

# Wekiva Wild and Scenic River System

COMPREHENSIVE RIVER MANAGEMENT PLAN UPDATE

## EXECUTIVE SUMMARY

Prepared for the  
Wekiva Wild and Scenic River System Management Committee

In partnership with  
The National Park Service

September 2023





# 1.0

## Executive Summary



This report provides an update to the Wekiva Wild and Scenic River System Comprehensive River Management Plan (CRMP) approved by the Wekiva Wild and Scenic River System Advisory Management Committee in May 2012. This update is compiled in 10 chapters with two additional chapters dedicated to literature cited and appendices. It builds on the template provided by the 2012 CRMP but is intended to be more streamlined by using hyperlinks to additional information, and relegation of some material to appendices. Frequent communication with current members of the management committee ensured collaboration and improved all aspects of the document. Comments from public workshops and online surveys were useful in focusing Goals and Actions, and in making recommendations for improving the website, social media applications, and digital marketing.

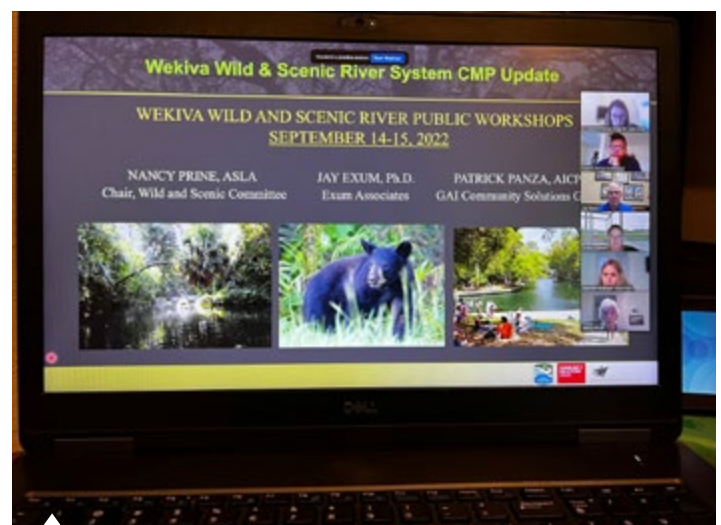
In 1968, Congress created the National Wild and Scenic Rivers System (Public Law 90-542; U.S.C. 1271-1287) to preserve certain rivers with outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations (<https://www.nps.gov/orgs/1912/index.htm>). On October 13, 2000, due to its free-flowing condition and Outstandingly Remarkable Values, the Wekiva River System, comprised of the Wekiva River, Rock Springs Run, Wekiwa Springs Run, and Black Water Creek, was officially designated as a national Wild and Scenic River. The Wekiva River System, located in Orange, Seminole, and Lake Counties encompasses a surface water drainage of approximately 242 square miles. A subsurface springshed extends south and west of the surface water basin and includes areas of high recharge to the Floridan aquifer, a critical source of water for the 31 springs in the Wekiva River System.



