



Healthy Vegetation at Timucuan E&HP

Plot Surveys Conducted by the Southeast Coast I&M Network

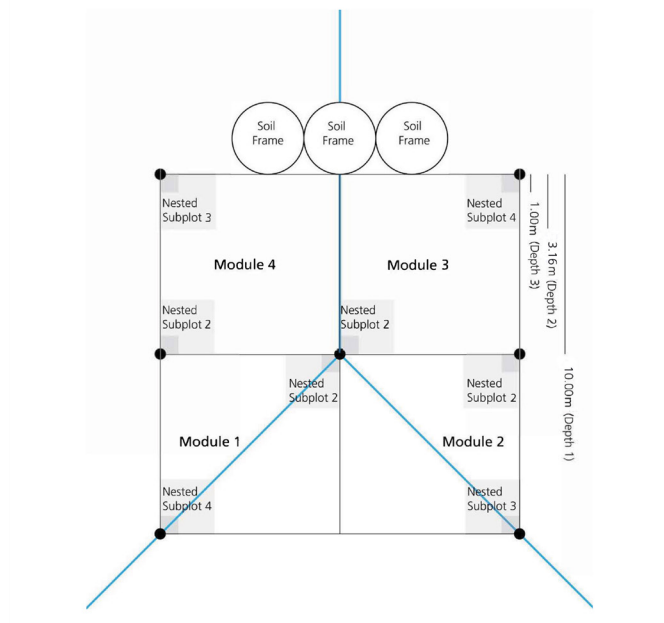
Overview

Even though it borders one of the largest cities in the eastern U.S., Timucuan Ecological and Historic Preserve provides a haven for a wide variety of plants and their communities in northeastern Florida. This is the conclusion from a vegetation health scorecard created for each major habitat in the Preserve. Despite the challenge of invasive species, native plant diversity scored “Good” in every monitored habitat, according to *Terrestrial Vegetation Monitoring at Timucuan Ecological and Historic Preserve 2023 Data Summary—Cycle 2 and Newly Established Cycle 1 Plots*, published by the Southeast Coast Inventory and Monitoring Network in 2025. The report highlights data collected in 2023 and compares it to baseline data from the initial survey in 2019.

Vegetation communities are influenced by the environment and impacts from natural and human-induced disturbances while still providing habitat and resources to a plethora of wildlife. In the National Park Service, the Southeast Coast Inventory and Monitoring Network takes “vital signs” of natural resources including terrestrial vegetation, to evaluate its ecological health. The information collected guides park management in enhancing the visitor experience while protecting and preserving these natural resources. Timucuan Ecological and Historic Preserve is approximately 46,000 acres between the St. Johns and Nassau Rivers, within the city limits of Jacksonville and Duval County, Florida. The two rivers form a vast estuarine system dominated by tidally influenced salt marsh and coastal hammock habitat, with three-quarters of the Preserve made up of tidal wetlands and open water.

