



EXUM ASSOCIATES, INC.

USER CAPACITY STUDY FOR THE **WEKIVA WILD AND SCENIC RIVER**

EXECUTIVE SUMMARY

MARCH 2020



*Prepared for the Wekiva Wild and
Scenic River Advisory Management
Committee in partnership with the
National Park Service*

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Wekiva River



Recreationists in Rock Springs at Kelly Park

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Conducted in Partnership with

THE WEKIVA WILD AND SCENIC RIVER ADVISORY MANAGEMENT COMMITTEE AND STAKEHOLDER GROUP:

Dept of Interior, National Park Service
(Wekiva AMC Designated Federal Officer)

East Central FI Regional Planning Council

Florida Dept of Environmental Protection –
Division of Recreation and Parks

Florida Dept of Environmental Protection –
Wekiva River Aquatic Preserve

Florida Forest Service Seminole State Forest
Audubon of Florida

Friends of the Wekiva River

Lake County Water Authority

Lake County

Orange County

Seminole County

St Johns River Water Management District

Florida Fish and Wildlife Conservation
Commission

City of Altamonte Springs

City of Longwood

City of Apopka

Florida Farm Bureau

Florida Forestry Association

The Nature Conservancy

Wekiva Island

Orange County Kelly Park

King's Landing

Wekiva Falls Resort



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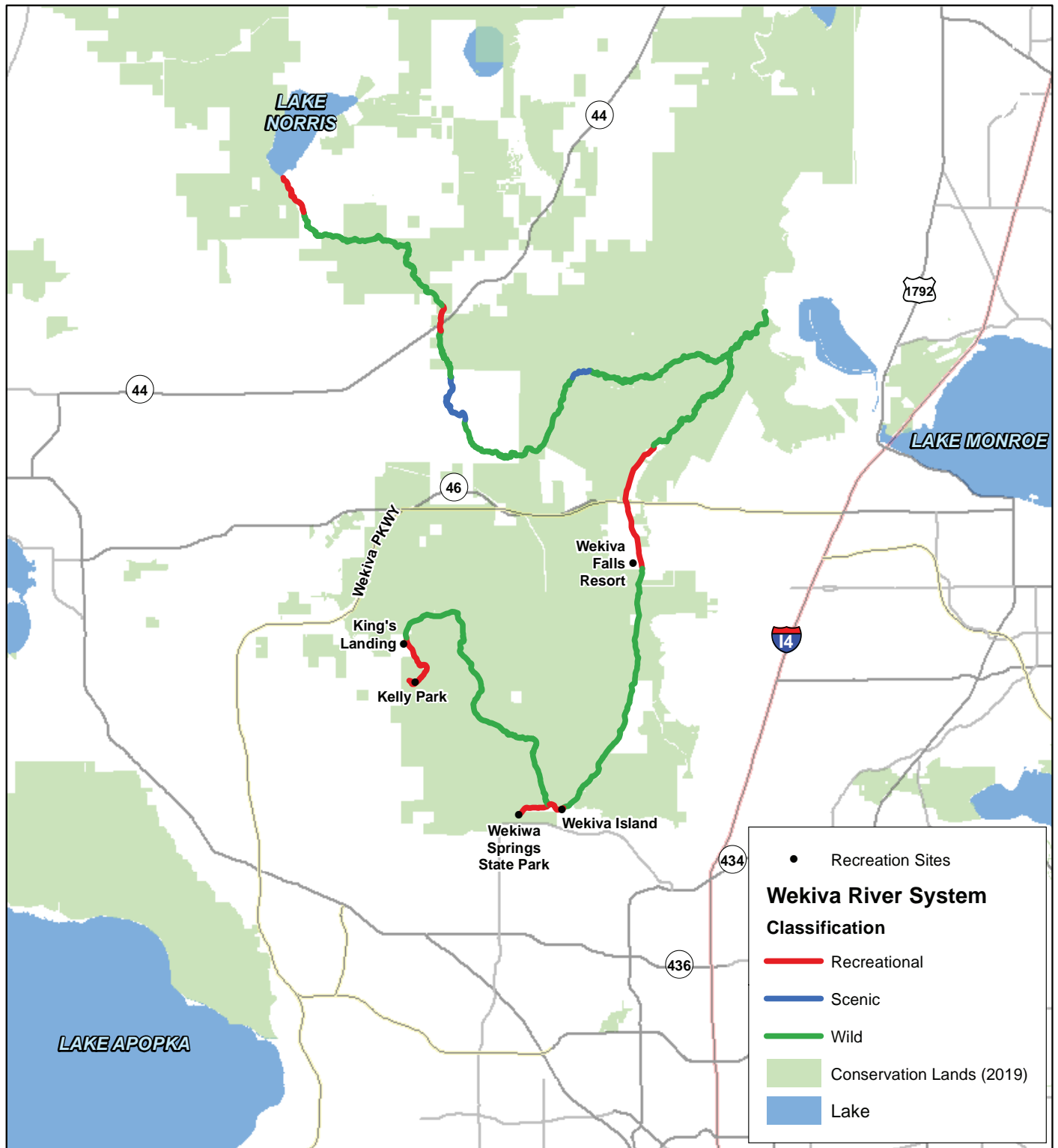
BACKGROUND AND SCOPE



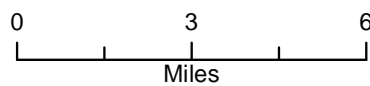
Anhinga perched over Black Water Creek

The Wekiva Wild and Scenic River System is comprised of three river segments totaling 41.6 miles: the Wekiva River and its tributaries of Wekiwa Springs Run, Rock Springs Run, and Black Water Creek. In 2000, the Wekiva River System was designated a component of the National Wild and Scenic Rivers System pursuant to Public Law 106-299. The Wild and Scenic Rivers Act directs federal river-administering agencies to address user capacities in a Comprehensive River Management Plan. Although a Management Plan was developed for the Wekiva River System in 2012, it did not address user capacities.

Exum Associates, Inc. was contracted to address the recreational use component of user capacities for the River System. This scope included visitor use, other public use, and administrative use, with emphasis on the recreational aspect of visitor use. The Study focused on User Capacity associated with resource-based recreation in the Wekiva River System, along with the associated benefits and impacts related to the Outstandingly Remarkable Values (ORV) of the Wekiva Wild and Scenic River. The scope is separate from, but written with consideration of, the 2012 Wekiva Wild and Scenic River System Comprehensive River Management Plan. This Study was not required to follow the National Environmental Policy Act (NEPA) review process.



Classifications of the Wekiva River System



Although the other ORVs were considered, this scope defined User Capacity with emphasis on the recreational aspect of visitor use. The two Recreation ORV goals are to:

- Provide opportunities for recreation on the Wekiva River System that are compatible with the area's natural and cultural features and management objectives.
- Ensure that river recreation minimizes environmental impacts and user conflicts and is compatible with the preservation of natural and cultural qualities of a National Wild and Scenic River.

The Study included extensive interaction with members of the Wekiva Wild and Scenic River Advisory Management Committee (AMC) and Stakeholders heavily involved with recreation. We collaborated with the University of Florida on a User Survey that was led by Dr. Taylor Stein and his graduate students, most notably Cece Lepa. Dr. David Barth of Barth Associates provided invaluable insight related to recreation activities and infrastructure, and Chris Gilhooley of DeLoach Engineering Science provided GIS analyses.

Six presentations were given to the AMC between November 2018 and January 2020. These presentations incrementally provided the results of the User Capacity Study, and this Executive Summarize provides a synopsis of these presentations and conclusions. An extensive database was compiled for the Study, and references to all of the materials collected were provided to the AMC.



Wekiva Springs Run

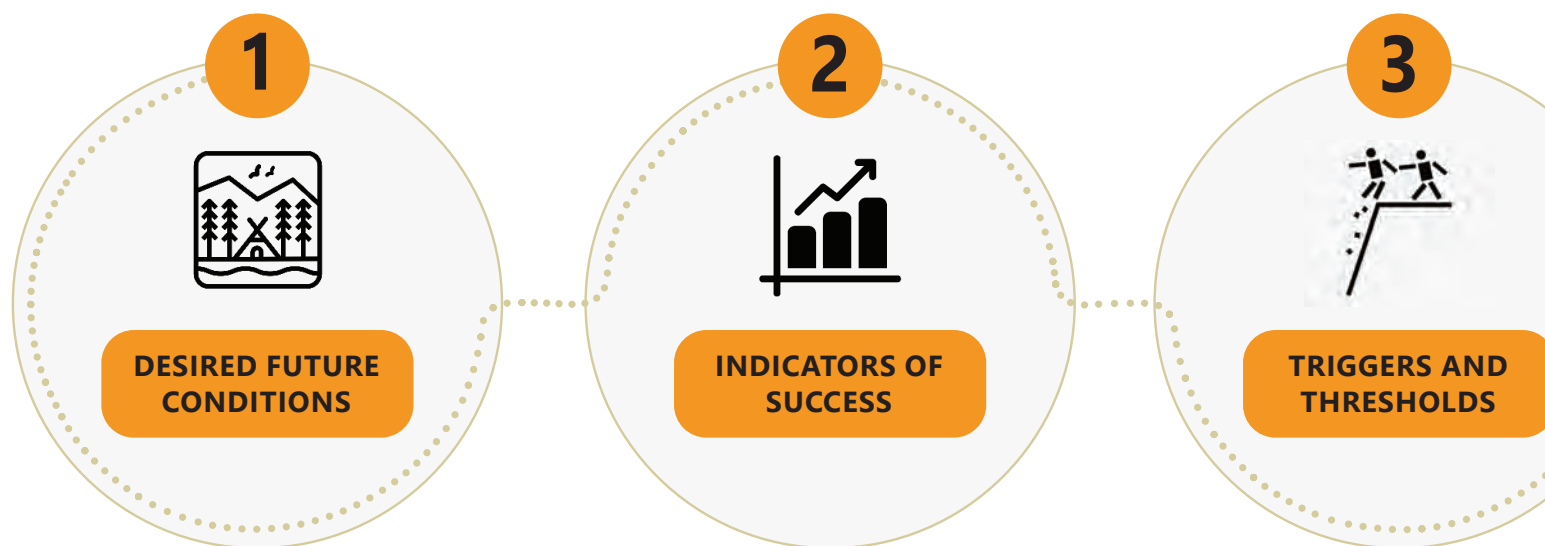


THE VISITOR USE MANAGEMENT FRAMEWORK PROCESS

We used an adaptation of the Visitor Use Management Framework, developed and used by various federal resources agencies to assess user (visitor) capacity. The initial steps of the process involve assessing baseline conditions (in this case, in 2000, at the time of the designation of the Wekiva as a Wild and Scenic River) and current conditions with respect to the environment and recreation uses. The baseline assessments were conducted as a part of the approval for designation as a Wild and Scenic River and updated in the 2012 Management Plan. This Study compiled data on current conditions and compared them with the status in 2000.