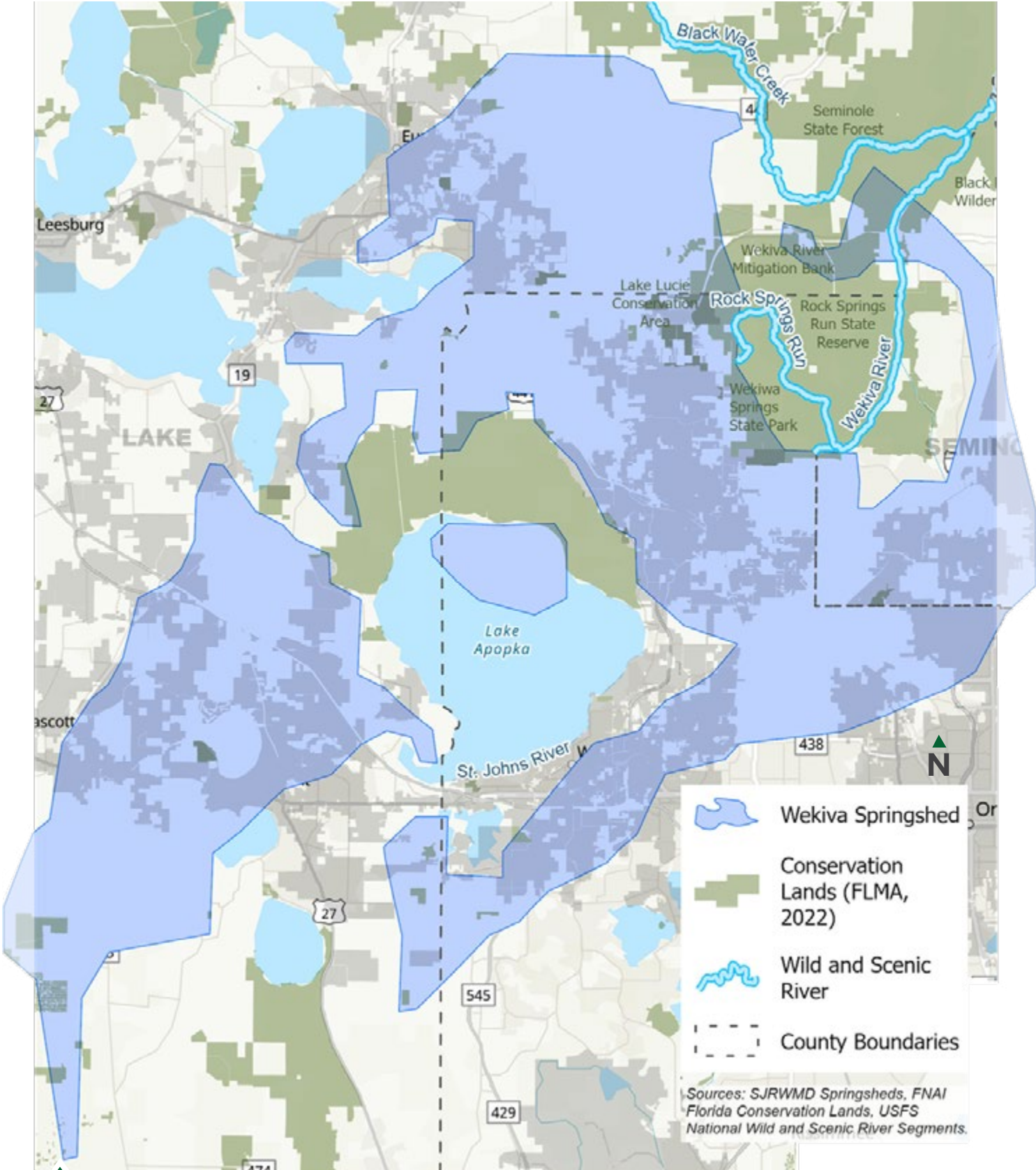
In-Person Public Meeting at Wekiwa State Park Rec Center 09/14/22



Wekiva Committee Meeting at Wekiva Island 11/29/22



Zoom Public Meeting/Presentation 09/15/22



Springshed For the Wekiva River System

In addition to its free-flowing condition, the Wekiva Wild and Scenic River System possesses five outstandingly remarkable values (ORVs), which include: 1) scenic, 2) recreation, 3) wildlife and habitat, 4) historic and cultural, and 5) water quality and quantity. The Wekiva River includes separate and distinctive Wild, Scenic and Recreational segments. The Wekiva Wild and Scenic River System Management Committee, made up of a broad coalition of state and local partners, led in coordination by the National Park Service, is formally tasked with ensuring those ORVs are protected and enhanced in perpetuity.

Threats to natural resources in the Wekiva basin are due in part to the expansive human population that live nearby. Based on data from the 2020 U.S. Census, almost 2.3 million people live within 30 miles of the Wekiva Wild and Scenic River System. North of these population centers is the Wekiva to Ocala Greenway, a network of conservation lands that extends from Wekiwa Springs State Park to the Ocala National Forest. South of the approximately 400,000-acre national forest, conservation lands within and connected to the Greenway total more than 100,000 acres owned by federal, state, local, and private entities.

The update to this CRMP is divided into 12 chapters. It provides an historical perspective, accomplishments since 2012, a summary of public engagement efforts, the state of the river, goals and actions, the role of partner agencies, proposed monitoring, literature cited and appendices.

**Chapter 3** provides a description of each river segment, including Wekiwa Springs and Wekiwa Springs Run, Rock Springs and Rock Springs Run, the Wekiva River, and Black Water Creek. Although Seminole Creek and the Little Wekiva River provide significant sources of water, they are not a part of the Federally-designated Wekiva Wild and Scenic River System.