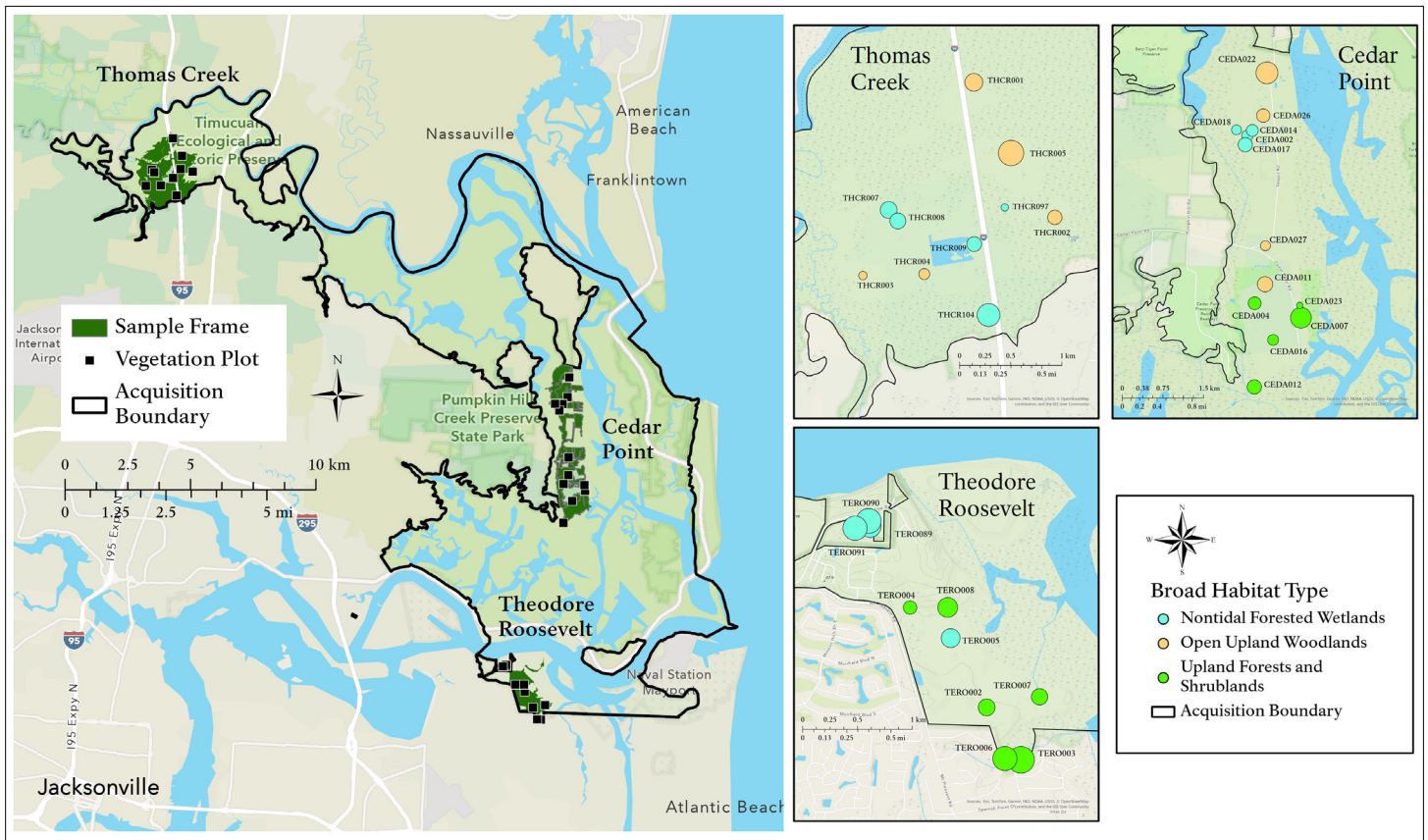
Methods

The network conducts surveys every four years at its parks, part of a long-term monitoring plan. Using permanently established 20×20-meter plots, data collected ranges from species abundance, tree density within canopy, sapling, and seedling size-classes, disturbances and threats, environmental attributes of the site, and the presence of downed woody debris for fire fuel estimation. During initial surveys at the Preserve in 2019, 23 plots were established across three broad habitats including nontidal forested wetlands, or low lying areas frequently or seasonally inundated with water but not influenced by tides; open upland woodlands, or pine-dominated communities with generally widely spaced trees occurring on relatively flat



Top, site CEDA018 in the Cedar Creek management unit during monitoring in 2023. Bottom, SECN plot diagram, a modified version of Level 5 Carolina Vegetation Survey. Black circles show ideal locations for rebar used as permanent markers of the plot. Blue lines represent fuel transects.

landforms; and upland forests and shrublands, or maritime-influenced hardwood- and occasionally pine-dominated forests occurring on rolling topography that represents former coastal dunes; all within three management units: Cedar Creek, Theodore Roosevelt and Thomas Creek. Ten more plots were established in 2023 making it 33 total across the park.

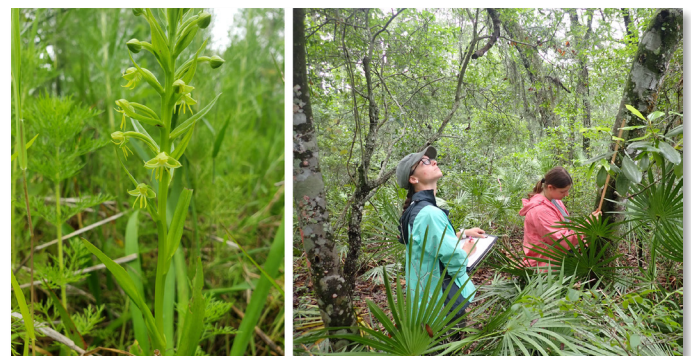


Left, Southeast Coast Network's vegetation monitoring sampling frame with plot locations. Right, plot locations within broad habitat types illustrating species diversity by plot. NPS / SECN

Results

Nearly 250 vascular plant taxa, including 37 not found previously, were detected. Two invasive species listed by the Florida Invasive Species Council, downy maiden and narrow sword fern, were among them. The most frequently occurring species across all plots were muscadine, saw palmetto and dune greenbrier. Other non-native species observed in 2023 include eight listed by the Florida Invasive Species Council. The most frequently occurring was Chinese tallow. Others included camphortree, downy maiden fern, common lantana, primrose-willow, Japanese climbing fern, narrow sword fern, and water spangles. Overall, invasive species were low across the Preserve, except for three plots within Spanish Pond, on the northern end of the Theodore Roosevelt Unit. One rare species tracked by the state of Florida, buckthorn bully, was detected during the latest round of surveys.

