St. Johns River Water Management District

Indian River Lagoon/ Upper St. Johns River Basin Plan

2026

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Introduction

The St. Johns River Water Management District (District) is a science-based organization responsible for managing and protecting water resources in northeast and east-central Florida. The District's mission is to ensure adequate water supplies to meet the needs of current and future users while protecting and restoring water quality and related natural resources.

Water resource opportunities and challenges vary across the District and evolve over time. To focus its resources and efforts more effectively and efficiently, the District is divided into four strategic planning basins: Lower St. Johns River Basin, Ocklawaha River Basin, Middle St. Johns River Basin, and the Indian River Lagoon/Upper St. Johns River Basin (IRL/USJRB). Within each strategic planning basin, the District identifies regional priorities and works with stakeholders and local government partners to identify and implement solutions that protect our natural resources and support Florida's growth by ensuring the sustainable use of Florida's water for the benefit of the people of the District and the state.

The IRL/USJRB covers more than 3,158 square miles and encompasses Brevard and Indian River counties, and portions of Volusia, Seminole, Orange, Osceola, and Okeechobee counties. The Indian River Lagoon (IRL) is a significant surface water basin in the southern portion of the District. Despite its name, the IRL is not a river but a shallow-water estuary. The IRL is comprised of three lagoons—Mosquito Lagoon, Banana River, and Indian River—that collectively span 156 miles, extending from Ponce de Leon Inlet in Volusia County to the southern boundary of Martin County.

The Upper St. Johns River Basin (USJRB), which forms the headwaters of the St. Johns River, begins in the vast freshwater marshes and swamps of Fort Drum Creek in Indian River and Okeechobee counties. It flows northward for approximately 30 miles before a defined river channel finally forms just south of Lake Hell n' Blazes in southern Brevard County. The USJRB continues north at the confluence between the St. Johns and Econlockhatchee rivers in Seminole County, a distance of over 110 river miles.

The Upper St. Johns River Basin Project (USJRBP) is a multi-decade collaboration between the U.S. Army Corps of Engineers (USACE) and the District. The 166,500-acre project uses the historic floodplain to provide flood protection, improve water quality, support water supply, and protect natural resources. This project combines structural features, such as levees, pump stations, and water control structures, with a semi-structural approach that allows the floodplain to store and move water more naturally, helping balance water management needs with environmental protection.

Executive Summary
Indian River Lagoon

The strategic priorities for the IRL are water quality, seagrass assessment, and coastal wetland restoration and resiliency.

The IRL water quality priority success indicators include reducing excess nutrient loading to the IRL through targeted nutrient-reduction projects, operating District projects that restore the historic watershed boundary between the IRL and USJRB, such as the USJRBP, Fellsmere Water Management Area (FWMA), Crane Creek/M-1 Canal Flow Restoration Project, and the completion of the design for the C-10 Water Management Area project. The District will also continue enhanced monitoring efforts, conduct in-depth data analyses, and develop the annual Status and Trends Report to further support project development. Finally, the District will advance the IRL Water Quality Modeling project by analyzing the effects of load reductions on nutrient and algal biomass concentrations in the IRL and simulating water quality in both natural and engineered systems.

The priority for IRL seagrass focuses on continued research to support the successful establishment of submerged aquatic vegetation (SAV) and improving understanding of the distribution and behavior of seaweed (*Caulerpa*) in the IRL while developing opportunities with partners to advance seagrass restoration efforts. Success indicators supporting this priority include advancing the Caulerpa Mapping project to enhance understanding of how seaweed interacts with and potentially impacts seagrass, a factor essential to meeting restoration goals. Additional efforts include completing the 2025 Seagrass and Caulerpa Mapping project to produce lagoon-wide maps derived from aerial photography, providing a comprehensive assessment of distribution in the IRL. The District will also begin Phase 2 of the IRL Seagrass Seedbank Assessment project to identify factors influencing seagrass growth and seed abundance, which will inform site selection for future plantings. Monitoring efforts will include tracking seasonal changes in seagrass populations at 100 sites across the IRL. The District will continue cooperative research aimed at improving the understanding of seagrass life history and resilience within the IRL.

The coastal wetland restoration and resiliency priority will focus on acquiring key parcels along the IRL, in collaboration with partners, to support the preservation and restoration of coastal wetlands. Success indicators for this priority include completing the Indian River County South Oslo Riverfront Conservation Area Restoration project, which will involve removing approximately 1,100 linear feet of perimeter dike associated with a mosquito impoundment, and the Riverside Conservancy Living Shoreline project. Additional efforts will focus on removing 14 miles of mosquito-impoundment dike at the Merritt Island National Wildlife Refuge, an action that will return more than 85 acres to natural wetland elevation and enhance approximately 1,100 acres of wetlands.

Executive Summary
Upper St. Johns River Basin

The strategic priorities for the USJRB include water quality and environmental restoration.

The lakes of the USJRB face multiple threats that require a clear understanding and effective management strategies to protect the health of the basin. Water quality success indicators include completing ongoing projects, advancing new project opportunities, and finalizing the Florida Department of Environmental Protection (DEP)-funded research on phosphorus management related to Class B biosolids applications. The USJRB water quality projects support these goals through continued monitoring, analysis, and reporting, as highlighted in the annual Status and Trends Report. Efforts also focus on sustaining and expanding invasive fish harvest programs to accelerate nutrient reductions and exploring incentives for commercial harvests. Additionally, the District provides essential modeling and analytical support to evaluate nutrient loading and enhance DEP's St. Johns River Water Quality Model, ensuring management decisions are grounded in sound scientific data.

The wetland communities, tributaries, uplands, and lakes that make up the USJRB form the ecological core of the entire St. Johns River system. Improving these interconnected natural communities is essential to effective, adaptive management of the basin. Environmental restoration success indicators for the USJRB focus on maintaining control of invasive and nuisance upland and aquatic vegetation, optimizing hydrologic management, and ensuring that the environmental needs are met through targeted research and project development.

Key initiatives include preserving and protecting water resources through strategic land acquisitions identified in the annual List of Critical Wetlands and Five-Year Land Acquisition Plan and supporting science-based decision-making through continued collection of hydrologic, water quality, and ecosystem indicator data. Additional efforts involve evaluating topographic changes in the marsh conservation areas (MCAs) to inform future management strategies; supporting endangered snail kite populations through monitoring, interagency coordination, and water management activities; and using remote sensing technologies to monitor plant communities and guide restoration actions. The District also prioritizes maintaining and enhancing District-owned lands through habitat restoration, prescribed fire, and invasive species management.

Essential modeling support is also provided for environmental restoration and resilience projects, including evaluating alternative regulation schedules for the USJRBP, improving emergency response to flooding, and assessing changes within wetland communities to sustain valuable recreational resources.

IRL/USJRB Strategic Planning Basin
IRL Water Quality

Priority:

- Improve water quality within the IRL

Objectives:

- Continue enhanced monitoring and conduct in-depth data analyses to further project development
- Complete the design of the C-10 Water Management Area project
- Operate the multiple flow diversion projects that restore the historic watershed boundary between the IRL and USJRB, such as the Crane Creek/M-1 Canal Flow Restoration Project
- Reduce excess nutrient loadings and legacy nutrients through nutrient reduction projects

Highlight:

The District has many ongoing activities to protect and improve water quality throughout the IRL/USJRB. A key component of this work is water quality monitoring and reporting. The District has water quality monitoring stations throughout the basin, and the resulting data are critical for identifying existing challenges and emerging trends. Monitoring also helps document water quality improvement, as well as successful habitat restoration, enhancement, and land management projects. These monitoring efforts are closely coordinated with many partners through DEP's total maximum daily load (TMDL) and basin management action plan (BMAP) programs.

The District analyzes and evaluates water quality data in the annual Status and Trends Report. The 2025 report (Figure 1) includes data collected during the status assessment period from January 1, 2020, through December 31, 2024. Stations with at least three years of data during this five-year assessment period were analyzed for their status. The fifteen-year trend assessment period spans January 1, 2010, through December 31, 2024, and requires at least ten years of data from the fifteen years of record to calculate a trend.

Nitrogen and phosphorus concentrations are used to monitor nutrient levels in water bodies, while SAV, or seagrass, serves as the key indicator of overall water quality. Changes in or loss of seagrass may indicate that the system is being stressed.

Algae grow in freshwater, brackish, and marine systems and are an integral part of food webs in healthy ecosystems. However, when ecosystems are stressed by excessive nutrients or hydrologic changes, algae may grow rapidly, resulting in algal blooms. While many algae are physically harmless, the abundance and persistence of blooms may shade out seagrass and reduce dissolved oxygen in the water, which can result in fish kills.

Some algal species produce toxins that can affect drinking and recreational waters, as well as degrade water quality conditions near the algal sources; these are known as harmful algal blooms (HABs).

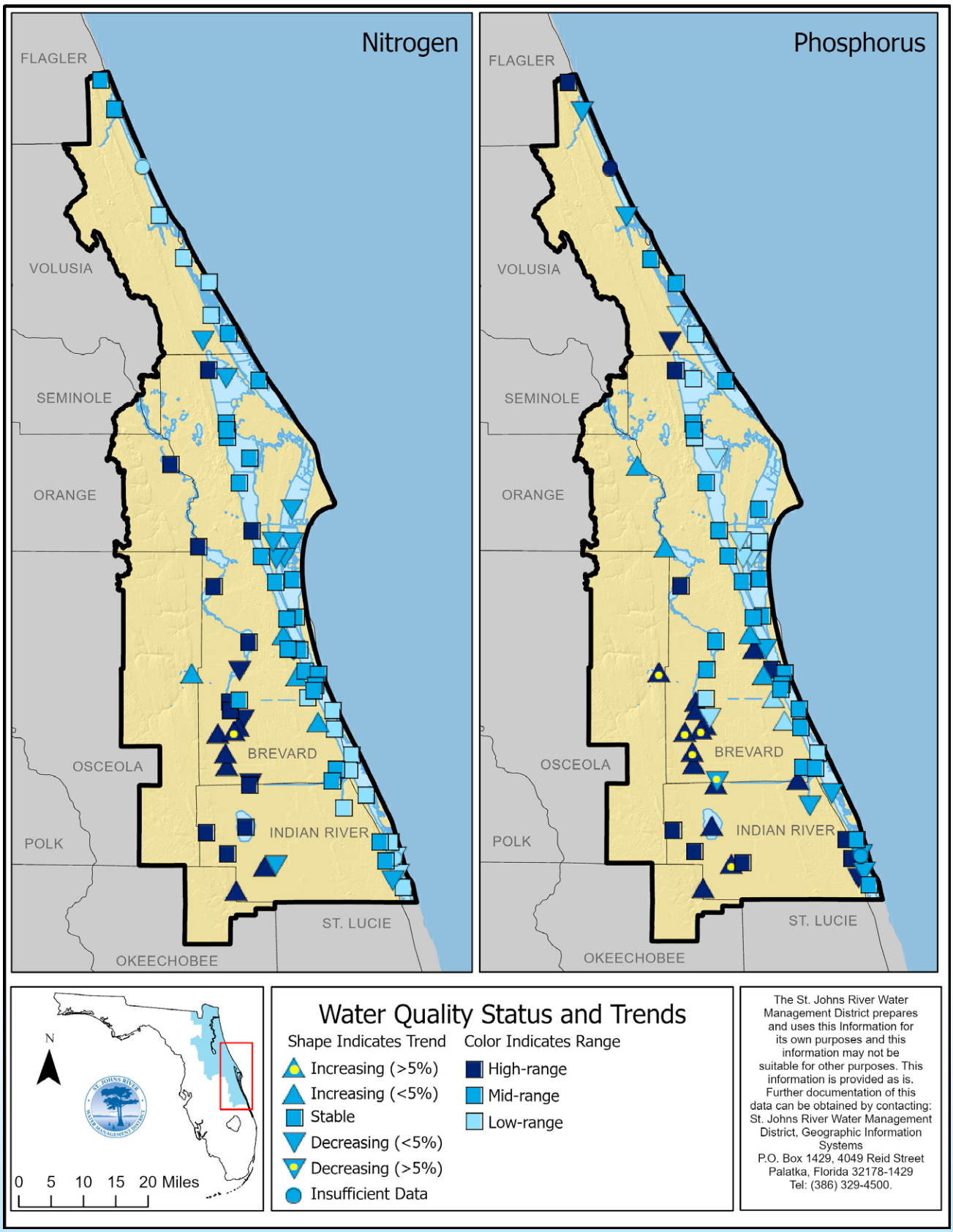

Figure 1. Water quality status and trends in the IRL/USJRB.

Reducing the conditions that lead to prolonged blooms is essential to limiting their intensity, duration, and size.

In the IRL, algal diversity and abundance are measured in coordination with partners, including the Indian River Lagoon National Estuary Program (IRLNEP) and the Phlips Laboratory at the University of Florida (ca. 2002–present). Chlorophyll abundance is also monitored via satellite imagery. The diversity of algal species can inform us of water quality conditions and trends within the IRL.

IRL Water Quality Modeling

The IRL Water Quality Modeling project will implement improvements to the existing water quality model of the IRL and assist in developing IRL water quality management strategies.

