Wekiva Wild and Scenic River System
Florida

September 2011

National Park Service
U.S. Department of the Interior


Wekiwa Spring


Black Water Creek


Limpkin


Above SR46 Bridge

Environmental Assessment for the Comprehensive River Management Plan

ENVIRONMENTAL ASSESSMENT
WEKIVA WILD AND SCENIC RIVER SYSTEM

Florida

The Wekiva Wild and Scenic River System was designated by an act of Congress on October 13, 2000 (Public Law 106-299). The Wild and Scenic Rivers Act (16 USC 1247) requires that each designated river or river segment must have a comprehensive river management plan developed. The Wekiva system has no approved plan in place.

This document examines two alternatives for managing the Wekiva River System. It also analyzes the impacts of implementing each of the alternatives. **Alternative A** consists of the existing river management and trends and serves as a basis for comparison in evaluating the other alternative. It does not imply that no river management would occur. The concept for river management under **alternative B** would be an integrated program of goals, objectives, and actions for protecting and enhancing each outstandingly remarkable value. A coordinated effort among the many public agencies and entities would be needed to implement this alternative. Alternative B is the National Park Service's and the Wekiva River System Advisory Management Committee's preferred alternative.

Implementing the preferred alternative (B) would result in coordinated multiagency actions that aid in the conservation or improvement of scenic values, recreation opportunities, wildlife and habitat, historic and cultural resources, and water quality and quantity. This would result in several long-term beneficial impacts on these outstandingly remarkable values.

This *Environmental Assessment* was distributed to various agencies and interested organizations and individuals for their review and comment in August 2010, and has been revised as appropriate to address comments received. For more information contact Jaime Doubek-Racine, National Park Service, 5342 Clark Road, PMB#123, , Sarasota, FL 34233.

U.S. Department of the Interior • National Park Service

SUMMARY

The Wekiva River System, composed of the Wekiva River, Rock Springs Run, Wekiwa Springs Run, and Black Water Creek, was designated by the U.S. Congress as a national wild and scenic river in October 2000. Five outstandingly remarkable values (ORVs) have been identified for the river system: scenic, recreational, wildlife and habitat, historic and cultural, and water quality and quantity. In accordance with the Wild and Scenic Rivers Act (PL 90-542), these values, the river system's free-flowing characteristics, and its immediate environment "shall be protected for the benefit and enjoyment of present and future generations" (section 1(b)) Wild and Scenic Rivers Act). Unlike most rivers in the national wild and scenic river system that are managed exclusively by either a federal or state agency, the Wekiva River System is considered a partnership wild and scenic river, meaning that it is jointly managed by a consortium of local stakeholder groups referred to as the Wekiva River System Advisory Management Committee (the advisory management committee) with oversight and coordination provided by the National Park Service (NPS).

Section 3(d)(1) of the Wild and Scenic Rivers Act requires that a comprehensive management plan be developed to serve as the basis for protecting a designated river's values. The *Comprehensive River Management Plan* developed by the Wekiva Wild and Scenic River System Advisory Management Committee through collaboration with the NPS (summarized as the preferred alternative in this document) fulfills the requirement of section 3(d)(1).

The Wekiva River System is in central Florida, including parts of Lake, Orange, and Seminole counties. The river system is just north of Orlando, one of Florida's principal metropolitan areas with a rapidly growing population. Approximately two million people reside in the tri-county area according to 2006 estimates by the U.S. Census Bureau.

During the past 30 years, human actions and an increasing population have created challenges to managers of the Wekiva River System's outstanding values. Wildlife habitat has been fragmented, and numerous exotic species have invaded natural areas. Diverse recreation demands have created conflicts between users and threaten the ecological integrity of the natural resources people come to enjoy. Water quality and quantity have also been affected by land use within and around the Wekiva River System. Important cultural resources have been degraded by visitors who are unaware of their value or who deliberately seek to loot artifacts.

Despite these challenges, resources of the Wekiva River System remain relatively intact. Resource managers, the public, and all those who enjoy the river system must be diligent in protecting these resources. Without adequate protection, areas of the river system may lose their values when the sights and sounds of modern life intrude on the back country of the Wekiva River System.

This environmental assessment explores two alternatives for future management of the Wekiva River System.

ALTERNATIVE A: CONTINUE CURRENT MANAGEMENT (THE NO-ACTION ALTERNATIVE REQUIRED BY THE NATIONAL ENVIRONMENTAL POLICY ACT)

Alternative A would continue existing management efforts in the Wekiva River System. The so-called "no-action"

alternative does not imply the cessation of ongoing activities but provides a baseline for comparison in evaluating the changes and impacts of the other alternative. Government agencies, including those on the advisory management committee, would continue to manage the river system as it is currently being managed. Existing agency operations and visitor facilities would remain in place.

A comprehensive river management plan required by Section 3(d)(1) of the Wild and Scenic Rivers Act would not be approved under this alternative and so it would be in violation of the act.

Alternative A includes the continuation of several actions and activities that benefit outstandingly remarkable values. It would not include specific actions that result in adverse impacts to these values, but would continue other ongoing trends that may cause adverse impacts.

Alternative A corresponds to the continuation of current management activities, therefore is *not likely to adversely affect* special status species (per compliance with Section 7 of the Endangered Species Act). . Alternative A would result in no new effects on historic and cultural resource values but could result in the continuation of *adverse effects* on some cultural resources under Section 106.

ALTERNATIVE B:
THE PREFERRED ALTERNATIVE

This alternative proposes an integrated program of goals, objectives, and actions for protecting and enhancing each outstandingly remarkable value. A coordinated effort among the many public agencies and entities would be needed to implement this alternative. Fortunately, public agencies and local governments of the river basin have a long history of partnership and cooperation that will provide a solid foundation for implementing the plan.

The goals, objectives, and actions are separated into five categories, one for each outstandingly remarkable value. The following summarizes the goals identified for each outstandingly remarkable value.

Scenic Goals

- Maintain and enhance healthy native plant and animal communities in the Wekiva River System.

- Maintain and enhance the wild and scenic character of the Wekiva River System by limiting the intrusion of the visual and audi-tory aspects of human development and activity.

Recreational Goals

- 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.

Wildlife and Habitat Goals

- Protect aquatic and aquatic-dependent organisms and their habitats throughout the Wekiva River System and its associated wetlands.

- Maintain habitat quality, landscape diversity, and ecosystem connectivity within the Wekiva basin area and associated

ecosystems with an emphasis on the black bear as an umbrella species.

- Reduce the impacts of invasive species and exotic species on native species and habitats throughout the Wekiva River System and its associated wetlands.

Historic and Cultural Resource Goals

- Identify, protect, and preserve historic and cultural resources from human-related and natural threats.

- Foster an understanding among the public of the significance of the historic and cultural resources of the Wekiva basin.

Water Quality and Quantity Goals

- Protect instream water quality of the Wekiva River System.

- Protect flow regimes of the Wekiva River System.

Alternative B would result in the continuation of existing programs and management efforts in addition to implementation of several goals, objectives and actions intended to further protect each outstandingly remarkable value. This alternative would foster the coordination of multiagency actions that contribute to the protection of scenic values, recreation values, wildlife and habitat values, historic and cultural resource values, and water quality and quantity values. Alternative B would also create opportunities for federal funding to assist in management and protection efforts.

Alternative B also includes a strategy for implementing a user capacity program that would involve the identification of potential impacts from resource use and an impact monitoring program to determine if the level of change is in an acceptable range.

The description of the preferred alternative appearing in this environmental assessment is a summary of the *Wekiva Wild and Scenic River System Management Plan* prepared for the Wekiva Wild and Scenic River System Advisory Management Committee, which is available from the advisory management committee.

Alternative B corresponds to the continuation of current management activities in addition to several new or enhanced initiatives protective of wildlife, therefore it is *not likely to adversely affect* special status species (per compliance with Section 7 of the Endangered Species Act). Overall, the implementation of alternative B would have *no adverse effect* on cultural resources and values under Section 106 of the National Historic Preservation Act.

THE NEXT STEP

A draft of the *Environmental Assessment* was posted on the NPS website for public review and comment during a 30-day time period between August and September 2010. Comments received during and subsequent to this were evaluated to produce this *Environmental Assessment* which will be accompanied by a decision document — a "Finding of No Significant Impact" — to document the NPS selection of an alternative for implementation. With the signed decision document, the plan can then be implemented by the various agencies and organizations under the auspices of the Wekiva Wild and Scenic River System Advisory Management Committee. However, this approval does not guarantee that funding will be available for implementation.

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PURPOSE AND NEED FOR THE ENVIRONMENTAL ASSESSSMENT

INTRODUCTION

This *Environmental Assessment* presents and analyzes two alternative future directions for the management and use of the Wekiva Wild and Scenic River System. Alternative A consists of existing management efforts and serves as a basis for comparison to evaluate alternative B, which involves implementation of the Wekiva Wild and Scenic River System Advisory Management Committee's comprehensive river management plan. Alternative B is the NPS's preferred alternative. The potential environmental impacts of both alternatives have been identified and assessed.

Comprehensive river management plans are intended to be long-term documents that establish and articulate a management philosophy and framework for decision making and problem solving. Key elements of a comprehensive river management plan include the following:

- Describe the existing resource conditions, including a detailed description of the outstandingly remarkable values.
- Define the goals and desired conditions for protecting river system values.
- Address user capacities.
- Address water quality issues and instream flow requirements.
- Reflect a collaborative approach with all stakeholders.
- Identify regulatory authorities of other governmental agencies involved in protecting river system values.
- Include a monitoring strategy to maintain desired conditions.
- Develop in compliance with the National Environmental Policy Act.

Actions directed by management plans or subsequent implementation plans are accomplished over time. Budget restrictions, requirements for additional data or regulatory compliance, and competing national park system priorities may prevent immediate implementation of many actions. Major or especially costly actions could be implemented 10 or more years into the future.

A GUIDE TO THIS ENVIRONMENTAL ASSESSMENT

This environmental assessment includes the components required by NEPA and the Wild and Scenic Rivers Act in the following format: Chapter 1 is the introductory material, the purpose and need for the environmental assessment, environmental topics that will/will not be analyzed, and the relationship of this environmental assessment to other planning efforts. Chapter 2 contains a description of the existing management as the required "no-action" alternative. It also contains a summary of the *Wekiva Wild and Scenic River System Comprehensive Management Plan*, prepared for the Wekiva Wild and Scenic River System Advisory Management Committee, as the preferred alternative (alternative B). Chapter 3 is a description of the environmental components that could be affected by actions in the alternatives. Chapter 4 describes the impacts that would be expected to occur if the alternatives were implemented. Chapter 5 is a record of the public involvement and other pieces of the planning process.

NEED FOR THE ENVIRONMENTAL ASSESSMENT

The Wild and Scenic Rivers Act requires a comprehensive river management plan for each designated river in the national wild and scenic river system. This environmental assessment provides compliance with the National Environmental Policy Act, the Endangered Species Act, the National Historic Preservation Act, and the Wild and Scenic Rivers Act for the plan.

THE NEXT STEP

A draft of the *Environmental Assessment* was posted on the NPS website for public review and comment during a 30-day time period between August and September 2010. Comments received during and subsequent to this were evaluated to produce this *Environmental Assessment* which will be accompanied by a decision document — a "Finding of No Significant Impact" — to document the NPS selection of an alternative for implementation. With the signed decision document, the Comprehensive River Management Plan can then be implemented by the various agencies and organizations under the auspices of the Wekiva Wild and Scenic River System Advisory Management Committee. However, this approval does not guarantee that funding will be available for implementation.

IMPLEMENTATION OF THE PLAN

The implementation of the approved plan will depend on future funding by the managing entities, including the National Park Service. Approval of this environmental assessment does not guarantee that the funding and staffing needed to implement the plan will be forthcoming. Full implementation of the plan could be many years in the future.

BRIEF DESCRIPTION OF THE RIVER SYSTEM

In 1968, acting upon growing public concern about threatened natural waterways, Congress passed the Wild and Scenic Rivers Act (Public Law 90-542). This act recognizes the values of certain rivers and their associated ecosystems as outstanding natural treasures that must be protected for the enjoyment of future generations. Several rivers were designated for immediate protection, and additional rivers were authorized for study as potential components of the federally protected system. Since then, Congress has amended the act to either designate or authorize study of additional rivers.

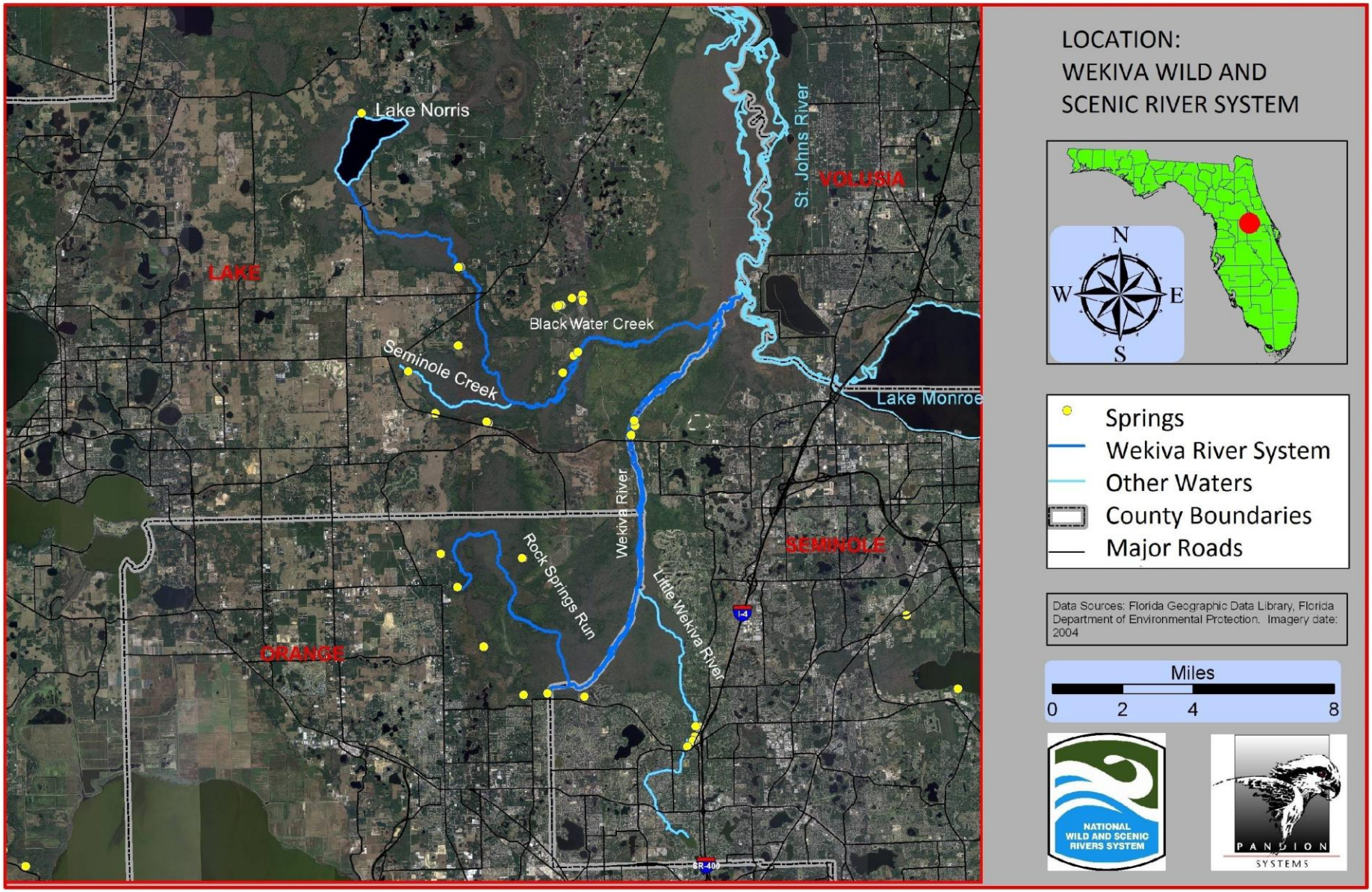
In 1996, at the request of local advocates, Congress passed Public Law 101-311 authorizing the study of the Wekiva River, Rock Springs Run, and Seminole Creek as possible additions to the national wild and scenic rivers system. After the "Wekiva River Study" was completed and published in 1999, the Wekiva River, together with Wekiwa Springs Run, Rock Springs Run, and Black Water Creek were designated by Congress as a national wild and scenic river on October 13, 2000 (see appendix A). The Location map depicts the federally designated Wekiva Wild and Scenic River System.

> The name "Wekiwa" is a legacy of the Seminole Indians who used the area. There has been confusion about the names Wekiwa and Wekiva, and many people use them interchangeably. Wekiwa is the Creek/ Seminole word for bubbling water, hence Wekiwa Springs; Wekiva is the Creek/ Seminole word for flowing water, hence Wekiva River (NPS 1999).

The Wekiva River together with Rock Springs Run, Wekiwa Springs Run, and Black Water Creek were selected for protection because they were found to be free-flowing and possessed five outstandingly remarkable values (ORVs)

associated with the river environment. These values are scenic, recreation, wildlife and habitat, historic and cultural, and water quality and quantity.

Black Water Creek is the spelling of this tributary to the Wekiva River used by the United States Geographic Survey (USGS), the official keepers of place names for the United States. It is also the spelling of the name in the designating Wild and Scenic Rivers Act amendment. Locally, it is often spelled as one word ("Blackwater Creek"). For consistency, this document will use the former spelling when referring to this tributary.


Lake Norris
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Black Water Creek
Seminole Creek
Lake Monroe
Wekiva River
Rock Springs Run
Little Wekiva River
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WEKIVA WILD AND
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PURPOSE AND SIGNIFICANCE

RIVER PURPOSE

The purpose of the Wekiva Wild and Scenic River System designation is to protect the river system and its outstandingly remarkable values for the benefit and enjoyment of present and future generations.

OUTSTANDINGLY REMARKABLE VALUES

Outstandingly remarkable values are the resources or values that make the designated segment of river needing or worthy of extra protection offered by the Wild and Scenic Rivers Act. The significance of the Wekiva Wild and Scenic River System is described as its outstandingly remarkable values:

Scenic Values

Much of the designated river segments are in a nearly pristine state and present an outstanding opportunity to see an unspoiled part of natural Florida. The visual resources are exceptional.

Recreation Values

The Wekiva River, Wekiwa Springs Run, and Rock Springs Run are major, nature-based, recreational resources for central Florida, including the highly urbanized Orlando metropolitan area. Black Water Creek is a recreational resource for the more experienced paddler.

Wildlife and Habitat Values

The Wekiva River System is one of Florida's most valuable and unusual natural resources because of its location in a region of biological transition between two climatic zones. The river system provides habitat for three species endemic to the Wekiva River basin and for five federally listed threatened or endangered species.

Historic and Cultural Values

The Wekiva area is considered to be one of the most important archeological areas in central Florida. Known cultural sites provide evidence that the area has been inhabited for more than 10,000 years.

Water Quality and Quantity Values

All of the designated river segments are classified as Outstanding Florida Waters, Florida's highest designation for water quality. Water quality and quantity are influenced by surface water drainage and groundwater flows within the Wekiva basin and springshed.

PLANNING ISSUES / CONCERNS

During the past 30 years, human actions and an increasing population have created challenges to managers of the Wekiva River System's outstanding values. Wildlife habitat has been fragmented, and numerous exotic species have invaded natural areas. Diverse recreation demands often create conflict between users and threaten the ecological integrity of the natural resources people come to enjoy.

Despite these challenges, resources of the Wekiva River System remain relatively intact. Resource managers, government leaders, the public, and all those who enjoy the river system must be diligent in protecting these resources. Without adequate protection, areas of the river system may have diminished values when the sights and sounds of modern life intrude upon the back country of the river system.

Issues that are associated with direct and indirect threats against each of the river system's five outstandingly remarkable values have been identified, and strategies for protecting those values are addressed in the comprehensive river management plan and summarized in this environmental assessment.

IMPACT TOPICS – RESOURCES AND VALUES AT STAKE IN THE PLANNING PROCESS

An important part of planning is seeking to understand the consequences of making one decision over another. To this end, management plans are accompanied, in this case, by an environmental assessment. Environmental assessments identify the anticipated impacts of possible actions on resources and on visitors and neighbors. Impacts are organized by topic, such as impacts on the visitor experience or impacts on vegetation and soils. Impact topics focus the environmental impact analysis and ensure the relevance of impact evaluation. The impact topics identified for this environmental assessment are outlined in this section and are based on the outstandingly remarkable values identified in previous studies of the river system. Also included is a discussion of some impact topics that are commonly addressed but that are not addressed in this environmental assessment for the reasons given.

IMPACT TOPICS TO BE CONSIDERED

The topics to be considered for detailed impact analysis in this environmental assessment are the outstandingly remarkable values listed in the designating legislation for the Wekiva Wild and Scenic River System.

Scenic Values

Much of the river system is in a nearly pristine state. Some proposed actions could affect scenic value or aesthetic resources, so this topic is retained for further analysis.

Recreation Values

Actions proposed in the alternatives could affect recreational use in the area. In particular, implementing a user capacity framework could displace some visitors, who might decide to visit other segments of the river or other areas in the region. The visitor experiences offered in these areas and management of the areas could change under the alternatives proposed in this environmental assessment, so this topic is retained for analysis.

Wildlife and Habitat Values

The river system's mammals, birds, amphibians, reptiles, and fish are important resources, and are important also to visitor experiences. Actions proposed in the alternatives could affect fish or wildlife resources. Any loss of habitat or decreases in populations would be of concern to river managers, visitors, and the public.

The Endangered Species Act requires federal agencies to ensure that their activities will not jeopardize the existence of any endangered or threatened species or result in the destruction or adverse modification of critical habitat of such species. Consultation with the U.S. Fish and Wildlife Service and Florida Fish and Wildlife Conservation Commission identified a number of threatened or endangered species or species of special concern associated with the river system. Actions proposed could affect listed species, so this topic is retained for further analysis.

Historic and Cultural Resource Values

Historic and cultural resource values typically comprise the cultural resource types recognized and described by the NPS — archeological resources, historic structures, cultural landscapes, ethnographic resources, and museum collections. The cultural resource type that may be affected by one or more of the alternative actions in this environmental assessment are archeological resources — those resources within the river system that are the physical evidence of past human activity and can represent both prehistoric and historic occupations, so this topic is retained for further analysis.

Water Quality and Quantity Values

The water resources in the river segments are protected and managed under the Clean Water Act of 1977. Changes in water quality and quantity can affect fish and wildlife populations as well as the health of visitors. The alternatives could result in a change in the type or level of use, which could affect water quality and/or quantity. This would be of concern to visitors and river managers so this topic is retained for further analysis.

Floodplains and Wetlands

Floodplains can exist even where there are no streams or flowing water. This is especially true in Florida, which is very flat and where connections could exist to the surficial aquifer and flooding may occur during periods of significant rainfall. Floodplain impacts have occurred and may continue to be permitted, although the water management district now requires compensating storage and attention to riparian protection zones. Historically, a significant amount of development has occurred in the floodplain of the Wekiva River System.

Wetlands directly connected to the Wekiva River System are found in low-lying areas along the river system and up to 2 miles away. It is common policy to avoid affecting wetlands and to minimize impacts when they are unavoidable. Under all of the alternatives in this environmental assessment, facilities proposed for development should be sited to avoid wetlands or to mitigate wetland impacts that cannot be avoided. Areas that might have wetlands are delineated before construction is permitted.

These topics are included in the discussions and analysis of wildlife and habitat values and water quality and quantity values.

IMPACT TOPICS DISMISSED FROM FURTHER CONSIDERATION

Some impact topics that commonly are considered during the planning process were not relevant to the development of this environmental assessment because of the following: (a) implementing the alternatives would have no effect, a negligible effect, or a minor effect on the resource or (b) the resource does not occur in the planning area. These topics are as follows.

Certain Cultural Resource Topics

Certain aspects of cultural resources that are typically analyzed in a document of this type either are not known to exist in the planning area or would not be affected by any proposed actions. These include historic structures, cultural landscapes, ethnographic resources, and museum collections.

It is possible that there are some remaining standing historic structures or other resources in these categories in the river corridors, but no actions proposed in this environmental assessment are anticipated to have an effect on them.

Historic structures are those that are generally more than 50 years old and provide insight into the historic significance of a place. These may be listed in the National Register of Historic Places; however, there are no known historic structures of this type in the river corridors.

Ethnographic resources are defined by the NPS as any "site, structure, object, landscape, or natural resource feature assigned traditional legendary, religious, subsistence, or other significance in the cultural system of a group traditionally associated with it." A cultural landscape is a reflection of human adaptation and use of natural resources and is often expressed in the way land is organized and divided, patterns of settlement, land use, systems of circulation, and the types of structures that are built. The character of a cultural landscape is defined both by physical materials, such as roads, buildings, walls, and vegetation, and by use reflecting cultural values and traditions.

No ethnographic resources or identified cultural landscapes have been brought to the attention of the planning team, and no actions proposed in the environmental assessment would affect these resources more than negligibly if they do exist. The NPS does not maintain any museum or archive collections associated with the Wekiva River System and so has no responsibility for this aspect of cultural resource management.

For the reasons given above, these topics are dismissed from further analysis.

Prime and/or Unique Farmland

The 1981 Farmland Protection Policy Act (Public Law 97-98) was passed to minimize the extent to which federal programs contribute to the unnecessary and irreversible conversion of farmland to nonagricultural uses, and to ensure that federal programs are administered in a manner that, to the extent practicable, is compatible with state, local governments, and private programs and policies to protect farmland.

Prime farm lands are defined as land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is also available for these uses. Prime farmlands are permeable to water and air and are not excessively erodible or saturated with water for a long period of time (*Soil Survey Manual, USDA Handbook No. 18*, October 1993).

Unique farmlands are lands other than prime farmland that are used for the production of specific, high-value food and fiber crops. They have the special combination of soil quality, location, growing season, and moisture supply needed to economically produce sustained high quality and/or high yields of a specific crop when treated and managed according to acceptable farming methods.

According to the Natural Resources Conservation Service, there are no prime or unique farmlands in Lake, Orange, or Seminole counties (http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx accessed on 6/26/09). Thus, there is no need to evaluate the impacts of alternatives on this topic.

Urban Quality and Design of the Built Environment

Consideration of this topic is required by 40 *Code of Federal Regulations* (CFR) 1502.16. The quality of urban areas is not a concern in this planning project except in the developed spring areas and at developed sites on the river system. Emphasis should be placed on designs, materials, and colors that blend in and do not detract from the natural and built environment. There are specific actions in the preferred alternative that address some aspects of this topic. Impacts from implementing either of the alternatives are anticipated to be negligible, so no further consideration of this topic is necessary.

The protection of open space is an aspect of design that can benefit wildlife and habitat, promote aquifer recharge, and reduce the need for watering and fertilizers. Action steps that promote the protection of open space through innovative design are identified in actions steps under alternative B.

Air Quality and Night Skies

The Clean Air Act states that land managers have an affirmative responsibility to protect air quality from adverse air pollution impacts.

Engine exhaust is the most common air pollutant in the Wekiva basin and is heaviest around urban areas, major roads, and some agricultural operations. Airborne particulates (e.g., dust and smoke) are generated from construction, agricultural operations, and wildfires (both naturally ignited and prescribed burns).

There is no major construction or other actions proposed in any of the alternatives that would have more than a temporary, localized, and negligible effect on local or regional air quality. Under either of the alternatives, traffic and recreational use of various sites along the rivers would likely increase as the human population in the region continues to increase. This would result in increased vehicle emissions that would comprise a slight adverse affect on regional and local air quality. The effects may be partially mitigated over the long term if national emission and mileage standards for vehicles are revised. Because there would be only negligible impacts on air quality, this topic is dismissed from further analysis in this document.

