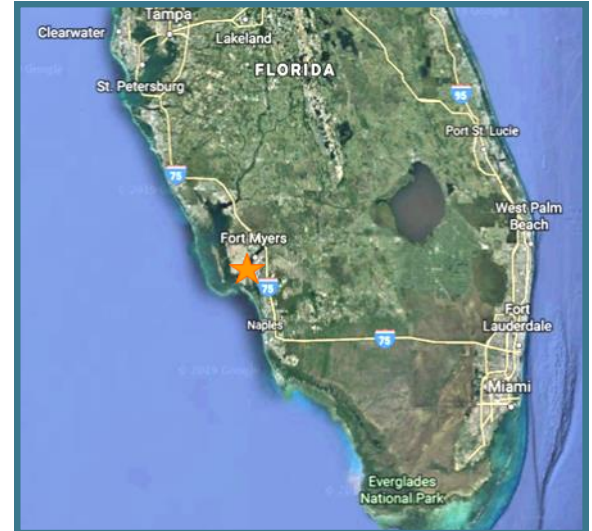
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Caloosahatchee Cyanobacteria Rapid Response Pilot Program

WATER QUALITY IMPROVEMENT



Summary

Florida has seen an increase in Harmful Algae Blooms (HABs) in recent years. In particular, toxic Cyanobacteria blooms (also known as blue-green algae) have plagued local freshwaters such as rivers, lakes, and ponds. HABs not only harm water quality, but some also release toxins that can negatively impact both aquatic life and human health. The warmer water of summer months combined with increased runoff from land containing high levels of nutrients provides ideal conditions for algae to thrive.

Agencies and local governments are working on solutions to reduce overall nutrient inputs into our waterways. In the meantime, immediate treatment of HAB affected waterways can help to curb affects when a bloom occurs. New technologies are being tested to help combat HABs. Once a successful method is established, a rapid-response system can be implemented to prevent future outbreaks from overtaking large areas of water.

CHNEP is funding a project to test the use of open-cell foam technology known as AquaFlex to absorb and remove excess nutrients from water along with Cyanobacteria and the toxin it produces (known as *Microcystis*). During the next bloom event, CHNEP will conduct a large-scale deployment of AquaFlex alongside an independent study to collect water and air quality samples. The data collection and analysis will be conducted by Florida Gulf Coast University (FGCU) scientists to test the effectiveness of the technology at improving water and air quality in the immediate vicinity of the treatment area. This work will take place in the Caloosahatchee River area.


Location: Lee County, FL

Partners: Florida Gulf Coast University, AquaFlex Holdings LLC

Status: Projected for 2022

CHNEP Cost: \$66,061

Funding Source: Environmental Protection Agency

2019 CHNEP Plan Activity: 
Water Quality Improvement 5.1: Supports Harmful Algal Bloom (HAB) research and monitoring and measures to reduce their environmental, social, and economic impacts through the identification and reduction of anthropogenic influences.

COASTAL & HEARTLAND NATIONAL ESTUARY PARTNERSHIP



Anticipated Results and Benefits

Improved Water Quality:

This project will include an independent study conducted by FGCU scientists to test the removal effectiveness of AquaFlex open-cell foam technology for nutrients, cyanobacteria, and its toxins. The study will also quantify improvements in water and air quality. This material could play a key role in rapid-response systems deployed by local governments and agencies once a bloom is detected and potentially prevent or slow the spread of cyanobacteria throughout large bodies of water.

Recreational Benefits:

Lessening the harmful effects of algae blooms is crucial in a number of ways. Exposure to toxins in Cyanobacteria can cause harm to surrounding wildlife, but also to humans that may be drinking, breathing, or in physical contact with the water. For this reason, harmful algal blooms have a major effect on recreational activities in the area such as swimming, fishing, and boating. This also negatively impacts tourism and the local economy.

Improved Aquatic Habitat:

Along with producing toxins, Cyanobacteria blocks the sunlight necessary for aquatic plants and animals to survive and depletes oxygen in the water column. Larger marine mammals can also ingest Cyanobacteria affected fish or plants and suffer from long-term health impacts or death. Lessening the spread or intensity of Cyanobacteria blooms will improve overall water quality, aquatic habitat, and fish and wildlife health.