The Visitor Use Management Framework in general, and this document in particular, provide guidance for managing visitor use along the Wekiva River System, including the Wekiva River Buffer Zone (a 0.25-mile wide zone that is adjacent to and landward of the ordinary high-water line on both sides of the river). The Framework also provides a decision-making process that ensures accountability and allows input from stakeholders and the public. It provides sound rationale upon which to base management decisions and actions. It is not a regulatory document, nor is it intended to replace local, state and federal regulations already in place to protect the River System. In fact, it should supplement these regulations and provide a mechanism to avoid impact or noncompliance. And, it is the hope of the AMC that any changes affecting the river would take these recommendations under consideration.

The Visitor Use Management Framework



Created and Used by:



US Army Corps
of Engineers®

Subsequent steps involved establishing Desired Future Conditions, Indicators of Success, Triggers and Thresholds and a process for Monitoring and avoiding impacts through Management.

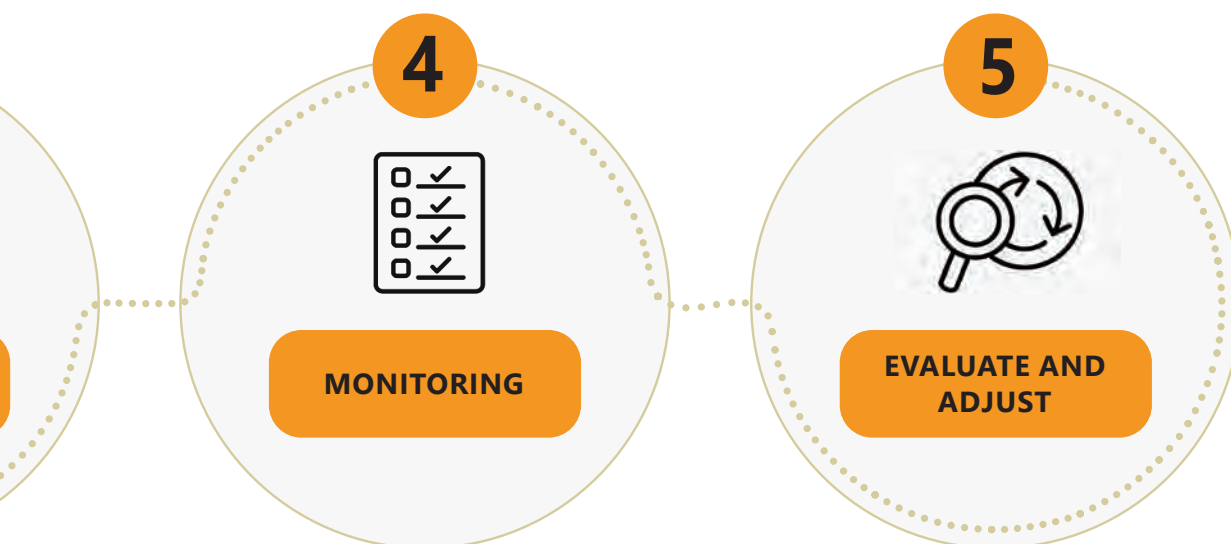
Desired Future Conditions (DFC) are statements of aspiration that describe resource conditions, visitor experiences and opportunities, and facilities and services. They should be:

- Aspirational – what we would like to achieve
- Results oriented - the “what,” not the “how”
- Responsive - to input received from the engaged public
- Useful – understandable, relevant to managers and users

Indicators of Success are resource or experiential attributes that can be measured so that progress toward DFC can be assessed. They should be:

- Connected to one or more DFC
- Meaningful
- Reasonably measurable
- Responsive to management actions

Triggers are conditions of concern for an Indicator that warrant management actions to prevent crossing a Threshold. **Thresholds** are minimally acceptable conditions associated with each Indicator. They serve as the “line in the sand” before corrective actions must be taken.





Example

THE VISITOR USE ASSESSMENT FOR ONE ASPECT OF ENVIRONMENTAL DEGRADATION

DFC: Beyond the stable conditions of the existing facility, there is no evidence of environmental degradation such as erosion, turbidity or vegetation disturbance.

INDICATOR OF SUCCESS: There are no bare surfaces that could result in erosion.

TRIGGER: Bare surfaces on erodible soils that could move sediments into a surface water or change native vegetative communities.

THRESHOLD: Erosion does not result in siltation into wetland or aquatic habitats associated with the River System.

MONITORED BY: Monthly site visits, visual/ photographic inspections.

POTENTIAL MANAGEMENT ACTIONS to avoid impacts and increase the likelihood of achieving the DFC (from Hammitt et al. 2015, see full citation in Appendix 3):

- Educate users on the effects of erosion,
- Restrict the type of use,
- Change the location of the use, and
- Harden the surface.

DATA FROM BASELINE AND CURRENT CONDITIONS INVENTORIES

CURRENT CONDITIONS DOCUMENTATION

We compiled an extensive dataset to document the current conditions of the River System. This included legacy documents, relevant scientific literature, photos, Go Pro videos, GIS data and information from facility inventories and stakeholder interviews. This extensive database on existing conditions was provided to the AMC. This database includes:

- A GIS database of land use, area of conservation lands, the river classification system, the GPS track of the navigable portions of the River System, etc.,
- Photos of every recreation site, facility, campsite and launch site as well as representative photos along every river segment,
- Representative Go Pro videos of each river segment,
- Studies documenting the diversity of flora and fauna and potentially-occurring threatened, endangered or rare species, and
- Data from facilities inventories and stakeholder interviews.



Black Water Creek





Kayaker in the Wekiva River

ENVIRONMENTAL IMPACTS FROM RECREATION ACTIVITIES

Direct impacts at Recreation Sites that have converted natural communities to impervious surfaces or removed the subcanopy diversity are the most significant impacts associated with recreation, but most of these occurred before the Wekiva was designated as Wild and Scenic.

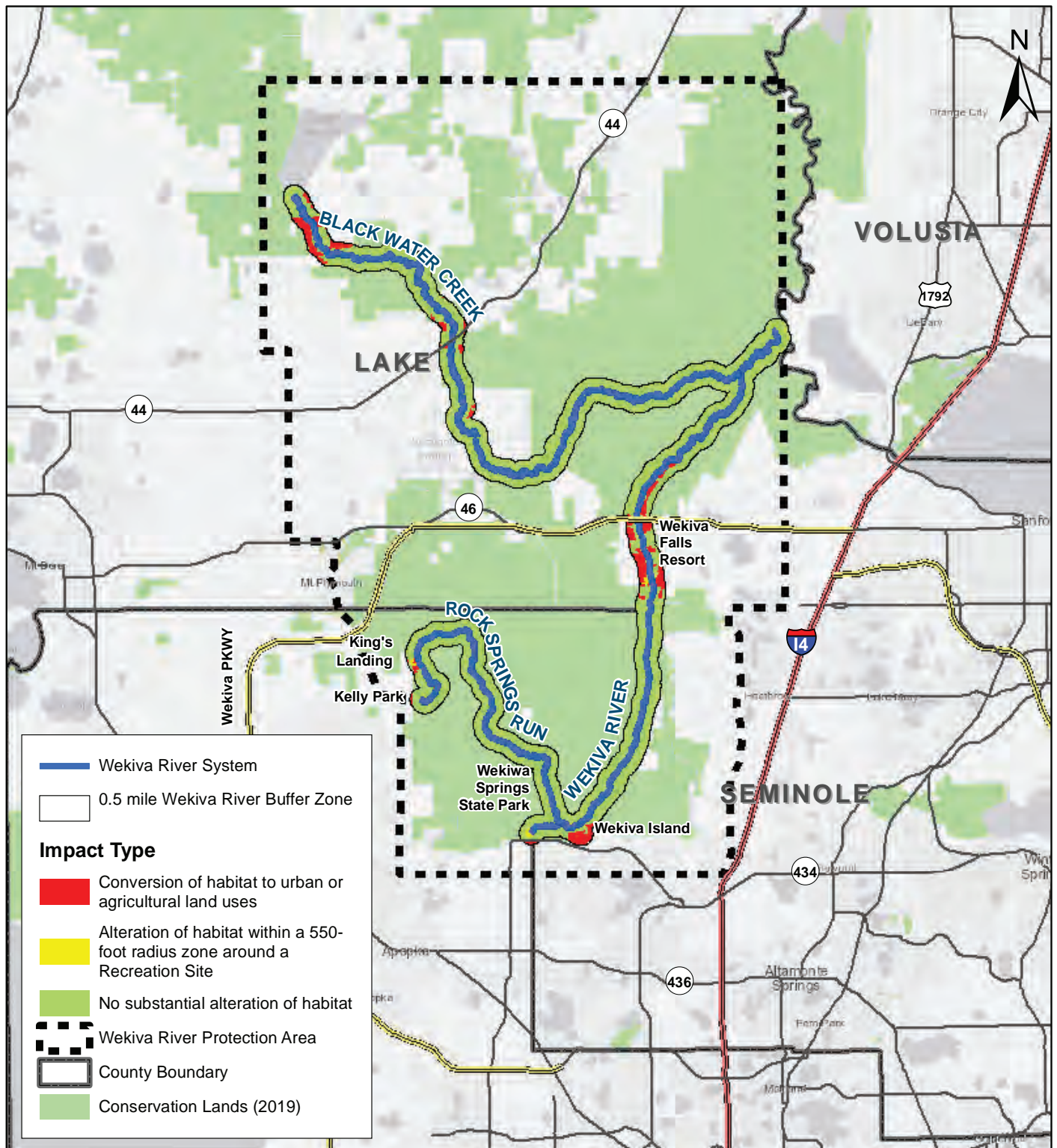
The adjacent figure and spreadsheet below depict the area of habitat conversion and alteration within each segment of the the Wekiva River Buffer Zone. The area of alteration was defined as a 550-radius zone around each Recreation Site. Based on St. Johns River Water Management District (SJRWMD) land use mapping, of the 14,134.4 acres in the Buffer Zone, 905 acres have been converted to an urban or agricultural land use, and another 83.4 acres have been altered by disturbance at Recreation Sites. The majority (13,146 acres, 93%) is still in natural condition.