Related to air quality is the clarity of night skies. The clarity of night skies is important to visitor experiences as well as being ecologically important. Air pollution and light pollution from artificial light sources outside the river corridors are diminishing the clarity and visibility of night skies. The proposed Wekiva Parkway project has the potential to impact night sky viewing.

Other than this, the continued undeveloped setting of the river corridors would not contribute adverse effects on night sky viewing opportunities. Although there would be continuing adverse effects on night sky viewing opportunities from surrounding development, there are no actions proposed in either alternative that would affect night skies, so this topic is dismissed from further consideration.

Soundscapes

The natural soundscape along the Wekiva River System is composed of sounds associated with physical and biological resources such as birds, insects, wind through the trees, and flowing water. Audible human-caused noise is a direct adverse impact on natural soundscapes. Natural soundscapes are important to healthy ecosystems as well as positive visitor experiences.

Because of the primarily undeveloped nature of the Wekiva Wild and Scenic River System, natural sounds tend to predominate along most designated segments of the river system. However, impacts on the river system's sound-scapes from human-related sources outside the river corridors can be substantial in certain areas. These areas include noise from traffic on State Road 46 (SR 46) where it crosses over the Wekiva River and noise at developed recreation sites such as Wekiwa Springs, Rock Springs, and private developments. The proposed actions would not appreciably affect these sources.

The alternatives presented in this environmental assessment may result in a change to the distribution or number of visitors or operations activities in a given area, which could have negligible, beneficial, or adverse effects on natural soundscapes, depending on the area. However, because anticipated impacts would be minor or less, this topic is dismissed from further analysis.

Indian Trust Resources

Secretarial Order 3175 requires that any anticipated impacts on Indian trust resources from a proposed project or action by agencies of the Department of the Interior be explicitly addressed in environmental documents. The federal Indian trust responsibility is a legally enforceable fiduciary obligation on the part of the United States to protect tribal lands, assets, resources, and treaty rights, and it represents a duty to carry out the mandates of federal law with respect to American Indian and Alaska Native tribes.

The lands comprising the planning area are not held in trust by the Secretary of the Interior for the benefit of Indians due to their status as Indians. Because there are no Indian trust resources associated with the river system, this topic was dismissed from further analysis.

Environmental Justice

Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," requires all federal agencies to incorporate environmental justice into their missions by identifying and addressing disproportionately high and adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities.

For the purpose of fulfilling Executive Order 12898, in the context of the National Environmental Policy Act, the alternatives addressed in this environmental assessment were assessed during the planning process. It was determined that none of the alternatives would result in disproportionately high direct or indirect adverse effects on any minority or low-income population or community. The following information contributed to this conclusion:

The developments and actions in the alternatives would not result in any identifiable adverse human health effects. Therefore, there would be no direct or indirect effects on human health within any minority or low-income population or community.

The impacts on the natural and physical environment that would occur due to any of the alternatives would not disproportionately adversely affect any minority or low-income population or community, or be specific to such populations or communities.

The alternatives would not result in any identified effects that would be specific to any minority or low-income community.

Native American tribes have and will continue to be consulted. No adverse effects were identified that disproportionately affect the tribes.

The Socioeconomic Environment

The socioeconomic environment could be slightly affected by implementation of actions proposed in alternative B that would monitor and potentially regulate the number of recreationists and their activities within the geographic area nearest the river system. The implementation of a user capacity study and facilities master plan would be beneficial to resource management of the river system. This is further analyzed in Chapter 2.

RELATIONSHIP OF THIS ENVIRONMENTAL ASSESSMENT TO OTHER PLANNING EFFORTS

THE WEKIVA PARKWAY

The Orlando-Orange County Expressway Authority and Florida Department of Transportation are in the planning process for the Wekiva Parkway, a multilane facility that would traverse the planning area and cross the Wekiva River at the location of the existing State Road 46 (SR 46) bridge. The Wekiva Parkway and Protection Act, adopted by the Florida legislature in 2004, provides guiding principles for the planning and design of this major new road construction project and requires that the parkway help protect natural resources in several ways.

There are currently only two wildlife tunnels (totaling 78 feet) under SR 46 in Lake County (west of the bridge over the Wekiva River) that provide safe crossings under SR 46 between Rock Springs Run State Reserve and Seminole State Forest for wildlife such as deer, bobcat, coyote, and bear. This configuration should be replaced by an integrated Wekiva Parkway/SR46 design that provides significantly longer elevated spans of roadway for wildlife movement and ecosystem connectivity. Instead of the two small existing tunnels, approximately 1.5 miles of bridging are proposed for the combined Wekiva Parkway/ SR46 structure. Elevating the parkway is expected to greatly reduce vehicle collisions with animals and reduce habitat fragmentation.

The parkway plan also proposes a new bridge where SR 46 crosses the Wekiva River. (The current bridge is about 561 feet long.) This new bridge will span approximately 1800 feet and should enhance habitat connectivity and animal movement within the riparian corridor.

As part of the parkway project, the portion of CR 46A through Seminole State Forest is proposed to be realigned and connect to SR 46 farther west, outside the forest and the primary ecological corridor. This would reduce the number of animals harmed by vehicles and provide habitat connectivity in the state forest.

The NPS and Wekiva Wild and Scenic River partners have and will continue to review actions associated with planning, design, and construction of the Wekiva Parkway to ensure that values of the river system are protected.

PUBLIC LAND MANAGEMENT PLANS

Various state agencies and local governments maintain management plans for public lands and resources in the Wekiva basin. State land managers include the Florida Department of Environmental Protection (FDEP), Division of Recreation and Parks (which manages Wekiwa Springs State Park, Lower Wekiva River State Park Preserve, and Rock Springs Run State Reserve), the St Johns River Water Management District (which manages lands associated with the Lake Norris, Black Water Creek, and the portion of the floodplain between the Wekiva River and Little Wekiva River known as the Wekiva Buffer Area) , and the Florida Department of Agriculture and Consumer Services (which manages Seminole State Forest). In addition, the FDEP Division of Coastal and Aquatic Managed Areas manages sovereign submerged lands in the Wekiva River Aquatic Preserve.

The Lake County Water Authority, a unique entity established by the state legislature, manages lands within the Wekiva area around Lake Norris. Local land managers include Seminole County, Lake County, Orange County, and the city of Apopka. Alternative B seeks to improve coordination among these various entities to achieve objectives of this environmental assessment.

The management plan for public lands in the basin includes some future actions that may increase interpretation and education amenities. Revisions to the Wekiva River Aquatic Preserve Management Plan are in progress and will include actions that provide educational opportunities. This environmental assessment would pose no conflict with plans of the public land managing agencies.

LOCAL GOVERNMENT PLANS AND AGENCY REGULATIONS

Pursuant to special pieces of state legislation, the Wekiva River Protection Act, and the Wekiva Parkway and Protection Act, various local governments and agencies are tasked with implementing policies and regulations affecting land use and the protection of natural resources within the Wekiva basin and springshed. Alternative B seeks to improve coordination between agencies and governments to more effectively achieve those objectives.

Docks on the Mekkle River

Chapter 2 - Alternatives, Including the Preferred Alternative

INTRODUCTION

Many aspects of the desired future conditions of the Wekiva Wild and Scenic River System are defined in the Wild and Scenic Rivers Act and other national mandates and policies. Within these parameters, input was solicited from the public, government agencies, tribal officials, and other organizations regarding issues and desired conditions for the river. Information about existing visitor use and the condition of the river's resources and facilities was gathered to determine which areas of the river system attract visitors and which areas have sensitive resources.

Using the above information, two alternatives were developed to reflect a range of ideas for future river management. Alternative A, Continue Existing Management Direction, would continue current management practices and objectives as defined by each agency. Alternative B, Enhance Resource Protection and High-Quality Visitor Experiences (the preferred alternative) would coordinate management strategies among agencies to achieve the desired visitor experience and maintain more optimal resource conditions. The complete set of goals, objectives, and action steps identified within the Comprehensive River Management Plan has been included in this chapter.

This chapter also describes mitigating measures that would be used to lessen or avoid negative impacts, future studies that would be needed, and the environmentally preferred alternative.

Additional plans or studies will be required before some of the results proposed in the alternatives are achieved. The implementation of any alternative also depends on future funding and environmental compliance. This environmental assessment does not guarantee that money will be forthcoming. The comprehensive river management plan establishes a vision of the future to guide day-to-day and year-to-year management of the river system, but full implementation could take many years.

SUMMARY OF LEGISLATION

National Wild and Scenic Rivers Act of 1968

Totaling 41.6 miles, the Wekiva River together with Wekiwa Springs Run, Rock Springs Run and Black Water Creek was designated by Congress as a national wild and scenic river under Section 3 of the Wild and Scenic River Act in October 2000 (PL 90-542). Unlike many rivers in the national system which are entirely managed by federal or state entities, the Wekiva is a partnership wild and scenic river managed by a consortium of local stakeholders represented by the Wekiva River Advisory Management Committee (the advisory management committee), with oversight by the NPS. Section 7 of that act requires federal review of federally assisted projects occurring in the banks or beds of a wild and scenic river.

Wekiva River Protection Act of 1988

The Wekiva River Protection Act, adopted by the Florida legislature in 1988, was an initial step toward achieving comprehensive protection of the Wekiva River System. The legislation required that Lake, Orange, and Seminole counties adopt comprehensive plan policies and land development regulations that apply to the designated Wekiva River Protection Area described in the statute. These policies and regulations were intended to better protect hydrologic resources, water quality, habitats,

and aquatic/wetland-dependent wildlife species associated with the Wekiva River System. New policies and regulations included protecting rural character, limiting development densities, creating river corridor and wetland setbacks, and establishing protection zones. Also, agencies such as the St. Johns River Water Management District were required to create additional regulatory standards to better protect the Wekiva River System as defined in the 1988 act (Wekiva River, Little Wekiva River, Black Water Creek, Rock Springs Run, Sulphur Run, and Seminole Creek). Development of Regional Impact thresholds in the Wekiva River Protection Area were also reduced so that development plans of a smaller size would require detailed analysis and review.

The legislation mainly addressed surface water influences on the river system. At the time the legislation was passed, groundwater influences on the Wekiva River System were not as well understood as they are at present. The extent of the groundwater basin that contributes to spring flow has only been well defined relatively recently. This groundwater basin, also known as the Wekiva springshed, extends considerably west and south of the Wekiva River Protection Area. Until recently, the Wekiva springshed lacked the protective regulations that were put into place for the Wekiva River Protection Area because the springshed is located largely outside of the geographic area defined by the 1988 act.

Wekiva Parkway and Protection Act of 2004

This state legislation provided guiding principles for the design of the Wekiva Parkway, a limited-access facility completing the Orlando beltway and connecting the city of Apopka to Sanford. The act includes requirements for structures to enhance wildlife movement and habitat connectivity and identifies four particular properties to be protected by acquisition or conservation easement near the proposed parkway. To ensure greater protection of water resources, the act designated another statutory area, described as the Wekiva Study Area, which included much of the groundwater contributing area to the west and south of the original Wekiva River Protection Area.

This act called for numerous actions and studies on the part of local governments and state agencies. These activities are overseen by the Wekiva River Basin Commission, which was created as part of the legislation. Pursuant to the 2004 act, local government responsibilities included the adoption of comprehensive plan policies and land development regulations to optimize open space and promote a pattern of development that is protective of recharge areas, karst features, and natural habitat. Strategies identified in the act to accomplish this included clustering, greenway plans, land acquisition, conservation easements, low density development, and best management practices. The act also encouraged local governments to coordinate water supply plans, reuse plans, wastewater treatment, and the replacement of conventional septic systems with performance-based technology where necessary. In addition, the 2004 act required the Florida Department of Environmental Protection and the Florida Department of Health to initiate rulemaking to implement stricter standards that reduce nitrate

loading from wastewater treatment plants and individual on-site septic systems. (Stricter standards have been implemented by the FDEP to reduce nutrient loading from wastewater treatment plants; however, additional studies are being pursued by the FDOH to further assess the contribution of septic systems to nutrient loading.) The Act also called upon the St. Johns River Water Management District to pursue rulemaking that expands the applicability of protective recharge criteria to include the Wekiva Study Area, combine certain consumptive use and environmental resource permitting processes, and consider reducing the volume threshold for consumptive use permits. (The St. Johns River Water Management District amended its rule for lawn and landscape irrigation to require more water conserving measures below the 100,000 gallon per day threshold, pursuant to 40C-2.042, F.A.C. This applies to the Wekiva area and throughout the district.)

Significant to Wekiva water quality concerns is a requirement in the act that the St. Johns River Water Management District develop a pollutant load reduction goal (PLRG) for the Wekiva Study Area. Pollutant load reduction goals are the precursors to TMDLs which require reductions in pollutant loadings to a water body that are needed to meet water quality goals. The first two steps of the PLRG process are to determine the nature of a water body's impairment and then identify the pollutants that are causing impairment. These steps led to the conclusion that nitrate and total phosphorus in the Wekiva River and Rock Springs Run should be reduced.

The act requires the Florida Department of Environmental Protection to adopt total maximum daily loads (TMDLs) for the Wekiva River and Rock Springs Run. This first required that these waterbodies be added to the Impaired Waters List, which was completed in January 2007. Development of the total maximum daily loads uses the findings published in the PLRG study to create a regulatory requirement for external nutrient and other pollutant loads. These loads can be targeted for future reduction in the "Basin Management Action Plan" that outlines how the adopted total maximum daily loads will be implemented. Total maximum daily loads for nitrate and total phosphorus were adopted by the Florida Department of Environmental Protection in June 2008.

Outstanding Florida Waters

The Wekiva River System has been designated as an "Outstanding Florida Water" by the state pursuant to Section 303 of the Federal Clean Water Act. The designation is the highest level of water quality protection within the state.

RIVER CLASSIFICATION

The Wild and Scenic Rivers Act states that for a river to be eligible for designation it must be "free-flowing" and must possess one or more "outstandingly remarkable" scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values. The waters in the Wekiva River System that were designated were found to be free flowing and to possess five outstandingly remarkable values (ORVs). These ORVs are scenic, recreation, wildlife and habitat, historic and cultural, and water quality and quantity values.

The Wild and Scenic Rivers Act also requires that river segments be classified as *wild, scenic*, or *recreational*, depending on the river segment's degree of natural character and use. The classifications are defined as follows:

Wild river segments — Those rivers or sections of rivers that are free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and waters unpolluted. These represent vestiges of primitive America.

Scenic river segments — Those rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads.

Recreational river segments — Those rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past.

The Wild and Scenic Rivers Act (PL 90-542) as amended in October, 2000, specified the following segments and classifications (see also the Classifications map following the description).

(A) Wekiva River and Wekiwa Springs Run — The 14.9 miles of the Wekiva River from its confluence with the St. Johns River to Wekiwa Springs, to be administered in the following classifications:

(i) From the confluence with the St. Johns River to the southern boundary of the Lower Wekiva River State Preserve, approximately 4.4 miles, as a wild river.

(ii) From the southern boundary of the Lower Wekiva River State Preserve to the northern boundary of Rock Springs State Reserve at the Wekiva River, approximately 3.4 miles, as a recreational river.

(iii) From the northern boundary of Rock Springs State Reserve at the Wekiva River to the southern boundary of Rock Springs State Reserve at the Wekiva River, approximately 5.9 miles, as a wild river.

(iv) From the southern boundary of Rock Springs State Reserve at the Wekiva River upstream along Wekiwa Springs Run to Wekiwa Springs, approximately 1.2 miles, as a recreational river.

(B) Rock Springs Run — The 8.8 miles from the confluence of Rock Springs Run with the Wekiwa Springs Run forming the Wekiva River to its headwaters at Rock Springs, to be administered in the following classifications:

(i) From the confluence with Wekiwa Springs Run to the western boundary of Rock Springs Run State Reserve at Rock Springs Run, approximately 6.9 miles, as a wild river.

(ii) From the western boundary of Rock Springs Run State Reserve at Rock Springs Run to Rock Springs, approximately 1.9 miles, as a recreational river.

(C) Black Water Creek.--The 17.9 miles from the confluence of Black Water Creek with the Wekiva River to the outflow from Lake Norris, to be administered in the following classifications:

(i) From the confluence with the Wekiva River to approximately 0.25 mile downstream of the Seminole State Forest road crossing, approximately 4.1 miles, as a wild river.

(ii) From approximately 0.25 mile downstream of the Seminole State Forest road to approximately 0.25 mile upstream of the Seminole State Forest road crossing,

approximately 0.5 mile, as a scenic river.

(iii) From approximately .025 mile upstream of the Seminole State Forest road crossing to approximately 0.25 mile downstream of the old railroad grade crossing (approximately River Mile 9), approximately 4.4 miles, as a wild river.

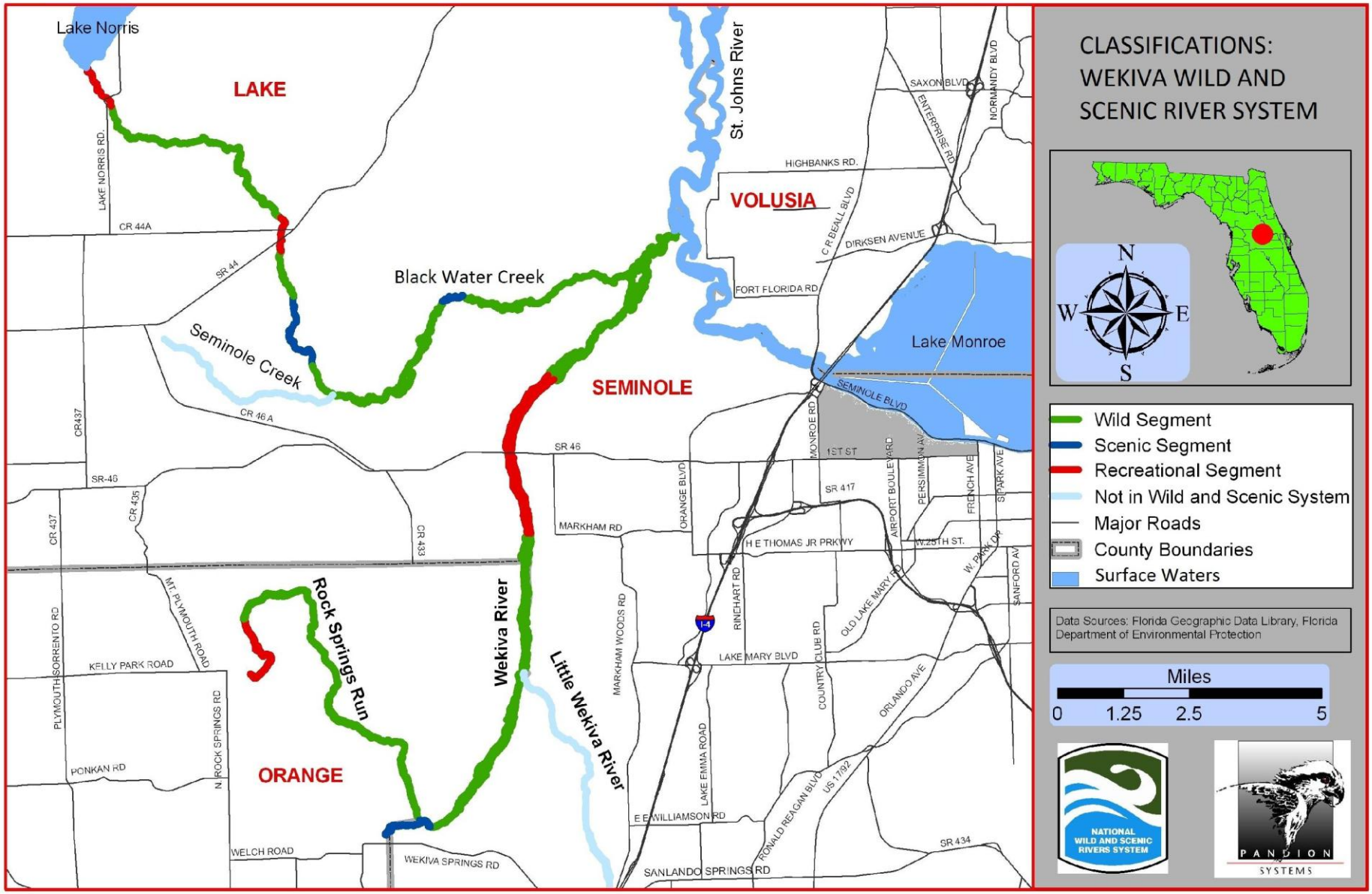
(iv) From approximately 0.25 mile downstream of the old railroad grade crossing (approximately river mile 9), upstream to the boundary of Seminole State Forest (approximately River Mile 10.6), approximately 1.6 miles, as a scenic river.

(v) From the boundary of Seminole State Forest (approximately river mile 10.6) to approximately 0.25 mile downstream of the SR 44 crossing, approximately .9 mile, as a wild river.

(vi) From approximately 0.25 mile downstream of SR 44 to approximately 0.25 mile upstream of the County Road (CR) 44A crossing, approximately .6 mile, as a recreational river.

(vii) From approximately 0.25 mile upstream of the CR 44A crossing to approximately 0.25 mile downstream of the Lake Norris Road crossing, approximately 4.7 miles, as a wild river.

(viii) From approximately 0.25 mile downstream of the Lake Norris Road crossing to the outflow from Lake Norris, approximately 1.1 miles, as a recreational river.


Lake Norris
LAKE
LAKE NORRIS RD.
CR 44A
SR 44
Black Water Creek
Seminole Creek
CR 46 A
CR437
SR-46
CR 437
CR 435
CR 433
MT. PLYMOUTH ROAD
PLYMOUTH SORRENTO RD
KELLY PARK ROAD
PONKAN RD
N. ROCK SPRINGS RD
Rock Springs Run
ORANGE
WELCH ROAD
WEKIVA SPRINGS RD
Wekiva River
Little Wekiva River
St. Johns River
HIGHBANKS RD.
VOLUSIA
C R BEALL BLVD
DIRKSEN AVENUE
FORT FLORIDA RD
Lake Monroe
SEMINOLE
SEMINOLE BLVD
SAXON BLVD
ENTERPRISE RD
NORMANDY BLVD
MONROE RD
1ST ST
SR 46
MARKHAM RD
ORANGE BLVD
SR 417
AIRPORT BOULEVARD
PERSIMMON AV
FRENCH AVE
SPARK AVE
H E THOMAS JR PRKWY
W.25TH ST.
W. PARK DR
SANFORD AV
I-4
RINEHART RD
MARKHAM WOODS RD
OLD LAKE MARY RD
LAKE MARY BLVD
COUNTRY CLUB RD
ORLANDO AVE
LAKE EMMA ROAD
E B WILLIAMSON RD
RONALD REAGAN BLVD
US 17/92
SR 434
SANLANDO SPRINGS RD
CLASSIFICATIONS:
WEKIVA WILD AND
SCENIC RIVER SYSTEM
N
W
E
S
Wild Segment
Scenic Segment
Recreational Segment
Not in Wild and Scenic System
Major Roads
County Boundaries
Surface Waters
Data Sources: Florida Geographic Data Library, Florida Department of Environmental Protection
Miles
0
1.25
2.5
5
NATIONAL WILD AND SCENIC RIVERS SYSTEM
PANDION SYSTEMS

Back of map

ALTERNATIVE A: CONTINUE EXISTING MANAGEMENT DIRECTION BY AGENCIES

CONCEPT

Alternative A would continue current management practices into the future. (This is the no-action alternative required by the National Environmental Policy Act). Its goal would be to retain the existing visitor experiences and land use strategies based on agency jurisdiction. The comprehensive management plan for the river system required by the Wild and Scenic Rivers Act would not be implemented. No new coordinated planning efforts with state, county, and local governments and private landowners would be initiated, but ongoing efforts would continue. In this alternative, the river system would be managed pursuant to existing federal, state, and local legislation. "No action" does not imply discontinuing the present uses or management actions or removing the existing Wild and Scenic River designation. The following provides a summary of legislation and agency oversight that is currently in place for managing the Wekiva River System, and that would continue under this alternative.

Because there would be no approved comprehensive river management plan as required by Section 3(d)(1) of the Wild and Scenic Rivers Act, this alternative would not be in compliance with the Act.

RIVER MANAGEMENT

Under alternative A, the Wekiva Wild and Scenic River System would continue to be managed under the Wild and Scenic Rivers Act and according to agency management plans. A full description of the classified segments may be found in this chapter under "River Classification".

Federal Agencies and Programs

Numerous local, state, and federal agencies have management or regulatory jurisdiction over the Wekiva Wild and Scenic River System. However, none of the lands in the boundary of the system are owned by the federal government.

National Park Service. The National Park Service has oversight of partnership wild and scenic rivers to help communities preserve and manage their own river-related resources by bringing together state, county, and community interests to preserve the outstandingly remarkable values for which the rivers were designated. Specifically, the NPS allocates funds for managing the Wekiva Wild and Scenic River System and all other partnership rivers throughout the country. In addition, the NPS is responsible for reviewing any and all federally assisted water resources projects, pursuant to Section 7 of the Wild and Scenic Rivers Act, that could affect a wild and scenic river, particularly its free-flow condition and its outstandingly remarkable values.

U.S. Army Corps of Engineers. The U.S. Army Corps of Engineers is charged with regulating waters of the United States. By definition these waters include coastal and navigable inland waters, lakes, rivers and streams; other intrastate lakes, rivers and streams (including intermittent streams); and mudflats, sandflats, wetlands, sloughs, wet meadows, and certain impoundments.

U.S. Fish and Wildlife Service. The U.S. Fish and Wildlife Service (USFWS) must be consulted if a federally protected species may be impacted by an activity within its jurisdiction. USFWS staff prepare an independent biological opinion, and an activity may not be authorized unless it is determined that the project is not

likely to jeopardize the continued existence of the species or result in the destruction of the habitat of the species.

State Agencies and Programs

Florida Department of Environmental Protection (FDEP). All of the wild and scenic river segments of the Wekiva River System are state waters. The Florida Department of Environmental Protection has programs regulating drinking water facilities, wastewater discharges (domestic and industrial), landfills (solid waste), facilities generating hazardous waste, and operations creating air discharges. Dredging, filling and/or construction activities in wetlands associated with private, single-family residences, domestic or industrial wastewater facilities, or landfills also are regulated by the department. In addition, this department sets water quality standards for the different categories of surface waters in the state. These standards are found in Chapter 62-302 of the *Florida Administrative Code*.

Florida Division of Recreation and Parks (also called the Florida Park Service or FPS). The Florida Division of Recreation and Parks is under the Florida Department of Environmental Protection. There are three state parks that are within the Wekiva Wild and Scenic River System. These three parks are: Wekiwa Springs State Park, comprising almost 9500 acres; Rock Springs Run State Reserve, containing over 14,000 acres; and Lower Wekiva River Preserve State Park, totaling approximately 17,400 acres. The total acreage of these three parks is nearly 41,000 acres, which is combined under one management plan as the Wekiva River Basin State Parks.

The Florida Division of Recreation and Parks' mission is to provide resource-based recreation while preserving, interpreting, and restoring natural and cultural resources. At all three parks, a variety of recreation for the visiting public is provided — from canoeing and swimming to guided horseback riding; both horses and canoes are provided by the park concessionaire. Wekiwa Springs State Park has a 60-site family campground, and for large groups there is the park's youth camp facility. There are four primitive campsites for canoeists along the both the Wekiva River and Rock Springs Run, with additional sites for hikers and horseback riders. Within the Wekiva River Basin State Parks boundaries there are more than 80 miles of multiuse trails for the public's enjoyment of nature, with an additional 15-mile canoe/kayak trail along the Wekiva River and Rock Springs Run.