The District is analyzing the effects of load reductions on nutrient and algal biomass concentrations in the IRL. These analyses involve updating the existing model to better represent recent bloom events and water quality conditions. The updated model will be used to simulate and predict water quality outcomes of potential projects and is scheduled for completion in late 2028.

C-10 Water Management Area

Located in southern Brevard County, this project includes pumping stormwater from the Melbourne Tillman Water Control District (MTWCD) C-9R and C-10 canals, which currently flow to the MTWCD C-1 Canal and ultimately to the IRL, into a new 1,300-acre stormwater treatment area (STA) for passive nutrient reduction before discharging into the Three Forks Marsh Conservation Area and the St. Johns River. This project provides both water quality and alternative water supply benefits. It will reduce freshwater and sediment, and is expected to reduce nutrient loads to the IRL by approximately 29,300 pounds of nitrogen and 1,300 pounds of phosphorus annually. The estimated flow restoration to the St. Johns River is 8 million gallons per day, increasing alternative water supply availability to downstream users who withdraw water from the river for consumptive uses.

The District anticipates completing design and permitting in 2028. Pending funding, construction is expected to begin in late 2029, with completion in 2032. The estimated total project cost is $105 million. To date, funding includes a $20,614,420 DEP resiliency grant, $10,826,204 from the Brevard County Save Our Indian River Lagoon Program grant, and $20,866,779 committed by

the District's Governing Board in January 2026. The District is continuing to work to secure the remaining funds needed for construction.

Flow Diversion Projects

Over time, the historic watershed boundary between the IRL and USJRB has been altered by a series of east-west canals that increased drainage to the IRL. This artificially increased the loading of freshwater, sediments, and nutrients entering the IRL. Concurrently, these canals drained freshwater from the USJRB and its vast floodplain wetlands.

The District has been implementing projects to reverse the artificial drainage associated with each of these canals. The most recently completed project is the Crane Creek/M-1 Canal Flow Restoration Project. Previous projects addressed drainage via the C-54 Canal, the Fellsmere Main Canal, and the C-1 Canal.

The Crane Creek/M-1 Canal Flow Restoration Project is an important regional water resource development effort completed in spring 2025. The project diverts drainage from a 5,300-acre urbanized watershed away from the IRL, routing it through a STA and back to the St. Johns River. This provides significant water quality benefits to the IRL, including annual nutrient load reductions of approximately 24,000 pounds of nitrogen and 3,100 pounds of phosphorus. In addition, restoring flow west to the USJRB creates approximately 7 million gallons per day of additional alternative water supply.

IRL Feasibility Study Projects

The IRL Stormwater Capture and Treatment Project Development and Feasibility Study, completed in June 2024, identified eight local-to medium-scale stormwater treatment projects for further evaluation to enhance water quality within the IRL (SJRWMD 2024). The 2024 study builds on the 2017 Indian River Lagoon Stormwater Capture and Treatment Preliminary Feasibility Analysis (2017 Study). From these eight projects, the District selected the Micco Water Management Area Improvements and the Chain of Lakes Enhanced Nutrient Reduction projects for further evaluation.

The Micco Water Management Area Improvements project is expected to achieve nutrient reductions of up to 40,000 pounds of nitrogen and 11,000 pounds of phosphorus annually, with an estimated cost of $9.1 million.

The Chain of Lakes Enhanced Nutrient Reduction project has an estimated nutrient reduction of 900 pounds of nitrogen and 80 pounds of phosphorus annually, with an estimated cost of $3.5 million.

Currently, the District is conducting water quality sampling to verify nutrient loads at both sites, with completion anticipated in October 2026. Upon completion, the District may pursue funding and partnerships to advance these projects.

IRL/USJRB Strategic Planning Basin
IRL Seagrass

Priority:

- Protect and enhance seagrass within the IRL

Objectives:

- Understand the distribution and behavior of seaweed in IRL
- Continue seagrass and seedbank research to ensure successful establishment
- Continue documenting seasonal changes in seagrass coverage

Highlight:

Seagrass is a major structural habitat and the primary indicator of the IRL's health. Determining how seagrass populations in the IRL recover after perturbations, such as phytoplankton blooms, is important in understanding the resilience of these critical habitats.

Through collaboration with the Florida Institute of Technology (FIT) and other partners, the District is evaluating the distribution of seagrass seeds and how sediment and dissolved oxygen characteristics influence spatial and temporal patterns of seagrass growth. Phase 1 of this project identified seed distribution patterns and was completed in June 2025. Phase 2 will further evaluate variability in seed densities relative to sediment conditions and changes in seagrass cover using the District's long-term fixed-transect monitoring. Phase 2 is anticipated to be completed by mid-2026. Cooperative efforts to understand the keys to successful establishment of seagrass are ongoing, with the District leading through its comprehensive seagrass monitoring program and years of historical data.

Between 2011–2019, as a result of multiple algal blooms, approximately 58 percent of the seagrasses were lost, with seagrass beds moving shoreward and shallower, and the percent cover of the beds decreased to approximately 4 percent. Since 2021, data shows a 24 percent increase in the areal extent of seagrass. However, most of the increase is in the northern IRL and Mosquito Lagoon.

IRL Seagrass and Seaweed (*Caulerpa*) Mapping

The IRL Seagrass Mapping effort produces lagoon-wide maps, derived from aerial photography, and provides a comprehensive assessment of seagrass in the IRL every two years. These important management tools provide an inventory of this valuable resource and support the IRLNEP Comprehensive Conservation Management Plan, the principal objectives of Goals I and II of the IRL Surface Water Improvement and Management Plan, and the TMDL and BMAP processes. District

partners in this mapping effort include DEP and the South Florida Water Management District (SFWMD).

In 2023, seaweed was mapped alongside seagrasses across 218 square miles of the northern IRL and Banana River Lagoon. Within the study area, 58 square miles of seaweed were documented and mapped. The seaweed maps, in addition to seagrass, will provide an understanding of how seaweed interacts with and possibly impacts seagrass, which is important for restoration goals.

The 2025 mapping effort included mapping seaweed with seagrass communities. The 2025 photo interpretation and mapping process for imagery collected is complete and will be available in May 2026.

IRL Seagrass Seedbank Assessment

The IRL Seagrass Seedbank Assessment project documents the distribution of seagrass seeds and sediment conditions within the IRL. The goal is to better understand potential impacts on seagrass growth and spatial understanding of the abundance of seagrass seeds, which will inform site selection for future seagrass planting. Partners include FIT, DEP, Florida Atlantic University/Harbor Branch Oceanographic Institution, SFWMD, and the District. Long-term data from over twenty years of District seagrass surveys and water quality monitoring were used to guide site selection.

Phase 1 data analyses, focused on the northern IRL boundary, were completed in June 2025. Phase 2 will expand data collection across the entire IRL, including SFWMD boundaries. The District will assist in data collection of seeds and sediments adjacent to existing long-term seagrass monitoring transects, data analyses, and reporting. Phase 2 is expected to be completed in June 2026.

IRL Seagrass Transects

For thirty years, IRL seagrass beds have been surveyed at least twice annually during summer and winter. Staff monitor 100 sites to document seasonal variation in seagrass populations, working in coordination with biologists at National Aeronautics and Space Administration (NASA), DEP, SFWMD, Florida Fish and Wildlife Conservation Commission (FWC), Florida Oceanographic Society, University of Florida, and the Marine Discovery Center. These long-term datasets have been invaluable in revealing status and trends in seagrass growth and declines, particularly following the algal "superbloom" in 2011.

IRL/USJRB Strategic Planning Basin
IRL Coastal Wetland Restoration and Resiliency

Priority:

- Continue acquisition and restoration of IRL coastal wetlands

Objectives:

- Acquire key parcels along the IRL in collaboration with partners for the purpose of preservation and restoration of coastal wetlands
- Work with partners on the restoration of publicly owned and impacted coastal wetlands and shorelines

Highlight:

Coastal wetlands are among the most biologically productive natural systems on Earth. These habitats serve as transitional zones between land and sea, providing a wide range of valuable ecosystem functions. District staff will continue to pursue opportunities to preserve and restore these areas. As part of ongoing efforts to reverse historic impacts to coastal wetlands and restore the economic benefits they provide, the District and its partners have identified key lands for acquisition through the District's List of Annual Critical Wetlands and Five-Year Land Acquisition Plan. In addition, the District can use intergovernmental agreements with its partners to accelerate and facilitate coastal wetland restoration efforts.

The Merritt Island National Wildlife Refuge T-10-H Dike Removal and Sternstein-Canaveral National Seashore Dragline projects are recent examples of coastal wetland restoration projects completed in cooperation with local partners and the U.S. Fish and Wildlife Service.

Design and permitting have been completed for the Riverside Conservancy Living Shoreline and South Oslo Riverfront Conservation Area

Restoration projects, with construction expected to be completed in fall 2026.

Additional IRL Acquisition and Restoration

The District has identified previously impounded or impacted coastal resources in previous planning efforts. Preservation and restoration of these impacted coastal wetlands remain ongoing priorities in collaboration with our partners. These projects may include acquisition (District or partner) to facilitate restoration or rehabilitation of these critical resources.

The District is also establishing intergovernmental agreements with collaborating local governments specifically for coastal wetland restoration projects. These agreements will improve coordination between entities and accelerate implementation.

Merritt Island National Wildlife Refuge Dike Removal

The Merritt Island National Wildlife Refuge T-10-H Dike Removal project was completed in spring 2025. Construction included removing approximately 3 miles of a mosquito impoundment perimeter dike in the Merritt Island National Wildlife Refuge and restoring and improving an impacted portion of coastal wetland in the IRL. The removed dike area was returned to tidal wetlands, while the wetlands within the impoundment benefit from increased connectivity with the IRL. These improvements enhance wildlife habitat, fisheries habitat, and wetland-driven water quality functions.

With remaining project funds, an additional 14 miles of dike removal is planned for completion in 2026, returning more than 85 acres to wetland elevation and enhancing approximately 1,100 acres of wetland impoundments.

Indian River County South Oslo Riverfront Conservation Area Restoration

The Indian River County South Oslo Riverfront Conservation Area Restoration project consists of removing approximately 1,100 linear feet of perimeter dike of a mosquito impoundment. The project will improve water exchange between impounded mangroves and the IRL and restore the area to provide more natural water levels. Additional benefits include restoration of wetland vegetation and improved wildlife and fisheries habitat. The project is expected to be completed in fall 2026.

Riverside Conservancy Living Shoreline

The District is collaborating with the Riverside Conservancy, located in southeastern Volusia County, to restore approximately 1 mile of shoreline through the construction of a living shoreline that will include mangroves, salt marsh vegetation, and the installation of oyster reef modules. The project will be completed in 2026.

IRL/USJRB Strategic Planning Basin
USJRB Water Quality

Priority:

- Ensure the sustainability of the USJRB water quality improvement projects
- Work with DEP to meet existing TMDLs and BMAPs and establish new ones to address impairments

Objectives:

- Complete ongoing water quality projects and investigate further project development
- Complete DEP-funded research on phosphorus management strategies from the application of Class B biosolids

Highlight:

The lakes of the USJRB face multiple stressors. Nutrient enrichment contributes to HABs, which can be toxic and shade the water column, reducing the light available to support critical SAV. The USJRBP incorporates large water management areas (WMAs) that filter nutrients from the water before discharging downstream. These areas also separate nutrient-rich water from MCAs.

Currently, approximately fifty water quality stations are monitored at least monthly within the USJRB. This includes two bi-weekly stations, three DEP HAB stations, and two continuous monitoring stations.

The District analyzes and evaluates water quality data in the annual Status and Trends Report. The 2025 report (Figure 1, pp. 8) is based on data from January 1, 2020, through December 31, 2024. Stations with at least three years of data during the five-year assessment period of record were analyzed for their status. The fifteen-year trend assessment period spans from January 1, 2010, through December 31, 2024, requiring at least ten years of data from the fifteen-year period of record to calculate a trend.

Calculations of annual average total nitrogen and total phosphorus loading from 2016–2020 suggest a recent increase in total phosphorus loads to Lake Washington is exceeding the nearby TMDL target.

USJRB Invasive Fish Harvest

The USJRB Invasive Fish Harvest project removes invasive fish species (tilapia, brown hoplo, and armored sailfin catfish) to support phosphorus reduction. This effort began in 2022 on Lake Winder and has expanded annually; nine lakes will be included in 2026. Harvesting occurs annually from January through June by contracted commercial fishermen.

In addition to being an effective tool for reducing phosphorus levels, the removal of invasive fish reduces sediment resuspension and minimizes destabilization of riverbanks caused by the burrowing behaviors of these species.

The removal of invasive fish may also support the recovery of SAV. By reducing sediment

resuspension, turbidity in the water column decreases, allowing more light to reach and support SAV growth. In addition, fewer fish can mean less physical disturbance and uprooting of existing vegetation, improving conditions for SAV to establish and expand.

Modeling to Support Water Quality Improvement Projects

The District utilizes hydrologic, ecological, and water quality models to guide planning efforts, evaluate management decisions, and investigate various environmental dynamics. Key modeling efforts that support water quality improvement projects include developing methodologies for incorporating Class B biosolids nutrient loading into water quality models, with model refinement planned to conclude in late 2026. Additionally, District staff provide data support and technical review for DEP's St. Johns River Water Quality Model, which guides TMDL and BMAP development and is scheduled for completion in 2027.