Alterations of habitat within the Wekiva River Buffer Zone (in acres)

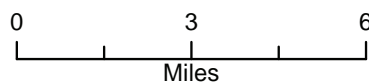
River Segment/ Classification	Conversion	Alteration	Natural	Total
Rock Springs Run				
Recreational	44.8	35.8	774.4	855
Wild	0	0	2,008.4	2,008.4
Wekiwa Springs Run and Wekiva River				
Recreational	426.9	42.5	1,168.4	1,637.8
Wild	106.2	5.1	3,798	3,909.3
Black Water Creek				
Recreational	80.2	0	410.5	490.7
Scenic	17.1	0	2,016.4	2,033.5
Wild	229.8	0	2,969.9	3,199.7
Totals	905	83.4	13,146	14,134.4

We documented other impacts to the environment as a result of recreation activities, including impacts at facilities, campsites, launch sites and areas of high recreation intensity.

These impacts are illustrated over the next two pages.



Alterations to habitat within the Wekiva River Buffer Zone



01 *Erosion at Kelly Park campground*



**ENVIRONMENTAL IMPACTS
RESULTING FROM RECREATION
ACTIVITIES**

- 01** Erosion, which occurs at almost every area of high recreation use
- 02** Grassed, likely fertilized landscapes in the Wekiva River Buffer Zone, primarily on private properties
- 03** Physical structures in the river
- 04** Litter deposition



02 *Sodded lawn along Rock Springs Run*



03 *Dislodged dock in Rock Springs Run*



04 *Litter on Shell Island archaeological resource site*



05 Construction activities associated with the Wekiva Parkway over the Wekiva River



06 Structure on tree in Rock Springs Run



07 Denuded vegetation at impromptu campsite on Black Water Creek

ENVIRONMENTAL IMPACTS RESULTING FROM RECREATION ACTIVITIES

05 Noise disturbance and light pollution

06 Unauthorized structures/scarring on trees

07 Vegetation alteration

08 Vegetation alteration



08 Lack of aquatic vegetation in areas of high recreation use at Kelly Park





Black Water Camp in Seminole State Forest

EXISTING FACILITIES

Recreation Sites

- Private operators and concessionaires have created relatively unique river-based niches for their businesses at five Recreation Sites:
 1. Kelly Park/Camp Joy – tubing, snorkeling and swimming in the headwaters of Rock Springs; primitive camping;
 2. Kings Landing – remote river experience, canoe, kayak and paddleboard rental with shuttle service along an 8.5-mile Run;
 3. Wekiwa Springs State Park – swimming and snorkeling at Wekiwa Springs; short-term canoe and kayak rental and concessions; miles of hiking, biking trails; primitive and RV camping near the River System;
 4. Wekiva Island – party atmosphere along the river with canoe, kayak and paddleboard rental; covered pavilions with concessions including alcohol; and
 5. Wekiva Falls Resort – overnight and extended stay with primitive camping and RVs with campground amenities, space and camping for large groups like boy scouts, tubing around the spring (“falls”), canoeing on the Wekiva River.
- Except for Wekiva Falls Resort, the private business and concessionaires provide recreation opportunities in the southern 10+/- miles of the River System – areas of highest activity are primarily in Recreational sections of the River System.
- Wekiva Island, Wekiwa Springs State Park and Kelly Park fill to capacity during most days over an extended summer season and many weekends across the year.

Campsites, Launch Sites and Parks

- Numerous other sites provide primitive camping along the river; canoe, kayak and paddleboard launching; picnicking and trailhead parking. These include:
 - 4 campsites on Wekiwa Springs State Park and Rock Springs Reserve State Park,
 - 2 campsites and a canoe launch/picnic area along Black Water Creek in Seminole State Forest,
 - Katie’s Landing with picnic areas and a launch site on the Wekiva River,
 - Wilson’s Landing with a pavilion, picnic areas, and a canoe launch on the Wekiva River, and, recently, a concessionaire for canoe rental and shuttling, and
 - A canoe launch at Lake Norris Conservation Area.

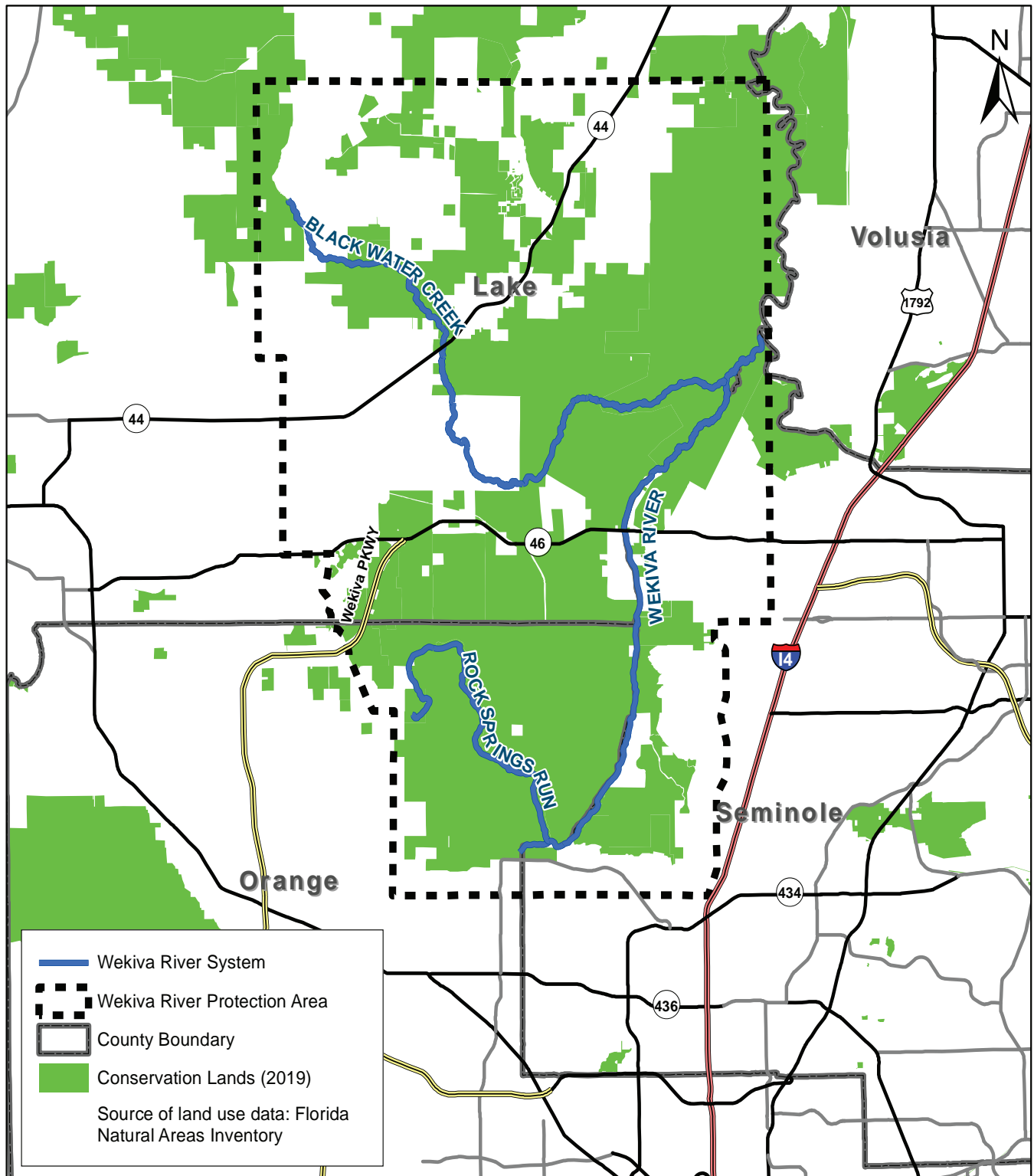


CHANGES SINCE THE DESIGNATION OF THE WEKIVA AS WILD AND SCENIC

Since 2000, there have been substantial changes in the Wekiva basin that have affected the recreation experience, either directly or indirectly. Based on a comparison of land use between 2000 and 2014 (the latest data from the SJRWMD), the area attributed to agriculture in the Wekiva River Protection Area decreased by 22.1%, while the area of urban development increased 5.4%. Land acquisitions over the same time increased the area of conservation land from 59,165 acres to 67,254, a 13.7% increase.

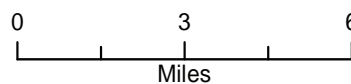
The availability of recreation services along the River System has changed slightly since 2000. The number of sites that rent canoes or provide concessions and that shuttle people for paddling has remained the same, although the location of the services has shifted slightly. There are slightly more restrooms and canoe launch sites available in 2020.





Conservation Lands in the Wekiva Basin in 2019

Wekiva Wild and Scenic River Advisory
Management Committee



Recreation Services along the Wekiva Wild and Scenic River System 2000-2019

River Segment/Site	Canoe/Kayak Rental		Concessions Available		Restrooms		Shuttle Services		Staff On-Site		Canoe Launch		Powerboat Launch	
	2000	2020	2000	2020	2000	2020	2000	2020	2000	2020	2000	2020	2000	2020
Rock Springs Run														
Kelly Park			✓	✓	✓	✓			✓	✓				
Kings Landing		✓		✓		✓	✓	✓		✓		✓		
Wekiwa Springs Run														
Wekiwa Springs State Park	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓		
Wekiwa River														
Wekiwa Marina/Island	✓	✓	✓	✓	✓	✓				✓	✓	✓	✓	✓
Wekiwa Falls	✓	✓		✓		✓				✓	✓	✓	✓	✓
Wilson's Landing (2004)		✓				✓		✓				✓		
Katie's Landing	✓		✓		✓	✓	✓		✓		✓	✓		
Wekiwa River Haven	✓		✓		✓				✓		✓		✓	
Black Water Creek														
Black Water Creek Day Use Area (Sand Road)												✓		
Lake Norris Conservation Area												✓		
St. Johns River														
Highbanks Marina			✓	✓	✓	✓					✓	✓	✓	✓
Totals	5	5	6	6	6	8	2	2	4	5	6	9	4	3

Based on data provided by Rob Mattson of the SJRWMD, average nitrate concentrations have not improved substantially since the designation of the River as Wild and Scenic in 2000. Nitrates at Rock Springs and Wekiwa Springs still exceed the Total Maximum Daily Load (TMDL) established by the state in the Basin Management Action Plan for the springs. The target TMDL for both Wekiwa and Rock Springs is an average nitrate concentration of 0.286 mg/l and the TMDL for phosphorus is an average concentration of 0.065 mg/l.