In addition to providing public recreation, FPS devotes significant time and effort to the protection of natural and cultural resources. Within the Wekiva River Basin State Parks boundaries there are 19 distinct natural community types in both uplands and wetlands type categories. A number of imperiled species inhabit these communities within state park boundaries, and great efforts were expended to protect their known habitats. These species range from the Florida scrub jays, gopher frog, Sherman's fox squirrel, and gopher tortoises in the uplands communities to bald eagles, wood storks, limpkins, and various species of egret and heron along the river system. Also present is the American alligator, which has made an amazing recovery from its former status as an endangered species. The most renowned of designated species on all three properties is the Florida black bear. In managing these species and their habitats, Recreation and Parks division staff use various tools and techniques from prescribed fire to active exotic species removal. Various historic and cultural sites have been

located, cataloged, and protected in all three parks, including the old Ethel cemetery and the numerous Timucuan and Seminole middens found through the park properties, especially along the river system.

Wekiva River Aquatic Preserve. Florida's aquatic preserves are administrated by FDEP's Office of Coastal and Aquatic Managed Areas as part of a network that includes 41 aquatic preserves, including the Wekiva River Aquatic Preserve. The Wekiva River Aquatic Preserve provides an overlay of environmental protection measures along the Wekiva River System and immediate surroundings, including part of the St. Johns River. The four long-term goals of the aquatic preserve program are to protect and enhance ecological integrity; restore areas to their natural condition; encourage sustainable use and foster active stewardship by local communities; and improve management through a process based on sound science, consistent evaluation, and continual reassessment.

Wekiva River Aquatic Preserve staff are responsible for more than 8,000 acres of state sovereign submerged lands, which include the entire Wekiva River, the lower 1-mile reach of Rock Springs Run, approximately 3 miles of the Little Wekiva River, 3 miles of lower Black Water Creek, and 20 miles of the St. Johns River from Interstate 4 in Sanford to State Road (SR) 44, just west of Deland and Lake Beresford.

Resource management activities conducted by staff include interagency coordination, evaluation of projects that may impact the aquatic preserve, exotic plant control, education programs, monitoring of wetland birds and other wildlife including listed species, fostering stakeholder participation in protecting the preserve, community assistance, restoration projects, and participation on various technical advisory committees. Aquatic Preserve management also includes adaptive management strategies that aim to adapt and adjust to changing resource management needs.

Title to submerged lands is held by the Board of Trustees of the Internal Improvement Trust Fund (the trustees). The governor and cabinet, sitting as the trustees, act as guardians for the people of the state and regulate the use of these public lands. Management authority for aquatic preserves is provided in Chapters 258 and 253, Florida Statutes. Administrative rules directly applicable to uses allowed in aquatic preserves are found in Chapters 18-20, *Florida Administrative Code*.

Florida Department of Agriculture and Consumer Services. The Florida Department of Agriculture and Consumer Services (FDACS), Florida Forest Service, manages more than 27,000 acres in east Lake County. Known as Seminole State Forest, these lands provide essential connectivity in the Wekiva basin, extending north of Rock Springs Run State Reserve to the Ocala National Forest. Although title to most of Seminole State Forest is held by the state of Florida as Board of Trustee lands, 2,939 acres surrounding Black Water Creek are owned by the St Johns River Water Management District.

Seminole State Forest is managed by the Florida Forest Service with the goal of protecting and maintaining the native biological diversity of the many ecosystems that comprise the state forest, while integrating public use of the resources. Multiple-use management promotes recreation, timber, wildlife including designated species, environmental education and other values that benefit Florida residents and visitors. Land management activities generally contribute to preserving the natural ecosystem around much of Black Water

Creek. Hunting is allowed by permit from the Fish and Wildlife Conservation Commission within parts of Seminole State Forest designated as wildlife management areas. Boating on Black Water Creek is also managed through a permit system.

St. Johns River Water Management District. The Wekiva basin is entirely within the jurisdictional boundaries of the St. Johns River Water Management District (SJRWMD or "the district"). The district oversees numerous activities to ensure the sustainable use and protection of water resources on both designated and undesignated segments.

The district holds title to approximately 9700 acres within the Wekiva basin. This includes the 3660 acre Lake Norris Conservation Area which it manages in cooperation with the Lake County Water Authority, as well as 2939 acres adjacent to Black Water Creek which is managed by the Florida Forestry Service as part of Seminole State Forest. The district also owns and manages 3074 acres of wetlands and floodplain known as the Wekiva River Buffer Conservation Area, located along the Wekiva and Little Wekiva rivers. (In conjunction with this, the district manages an adjacent 634 acre parcel for Audubon of Florida.) Finally, the district shares title with Orange County and Lake County to parcels acquired for conservation near the Wekiva Parkway. In addition to its land holdings, the SJRWMD has acquired protective conservation easements over various privately-owned parcels throughout the basin.

The district has two primary regulatory programs, the Consumptive Use Permit (CUP) program and the Environmental Resource Permit (ERP) program.

Part II of Chapter 373, Florida Statutes, authorizes the water management districts to require permits for the consumptive use of groundwater and surface water. The St Johns River Water Management District requires a CUP applicant to establish that a proposed withdrawal of water meets a three-pronged statutory test: (1) the use must be reasonable-beneficial; (2) the use must not interfere with existing legal uses; and (3) the use must be consistent with the public interest. Chapter 40C-2, *Florida Administrative Code,* and the Applicant's Handbook, Consumptive Uses of Water incorporated by reference in rule 40C-2.101, F.A.C., contain the criteria necessary to demonstrate that a use meets the three-pronged statutory test.

Part IV of Chapter 373, Florida Statutes, authorizes the water management districts and the Florida Department of Environmental Protection to require environmental resource permits for the construction and operation of surface water management systems (a term encompassing most land development activities) whether in uplands or wetlands. Criteria that an applicant must meet are contained in Chapter 40C-4, *Florida Administrative Code.* Additionally, where any regulated activity is located in, on, or over wetlands or other surface waters, the environmental resource permit applicant must establish that the activity is not contrary to the public interest, or, if within an Outstanding Florida Water, that the activity would be clearly in the public interest. Public interest criteria for activities affecting surface water and wetlands are contained in Section 373.414, *Florida Statutes*. The St. Johns Water Management District has adopted special environmental resource permit criteria for the Wekiva River Hydro-logic Basin in Chapter 40C-41, *Florida Administrative Code*. A permit applicant proposing a project in this basin must meet the criteria in both

chapters 40C-4 and 40C-41, *Florida Administrative Code*.

Sections 373.042 and 373.0421, Florida Statutes, in Part I of Chapter 373 authorize the water management districts to establish minimum flows and levels (MFLs) of surface waters and ground waters. These MFLs are implemented through the consumptive use and environmental resource permitting program. The district has established minimum groundwater levels and minimum annual spring flows for Messant Spring, Palm Spring, Rock Spring, Sanlando Spring, Seminole Spring, Starbuck Spring, and Wekiwa Springs. Surface water levels and flows have been established for the Wekiva River and Black Water Creek. Section 373.709, Florida Statutes in Part VII of Chapter 373 requires the water management districts to develop regional water supply plans to ensure that existing and future water demands are met and water resources and related natural systems are sustained. The planning period is 20 years, with plans required to be updated at least every five years. MFLs are constraints in planning for sustainable water supplies.

Lake County Water Authority. The Lake County Water Authority (LCWA) is a special agency created by the Florida legislature in 1953 for the following purposes: (1) controlling and conserving the freshwater resources of Lake County; (2) fostering and improving the tourist business in the county by improvements to streams, lakes and canals in the county; (3) providing recreational facilities for the tourists, citizens and taxpayers of the county by a more efficient use of the streams, lakes and canals in the county; (4) improving the fish and aquatic wildlife of the county by improving the streams, lakes and canals in the county; and (5) protecting the freshwater resources of Lake County through assisting local governments in the treating of stormwater runoff by conserving freshwater to improve the streams, lakes and canals in the county. As part of this effort, the Lake County Water Authority manages nearly 800 acres that it has acquired for conservation in the Wekiva basin, including Lake Tracy Preserve, Bear Track Preserve, and Wolfbranch Sink. The LCWA also works cooperatively with the St Johns River Water Management District to manage and provide recreational access to Lake Norris Conservation Area.

Florida Fish and Wildlife Conservation Commission. The Florida Fish and Wildlife Conservation Commission (FWC) manages the state's fish and wildlife resources, including more than 575 species of terrestrial wildlife and 700 species of saltwater and freshwater fish. Among its several functions, FWC issues licenses for hunting and fishing, administers permit programs for incidental take and relocation, regulates captive breeding and possession of wildlife, and performs law enforcement. In addition, the FWC Invasive Plan Management Section is the lead agency for aquatic plant management in Florida. FWC biologists are engaged in various activities relating to wildlife and habitat conservation, including research, management, and education.

Florida Department of Health. The Florida Department of Health (FDOH) administers several programs to promote public health in coordination with county health departments, including but not limited to those related to disease control, family health care services, and sanitation. Pursuant to the Wekiva Parkway and Protection Act, the FDOH in coordination with FDEP is charged with evaluating standards for onsite wastewater disposal systems to achieve nitrogen reductions protective of groundwater quality within the Wekiva Study Area. Pursuant to the Act, the

FDOH is authorized to adopt rules as appropriate to reduce nutrient loads, considering measures such as the use of performance-based onsite systems and establishment of a program for the inspection and maintenance of septic systems. This, however, has not occurred. At the direction of Florida legislature, additional studies are being pursued by FDOH to further assess the contribution of septic systems to nutrient loading.

Local Governments

The Wekiva River Protection Act of 1988 (Chapter 359, Part II, Florida Statutes) required that Lake, Orange, and Seminole counties adopt comprehensive plan policies and land development regulations that protect natural resources and rural character within the Wekiva River Protection Area. Policies and regulations control the density and intensity of development in the protection area, as well as prescribe certain regulatory requirements. The Wekiva Parkway and Protection Act, adopted in 2004, expanded upon that framework to require special consideration of springshed and groundwater resources within a designated "Wekiva Study Area," and emphasized the protection of open space. In addition to county governments, the 2004 legislation applies to all 12 municipalities that are within or partially within the designated study area.

ALTERNATIVE B: ENHANCE RESOURCE PROTECTION AND HIGH-QUALITY VISITOR EXPERIENCES (PREFERRED ALTERNATIVE)

CONCEPT

Alternative B, the preferred alternative, would seek to enhance natural and cultural resource protection and promote high-quality visitor experiences through a set of comprehensive management strategies and actions. The outstandingly remarkable values as identified in the Wekiva Wild and Scenic River System Comprehensive Management Plan (scenic, recreation, wildlife and habitat, historic and cultural, and water quality and quantity) would receive enhanced protection and management attention. Current protective measures in place under alternative A would continue, including existing management direction of the Wekiva River System by state and local agencies. The NPS would oversee and coordinate implementation of the comprehensive river management plan with the Wekiva River System Advisory Management Committee (the advisory management committee).

Approval of the preferred alternative would meet the requirements of Section 3(d)(1) of the Wild and Scenic Rivers Act for a comprehensive river management plan.

The description of alternative B appearing in this chapter includes the goals, objectives, and action steps of the *Wekiva Wild and Scenic River System Comprehensive Management Plan* prepared by the Wekiva Wild and Scenic River System Advisory Management Committee. The Wekiva Wild and Scenic River System Comprehensive Management Plan is available from the advisory management committee.

BOUNDARIES

Section 3(b) of the Wild and Scenic Rivers Act requires the establishment of boundaries for a river corridor. The act allows for river corridor boundaries that do not exceed 320 acres of land per river mile, generally comprising an area 0.25 mile from the ordinary high water marks on either side of the river. In the case of the Wekiva River, designated as a locally managed partnership river, federal land acquisition is expressly not authorized, and the act does not provide the federal administering agency (in this case the NPS) to regulate actions on nonfederal lands.

Thus, in accordance with Section 3(b) of the Act, the boundaries of the Wekiva Wild and Scenic River System are hereby established as a corridor one-quarter (0.25) mile from the ordinary high water marks on either side of the rivers for a total width of one-half mile. Establishment of these boundaries in no way encumbers the rights of private landowners or local or state government entities with land holdings inside the boundaries. Further, the boundaries do not preclude the advisory management committee and others from engaging in management actions that are beneficial to the protection and enhancement of the river's outstandingly remarkable values that extend outside the boundaries.

These statutory boundaries are intended to support the protection of the river system's outstandingly remarkable values via means other than federal land ownership and federal regulation — such as incentive-based approaches, conservation easements, locally adopted zoning ordinances, and land management actions undertaken by nonfederal land managers (e.g., the

Florida Department of Environmental Protection). However, Section 7 of the act does require federal regulation of any federally assisted water resources project occurring within the bed or banks of the Wekiva Wild and Scenic River System.

Management Areas Related to Outstandingly Remarkable Values

Several of the management objectives and actions called for in the plan to protect or restore the identified outstandingly remarkable values occur well outside the statutory boundary. The advisory management committee has recognized that some resource management issues — notably water quality and water quantity — correspond to resource management areas that involve the entire watershed and springsheds.

RIVER SYSTEM MANAGEMENT

Under alternative B, the agency involvement and jurisdiction described under alternative A would continue. However, with alternative B, the advisory management committee, in partnership with the NPS and state and local land managers, would take the lead role in coordinating multijurisdictional river management issues and ensuring that the management actions in the plan would be implemented by the appropriate agencies as available staff and funding allows.

The *Comprehensive River Management Plan* includes a long-term framework for protecting and managing the identified outstandingly remarkable values, managing use by visitors, and other factors. Under the preferred alternative, for each outstandingly remarkable value (scenic, recreation, wildlife and habitat, historic and cultural, and water quality and quantity) there are two or more proposed goals for management. As outlined in the following text, each goal has a series of objectives and actions that, if achieved, would contribute to accomplishment of that particular goal.

The Wekiva Wild and Scenic River System would be managed according to the segment classifications to maintain their outstandingly remarkable values (see following Classifications map). Segments classified as *wild* would be managed to maintain primitive shorelines in an undisturbed state. Segments classified as *scenic* would be managed to maintain river values and the largely primitive and natural-appearing shorelines while providing some user accessibility. More development may exist in segments classified as *recreational*, but those segments would be managed to offer high-quality recreational opportunities while preserving the outstandingly remarkable values present.

The following was prepared for the Comprehensive River Management Plan by the Wekiva River System Advisory Management Committee. It should be recognized that as an advisory group, the committee itself does not necessarily have authority to implement each goal, objection, and action. Authority rests with the individual entity with jurisdiction.

Scenic Values

Goal 1: Maintain and enhance healthy native plant and animal communities in the Wekiva River System.

Objectives

A. Continue to monitor and control nuisance and invasive exotic vegetation within the Wekiva River System using the category I and II lists produced by the Florida Invasive Pest Plant Council as a guide. Species that

require attention include, but are not limited to, hydrilla, water hyacinth, water lettuce, wild taro, elephant ear, para grass, Chinese tallow, East Indian hygrophila, and cattail.

i. Implement as shown under goal 3 for wildlife and habitat.

B. Assess the impacts associated with the proliferation of invasive exotic fishes such as, but not limited to, armored catfish within the Wekiva River System and develop actions for expanding monitoring and control strategies.

i. Implement as shown under goal 3 for wildlife and habitat.

C. Monitor and control invasive exotic invertebrates within the Wekiva River System, including but not limited to channeled apple snails if they become established, and develop actions for expanding monitoring and control strategies.

i. Implement as shown under goal 3 for wildlife and habitat.

D. Expand current partnerships with private businesses and concessionaires who operate on the river system or within the Wekiva basin parks to ensure that their activities are protective of wild and scenic river values and to provide unified, supporting messages to their clients about the wild and scenic status of the Wekiva River System and regulations and guidelines for its use.

i. Develop a set of unified messages that reinforce the wild and scenic status of the river system.

ii. Compile a list and description of all regulations and guidelines for public distribution relating to recreational use of the river system that includes the location of resting, picnic and camping facilities, and appropriate put-in and pull-out areas.

iii. Provide materials as needed to help concessionaires educate their customers about proper and sustainable use of the river system.

iv. Work with private business and concessionaires to improve operational practices, including but not limited to shoreline protection, wake control, and litter.

v. Assess the need to train private businesses and concessionaires about river stewardship and develop a program if needed.

Scenic Values Goal 2: Maintain and enhance the wild and scenic character of the Wekiva River System by limiting the intrusion of the visual and auditory aspects of human development and activity.

Objectives

A. In order to minimize visual disturbance, continue to enforce development regulations for private waterfront properties and businesses relating to land clearing, preservation of native vegetation, signs and river-based structures including but not limited to docks and launch areas within the Wekiva River System corridors. If necessary, improve

government regulations regarding these activities and structures.

i. Work with county governments and the St. Johns River Water Management District to clearly identify the current relevant regulations.
ii. Encourage a regime of strict interpretation and enforcement of these regulations for new developments in the river corridor.
iii. Develop a checklist for assessing the current state of properties in the river corridor for all parameters listed.
iv. Use checklists to assess properties in the river corridor.
v. Develop a plan for communication with residents and recreational users to remedy problem areas.

B. Support a prohibition of access for gasoline-powered, motorized watercraft to Rock Springs Run and Black Water Creek, except for authorized service vessels.

i. Support revisions to management plans to achieve this objective.
ii. Encourage patrols by off-duty law enforcement officers. (These patrols could have multiple law enforcement purposes across the entire system.)

C. Ensure that the new road bridge proposed for the Wekiva Parkway, as well as any related construction, is designed to limit its visual and auditory intrusion on the Wekiva River.

i. Coordinate closely with the agencies responsible for designing and building the bridge throughout the process, including but not limited to the Orlando Orange County Expressway Authority and Florida Department of Transportation; coordinate with the Wekiva River Basin Commission and the Wekiva Coalition.
ii. Ensure that light intrusion is minimized.

D. Continue to implement and strengthen development regulations and practices for preservation of native vegetation, land clearing, structures, and plantings at publicly owned recreation areas within the Wekiva River System.

i. Assess current regulations and practices and their implementation at all public recreation areas.
ii. Develop plans to remedy any problem areas.
iii. Put remedies into action according to plans.

E. Establish regulations limiting the intrusion of artificial light to protect dark skies within the river corridor of the Wekiva River System.

i. Coordinate with Seminole, Orange, and Lake County governments to establish these regulations.
ii. Once regulations are established, coordinate with these entities, as well as the Florida Park Service and the Florida Fish and Wildlife Conservation Commission, on enforcement.

F. Create rules and enforcement mechanisms to regulate noise pollution within the Wekiva River

System appropriate to the wild, scenic, or recreational designations of the different river segments.

i. Establish decibel levels of acceptable noise in the three river segments.
ii. Include assessment of noise levels in the recreation impact monitoring and management plan.
iii. Based upon this assessment, establish, post, and enforce noise regulations and river use guidelines.

G. Redesign the junction of SR 44 and CR 44A to limit visual and auditory intrusions on Black Water Creek so that only one bridge crosses the creek at this location.

i. Coordinate with the Florida Department of Transportation and Lake County to raise this issue and encourage a new design.
ii. Schedule and implement reconstruction.

H. Continue to implement and strengthen the existing Adopt-a-River monitoring, control, and removal plan for litter along and within the Wekiva River System.

i. Continue and assess the effectiveness of current litter collection efforts.
ii. Support and as beneficial expand volunteer Adopt-a-River programs, such as the Seminole County Environmental Restoration Volunteers (SERV).
iii. Build messages about litter control into the river use regulations and guidelines as specified in Objective D above.

I. Except for the Wekiva Parkway, work to ensure that no new roads for motor vehicle traffic are constructed across waters of the Wekiva River System, and ensure that any trails for bicycle or pedestrian use are limited in scale to minimize visual intrusion and are located within existing disturbed areas to prevent adverse impacts on native vegetation, shorelines, and riparian corridors.

i. Monitor the status of proposed state and local road projects and engage in planning efforts as necessary to meet this objective.
ii. Coordinate with Orlando-Orange County Expressway Authority, the Florida Department of Transportation, FDEP Office of Greenways and Trails, Florida Trails Association, and local governments regarding the location and design of trails.

Recreation Values

Goal 1: Provide opportunities for recreation on the Wekiva River System that are compatible with the area's natural and cultural features and management objectives.

Objectives

A. Conduct a Recreation Assessment to determine who is currently using the river, how use is projected to change, determining level of use, and what uses and levels of use are compatible with each river segment.

i. Conduct a survey of current users of the Wekiva River, Wekiwa Springs Run, Rock Springs Run, and Black Water Creek, as well as the

adjacent section of the St. Johns River.

ii. Research the trends in current and potential use of the Wekiva River System using boat registrations for Seminole, Lake, and Orange counties, as well as visitor information from public and private access points along the river system.

iii. Conduct compatibility and carrying capacity studies to determine what types of use and what level of use (including amount, speeds, size of watercraft, etc.) would be appropriate for the river system.

iv. Determine what types of use should and should not be allowed along the Wekiva River System.

v. Determine where different types of recreation should occur, including where any access points or recreation sites should be created or removed (e.g., see the design guidelines in appendix B).

B. Create a Facilities Master Plan that indicates what facilities should be provided to support the uses determined to be appropriate by the Recreation Assessment.

i. Determine which facilities should be provided to support the conclusions of the Recreation Assessment, including: public access areas, camping areas, picnic areas, parking, restrooms, and boat rentals.

ii. Create a map of the location and type of facilities needed.

iii. Determine a cost estimate and priority for each element of the Facilities Master Plan.

iv. Seek funding and sponsorship opportunities for proposed facilities.

C. If necessary to protect and secure public access, pursue the public acquisition of established privately operated recreation sites on the Wekiva River System to maintain long-term access for passive recreation in accord with the findings of the Recreation Assessment.

i. Monitor the status of commercial properties with existing access along the river system. If a privately operated access site comes up for sale, consider purchasing the property to maintain sufficient public access to the Wekiva River System.

ii. Revise management plans or develop new plans as appropriate for additional properties.

D. If necessary to protect and secure public access, pursue the public acquisition of new sites for river access based upon the findings of the Recreation Assessment and Facilities Master Plan.

i. Based upon findings of the Recreation Assessment, and in accord with the maintenance of all Wild and Scenic values, determine potential sites for public access not currently in public ownership.

ii. If one of these targeted sites becomes available, consider acquisition for purposes of maintaining or improving river access.

iii. Revise management plans or develop new plans as appro-

priate for additional properties.

Recreation Value Goal 2: 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.

Objectives

A. Create a recreation impact Monitoring and Management Plan that identifies Limits of Acceptable Change (thresholds) and management actions for ecological and social impacts from recreation.

   i. Determine which resources should be monitored and protected within the Wekiva River System.
   ii. Determine where resources that should be monitored and protected are located and map these resources.
   iii. For each resource to be monitored and protected, determine the Limit of Acceptable Change, level of impact, or user capacity that is acceptable for that resource.
   iv. Create a monitoring program to keep track of resources and determine if, when, and how they have been altered by recreation activities or other impacts.
   v. Create an action program that lays out the steps that will be taken if a resource has been degraded beyond an acceptable level.
   vi. Determine who will implement the steps needed to address resource impacts.

B. Expand current partnerships with private businesses and concessionaires who operate on the river system or within the Wekiva basin parks to ensure that their activities are protective of Wild and Scenic River values, and to provide unified, supporting messages to their clients about the wild and scenic status of the Wekiva River System and the regulations and guidelines for its use.

   i. Develop a set of unified messages that reinforce the wild and scenic status of the river system.
   ii. Develop a set of unified regulations and guidelines for public distribution relating to recreational use of the river system that includes the location of resting, picnic and camping facilities, and appropriate put-in and pull-out areas.
   iii. Provide materials as needed to help concessionaires educate their customers about proper and sustainable use of the river system.
   iv. Work with private business and concessionaires to improve operational practices, including but not limited to shoreline protection, wake control, and litter.
   v. Assess the need to train private businesses and concessionaires about river stewardship and develop a program if needed.

C. Support a prohibition of gasoline-powered, motorized watercraft on Rock Springs Run and Black Water Creek, except for authorized service vessels.

   i. Work with state agencies to extend prohibition of motorized water craft on Black Water Creek.

ii. Assess existing enforcement of rules associated with motorized water craft on Black Water Creek and Rock Springs Run, and modify as necessary.

iii. Encourage patrols by off-duty law enforcement officers. (These patrols could have multiple law enforcement purposes across the entire system.)

iv. Include guidelines for monitoring and addressing motorized boat use along the river in the Monitoring and Management Plan.

v. Ensure that concessionaires that rent motorized boats within the Wekiva River System (and the St. Johns River) alert their customers about limits on motorized boat access in these areas.

Wildlife and Habitat Values

Goal 1: Protect aquatic and aquatic-dependent organisms and their habitats throughout the Wekiva River System and its associated wetlands.

Objectives

A. Coordinate with the St. Johns River Water Management District, Florida Department of Environmental Protection, and other interested or affected parties to ensure adequate water quantity and quality in the Wekiva River System to maintain a diversity of aquatic and aquatic-dependent species and habitats (see Water Quality and Quantity section).

i. Implement all goals, objectives, and strategies as described in the water quality and quantity section.

B. Conduct species-specific surveys followed by annual monitoring for aquatic invertebrates in the Wekiva basin springs, such as the Wekiwa Springs hydrobe, Wekiwa siltsnail, and Orlando cave crayfish, to establish baseline population levels and document population trends.

i. Contract with aquatic scientists to establish baseline populations and to develop monitoring protocols for aquatic invertebrates in the Wekiva basin, including but not limited to the Wekiwa Springs hydrobe, Wekiwa siltsnail, and Orlando cave crayfish.

ii. Implement a monitoring program for aquatic invertebrates using the protocol.

iii. Contract analysis of invertebrate sampling to document population trends.

C. Continue to monitor the condition of, and any changes to, submerged aquatic vegetation (SAV) beds, particularly eelgrass beds which are a distinctive component of the Wekiva River System and indicative of a healthy riverine system.

i. Consult with aquatic ecologists to determine an optimal status for eelgrass beds within the Wekiva River System and to develop a protocol for measuring and monitoring the health of eelgrass.

ii. If needed, based upon monitoring, establish a restoration program for eelgrass beds to reestablish the optimal condition, with a goal for time of completion.

iii. Contract with fishery scientists to establish the baseline of the bluenose shiner population (a rare fish that favors eelgrass beds) within the Wekiva River System and to develop a monitoring protocol.

iv. Implement a monitoring program to track bluenose shiner populations as an additional indicator of eelgrass health and within guidelines of the monitoring protocol.

D. Continue monthly bird surveys on the Wekiva River System and surrounding riverine systems and produce an annual report that assesses trends in bird populations.

i. Consult with statisticians and ornithologists for appropriate analysis of monthly bird survey data to assess population trends.

ii. Continue monthly bird surveys using volunteers and a quarterly contracted survey.

E. Assess the extent to which West Indian manatees use the lower Wekiva River and the various factors associated with their feeding, movement, and other behaviors in relation to the St Johns River.

i. Contract with marine mammalogists to study manatee behavior in and their use of the lower Wekiva River.

F. Establish annual monitoring programs for reptiles and amphibians.

i. Consult with herpetologists to determine the most effective ways of monitoring the status of reptile and amphibian populations associated with the river system.

ii. Implement a monitoring program.

G. Expand efforts to promote bear awareness and take steps to decrease human-bear conflicts.

i. Implement multimedia presentations for public lands visitors, homeowner associations, schools, and private organizations.

ii. Distribute printed material published by governmental agencies such as the Florida Fish and Wildlife Conservation Commission or nonprofit conservation organizations.

iii. Encourage or require the use of bear-proof trash receptacles in those parts of the Wekiva basin area with frequent bear activity.

Wildlife and Habitat Goal 2: Maintain habitat quality, landscape diversity, and ecosystem connectivity within the Wekiva basin and associated ecosystems with an emphasis on the black bear as an umbrella species.