Biosolids Investigation

One source of phosphorus in the USJRB is from the land application of Class B biosolids. DEP is funding applied research to identify solutions to reduce potential impacts that phosphorus-rich Class B biosolids can pose to water quality in USJRB receiving water bodies. This collaborative effort with the University of Florida and Florida International University is scheduled to be completed in 2027.

IRL/USJRB Strategic Planning Basin
USJRB Environmental Restoration

Priority:

- Continue environmental restoration efforts in the USJRB

Objectives:

- Complete research and develop projects to optimize hydrologic and water quality management, and ensure the environmental needs of the system are met
- Achieve and maintain control of invasive and nuisance upland and aquatic vegetation

Highlight:

One way the District fulfills its mission to preserve and protect Florida's water resources is through land acquisition and management. The primary goal of buying land is to protect water resources, especially wetlands. In addition, these lands protect plant and wildlife habitat and provide areas for public recreation and environmental education. The future acquisition strategy for the IRL and USJRB will focus on lands identified on the annual List of Critical Wetlands and the Five-Year Land Acquisition Plan for water resource protection, natural systems enhancement or restoration, floodplain connectivity, and optimal land management boundaries.

The District requires ongoing data collection on hydrologic, water quality, and key ecosystem indicators to make science-based decisions. As such, the District maintains ambient monitoring of hydrology, water quality, and biological indicators at key locations around the District. These data guide actions related to each of the District's core missions. In the USJRB, real-time hydrologic monitoring is critical to the management of the many water control structures associated with

the USJRBP. These data support timely flood protection operations while maintaining water levels needed to sustain the abundant wetlands and water quality treatment areas. To evaluate the health of the restored wetland plant communities and ensure compliance with permit criteria associated with permits to construct the project, the District conducts detailed wetland mapping. This work uses satellite imagery with community identification processed via machine learning, supported by extensive field verification.

Elevation Transects in Blue Cypress Marsh Conservation Area

The Elevation Transects in Blue Cypress Marsh Conservation Area (BCMCA) project will evaluate topographic elevations and soil characteristics to assess changes in land surface conditions and soil conditions to support future evaluations

of hydrologic performance. Soil sampling and characterization will build upon this survey data and is expected to be completed by late 2026. This work expands on prior surveys on adjacent properties that illustrated large changes in land elevation due to changing hydrologic conditions.

Hydrologic Restoration in the St. Johns Marsh Conservation Area

The Hydrologic Restoration in the St. Johns Marsh Conservation Area (SJMCA) project focuses on reestablishing more desirable water levels. One project being contemplated involves the installation of two 1,000-foot earthen plugs on the western side of the SJMCA. Four other earthen plugs on the eastern side along the C-40 Canal will also be improved to rehydrate the marsh in the southern and mid-sections of the marsh. These actions are expected to improve both water quality and habitat conditions.

Survey of Snail Kite Breeding and Habitat Use in the USJRB

Annual surveys of the federally endangered snail kite have been conducted in the USJRB since the mid-1980s. In cooperation with University of Florida researchers, these surveys document snail kite habitat use and reproduction activity and provide valuable information that helps guide water management activities within the USJRB. Snail kites depend on healthy, diverse wetlands to provide sufficient food resources (apple snails) and suitable areas for nesting and are therefore excellent indicators of wetland health. During peak nesting months, March through June, surveys are conducted every two to three weeks; outside of this period, surveys are conducted monthly.

Modeling to Support Environmental Restoration and Resilience Efforts

Modeling to support environmental restoration and resilience initiatives includes evaluating alternative regulation schedules for the USJRBP, informing emergency responses to flooding, and

updating the existing USJRB hydrology model to guide management decisions. Different water regulation options are being evaluated to see how the system can be managed more effectively for wetland restoration and flood protection, with this work expected to be completed by mid-2026. The USJRB real-time flood forecasting model has been operational since 2024 and will continue to operate during the 2026 hurricane season to forecast flooding at key lakes, rivers, and roads. In addition, the USJRB hydrology model will be updated in early 2026 using new elevation data to better understand how water moves through wetlands in the BCMCA and how management actions may affect wetland conditions.

Plant Community Mapping

The Plant Community Mapping effort uses remote sensing to monitor vegetation across the USJRB. Information collected from plant community monitoring is useful for a number of purposes, ranging from evaluating the quality of fish and wildlife habitat to documenting the success or failure of various restoration and management activities. Basin-wide mapping occurs every seven years. Initial mapping began in 2001 using aerial imagery; satellite imagery has been used since 2022 and will be used for future mapping efforts, with the next mapping cycle to begin in 2029.

Land Management and Invasive Plant Management Programs

The District's Bureau of Land Resources is responsible for habitat restoration, prescribed fire and wildfire response, and invasive and nuisance species management on 435,000 acres of District lands. Land management plans approved by the Governing Board establish the philosophy and direction for management of each property and ensure protection of water resources, habitat diversity, compatible recreation, restoration goals, and the continuation, where possible, of traditional land and water resource uses. Legislative directives guide the land management planning process from acquisition evaluations to the development of land management plans. These plans identify resource needs and compatible uses, and the District solicits public input in the review and update of each plan.

The District's Invasive Plant Management Program manages invasive and nuisance upland and aquatic vegetation on District lands. The program's goal is to maintain invasive and nuisance plant populations at the lowest feasible levels to support native vegetation, protect water resources, and provide for the operation and maintenance of District regional flood protection projects.

Basin Overview
Physiography of Basin

To focus its resources and efforts more effectively and efficiently, the District is divided into four strategic planning basins: Lower St. Johns River Basin, Ocklawaha River Basin, Middle St. Johns River Basin, and the IRL/USJRB (Figure 2).

Approximately two-thirds of the length of the IRL falls within the District's boundaries, extending from Volusia County to Indian River County. In 2016, the IRLNEP extended its boundary north by 25 miles into the Volusia County Halifax River sub-basin, adding 310 square miles to the IRL watershed.

The IRL is one of the most diverse estuaries in North America, and its natural resources provide substantial economic goods and services. The lagoon spans approximately 353 square miles and receives drainage from 2,284 square miles. The western side of the IRL basin is separated from the USJRB by the Atlantic Coastal Ridge, which extends along the eastern portions of Indian River, Brevard, and Volusia counties. Freshwater inputs to the IRL include stormwater runoff, groundwater, rainwater, and tributary and canal discharges. Major natural tributaries include the Sebastian River, Turkey Creek, Crane Creek, Eau Gallie River, Addison Creek, Spruce Creek, and Tomoka River (Figure 3).

The USJRB encompasses more than 1 million acres and historically included nearly 400,000 acres of floodplain marsh that formed the headwaters of the St. Johns River. The western boundary of the basin is defined by the Osceola Ridge, which rises 60–80 feet above sea level. The basin extends along the western edge of Brevard and Indian River counties and occupies small portions of Orange, Seminole, and Volusia counties. Forty-six blackwater streams flow east from the ridge into the upper St. Johns River. Some of the major USJRB tributaries include Taylor Creek, Jane Green Creek, Cox Creek, Wolf Creek, Blue Cypress Creek, and Fort Drum Creek.

The basin also contains several shallow lakes, including Blue Cypress, Hell'n Blazes, Sawgrass, Little Sawgrass, Washington, Winder, Florence, Poinsett, and Puzzle lakes. Lake Washington, a Class I Waterbody, serves as the primary public water supply for the City of Melbourne.

Several canals, some dating back to the 1800s, were constructed to drain areas within the USJRB for agricultural purposes, flood protection, and to divert that water to the IRL. Some major canals include the Indian River Farms Water Control District canals, C-54 Canal, Fellsmere Main Canal, Sottile Canal, C-1 Canal, and M-1 Canal. Through these canals, large volumes of freshwater have been diverted from the St. Johns River watershed to the IRL and the Atlantic Ocean.

The C-54 Canal was constructed in the 1960s along the Indian River–Brevard County line for flood

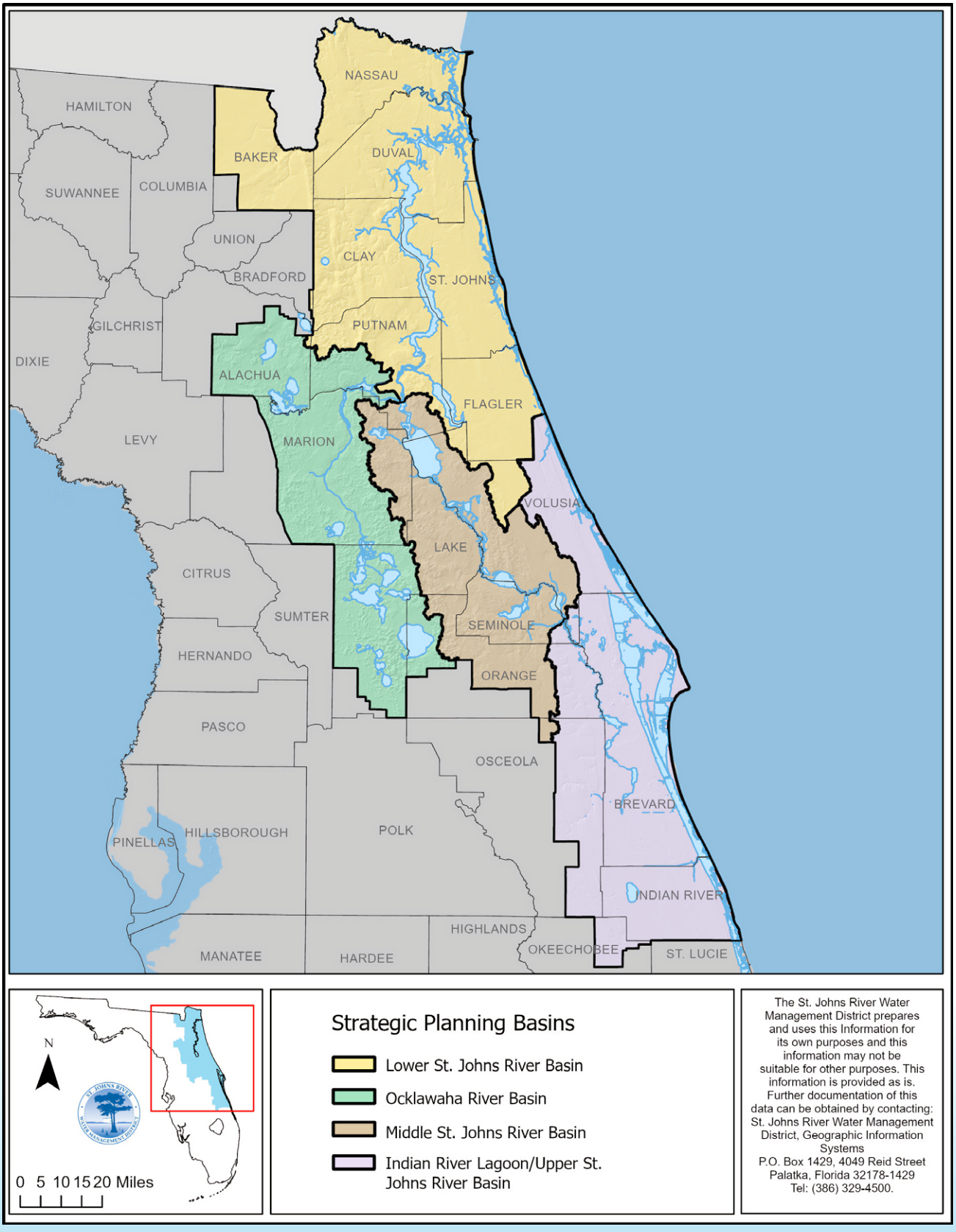

Figure 2. Strategic Planning Basins of the St. Johns River Water Management District.