Water Quality Comparison for Rock Springs, Wekiwa Springs and the Wekiwa River at SR 46: 2000 vs 2018 (in mg/l)

Parameter	Rock Springs		Wekiwa Springs		Wekiwa River at SR 46	
	2000	2018	2000	2018	2000	2018
Total Nitrogen (NOx)	1.42	1.32	1.27	1.19	0.53	0.39
Total Phosphorus (PO4)	0.07	0.08	0.10	0.11	0.09	0.09

Changes

IN RECREATION ACTIVITIES AND LOGISTICS SINCE THE DESIGNATION OF THE WEKIVA AS A WILD AND SCENIC RIVER IN 2000

- Emphasis on Social Media
- Cell phone capabilities and patterns of use
- GPS functions and availability
- Video production
- Paddleboards
- Drone use



DFC, INDICATORS OF SUCCESS, TRIGGERS AND THRESHOLDS

Desired Future Conditions (DFC) describe objectives and outcomes and reflect aspirational conditions of the River system related to conservation and recreation. Through extensive review with AMC members and Stakeholders, we defined DFC for river-based recreation in all River segments (**Appendix 1**). These DFC are also relevant to the 0.25-mile buffer from the ordinary high-water line on both sides of the river, e.g. the Wekiva River Buffer Zone. DFC were established for 27 topics in three categories: Facilities, River Conditions and the User Experience. During the iterative process of review and input from the AMC/Stakeholder group, we received input on the DFC and Indicators of Success from representatives of:

- Seminole State Forest
- Friends of the Wekiva River
- Aquatic Preserve Alliance
- Kelly Park
- Orange County
- Seminole County
- Wekiwa Springs State Park/
Florida Department of
Environmental Protection
- National and State Park
Concessions
- Wekiva Island
- Wekiva Falls
- St. Johns River Water
Management District
- Wekiva Aquatic Preserve

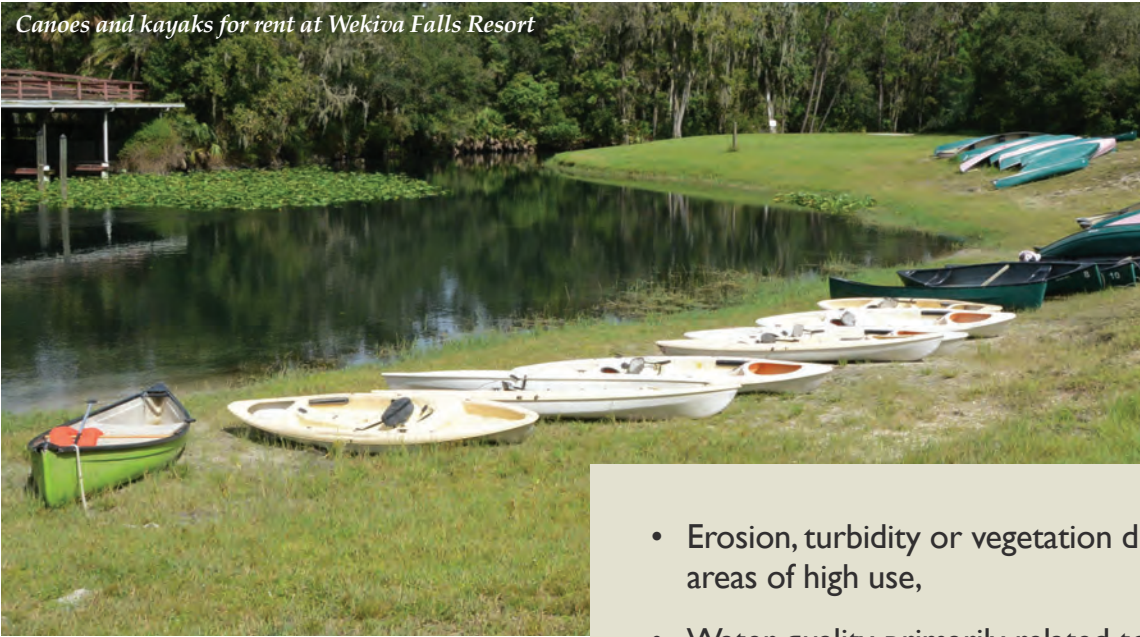
Indicators of Success, Triggers and Thresholds are included in **Appendix 2**. At least one Indicator was established for each DFC, and Triggers were established for each Indicator. Indicators are measurable outcomes that can be used to assess progress towards the DFC. They provide the ability to compare current conditions with those that are desired, and to intensify or adjust efforts to achieve the objectives. Triggers identify conditions that warrant management actions to prevent crossing a Threshold, which are the minimally acceptable conditions for each Indicator. Thresholds serve as the “line in the sand” before corrective action must be taken to achieve DFC.



Picnic area at Katie's Landing



Canoes and kayaks for rent at Wekiva Falls Resort



**MANY OF THE DFC ARE
CURRENTLY SUFFICIENTLY MET.**

*There are
deficiencies in
DFC related to:*

- Erosion, turbidity or vegetation disturbance in areas of high use,
- Water quality, primarily related to pollution from nutrients,
- The extent of native aquatic vegetation in areas of high recreation use,
- Consistency of signage,
- Communication and enforcement of existing regulations related to restrictions on uses on private property within the Wekiva River Riparian Habitat Protection Zone,
- Invasive exotic vegetation management,
- Protection of archaeological and cultural resources,
- The extent of external noise from human activities and the use of measures to abate it,
- Sources of permanent, artificial lighting that are visible from the River System and the lack of communication to private property owners on ways to minimize light pollution,
- The use of the River System by boats with motors greater than 25 horsepower,
- Motorized boat traffic in Black Water Creek and
- The lack of a plan for emergency assistance along the River System.



Paddlers on the Wekiva River at Wekiva Island

MONITORING

The success of the Visitor Use assessment depends on dedication to monitoring the Indicators of Success. We developed monitoring protocol for each Indicator and reviewed a comprehensive checklist of the monitoring protocol with the AMC and Stakeholder group. Monitoring included five broad categories:

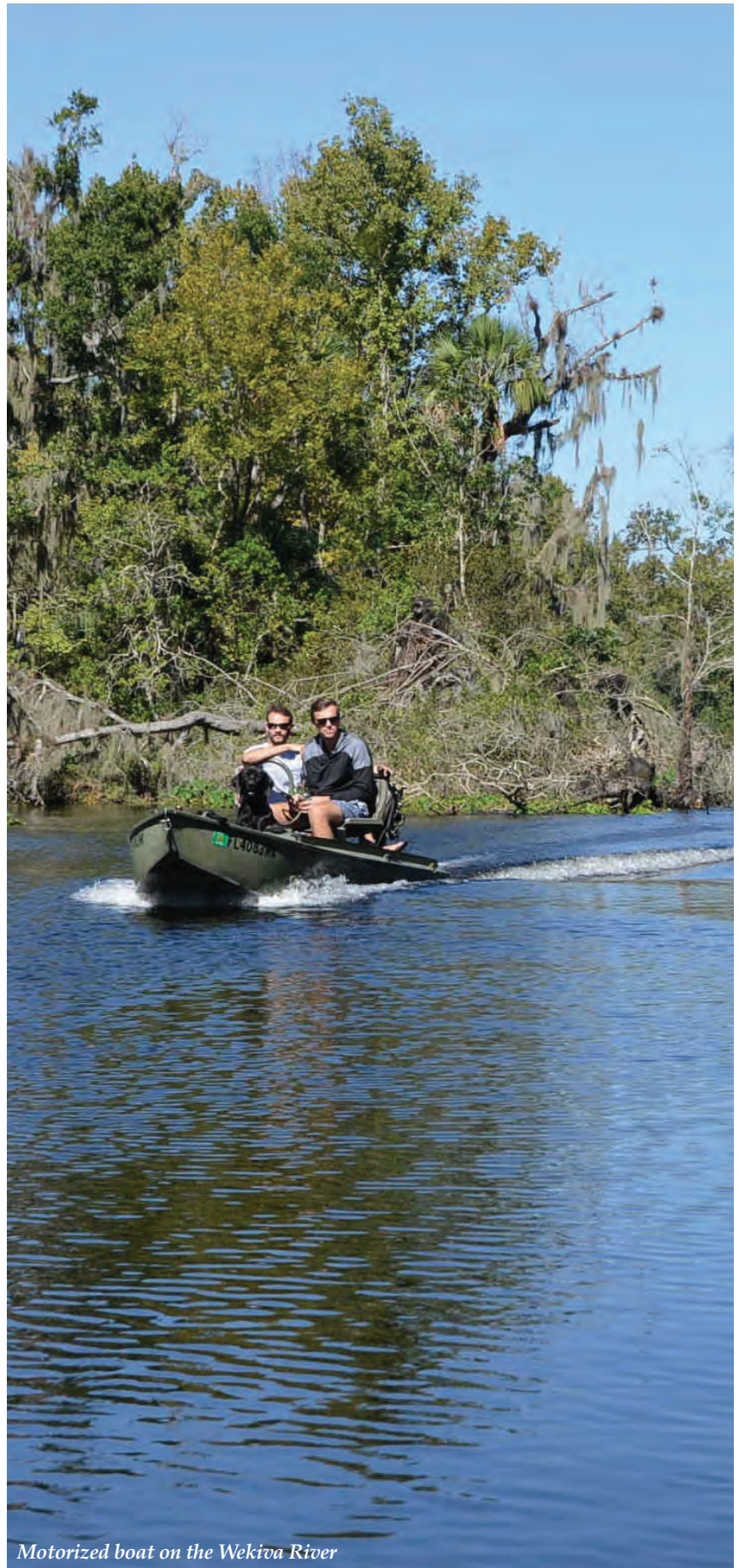
1. Regular inspections of Recreation Sites and the River System, including photographic documentation and solicitation of feedback from users;
2. Law Enforcement patrols and reports with an annual summary;
3. User Surveys and distribution of educational information;
4. Coordinated water quality and quantity monitoring with annual reports from the Florida Department of Environmental Protection (FDEP) and the SJRWMD; and
5. Annual interviews with the AMC and Stakeholders tied to budgeting for recreation and resource priorities.



Approach

TO MONITORING

- Public Land Managers and Stakeholders conduct regular monitoring of facilities, campsites, signage, access points, launch sites and the river system.
- Law Enforcement conducts routine patrols to monitor facilities, hunters and fishers, cultural resources sites, access points and the river.
- User Surveys are conducted frequently at Recreation Sites, and comprehensively every 5 years.
- Water quality data and data on flow rates are compiled and presented annually to the AMC by the FDEP and SJRWMD.
- An AMC Monitoring subcommittee and/or the Wekiva River Ambassador annually consolidate reports and present an annual “State of the River” to the AMC, Stakeholders and the public.
- The AMC identifies short- and long-term management actions to remedy deficiencies and considers their priority in the Wekiva W&S River annual budget.