Objectives

A. Support design and construction of the Wekiva Parkway and associated roadway modifications, consistent with purposes of the Wekiva Parkway and Protection Act and the National Wild and Scenic River Act, to enhance habitat connectivity and corridors for wildlife movement.

i. Promote cooperation among agencies, local governments, and conservation organizations to complete the Wekiva

Parkway project in a timely manner.

ii. Ensure the bridging of ample sections of the Wekiva Parkway to provide for movement of bears and other wildlife.

iii. Manage vegetation, fencing, and other features of the Wekiva Parkway to facilitate wildlife movement.

iv. Monitor movement and behavior patterns of bears and other wildlife underneath bridged sections of the Wekiva Parkway.

B. Evaluate and where possible pursue corrective action to remove impediments to the movement of bears and other wildlife between the Wekiva basin and Ocala National Forest north of the Wekiva Parkway caused by roads and incompatible land uses. Address the potential impact of road construction on such wildlife movement through design for wildlife crossings and other mitigative measures.

i. Install wildlife underpasses under roadways that cross the Wekiva basin ecological corridor such as SR 44 and CR 42.

ii. Reconfigure roadways that present an unnecessary hindrance to wildlife movement, such as the junction of SR 44 and CR 44A at Black Water Creek.

iii. Pursue habitat restoration or enhancement projects where needed.

iv. Remove barriers to wildlife movement, such as structures, walls, or fences (except where necessary to guide wildlife to areas of safe passage).

C. Discourage additional new road construction within the Wekiva basin and ecological corridors that could impede the normal movement of bears and other wildlife, and attempt to avoid the construction or expansion of new roads within public conservation land. Address the potential impact of road construction on such wildlife movement through design for wildlife crossings and other mitigative measures.

i. Establish policies to discourage new road construction and maintenance activities that could impede the normal movement of bears and other wildlife, and to discourage the construction or expansion of new roads within public conservation land; ensure that any new road construction and maintenance activities do not impede normal movement of bears and other wildlife.

ii. Consolidate transportation improvements within existing roadways, provide alternatives that remove traffic from the basin and ecological corridors, and provide measures that mitigate the impact of roads on the movement of wildlife.

D. Identify private lands that represent missing pieces within the Wekiva basin portfolio of public conservation lands and the Wekiva-Ocala Greenway project; prioritize and pursue such lands needed for preservation through acquisition and/or conservation easements.

i. Pursue programs at the federal, state, and local

level for the protection of conservation lands, including but not limited to (a) encouraging annual state legislative funding for Florida Forever and as appropriate its expansion, (b) the appropriation of special funding for key acquisitions and easements, (c) the expansion of local land acquisition and easements programs, and (d) partnerships with private conservation organizations.

E. Identify private lands with critical and unique features (such as springs or other karst features) or under-represented habitats within the Wekiva basin and springshed; prioritize and pursue such lands from willing sellers for preservation through acquisition and/or conservation easements.

   i. Consult with local governments, environmental agencies and conservation organizations such as The Nature Conservancy and local land trusts for help in identifying and protecting critical and unique features within the Wekiva basin and springshed.

F. Identify areas within the Wekiva River System floodplain with impacted hydrology and develop a plan to improve the hydrology of the associated riparian habitats.

   i. Consult with the St. Johns River Water Management District to determine if impacted areas have been identified and if a plan exists to restore hydrological function.
   ii. Support the development of a plan and its implementation if necessary.

G. Continue and improve the implementation of prescribed fire on public conservation lands within the Wekiva basin area, including within ecotones (transition areas between different habitat types) and riparian zones.

   i. Continue and enhance interagency cooperation with prescribed fire planning and implementation.
   ii. Establish designated smoke corridors, with ordinances where needed, to facilitate the work of prescribed burns.
   iii. Educate residents about the importance of prescribed fire to maintain healthy ecosystems and reduce the risk of wildfires.

H. Work with agencies, local governments, and the private sector to encourage the designation of common open space for the protection of functional habitat corridors for wildlife movement in development plans within the Wekiva basin area.

   i. Support the establishment and implementation of city and county land development regulations, and landowner incentives, for open space preservation on new developments.

Wildlife and Habitat Goal 3: Reduce the impacts of invasive species and exotic species on native species and habitats throughout the Wekiva River System and its associated wetlands.

Objectives

A. Continue to monitor and control nuisance and invasive exotic vegetation within the Wekiva River System and its associated wetlands using the category I and II lists produced by the Florida Invasive Pest Plant Council as a guide. Species that require attention include, but are not limited to, hydrilla, water hyacinth, water lettuce, wild taro, para grass, Chinese tallow, East Indian hygrophila, and cattail.

   i. Continue and expand current efforts to eradicate and/or control the spread of hydrilla, water hyacinth, water lettuce, wild taro, para grass, and Chinese tallow.
   ii. Continue to monitor and track trends for these and other invasive exotic species.
   iii. Continue to monitor the spread of East Indian hygrophila currently found in the Little Wekiva River and develop a protocol to prevent its spread in the Wekiva River System as needed.
   iv. Continue to monitor for the occurrence of new invasive exotic species and institute control measures as needed.
   v. Manage cattail to prevent expansion to new locations to prevent large-scale invasions of in-stream or riparian habitats.

B. Assess the impacts associated with the proliferation of invasive exotic fishes such as, but not limited to, armored catfish within the Wekiva River System and develop actions for expanding monitoring and control strategies.

   i. Contract with fishery biologists to assess any impacts of armored catfish on the Wekiva River System.
   ii. Continue, and expand as feasible, current efforts to remove armored catfish.
   iii. Develop a protocol for monitoring and controlling exotic fishes.
   iv. Implement a monitoring and control program for exotic fishes using the protocol.

C. Monitor and control invasive exotic invertebrates within the Wekiva River System and its associated wetlands, including but not limited to channeled apple snails (if they become established), and develop actions to expand monitoring and control strategies.

   i. Support research on the impacts of channeled apple snails on aquatic habitats, native apple snail populations, and limpkin populations, and adjust control strategies as appropriate.
   ii. If control is warranted, establish a program to remove channeled apple snails and channeled apple snail egg clusters.

Historic and Cultural Values

Goal 1: Identify, protect, and preserve historic and cultural resources from human-related and natural threats.

Objectives:

A. Complete a comprehensive survey of the historic and cultural resources within the Wekiva basin, particularly those that are either directly or indirectly

functionally related to the river system.

i. Identify and prioritize areas that have not been surveyed.
ii. Survey the areas.
iii. Document a description of each new site found.
iv. File a record of each site with the Florida Master Site File.

B. Establish a system to prioritize significant historic and cultural resources for protection efforts.

i. Identify significant resources based on existing archeological surveys and results of the com-prehensive survey in Objective 1A.
ii. Use expert input as recommended by the Florida Division of Historical Resources to create a priority system.
iii. The priority system should address items outlined in the "BMP Guide" (see Objective 1C.)
iv. Use the priority system to assign a priority to known sites and newly discovered sites.

C. Implement the "Best Management Practices Guide to Protecting Archaeological Sites" (Florida Bureau of Archaeological Research) to stabilize and protect, at a minimum, high priority sites.

i. Create a protocol for implementing the Best Management Practices.
ii. Implement the Best Management Practices based on the priority assigned to sites.

D. Assign at least one trained public agency staff member ("Cultural Resources Coordinator") to regularly monitor and implement protection and management strategies associated with historic and cultural resources.

i. Assess staff roles and availability within each agency.
ii. Create a strategy to assign one person as the Cultural Resources Coordinator, specifying the percent of their time that is devoted to monitoring sites and implementing protection and management strategies.
iii. Establish an agreement or Memorandum of Understanding to create this position through a partnership of multiple agencies.
iv. The Cultural Resources Coordinator should focus on coordinating the accomplishment of objectives in this section, particularly Objectives 1A, 1B, and 1C.

E. Work with the law enforcement divisions of each agency to target high priority sites for regular patrol and enforcement of state cultural resources protection laws to deter vandalism and looting. Frequently patrolled sites receive less vandalism.

i. Implement regular communication between resource managers and local law enforcement.
ii. Ensure that a list of law enforcement contact information is readily available to agency staff.
iii. Familiarize law enforcement personnel with high priority sites.

iv. Use off-duty law enforcement officers to patrol during weekends and holidays.

F. Ensure that law enforcement personnel attend training on archeological resource protection.

i. Identify key law enforcement personnel who need to attend the training that is available from the Florida Bureau of Archaeological Research.

G. Continue regular maintenance by public employees and volunteers at sites that receive regular public use to deter vandalism and looting. Well maintained sites receive less vandalism.

i. Use resources from the Florida Bureau of Archaeological Research, such as the Stewardship Volunteer Program and Sitewatch Program.

H. On private lands, work closely with the landowner to protect and preserve identified priority sites, using Best Management Practices as needed.

i. Establish and implement an outreach protocol to inform private landowners of the importance of the site(s), why the site(s) should be protected, and the resources available to assist them in protecting and managing the site(s).

ii. Refer to the resources of the Florida Bureau of Archaeological Research for guidance on cultural resource protection for private landowners, including the document "Best Management Practices: An Owner's Guide to Protecting Archaeological Sites — Preserving and Protecting Florida's Archaeological Sites for Future Generations", the document "Conservation Easements Guidebook to Protecting Sites on Private Lands" and the Site Stewardship Agreement.

I. Establish additional protections for Shell Island through discussions with Rollins College, with advisement from the Florida Division of Historical Resources.

i. Perform an assessment of the Shell Island site to determine additional site protections needs.

ii. Consider all options for additional protection, including public acquisition.

J. Establish site-specific strategies to protect high priority cultural resources from vandalism and looting in accordance with Best Management Practices.

i. Consider strategies outlined in the BMP guide identified in Objective 1C, such as the use of native groundcover and natural barriers for camouflage.

ii. As soon as vandalism or looting is discovered at a site, prevent further disturbance by immediately repairing the damage.

iii. Use expert input to design and implement site-specific strategies.

iv. Coordinate with the Florida Division of Historical Resources before conducting any ground-disturbing activities.

K. Assess causes of erosion and other forms of natural degradation at high priority sites and take site-specific corrective actions to problems as needed.

   i. Consult with an archeologist and other qualified professionals to determine the nature of the threats and the appropriate site-specific protection measures to stabilize the site.
   ii. Coordinate with the Florida Division of Historical Resources before conducting any ground-disturbing activities.

L. Ensure that, wherever feasible, all current and future recreational trails are routed at least 50 feet from cultural sites, with adequate natural vegetation barriers between the trail and site to discourage access.

   i. Assess the current trail system to make sure it adheres to this objective.
   ii. Evaluate all future proposed trails to ensure that they adhere to this objective.

M. Create partnerships with educational institutions to promote research of the significant historic and cultural resources in the Wekiva basin.

   i. The Cultural Resources Coordinator should identify educational institutions and create these partnerships.

Historic and Cultural Goal 2: Foster an understanding among the public of the significance of the historic and cultural resources of the Wekiva basin.

Objectives:

A. Write a comprehensive history of human habitation in the Wekiva basin area. Use this information to update all documentation (land management plans, websites, and printed materials) with an accurate account of the history of the basin.

   i. Coordinate with historical societies, etc., to identify a qualified person or a small team to write a comprehensive history of the Wekiva basin area.
   ii. Publish the history in hard copy and make it, or some version of it, available online.
   iii. Perform an inventory and assessment to identify all documents (land management plans, websites, and printed materials) that need to be updated.
   iv. Update the documents identified in the inventory and assessment.

B. Ensure that messages provided by resource managers, private businesses, and concessionaires include clear language to indicate that looting and vandalism of cultural resource sites is illegal and that enforcement actions will be taken.

   i. Ensure that a consistent message is used on any signs at all access points to the river system.
   ii. Ensure that historic and cultural resource protection is addressed in all river use guidelines.

C. Ensure that educational programs and interpretation of cultural resources within the Wekiva basin include consistent messages about the importance of these resources.

   i. Develop fact sheets on the historic and cultural resources in the Wekiva basin.
   ii. Include key messages that should be delivered at every education and public relations opportunity.

D. Incorporate historic and cultural research findings into educational programs, interpretation, and public relations materials, as appropriate.

   i. Provide a summary of research findings to agency education and outreach staff.

E. Identify and establish at least one cultural site within the basin to be used as a public education site.

   i. Identify a cultural site that is appropriate for use as a public education site.
   ii. Create messages about cultural resources and the people who left them in the Wekiva basin. Include messages created in Objective 2C and information about proper treatment of the site and rules to prevent disturbance.
   iii. Ensure that construction of structures and facilities does not damage the site.
   iv. Place interpretive and educational signs and related facilities to avoid or minimize visual intrusion on any scenic vistas associated with the site.
   v. Direct the flow of people and vehicles to prevent damage over the long term.

Water Quality and Quantity Values

Goal 1: Protect instream water quality of the Wekiva River System.

Objectives

A. Protect springs, surface waters, wetlands, karst features, and high recharge areas within the Wekiva basin and springshed through land acquisition and the purchase of conservation easements.

   i. Support wildlife and habitat Goal 2, Objective 2D, Action i.
   ii. Create an acquisition inventory of potential areas of significance to the Wekiva system, including high recharge areas and areas of aquifer vulnerability in the Wekiva springshed that may not be in proximity to the river itself (with special emphasis on high recharge areas and areas of aquifer vulnerability that also have habitat value).
   iii. From the inventory in (ii), rank the importance of potential areas, thereby creating a prioritized list of potential acquisitions.
   iv. From steps (ii) and (iii), determine potential funding sources and steps for acquisition through existing programs.
   v. Investigate/pursue additional funding mechanisms at the federal, state, and local level for the protection of conservation lands within

the Wekiva basin and springshed, including but not limited to appropriation of special funding for key acquisitions and easements, expansion of local government acquisition and easements programs, and the creation and strengthening of partnerships with private conservation organizations.

B. Continue to strictly interpret the Outstanding Florida Waters (OFWs) statute for all impacts to the Wekiva River System.

   i. Review proposed activities for potential risk of water quality degradation and Outstanding Florida Waters violations.
   ii. Investigate any activity that may be causing water quality degradation and pursue corrective actions.

C. Evaluate the effectiveness of stormwater treatment techniques, enforcement, and regulations currently in place, and as appropriate strengthen these provisions.

   i. Review and evaluate the effectiveness of the local government stormwater master plans in the Wekiva basin and springshed.
   ii. Encourage local governments to identify and as feasible implement the most effective stormwater treatment measures.
   iii. Contact the Florida Department of Environmental Protection Watershed Management staff regarding the revision of the state stormwater rule that is underway, and request that a presentation be made to the advisory management committee regarding this revision.
   iv. Assess resources used for enforcement purposes among responsible agencies. (The St. Johns River Water Management District and local governments have their own stormwater regulations.)
   v. Prioritize most important areas and regulations for water quality in the Wekiva River System based on (iii), and evaluate whether enforcement resources are sufficient in these areas based on (iv). Make recommendations for changes in efforts and/or priorities based on findings.

D. Continue to monitor the condition of and any changes to submerged aquatic vegetation (SAV) beds, particularly eelgrass beds, which are a distinctive component of the Wekiva River System and indicative of a healthy riverine system.

   i. Determine an optimal status for eelgrass beds within the Wekiva River System. Based on this determination, map areas in which the condition is degraded.
   ii. Based on the results of (i), work with Wekiva River Aquatic Preserve personnel to determine whether limiting exposure to recreational use or management changes would improve the condition of eelgrass beds.
   iii. If needed, based on (i) and (ii), establish a restoration program for eelgrass beds to

reestablish the optimal condition, with a goal for time of completion.

E. Support research and monitoring efforts pertaining to algal growth, particularly filamentous algae, which can indicate the presence of increased nutrients within the Wekiva River System.

   i. Continue the research program that was initiated during the Pollutant Load Reduction Goals (PLRG) study on the Wekiva River and Rock Springs Run.
   ii. Assess whether additional research and monitoring is needed.
   iii. Review findings annually and modify research and monitoring techniques accordingly.

F. Support implementation of the Wekiva River System Total Maximum Daily Loads (TMDLs)/Basin Management Action Plan (BMAP) program, whose goal is to reduce nutrient loads in the Wekiva River and Rock Springs Run as well as other water bodies within the Wekiva River System.

   i. Review the future TMDL evaluations and provide input to the Florida Department of Environmental Protection on TMDL development prior to approval of any revised TMDLs.
   ii. Promote public, local government and agency participation in preparing the Bbasin Management Action Plan and implementation of projects and activities designed to reduce pollutant loads.
   iii. Support research and the evaluation of new information regarding groundwater and surface water nutrient impacts in the Wekiva basin and springshed; and ensure that all information is appropriately used in any future decisions and actions.

G. Create and implement a communication program for residents, businesses, landscaping professionals, and public employees whose work involves landscaping to address fertilizer application practices and the harm caused by nutrient loading to surface water and groundwater quality.

   i. Identify a lead agency to create this program.
   ii. Develop the program based on concepts of community based social marketing.

H. Evaluate and implement feasible stormwater retrofit projects and new stormwater treatment technologies, both on-site and regionally, within the Wekiva basin and springshed to meet existing requirements and/or provide innovative treatment approaches for nutrient removal.

   i. Identify potential retrofit projects and technologies on individual properties within the Wekiva basin and springshed.
   ii. Select projects for feasibility studies and future construction.
   iii. Identify future opportunities for new regional stormwater treatment projects.

I. Enforce, assess, and as appropriate strengthen regulations of the St. Johns River Water Management District and state and local governments

pertaining to sinkholes and other karst features that can be a direct conduit for nutrients and pollutants into the aquifer, including but not limited to adjacent land use, setbacks, buffers, and discharges.

i. Request that representatives of the St. Johns River Water Management District, Florida Department of Environmental Protection, and local governments make a presentation to the advisory management committee regarding existing regulations and potential improvements to regulations relating to the protection of groundwater quality from nutrients and pollution via sinkholes and other karst features.
ii. Evaluate resources for enforcement.
iii. Prioritize most important areas and regulations for protection of groundwater quality in the Wekiva River System based on (i), and evaluate whether enforcement resources are sufficient in these areas based on (ii).
iv. Make recommendations for changes in protection efforts and priorities based on findings.

J. Encourage proper maintenance of existing septic systems throughout the Wekiva basin and springshed. Within areas identified to be "more vulnerable" and "vulnerable" by the Wekiva Aquifer Vulnerability Assessment, encourage the use of performance-based onsite wastewater treatment systems as appropriate.

i. In consultation with the county health departments, develop and implement a program to ensure the periodic pump-out of existing septic systems.
ii. Develop and implement an educational program to support (i).
iii. Develop and implement a program of incentives for property owners who have septic systems within the "more vulnerable" and "vulnerable" areas of the basin and springshed to upgrade to performance-based systems as appropriate.
iv. Create a program to ensure maintenance of performance-based systems in the Wekiva basin and springshed.

K. Evaluate impacts to water quality from septic systems within areas vulnerable to surface water contamination adjacent to the Wekiva River System, and as appropriate establish programs to replace existing systems, retrofit with performance-based systems, or connect to central sewer facilities if in close proximity to a regional wastewater treatment facility.

i. Review and update the inventory of properties on septic systems that are adjacent to Wekiva River System water bodies.
ii. Collaborate with the Florida Department of Health to determine age of systems and whether there are known problems or complaints regarding these systems.
iii. Coordinate with the Florida Department of Health and Florida Department of Environmental Protection to

assess the impact on water quality of septic systems adjacent to the Wekiva River System.

iv. Determine whether anticipated water quality improvement warrants retrofit or replacement of those septic systems adjacent to the Wekiva River System, or connection to central sewer facilities.

v. Depending upon the results of (iv), develop incentive-based programs to offer landowners for retrofit replacement, or connection to central sewer facilities where appropriate.

L. Convert existing urban areas with a high density of individual onsite septic systems to central sewer where feasible and environmentally necessary within the Wekiva Study Area.

i. Expand septic system mapping undertaken for TMDL documentation to better map areas with high septic system density, and include the entire springshed.

ii. Evaluate central sewer expansion and mandatory hook-up plans of local governments.

iii. Consider results of (i) and (ii) in light of aquifer vulnerability in high septic density areas. Prioritize areas based on aquifer vulnerability.

iv. Collaborate with local governments to incorporate results of (iii) into central sewer expansion and mandatory hook-up plans as appropriate.

M. Support ongoing projects that improve water quality in the Little Wekiva River. These projects include wastewater treatment plant upgrades, projects identified in the Little Wekiva watershed, and projects recommended in the Wekiva Parkway and Protection Act Stormwater Master Plan.

i. Review St. Johns River Water Management District and local government project listings, using these to create a "master project list" of ongoing projects. Include wastewater treatment plant upgrades and shoreline stabilization.

ii. Prioritize project list based on impacts to the Little Wekiva River.

iii. Refer to action steps for Objective 1F (TMDL/BMAP program) because a final BMAP will include a similar list of projects.

N. Enforce, assess, and as appropriate strengthen regulations and educational efforts relating to lawn and landscaping practices and the responsible use of fertilizers to limit nutrient loading within the Wekiva basin and springshed.

i. Support implementation and enforcement of the FDACS Urban Turf Fertilizer Rule (Rule 5E-1.003(2) *Florida Administrative Code* - Labeling Requirements for Urban Turf Fertilizers) and appropriate nutrient limitation recommendations of the Urban Fertilizer Task Force.

ii. Evaluate agency legislative authority; determine potential ways of strengthening agency regulations and enforcement regarding fertilizer use, including

expansion of authority as needed.

iii. Strengthen agency regulations and enforcement as appropriate, pursuant to (ii).

iv. Evaluate existing local government regulations and enforcement relating to turfgrass, landscaping, and fertilizer use; identify potential ways of strengthening regulations and enforcement.

v. Strengthen local government regulations and enforcement as appropriate, pursuant to (iv).

vi. Continue to support the Wekiva Promise initiative, an education program that addresses residential fertilizer use and promotes personal stewardship in protecting the Wekiva River basin and springshed.

vii. Work with state agencies and local governments to establish incentive programs to reduce turf grass area and promote landscaping that does not require the intense use of fertilizers.

viii. Request information from local wastewater treatment utilities or the Florida Department of Environmental Protection regarding the typical water quality concentrations, including nitrates and phosphorus, of reclaimed water intended for irrigation.

ix. Promote education regarding the nutrient concentrations and fertilizer effect in reclaimed water and that fertilizer application can be reduced when reclaimed water is used for irrigation.

O. Support research regarding the impacts of land application of reclaimed water from wastewater treatment plants (advanced and conventional) on shallow groundwater and the Floridan Aquifer to determine if additional treatment is required.

i. Invite a representative of the FDEP, SJRWMD or an academic establishment to present information to the advisory management committee regarding what is known about the impacts of using reclaimed water on groundwater quality.

ii. Based on (i), determine whether research is ongoing to address data gaps and pursue additional research if appropriate.

iii. Based on (ii), determine whether reclaimed water application presents a potential threat to groundwater quality and pursue additional treatment if determined necessary.

Water Quality and Quantity Goal 2: Protect Flow Regimes of the Wekiva River System.

Objectives

A. Evaluate existing and proposed withdrawals of water within the Wekiva River basin and springshed in light of their potential impact to the Wekiva River System, and as appropriate strengthen policies and regulations that limit and manage water consumption.

i. Obtain an inventory and map of existing water with-drawals in the Wekiva springshed and basin requiring a Consumptive Use

Permit (CUP) and develop an estimate of private individual wells that do not require a CUP.

ii. Evaluate impacts to the Wekiva River System from existing and proposed withdrawals.

iii. Review new withdrawal proposals and provide comment during the Consumptive Use Permit process.

iv. Continually update inventory and evaluations in (i) and (ii).

v. Participate in the rulemaking process: (1) to consolidate Environmental Resource Permits (ERPs) and Consumptive Use Permits (CUPs) for projects requiring both an ERP and a CUP that involve irrigation of urban landscapes, golf courses, or recreation areas; and (2) to further limit and manage water consumption as may be appropriate.

B. Support planned efforts to evaluate and update existing Minimum Flows and Levels (MFLs) of the Wekiva River at the State Road 46 bridge. Identify whether there is a need for additional MFLs or revisions to existing MFLs to adequately protect the Wekiva River System.

i. Request an identification (including a MFL map) of and status report on all MFLs within the Wekiva River basin.

ii. Review and comment on the existing MFLs, proposed MFLs, and the St. Johns River Water Management District's MFL Priority List and Schedule.

iii. Pursue the adoption of new MFLs or the revision of existing MFLs as appropriate based on (ii).

C. Evaluate the protection of Outstandingly Remarkable Values that may be affected by flows and water levels of the Wekiva River System; determine whether additional protection is required, and if so whether such protection may be achieved by refinement of MFLs, by a federal water reservation pursuant to Section 13(c) of the Wild and Scenic Rivers Act, by a water management district water reservation pursuant to Section 373.223(4), Florida Statutes, or by other processes.

i. Determine if existing flow and water level protection measures adequately protect the Outstandingly Remarkable Values of the Wekiva River System.

ii. If additional protection is needed, determine whether that protection can be best achieved by refinement of MFLs, by a federal water reservation pursuant to Section 13(c) of the Wild and Scenic Rivers Act, by a water management district water reservation pursuant to Section 373.223 (4), Florida Statutes, or by other processes.

iii. Work with the SJRWMD and the National Park Service to take the most appropriate action based on (ii).

D. Evaluate existing SJRWMD Environmental Resource Permit (ERP) and Consumptive Use Permit (CUP) rules and current enforcement methods that pertain to residential, commercial, industrial, and agricultural water use and landscaping to identify opportunities for additional water conservation.

i. Evaluate existing ERP and CUP rules and request a presentation from the SJRWMD on existing rules and methodology for permit review.
ii. Compare the SJRWMD rules to local ordinances.
iii. Assess water conservation enforcement programs and resources of local governments and the SJRWMD.
iv. Identify opportunities for improving efficiency and water conservation, such as limiting turf grass, requiring Florida-friendly landscaping, use of dry retention, preserving non-irrigated open space to reduce water consumption and promote aquifer recharge, and use of water-efficient fixtures/ appliances for new construction.
v. Revise SJRWMD rules and local regulations as appropriate based on (iv).

E. Work with the SJRWMD to evaluate and as appropriate strengthen regulations and incentive programs to conserve water within the Wekiva basin and springshed, including but not limited to those addressing water allocation, water consumption, water billing rate structures, irrigation, and lawn or landscaping practices. Work with local governments to evaluate and as appropriate strengthen regulations and incentive programs to conserve water within the Wekiva basin and springshed, including but not limited to those addressing plumbing codes, installation of irrigation systems, lawn and landscaping ordinances, and water billing rates.

i. In light of results of Objective 2D, determine the need for revisions to regulations of the SJRWMD to improve water conservation; revise regulations as appropriate.
ii. Revise local government regulations as appropriate.
iii. Work with agencies and local governments to establish incentive programs to reduce turf grass area, promote landscaping that does not require intense irrigation, and promote other means of water conservation.

F. Promote the efficient use of reclaimed water within the Wekiva basin and springshed. Evaluate whether the use of reclaimed water has an adverse impact on Outstandingly Remarkable Values that may be affected by flows and water levels of the Wekiva River System. Evaluate whether transports of water outside of the Wekiva basin and springshed have an adverse impact on Outstandingly Remarkable Values that may be affected by flows and water levels of the Wekiva River System.

i. Request information from the Florida Department of Environmental Protection or local wastewater treatment utilities regarding existing reclaimed water programs and plans for expansion.
ii. Evaluate whether the use of reclaimed water (including reclaimed water supplies supplemented with groundwater or surface water) can have an adverse impact on ORVs that may be affected by flows and water levels.

iii. Revise strategies and plans for the use of reclaimed water as necessary based on (i) and (ii), and promote the use of reclaimed water only where appropriate.

iv. Study whether transports of water outside of the Wekiva basin and springshed can have an adverse impact on ORVs that may be affected by flows and water levels.

v. Revise strategies and plans for the transport of water, as necessary based on (iv).