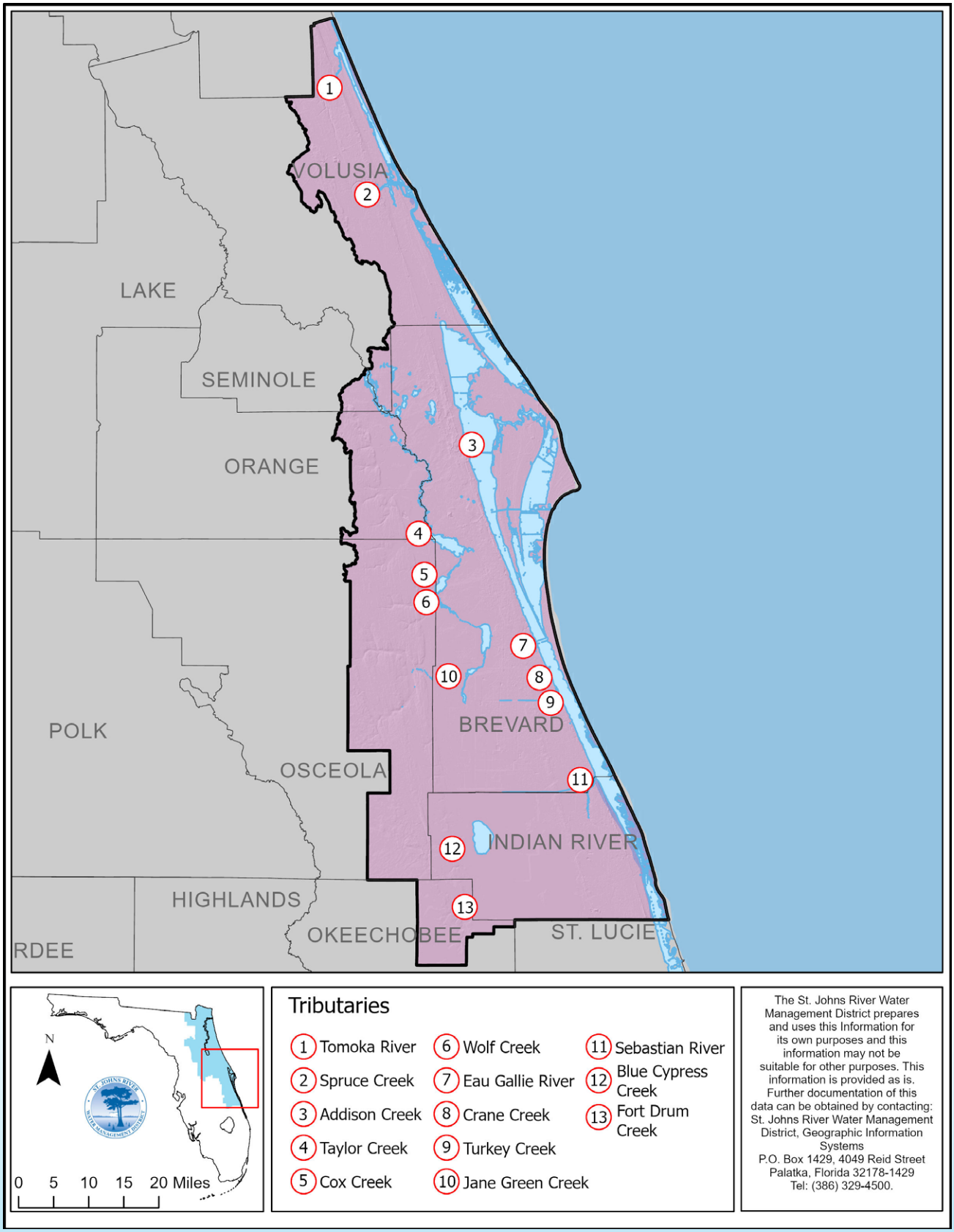

Figure 3. Major tributaries of the IRL/USJRB.

protection and is owned and maintained by the District. Most other canals were constructed as part of drainage projects by Special Water Control Districts (SWCDs) and are owned and maintained by those entities. SWCDs are special taxing districts of the State of Florida (Chapter 298, Florida Statutes) created, in part, to construct, operate, and maintain canals, ditches, drains, levees, irrigation, and water control.

Within the USJRB, there are seven SWCDs, including:

- Delta Farms Water Control District
- Fellsmere Water Control District
- Indian River Farms Improvement District
- Melbourne-Tillman Water Control District
- Sebastian River Water Control District
- St. Johns Improvement District
- Vero Lakes Water Control District

Flood protection within the USJRB is facilitated by a joint federal and state project known as the USJRBP. Initial flood protection efforts in the USJRB began under the USACE through the Central and South Florida Flood Control project (C&SF) in the late 1940s in response to hurricanes and flooding. Construction in the USJRB began in 1966 but was later halted with the passage of the National Environmental Policy Act (NEPA) pending development of an Environmental Impact Statement.

Following a lengthy environmental review, the USJRBP was redesigned to minimize environmental concerns regarding negative impacts to wetlands and the IRL. Construction of the USJRBP resumed in the late 1980s with a focus on using the historic floodplain to store water, improve water quality, provide water supply benefits, and protect natural resources using a semi-structural approach to water management in addition to utilizing structural components, including levees, pump stations, structures, etc. Construction of USJRBP components was completed in 2016, and the project is now fully operational.

The District developed an Environmental Water Management Plan (EWMP) to guide operational decisions for USJRBP discharges. The EWMP supports environmental benefits and will be attached as an appendix to the Master Water Control Manual for the project.

The USJRBP extends approximately 40 miles, from Indian River County north of the Florida Turnpike to Lake Washington in central Brevard County. The project includes more than 100 miles of flood protection levees, seven major gated spillway structures, and numerous smaller water control structures. Other key features include two WMAs, four MCAs, and two water retention/detention areas (RAs) (Figure 4).

All project areas store stormwater runoff to provide flood protection. However, when not being used for stormwater storage, individual project area purposes vary. WMAs primarily separate and improve runoff and discharges from adjacent agricultural and urbanized lands and provide water supply for irrigation and freeze protection. MCAs preserve and protect extant basin wetland habitats and provide water to augment dry-season river flows. RAs are managed by partner agencies for wildlife habitat.

Adjacent to the USJRBP, the District has constructed, or is planning to construct, four WMAs that lie outside the federal levee system, including the FWMA, Blue Cypress WMA-East, Sawgrass Lake WMA, and the C-10 Water Management Area project.

All WMAs, MCAs, and RAs, both within and outside the federal project footprint, serve to improve the quality of runoff water diverted to the basin and support water supply benefits, provide fish and wildlife habitat, and offer recreational opportunities such as fishing, hunting, boating, and birding, as well as contribute to USJRBP goals. Storing water in these areas greatly reduces the need to discharge potentially damaging quantities of freshwater, sediments, and nutrients to the IRL.

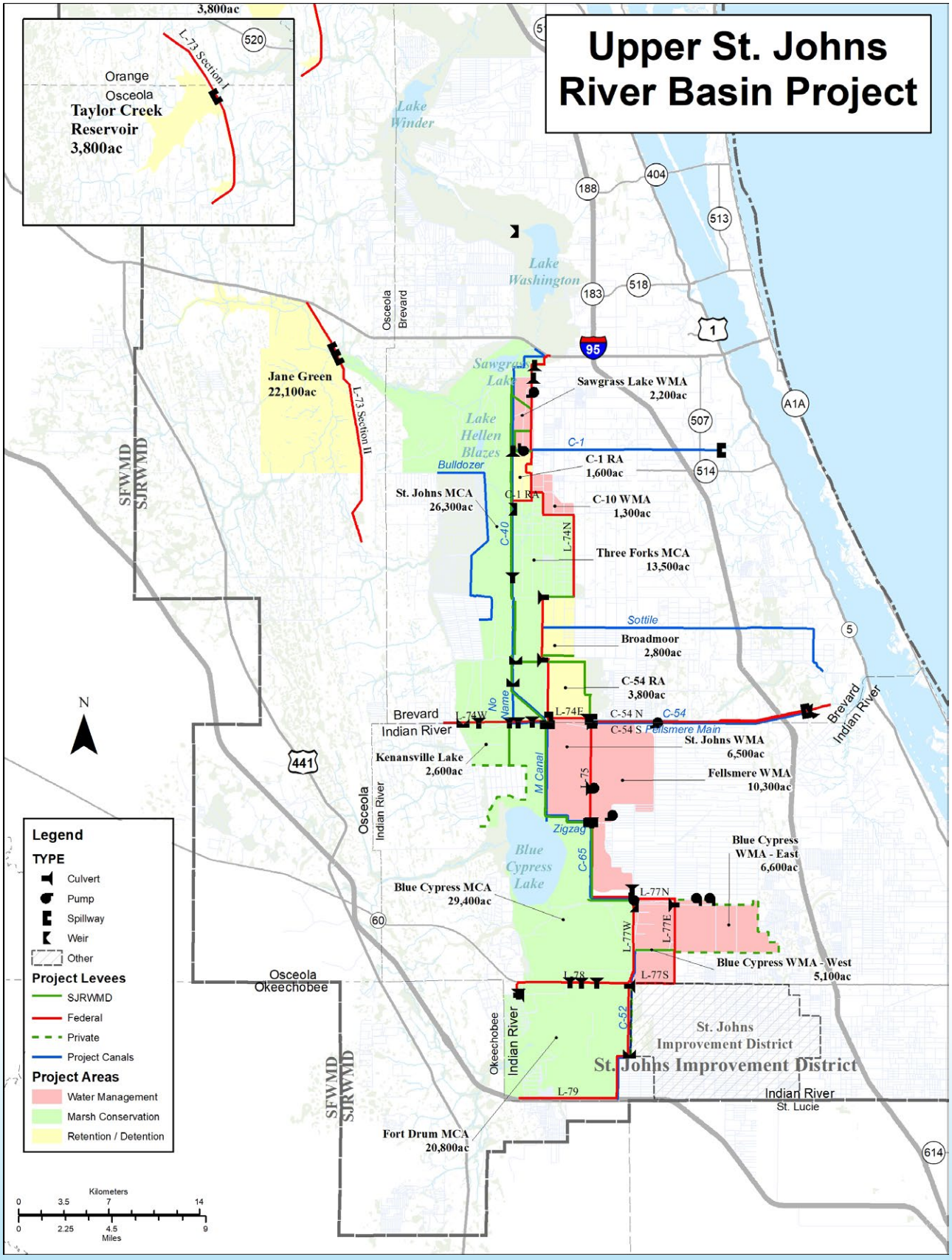

Figure 4. USJRBP map.

Water Quality

Protecting and restoring water quality is a core mission of the District. Strategies include a commitment to comprehensive monitoring to guide impairment determinations, manage restoration projects, and evaluate effectiveness. Monitoring provides a wealth of information that enables the District to make resource decisions based on accurate and timely information and documents the condition of more pristine waters. These efforts are closely coordinated with many partners, including DEP's TMDL and BMAP programs.

DEP conducts a biennial assessment of all the major watersheds, or basins, in Florida every two years. Water bodies that do not meet the applicable standards are classified as impaired. The 2022–2024 Biennial Assessment was adopted on August 16, 2024.

DEP has adopted TMDLs for twenty-one water bodies and tributaries within the IRL, three water bodies within the Halifax River system, and three water bodies within the USJRB. Impairments for these water bodies include total nitrogen and total phosphorus and/or low dissolved oxygen levels. TMDLs are developed for water bodies verified as not meeting their water quality standards. TMDL documents are available on DEP's website.

BMAPs contain a comprehensive set of actions designed to achieve pollutant reductions established by a TMDL. There are three distinct IRL BMAPs in the basin due to the IRL's large geographical area and hydrological differences: Banana River Lagoon, Central IRL, and North IRL. No BMAPs have been developed for the USJRB.

Current Status and Trends, District Reporting

Over several decades, water quality in the IRL has degraded due to stormwater discharges, agricultural runoff, wastewater treatment plant effluent, and septic tanks. Water residence time

varies throughout the IRL due to the proximity of inlets and resultant oceanic flushing. For example, residence time in the Banana River Lagoon can be up to two years, increasing vulnerability to HABs as a result of nutrient loading.

The water column shading caused by algal blooms has resulted in declines in seagrass density and cover as documented through the District's long-term seagrass monitoring. Water quality conditions necessary for seagrass recovery in the IRL are the focus for determining IRL TMDLs. The median depth limits of seagrass coverage in the IRL decreased over the years because of changes in water quality conditions resulting from anthropogenic influences. The loss of seagrass has affected other important species, including commercial and sport fisheries and manatees that depend on the seagrass habitat. Over the past decade, multiple prolonged HABs have occurred in the IRL.

For the IRL, the District developed pollutant load reduction goal (PLRG) targets based on maintaining and enhancing the growth and distribution of seagrasses. Targets were developed on the premise that reducing the amount of nutrients and suspended material entering, or made available within the IRL system, will increase water clarity and allow more light to reach the bottom to encourage seagrass expansion. PLRGs were used by DEP to develop the IRL basin TMDLs. Each segment of the IRL has a unique TMDL with required reductions ranging from 35–72 percent of the starting modeled loads. Additionally, eight tributaries of the IRL have established nutrient or dissolved oxygen TMDLs.

The lakes of the USJRB face similar challenges. Nutrient enrichment stimulates HABs, which can be toxic and shade the water column, reducing the light available to support critical SAV. The District's PLRG for the USJRB lakes along the river mainstem (Hell'n Blazes, Sawgrass, Washington, Winder, and Poinsett) established a target total phosphorus concentration threshold that is considered protective of these lakes in reducing the frequency and severity of HABs (Keenan et al. 2002).

Water quality monitoring occurs monthly throughout the IRL and its major tributaries. Across the IRL, there are fifty-five ambient monitoring stations that are monitored for a variety of parameters, such as nutrients, metals, and environmental factors. In addition, there are six continuous monitoring sondes to measure relative chlorophyll, salinity, temperature, depth, fluorometric dissolved organic matter, turbidity, water temperature, pH, and conductivity. Sampling in small, brief watershed conveyances, such as ditches and feeder canals, is project-based.

Salinity trends in the IRL indicate a weak decrease in the Banana River, north IRL, and central IRL. While salinity fluctuations are expected in an estuary, the timing of freshwater input combined with other stressors, such as light or dissolved oxygen limitation events or cool temperatures, can negatively impact flora and fauna throughout the IRL.