Recreational Segment of The Wekiva River System - Wekiwa Springs



Wekiwa Springs Run



Wild Segment of The Wekiva River System - Black Water Creek



Rock Springs

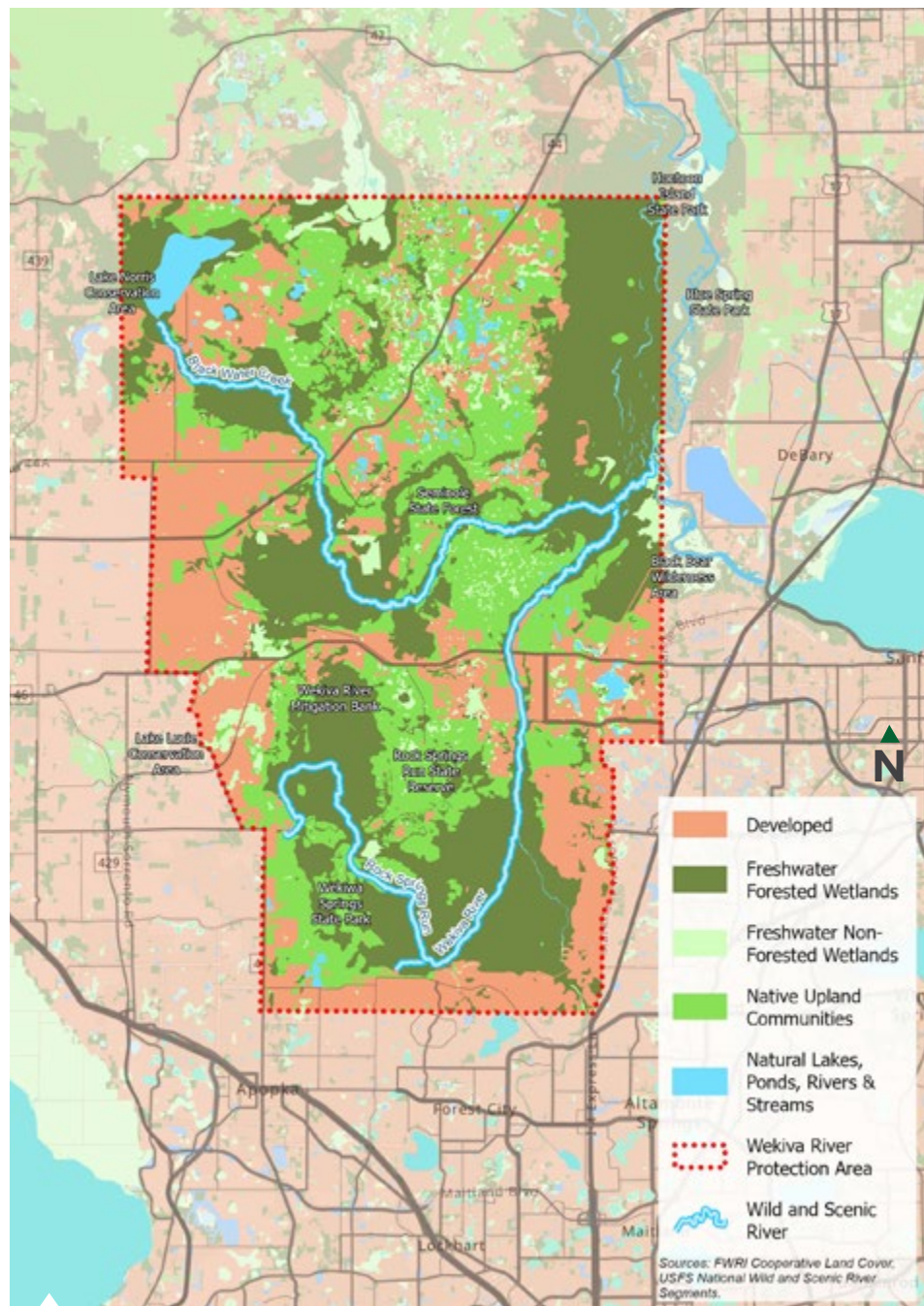
The Friends of the Wekiva River, Inc. and the East Central Florida Regional Planning Council collaborated on a study in 2021 to assess the economic value of natural resources in the Wekiva basin. Employment in government and private businesses related to the natural resources of the Wekiva River System accounted for 499 jobs, \$60 million in output sales, and \$23 million in personal income according to the study.