G. Encourage compliance with Best Management Practices for irrigation by nursery, landscaping, and agricultural businesses.

i. Request information on the results of Best Management Practices compliance surveys from the Florida Department of Agriculture and Consumer Services.

ii. Request information from the St. Johns River Water Management District regarding compliance with consumptive use permit requirements and permitted withdrawal amounts.

iii. Based on (i) and (ii), determine whether additional action is needed to protect groundwater volume and achieve compliance with Best Management Practices and Consumptive Use Permits.

H. Work with local governments, agencies, and the private sector to encourage a more water-conscious form of development within the Wekiva basin and springshed.

i. Promote Low Impact Development workshops, such as those offered by the Program on Resource Efficient Communities (University of Florida); arrange for workshops to be offered in the Wekiva area.

ii. Coordinate with local governments, agencies, and the private sector to encourage a more water-conscious form of development using techniques identified in Objective 2D (iv).

USER CAPACITY (CARRYING CAPACITY)

OVERVIEW

Comprehensive river management plans must address user capacity management. User capacity is defined as the type and level of use that can be accommodated while maintaining the desired conditions of a river's resources and visitor experiences. The following description of a user capacity program is included as a component of preferred alternative B.

User capacity management involves establishing desired conditions, monitoring, evaluating, and taking actions (managing visitor use) to ensure that the identified outstandingly remarkable values are protected. The premise is that with any use on public lands comes some level of impact that must be accepted; therefore it is the responsibility of the managers to decide what level of impact is acceptable and what management actions are needed to keep impacts within acceptable limits. Instead of just tracking and controlling user numbers, it may be necessary to more actively manage the levels, types, and patterns of visitor use and other public uses as needed to preserve the condition of the resources and quality of the visitor experience. The monitoring component of this process helps to evaluate the effectiveness of management actions and provides a basis for informed management of public use.

The user capacity management process can be summarized by the following major steps:

1. Establish desired conditions for resources and visitor experiences.
2. Identify indicators (things to monitor to determine whether desired conditions are being met, e.g., soil loss, vegetation damage).
3. Identify standards (limits of acceptable change) for the indicators.
4. Monitor indicators to determine if there are trends or if standards are being approached.
5. Take management action to maintain or restore desired conditions.

With limited staffs and budgets, managers must focus on areas where there are definite concerns and/or clear evidence of problems. This means monitoring should generally take place where conditions are approaching the standards, conditions are changing rapidly, specific and important values are threatened by visitation, and/or the effects of management actions taken to address impacts are uncertain.

User capacity is addressed in this environmental assessment in the following ways:

- It outlines desired resource conditions, visitor experience opportunities, and types of facilities to support the resource conditions and visitor experiences for different areas.
- It describes the river system's most pressing use-related resource and visitor experience concerns. This helps managers focus limited resources on specific potential indicators and determine what kinds of baseline information is needed.
- It identifies potential indicators that could be monitored in the future to determine if desired conditions are not being met because of unacceptable impacts from public use. As river managers collect more detailed information

on use-related concerns, specific indicators would be selected for monitoring and corresponding standards (limits of acceptable change) would be identified.
- It outlines representative examples of management actions that might be used to avoid or minimize unacceptable impacts from public use.
- It identifies specific geographic areas for special monitoring attention.

The last steps in the user capacity process, which would continue indefinitely, involve monitoring the identified indicators and taking management actions as needed to minimize impacts. As a means for providing flexibility in the face of changing conditions, river managers would use an adaptive management approach when appropriate. (Adaptive management is a management system based on clearly identified outcomes, monitoring to determine if management actions are meeting outcomes, and if not, making changes that would best ensure that outcomes are met or that outcomes are reevaluated.) If new use-related resource or visitor experience concerns arise in the future, additional indicators and standards would be identified as needed to address these concerns.

DESIRED CONDITIONS FOR OUTSTANDINGLY REMARKABLE VALUES

Scenic

The existing scenic resources/values are protected or enhanced through management actions and plans of the various agencies. The Advisory Management committee would work with other entities to ensure that scenic resources are considered in future project planning.

Recreational

Recreational values (including access and appropriate activities) are maintained or enhanced according to the description and management guidelines for each river segment classification.

Wildlife and Habitat

Wildlife populations and their habitat are protected from further degradation or enhanced through interagency efforts included in alternative B such as exotic species control, habitat restoration, land preservation, wildlife management, and similar projects.

Historic and Cultural

Historic and cultural resources/values are preserved in place. Damage to resources is reduced or eliminated. Future projects are surveyed for cultural resources prior to ground disturbance and impacts are mitigated.

Water Quality and Quantity

Hydrologic resources are protected from degradation or enhanced through interagency efforts.

EXISTING VISITOR ACTIVITIES

Recreational activities in the Wekiva basin include canoeing/kayaking, bank fishing, boat fishing from motorized and non-motorized boats, pleasure boating, personal watercraft use, picnicking, camping (primitive, developed, and horse), tubing, swimming in undeveloped and developed areas, snorkeling, wildlife watching, hiking, horseback riding, and hunting.

OVERVIEW OF CURRENT AND POTENTIAL USE-RELATED IMPACTS

This section discusses existing and potential use-related impacts that may occur in or along the designated rivers and may pose challenges for managing for the desired conditions of the outstandingly remarkable

values described in this environmental assessment.

Existing facilities along the river system generally support enjoyable visitor opportunities and protect resources, and based on projected trends would continue to function fairly well. Parking areas at the most popular locations often fill to capacity during the summer weekends. As a result, visitors may be frustrated in trying to reach certain areas and may be turned away or asked to wait for an opening. There is only one designated campsite (Buffalo Tram Camp) on the Wekiva River. Camping at unauthorized sites along the river may impact sensitive resources.

In the summer, high volumes of use in Rock Springs Run, Wekiwa Springs Run, and along certain reaches of the Wekiva River cause crowded conditions at times. Concerns have been expressed about this issue and its related impacts on visitor experience. If use increases or patterns of use change, crowding in these areas may worsen and/or become more frequent. In addition to crowding, observations in certain high use areas indicate that use on the river system is resulting in excessive impacts on the riverbanks and associated floodplains. Some these impacts include proliferation of informal trails, erosion, vegetation damage and loss, litter, and improper disposal of human waste.

Concerns have also been raised about impacts to the river system and its scenic values due to unpermitted commercial uses and activities in certain areas.

Although most impacts on water quality are from sources away from the river system, impacts from visitor use are also a concern (e.g., increased sedimentation and *E. coli*). Use levels on Black Water Creek are currently quite low, and it is anticipated that they will remain low.

Intentional as well as inadvertent impacts on cultural resource sites are a management concern. For example, recreational use on Shell Island is causing impacts from trampling and visitor-created trails. In addition, pothunting (illegal digging and taking of artifacts) has occurred there in the past. The island is owned by Rollins College and is closed to the public except for authorized permitted uses, but this closure is being blatantly ignored. Recently FDEP Wekiva River Aquatic Preserve has partnered with Rollins College on a Shell Island Protection Initiative. The college donated funds to support this effort as well as a Shell Island Citizen Patrol Initiative. FDEP staff has inspected the site, removed litter, removed rope swings, and documented damage to trees and other areas of the island. Rope swings continue to be put back by violators after they are removed. No Trespassing signs, Resource Management in Progress signs, and signs describing the site's value have been installed, but these have also been vandalized by a few violators. When signs are in place, the general public typically respects the site; however addition law enforcement actions are required.

POTENTIAL USER CAPACITY INDICATORS AND RELATED MANAGEMENT ACTIONS

Although no comprehensive visitor use study or carrying capacity study has been performed to date, some of the Florida state parks do have limits on the daily visitor capacity based on the number of people or vehicles that can be accommodated by park facilities. Kelly Park, managed by Orange County, also has a daily user limit. Boating on Black Water Creek is managed through a permit system by

Seminole State Forest. There is a need for establishing indicators or thresholds (i.e., water quality, amount of trash, bank erosion, species diversity, condition of archeological resources, visitor experience, etc.) to determine the limits of capacity for the system as a whole.

Some potential indicators that may be monitored to better understand the magnitude and trends of the most pressing use-related concerns described in the previous section have been identified. Final selection of indicators and standards for monitoring purposes and implementation of management actions that affect use will comply with NEPA (1969), Section 106 of the National Historic Preservation Act, and other laws and regulations as appropriate.

Agencies that have management responsibility on the river system recognize that visitor use-related impacts may be occurring on their lands. Managers continue to address these issues through education, law enforcement, and in other ways. Potential user capacity indicators and management actions may include the following (see the description of alternative B for additional related actions):

- **Water quality**
  Monitoring indicators: quality of water including pollutants, nutrient concentrations, sediments, and dissolved solids

  Management actions that may be considered to avoid or minimize impacts on water quality related to visitor use include encouraging low-impact practices (e.g., Leave No Trace); providing more waste disposal facilities; redistributing use to lesser used areas or off-peak times; and reducing/ eliminating certain uses, activities, or equipment that are contributing to water quality degradation.

- **Litter**
  Monitoring indicators: amount and type of observed litter in the water and on shore

  Management actions that may be considered to avoid or minimize litter include encouraging personal responsibility for waste disposal, prohibiting disposable containers (e.g., plastic or Styrofoam cups, coolers, etc.), and providing more animal-proof waste receptacles.

- **Impacts on riverbanks such as erosion, vegetation damage or loss, and creation of informal trails**
  Monitoring indicators: overall health of riparian communities, changes in plant diversity, and sedimentation from erosion

  Management actions that may be considered to avoid or minimize riverbank impacts include encouraging low-impact practices; directing use to designated areas or facilities; providing more waste disposal receptacles; increasing the number of signs to direct visitors to appropriate facilities; reducing use levels or redistributing use to lesser used areas or off-peak times, designating additional sites for camping or pull-outs, or restoring sites if necessary.

- **Improper human waste disposal**
  Monitoring indicators: direct observation or odor

  Management actions that may be considered to prevent or minimize improper human waste disposal include encouraging proper waste disposal, providing more toilet facilities, directing use to

appropriate facilities, and reducing use levels.

- **Overcrowding at parking areas**
  Monitoring indicators: available parking spaces and parking in unauthorized areas

  Management actions that may be considered to prevent or minimize these impacts include providing advanced planning information that encourages visitation to lesser used areas or at off-peak times, providing real-time information about parking availability, adding more parking or redesigning parking areas for greater efficiency, and actively redistributing use to other sites when areas are full.

- **Crowding from high use levels at developed water play areas**
  Monitoring indicators: direct observation of conflicts and visitor complaints

  Management actions that may be considered to prevent or minimize crowding at water play areas include providing information on visitor etiquette, encouraging visitation at off-peak times, and limiting the number of people in a swimming area at one time (first-come first-served, permit system, etc.).

- **Crowding from high use levels on certain river segments**
  Monitoring indicators: direct observation of conflicts, visitor complaints.

  Management actions that may be considered to prevent or minimize crowding on the river system include providing information on visitor etiquette, redistributing visitation to lesser used areas or off-peak times, and limiting the number of watercraft on the river (first-come first-served, permit system, etc.). Different restrictions or limits based on the type of watercraft (motorboats, personal watercrafts, canoes/kayaks) may be appropriate.

- **Impacts on wildlife and habitat from user activities on the river system.**
  Monitoring indicators: population numbers, apparent health, and hazards to wildlife.

  Management actions that may be considered to prevent or minimize user-caused impacts include providing information on sensitive species and protective measures, redistributing visitation to less critical areas, and limiting the number of watercraft during sensitive periods. Management actions that may be considered to prevent hazards to wildlife include providing information regarding the proper use and disposal of fishing line and tackle, limiting fishing to certain areas, providing more animal-proof trash receptacles, and discouraging the feeding of wildlife.

- **Vandalism and unintentional damage to historic and cultural sites**
  Monitoring indicators: changes in condition or evidence of disturbance

  Management actions that may be considered to prevent or minimize impacts on cultural resource sites include providing more information on the sensitivity and value of the cultural resources, hardening or protecting heavily used areas with special materials, increasing ranger or law enforcement patrols in target areas, educating vendors, using remote monitoring techniques, and directing use away from (or enforced closure of) particularly vulnerable sites.

- **Impacts on scenic values**
  Monitoring indicators: number and type of visual intrusions

  Management actions that may be considered to prevent or minimize impacts on scenic quality include working with state and local agencies to avoid, minimize or mitigate potential negative impacts of new development such as docks, bridges, and recreational facilities.

AREAS FOR SPECIAL MONITORING ATTENTION

Areas that warrant special resource and/or visitor experience monitoring attention include the following:

- Shell Island and other known archeological sites
- popular camping or stopping areas
- water play areas (Wekiwa Springs, Rock Springs, and Wekiva Falls) for water quality issues
- areas of concentrated watercraft use such as near commercial canoe rental facilities and popular access sites (e.g., Kings Landing sites, Wekiva Island, Wekiva Falls canal, and Katie's Landing)
- Wekiva River in the vicinity of the concrete bridge at Wekiva Island (also known as the "bridge to nowhere")
- Wekiwa Springs Run
- Rock Springs Run

PROGRAMS AND STUDIES NEEDED

In the process of developing a cohesive management strategy for the Wekiva Wild and Scenic River System, a number of needed baseline programs and studies were identified. Additional data needs would be identified by the advisory management committee as part of the implementation of alternative B. After completion and approval of this environmental assessment, these programs and studies would need to be completed to fully implement the comprehensive river management plan. In addition to the planning and data needs listed below, others may be identified by the advisory management committee as part of the implementation of the approved alternative.

VISITOR MANAGEMENT AND SOCIOECONOMIC IMPACTS

- Complete a visitor experience and resource protection (VERP) or similar plan to establish the river system carrying capacity and thresholds (limits of acceptable change) for ecological and social impacts from recreation. The plan would define compatible uses for each river segment and develop an impact monitoring and management strategy based on a Recreation Assessment that also addresses carrying capacity. (Indicators and management strategies for capacity are discussed in more detail under User Capacity.)
- Develop a Facilities Master Plan that describes what facilities should be provided to support uses determined appropriate by the Recreation Assessment.
- Conduct an assessment of enforcement effectiveness of regulations related to protecting outstandingly remarkable values. Consider additional enforcement mechanisms, innovative interagency cooperation, and associated staffing needs.
- Develop a coordinated public education/outreach plan to implement and elaborate on the action steps in this plan. Education should focus on proper etiquette on a wild and scenic river, the importance of protecting sensitive resources (middens, shoreline vegetation, wildlife, etc.), and applicable regulations.
- As part of an education/outreach plan, include programs such as river clean-up ("Adopt-a-River"), Junior River Rangers, the Wekiva Promise initiative, speaking engagements for advisory committee members, and other similar initiatives.
- Complete a socioeconomic study of the river system region, and how river uses impact concessionaires, local communities, and businesses.

RESOURCE MANAGEMENT

- Coordinate with the Department of Historic Resources to assess and survey of historic and cultural resources, including an archeological site condition assessment with monitoring and stabilization recommendations.
- Review existing and ongoing research, and as appropriate establish monthly and annual species-specific monitoring programs to establish baseline population levels and document trends.
- Coordinate with the FWC Invasive Species Management Section to

assess the impacts associated with the proliferation of invasive exotic species, and if necessary, develop actions for expanding monitoring and control strategies.

- Coordinate with the Florida Park Service and St Johns River Water Management District to identify areas within the Wekiva River System floodplain with impacted hydrologic resources, review past hydrologic restoration projects, assess current plans to improve the hydrology of riparian habitats, and as needed develop additional plans for improvement.
- Evaluate the impact of existing and proposed ground and surface water withdrawal on flows and ecological processes of the Wekiva River System, and determine whether additional programs, policies, and/or regulations, , including revised or additional MFLs or the adoption of reservations of water, are warranted to protect the river system.
- Conduct research regarding the impacts of land application of reclaimed water from wastewater treatment plants on shallow groundwater and the Floridan Aquifer to determine if additional treatment or policy changes are required.

IMPLEMENTATION

ROLE OF ADVISORY COMMITTEE AND WEKIVA BASIN WORKING GROUP

The proposed management plan as outlined in alternative B would guide the future management of the Wekiva National Wild and Scenic River System. Interagency cooperation with the advisory management committee would be needed to produce coordinated and targeted efforts to implement the plan. The following scheme for plan implementation is recommended under alternative B.

The advisory management committee was established according to NPS rules to be responsible for overseeing the development of the comprehensive river management plan. This committee should continue to operate and oversee plan implementation. The Wekiva River Basin Working Group (working group), which has met for at least 15 years, should consider taking on a supporting role in the implementation of this plan. Many key members of the advisory management committee currently serve on the working group, whose mission it is to encourage interagency coordination within the Wekiva basin. Implementing the management plan would fit well with this mission. It may be advantageous for the advisory management committee and the working group to hold occasional joint meetings.

INTERAGENCY COOPERATION

It is recognized that there is already considerable interagency cooperation occurring among the various government agencies that work within the Wekiva basin. This is largely because of the coordinated efforts of the Wekiva River Basin Working Group over many years. A critical step to achieve interagency cooperation under the preferred alternative would be to secure the support of state, county, and municipal agencies that have jurisdiction in the Wekiva basin. Each agency and local government that has jurisdiction to manage public lands within the Wekiva basin has its own mission and may produce a separate management plan based upon its own internal guidelines and management planning. Implementation of the approved *Comprehensive River Management Plan* would be facilitated if each management plan of agencies and local governments is reviewed to ensure compatibility with this plan. Most agency management plans receive periodic updates. It is recommended that particular attention be paid to the *Comprehensive River Management Plan* and this environmental assessment during any updates to ensure compatibility.

A written section on interagency cooperation should be a regular part of all agency plan updates. Additionally, it is recommended that all agencies compare staffing structures for any overlaps or deficiencies to optimize staff resources.

FUNDING

Approval of this environmental assessment does not guarantee that funding will be forthcoming regardless of which alternative is approved. Funds to implement the river management plan would be sought from a variety of sources. The NPS has funds available for wild and scenic river management. These funds are disbursed annually on a competitive basis. A portion of the funds available are allotted to each NPS region and then disbursed to

eligible rivers within each region based on need.

Partnership Wild and Scenic Rivers have been successful in leveraging scarce resources to implement their respective river management plans. Leveraging funds from the private sector; local, state, and federal governments; and the river partners have attained a level of river management that would not be possible with NPS-only support (for examples, see http://www.nps.gov/nero/ rivers/ riversfunding.htm).

Other funding sources include federal and state specialized program funds, such as for exotic plant management, and those from private foundations.

THE ENVIRONMENTALLY PREFERABLE ALTERNATIVE

The environmentally preferable alternative is determined by applying the criteria suggested in NEPA of 1969, which guides the Council on Environmental Quality (CEQ). The council provides direction that the environmentally preferable alternative is the alternative that would best promote the national environmental policy as expressed in Section 101 of NEPA:

1. fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;
2. assure for all generations safe, healthful, productive, and aesthetically and culturally pleasing surroundings;
3. attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences;
4. preserve important historic, cultural and natural aspects of our national heritage and maintain, wherever possible, an environment that supports diversity and variety of individual choice;
5. achieve a balance between population and resource use that will permit high standards of living and a wide sharing of life's amenities; and
6. enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

Criterion 6 is beyond the scope of this project because: (a) the Wekiva Wild and Scenic River System is not within a national park unit (which would otherwise address criterion 6 via agency policy), and (b) the development of local recycling programs and renewable resource enhancement are not objectives or goals of the river management partnership.

Alternative A represents the current management direction for the Wekiva Wild and Scenic River System. Systemwide planning would occur primarily through existing efforts of the Wekiva Basin Working Group and its member organizations, but would not have the cohesive, results-oriented focus on Wild and Scenic ORVs achieved through implementation of alternative B (with the *Wekiva Wild and Scenic River System Comprehensive Management Plan)*. The protection of cultural and natural resources would be less integrated under alternative A than under alternative B. Alternative A would not fully realize criteria 1, 3, 4, and 5.

Alternative B, the preferred alternative, would lead to increased management attention to and emphasis on preserving all wild and scenic river values. It would aid in protecting and enhancing natural and cultural resources (criteria 1, 4, and 5). It also would enhance opportunities for high-quality, resource-dependent visitor experiences through traditional recreational uses (criteria 2 and 3).

After careful review of the potential resource and visitor impacts, NPS staff and the advisory management committee have concluded that the NPS preferred alternative also is the environmentally preferable alternative. Alternative B would enhance the ability of the NPS, advisory management committee, and partner agencies to protect natural and cultural resources while allowing visitors to enjoy a wide range of traditional river-related recreational activities.

Alternative B would (a) assist in providing a high level of protection for natural and cultural resources while attaining the widest range of neutral and beneficial uses of the environment without degradation; (b) contribute to an environment that supports diversity and variety of individual choice; and (c) integrate resource protection with opportunities for an appropriate range of visitor uses. Thus, this alternative would surpass the other alternative by best realizing the fullest range of national environmental policy goals as stated in Section 101 of the National Environmental Policy Act and consistent with designation of the Wekiva River System as a National Wild and Scenic River.

MITIGATIVE MEASURES

To ensure that implementation of actions protects unimpaired natural and cultural resources and the quality of the visitor experience, a consistent set of mitigative measures is recommended to be applied to actions proposed in the plan.

An implementing state agency should perform appropriate environmental review (i.e., those required by state law and agency requirements) for these future actions. The implementation of an action would also need to comply with U.S. Army Corps of Engineers Section 404 permits and other applicable state and local permits.

The following mitigating measures and best management practices are recommended to avoid or minimize potential impacts from implementation of actions. These measures were considered as part of the alternatives in the analyses of environmental impacts.

CULTURAL RESOURCES

- Agencies should continue to develop inventories for and oversee research about archeological, historical, and ethnographic resources to better understand and manage the resources.

- Conduct archeological site monitoring and routine protection. Conduct data recovery excavations at archeological sites threatened with destruction where protection or site avoidance during design and construction is infeasible.

- Continue consultations with culturally associated American Indian people. Protect sensitive traditional use areas to the extent feasible.

- Wherever possible, locate new projects and facilities in previously disturbed or existing developed areas. Design facilities to avoid known or suspected archeological resources.

- If previously unknown cultural resources are discovered during project work, all work in the area should cease until the site can be evaluated by a qualified person and appropriate treatment can be implemented.

- Design, locate, and construct facilities to avoid or minimize adverse effects on cultural resources and intrusions into the cultural landscape.

NATURAL RESOURCES

- Conduct surveys for rare, threatened, and endangered species as warranted.

- Locate and design facilities and actions to avoid adverse effects on rare, threatened, and endangered species. If avoidance is infeasible, minimize and compensate for adverse effects on rare, threatened, and endangered species in consultation with the appropriate resource agencies. Conduct work outside critical periods for the specific species.

- To prevent water pollution during construction, use best management practices such as erosion control measures, minimized discharge to water bodies, and regular inspection of construction equipment for leaks of petroleum

and other chemicals. Minimize the use of heavy equipment in a waterway.

- Design, locate, and construct facilities to avoid or minimize adverse effects on natural resources and visual intrusion into the natural landscape.

Local wildlife

Chapter 3 - Affected Environment

INTRODUCTION AND GENERAL DESCRIPTION

This chapter describes the existing environment of the Wekiva Wild and Scenic River System and the surrounding region. The chapter is focused on the outstandingly remarkable values of the river system as identified in the study that led to its designation.

The Wekiva Wild and Scenic River System is in Orange, Seminole, and Lake counties in north-central Florida. The surface watershed, or drainage basin, of the river system is approximately 242 square miles in size, with its northernmost extent reaching into Marion County. The aquifer recharge area, or springshed, of the river system extends beyond this surface water drainage basin (primarily to the south and west). The interaction between surface and groundwater is very complex. Within the springshed, rainwater percolates through porous limestone and karst geologic features, and eventually reaches the Floridan aquifer. This groundwater eventually resurfaces via the many springs throughout the basin and flows downstream via surface streams and rivers. Groundwater generally flows in a southwest-to-northeast direction through the springshed. The sizes of the Wekiva surface water basin and groundwater capture area make the Wekiva River System a primary hydrologic feature of Orange, Seminole, and Lake counties.

The Orlando metropolitan area is south-southeast of the Wekiva River System. Although the Wekiva River itself does not run through the developed north suburbs of Orlando, these developed lands cover the southern quarter of the river system's watershed. More than two million people live within 30 miles of the Wekiva River System. Much of the land adjacent to the river system is in public ownership, with the majority being owned by the state of Florida and the St. Johns River Water Management District. Other public lands owned by various local governments (e.g., county parks), the Lake County Water Authority, and the federal government (Ocala National Forest) also exist within the watershed, springshed or Wekiva-Ocala ecological corridor. Almost all of the private lands adjacent to the river system are within Seminole and Lake counties.

THE WEKIVA RIVER SYSTEM

The Wekiva River System includes the Wekiva River, Rock Springs Run, Wekiwa Springs Run and Black Water Creek. The river system is influenced by landscapes within two separate boundaries. The first is the boundary of the Wekiva River surface water drainage basin. A substantial portion of this area is in public ownership. The second boundary is that of the Wekiva springshed, which encompasses a much larger landscape within which water percolates and travels through underground strata to eventually emerge at the springs.

The dynamics of this type of river system are complex, involving continual exchanges of groundwater recharge and discharge as well as surface runoff during rainstorms. The rivers and streams associated with the Wekiva River are fed by both springs and surface runoff.

Although the springs provide a relatively consistent flow of fresh water throughout the year (in water flow volume and temperature), the seasonal variations in surface runoff flows may be substantial. Elevations within the Wekiva basin range from sea level to about 70 feet above sea level. The local climate is considered subtropical, with an average annual

temperature of 72 degrees. Daily maximum Fahrenheit temperatures in the summer are typically in the low to mid-90s. The average annual rainfall in the Wekiva basin is 52 inches, with June through October being the rainiest season.

This dynamic hydrological system and the local climate combine to provide ideal conditions for a diverse variety of natural communities in the river basin, such as pine flatwoods, wet and dry prairie, hydric hardwood hammocks, longleaf pine and wiregrass, xeric scrub oak, sand pine scrub, swamp, and marsh communities. These communities support numerous species of plants and animals, some of which are endangered, threatened, or species of special concern.

This document focuses on the resources and values of the waterways that are designated components of the Wekiva Wild and Scenic River System. When Congress designated the Wekiva River System as a National Wild and Scenic River in October 2000, the following waterways were included given their unique *wild*, *scenic*, and/or *recreational* qualities:

- Wekiva River (*wild* segments and *recreational* segments)
- Rock Springs Run (*wild* segments and *recreational* segments)
- Wekiwa Springs Run (*scenic* segment)
- Black Water Creek (*wild, scenic,* and *recreational* segments)

The Little Wekiva River and Seminole Creek were not designated as components of the wild and scenic river system.

Wekiwa Springs and Wekiwa Springs Run

Wekiwa Springs is an artesian flow in Wekiwa Springs State Park, which is managed by the Florida Park Service, an agency of the Florida Department of Environmental Protection. Wekiwa Springs Run flows about 1 mile before connecting with Rock Springs Run to form the Wekiva River.

Wekiwa Springs is a second magnitude spring with exposed limestone from the Hawthorn Formation just below the water's surface. The spring discharges about 48 million gallons per day of crystal clear water from at least five horizontal caverns 14 feet below the surface in a kidney shaped pool. The spring and its vicinity are extremely popular for swimming and sunning activities. Estimated peak summer use of the main spring area is between 1,200 and 1,500 persons per day. The bank adjacent to part of the pool has been bulk-headed, and ladders provide swimmer access to the water. Facilities near the main spring area include a canoe concession, snack bar, playground, two picnic pavilions, restrooms, a visitor center, and paved parking. A portion of the slope leading down to the spring is maintained as a grassy area for sun bathing, picnicking, viewing nature, and other uses.