Motorized boat on the Wekiva River

MANAGEMENT ACTIONS

Achieving DFC will require implementing management actions. Many of the actions included in the 2012 Comprehensive River Management Plan are consistent with the comprehensive management needed to achieve these aspirational conditions (one of which was to conduct this study). Sections 4.2.3 and 4.3.3 provide a summary of management actions identified at that time for the Recreational and Wildlife and Habitat ORVs. Some Thresholds are frequently exceeded (erosion, presence of litter, etc.) and require regular management to alleviate. Some management is routinely implemented, e.g. picking up trash and conducting river cleanups. Other management actions may require planning and budgeting, e.g. removing debris from the River System after major storm events. Still others may require modifying recreation use or educating users about the impacts of their actions.

Two literature sources provide an excellent summary of management actions to prevent impacts to the environment or user experience from recreation activities in wildlands.

EXCERPTS INCLUDE:

- Modify the type of use,
- Modify visitor behavior, attitudes and expectations,
- Modify the timing or location of use,
- Increase the ability of sites to handle use, and
- Reduce use or increase the supply
- Educate the User,
- Limit the number of users, the length of stay or season,
- Harden areas of concentrated use,
- Disperse the use, and
- Limit group size

from the Interagency Visitor Use Management Framework (2016); see the full citation in Appendix 3

from Hammitt et al. (2016)



RESULTS OF THE USER SURVEY

Locations where user surveys were conducted

Site	Number Completed	Percent
Wekiwa Springs State Park	91	30.3
Wekiva Island	74	24.7
King's Landing	40	13.3
Kelly Park/Rock Springs	39	13
Wekiva Falls Resort	27	9
Wilson's Landing	21	7
Katie's Landing	7	2.3
High Banks Public Boat Ramp	1	0.3
Total	300	100

Overall satisfaction with their visit

	Number	Percent
Very Satisfied	161	69.1
Satisfied	32	13.7
Satisfied	30	12.9
Slightly Satisfied	4	1.7
Neutral	3	1.3
Very Unsatisfied	2	0.9
Unsatisfied	1	0.4
Total	233	100

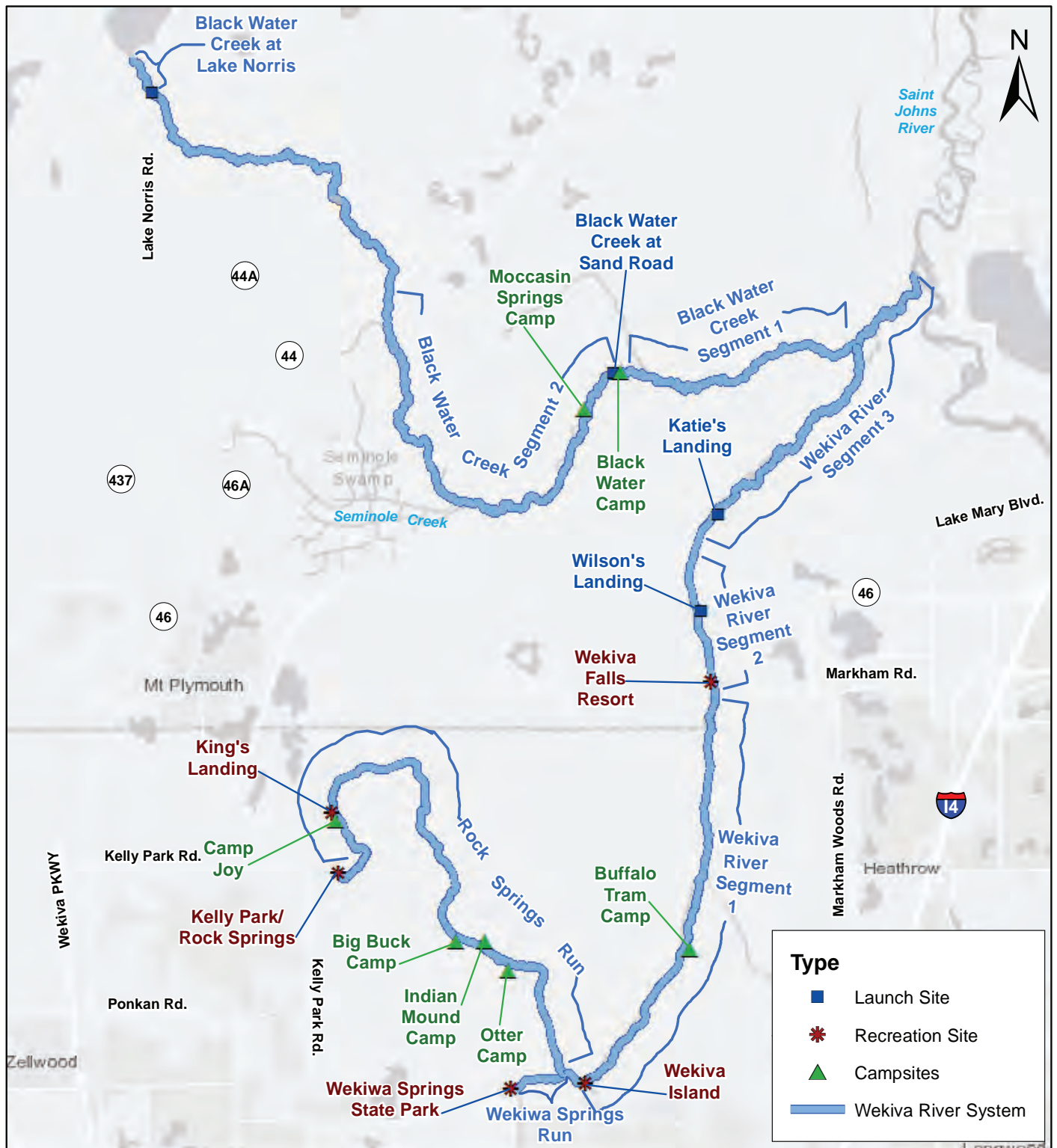
Did you feel crowded

	Number	Percent
No	200	87
Yes	30	13
Total	230	100

Questionnaires aimed at assessing the user experience were collected between April and December 2019. The majority were collected between June and August. During this period of peak user activity, surveys were scheduled for every day of the week. After public schools in Orange County reconvened in mid-August, survey collection was limited to Friday through Sunday. Surveys were conducted at all five Recreational Sites and at Wilson's Landing, Katie's Landing and at the High Banks Boat Ramp. After collecting 65 questionnaires at Wekiwa Springs State Park and Wekiva Island, survey work was limited at both sites.

A total of 300 questionnaires was completed by recreational users of the Wekiva River System. **Appendix 4** includes a comprehensive summary of the User Survey component of this investigation. An attempt was made to survey users as they completed their river experience (at boat ramps, canoe rental facilities, beaches where tubers congregated, at springs, etc.). Most of the people surveyed were employed full time (69.1%), white (85.1%), under 40 (57.0%) and female (58.2%). Interestingly, 40.9% of the respondents indicated that it was their first visit to the park or Recreation Site.

Most people surveyed had paddled or tubed in the River System (63.1%) and were Very Satisfied with their experience (69.1%). 77.2% thought that protection of the natural environment was of the greatest level of importance and 73.1% were Very Satisfied that the environment was being protected. Overall, 61% of users felt it Very Important to be able to recreate in areas that were not over-crowded. Only 13% of respondents said they felt crowded during their experience; this percentage was only slightly higher (14.8%) at rural sites (Wilson's and Katie's Landings and High Banks Boat Ramp).



Recreation Sites, campsites, launch sites and river segments within the Wekiva River System



Kayakers on the Wekiva River



Recreation activities rated as most important

	Number	Percent
Paddling (canoe/kayak)	128	42.7
Sun-bathing	35	11.7
Tubing	32	10.7
Swimming	23	7.7
Nature Viewing	20	6.7
Hiking/Walking	14	4.7
Boating (motorized)	12	4
Camping	8	2.7
Fishing	7	2.3
Paddle Boarding	6	2
Mindfulness	6	2
Picnicking	2	0.7
Jogging/Running	2	0.7
Birdwatching	2	0.7
Photography	1	0.3
Geo-caching	1	0.3
Other	1	0.3
Total	300	100

Keeping in mind that users were typically surveyed near boat launches, tubing runs or canoe rental facilities, the recreation activities that were most frequently identified as the reason for recreating on the River System included paddling (42.7 %), sun-bathing (11.7%), tubing (10.7%), swimming (7.7%) and nature viewing (6.7%).

An indicator that a recreation area is above capacity in meeting user demand can be expressed in visitors indicating that they are finding problems in the area (e.g., lack of parking or unclear restrooms). Therefore, respondents were asked to evaluate the importance and satisfaction with key recreation facilities and services in the River System

Almost every survey item evaluated was rated above four (out of five) for importance and satisfaction. In other words, the appearance, accessibility, cleanliness, degree of crowding, etc. were all deemed important to users, and they were also equally satisfied with current



conditions. This was true for urban parks, private facilities and rural launch sites. Rural users did have some of the lowest satisfaction scores, but they also had some of the lowest importance scores - particularly for facilities. Since these areas have very few facilities, the results could provide evidence that providing additional facilities in rural areas might not be what visitors want or expect.

Recreationists expressed high satisfaction (4.5 - 4.6 out of five) with the degree of crowding at the sites that they visited even in areas that are often filled at maximum capacity. Past research shows that high use levels often do not result in unpleasant feelings of crowding – especially in sites where visitors expect there to be crowds. However, this study showed visitors did not feel crowded even in the more rural areas of the system when it is likely they did experience a variety of social contacts during their visit. It appears that recreationists in the Wekiva basin have a rather homogenous tolerance to crowding on the River System. This could show the uniqueness of an urban-based recreation area, where visitors are not putting forth the time and effort to escape crowds like visitors do in larger, more pristine nature-based recreation areas (e.g., large national forests and wilderness areas).



LITERATURE REVIEWED AND BIBLIOGRAPHY

Appendix 3 provides a bibliography of the literature relied upon for this study and publications related to the Wild and Scenic River.