Shoal grass, the most abundant canopy-forming seagrass in the IRL, has a wide range of salinity

tolerance and can persist through short periods of fresher waters if other stressors are not present. Other seagrasses, such as widgeon grass, rebound well when salinity is lower and tend to form a robust seedbank. Understanding the cycle of water quality dynamics in the framework of the biological components of the ecosystem is integral to the management of the IRL.

Within the USJRB, approximately fifty water quality stations are monitored at least monthly, including two bi-weekly stations, three DEP HAB stations, and two continuous monitoring stations. Calculation of annual average total phosphorus loading from 2016–2020 showed a 44 percent increase in Lake Washington since the establishment of the TMDL in 2006 (Papacek 2025; Gao 2006). Most of this additional nutrient loading originates from the western watersheds, including the Jane Green Detention Area, the tributaries surrounding the St. Johns MCA, and the structures discharging to the C-40 Canal (Figures 5 and 6). This increase in total phosphorus loading is associated with land use changes in the western portions of the watershed since 2010. Calculation of total nitrogen and total phosphorus loading along the river mainstem shows that due to its large size and associated runoff, the basin contributes approximately 70 percent of the total nitrogen and total phosphorus load to downstream lakes in the Middle St. Johns River Basin. These lakes have total nitrogen and total phosphorus TMDLs that will not be met until loading from the USJR basin is reduced (Gao 2009).

The eastern portion of the watershed contributes 1–3 percent of the western watershed's nutrient contributions and has the benefit of the USJRBP, which was designed to provide both water supply (irrigation and freeze protection) and stormwater treatment for the large citrus groves to the east of the project.

Increased total phosphorus loading in the western USJRB tributaries correlates with increased land application of Class B biosolids in the region

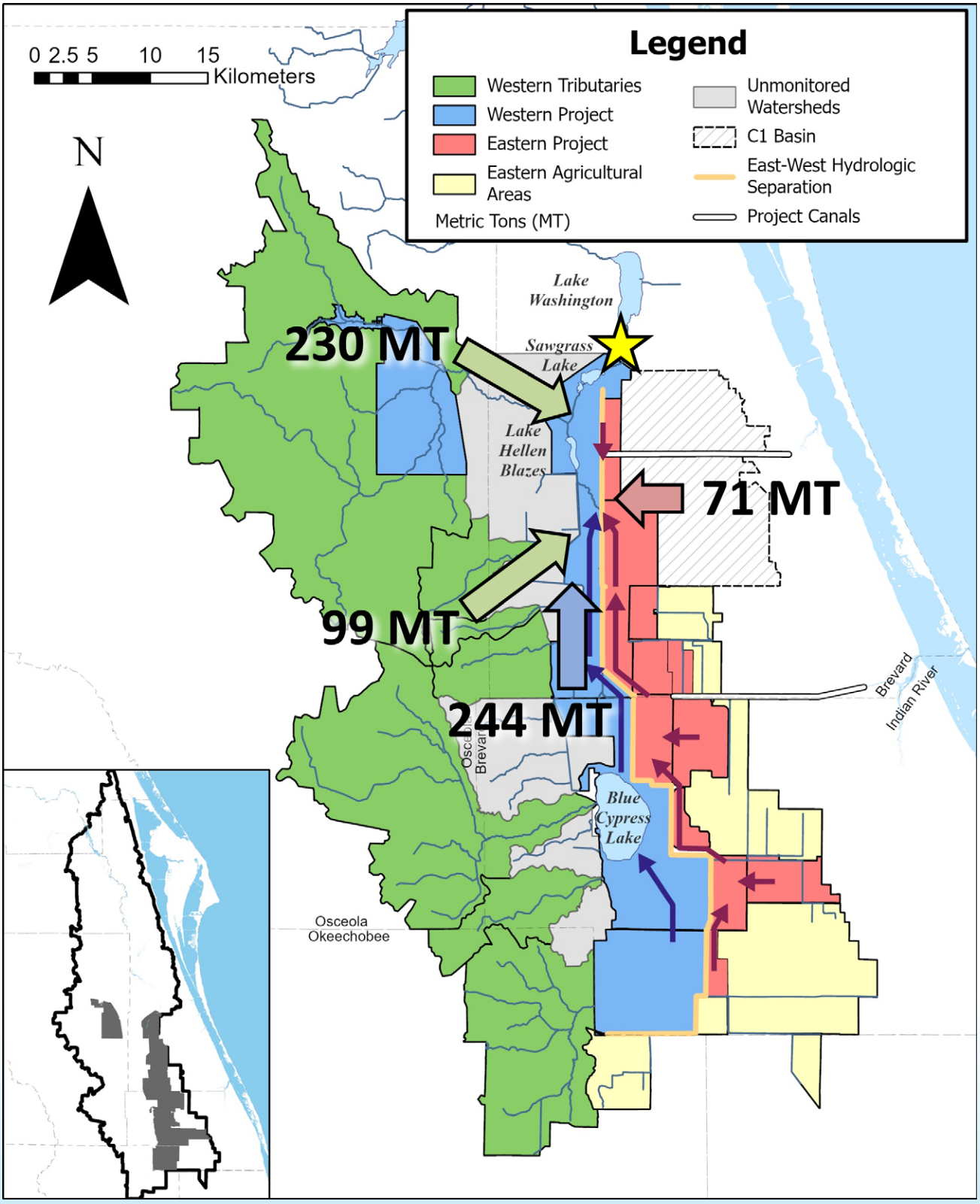

Figure 5. Mean annual total nitrogen loads from USJRB watersheds to Lake Washington from 2016–2020.

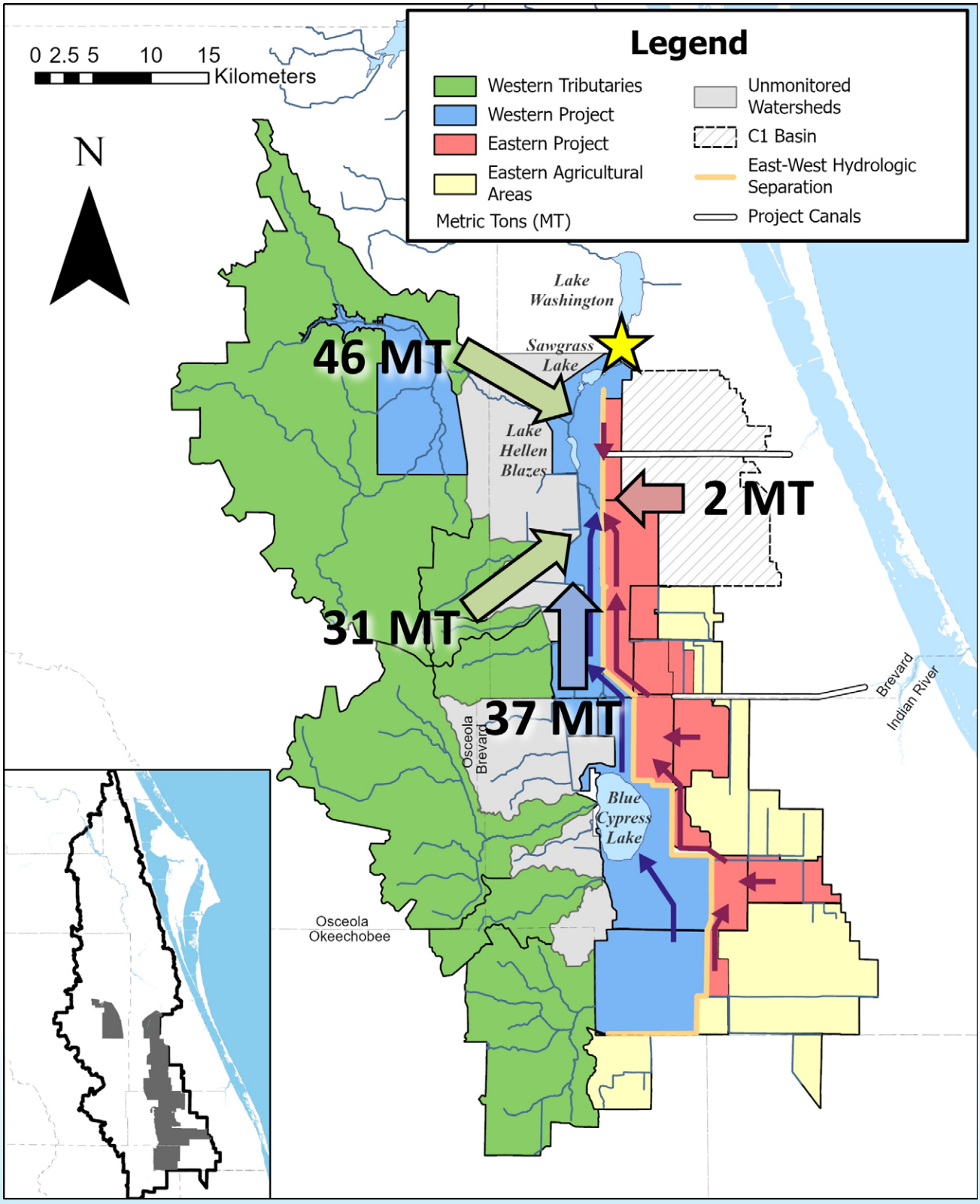

Figure 6. Mean annual total phosphorus loads from USJRB watersheds to Lake Washington from 2016-2020.

(Canion et al. 2021). Following modifications to state rules, which effectively banned application in the Lake Okeechobee-St. Lucie-Caloosahatchee watersheds to the south, application of nutrients derived from biosolids has increased in the USJRB (Figure 7). Several ongoing District projects are directed at improving biosolids management in the USJRB, including increased monitoring within these impacted watersheds, as well as identifying potential solutions.

The 2026 Florida Farm Bill (SB 290), signed into law by Governor Ron DeSantis, includes provisions to phase out the land application of biosolids by 2028. This regulatory change will require adjustments to current management practices and long-term planning.

HAB Assessments

Direct grab samples for HABs are collected and assessed for algal diversity and abundance based on cell counts and chlorophyll concentrations, while satellites also monitor chlorophyll abundance. The diversity of algal species can provide information on water quality conditions and trends within the IRL.

The District, in cooperation with DEP, maintains HAB monitoring stations at Blue Cypress Lake, St. Johns WMA, and Lake Washington. Sampling occurs monthly or twice per month during the peak bloom season (April through October), with results shared with local county health departments and published on DEP's public algal bloom dashboard.

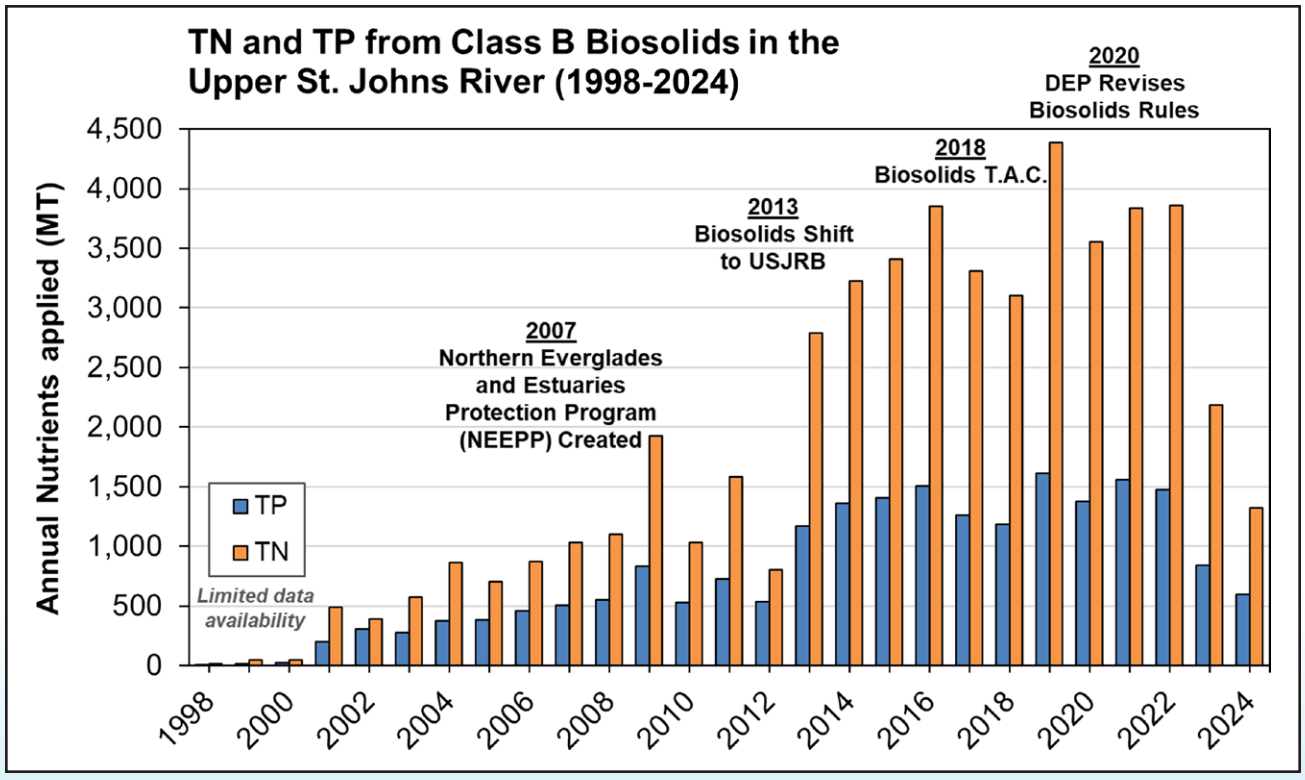

Figure 7. Total nitrogen (TN) and total phosphorus (TP) annual applications derived from Class B biosolid applications in USJRB from 1998-2024.