Rock Springs and Rock Springs Run

Rock Springs, another second magnitude spring, is in Kelly Park, a 237-acre park owned by Orange County. Rock Springs represents one of the few areas in central Florida where the limestone of the Hawthorn Formation is exposed. The primary discharge, originating at the base of a partially submerged limestone bluff, produces an average discharge of about 41.8 million gallons per day. The spring run begins at the spring point of discharge and continues for several hundred feet until it divides into two flows. One flow forms a large public swimming area with concrete retaining walls on two sides. Both flows rejoin below the swimming area, and the spring run then flows northward for

about 1.5 miles before turning south. Rock Springs Run continues southward for approximately 9 miles before meeting Wekiwa Springs Run to form the Wekiva River. There are no road crossings or bridges over Rock Springs Run. Most of the land along Rock Springs Run is in public ownership, much of which is a floodplain. This floodplain area is about 3 miles wide, east to west.

Wekiva River

The Wekiva River flows approximately 14.2 miles from the confluence of Wekiwa Springs Run and Rock Springs Run to the St. Johns River. The Wekiva River is fed by a combination of natural springs as well as about 130 square miles of watershed in north Orange County and northwest Seminole County, and approximately 112 square miles of watershed in Lake County.

One-quarter mile downstream of its beginning, the Wekiva River receives discharge from Miami Springs (also known as Sweetwater) Run/Canal. The area between the inflow from Miami Springs and about 3.75 miles farther downstream, where the Little Wekiva River enters, is called Wekiva Swamp. Numerous islands characterize this area. The water is often clear, but can remain tannic for some time after a storm. Approximately 6 miles downstream of Wekiwa Springs, the floodplain narrows and sediments change from organic silts to sand. From here the river meanders northeast towards the St. Johns River. Wekiva Falls Run/Canal, a 2,000-foot tributary originating at Wekiva Falls campground, merges with the Wekiva River just south of the SR 46 bridge. This bridge, at river mile 6.1, is the only crossing over the Wekiva River. Black Water Creek joins the Wekiva River about 1 mile upstream of the confluence of the Wekiva River and the St. Johns River.

Black Water Creek and Seminole Creek

Black Water Creek is a major tributary to the Wekiva River. Its headwaters are at Lake Dorr in the Ocala National Forest. Upstream of the confluence with Seminole Creek, Black Water Creek is fed by groundwater seepage and a small spring and outflow from Lake Norris. The creek falls an average of 1.9 feet per mile over 16 miles between Lake Norris and the Wekiva River. It has an expansive floodplain and a sinuous and braided channel with many deadwood snags. Black Water Creek, from Lake Norris to where it joins the Wekiva River, is included as part of the wild and scenic river system. Through this stretch, Black Water Creek has four crossings, including Sand Road at mile 4.72 within Seminole State Forest, State Road 44 (SR 44) at river mile 11.75, County Road 44A (CR 44A)at river mile 11.8, and Lake Norris Road at about river mile 16.8.

Seminole Creek, a tributary of Black Water Creek, originates at Seminole Springs and travels through Seminole Swamp before joining Black Water Creek. Springs contribute a larger portion of the flow downstream of the confluence with Seminole Creek than upstream. Seminole Creek flows across private lands and is in near pristine condition.

For the purpose of this environmental assessment, it should be noted that while Black Water Creek is included as part of the officially designated Wekiva Wild and Scenic River System, Seminole Creek is not.

Little Wekiva River

The Little Wekiva River basin receives drainage from an urbanized 42-square-mile area west and north of downtown Orlando. The river flows northward for 15 miles from Lake Lawne just north of

SR 50 in Orange County through Altamonte Springs in Seminole County. The flow of the Little Wekiva is augmented by five springs. The Little Wekiva River flows into one of the southern arms of the Wekiva Swamp and on into the Wekiva River about half way between Wekiwa Spring and where the Wekiva River joins the St. Johns River. Although the Little Wekiva provides significant source of water into the Wekiva River, it is not included in the Wekiva Wild and Scenic River System.

Springs

There are currently 31 named springs within the basin. Six of these feed directly or indirectly into the Wekiva River, four feed into Rock Springs Run, five feed into the Little Wekiva River, and 16 feed into the Black Water Creek and Seminole Creek drainage basin. Wekiwa Springs and Rock Springs are second magnitude springs, and the remaining 29 springs have a lower flow. Taken together, this complex of springs provides hundreds of millions of gallons of water per day into the various drainages of the Wekiva River basin.

The water that feeds the springs, which in turn feeds the headwaters (or spring runs) of two major tributary streams for the Wekiva River, is groundwater. Florida's spring systems are governed by complex hydrologic forces that cause water recharge of the underlying aquifer through permeable soils or fissures. After traveling through a network of underground karst conduits and porous limestone, the water eventually returns to the surface. The water that appears at springs may have been under the ground for days, weeks, months, years, or decades depending upon its path from the surface and through the aquifer. Much of the water in the Wekiva River System comes from rain that falls outside the boundaries of public lands in an area known as the Wekiva springshed. Although the boundaries of surface watersheds are relatively easy to identify, springshed boundaries are more difficult to define. Furthermore, the quality and quantity of water in the aquifer and springs is affected by land uses just as surface waters are affected by land uses.

DEMOGRAPHICS

All counties in the Wekiva River basin have experienced considerable population growth and urban expansion in recent decades, with the Orlando metropolitan area being a primary growth catalyst. According to U.S. Census Bureau estimates for 2008, the largest percentage increase in population in the study area during the past two decades occurred in Lake County, where population rose from 152,104 in 1990 to 307,243 in 2008. This amounts to a 102% increase in less than 20 years. Rapid growth rates have also been experienced in Seminole and Orange counties. During the same time period, Seminole County has had a population increase of 43% (from 287,529 to 410,854), and Orange County has had a 58% increase (from 677,491 to 1,072,801).

Of the three counties, Lake County remains the most rural county and has the lowest population density. According to the 2000 U.S. census, Lake County had a population density of 221 people per square mile, whereas Orange and Seminole counties had population densities of 988 and 1,186 people per square mile, respectively. However, as the census information suggests, Lake County is becoming more and more developed, with increased population and urbanization. The Interstate 4 corridor in Seminole County to the east of the Wekiva River is also being rapidly developed. These trends will likely continue, resulting in (1) a decrease in the amount of

open space land in the Wekiva basin and springshed, and (2) an increase in recreation pressure on the Wekiva River because of regional population growth and potential development near the river system and surrounding public lands.

CONSERVATION LANDS

More than 77,000 acres of land in the Wekiva basin and its environs have been purchased for conservation and are now managed by public agencies at the local and state levels. Furthermore, much of the Wekiva National Wild and Scenic River System is within or adjacent to public conservation lands (see Conservation Lands map). This public ownership is largely why the Wekiva River System remains relatively undeveloped and holds its wild and scenic river status. See table 3 for a listing of public conservation lands.

A small portion of the northern Wekiva basin is also protected as part of the Ocala National Forest.

State Lands

The state of Florida accounts for the largest acreage of public land in the Wekiva River basin, in the form of state parks, a state reserve, a state forest, and sovereign submerged lands designated as an aquatic preserve. Most of Rock Springs Run, much of the Wekiva River, and a significant portion of Black Water Creek, run through these state-owned lands. Thus, the management of these state lands plays a very important and direct role in protecting and sustaining the Wekiva Wild and Scenic River System.

Conservation Lands

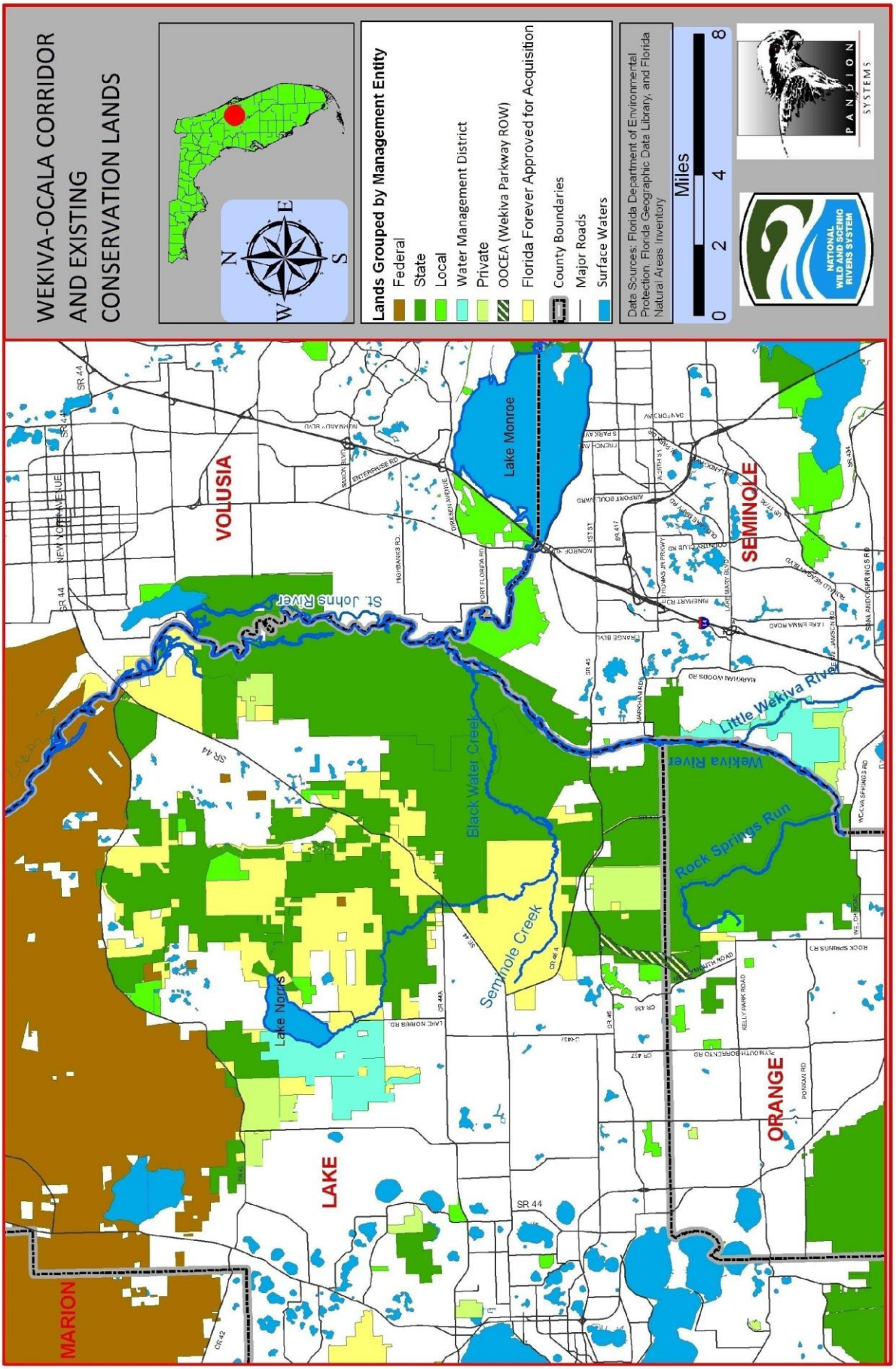


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TABLE 1. PUBLIC CONSERVATION LANDS IN THE WEKIVA RIVER BASIN AREA

Management Agency	Area Managed *
Florida Department of Environmental Protection (FDEP)	**40,980 acres** + Wekiva River Aquatic Preserve
Florida Division of Recreation and Parks	
Wekiwa Springs State Park	9,492 acres **
Rock Springs Run State Reserve	14,083 acres
Lower Wekiva River Preserve State Park	17,405 acres ***
Coastal and Aquatic Managed Areas (CAMA) Wekiva River Aquatic Preserve	Approximately 8,000 acres of sovereign submerged lands located "waterward" of ordinary high water on all of the Wekiva River, 3 miles of the Little Wekiva River, 1 mile of Rock Springs Run, and the lower 3 miles of Black Water Creek (may include portions of other lands listed)
Florida Department of Agriculture and Consumer Services (FDACS) Florida Forest Service (FFS) Seminole State Forest	**27,102 acres** (includes 2,939 acres owned by SJRWMD)
St. Johns River Water Management District (SJRWMD)	**6,734 acres**
Lake Norris Conservation Area (with Lake County Water Authority)	3,660 acres
Wekiva River Buffer Conservation Area	3,074 acres
Lake County Water Authority (LCWA)	**784 acres**
Lake Tracy	445 acres
Bear Track Preserve	185 acres
Wolfbranch Sink	154 acres
Lake County	**999 acres**
Ellis Acres Reserve/Akron Meadows	417 acres
Northeast Scrub Preserve	60 acres
Mt. Plymouth Lakes	184 acres
South Pine Lakes Reserve	128 acres
Part of Neighborhood Lakes	210 acres **** (ownership shared with SJRWMD)
Orange County	**560 acres**
Kelly Park	237 acres
Lake Lucie Conservation Area (Fazio parcel)	160 acres
Sandhill Preserve (Strite parcel)	83 acres
Part of Pine Plantation	40 acres *****
Apopka Blue Sink (City of Apopka)	40 acres
Seminole County	**19 acres**
Wilson's Landing Park	19 acres
TOTAL	**77,178 acres** + Wekiva River Aquatic Preserve

* Federal public lands and private conservation lands are not listed.

** This also includes portions of parcels acquired pursuant to the Wekiva Parkway and Protection Act (Neighborhood Lakes and Pine Plantation) managed by FDEP as part of Wekiwa Springs State Park. Portions of Neighborhood Lakes managed by FDEP include 538 acres in state ownership, 316 acres owned jointly by SJRWMD and Orange County, and 521 acres owned by the Orlando-Orange County Expressway Authority (OOCEA). OOCEA lands not required for the Wekiva Parkway will be transferred to the state for conservation. Portions of Pine Plantation managed by FDEP include 345 acres in state ownership. Additionally, FDEP manages 36 acres as part of Wekiwa Springs State Park that was acquired by the state with Pine Plantation.

*** This also includes Katie's Landing, 6 acres managed for river access in cooperation with Seminole County.

****Lake County manages 210 acre of Neighborhood Lakes that it owns jointly with SJRWMD.

*****Orange County manages 40 acres of Pine Plantation that was acquired by OOCEA and transferred to the county.

The Florida Department of Environmental Protection – Division of Recreation and Parks (also known as the Florida Park Service or FPS) manages approximately 41,000 acres of state conservation land in three parks: Wekiwa Springs State Park, Rock Springs Run State Reserve, and Lower Wekiva River Preserve State Park. These three parks include stretches of the Wekiva River, Rock Springs Run, and Black Water Creek. Approximately 8000 acres of sovereign submerged lands along the Wekiva River System, as well as a 20-mile segment of the St Johns River are managed by the Florida Department of Environmental Protection - Office of Coastal and Aquatic Managed Area as part of the Wekiva River Aquatic Preserve.

The Florida Department of Agriculture and Consumer Services–Florida Forest Service (FFS) manages more than 27,000 acres which comprise Seminole State Forest. The state forest contributes to connectivity between state public lands and the Ocala National Forest, and includes segments of Black Water Creek

The St. Johns River Water Management District (SJRWMD or the district) holds title to approximately 10,000 acres in the basin. 2939 acres owned by the district adjacent to Black Water Creek is managed by the Florida Forest Service as part of Seminole State Forest. The district's 3660 acre Lake Norris Conservation Area is managed cooperatively by the district and Lake County Water Authority. The district also owns and manages 3074 acres of wetlands and floodplain known as the Wekiva River Buffer Conservation Area, located along the Wekiva River and between the Wekiva and Little Wekiva rivers. Finally, the district shares title with Orange County and Lake County to parcels acquired for conservation near the future Wekiva Parkway.

The Lake County Water Authority (a special district created by the Florida legislature) owns and manages land in the Wekiva River basin including Lake Tracy, Wolfbranch Sink, and Bear Track Preserve. The authority also helps manage the Lake Norris Conservation Area.

Local Government Lands

The only significant county-owned lands that contain portions of the designated wild and scenic river system are Orange County's Kelly Park at Rock Springs and Seminole County's Wilson's Landing Park. The 237-acre Kelly Park is managed by the Orange County Parks and Recreation Division of the Community and Environmental Services Department. Kelly Park contains Rock Springs and a short segment of Rock Springs Run. The 19-acre Wilson's Landing Park is managed by the Seminole County Parks and Recreation Division of the Leisure Services Department. Katie's Landing, consisting of 6 acres on the Wekiva River, is part of Lower Wekiva River Preserve State Park and managed cooperatively by FDEP and Seminole County Parks and Recreation Division. Both of these parks in Seminole County serve as boat landing sites for the Wekiva River.

Other county and municipal parks also exist in the Wekiva River basin, but these do not contain a designated part of the Wekiva River System.

Private Conservation Lands

Audubon of Florida owns a 649 acre tract of land adjacent to the Wekiva River between river mile 9 and river mile 10 in Seminole County that is encumbered by a conservation easement, and thus is held for conservation purposes. The land is managed in

conjunction with adjacent SJRWMD lands.

In 2011, The Nature Conservancy acquired Hollywood Pines, 631 acres of mostly forested wetlands abutting the Wekiva River Aquatic Preserve on the St Johns River in Lake County. The parcel supports habitat connectivity within the Wekiva-Ocala Greenway.

In addition to parcels owned by private conservation organizations, a 1,600 acre private mitigation bank known as "Wekiva Mitigation Bank" operates within the basin. This bank, permitted by the Florida Department of Environmental Protection, is in east Lake County just south of the proposed Wekiva Parkway and is surrounded by Rock Springs Run State Reserve. Wetland and upland restoration occurs on the site in exchange for development impacts elsewhere in the basin.

Several conservation easements are held by the state of Florida or St Johns River Water on private land, which are committed to conservation but owned and managed privately. In addition to a conservation easement obtained through the permitting of Wekiva Mitigation Bank, FDEP holds easements to approximately 1600 acres of private land within the Wekiva-Ocala Greenway project of Lake County (Maxwell and Holman parcels). The St. Johns River Water Management District in total has acquired conservation easements to over 2300 acres of private land in the Wekiva basin.

MANAGEMENT OF PUBLIC LANDS

Most publicly owned land in the Wekiva basin is generally managed and used in a way that balances resource conservation with public recreation. Each government agency may have its own individual management priorities, but they work together to accomplish shared resource management goals.

Some differences in land and water management are made more apparent by comparing the recreational uses that are allowed on each tract of public land. The allowed recreational uses will be discussed in more detail in the "Recreation Values" section later in this chapter.

The various public land agencies generally have missions that provide outdoor recreation and nature experiences for the public while protecting natural resources. In general, most of the county parks in Lake, Orange, and Seminole counties are managed with a high priority placed on active and passive recreation in a natural setting. Although the three state parks in the basin (Wekiwa Springs State Park, Rock Springs Run State Reserve, and Lower Wekiva River Preserve State Park) are all managed by the Florida Division of Recreation and Parks, they each have slightly different land management priorities. For example, Wekiwa Springs State Park has a relatively strong emphasis on diverse recreation opportunities and public access, and Rock Springs Run State Reserve and Lower Wekiva River Preserve State Park place a higher priority on resource protection. Although the latter two parks provide ample recreational opportunities and public access, the allowable recreational uses and access tend to be more passive and/or selective.

Other public lands in the basin are managed by agencies that hold management priorities in conserving a particular resource, such as a forest or water. Thus, although the Florida Forest Service, the St. Johns River Water Management District, and the Lake County Water Authority all allow public access and recreation, their respective lands are managed in a way that places a high priority on protecting the resource so that the resource may be available for future use.

The Florida Department of Environmental Protection, Office of Coastal and Aquatic Managed Areas, manages more than 8,000 acres of sovereign submerged lands, designated as part of the Wekiva River Aquatic Preserve. The aquatic preserve includes the Wekiva River and the lower reaches of Rock Springs Run, Black Water Creek, and the Little Wekiva River. The Wekiva River Aquatic Preserve also includes a portion of the St. Johns River, from Interstate 4 just west of Sanford, to SR 44, just west of Deland.

All of the wild and scenic river segments covered in this plan have been designated as "Outstanding Florida Waters" (OFWs) under Chapter 62-4 of the *Florida Administrative Code*. Although this status gives these river segments the highest protection from water quality degradation that is possible under state regulatory programs, it does not completely prevent surface water discharges or eliminate all sources of pollution.

Public lands are shown on the previous Conservation Lands map.

EXISTING LAND USES AND DEVELOPMENT ON PRIVATE LAND

As noted in the previous section, much of the land adjacent to the Wekiva River System is in public ownership and is managed according to the conservation and recreation policies of the various management entities. Exceptions to public ownership include private agricultural lands and private lands that are developed with residential and commercial land uses. More specifically, some existing single-family residential development and a commercial outfitter are located just downstream of Kelly Park on Rock Springs Run and downstream of Wekiwa Springs on the Wekiva River. Residential development and commercial outfitters also exist along the middle section of the Wekiva River in Lake and Seminole counties (both upstream and downstream of the SR 46 bridge). Private agricultural lands are primarily along the Black Water Creek drainage basin, downstream of Lake Norris. A large tract of private agricultural and undeveloped land referred to as "Seminole Woods" is surrounded by Seminole State Forest. With the exception of grazing that occurs on some of the upland fringes of Seminole Woods and silviculture, most of this private tract is currently in an undeveloped condition.

Larger areas of private lands exist beyond the designated waterways but within the Wekiva drainage basin and springshed. These areas include a mix of residential, commercial, and agricultural properties. Development ranges from agricultural uses and very low-density rural-residential land uses (predominantly in east Lake County and northwest Orange County) to high-density residential, commercial, and industrial urban land uses in the greater Orlando metropolitan area of Orange and Seminole counties.

OUTSTANDINGLY REMARKABLE VALUES (RESOURCES THAT COULD BE AFFECTED)

Chapter 1 of this environmental assessment includes a brief description of each outstandingly remarkable value identified in the Wekiva Wild and Scenic River System Comprehensive River Management Plan (scenic, recreation, wildlife and habitat, historic and cultural, and water quality and quantity) and why it is outstandingly remarkable. This chapter provides more detailed descriptions and current condition of these values.

SCENIC VALUES

The Wekiva River System is an exceptional visual resource on local, state, and national levels. Scenic values include the landscape within direct view of the river and existing recreation sites and facilities that are directly related to the river. This river system provides ample opportunities for nature observation and education, nature photography, and scenery appreciation. Many of the river segments are in a near-pristine state. As a result, they present the opportunity to see an unspoiled part of natural Florida. In addition to being of high quality, the scenic resources of the Wekiva River System are abundant, because the Wekiva River and its tributaries combine to provide many miles for natural exploration. The crystal clear waters of the springs and river system; the unspoiled blackwaters of Black Water Creek; and the mosaic of sandhills, flatwoods, hammock, scrub, and wetland communities surrounding the river system all contribute to make the area a unique scenic resource of national value.

Given the expanding urbanization of central Florida, the amount and quality of open lands and natural scenery in Lake, Seminole, and Orange counties is decreasing. Thus, as population and urban growth continue, the scenic value of the Wekiva River System will be more and more important to the community and its residents.

The scenery as one journeys down the various reaches of the Wekiva River System matches the scenery that would be expected in each segment's classification. The *wild* segments are in their natural state with mostly native vegetation along the banks. The landscapes are primarily floodplain swamp and hydric hammock on Rock Springs Run and the upper Wekiva River. On Wekiwa Springs Run and the lower Wekiva River, a mix of upland and wetland vegetation types predominate close to the river until the river enters the floodplain of the St. Johns River about 1 mile from the confluence. Occasionally, parts of Rock Springs Run are blocked by downed trees from storms. Although inconvenient for boating, the downed trees can lend a sense of wilderness to the river reach and improve aquatic habitat. It should be noted, however, that downed trees can be a significant hazard to beginning paddlers. The Aquatic Preserve and Invasive Plant Management Section of FWC spend considerable time removing navigational hazards throughout the Wekiva River System.

Motorized boats, particularly on the Wekiva River, can create visual, auditory, and even olfactory disturbance for paddlers. Personal watercraft (e.g., jet skis) use may be increasing, and if so could create more impacts. Low-flying airplanes, primarily commercial passenger jets banking overhead on approach to the Sanford Airport, are a relatively recent phenomenon. Noise and visual disturbance associated with low-flying

aircraft can diminish the values of *scenic* and *wild* segments of the river system.

Private shoreline development in the form of residences, boat launch facilities, docks, and decks have negatively affected scenic values of the river, particularly within the recreational segments.

The visual impact of the SR 46 bridge, in the center of a *recreational* segment of the Wekiva River, is also a disturbance to scenic values. Plans are in place for a new bridge over the Wekiva River as part of the integrated Wekiva Parkway/SR46 design. The new bridge will have a higher structure spanning more of the riparian corridor.

Vandalism, soil compaction, and bank erosion occurring on Shell Island and other shell middens along the Wekiva River are intrusive and can damage significant cultural resources; these activities can also remind visitors of the outside world, potentially detracting from a wilderness experience. Similarly, litter along the river system, along the shoreline, and at the bottom of the river channel detracts from the scenic value of the river system. The most common litter items are beer and soda cans, typically found during high use seasons. Other items frequently encountered include plastic bags and cups and Styrofoam (cups, bait cups, coolers). Fishing line and tackle is occasionally found in the river or entangled in vegetation along the shore, or overhanging the water.

Given the number of canoeists and boaters on the Wekiva River System, litter clean-up presents a constant challenge for resource managers. Aquatic preserve staff conducts at least 12 cleanups per year with volunteers and often pick up debris during regular work activities. Kings Landing canoe rental, at the top of Rock Springs Run, requests that its patrons do not take beverage containers on the water.

Signs on the river can detract from the experience if they are adrift or in disrepair. The Florida Division of Recreation and Parks plan to clean up old signs and is in the process of installing new ones.

Invasive and exotic plant species also affect the scenic value of the Wekiva River System. When certain reaches become infested with exotic plants or algae blooms, scenic values can be considered impaired. This adverse impact is particularly noticeable when invasive aquatic plants take over a reach of river to a point where the surface water is no longer visible. FWC, FPS, and Aquatic Preserve staff has worked for many years to control exotic species in the Wekiva River System.

Black Water Creek provides the potential for a peaceful, scenic experience with predominantly native riparian and floodplain vegetation. Its narrow and sinuous route through the Seminole State Forest, Lower Wekiva River Preserve State Park, and St. Johns River Water Management District lands provides for a challenging and excellent backcountry paddle. Not all of Black Water Creek is navigable, depending on water level and downed trees or other vegetation that may inhibit passage. Roadway bridges traverse Black Water Creek at Sand Road, SR 44, CR 44A, and Lake Norris Road. The bridges over SR 44 and CR 44A are very close together, thus magnifying the adverse impact upon scenic qualities where these two roads cross the creek.

RECREATION VALUES

The Wekiva River, Wekiwa Springs Run, Rock Springs Run, and Black Water Creek serve as a major recreational

resource for central Florida, particularly the large Orlando metropolitan area. Recreational activities in the Wekiva basin include canoeing/kayaking, bank fishing, boat fishing from motor and nonmotorized boats, personal watercraft use, picnicking, camping (primitive, developed, and horse), tubing, swimming, snorkeling, wildlife watching, hiking, horseback riding, and hunting. The Wekiva River/Rock Springs Run Canoe Trail is officially designated as part of Florida's statewide system of greenways and trails.

For the purposes of this assessment, access points for recreation are defined as areas where people can access the river system from public or private lands. Rest stops are places where people recreating stop their boats and temporarily get out. Takeouts are places where people remove their boats from the water or complete their trip and exit the river. Access points, rest stops, and takeouts are either designated or nondesignated, and can be on public or private land.