The store at Kings Landing

The effects of climate change on the Florida peninsula will result in increasing temperatures and what are likely to be heavy, episodic rain events. A decrease in the number of days with temperatures below freezing will likely affect vegetative communities and could result in a shift northward of subtropical plants. Some models indicate that the dry season may be prolonged, which could cause a reduced flow in the Wekiva River System, and greater saltwater intrusion. Environmental monitoring, along with adaptive management strategies are necessary to ensure protection of the ORVs.

**Chapter 4** provides a description of the river environment, including natural resources, historic and cultural resources, and recreation resources. A map of developed land and natural communities in the Wekiva River Protection Area shows that developed



Natural Communities in the Wekiva River Protection Area

areas total 28% of the 121,000-acre area. Wetlands of all types comprise approximately 45%, and native upland communities about 27% of the area.

An extensive list of plants and animals known to occur within the Wekiva Wild and Scenic River System is provided in the Unit Management Plan for Wekiva River Basin State Parks and the 10-year

Management Plan for Seminole State Forest. A list of potentially occurring Threatened or Endangered species was obtained through a request for an Element Occurrence Report by the Florida Natural Areas Inventory, and Table 3 summarizes the data. Notable species of plants and animals are described in the listed species section of Chapter 4.



*Water Hyacinth: an invasive plant that occurs in the Wekiva River System*



*Vermiculated Sailfin Catfish: an invasive fish that occurs in the Wekiva River System - photo provided by the late Jay Holder*

The Wekiva River Aquatic Preserve Management Plan provides a list of exotic plants found in the Preserve, which should be representative of exotic species in the river system. Category I plants found in wetland and aquatic habitats include wild taro, common water-hyacinth, green hygro, hydrilla, Peruvian primrosewillow, torpedograss, elephantgrass, and paragrass. Exotic plants in the Wekiva Wild and Scenic River System are managed by the Florida Fish and Wildlife Conservation Commission (FWC) and the U.S. Army Corps of

Engineers. Recent studies by the FWC on exotic fish that occur in the river system found brown hoplo, blue tilapia, vermiculated sailfin catfish, walking catfish, and chanchitas to be prevalent.

An extensive summary of historic and cultural resources is provided in this update to the CRMP. The historical record has been summarized in numerous other documents, and an attempt was made to verify and update the references. Humans have lived in the Wekiva basin for thousands of years and evidence of their presence

is summarized in records in the Florida Master Site File maintained by the Florida Division of Historical Resources. The cultural history of the Wekiva basin is equally fascinating, including the history of communities that developed around Wekiwa Springs (formerly known as Clay Springs), and the importance of the river to travel into Central Florida prior to the advent of railroads. In 1941 the Apopka Sportsman Club purchased land in the Wekiwa Springs area and sold this land to the state in 1969. Wekiwa Springs State Park was established in 1970.



*Ethel residents in 1912*



Recreation Hubs for the Wekiva River System

Recreational resources are focused around 12 recreational hubs with various amenities at each hub. The services provided at each hub are outlined in Table 4. A summary of the recreation resources for each segment of the river is also provided in the recreational resources section of Chapter 4.

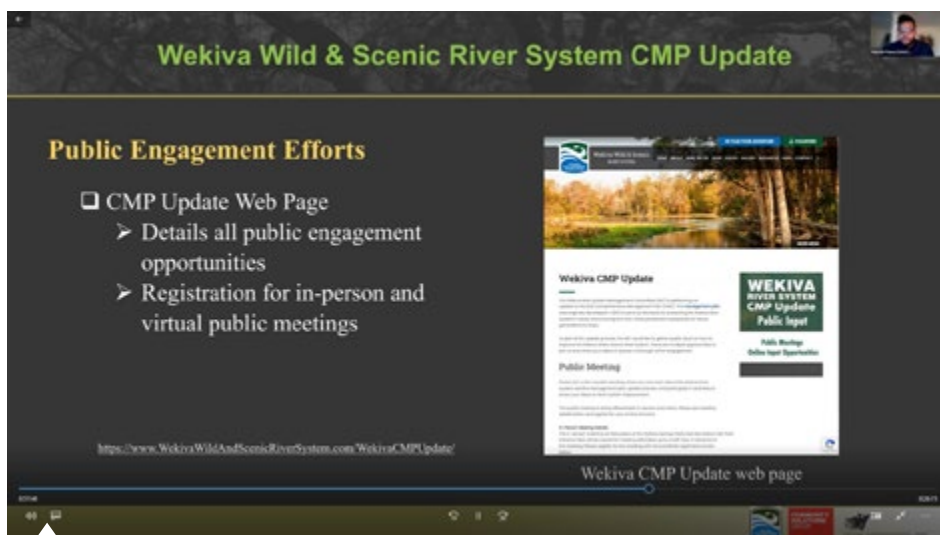
**Chapter 5** lists accomplishments that were substantially completed after the 2012 CRMP. These accomplishments are summarized in four categories: Wild and Scenic River System Management Committee and River Ambassador activities, Wekiva Wild and Scenic River System Management Committee funded initiatives, Non-Governmental Organization initiatives, and state and local government actions. Highlights include, among many other things:

- Development and installation of new unified signage branding the national Wild and Scenic River logo across the Wekiva River System
- Production of two paddling guides covering the Wekiva River and Black Water Creek
- Creation of, and updates to the Wekiva Wild and Scenic River System website
- Participation as a stakeholder for both Basin Management Action Plans
- Funding for research on Florida black bear movements at the urban interface with Rock Springs Run State Reserve and Wekiva Springs State Park
- Collaboration with agencies responsible for designing and building the Wekiva Parkway bridge over the Wekiva River (and wildlife underpasses)
- Surveys of submerged aquatic vegetation and fish populations.



Kiosk at Lake Norris Conservation Area with Paddle Guide and Wild and Scenic River System Information

A summary report on the public engagement conducted for this updated CRMP is included as **Appendix A**. This updated CRMP provides a general overview of the responses from the public, including an in-person workshop, a Zoom workshop, an online survey, and input from a mapping exercise that was posted on the Wekiva Wild and Scenic River System website. **Appendix B** provides a summary of recommendations related to the digital marketing strategy.



Screenshot from the Zoom presentation

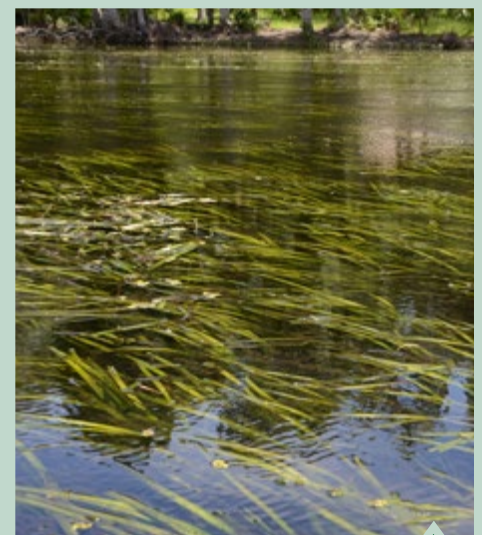
**Chapter 7** is titled “State of the River System,” and it includes a description of the existing conditions of the river by highlighting the assets and identifying threats and impacts for each ORV. Recent monitoring data and scientific literature are provided to affirm the characterizations and status of each ORV.

**Assets associated with the Scenic ORV include:**

- More than half of the river system flows through public conservation lands characterized by native aquatic and wetland vegetation
- The river’s Wild and Scenic segments provide predominantly unobstructed views of natural communities along the river.

**Threats and impacts to the Scenic ORV include:**

- Alteration of shoreline vegetation, physical structures, and litter
- Excessive algae growth and the loss of native submerged aquatic plants that affect the experience of river users, particularly in Wekiwa Springs Run
- Roadway bridges associated with the Wekiwa Parkway, SR 44, and various local roads obstruct natural views of the river surroundings.



Eelgrass Beds in the Wekiva River

#### Assets of the Recreation ORV include:

- A diversity of recreational opportunities at 12 hubs throughout the river system
- A paddling guide with information on distances between access points, services available, and the names of campgrounds, springs, and access points.

#### Threats and impacts associated with the Recreational ORV include:

- Shoreline erosion, vegetation alteration, and vandalism and erosion of historic shell middens
- Navigational impairments after major storms
- The potential for diminished user experiences due to increasing use and user conflict.



*Shoreline Erosion at Kings Landing*



*People Recreating at Kelly Park*

The Wildlife and Habitat ORV was characterized in two general aspects in the 2012 CRMP: aquatic and wetland habitats, as well as the wildlife corridor encompassed by the Wekiva to Ocala Greenway.