RECOMMENDATIONS

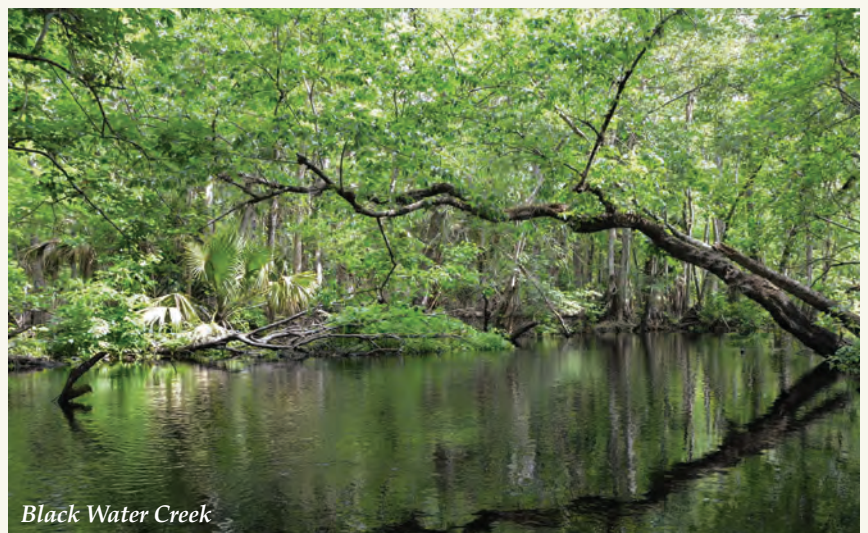
- **Direct impacts, particularly at the five Recreation Sites have resulted in habitat alteration**, and the disturbance from high visitor use has a negative influence on wildlife, but these primarily occurred before designation of the Wekiva as a Wild and Scenic River in 2000. Additional direct or indirect impacts along the River System, including the Wekiva River Buffer Zone, should be avoided.
- There are substantial areas of private property within the Wekiva River Buffer Zone; the ability to protect natural resources and sustain the **recreation experience would be enhanced if these areas were publicly-owned or if there were a conservation easement in place to protect the Buffer Zone.**
- Although most of the water quality problems affecting the River System are not caused by recreation-related activities, **the AMC/Stakeholder group should monitor and influence policy makers that can fund or regulate sources of pollution.** Ultimately the degradation of water quality and the aquatic habitat affects the ORV of the River System.
- **Exposed soils on erosive slopes are an issue at every location of relatively high recreation use**, even those in isolated, Wild sections of the River System. Although the impacts of these erosive soils are small and isolated, they are persistent and a poor example of management. These areas should be hardened, or activities curtailed until the sources of erosion can be stabilized.



Indian Mound Camp along Rock Springs Run



Bank fishing in Black Water Creek at Moccasin Springs Camp



Black Water Creek



- User surveys provide insightful data on user groups and their recreation experience. **Comprehensive User Surveys should be conducted on a regular basis**, and surveys implemented by individual Stakeholders should be shared with the AMC.
- **Monitoring is key to the success of the Visitor Use Management Framework.** A monitoring subcommittee should be established within the AMC so that a collective approach to regularly assessing the Indicators of Success can be implemented. Reporting on the results should be prioritized at an annual AMC meeting.
- Litter in the River System is a persistent, albeit relatively minor problem. **Concessionaires and private property owners should strive to reduce the amount of litter and disposable materials that are taken onto the river.**
- Some aspect of approximately ten DFC are currently not being met and an even greater number of the Indicators of Success are deficient. **The DFC are aspirational, and it will require substantial effort to achieve them all**, but the AMC should remain vigilant about assessing them on at least an annual basis.
- A complete survey of archaeological and cultural resources has not been conducted, and, **one known archaeological resource, Shell Island, is frequently impacted by recreation activities.** The AMC should discuss options for protecting Shell Island, and potentially, providing restroom facilities on this section of the River.
- **Several aspects of the Visitor Use Management Framework may require annual funding** by the AMC, and they should be considered in annual budget conversations. These include maintaining navigability, monitoring and user surveys, among other aspects.
- The branding of a consistent message for the Wild and Scenic River is primarily evident only with the paddle guide and kiosks at each of the five Recreation Sites, and in some cases, these are not prominently displayed. **The AMC should consider adopting more consistent signage** to convey the message of a unified approach to managing the Outstandingly Remarkable Values of the Wekiva Wild and Scenic River.



Rock Springs





The Store at Kings Landing

APPENDICES

APPENDIX 1 DESIRED FUTURE CONDITIONS

APPENDIX 2 INDICATORS OF SUCCESS

APPENDIX 3 BIBLIOGRAPHY

APPENDIX 4 USER SURVEY *Provided as a Separate Document*

APPENDIX I

DESIRED FUTURE CONDITIONS

Desired Future Conditions Wekiva Wild and Scenic River

March 2020

Desired Future Conditions (DFC) describe objectives and outcomes and reflect aspirational conditions of the River system related to conservation and recreation. These DFC are relevant for river-based recreation in all Wekiva Wild and Scenic River segments and include a 0.25-mile buffer from the ordinary high-water line on both sides of the river, e.g. the Buffer Zone.

CLASSIFICATION:	Wild	Scenic	Recreational
Facilities			
Campsites, Boat Launches and Recreation Sites'	Primitive facilities are clean, well-maintained, and free of litter or debris	Facilities are clean, well-maintained, and free of litter or debris	Same as Scenic
	Primitive facilities are limited, aesthetically-pleasing, constructed with materials that are not harmful to the environment and blend with the natural environment	Facilities are aesthetically-pleasing, constructed with materials that are not harmful to the environment; new facilities are designed to blend with the natural environment	Same as Scenic
	The view of any new primitive facilities, campsites and camp gear/tents/hammocks is obscured from the River System, or compatible with river-based recreation	Same as Wild	The view of new facilities, campsites and camp gear/tents/hammocks is obscured from the River System, or designed to blend with the natural environment
	Beyond the stable conditions of the existing facility, there is no evidence of environmental degradation such as erosion, turbidity or vegetation disturbance	Same	Same
Restrooms	Restrooms are not provided; NPS and USDA criteria ² for remote waste management are communicated to users	Same as Wild	Restrooms, if provided, are clean and well-maintained; advanced wastewater treatment is provided
Branding, Signage and Messaging	Signage and kiosks are informative, consistent with others within the River System and highly visible to intended users	Same	Same
Concession Services	No rentals or concession services are available	Same as Wild	The status and extent of equipment rentals, supplies, sundries, food and beverage concessions are well known by users; concessionaires help reduce impacts from recreation activities; visitors rate services and products as high quality

CLASSIFICATION:	Wild	Scenic	Recreational
Facilities (continued)			
Safety	The facility is remote, but safe and secure from vandalism and unauthorized entry and illegal activities that may degrade environmental, recreational, or cultural resource values or experiences	Same	The facility is safe and secure from vandalism and unauthorized entry and illegal activities that may degrade environmental, recreational, or cultural resource values or experiences
Access	Public access to Wild segments is provided from Scenic or Recreational segments; access to Moccasin and Blackwater camps are provided via maintained field roads in Seminole State Forest	Roads, trails and bridges at designated public access points are maintained to allow access for river-based recreation	Same as Scenic
Stormwater Treatment	No impervious surfaces or substantial sources of pollution exist; stormwater runoff is controlled to limit the potential for erosion of sediments into surface waters	Same as Wild	Provided for impervious surfaces, retrofit planned, if beneficial; for pervious surfaces, stormwater runoff is controlled to limit the potential for erosion of sediments into surface waters
Private Resident and Neighborhood Use	Privately-owned property is effectively limited and regulated by local restrictions on use within the Wekiva River Riparian Habitat Protection Zone	Same as Wild	New construction of private residences or club facilities is effectively regulated by local restrictions on use within the Wekiva River Riparian Habitat Protection Zone
River Conditions			
General	Recreation uses do not degrade natural resources or impede the ability to implement management	Same	Same
Water Quality	Recreation activities do not degrade water quality or restrict management actions to improve it; coordinated efforts across the basin result in a reduction in levels of nitrogen in the River System	Same	Same
Water Quantity	Recreation activities do not affect the quantities, or pathways of surface or groundwater; low flow rates do not impede the ability for recreationists to navigate the River System	Same	Same

CLASSIFICATION:	Wild	Scenic	Recreational
River Conditions (continued)			
Vegetative Communities	Recreation activities do not impact the abundance and diversity of native vegetation, or restrict the ability to control exotic species	Outside of the small and focused areas managed for concentrated use, recreation activities do not impact the abundance and diversity of native vegetation, or restrict the ability to control exotic species	Outside of the limited areas managed for concentrated use, recreation activities do not impact the abundance and diversity of native vegetation, or restrict the ability to control exotic species
Vegetation Management	Invasive exotic vegetation is managed so that it does not affect recreation or the value of wetland and aquatic habitat	Same	Same
Litter	Potential sources of litter are controlled, and there is a plan in place to monitor and remove litter that makes it into the River System	Same	Same
Navigability	Outside of the portions of Black Water Creek designated as Unnavigable or Difficult to Paddle, Wild segments of the River System are maintained to allow passage by nonmotorized watercraft with occasional portaging; Wild segments of the Wekiva River (not including Black Water Creek or Rock Springs Run) are managed to allow passage by boats with motors of 25 hp and less	Outside of the portions of Black Water Creek designated as Unnavigable or Difficult to Paddle, Scenic segments of the River are maintained to allow access and passage by nonmotorized watercraft with occasional portaging	Recreational segments of the River are maintained to allow access and passage by nonmotorized watercraft with a minimum amount of portaging; Recreational segments of the Wekiva River (not including Rock Springs Run or Wekiwa Springs Run) are managed to allow passage by boats with motors of 25 hp and less
Wildlife	Native wildlife thrive in natural communities managed for their historical biological diversity	Same as Wild	Native wildlife thrive in natural communities managed for their historical biological diversity; activities in degraded habitats do not affect the wildlife in adjacent, natural communities
Listed Species	Habitat for potentially occurring, state- and federally-listed species of plants and animals is protected and managed	Same as Wild	Occupied habitat of state- and federally-listed species of plants and animals is protected and managed
Cultural Resources	Archaeological and cultural resources are identified and protected from recreation activities	Same	Same

CLASSIFICATION:	Wild	Scenic	Recreational
User Experience			
Human Interaction	The experience is characterized by minimal human interaction	Same as Wild	The experience is characterized by human interaction with people engaged in river-based recreation
Experience	River-based recreationists are extremely satisfied with their experience	Same	Same
Noise	There is minimal external noise from human activities such as roadways, commercial businesses, other users, etc. Recreation users are aware of the effects of noise on wildlife and the river experience and seek to abate noise from their activities	Same as Wild	Recreation providers and users are aware of the effects of noise on wildlife and the river experience and seek to abate noise from their facilities and from external sources such as roadways, commercial businesses, etc.
Artificial Lighting	Sources of permanent, artificial lighting visible from the river are restricted on public property. Private property owners are provided with information on ways to minimize light pollution in the river system	Sources of permanent, artificial lighting visible from the river are excluded	Landowners are provided with information on ways to minimize light pollution in the river system; light from Recreation Sites is shielded to reduce light pollution in adjacent natural areas
Human Settlement and Artificial Structures	New structures associated with river-based recreation facilities are screened from the river, aesthetically pleasing, and constructed with innocuous materials	There are limited indications of human settlement, and limited views of artificial structures	New structures associated with river-based recreation facilities are screened from the river or designed to blend with the natural environment, aesthetically pleasing, and constructed with innocuous materials
Motorized Boat Traffic	Motorized boat traffic is prohibited in Wekiwa Springs Run, Rock Springs Run and Black Water Creek, except for approved research and management activities; airboats of any kind, and boats with motors larger than 25 horsepower are not used in the River system; power boat operators slow to no wake in the vicinity of canoes, kayaks and paddleboards	Same as Wild	Same as Wild
Emergency Planning	There is a plan in place for emergency assistance along the river system	Same	Same

CLASSIFICATION:	Wild	Scenic	Recreational
User Experience (continued)			
Hunting	Hunting may be allowed with appropriate permits, within the 0.5-mile wide the Buffer Zone	Same	Same
Fishing	Fishing is allowed with appropriate permits	Same	Same

¹ The reference to Recreation Sites refers to the 5 areas of greatest concentration of river-based recreation: Kelly Park, King's Landing, Wekiwa Springs State Park, Wekiva Island and Wekiva Falls.