The recreational opportunities on the various waterways of the Wekiva Wild and Scenic River System are described below. See the previous Conservation Lands map for the locations of public lands associated with river-based recreation in the Wekiva River System.

Wekiva River and Wekiwa Springs Run

The Wekiva River and Wekiwa Springs Run comprise one of the few remaining near-pristine riverine systems in central Florida, and their natural springs have been enjoyed by people since Native Americans first occupied this area. Today, people come to the river and run to enjoy the opportunities provided by their cool, clear waters and diverse ecosystems. Access is from public lands (state and county), private businesses/boating operations, private residential properties, and the St. Johns River. Designated public access along the Wekiva River includes Wilson's Landing County Park and Katie's Landing, with Wekiwa Springs State Park providing public access on Wekiwa Springs Run. Private canoe/kayak facilities that offer access along the Wekiva River are currently Wekiva Island and Wekiva Falls Resort. A private canoe/kayak concessionaire also operates within Wekiwa Springs State Park.

Wekiwa Springs State Park. This state park is at the headwaters of the Wekiva River and offers a glimpse of what central Florida looked like when the Timucuan Indians fished and hunted along the river banks long ago. The nearly 9500-acre park has more than 215,000 visitors and more than 55,000 campers a year. The main spring area is the most used area in the park, particularly during the peak season. Recreational opportunities at Wekiwa Springs State Park include swimming, hiking, biking, horseback riding, snorkeling, wildlife watching, tubing, picnicking, camping, and canoeing/ kayaking. Wekiwa Springs State Park Nature Adventures is the park's canoe/ kayak concessionaire that rents approximately 200 boats per day on weekends and 60 boats per day on week-days during the busiest season (March to November). A concession stand provides refreshments. Picnic areas and shelters are provided in the areas around Wekiwa Springs and Sand Lake. A playground is located in the spring picnic area, along with a volleyball area and horseshoe pit. A museum and visitor center houses exhibits on natural and cultural history. The park has 9 miles of equestrian trails, 8 miles of biking trails (plus use of equestrian trails for biking), and 13.5 miles of trails for hiking. Wekiwa Springs State Park also provides 60 full-facility campsites (water, electricity, fire pit, picnic table, and restroom/ showers), along

with a primitive camping area. Primitive camping opportunities provided along Rock Springs Run within Wekiwa Springs State Park include two canoe camping sites (Otter Camp and Big Buck Camp).

Lower Wekiva River Preserve State Park. This park spans about 6 miles of the St. Johns River, the lower 4 miles of the Wekiva River, as well as the lower reaches of Black Water Creek. This system of blackwater streams and wetlands provides habitat for black bears (*Ursus americanus floridanus*), river otters (*Lutra Canadensis*), American alligators (*Alligator missippiensis*), and wood storks (*Mycteria americana*). Although natural resource protection is a priority in this state park of approximately 17,400 acres, some limited recreational opportunities are available. Recreational activities include canoeing/kayaking, horseback riding, primitive horse camping, hiking, biking, and wildlife watching. Canoeists and kayakers can travel through the park along the St. Johns River, the Wekiva River, and Black Water Creek. However, the park's only designated launch/ takeout access point is at Katie's Landing (described below in more detail). Visitors can use the self-guided 2.5-mile nature trail at the south end of the park to get an overview of the park, or they can travel some of the 18 miles of multiuse trails on foot, horseback, or bike in the northern portion of the park. Horses are not allowed in the southern portion of the park. The Lower Wekiva River Preserve State Park also offers primitive horse camping opportunities in designated areas of the northern portion of the park. Horse stalls and corrals are available. Camping reservations are made via Wekiwa Springs State Park.

Katie's Landing. This landing is a public canoe/kayak launch site just north of SR 46, and is managed as part of Lower Wekiva River Preserve State Park. The site began as a fish camp, canoe operation, and private campground in the late 1940s and was sold to the state in 2001. The Florida Department of Environmental Protection will continue to manage Katie's Landing as a canoe/kayak launch and takeout site and provide parking, restrooms, and a picnic facility. In the future, the boat concessionaire at Wekiwa Springs State Park may offer a shuttle service to pick up boaters who rent canoes and kayaks at the state park upstream. Swimming and motorized boat launching is not permitted due to the surrounding shallow waters and fragile eelgrass beds.

Wilson's Landing. This landing is a 19-acre Seminole County facility developed in 2004 that includes a small pavilion, a pier on the Wekiva River, restrooms, and paved parking area. Wilson's Landing has functioned as an unofficial launch and takeout site for canoes and kayaks.

Rock Spring Run State Reserve. This reserve also includes a large stretch of the Wekiva River, which runs along its eastern boundary. Rock Springs Run State Reserve is described below in the recreation summary for Rock Springs Run.

Wekiwa Springs State Park — Nature Adventures. This private concessionaire operates out of Wekiwa Springs State Park. This concessionaire provides canoe and kayak rentals and guided river tours. Visitors launch from the spring and can paddle down Wekiwa Springs Run about 1 mile to the Wekiva River or farther. In the future paddlers may have the option of continuing on to Katie's Landing and be returned to the park by the concessionaire.

Wekiva Island. This is a privately owned facility that offers an opportunity for motorboat, canoe, and kayak launching in addition to bait,

tackle, food sales. Limited motorboat storage is also available. This private facility also rents canoes and kayaks. Wekiva Island is also used as a takeout point for boats that are rented from Kings Landing along Rock Springs Run.

Wekiva Falls Resort. This resort, along the Wekiva River, offers motorboat tours of the river (seating capacity of more than 20 people per boat), as well as canoe and kayak rentals. Resort guests can also use the marina to launch their boats. Wekiva Falls Resort has more than 800 recreational vehicle (RV) sites, along with laundry, showers, a fishing and camping supply store, picnic sites, and a swimming beach surrounding a large artesian well that flows to the Wekiva River.

Wekiva River Haven. This privately owned facility is downstream of Katie's Landing and has closed in recent years. Before closure, this facility rented small motorboats and catered primarily to anglers by offering bait, food, and other supplies. The future use and management of this property is unknown.

Rock Springs Run

Rock Springs Run's diverse scenery, unique plant communities, and excellent paddling opportunities make it a popular recreation destination. The run twists and turns for 8 miles as it winds its way to the Wekiva River through various habitats including pine flatwoods, marshes, and subtropical and dense hardwood forests. A few private homes and cabins can be seen for the first 0.25 mile of the run, but the remainder of the run is undeveloped and generally pristine as it flows through public land. Rock Springs and the upper parts of Rock Springs Run can be accessed at Kelly Park. Canoeists and kayakers can access Rock Springs Run at Kings Landing, a private outfitter about a 0.5 mile downstream from Kelly Park, or from the Wekiva River farther downstream. Navigating Rock Springs Run can be a challenge for beginning paddlers because of fallen trees and submerged vegetation in the run. Three primitive canoe/kayak campsites along the run can be reserved through Wekiwa Springs State Park.

Kelly Park. This park is Orange County's highest use park and is home to the headwaters of Rock Springs Run. Rock Springs bubbles up from a cleft in a limestone outcropping and feeds the run as it flows to the Wekiva River. The 237-acre park is a popular getaway for local residents and visitors alike, and it is managed by the Orange County Parks and Recreation Division (a branch of the Community and Environmental Services Department). The park has about 300,000 visitors per year. During the summer the park often reaches capacity, causing many potential visitors to be refused entry. Recreational activities in Kelly Park include swimming, snorkeling, tubing, picnicking, hiking, biking, volleyball, wildlife watching, and camping (25 full-facility campsites and a primitive camping area). Many visitors rent or bring inner tubes and put them in at Rock Springs. Visitors then tube down the 1-mile run to the main swimming area. The 20-to 30-minute trip winds through limestone outcroppings and natural pools that attract many swimmers during warm months. An extensive series of boardwalks allows access to different areas of the park while lessening impacts to the shoreline.

Rock Springs Run State Reserve. This reserve spans the shoreline of both Rock Springs Run and the Wekiva River. Sand pine scrub, pine flatwoods, swamps, and miles of pristine shoreline make this reserve encompassing over 14,000 acres a

refuge of natural beauty. Although there are no boat launches on the Wekiva River or Rock Springs Run within the reserve, boaters can travel through the reserve on both waterways after accessing the river system at a designated launch sites upstream or downstream. Reserve visitors can also enjoy bicycling, hiking, horseback riding, canoe camping, horse camping, and wildlife watching, and hunting. The reserve provides more than 15 miles of multiuse trails for hiking, biking, and equestrian use. Primitive camping opportunities include two canoe camping sites (Indian Mound Camp on Rock Springs Run and Buffalo Tram Camp on the Wekiva River). Guided trail rides and horse rentals are available. The Florida Park Service also recently contracted with a concessionaire to operate a Wekiva River launch access in the reserve. As with Seminole State Forest, hunting is allowed in part of Rock Springs Run State Reserve designated as a wildlife management area at selected times during hunting season. No camping or horseback riding is allowed during scheduled hunting days.

Kings Landing. This landing is a private canoe livery on the western end of Rock Springs Run, just downstream from Kelly Park. The business currently rents about 100 canoes per month, with an anticipation of increased use in the future. Kings Landing has been in existence for decades and was shut down for several months after the 2004 and 2005 hurricanes caused widespread damage and blockage of the run. The business was purchased in 2007 by its current owner who has renovated the facility. Canoe renters from Kings Landing have an 8-mile run down Rock Springs Run to Wekiva Island at the upper reach of the Wekiva River. The Wekiva Island operator provides a takeout ramp and space for vehicle parking and canoe storage for Kings Landing customers.

Wekiwa Springs State Park. This park also includes a large stretch of Rock Springs Run, which runs along its northern border. Wekiwa Springs State Park is described in the recreation summary for the Wekiva River and Wekiwa Springs Run.

Black Water Creek

This creek flows out of Lake Norris and runs through St Johns River Water Management District lands, Seminole State Forest, a large forested, private property, and Lower Wekiva River Preserve State Park on its way to the Wekiva River. As its name implies, Black Water Creek is a beautiful, dark stream, the result of tannic conditions in the water. Although several miles long, the creek is much less accessible than other parts of the river system. Black Water Creek only has one public canoe facility at Lake Norris Conservation Area and a few minimally developed launch sites downstream in Seminole State Forest lands. Dense vegetation and downed trees make boating on Black Water Creek challenging, but this limited access and undeveloped surroundings provide solitude and backcountry paddling. The creek is not navigable between Lake Norris Road and the confluence of Seminole Creek. (Signs have been installed along the creek south of Lake Norris Road, north of CR44A and south of SR44 to warn the public of this condition.) The portion of Black Water Creek within Seminole State Forest east of the confluence with Seminole Creek and continuing to the Wekiva River is periodically cleared to allow passage of small watercraft. Access to this section is typically from the Black Water Creek Day Use area in Seminole State Forest. Small nonmotorized boats are also sometimes able to access the lower reach of Black Water Creek from its confluence with the Wekiva River. There are no private concessionaires on Black Water Creek.

Seminole State Forest. This state forest includes more than 27,000 acres and is managed by the Florida Forest Service (a branch of the Florida Department of Agriculture and Consumer Services). This ecologically diverse forest contains 13 different natural communities — almost all of the naturally occurring vegetative communities found in central Florida. Recreation opportunities in the forest include hiking, picnicking, camping, fishing, wildlife watching, biking, and hunting. Forest access is available from SR 44 and SR 46; however, a state forest use permit is required for drive-in access. Day use entrance fees are collected at self-service pay stations near the entrance gates. Seminole State Forest provides three designated river access points suitable for nonmotorized boats along Black Water Creek. Two of the access points are from campsites and one is a day use launch site. There are no boat access points on the Wekiva River. More than 20 miles of multiuse trails are available for hiking, biking, and equestrian use. Seminole State Forest also provides one primitive canoe campsite on Black Water Creek (Moccasin Springs Camp), four primitive campsites along hiking trails, and two large primitive group campsites in open fields. As with Rock Springs Run State Reserve, hunting is allowed in part of Seminole State Forest designated as a wildlife management area at selected times during hunting season.

Lake Norris Conservation Area. This area was purchased by the St. Johns River Water Management District to protect the extensive hardwood swamp on the western shore of the lake and the shoreline of Black Water Creek. Lake Norris is a spectacular blackwater lake that supports a variety of bird life, including abundant osprey. The upland portion of the conservation area consists of improved pasture, scrub, and a small amount of planted pine. Available recreation activities include hiking, wildlife viewing, primitive camping, fishing, horseback riding, bicycling, and canoeing. Canoes are available for public use through the Lake County Water Authority, which helps manage the conservation area. Motorized vehicles are prohibited.

Lower Wekiva River Preserve State Park. This park also lies along a significant stretch of Black Water Creek. Lower Wekiva River Preserve State Park is described in the recreational summary for the Wekiva River and Wekiwa Springs Run.

WILDLIFE AND HABITAT VALUES

The complex hydrology of the Wekiva River basin and area's climate combine to create favorable conditions for a variety of natural communities. Some of these natural communities include pine flatwoods, wet and dry prairie, hydric hardwood hammocks, longleaf pine and wiregrass, xeric scrub oak, sand pine scrub, swamp, and marsh communities. These support a biologically diverse collection of upland, wetland, and aquatic species, including several that are listed at the state or federal level as endangered, threatened, or species of special concern.

Consistent with the National Wild and Scenic River designation, wildlife considered in this environmental assessment will be limited to those species whose lives are directly linked to the river system. The Florida black bear is included for its regional importance as an umbrella species and its regular use of floodplain swamps along the Wekiva River system. The most relevant area of the basin to be considered in this environmental assessment, relative to wildlife and habitat, is the 100-year floodplain and the Wekiva River Riparian Habitat Protection Zone.

Invasive exotic species, where they represent a threat to the continued existence of native species, will be considered within this value.

For the purposes of fulfilling requirements of NEPA, the wildlife species and habitat included in this analysis will be limited to the species that are: (a) listed as threatened or endangered at a state or federal level; and (b) could be affected by the proposed action. Species listed as species of special concern in the state do not necessitate NEPA analysis. However, this analysis includes some additional information on certain species of special concern to help tell the story of the overall ecological system in the Wekiva basin.

It should be noted that during the completion of this environmental assessment, the Florida Fish and Wildlife Conservation Commission (FWC) decided to revise its state methodology for designating species as endangered, threatened, or species of special concern. As a result, the status of several species identified in this environmental assessment will change.

In the future, FWC will recognize federally listed species as "federally-designated endangered" and "federally-designated threatened". Species uniquely identified by FWC as being at risk of extinction will be identified as "state-designated threatened". The state species of special concern category will be maintained until all species in it are reviewed and either identified as state-designated threatened or removed from the list. Species removed from the state list will continue to be managed by FWC according to management plan that have or will be developed.

The management plan for the Wekiva Wild and Scenic River System provides additional information on wildlife and habitat not included in this environmental assessment. Please refer to the committee's management plan for additional information (contact the Wekiva Wild and Scenic River System Advisory Management Committee).

Background

The Wekiva River System watershed is a mosaic of upland, wetland, and aquatic habitats at the southern end of an important wildlife corridor that connects the Wekiva basin to the Ocala National Forest. An extensive floodplain of hardwood forest, as much as three miles wide, provides habitat for several species designated as endangered, threatened, or species of special concern. The Wekiva basin is at a transitional area between temperate and subtropical climatic zones. The species overlaps result in one of the richest floral compositions in Florida (NPS 1999). Unusual plant species found in the Wekiva basin include red buckeye, chinquapin, and Carolina basswood, species more commonly associated with Appalachia. This richness extends also to plant communities, with fourteen different native plant communities identified in the Wekiva basin:

- wet flatwoods
- baygall
- mesic flatwoods
- floodplain swamp
- scrubby flatwoods
- hydric hammock
- sandhills
- flatwoods/prairie/marsh lake
- scrub
- spring-run stream
- upland hardwood forest and blackwater stream
- upland mixed forest
- aquatic and terrestrial cave
- xeric hammock

This diverse array of natural communities is home to a wide variety of wildlife species. For example, one

of the state's largest populations of Florida black bear, currently listed by the state of Florida as a threatened species, uses the protected riparian corridor and surrounding habitat to move between the Ocala National Forest and large patches of conservation lands that comprise the Wekiva-Ocala Greenway in Orange, Seminole, and Lake counties. The wood stork (*Mycteria americana*), a federal endangered species, nests in cypress trees in the Wekiva River Aquatic Preserve and is often observed foraging in the river shallows. The bald eagle (*Haliaeetus leucocephalus*), protected under the federal Bald and Golden Eagle Protection Act, can also be seen along the river system. The little blue heron (*Egretta caerulea*), tri-colored heron *(Egretta tricolor*), and limpkin (*Aramus guarauna*) are state species of special concern.

The river system also provides food and habitat for the river otter (*Lutra canadensis*) and American alligator (*Alligator mississippiensis*). West Indian manatees (*Trichechus manatus*), state and federally listed as endangered, have been observed in the lower reaches of the Wekiva River and more recently in upstream locations.

Two aquatic invertebrates unique to the Wekiva River are the Wekiwa Springs hydrobe (*Aphaostracon monas*) and the Wekiwa siltsnail (*Cincinnatia wekiwae*) (NPS 1999), found in and around the spring area of Wekiwa Springs State Park. In addition, the Orlando cave crayfish (*Procabarus acherontis*) groundwater sites associated with six or seven spring cave systems of the lower Wekiva River basin (FDEP 2005).

Special Status Species

Special status species in the Wekiva River basin are those listed as *endangered*, *threatened*, or *species of special concern* by the U.S. Fish and Wildlife Service (USFWS) or the Florida Fish and Wildlife Conservation Commission (FWC). Federally listed species are protected under the terms and provisions of the Endangered Species Act, and state-listed species are protected under Rules 68A-27.003, 68A-27.004, and 68A-27.005 of the *Florida Administrative Code*. All of these species are also monitored and tracked by the Florida Natural Areas Inventory (FNAI).

As noted above, although state designated species of special concern live in the Wekiva basin area, this NEPA analysis focuses only on state and federally designated threatened and endangered species. A list of threatened, endangered, and species of special concern that may exist in the Wekiva basin area, in addition to the state and federal status of each, are identified in appendix C.

Four federally-listed special status species were originally identified for compliance review pursuant to Section 7 of the Endangered Species Act by this environmental assessment — the Florida scrub jay, eastern indigo snake, East Indian manatee, and wood stork. The Florida scrub jay is present in scrub and scrubby flatwood habitats of the Wekiva basin, including some areas in proximity to the river system; however the species is not typically associated with the water-course of the Wekiva River System or wetlands and floodplain areas adjoining the river system that fall within the scope of wildlife and habitat values addressed by this environmental assessment.

Alternative A corresponds to the continuation of current management activities, and therefore is *not likely to adversely affect* special status species. Alternative B corresponds to the continuation of current management activities, in addition to several new or enhanced initiatives intended to further

protect wildlife and habitat associated with the Wekiva River System, and therefore is also *not likely to adversely affect* special status species.

The following is additional information on some special status species. Once again, although The National Environmental Policy Act does not require the analysis of state species of special concern, some of the following species narratives are provided as background information about the Wekiva River System.

Florida black bear (*Ursus americanus floridanus*) — The Florida black bear is a species of regional importance that uses the Wekiva basin, and is currently listed as threatened by the state. Florida black bears occupy a diversity of habitats including upland forests, wetlands, and floodplains. They also frequent the riparian corridor. The Florida black bear is considered an umbrella species because successful protection of its habitat will benefit not only the bear, but many other species within the basin that collectively constitute a healthy ecosystem. The bears in the Wekiva River basin are considered part of the larger Ocala bear population, one of eight recognized bear populations in Florida. The Ocala population is medium in size relative to the state's other populations, yet it has the highest roadkill mortality rate. Between 1976 and 2002, 503 of the 1,340 bears killed on Florida roads were from the Ocala population. Bear-human conflicts are on the rise statewide, primarily on private properties adjacent to or near conservation lands. There has not been a documented incident of a black bear harming a person in Florida; however, humans have substantial impacts on bears. The Ocala bear population led in the number of human-bear conflict reports from 1978 to 2002 (3,027). These conflicts include bears breaking into food storage areas, ransacking garbage, and occasionally attacking livestock. A chronic problem within neighborhoods near bear habitat is that individual bears routinely seek out garbage from dumpsters or garbage that is left in unsecured containers outside of residences. The act of intentionally feeding a bear is prohibited in Florida, yet enforcement is nearly impossible.

If a bear has been fed or learns to consider developed areas as reliable food sources, consequences to the bear can be tragic. When a human/bear conflict becomes significant, the Florida Fish and Wildlife Conservation Commission may be contacted by a resident who expects that the particular bear will be trapped and relocated. . Trapping and relocating bears (usually to the Ocala National Forest) was attempted in the past; however those efforts were time-consuming and often unsuccessful. Therefore today FWC staff frequently resorts to euthanasia.

A multifaceted approach is currently used to address bear conflicts within and around the Wekiva basin park system. Bear-proof dumpsters and trash receptacles for the parks have been purchased with funds contributed by Defenders of Wildlife or through regular state agency budgets. Additional bear-proof receptacles have been donated by the U.S. Forest Service. Educational materials regarding bear-human conflicts include materials designed by the Florida Fish and Wildlife Conservation Commission, a presentation on bears developed by state staff, and printed materials provided to residents of nearby subdivisions.

West Indian manatee (*Trichechus manatus*) — Manatees are occasional visitors to the lower Wekiva River but typically do not venture far upriver. For the past several years, however, manatees have been observed at Wekiwa Springs, Wekiva Island, and other upstream locations. Although the St. Johns River has been designated as critical habitat for this federally endangered species, no waters of the Wekiva River System, addressed by this Environmental Assessment, are so designated. More boat traffic entering the Wekiva River from the St. Johns River could expose manatees to increased propeller-caused injuries and disturbance, especially given the narrow and shallow dimensions of the Wekiva River.

Bald eagle (*Haliaeetus leucocephalus*) — Formerly listed as threatened under the federal Endangered Species Act, the bald eagle was removed in June 2007 because of significant gains in its population. The bald eagle, however, remains protected under the federal Bald and Golden Eagle Protection Act. Bald eagles are frequently seen along the Wekiva River System preying on fish. There are eight known bald eagle nest sites within the Wekiva River Protection Area. Annual nest survey flights are conducted by the Florida Fish and Wildlife Conservation Commission.

Wood stork (*Mycteria americana*) — The wood stork rookery in the northeastern area of the basin has been unoccupied since at least 1999, probably because of unsuitable water levels in the basin that adversely impact nesting success. Wood stork nesting success depends on two primary factors — the availability of adequate food sources at the onset of the nesting season and the presence of sufficient water to support alligators that patrol the waters and consume raccoons, the primary nest predator of wood storks. Wood storks forage in shallow (6”–10”) waters of marshes, swamps, ditches, canals, and lakes where fish are concentrated. Below-normal rainfall and the resulting lack of adequate local food resources may have prevented nesting in recent years.

Limpkin (*Aramus guarauna*) — The limpkin is currently listed as a state species of special concern. Monthly surveys of limpkins and other bird species have been conducted by volunteers and Wekiva River Aquatic Preserve staff in recent years. When compared to surveys conducted in 1992 and 2002, the recent surveys indicate a stable population of limpkins in the Wekiva basin. The channeled apple snail, or golden snail (*Pomacea canaliculata*), a large invasive exotic, has been found in nearby Lake Brantley and may soon infest the Wekiva River. It is unknown what effects these exotic snails may have on the limpkin’s main food source, native apple snails (*Pomacea paludosa*) or their habitat, and ultimately on limpkins themselves. Channeled apple snails feed on eelgrass and are serious pests in a number of other countries.

Bluenose shiner (*Pteronotropis welaka*) — The bluenose shiner has been reported to occur within the Wekiva River System and a limited number of sites in the panhandle of Florida. However, its population numbers are not well known in either region. It is currently listed as a species of greatest conservation need by the Florida Fish and Wildlife Conservation Commission. One specimen of this rare minnow species was collected during a fish and macroinvertebrate

study of the Wekiva River in 1999. The authors of the report noted that it was found in eelgrass habitat, an important habitat for a number of aquatic species.

Orlando cave crayfish (*Procambarus acherontis*), Wekiwa Springs hydrobe (*Aphaostracon monas*), and Wekiwa siltsnail (*Cincinnatia wekiwae*) — These species are endemic to the Wekiva River basin and are designated as species of Greatest Conservation Need by the Florida Fish and Wildlife Conservation Commission because of their geographically narrow distribution and because the status and trend of their populations are unknown (FWC 2007). They are candidates for state listing as species of special concern, awaiting further information on their current status.

The Wekiwa Springs hydrobe and Wekiwa siltsnail were discovered in the 1970s in and near the main spring area of Wekiwa Springs State Park, on vegetation and in sand within the spring boil and in the very upper reaches of the spring run. The Orlando cave crayfish is restricted to groundwater sites associated with six or seven spring cave systems of the lower Wekiva River basin (FDEP 2005). This species has been recorded inside Wekiwa Springs State Park and is seen periodically in the spring at the mouth of the underwater cavern.

A survey of the Wekiwa Springs State Park during May 2002 did not find the Orlando cave crayfish. A survey in 1997 also failed to detect any of the three species, and the report cited the need to sample specifically for these species within the caves and springheads. Water quality and quantity and overall condition of the springs are probably the most important issues regarding the conservation of these invertebrates.

Habitat Connectivity

The Wekiva basin is recognized as the southern part of a contiguous landscape of ecologically connected habitat extending from Wekiwa Springs State Park northward through the waterways, wetlands, and uplands of the Wekiva and St Johns river basins and into the Ocala National Forest. The overall health the Wekiva basin ecosystem and the biodiversity of natural communities in it are inextricably linked to this larger conservation landscape. Establishing a secure and contiguous corridor of public conservation lands in this area has been a focus of attention of the Florida Forever Wekiva-Ocala Greenway Project and past land acquisition programs. Protecting wildlife and habitat values of the federal Wekiva Wild and Scenic River System over the long term will depend largely on successful completion of this state land acquisition effort.

Management Issues

Invasive and Exotic Species. The aquatic, wetland, and terrestrial habitats in the Wekiva River basin are all directly affected by the introduction and spread of invasive, exotic plant and animal species. Because these opportunistic species often outcompete native species and degrade or displace native habitat, the overall biodiversity of the Wekiva basin and its natural ecosystems are threatened by such species. The presence and abundance of invasive and exotic species can be used as an indicator of ecosystem health.

Invasive aquatic plants, listed by the Florida Exotic Pest Plant Council, such as wild taro (*Colocasia esculenta*), hydrilla (*Hydrilla*

verticillata), water lettuce (*Pistia stratiotes)*, and water hyacinth (*Eichhornia crassipes*), may adversely affect aquatic habitats. These invasive aquatic plants are considered one of the biggest challenges for public land managers in the Wekiva basin. East Indian hygrophila (*Hygrophila hydrosperma*), an exotic invasive aquatic plant, is established in the Little Wekiva River, but is not yet widespread in the basin.

The Wekiva River Aquatic Preserve and the Florida Fish and Wildlife Conservation Commission Invasive Plant Management Section (IPMS) manage these exotic aquatic plants with periodic herbicide treatments. Wild taro is especially difficult to control, requiring multiple treatments each season. Wild taro grows along stream banks and forms large floating mats that can impede navigation. Floating mats are generally not treated with herbicides because of their potential to break up into smaller pieces and spread to new sites downstream.