#### Assets of aquatic and wetland habitat include:

- A diverse assemblage of native fish, extensive eelgrass communities, and the presence of several listed species, including bluenose shiner.

#### Threats and impacts to aquatic and wetland habitat include:

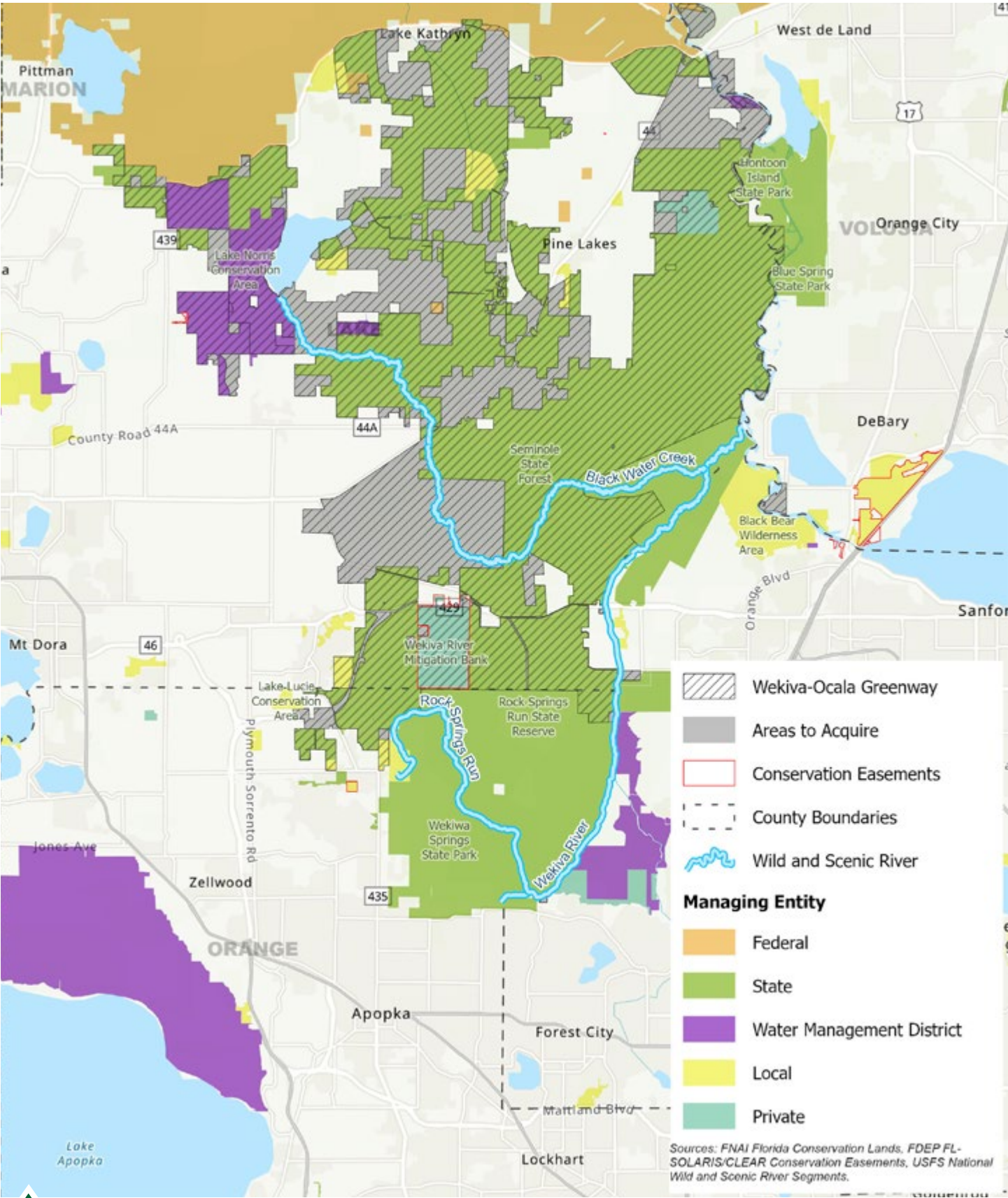
- The potential loss of the native aquatic macrophyte community
- An increasing prevalence of algae mats and filamentous cyanobacteria.