² Waste management guidance is provided in the National Park Service's 2018 publication entitled Best Practices for Remote Waste Management (<https://www.nps.gov/articles/waste-management.htm>) and the USDA Forest Services' 1995 publication entitled Remote Waste Management (<https://www.fs.fed.us/t-d/pubs/html/95231202/95231202.html>)

APPENDIX 2

INDICATORS OF SUCCESS

Indicators of Success, Monitoring Protocol, Triggers and Thresholds Wekiva Wild and Scenic River

March 2020

Desired Future Conditions (DFC) describe objectives and outcomes and reflect aspirational conditions of the River system related to conservation and recreation.

Indicators of Success (Indicators) are measurable outcomes that can be used to assess progress towards the DFC. Well-defined Indicators provide the ability to compare current conditions with those that are desired, and to intensify or adjust efforts to achieve the objectives.

Monitoring Protocol describe the techniques for evaluating Indicators of Success.

Triggers identify conditions that would warrant management actions to prevent **crossing a Threshold**.

Thresholds are the minimally acceptable conditions for each Indicator. They serve as the “line in the sand” before corrective action must be taken to achieve DFC.

INDICATORS OF SUCCESS			
Classification	Wild	Scenic	Recreational
Facilities			
Campsites, Boat Launches and Recreation Sites	There is no litter or food waste	Same	Same
	Evidence of fire from campers is limited to fire pits	Same	Same
	There is no damage to vegetation	Same	Same
	There are no bare surfaces that could result in erosion	Same	Same
	Site amenities are clean, in good condition, and functioning properly	Same	Same
	Facilities are aesthetically-pleasing, constructed with materials that do not leach harmful chemicals into soils, groundwater or surface waters, and blend with the natural environment	Same	Same
	The view of campsites, facilities and camp gear/ tents/hammocks is obscured from the River System, or compatible with activities at the recreation site	The view of campsites, facilities and camp gear/ tents/hammocks is obscured from the River System, or compatible with activities at the recreation site	The view of campsites, facilities and camp gear/tents/hammocks is obscured from the River System, or built to blend with the natural environment
Restrooms	Facilities are clean and well-maintained	Same	Same
	There is no evidence of vandalism or mis-use	Same	Same
	There is no evidence of human waste	Same	Same

MONITORING PROTOCOL	TRIGGERS (conditions that warrant management actions)	THRESHOLDS (minimally acceptable conditions)
Monthly site visits, visual/ photographic inspection	The presence of litter	There is no litter observed at facilities during monthly site visits
Monthly site visits, visual/ photographic inspection	Fire scars from campers outside of fire pits	Fire scars from campers do not extend beyond the designated campsite
Monthly site visits, visual/ photographic inspection	Trampled vegetation or a shift in species composition	Vegetation removal or shift in species composition does not extend beyond 25 feet of the facility
Monthly site visits, visual/ photographic inspection	Bare surfaces on erodible soils that could move sediments into a surface water or change native vegetative communities	Erosion does not result in siltation into wetland or aquatic habitats associated with the River System
Monthly site visits, visual/ photographic inspection	Dirty, nonfunctioning amenities	There are no dirty, nonfunctioning amenities
Monthly site visits, visual/ photographic inspection	Facilities built with materials that leach toxic byproducts into soils, groundwater or surface waters; new facilities that don't lend with the natural environment; proposed new facilities in the Wekiva Buffer Zone	There are no facilities with construction materials that leach toxic byproducts into soils, groundwater or surface waters
Monthly site visits, visual/ photographic inspection; User Surveys every 5 years	Views of campsites, facilities and camp gear/tents/ hammocks that diminish the experience in that River segment	User Survey data do not indicate negative experiences associated with views from the River System
Regular inspections of restrooms confirm that they are functioning properly (Primitive - monthly; Scenic - monthly; Recreational - daily)	Dirty or nonfunctional restrooms	There are no dirty or nonfunctional restrooms
Regular inspections of restrooms confirm that they are functioning properly	Vandalism	There is no vandalism of restroom facilities
Annual inspections of septic systems confirm that they are functioning properly, records confirm that tanks are pumped at least every 3 years	Evidence of human waste	Human waste is not detectable by users; there is no evidence of pollution in ground or surface waters from human waste in the Wekiva Buffer Area



INDICATORS OF SUCCESS			
Classification	Wild	Scenic	Recreational
Facilities (continued)			
Branding, Signage and Messaging	Sign and kiosk design guidelines and content have been agreed-upon by all partner agencies	Same	Same
	Signs and kiosks are consistent, clean, legible, well-stocked, and well-maintained	Same	Same
Concession Services	NA	NA	The status and extent of equipment rentals, supplies, sundries, food and beverage concessions is well advertised and meets demand; concessionaires provide educational materials, recyclable containers and reusable litter bags; visitors rate services and products as high quality
Safety	Facilities are routinely patrolled by law enforcement officers	Same	Same
	There is no evidence of personal injury, loss of property, vandalism, unauthorized entry, and/or illegal activities	Same	Same
Access	Other than periods of extreme high water, there are no times in which appropriate public access is not available	Same	Same
Stormwater Treatment	There are no incidents of turbid runoff or sedimentation into the River System from exposed soils as a result of human activity	Same	Same
			Potential pollutants in runoff from impervious surfaces are captured and treated before entering surface waters within the River System

MONITORING PROTOCOL	TRIGGERS (conditions that warrant management actions)	THRESHOLDS (minimally acceptable conditions)
Annual site visits, visual inspection (in conjunction with Campsites, Boat Launches, Recreation Sites, and Restrooms)	Inconsistent signage	There are no Recreation Sites without up-to-date signage consistent with Wekiva River AMC-approved guidelines
	Missing or dilapidated signage	There are no facilities without informative, functional signage
User Surveys every 5 years	Users complain to concessionaires and land managers about concession services; concessionaires do not provide educational materials, recyclable containers and reusable litter bags	User Survey data do not indicate negative opinions related to concessionaire services; concessionaires provide educational materials, recyclable containers and reusable litter bags
Law enforcement patrol reports	Land Managers and Recreation Site owners do not see or hear from Law Enforcement	Law Enforcement conducts at least monthly reviews of Recreation Sites
AMC reports; User Surveys every 5 years	Personal injury, loss of property, vandalism, unauthorized entry, and/or illegal activities	User Survey data do not indicate negative opinions related to safety; AMC reports do not indicate increased frequency of personal injury, loss of property, vandalism, unauthorized entry, and/or illegal activities
Regular inspections	Facilities are inaccessible	Appropriate public access is provided except during the rainy season
Regular inspections	Turbidity or sedimentation is caused by recreation activities	Discharges from recreation activities do not increase turbidity by more than 15 NTU above background or result in deposits of sediments in the River System
Regular inspections	Runoff from impervious surfaces flow untreated into the River System	No new impervious surfaces are constructed without stormwater treatment



INDICATORS OF SUCCESS			
Classification	Wild	Scenic	Recreational
Facilities (continued)			
Stormwater Treatment (continued)			Marinas have a Clean Marina certification and an action plan to prevent fuel spills into the River System
Private Resident and Neighborhood Use	Private property owners within the Buffer Zone are provided with information on Best Management Practices to protect the Outstandingly Remarkable Values of the Wild and Scenic River System	Same	Same
	There are no violations of local regulations protecting the Riparian Habitat Protection Zone of the River System	Same	Same
River Conditions			
General	There is no physical evidence of impact from recreationists such as rope swings and ladders on trees; fire pits and trampled vegetation from camping at undesignated sites; tree stands; litter; impromptu parking, trails or launches along the River System, etc.	Same	Same
Water Quality	There are no detectable downstream impacts from recreationists such as sedimentation, sustained turbidity or changes in water chemistry	Same	Same
			No inorganic fertilizers are used by Stakeholders at Recreation Sites within the Buffer Zone
	Nutrient levels trend towards the Total Maximum Daily Levels (TMDL) defined in the Basin Management Action Plan (BMAP) and are achieved by the projected dates	Same	Same

MONITORING PROTOCOL	TRIGGERS (conditions that warrant management actions)	THRESHOLDS (minimally acceptable conditions)
Clean Marina Plan	Marinas in the River System do not have a Clean Marina Plan	All marinas in the River System have a Clean Marina Plan
Annual confirmation that this information is useful and readily available to private property owners	Private property owners violate BMPs for the W&S River	The AMC receives no reports of impacts by private property owners to resources for which there are BMPs (archaeological, water quantity and water quality)
AMC reporting	Private property owners violate local regulations protecting the Riparian Habitat Protection Zone (RHPZ) of the River System	The AMC receives no reports of unpermitted impacts to the RHPZ
Annual visual monitoring	Physical evidence of impacts to natural resources	Recreationists do not cause impacts to native vegetation or water quality in surface waters of the River System
Annual visual monitoring, water quality evaluation	Changes in water chemistry, turbidity or sedimentation is caused by recreation activities	There are no changes in water chemistry from recreation activities and discharges from recreation activities do not increase turbidity by more than 15 NTU above background or result in deposits of sediments in the River System
Annual interviews with AMC and Stakeholders	Inorganic fertilizers are used in the Buffer Zone	There are no inorganic fertilizers used by AMC Stakeholders at Recreation Sites within the Buffer Zone
Coordinated water quality testing and a consolidated annual report	Nutrient levels are not trending towards BMAP goals	There is progress towards BMAP goals for reducing nutrients in the springs, creeks and rivers of the River System