In both nontidal wetland and upland forest and shrubland plots of the Preserve, the number of live trees increased from 2019 to 2023, but in open upland woodland plots, because lots of trees died in the Yellow Bluff Wildfire in 2019, there was a reduction. Tree-sized species detected in the latest round within nontidal forested wetlands included loblolly bay, slash pine, swamp tupelo, and water oak. Within open upland woodlands, it was slash pine and longleaf pine; and within upland forests and shrublands, the list included live oak, cabbage palmetto, sand laurel oak, and pignut hickory.



Left, water-spider orchid (*Habenaria repens*) observed in one of the three newly established plots in Spanish Pond. Its conservation status is listed as vulnerable in Florida. Photo by Hanna Rosner-Katz. Right, Taking tree measurements at Timucuan E&HP in 2023. NPS / SECN

Red bay and swamp bay were historically dominant understory or shorter trees within the Preserve. They have nearly been eliminated over the past 20 years due to the presence of laurel wilt disease, a fungal pathogen that impacts these bay species and other plants within the Laurel Family. Just a single red bay tree was found in the network's plots across the Preserve in 2023. But there is some good news. Although red and swamp bay were mostly absent from the canopy, they were present and, in many cases, abundant within the seedling and sapling layers of all broad habitat types across the Preserve.

Results (continued)

Long-term monitoring will assess whether these younger individuals survive over time to re-establish within the subcanopy of these forests. Overall, sapling regeneration across the Preserve is low. In other eastern U.S. parks, this is often caused by heavy browsing by white-tailed deer. At Timucuan, it could be deer, feral hogs, or other factors. Again, long-term monitoring will help determine the causes and whether low sapling numbers continue.

No widespread disturbances were observed in vegetation plots within nontidal forested wetlands or upland forests and shrublands. The most common disturbances were wind damage, remnants of past fires, and former land use like timber harvesting. As mentioned before, recent fire history has had a major impact on open upland woodlands. The Yellow Bluff Wildfire caused heavy canopy tree loss between 2019 and 2023 in areas that had not burned for decades. When fire occurs after long periods without burning, it is hotter and more intense, damaging soil and canopy. Historically, these pine flatwoods burned every one to three years at a low intensity. Today, unburned stands outside the footprint of the Yellow Bluff fire still resemble pre-fire conditions, but if they burn after 20-plus years without fire, the damage could be severe.

Long-term monitoring will continue at Timucuan Ecological and Historic Preserve with another round of surveys in 2027.

About the Southeast Coast Network

In 1999, the National Park Service initiated a long-term ecological monitoring program, known as "Vital Signs Monitoring," to provide the minimum infrastructure to allow more than 270 national park system units to identify and implement long-term monitoring of their highest-priority measurements of resource condition. Monitoring resources in parks develops scientifically sound information on the current status and long-term trends in the composition, structure, and function of park ecosystems, and determines how well current management practices are sustaining those ecosystems. The NPS Vital Signs Monitoring Program addresses five goals for all parks with significant natural resources:

- Determine the status and trends in selected indicators of the condition of park ecosystem,
- Provide early warning of abnormal conditions,
- Provide data to better understand the dynamic nature and condition of park ecosystems,
- Provide data to meet certain legal and Congressional mandates, and
- Provide a means of measuring progress towards performance goals.



Top, plot THCR001 after the Yellow Bluff Wildfire in 2019. Above, the same plot during the 2023 survey. NPS / SECN

The Southeast Coast Network (SECN) includes eighteen administrative areas containing twenty park units, fifteen of which contain significant and diverse natural resources. In total, SECN parks encompass more than 184,000 acres of federally-managed land across North Carolina, South Carolina, Georgia, Alabama, and Florida. The parks serve a wide diversity of cultural and natural resource missions and include: five national monuments, four national seashores, three national battlefield parks, two national historic parks, a national memorial, a national recreation area, an ecological and historic preserve, and a single national park. The parks range in size from slightly more than 20 acres to nearly 60,000 acres, and when considered with non-federal lands jointly managed with NPS, the network encompasses more than 253,000 acres.

For More Information

SECN Home Page

<https://www.nps.gov/im/secn/index.htm>

SECN Reports & Publications:

<https://www.nps.gov/im/secn/reports-publications.htm>

About the NPS Inventory & Monitoring Program:

<https://www.nps.gov/im/index.htm>

Data Downloads via the Natural Resource Information Portal:

<https://irma.nps.gov/Portal/>