Natural Systems

SAV

Maps of the IRL documented locations and areal extents of seagrass beds have been periodically produced since the 1940s, and surveys of fixed transects yielded changes in percent cover and depths at the end of the canopy since 1994. In 2011, a widespread algal bloom and loss of seagrass occurred throughout most of the IRL system, extending from southern Mosquito Lagoon to just north of Fort Pierce Inlet (Figure 8). Between 2011–2019, approximately 58 percent of seagrasses were lost, with offshore ends of canopies moving shoreward and shallower, and the percent cover decreased to approximately 4 percent.

More recent data show an increase in seagrass extent between 2021–2023 of approximately 24 percent; however, most of the increase is in the northern IRL and Mosquito Lagoon (Figure 9, Figure 10). Monitoring in 2025 recorded increases in seagrass percent cover and transect length in the Mosquito Lagoon (ML), northern IRL (NIRL), Banana River Lagoon (BRL), south-central IRL (SCIRL), and southern IRL (SIRL) (Figure 10). Seagrass in the central IRL did not see improvement (Figure 10). The Mosquito Lagoon, northern IRL, Banana River Lagoon, central IRL, south-central IRL, and southern IRL are sublagoons of the IRL. These sublagoons further define the seagrass coverage lagoon-wide.

Native species of SAV found in the USJRB include eelgrass, Illinois pondweed, coontail, and southern naiad. SAV provides important habitat for both fish and wildlife. Hydrilla, an invasive species, is also present and, at times, has become extremely abundant.

Bivalves

Hard clams have historically been significant contributors to healthy water quality in the IRL (Arnold et al. 2002) via filter-feeding that reduces turbidity from algae. This allows greater light penetration to the sediment surface, which supports seagrass beds that, in turn, sustain a diversity of species. Additionally, clams remove organic nutrients from the water column and deposit them in sediments (Galimany et al. 2017), further reinforcing water clarity while isolating nutrients.

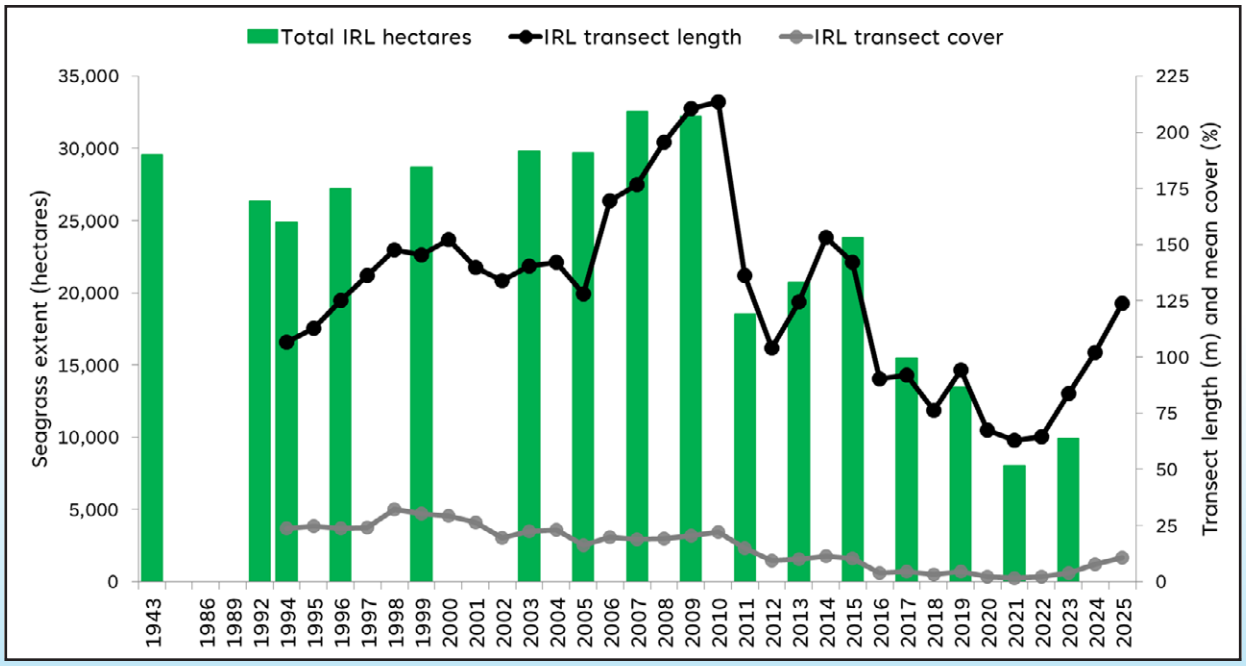

Figure 8. Seagrass areal extent and transect length and cover within the IRL.

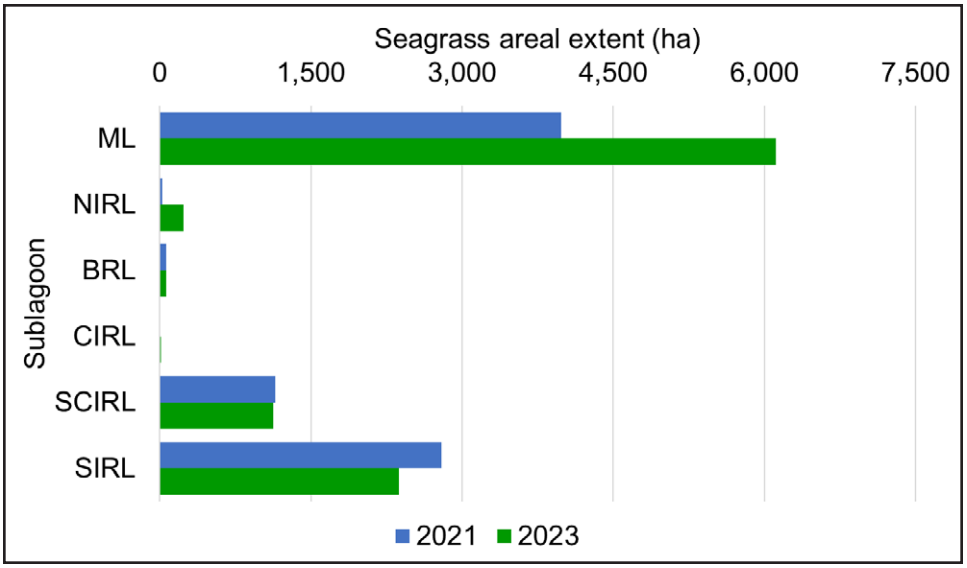

Figure 9. Seagrass areal extent from 2021-2023 by sublagoon.

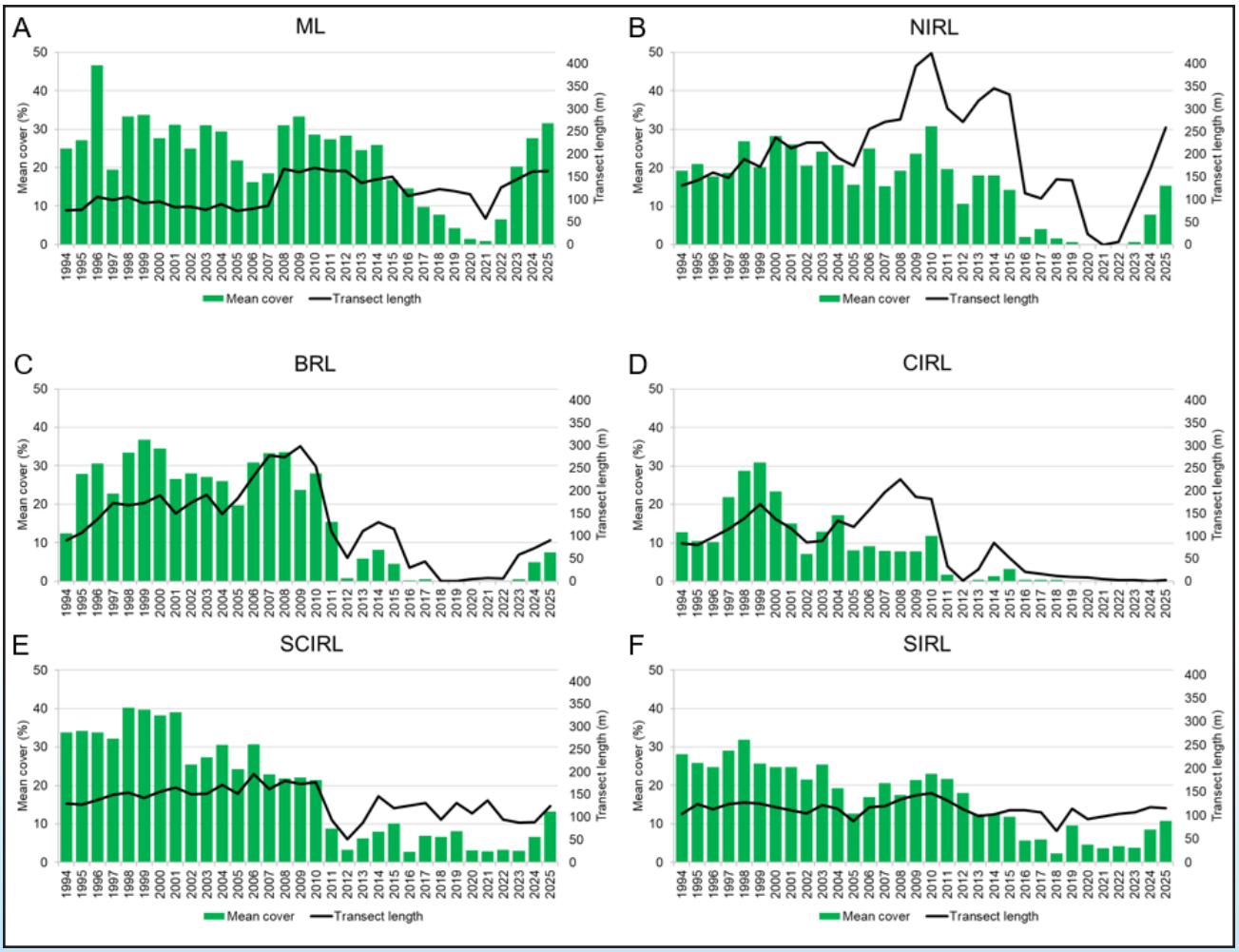

Figure 10. Seagrass mean cover and transect length from fixed transect monitoring by sublagoon (A-F).

However, overharvesting and degraded water quality have led to the collapse of native hard clam populations in the IRL. Restoration of impacted clam populations is a critical component of restoring the IRL (Arnold 2001). Clams are highly dependent on local environmental conditions, therefore it is critical to highlight restoration needs, obstacles, and knowledge surrounding clam restoration in the IRL. The research, management, and outreach priorities, that are detailed by local stakeholders for successful implementation of clams in IRL restoration projects, are available in the Clam Workshop 2022 White Paper.

The University of Florida's Whitney Laboratory for Biosciences is working to restore native hard clams to the IRL. Building on previous successes, Blue Ocean Quest, in collaboration with the District and the Whitney Lab, experimented with a novel approach to deliver millions of juvenile clams to restoration sites via heavy lift drones. This approach negates the labor and time-intensive traditional aquaculture techniques of growing adult clams and restoring them with the use of cover nets or other protective gear. Further, this can be accomplished for approximately one-third of the cost of clam restoration via the traditional methods currently being employed and without the risk of marine animal entanglement from derelict netting or bags.

The eastern oyster has been classified as an ecosystem engineer, as well as a keystone species because of the important benefits that oysters and oyster reefs provide. Oysters filter and clean the surrounding water and provide habitat to fish, invertebrates, and other shellfish. In some places, oyster reefs can serve as barriers to storms and tides, preventing erosion and protecting productive estuary waters. Due to their three-dimensional structure, oyster reefs can maintain high levels of ecosystem diversity. The loss of oyster reef coverage has encouraged different types of conservation, mapping, monitoring, and restoration efforts throughout its native range, including within the IRL region. More information is available on FWC's website.

Fisheries

The IRL supports a variety of recreational fish species, including red drum, sea trout, flounder, snook, tarpon, sheepshead, permit, pompano, and black drum. The FWC conducts monthly sampling of fish in the IRL through its Fisheries Independent Monitoring (FIM) program. Sampling effort and catch are summarized each year into the FIM Annual Report.