*Invasive island apple snail & native apple snail*



*Periphyton on Eelgrass in the Wekiva River*



Conservation Land Management in the Wekiva to Ocala Greenway

**Assets associated with the Wekiva to Ocala Greenway include:**

- Almost 60,000 acres within the Greenway in permanent conservation
- The Central Florida black bear population is the largest in the state.

**Threats and impacts to the Wekiva to Ocala Greenway would result from:**

- Incompatible land uses in the remaining 22,000+ acres of the Greenway that are not yet in public ownership or under conservation easement.

**Assets of the Historic and Cultural ORV include:**

- The substantial history of investigations and published literature on historical and cultural resources over small areas of the Wekiva River System.

**Threats and impacts to Historic and Cultural ORV include:**

- A void of knowledge on the extent of resources over much of the Wekiva River System
- Vandalism, soil compaction, and bank erosion on the Shell Island midden and other middens on the Wekiva River.



Black Bear



Buffalo Tram Campsite

***Buffalo Tram Campsite is a historic primitive campsite on the west side of the river within Rock Springs Run State Reserve. The campsite can only be accessed by canoe or kayak.***

The conditions and influencing factors associated with water quality and quantity are treated separately in the Plan:

#### Assets of the Water Quality ORV include:

- Nutrient loads have not increased since the designation of the Wekiwa River System as a Wild and Scenic River
- Nitrate concentrations in water emanating from springs diminish as it moves downstream.

#### Threats and impacts to the Water Quality ORV include:

- Continued water quality degradation from fertilizers and septic systems and saltwater intrusion
- Despite the prevalence of a multifaceted system of regulations and projects to protect water quality in Wekiwa and Rock Springs, nitrate loads remain 4 to 5 times above target.

#### Assets of the Water Quantity ORV include:

- Flow rates from Wekiwa and Rock Springs have been above the target for the last 4 years.

#### Threats and impacts to the Water Quantity ORV include:

- Unlike Wekiwa and Rock Springs, flow rates in Palm Springs have been substantially below targeted goals for the last 40 years, and it is unknown whether the troubling trends in flow for Palm Springs are an indicator of future trends for the other springs in the Wekiwa River System.



## Water Quality

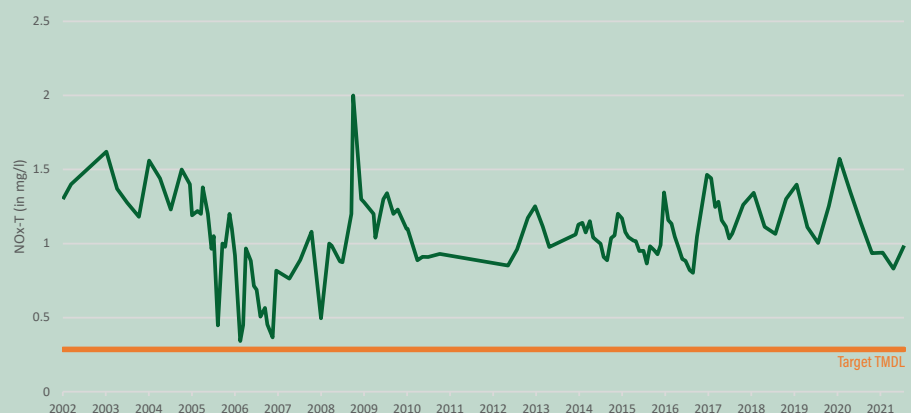
### Nitrate-Nitrite Concentrations 2002-2022

Target TMDL (0.286 mg/l)

Nitrogen in excess amounts can cause eutrophication, which, particularly in a spring system, may result in changes in the types of plants and animals that live in the spring run.



**Over the past 20 years, nitrate-nitrite concentrations have been consistently about 4 times the target concentration for Wekiwa Springs.**