CONTACT INFORMATION

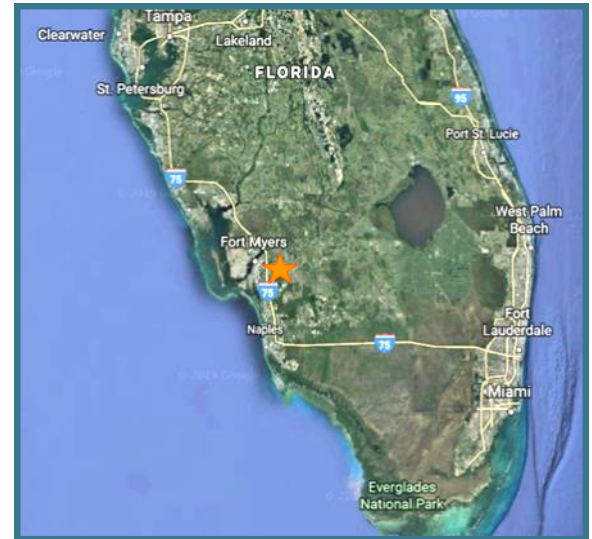
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Wild Turkey Strand Preserve Restoration

FISH, WILDLIFE, & HABITAT RESTORATION



Summary

Wild Turkey Strand is a 3,105-acre area preserve, consisting of several plant communities including freshwater wetland, pine flatwoods, prairie, hammock, and swamp. The area provides critical habitat for wood stork, roseate spoonbill, bald eagle, gopher tortoise, Florida panther, and over 100 other recorded wildlife species. In addition, over 500 plant species have been documented at the preserve including three state-listed species.

During World War II the preserve was used as a U.S. military training base. Some historic infrastructure from the army air field remains on the preserve today. Additionally, parts of the preserve were historically used as crop fields and cattle ranches, as well as for hunting and illegal dumping. The Coastal and Heartland National Estuary Partnership (CHNEP) will be working together with Lee County and other partners to fund a portion of this 400 acre hydrological and habitat restoration project of former agricultural land within Wild Turkey Strand Preserve and the Lee County Density Reduction/Groundwater Resource (DRGR) Zone that is a part of the Charlotte Harbor estuaries area to provide enhanced wetland and upland habitat, improved water quality, and restored hydroperiods and ecosystem function.

Location: Lee County, FL

Partners: Lee County Dept. of Parks & Recreation, Conservation 20/20 Program

Implemented: Beginning 2022

Status: Ongoing

CHNEP Cost: \$129,213

Funding Source: Restore America's Estuaries (RAE) 2021 National Estuary Program Coastal Watersheds Grant (NEP CWG), Environmental Protection Agency

2019 CHNEP Plan Activity:



Fish, Wildlife, and Habitat Protection 2.2: Encourage management of public lands and public conservation easements to protect, restore, and create native plant and animal communities. Hydrological Restoration 2.2: Increase fresh surface water and groundwater availability to support healthy natural systems.

COASTAL & HEARTLAND NATIONAL ESTUARY PARTNERSHIP

Relevance

Long term management, preservation and restoration activities within this region are guided by the CHNEP 2019 Comprehensive Conservation and Management Plan (CCMP). The project will address all four priority pillars of the CCMP, including Hydrological Restoration, Water Quality Improvement, Fish, Wildlife, and Habitat Restoration, and Public Outreach. The project will increase the area of restored wetland habitat and reduce nutrient loading, return natural patterns of quantity, timing and distribution, increase retention time for natural filtration of agricultural runoff from surrounding agricultural operations, and increase fresh surface water and groundwater availability to support healthy natural systems. Documented listed species at the preserve will directly benefit from this project. Additionally, the project will provide public engagement through guided walks and interpretive signage on the trail that educates visitors about water quality issues, land management practices, native plant and wildlife species, and the value of wetlands.

Impact

The completion of this project will provide restored habitat as well as improved water quality and ecosystem function for the target wetland plant communities. Both water depth and hydroperiod should increase throughout the project area and outfall wetlands. This will expand the extent of existing wetlands and will change the vegetation structure in other areas to sustain aquatic wildlife. Breeding habitat for amphibians and birds, foraging habitat for wading birds and reptiles, freshwater drinking source for other wildlife, and surface water for aquifer recharge are some of the anticipated benefits.

The project will enhance the quality of wildlife habitat for by restoring an abandoned developed area within a public preserve to a natural state.



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326 W. Marion Ave.
Punta Gorda, FL 33950-4417
(941) 575-5090
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