Fisheries in the USJRB are managed by the FWC, which conducts sport fish annual abundance surveys and monitors angler effort and success. Areas with the greatest recreational fishing effort include the Fellsmere, Blue Cypress, and St. Johns River WMAs, and Kenansville Lake. Blue Cypress Lake and Lake Washington provide some of the best fishing with regard to the natural lakes. Activities by the District to enhance sport fishing generally center around aquatic weed control and protecting angler access. In 2023, the St. Johns WMA was drawn down to facilitate the planting of 40,000 spatterdock and 131,000 bulrush plants. These plants have done well, and the improved sportfishing for bass, speckled perch, and bluegill have improved as noted in the November 2025 issue of *Florida Sportsman*.

Invasive Species

Invasive fish populations, particularly tilapia and sailfin catfish, have increased significantly since 2007. Tilapia are the most widely distributed invasive fish in the world. First introduced to Florida in the 1960s, they have spread throughout peninsular Florida and are now the most abundant invasive fish in the state. Tilapia dig large bowl-shaped nests that can potentially displace native SAV and aggressively compete for spawning grounds. Tilapia eat a wide variety of foods, and their foraging on benthic algae can lead to increased eutrophication.

Although the effects of sailfin catfish on native fishes are largely unknown, they build burrows along the shoreline that can threaten the integrity of canal banks and levees. Burrowing has been especially evident upstream of State Road 50 in

the primary spawning grounds of American and hickory shad, where bank collapse associated with burrowing activity has shallowed the river channel and altered flow. Sailfin catfish burrows have also been documented as a potential problem for levee integrity in the USJRBP. They also sequester high concentrations of total phosphorus in their flesh.

In 2022, the District initiated a haul seine harvesting program on Lake Winder that allowed commercial anglers to harvest and sell tilapia. One goal of the program was to evaluate whether tilapia harvest could serve as a cost-effective nutrient removal tool. As a condition of the agreement, anglers were also required to remove all sailfin catfish. That year, more than 23,000 pounds of tilapia and 9,000 pounds of sailfin catfish were removed from Lake Winder. In 2023, the program expanded to Lakes Florence and Poinsett, where an additional 45,000 pounds of tilapia and 5,000 pounds of sailfin catfish were removed.

By 2025, the harvest had expanded even further to include Lakes Cone, Poinsett, Florence, Winder, Washington, Sawgrass, Hell'n Blazes, Loughman, and Salt. Between 2022–2025, approximately 197,858 pounds of invasive fish and 1,721 pounds of total phosphorus were removed from USJRB lakes. Over that same period, the program generated $124,945 in revenue for participating commercial anglers.

Coastal Habitat Restoration

Coastal wetlands perform a vast array of ecosystem functions, including food web support, habitat, wave attenuation, erosion control, purifying water by sequestering nutrients, pollutants, and sediments, sequestering carbon, and providing aesthetic and recreational value.

Many coastal wetlands along the IRL were historically impacted to help control mosquitoes. The impacts included dragline ditching, impounding, and isolating the wetlands. Impacted wetlands are less able to provide the critical nursery areas for important sport and commercial species. Properly functioning wetlands remove and permanently store nutrients, transform nutrients into forms less likely to stimulate algal growth, and help protect shorelines against sea-level rise.

Restoration of impacted wetlands generally involves the removal of dikes and spoil piles by returning the material to the adjacent borrow areas and then regrading the area to match the elevation of nearby functional wetlands. The acquisition and management of the IRL's wetlands continues to be a District priority.

Four general types of impacted coastal wetlands are targeted for rehabilitation or restoration: impounded wetlands, dragline-impacted ditched wetlands, dredge- or fill-impacted wetlands, and impacted oyster reefs. An additional initiative that combines some of these efforts is the creation of living shorelines, which is to protect or enhance erodible or disturbed shorelines by creating habitats on or adjacent to shorelines (as opposed to using hardening methods like bulkheads, riprap, etc.). The District has been successful in implementing projects in all of these categories (Brockmeyer et al. 1997, 2022).

The large number of entities involved in the management and restoration of these impacted wetlands has led the District to develop strong partnerships to ensure that all mandated goals are met while achieving ecological goals. Furthermore, these partnerships have leveraged significant cost-share funding, grant funds, and in-kind services, multiplying the District's investment severalfold and supporting large-scale wetland rehabilitation.

District Lands

Land Management

The District owns 327,887 acres of conservation lands within the IRL/USJRB. Thirteen conservation areas, encompassing 226,203 acres, are managed directly by the District, with the remainder managed by cooperating partners (Table 1).

Natural Systems Restoration

The District's primary goal in purchasing and managing land is to preserve and protect water resources. Conservation lands within the IRL/USJRB support a diverse assemblage of natural communities, providing significant habitat for a variety of plant and animal species. Natural systems restoration improves species diversity and the overall natural community health and resilience.

District staff utilize adaptive management principles when restoring lands, allowing for adjustments to decision-making as new information is gathered and put into context. One method of natural systems restoration is the use of prescribed fire, which reduces the risk of severe and dangerous wildfire while enhancing the land's environmental quality.

Prescribed fires provide multiple benefits, including restoring and maintaining natural communities, reducing the risk of destructive wildfires, supporting fire-adapted plants and animals, cycling nutrients, controlling tree diseases, and opening scenic vistas.

Managed Area	Lead Land Manager	County	Acres
Blue Cypress Conservation Area	District	Indian River	42,843
Buck Lake Conservation Area[1]	District	Brevard and Volusia	9,625
Canaveral Marshes Conservation Area	District	Brevard	11,695
Clark Bay Conservation Area[2]	District	Volusia	5,133
C-54 Canal	District	Brevard and Indian River	897
Fellsmere Water Management Area	District	Indian River	10,036
Fort Drum Marsh Conservation Area	District	Indian River	20,957
Micco Water Management Area	District	Brevard	458
River Lakes Conservation Area	District	Brevard and Osceola	41,259
Sand Lakes Restoration Area	District	Indian River	1,255
Seminole Ranch Conservation Area[1]	District	Brevard, Orange, Seminole, and Volusia	29,545
Three Forks Conservation Area	District	Brevard	47,561
Turnbull Hammock Conservation Area	District	Volusia	4,939
Pine Island Conservation Area	Brevard County	Brevard	928
Sebastian Storm Water Park	City of Sebastian	Indian River	177
Indian River Lagoon Preserve State Park	DEP	Brevard	367
St. Sebastian River Preserve State Park	DEP	Brevard and Indian River	21,843
Mosquito Lagoon Aquatic Preserve	DEP	Volusia	105
Charles H. Bronson State Forest	Florida Forest Service	Orange and Seminole	9,791
Little-Big Econ State Forest[1]	Florida Forest Service	Seminole	8,672
Tiger Bay State Forest[2]	Florida Forest Service	Volusia	11,814
Bull Creek Wildlife Management Area	FWC	Osceola	23,324
Salt Lake Wildlife Management Area	FWC	Brevard	5,349
T. M. Goodwin Waterfowl Management Area	FWC	Brevard	6,521
Tosohatchee State Preserve	FWC	Orange	313
Triple N Ranch Wildlife Management Area	FWC	Osceola	7,595
North Sebastian Conservation Area	Indian River County	Indian River	134
Oslo Riverfront Conservation Area	Indian River County	Indian River	340
Longleaf Pine Preserve[1]	Volusia County	Volusia	4,272
Spruce Creek Preserve	Volusia County	Volusia	139

Conservation lands are wholly within the IRL/USJRB unless otherwise noted.
1. Conservation land is within the IRL/USJRB and the Middle St. Johns River Basin.
2. Conservation land is within the IRL/USJRB and the Lower St. Johns River Basin.

Table 1. Conservation lands within the IRL/USJRB.

Detailed Descriptions of Major Capital Projects

C-10 Water Management Area

Description

The C-10 Water Management Area project includes construction of 4 miles of a new earthen dam, modifications to 4 miles of an existing federal embankment, construction of a 300-cubic-feet-per-second pump station, primary and emergency discharge structures, and a public boat ramp. This project will reduce nutrient loading to Turkey Creek and the IRL, which are designated as impaired for nutrients, and supports the DEP-adopted BMAP for the Central Indian River Lagoon (Project Number SJRWMD-05). The C-10 Water Management Area project was identified in the 2017 Study funded by the District and DEP, which evaluated local and regional stormwater capture and treatment projects within the IRL estuary.

This project also provides an alternative water supply source by discharging to the St. Johns River, benefiting downstream water supply utilities. Additionally, it will reduce flood stages in the local region and reduce discharges to Turkey Creek and the IRL, which are vulnerable to flooding, storm surge, and sea-level rise, as identified in the DEP Statewide Vulnerability Assessment.

The project is located north of and adjacent to Three Forks MCA and south of Sawgrass Lake WMA in Brevard County (Figure 11).

Background

The C-1 Canal in Brevard County is a historic agricultural canal constructed in the 1920s that continues to drain portions of the historic USJRB to the IRL. This diversion from natural and historic flows from the USJRB to the IRL has increased nutrient loading and decreased salinity in the IRL, harming natural systems such as seagrasses.

The District has restored a significant amount of surface water flow back to the USJRB through completion and continued operation of the C-1 diversion project, otherwise known as the C-1/ Sawgrass Lake WMA project (C-1/SLWMA). The C-10 Water Management Area project is essentially Phase 2 of the C-1/SLWMA and will further restore additional surface water flows to the USJRB while also reducing nutrient loading to the IRL

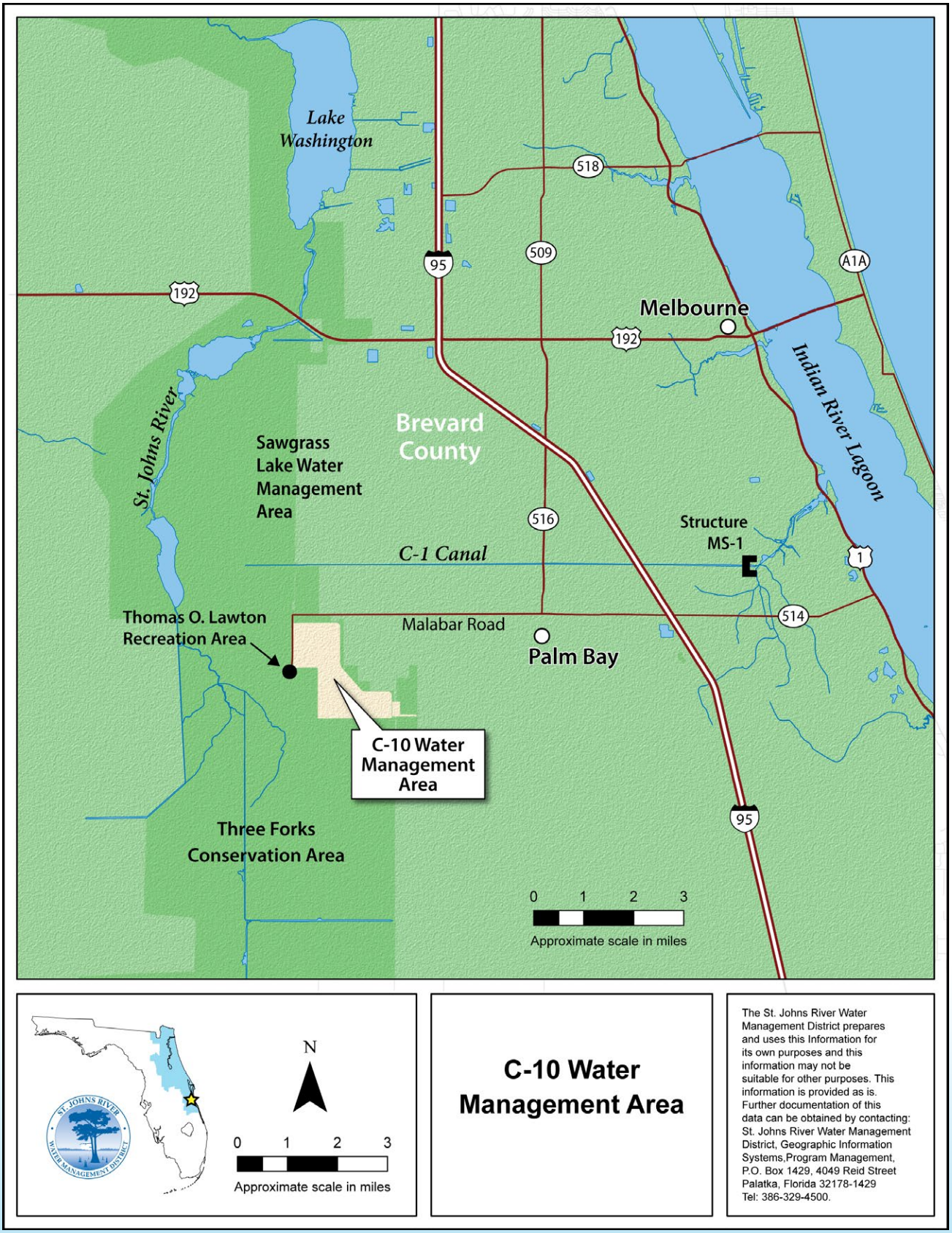

Figure 11. C-10 Water Management Area.

Importantly, the restoration of flows to the USJRB will also increase alternative water supply availability for downstream utilities, including the City of Melbourne, which relies on both surface water from the St. Johns River and groundwater from the Floridan aquifer system as its raw water sources.