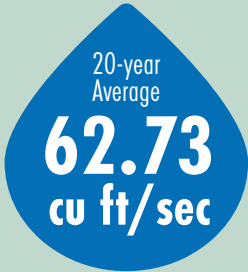


# Water Quantity

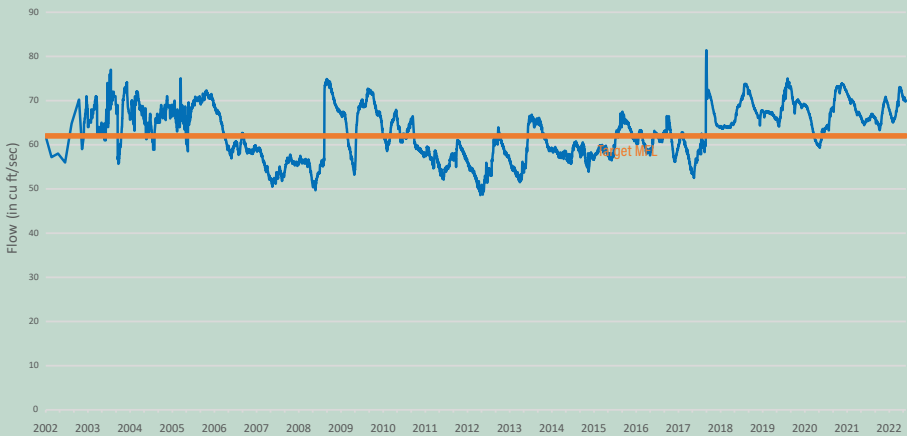
## Flow Rates 2002-2022

Target MFL for Wekiwa Springs (62 cu ft/Sec)

The amount of water moving down a river at a given time and place is referred to as its discharge, or flow, and is measured as a volume of water per unit time, typically cubic feet per second.



**Data from 2010 - 2018 seemed to indicate a flow rate below the target for minimum flows, but recent flow rates have been above target. An evaluation of the patterns of flow in Wekiwa Spring and other springs in the basin is ongoing to assess the effects of groundwater pumping across the springshed.**



**Chapter 8** summarizes Goals and Actions to alleviate or prevent the threats and impacts to the river system described in Chapter 7. Successful completion of these Goals and Actions will require frequent review by the Wekiva Wild and Scenic River System Management Committee and the involvement of groups that have not previously participated in Committee meetings in the past. Responsible entities include members of the Wekiva Wild and Scenic River System Management Committee, private recreation providers, Non-Governmental Organizations, and Rollins College. Goals and Actions, along with entities responsible for executing them, are provided in Table 6 of the CRMP.

**Chapter 9** summarizes Wild and Scenic River partner agency regulations and management plans that protect and restore natural resources in the Wekiva Wild and Scenic River System. An overview of the regulatory framework for federal, state, and local governments with jurisdiction over natural resources in the Wekiva basin is provided. Also included in this chapter are summaries of the management plans implemented by state and local agencies over thousands of acres of natural lands in the basin.



*Longleaf Pines at Wekiwa Springs State Park*



*Recreationists and Paddlers on the Wekiva River System at Wekiwa Island*



*Paddlers on Rock Springs Run*

**Chapter 10** provides an initial outline for future monitoring, research, and reporting for each ORV. Key Monitoring actions include:

- Conduct user surveys approximately every 5 years to assess satisfaction with recreation experiences on the river system or assess and monitor public feedback and engagement through digital platforms.
- Continue water quality sampling and measuring flow data from springs and surface waters of the Wekiva River System.
- Assess proposed and completed projects and progress towards the defined goals for water quality improvement in the two Basin Management Action Plans (BMAP) covering the river system.
- Assess progress on revisions to the Minimum Flows and Levels (MFL) that are being developed by the SJRWMD for the Wekiva River and select springs.
- Map aquatic vegetation in the Wekiva River System to create a baseline of native aquatic vegetation. Assess these conditions annually.
- Assess areas of rampant algal growth, particularly filamentous algae, and its effects on aquatic ecosystems within the Wekiva River System.
- Track acquisitions and the purchase of conservation easements within the remaining 22,000+ acres in the Wekiva to Ocala Greenway.
- Complete a comprehensive survey of historic and cultural resources.
- Evaluate the effectiveness of public outreach efforts by assessing website traffic, responses to emails, social media likes and shares, etc.



*Survey Being Conducted at Kelly Park*



*Native Wetland Vegetation on Rock Springs Run*



*Bank fishing in Black Water Creek from Moccasin Springs Camp*

**Chapter 11** lists the literature cited in the report, and **Chapter 12** provides appendices of information referenced in the body of the report. Appendices include the public engagement summary report, digital marketing recommendations, the Florida Natural Areas Inventory Element Occurrence Report, lists of incomplete BMAP projects, applicable federal and state laws and regulations, and the objectives and actions of management plans implemented by local and state partners on the Wekiva Wild and Scenic River System Management Committee.



*Motorized boat on the Wekiva River*



*Black Water Camp in Seminole State Forest*



Prepared by:



EXUM ASSOCIATES, INC.

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