INDICATORS OF SUCCESS			
Classification	Wild	Scenic	Recreational
River Conditions (continued)			
Water Quantity	There are no restrictions or diversions of surface or groundwater flows caused by the activities of recreationists, AMC members or Stakeholders	Same	Same
	Flow rates across the River System do not drop below established Minimum Flows and Levels (MFL) as defined by the SJRWMD	Same	Same
Vegetative Communities	There is no reduction in the abundance and diversity of native plants from the activities of recreationists at campsites or launches	Same	Same
Vegetation Management	Outbreaks of invasive exotic vegetation do not restrict paddling in the navigable portions of the River System	Same	Same
	Public land managers remove invasive exotic species within the Buffer Zone	Same as Wild	AMC and Stakeholders remove invasive exotic plants at Recreation Sites; Private property owners are provided information on invasive species of plants so they can assist with their removal from the River System
Litter	There is no evidence of litter in the River System	Same	Same
	Recreationists are well informed as to how to manage potential sources of litter before they enter the River System	Same	Same
	Annual river cleanups are held to remove litter that makes it into the River System	Same as Wild	Monthly river cleanups are implemented and the Recreational segments of the River System have been "adopted" through an Adopt-a-River program

MONITORING PROTOCOL	TRIGGERS (conditions that warrant management actions)	THRESHOLDS (minimally acceptable conditions)
Monitoring during all on-site reviews	Diversions of surface or groundwater flow	There are no changes to surface or groundwater flows
Coordinated water quantity monitoring and a consolidated annual report summarizing activities that could result in decreased water flow	Flow rates trending below MFL	Flow rates do not drop below MFL
Annual visual, photographic monitoring	Trampled vegetation or a shift in species composition	Vegetation removal or shift in species composition does not extend beyond 25 feet of campsites or launches
Annual visual, photographic monitoring	Paddling in the navigable portions of the River System are restricted by invasive exotic vegetation	Outside of those areas designated as Unnavigable or Difficult to Paddle, no more than 2 portages per mile in Wild and Scenic segments or 1 portage per mile in Recreational segments are required except after major storm events
Annual interviews with AMC and Stakeholders	Category I exotic plants within the Buffer Zone	There are no Category I exotic plants within the Buffer Zone
River cleanups, photographic monitoring	The presence of litter	Minimal amounts of litter are removed during river cleanups
User Surveys conducted every 5 years	The presence of litter	User Survey data indicate that recreationists are well informed about how to avoid littering in the River System
Results of monthly/annual cleanups and annual interviews with AMC and Stakeholders	The presence of litter	River cleanups are conducted once per year in Wild and Scenic segments and at least 6 times per year in Recreational segments



INDICATORS OF SUCCESS			
Classification	Wild	Scenic	Recreational
River Conditions (continued)			
Litter (continued)			Adequate receptacles are strategically located and maintained to prevent litter from entering the River System
Navigability	Annual funding is budgeted for debris removal to allow passage by nonmotorized watercraft	Same	Same
	Outside of those areas designated as Unnavigable or Difficult to Paddle, no more than 2 portages (around or over debris) per mile are required in Wild sections of the River System except for a 6-month timeframe after a major storm event	Outside of those areas designated as Unnavigable or Difficult to Paddle, no more than 2 portages (around or over debris) per mile are required in the navigable portions of the Scenic sections of the River System except for a 6-month timeframe after a major storm event	No more than 1 portage (around or over debris) per mile is required in the navigable portions of the Recreational sections of the River System except for a 6-month timeframe after a major storm event
	Debris from fallen trees is removed or cut from Wild Segments that are maintained for navigation to provide a window that is 9 feet high, 6 feet wide and 1.5 feet below the surface at normal water elevation to accommodate a motorized boat or an airboat for emergency management and exotic species control	Debris from fallen trees is removed or cut from Scenic Segments that are maintained for navigation to provide a window that is 9 feet high, 6 feet wide and 1.5 feet below the surface at normal water elevation to accommodate a motorized boat or an airboat for emergency management and exotic species control	Debris from fallen trees is removed or cut to provide a window that is 9 feet high, 6 feet wide and 1.5 feet below the surface at normal water elevation to accommodate a motorized boat or an airboat for emergency management and exotic species control
Wildlife	Information is provided through signage and brochures, and at kiosks and the WV&S website to recreationists about wildlife that occur in the River System and how to minimize disturbance and habitat degradation	Same	Same
	Bird rookeries and nest sites are protected from disturbance that could impact survival of the eggs or young	Same	Same

MONITORING PROTOCOL	TRIGGERS (conditions that warrant management actions)	THRESHOLDS (minimally acceptable conditions)
Annual interviews with AMC and Stakeholders	The presence of litter	Trash receptacles are located at places with high use
W&S Budget	Inadequate funding for debris removal	Debris removal is considered in the annual budget for the W&S River, or debris removal is conducted by land managers responsible for managing the River System
Annual visual, photographic monitoring	Paddling in the navigable portions of the River System are restricted by debris	Outside of those areas designated as Unnavigable or Difficult to Paddle, no more than 2 portages per mile are required except after major storm events
Annual visual, photographic monitoring	Debris restricts motorized boats or airboats used for emergency management and exotic species control	Outside of those areas designated as Unnavigable or Difficult to Paddle, motorized boats or airboats for emergency management and exotic species control can access the River System
Monthly inspections; User Surveys every 5 years	There is no information about frequently-occurring wildlife at recreation sites, campsites and launch sites	Kiosks, signage, brochures and the W&S website provide information about frequently-occurring wildlife and how to avoid impacting them
Annual biologist and citizen scientist surveys	A bird rookery is established in the River System	Specific management actions are implemented to protect bird rookeries from disturbance



INDICATORS OF SUCCESS			
Classification	Wild	Scenic	Recreational
River Conditions (continued)			
Wildlife (continued)	Wildlife law enforcement officers patrol the River System to control poaching and harassing of wildlife	Same	Same
			No invasive or exotic species of wildlife are present at Recreation Sites
Listed Species	Citizen scientists and biologists continue to identify the locations and distribution of listed species, particularly those that are endemic to the River System	Same	Same
	Management plans for listed species expected to occur are developed by public land managers to protect the species and to minimize impacts from recreationists	Same	Same
Cultural Resources	Surveys for archaeological and cultural resources are conducted prior to activities that could destroy or disrupt the resource	Same	Same
	No impacts to archaeological and cultural resources occur due to recreation or management activities	Same	Same
User Experience			
Human Interaction	Five-year surveys document high user satisfaction	Same	Same
Experience	Five-year surveys document high user satisfaction	Same	Same
Noise	Noise levels are not disturbing to users	Same	Same
Artificial Light	Light pollution is not disturbing to users	Same	Same

MONITORING PROTOCOL	TRIGGERS (conditions that warrant management actions)	THRESHOLDS (minimally acceptable conditions)
Wildlife law enforcement reports	Land Managers and Recreation Site owners do not see or hear from Law Enforcement	Law Enforcement conducts at least monthly reviews of Recreation Sites, and quarterly reviews of Wild and Scenic segments
Annual interviews with AMC and Stakeholders	The presence of exotic wildlife within the Buffer Zone	Exotic species of wildlife do not expand from Recreation Sites into the Buffer Zone
Annual biologist and citizen scientist surveys	No data is being collected on listed species with potential for occurrence in the basin	Public land managers encourage field work and research by citizen scientists, natural resource agencies and academics
Florida Fish and Wildlife Conservation Commission, Florida Department of Environmental Protection and Seminole State Forest Management Plans	No data is being collected on listed species with potential for occurrence in the basin	Management plans for public lands in the River System are up to date
Field surveys	Soil disturbance in areas with potential for archaeological or cultural resources	Sufficient information on archaeological and cultural resources is available to protect these resources from disturbance
Annual interviews with AMC and Stakeholders Annual visual, photographic monitoring	Soil disturbance in areas with potential for archaeological or cultural resources	Sufficient information on archaeological and cultural resources is available to protect archaeological or cultural resources from disturbance
User Surveys conducted every 5 years	Users are not satisfied with their experience	User Survey data do not show dissatisfaction with their recreation experience
User Surveys conducted every 5 years	Users are not satisfied with their experience	User Survey data do not show dissatisfaction with their recreation experience
User Surveys conducted every 5 years	Users are not satisfied with their experience because of the levels of noise they encounter	User Survey data do not show that recreationists are disturbed by noise
User Surveys conducted every 5 years	Users are not satisfied with their experience because of the amount of light pollution	User Survey data do not show that recreationists are disturbed by light pollution



INDICATORS OF SUCCESS			
Classification	Wild	Scenic	Recreational
User Experience (continued)			
Human Settlement and Artificial Structures	There are limited indications of human settlement, and limited views of artificial structures	There are limited indications of human settlement, and limited views of artificial structures	New structures associated with river-based recreation facilities are screened from the river, aesthetically pleasing, and constructed with innocuous materials
Motorized Boat Traffic	There is no motorized boat traffic in Wekiwa Springs Run, Rock Springs Run or Black Water Creek except for approved research and management activities	Same	Same
	Except for approved research and management activities airboats of any kind, and boats with motors larger than 25 horsepower do not enter the River System	Same	Same
	Power boat operators slow to no wake in the vicinity of canoes, kayaks and paddleboards	Same	Same
Emergency Planning	There is a plan in place for emergency assistance along the river system	Same	Same
Hunting	Hunting may be allowed with appropriate permits, within the 0.5-mile wide Buffer Zone	Same	Same
Fishing	Opportunities for fishing are described in materials provided to river users	Same	Same

MONITORING PROTOCOL	TRIGGERS (conditions that warrant management actions)	THRESHOLDS (minimally acceptable conditions)
Annual visual, photographic monitoring, User Surveys conducted every 5 years	There is an increase in indications of human settlement, and/or views of artificial structures; Users are not satisfied with their experience because of views of artificial structures	User Survey data do not show that recreationists are disturbed by views of artificial structures
Annual interviews with AMC and Stakeholders, User Surveys conducted every 5 years	Unauthorized motorized boat traffic occurs in Wekiwa Springs Run, Rock Springs Run or Black Water Creek	There is no motorized boat traffic in Wekiwa Springs Run, Rock Springs Run or Black Water Creek except for approved research and management activities
Annual interviews with AMC and Stakeholders, User Surveys conducted every 5 years	Unauthorized motorized boat traffic occurs in Wekiwa Springs Run, Rock Springs Run or Black Water Creek	There are no airboats or boats with motors larger than 25 horsepower in the River System except for approved research and management activities
Annual interviews with AMC and Stakeholders, User Surveys conducted every 5 years	Canoeists, kayakers and paddleboarders complain of waves caused by power boats	User surveys do not indicate dissatisfaction of canoeists, kayakers and paddleboarders from waves caused by powerboat operators
AMC-approved Emergency Plan	There are no plans in place for emergency assistance	There is a plan in place for emergency assistance along the river system
Annual interviews with AMC and Stakeholders	Unauthorized hunting occurs in the Buffer Zone	Approved hunting occurs in the Buffer Zone
Annual interviews with AMC and Stakeholders	Users are unaware of opportunities for fishing	Approved fishing occurs in the River System



APPENDIX 3

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