District staff were on track to complete the 100 percent design milestone in 2024. However, due to changes in available staff resources and the expansion of best management practices for dam safety, the District instead went under contract with an engineering firm to design, permit, and assume engineer-of-record responsibilities for the C-10 Water Management project. The District anticipates completing design and permitting in 2028.

Pending funding, construction is expected to begin in late 2028 and be completed in 2032. The estimated total project cost is $105 million. To date, the District has received a $20,614,420 DEP resiliency grant, a $10,826,204 grant from Brevard County's Save Our Indian River Lagoon Program, and a $20,866,779 commitment from the District's Governing Board in January 2026. The District is working to secure the remaining funds needed for construction.

Benefit and/or Impact

The C-1/SLWMA project currently returns 40 percent of C-1 Canal flows to the USJRB and reduces nutrient loads to the IRL by an estimated 148,000 pounds per year of total nitrogen and 13,000 pounds per year of total phosphorus. With the addition of the C-10 Water Management Area, an additional 10 percent, or 7.9 million gallons per day, of average annual flow will be restored to the USJRB. The project is expected to further reduce nutrient loading to the IRL by an estimated 29,300 pounds per year of total nitrogen and 1,300 pounds per year of total phosphorus.

Surface water will be pumped from the C-1 lateral canals and treated in the proposed C-10 Water Management Area before discharging to Three Forks MCA and eventually to the St. Johns River. The addition of 7.9 million gallons per day of surface water to the St. Johns River provides an appreciable alternative water supply source to downstream utilities, the closest of which is the City of Melbourne, which provides potable water to nearly 165,000 customers.

Furthermore, the DEP Statewide Vulnerability Assessment identifies the affected watershed, Turkey Creek, and the IRL as vulnerable to flooding, storm surge, and sea-level rise. The proposed project will help reduce flooding and improve resiliency in the local region.

Upper St. Johns River Basin Flood Protection Infrastructure Projects

Description

The District is the local sponsor for the USJRBP (Figure 12) and is responsible for operating and maintaining 108 miles of flood control levees, eight major water control structures, and over 100 minor water control structures, weirs, and pump stations. Significant investment is required to maintain the levees and structures to USACE standards.

USACE and the District have invested approximately $250 million over three decades to construct the USJRBP. The District's work plan includes ongoing repairs to the USJRBP over the next several years.

The USJRBP has received multiple awards for blending federal levee system structures with the District's floodplain wetland restoration including the 2008 Australia-based Thiess International River Prize as one of the most innovative environmental river restoration projects in the world; 2016 Project of the Century by the Florida Engineering Society; and in 2019, was featured as one of the nation's top wetland restoration projects by the Association of State Wetland Managers.

Background:

In the early 1900s, the upper basin of the St. Johns River was diked and drained for agriculture, with canals constructed to divert floodwaters from the basin east to the IRL. By the early 1970s, 62 percent of the marsh, which functions as a natural flood attenuation feature, was gone.

The alterations degraded the upper basin's remaining marshes, impacting its natural ability to provide flood attenuation, and also diminished water quality in the IRL. In 1977, the District and USACE embarked on an ambitious, long-term flood control project that would revitalize the upper basin. The USJRBP restored portions of the historic floodplain through reservoir construction and replumbing existing canals. The project's goals included providing flood protection, improving water quality, reducing freshwater discharges to the IRL, providing water supply, and restoring wetland habitat.

The main benefits of the USJRBP are to ensure that the federal flood protection systems are properly maintained. These projects also provide important water quality benefits to the St. Johns River and IRL. In addition, the USJRBP is a critical source of potable water, as the City of Melbourne meets a portion of its water supply via surface withdrawals from Lake Washington, just downstream of the USJRBP.

Benefit and/or Impact

The primary benefit of the USJRB project is to ensure that the federal flood protection infrastructure remains reliable and effective. Additional benefits include improved water quality in the St. Johns River and IRL.

Planned efforts focus on levee repair, stabilization, and infrastructure improvements. These projects will help assimilate existing and additional water and help reduce downstream nutrient loads, while facilitating significant nutrient load reductions to the IRL. The total estimated construction cost for infrastructure improvements is $7.4 million. Projects include upgrades to water control structure S-161, USJRB levee stabilization, and refurbishment of minor water control structures.

S-161 is one of the major water control structures that plays a strategic role in the USJRBP. As such, rehabilitation of the structure is key to ensuring the long-term reliability of the District's flood protection mission in the USJRB. While this structure has been maintained, it has not undergone a full refurbishment since its construction in the early 1970s. Rehabilitation is currently planned for fiscal year 2028–29, but funding has not yet been secured.

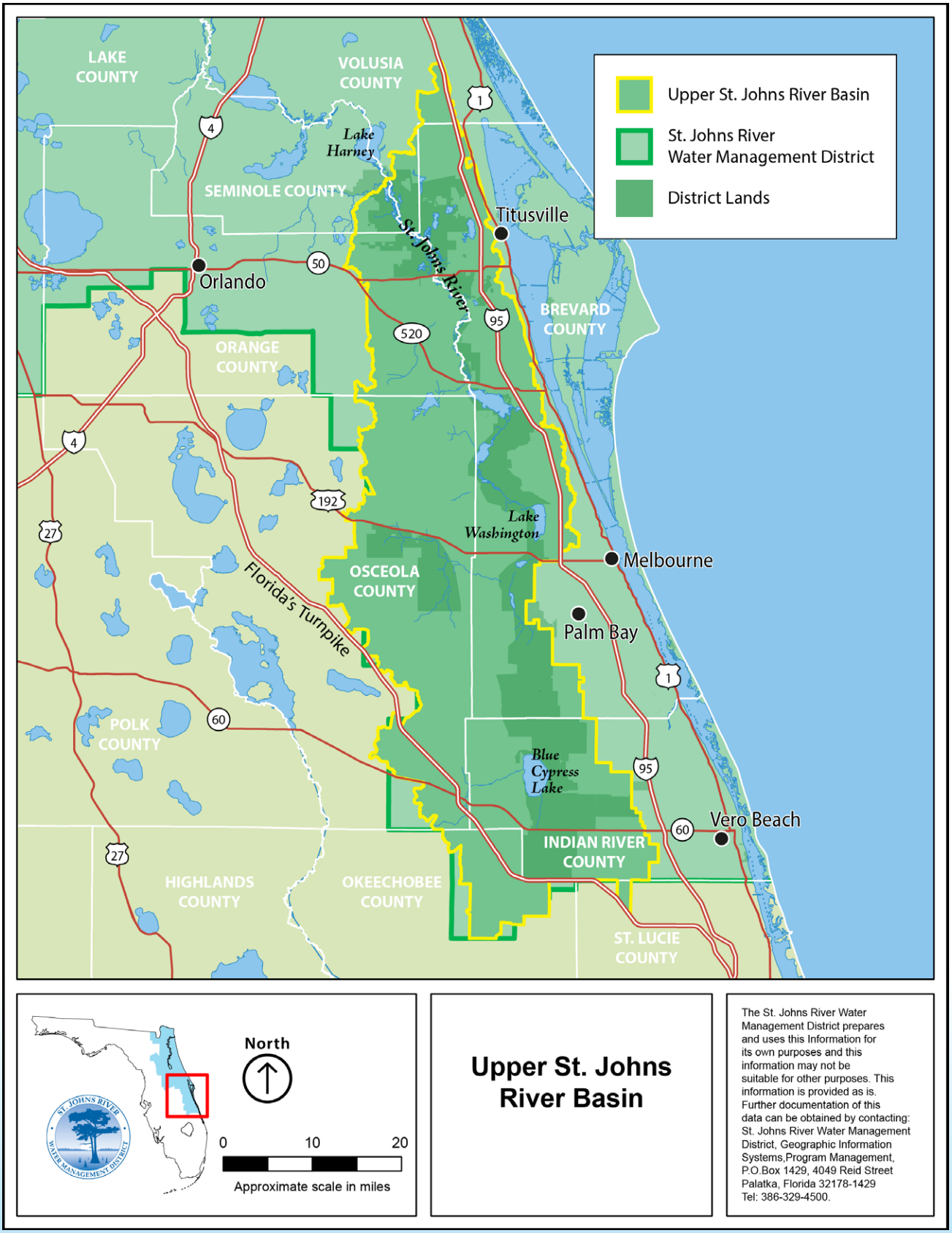

Figure 12. USJRBP Area.

Glossary

aquifer: A geologic formation, group of formations, or part of a formation that contains sufficient saturated, permeable material to yield significant quantities of water to wells and springs.

basin (groundwater): A hydrologic unit containing one large aquifer or several connecting and interconnecting aquifers.

basin (surface water): A tract of land drained by a surface water body or its tributaries.

basin management action plan (BMAP): A BMAP is a framework for water quality restoration that contains a comprehensive set of solutions to achieve the pollutant reductions established by a total maximum daily load (TMDL). Examples include permit limits on regulated facilities, urban and agricultural best management practices, wastewater and stormwater infrastructure, regional projects, and conservation programs designed to achieve pollutant reductions established by a TMDL. BMAPs are adopted by Secretarial Order and are legally enforceable.

Class B biosolids: Biosolids are a product of the wastewater treatment process. During wastewater treatment, the liquids are separated from the solids. Those solids are then treated physically and chemically to produce a semisolid, nutrient-rich product known as biosolids. Biosolids are divided into "Class A" and "Class B" designations based on treatment methods. The different classes have specified treatment requirements for pollutants, pathogens, and vector attraction reduction, as well as general requirements and management practices. Approximately two-thirds of the biosolids generated in Florida are Class B, the majority of which are applied to pastureland to improve fertility.

classification of surface waters: Florida has six surface water classifications reflecting designated uses, which are arranged in order of degree of protection required: Class I—Potable Water Supplies, Class II—Shellfish Propagation or Harvesting, Class III—Fish Consumption; Recreation, Propagation and Maintenance of a Healthy, Well-Balanced Population of Fish and Wildlife, Class III-Limited—Fish Consumption; Recreation or Limited Recreation; and/or Propagation and Maintenance of a Limited Population of Fish and Wildlife, Class IV—Agricultural Water Supplies, and Class V—Navigation, Utility and Industrial Use. For a more detailed description of classes and specific waterbody designations, see 62-302.400, Florida Administrative Code (F.A.C.).

drainage basin: Land area where precipitation runs off into streams, rivers, lakes, and reservoirs. It is a land feature that can be identified by tracing a line along the highest elevations between two areas on a map, often a ridge. The drainage basin is a part of the earth's surface that is occupied by a drainage system, which consists of a surface stream with all its tributaries and impounded bodies of water. It is also known as a watershed, a catchment area, or a drainage area.

ecosystem: Biological communities together with their environment, functioning as a unit.

fiscal year (FY): The fiscal year for water management districts begins on October 1 and ends on September 30 the following year.

groundwater: Water beneath the surface of the ground, whether or not flowing through known and definite channels. Specifically, that part of the subsurface water in the saturated zone, where the water is under pressure greater than the atmosphere.

hydrology: The scientific study of the properties, distribution, and effects of water on the earth's surface, in the soil and underlying rocks, and in the atmosphere.

invasive species: An invasive species is an organism that begins to spread or expand its range from the site of its original introduction and that has the potential to cause harm to the environment, the economy, or human health.

million gallons per day (mgd): A rate of flow of water equal to 133,680.56 cubic feet (cf) per day, or 1.5472 cubic feet per second (cfs), or 3.0689 acre-feet per day. A flow of 1 million gallons per day for 1 year equals 1,120 acre-feet (365 million gallons).

natural system: A self-sustaining living system that supports an interdependent network of aquatic, wetland-dependent, and upland living resources.

natural system enhancement: Activities conducted to improve the habitat value of wetlands or surface waters for fish and wildlife by eliminating harmful drainage, improving water quality, preventing erosion, stabilizing eroding shorelines, planting wetland vegetation, removing spoil, removing invasive or nuisance vegetation, providing structural habitat, and restoring dredged holes to elevations before they were dredged.

nuisance species: An animal or animals exhibiting behavior that causes (or is about to cause) property damage, presents a threat to public safety, or causes an annoyance within, under, or upon a building.

stormwater: Water that does not infiltrate but accumulates on land as a result of storm runoff, irrigation runoff, or drainage from areas, such as roads and roofs.

surface water: Water above the soil or substrate surface, whether contained in bounds, created naturally or artificially, or diffused. Water from natural springs is classified as surface water when it exits from the spring onto the earth's surface.

total maximum daily load (TMDL): A TMDL is a scientific determination of the maximum amount of a given pollutant that a surface water can absorb and still meet the water quality standards that protect human health and aquatic life. Waterbodies that do not meet water quality standards are identified as "impaired" for the particular pollutants of concern—nutrients, bacteria, mercury, etc.—and TMDLs must be developed, adopted, and implemented to reduce those pollutants and clean up the waterbody.

watershed: A region or area bound peripherally by water and draining ultimately to a particular watercourse or body of water. Watersheds conform to federal hydrologic unit code standards and can be divided into sub-watersheds and further divided into catchments, the smallest water management unit recognized by water management operations.

wetland: An area that is inundated or saturated by surface or groundwater with vegetation adapted for life under those soil conditions (e.g., swamps and marshes).

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