IPMS coordinates and contracts with private companies to manage exotic aquatic plants in the Wekiva River System and maintain navigability. The aquatic preserve staff focus primarily on various exotic species that the contractor does not treat such as Chinese tallow, para grass, wild taro, and torpedo grass. Aquatic preserve records indicate about 40 acres of exotics are treated each year. One staff member works almost full time on exotics control and also conducts special herbicide treatments for hydrilla in Wekiwa Lagoon. Although this work keeps exotics in check, all of these exotics are prolific, and it is extremely difficult to eliminate them. Aquatic preserve staff also control the proliferation of nuisance cattail (*Typha* sp.), a native plant that may impede navigation in some areas of the river system if not managed. Nuisance cattails formerly present along one section of Rock Springs Run and along one section of the Wekiva River near Katie's Landing have been reduced significantly and are currently under maintenance control.

Some notable invasive and exotic faunal species in the Wekiva River basin are described below.

Armored catfish (*Pterygoplichthys disjunctivus*) — Armored catfish have been seen in large numbers in Wekiwa Springs. These fish feed on algae attached to rocks, logs, vegetation, and even manatees which are clearly agitated by them. Armored catfish excreta is likely contributing to increased nutrient levels that may further exacerbate algal blooms and weed infestations. State park staff observations indicate that these fish are increasing erosion of shorelines by burrowing to create spawning cavities. Since 2003, state biologists and volunteers have removed many armored catfish from the Wekiwa Springs area. This removal is conducted during most of the year and as often as weekly during winter cold spells when the fish tend to concentrate near the spring.

Brown hopolo (*Hoplosternum littorale*) - Brown hopolo were confirmed in Rock Springs Run in 2005. These exotic fish typically thrive in weedy areas with low oxygen levels. Currently, the brown hopolo is not being targeted for control because further research is needed to assess the impact of this fish on the Wekiva River System.

Channeled apple snail (*Pomacea canaliculata*) — The channeled apple snail is an invasive exotic snail from South America that is found in Lake Brantley, near the Wekiva River. Although a great potential exists for invasion, this species has not yet been observed in the

Wekiva River System. The channeled apple snail is much larger than the native apple snail that limpkins depend upon for food. This species has been known to feed on eelgrass and other native aquatic vegetation. The impacts from these snails on native apple snails and native plants, invertebrates, and fishes are unknown and difficult to predict. It is known that channeled apple snails feed on eelgrass and are serious pests in a number of countries. Limpkins are known to feed on channeled apple snails in other aquatic systems.

Habitat Fragmentation. Habitat fragmentation is the result of large blocks of contiguous landscape being broken into smaller patches, often separated by roads and subdivisions. Although much of the Wekiva basin is in public conservation, it is not all contiguous. Critical corridors for wildlife movement contain unprotected parcels in private ownership, leaving them vulnerable to fragmentation. Roads and development contribute to habitat fragmentation that particularly affects wide-ranging mammals like the Florida black bear. Birds can also be affected by fragmentation if patches of required habitat are not located within sufficient proximity to each other to allow population dispersion.

Fragmentation causes both a direct and indirect loss of wildlife habitat. Black bears, for example, favor large blocks of natural habitat and tend to avoid small patches, roads, and developments. Thus a divided landscape — even one consisting of quality habitat — may lose functionality. Fragmentation also makes it difficult to maintain natural communities and manage habitat for wildlife use through actions such as prescribed fire. The ultimate results of fragmentation are diminished biodiversity and a loss of usable habitat for wildlife.

Road Mortality. Roads in the Wekiva basin have the highest rate of bear mortality in the state. One hundred bears, the highest rate among all counties, were killed in vehicle collisions in Lake County between 1976 and 1995. State Road (SR) 46 and SR 19 in Lake County were identified as having the highest rate of roadkills during that time period. Wekiva River State Park staff conducted a study of wildlife use and roadkills near the original SR 46 wildlife underpass from November 2001 to August 2003, including deployment of cameras, installation and maintenance of vegetation to guide wildlife to the underpass, and conducting track counts near those locations. Wildlife underpasses on SR 46 and other roads have been shown to decrease roadkill of bears and other wildlife, ; however animals, including bear, still die on roads in the basin. To accommodate the safe passage of wildlife, plans for the Wekiva Parkway include elevating sections of the new parkway system, and relocating the junction of SR 46 and CR 46A outside the primary ecological corridor.

Recreational Impacts on Wildlife and Habitat (see also Recreation Values). Recreation is included here as an issue to the extent that it impacts wildlife and habitat values. Certain forms of recreation, such as the use of jet skis and motorboats, may be incompatible with the protection of habitat and wildlife, depending on the location or extent of their use. For example, motorized watercraft can create noise or wakes that disturb wildlife, and boat propellers can damage eelgrass beds or harm manatees. Even nonmotorized boating can have substantial effects on wildlife habitat if the amount of human use is excessive or the timing or location of the use is inappropriate. Given the heavy recreational use of the Wekiva River System, these types of adverse

impacts on wildlife and wildlife habitat already exist in some areas.

Litter and discarded monofilament fishing line in the river or tangled in the tree canopy also pose a threat to wildlife.

It should be noted that nature-based recreation and ecotourism, when properly managed, can be an important asset to the protection of wildlife and habitat by building public awareness and appreciation for the Wekiva River System and the national wild & scenic river program.

Prescribed Fire. Prescribed fire is an important land management tool for maintaining a healthy ecosystem. Although fire is often associated with the management of upland systems, it also plays a role in the management of wetlands and other natural communities, including ecotones, that provide important habitat. Fire is a natural component of Florida's ecology, so without it natural communities may become overgrown, less diverse, or transition to other habitat types. Some plant species even require fire as part of their reproductive life cycle. A regular regimen of burning that mirrors the frequency of fires that occurred naturally before European settlement can significantly contribute to the health of natural systems. Prescribed fire also reduces vegetative fuel loads, which decreases the risk of very intense, uncontrolled wildfires that can be devastating to both natural systems and private property.

For example, the Florida Forest Service uses prescribed fire to manage Seminole State Forest. This is critical for the maintenance of scrub habitat, which is important to the Florida scrub-jay (*Aphelocoma coerulescens*), a federal and state threatened species. The Florida Forest Service also works with the Florida Park Service to conduct prescribed burns on Wekiwa Springs State Park, Rock Springs Run State Reserve, and Lower Wekiva River Preserve State Park. According to the management plan for these three state parks, the Florida Park Service attempts to burn at least 6,000 acres of the Wekiva River Basin State Parks each year. The ability to carry out these programs, however, can be hindered by budgetary or staff limitations.

In some areas, the ability to conduct prescribed burns has been made difficult by residential or commercial development located next to or within habitats that require fire, creating access and safety issues. Also residents and businesses often do not appreciate the importance of prescribed fire or the dangers of fire suppression. As a result, in some areas land managers have had to resort to less effective and more costly mechanical means of reducing fuel loads. Expanded education and outreach programs for private landowners and business owners in the area would help improve their understanding of the importance of prescribed fires and the dangers of fire suppression.

Nutrient Load Impacts on Biodiversity (See also Water Quality and Quantity Value). Nutrient loading is included here as an issue to the extent that it impacts wildlife and habitat values. Aquatic species and rare invertebrates associated with spring vents are particularly sensitive to water quality and an imbalance in nutrient content. In addition, invasive aquatic species, including algae, thrive on higher nutrient levels in the water. The proliferation of algae and other invasive species can have many adverse biological effects on individual aquatic wildlife species and natural communities. Increased quantities and frequencies of invasive aquatic species and algae in springs, spring runs, and the river channel are symptomatic of a growing problem within the Wekiva River System.

The natural background level of nitrates in Florida springs is typically 0.2 milligrams/liter (mg/L) or less. The Florida Springs Task Force, in its November 2000 report, identified 1.0 mg/L as a threshold at which normal spring biological functions are degraded. The recently adopted total maximum daily loads (TMDLs) identify targets specific to the Wekiva River System to be 0.065 mg/L for total phosphorus and 0.286 mg/L for nitrates. Springs in the Wekiva River System have already exceeded this level.

HISTORIC AND CULTURAL RESOURCE VALUES

Historic and cultural resource values comprise the cultural resource types recognized and described by the National Park Service: archeological resources, historic structures, cultural landscapes, ethnographic resources, and museum collections. This environmental assessment primarily addresses archeological resources that are the physical evidence of past human activity and can represent both prehistoric and historic occupations.

Historical Overview

For millennia, the Wekiva basin area has provided abundant natural resources for human occupation. The spring runs, rivers, hardwood hammocks, and dense forests offered food, water, shelter, and breeding sites for many forms of wildlife and provided excellent plant and animal food for human inhabitants. Numerous archeological and historic sites have been recorded in the general region. Remains of now extinct Pleistocene megafauna and large herd animals have been found with the distinctive fluted projectile points made by Paleo-Indians (11,000–8,000 BC). The Early Archaic Period (8000–6000 BC) continued the tradition of hunters and gatherers but with increased populations. The most readily identifiable sites are the mounds and middens along riverbanks. These features are typically domestic refuse heaps of shell, stone tools, animal bone, ceramics, and other artifacts. A mound or midden may also contain human burials, ceremonial artifacts, and other grave items.

The first major occupation of the St. Johns River valley occurred during the Mount Taylor Period (6000–2000 BC), as evidenced by large freshwater shell middens; burials in a wet environment; and stemmed, broad-bladed projectile points. The Orange Period (2000–500 BC) marked the appearance of ceramics, an apparent increase in population size, sociopolitical complexity, and territorial range. The St. Johns Period (500 BC– AD1565) showed a continued preference for mound building, but the later part of the period was also marked by profound changes in Native American life, including European influences. European artifacts are occasionally found in St. Johns Period burial mounds and middens (Milanich and Fairbanks 1980; Milanich 1994). Most of the sites in the Wekiva River basin date from the Orange and St. Johns II periods (ca. 2500 BC to post AD 800) (Weisman 1993).

Although central Florida was not occupied by Europeans during most of the Spanish-British period, Hernando DeSoto’s Florida expedition (1539-1540) marked the beginning of a steep decline in the Native American populations in the state. During the next 150 years, Timucuan Indians in central and east Florida were forced to migrate or succumbed to European diseases. Other tribes fled to north Florida from invasions of their homelands in Georgia and Alabama in the 1700s. The Seminole Indians, who primarily descended from these

cultures, used the Wekiva River headwaters for hunting and traveled the river as a route to the St. Johns River during the early 1800s.

By the 1820s, central Florida was also in use by early European-American settlers, and the Wekiva River and spring appear on several military maps. There was a minor military road running from Fort Mellan (Sanford) to Fort Mason (Eustis), which passed through the spring area. Early maps show little of the Wekiva area other than a trading post and trapping area.

In 1842 at the close of the Second Seminole War, Congress passed the Armed Occupation Act giving 160 acres to any man who would live on the property and cultivate at least 5 acres. By the mid-1800s the Wekiva basin was used by settlers for farming and milling lumber and grain. The area around Rock Springs and Wekiwa Springs became a focal point for early settlers. The town of Clay Springs was started around Wekiwa Springs. The spring outlet served as a landing spot for suppliers.

Cotton farming and cypress logging were major crops near Rock Springs Run, which was dammed to power a sawmill and a gristmill. Another sawmill was built on the upper Wekiva River, and a gristmill operated at Wekiwa Springs until the Civil War. A mound indicating the site of the dam for this mill still remains along Mill Creek. During the Civil War a Federal Company camp was located at Rock Springs.

In 1865, after the Civil War ended, another homesteading act encouraged settlers into the area. During this time, steamships and barges used Wekiwa Springs as a loading and unloading point. The town of Clay Springs supported a wharf and warehouse for cargo steamers navigating the St. Johns River to the Wekiva River from the town of Mellonville (now Sanford). Around 1875 the settlement of Markham was established and supported by the railroad system and Wekiva River. Three sites are connected with this time period in the Markham Woods area, including an African American cemetery and church.

The South Florida Railroad broke ground in 1880 to connect Sanford, Lake Mary, Longwood, and Altamonte Springs with Jacksonville. Shortly thereafter the Sanford-Lake Eustis rail line was built with connections in Sorrento, Mount Dora, Eustis, and the former town of Ethel (in what is now Rock Springs Run State Reserve). The wooden bridge that crossed the Wekiva River (near what is today Lake Markham Road) eventually burned down, and much of the original rail bed was removed. Portions of this railroad network have since been converted into a bike trail as part of the Seminole County Rails to Trails program.

The tourism industry also arrived in the 1880s when Wekiwa Springs was still known as Clay Springs. In 1906 the name of Clay Springs was changed to Wekiwa Springs. Facilities at Wekiwa Springs included a hotel, a sanitarium, cabins, a picnic area, bathhouses, and a rail toboggan ride. The hotel and other recreational facilities operated until the Great Depression, after which the buildings either burned or were dismantled.

By the late 1800s the making of turpentine was also an important economic activity in the area. Many catfaced pines and clay turpentine pots can still be found. The logging of cypress in the bottomlands of the Wekiva and St. Johns rivers also began at this time.

Construction of the first roads in Lake County began in 1915. Before that time, rivers served as the main transportation with steam and paddlewheel boats. The economic base

of the region during the first part of the 20th century was primarily cattle and ranching, along with farming, citrus groves, lumber, and turpentine. From 1900 to 1940 agriculture was a major portion of the economy in Seminole County, with vegetables transported all over the country by rail. Timber logging became widespread in the region by the late 1930s.

Some old logging (or tram) roads and railroad grades still exist. One elevated grade occurs in the sandhill community at Wekiwa Springs State Park, and runs north-south through the entire unit. This grade was constructed in the late 1850s for a passenger railway from Eustis to Orlando that never came to fruition, but it was used to support the timber industry at Wekiwa Springs.

Some of the old tramways are still visible, while others built through the floodplain swamp and hydric hammock communities have revegetated with hardwoods. Evidence of old logging equipment and portions of the railroad tramway still remain on public lands in some areas.

In 1941 the Apopka Sportsman's Club purchased land in the Wekiwa Springs area from the Wilson Cypress Company for hunting, fishing, and other recreational uses. In 1969 the state purchased the property from the sportsman's club for Wekiwa Springs State Park, which opened in 1970. Agriculture in the basin shifted largely to silviculture, grazing, and nurseries during the later part of the 20th century. Since the opening of Walt Disney World in 1971, much of central Florida, including the Wekiva basin, has experienced significant growth which continues today.

Management Issues

Florida Statutes, Chapter 267, requires that each state agency having direct or indirect jurisdiction over a proposed state or state-assisted undertaking shall consider the effect of the undertaking on any historic property that is included in, or eligible for inclusion in, the National Register of Historic Places (National Register). The statute requires that each agency afford the Florida Division of Historical Resources (FDHR) a reasonable opportunity to comment with regard to such an undertaking. In consultation with the division, each state agency must also establish a program to locate, inventory, and evaluate all historic properties under the agency's ownership or control that appear to qualify for the National Register. Florida statutes prohibit the removal of artifacts from these sites without a permit from the Bureau of Archaeological Research, a bureau within the division. In addition, all federally funded projects also require consultation with division staff under Section 106 of the National Historic Preservation Act. Federally funded projects are also subject to other laws and executive orders pertaining to consultation with federally recognized tribes.

Numerous previously recorded and documented historic and cultural resources have been catalogued in the Florida Master Site File maintained by the Florida Division of Historical Resources. Most previously recorded sites in the area have been on state lands. However, only small portions of land in the Wekiva basin have been adequately surveyed for cultural resources. Therefore, it is likely that there are other unrecorded historic and cultural sites present.

Small test pits have been excavated in several of the mounds revealing pottery fragments, animal bones, and

shells. Several points and pottery fragments have been found by swimmers and divers in and around the main spring outlet at Wekiwa Springs State Park. In many areas along Rock Springs Run and the Wekiva River, midden sites are found on the accessible dry land, and some sites are used extensively as resting and picnic locations by boaters and canoeists, leading to degradation.

At present, there are 54 known archeological sites on public lands in the Wekiva basin area (see appendix D). Fifty of these sites are in the aquatic preserve or state parks and include an underwater shipwreck, 32 middens, a prehistoric village site, 4 pre-ceramic lithic waste scatter sites, 3 African American sites including a cemetery and church, an artifact scatter site, 4 isolated finds, a cemetery from the Ethel settlement, a burial mound, a logging tramway, and a refuse site with the remains of a windmill. The other four sites are in the Wekiva River Buffer Conservation Area (a site of unknown type), Seminole State Forest (a limited surface scatter of pottery from a probable campsite), and Kelly Park (evidence of pre-Columbian settlement and an early homestead site). Tramways constructed for logging during the late 19th century and early 20th century severely altered hydrological regimes over vast areas within the Wekiva basin. To restore hydrology, culverts have been installed along various tramways. Several miles of tramway have been removed in Rock Springs Run State Reserve and Lower Wekiva River Preserve State Park. Tramways have also been breached (partially removed) in Seminole State Forest as mitigation projects.

On private lands in the vicinity of the Wekiva River, there are 36 known archeological sites including 7 middens, 3 prehistoric habitations, a lithic waste scatter, 15 artifact scatter sites, 5 isolated finds, a burial mound, a site with the remains of a windmill, an American homestead site (19th century), a site with the remains of a sawmill (including segments of railroad grade and historic road), and an American site (20th century of unknown type) (see appendix D for a complete list).

All of these elements certainly have regionally significant resource values and may well have national significance but have not been studied for inclusion as National Historic Landmark sites.

WATER QUALITY AND QUANTITY VALUES

Water resources are critical to the nature of a national wild and scenic river. Water quality is linked to land uses and human activities in and along the river corridor and in the larger region that contributes groundwater and surface water to the Wekiva River System. Flow volume and rate are also affected by human activities and long-term climate patterns that affect rainfall, which is the fundamental source of water for the river system. Because water quality and quantity depend on both the surface water drainage basin and the groundwater capture area of springs in the Wekiva River System, the surface watershed and springshed are both considered when analyzing this value.

Given the influence of land use on surface water and groundwater, the rapid conversion of natural and agricultural lands to urban or suburban development throughout much of the watershed and springshed poses a threat to water quality and water quantity in the Wekiva River System. For example, intense development can lead to a reduction in spring flow because of greater demand for water from the aquifer and an increase in impervious surfaces that reduce

infiltration. Pollutant and nutrient loading can also be worsened by intense development that brings increased use of chemicals and fertilizers for lawns and landscaping, runoff from roads, and wastewater discharges to surface water and groundwater.

All of the waterways in the Wekiva Wild and Scenic River System are classified as Outstanding Florida Waters, the state's highest designation for water quality. The character of the water ranges from the crystal-clear flows from the artesian springs and spring runs to the tannin-colored waters of blackwater creeks and streams. Water quality and quantity, which are affected by spring flow and drainage from adjacent land, contribute to the popularity of the springs and river system as recreational resources and to the overall health and integrity of ecosystems in the basin.

Additional significant information on water quality and quantity is included in the management plan under the subsections titled:

- *Recent Initiatives Pursuant to the Wekiva Parkway and Protection Act*

- *Strategies to Reduce Nutrient Loads*

- *Strategies to Conserve Groundwater*

Water Quality

Much of the material in this section is cited from the pollutant load reduction goal (PLRG) study (Mattson et al. 2006) that was completed by the St. Johns River Water Management District as directed by the Wekiva Parkway and Protection Act. Additional water quality data was drawn from the semiannual "EcoSummary" reports by FDEP staff.

The wide range of water quality attributes in the Wekiva Wild and Scenic River System is particularly distinctive compared to other Florida rivers — ranging in appearance from the very clear waters of spring outlets and spring runs to the naturally dark tannic waters found in Black Water Creek. The wide range of water quality attributes also contributes to a high diversity of aquatic communities and habitats that support numerous animal and plant species, including invertebrates that are unique to springs of the Wekiva River System. Appendix E, which summarizes historical water quality data for the Wekiva River and Rock Springs Run, shows the considerable differences in these river segments, especially for conductivity, color, total organic carbon, and chlorophyll-a.

A detailed review of the water quality status of the Wekiva River and Rock Springs Run was included in the recent PLRG study (Mattson et al. 2006). These waterways have high concentrations of dissolved minerals because of their natural setting in an area influenced by karst geology. However water quality in some reaches is also influenced by inflows of surface water with dark color and acidity from decomposing vegetation.

A distinctive characteristic of the Wekiva River is that spring flow is a significant component of the total flow of the river. Therefore, the water quality of the freshwater springs that contribute to the Wekiva is especially important to the river's overall water quality. Based on average annual flow rates, the two largest springs in the Wekiva River System are Wekiwa Springs and Rock Springs, which are among the most southern of east Florida's freshwater springs. These two springs are situated next to limestone outcroppings, which are rare in central Florida and indicate that the top of

the Floridan Aquifer is at or near the land surface.

Studies completed during the 2000 FDEP statewide stream bioassessment program included sampling for the Wekiva River and Rock Springs Run. Results show high concentrations of nitrate in both waterways — higher than those in 95% of other Florida waterways — and nutrient levels high enough to potentially support high levels of algal growth in both waterways.

Elevated nitrate concentrations are a concern for many of Florida's freshwater springs (Florida Springs Task Force 2000 and 2006). A concentration of 0.20 mg/L is widely cited as the naturally occurring baseline (background concentration) for Florida springs. In some of the springs of the Wekiva River System, nitrate concentrations greatly exceed the threshold of 0.35 mg/L used by FDEP staff to indicate potential groundwater-surface water impacts. The high levels of nitrates in the springs that feed the Wekiva River System are believed to be related to present and past agricultural uses as well as present urban/suburban land uses.

Contributors to nitrogen levels in the Wekiva River System include but are not limited to individual onsite wastewater disposal systems (e.g., septic systems), centralized wastewater treatment plants, and fertilizer applications to agricultural land and urban/suburban landscapes. Nitrogen is also introduced to the river system through natural processes such as atmospheric deposition and decay of organic material; however these sources correlate to much lower background nitrate concentrations that exist within the environment absent human impacts (< 0.2 mg/L).

Trend analysis since 1984, done as part of the PLRG study, shows a decline in nitrate and total phosphorus for the Wekiva River. However, even with these declines, the concentrations greatly exceed those considered healthy for a spring-fed river system. Nitrate concentrations within waterways associated with both the Wekiwa River and Rock Springs Run were found to be high (> 1 mg/L) at the spring outlets. This corresponds to observations that the highest biomass of attached algae was found in and around the springs.

The groundwater that contributes to each of the springs in the Wekiva River System may be strongly influenced by land use activities that are far from the river system itself, such as agriculture and urban or suburban development. Due to latency in the transport of nutrients through the aquifer, agricultural activity in past years may still be affecting water quality of the springs as well.

Water Quantity and River Flow

Maintaining the volume of water and discharge characteristics are important management considerations for any river system. This is particularly important to sustaining a wild and scenic river given the effect that flow has on aquatic communities, ecosystem processes, water quality, and river recreation. For the Wekiva River System, water volume and flow characteristics are influenced by spring flow, water storage characteristics of adjacent floodplains, and land use (including agriculture and urban or suburban development). The impacts of development that took place before current stormwater management practices went into effect are also particularly important (prior to the mid-1980s).

It should be noted that development has affected the Little Wekiva River to a much greater degree than the Wekiva and has changed this

tributary's flow characteristics so that peak flow rates are higher, resulting in channel scouring and erosion. Although the Little Wekiva River is not included in the national wild and scenic river system, these problems still translate into Wekiva River impacts downstream.

Approximately half of the Wekiva River's flow originates from springs. Flow data for Wekiwa Springs and Rock Springs show a trend of decreasing spring flow from the early 1970s until 2003. Decreasing flow trends were also noted for springs along the Little Wekiva River (Palm, Sanlando, and Starbuck Springs). Factors that may be causing this decline include the effects of urbanization and reduced recharge because of increased impervious surface, groundwater pumping from the Wekiva springshed, and a long-term decline in annual rainfall. Studies indicate that urbanization of the Rock Springs groundwater contributing area has been responsible for a 10% to 15% decrease in spring flow. Urbanization that results in a loss of groundwater recharge, such as loss of infiltration because of pavement, can also be an important factor in flow declines.

In 1992 the St. Johns River Water Management District adopted minimum flows and levels (MFLs) for the Wekiva River at SR 46, Black Water Creek at SR 44, and eight springs along the Wekiva and its tributaries (Messant, Miami, Palm, Rock, Sanlando, Seminole, Starbuck, and Wekiwa). These levels are intended to protect the water resources and ecology of the area from harm caused by water withdrawals. Pursuant to the Wekiva Parkway and Protection Act, minimum flows and levels for Rock Springs and Wekiwa Springs were reviewed and analyzed again, and were determined to be sufficiently protective of the water resource. A reevaluation of the Wekiva River minimum flow at the SR 46 bridge is planned for 2013.

To ensure that the Wekiva River System minimum flows and levels and other environmental resources in the area are protected, the St. Johns River Water Management District recently amended its consumptive use permitting rules regarding the use of groundwater, with specific limitations on the amount of additional groundwater that can be developed within a geographic area designated as the Central Florida Coordination Area. This area includes some, but not all, of the Wekiva springshed.

The St. Johns River Water Management District is currently updating its 2005 regional water supply plan. This plan, like the existing plan, will include conservation measures, alternative water supply development projects, and water resource development projects intended to meet the demands of existing and future water users and ensure the sustainability of water resources and related natural systems. The plan is required pursuant to Section 373.709, F.S.

CLIMATE CHANGE

Climate change is perhaps the most far-reaching and irreversible threat the national park system has ever faced (NPCA 2007). Climate change in this context refers to a suite of human-accelerated changes occurring in Earth's atmospheric, hydrologic, and oceanic systems. These changes, including increased global air and ocean temperatures, widespread melting of snow and ice, and rising global average sea level, provide unequivocal evidence that the climate system is warming.

Although the warming trend, commonly referred to as global warming, is discernable over the entire past century and a half, recent decades have exhibited an accelerated warming rate with 11 of the last 12 years ranking among the 12 warmest years on record. Most of the observed temperature increase can be attributed to human activities that contribute greenhouse gases. These greenhouse gases —particularly carbon dioxide from the burning of fossil fuels — cause Earth's atmosphere to act like a blanket and trap the sun's heat. While the insulating effect (or greenhouse effect) of our atmosphere is important to living systems, the rapid increase in greenhouse gases since the mid-19th century has turned the thermostat up higher than to what our systems are adapted.

Although climate change is a global phenomenon, it manifests differently in different places. One of the most dramatic effects of global warming is the impact on sea level. A rising sea level could affect natural and cultural resources, and is likely to interfere with public use and enjoyment of coastal and low-lying parks. In addition to possible impacts to Florida's low-lying land areas, this encroachment of sea water could also alter the aquatic conditions and chemistry of inland freshwater systems. For example, the freshwater of some inland rivers may become brackish by mixing with more sea water, or a rise in seal level could result in the intrusion of salt water into the aquifer of freshwater springsheds.

Many places in the world have already observed and recorded changes that can be attributed to climate change, and trends suggest that a drying of historically wetter landscapes within the Wekiva basin and springshed may be occurring. This too can result in changes to the health and distribution of natural communities.

Climate change is a long-term phenomenon. The likelihood that significant effects will be seen during the life of the river management plan is fairly certain, but the impacts on the Wekiva River System have not been specifically determined at this time.

Implementing either alternative in this environmental assessment would have very little effect on the cumulative level of greenhouse gases or other climate change factors (e.g., carbon footprint) when viewed regionally. However, there are several management directions that individual agencies could take that would reduce their contribution to climate change. Examples of these include adding insulation and weather-proofing to existing buildings, employing solar panels to generate electricity, using high-mileage vehicles, protecting native vegetation and planting trees that absorb carbon, and providing educational messages about reducing our impact on the climate. These programs and others could be implemented under either of the alternatives and would contribute towards the global effort to reduce human-caused climate change.

local wildlife

Chapter 4 - Environmental Consequences

INTRODUCTION AND METHODOLOGY

The National Environmental Policy Act requires that environmental assessments disclose the environmental impacts of a proposed federal action (e.g., the impact from the implementation of the approved alternative). This chapter provides a discussion of the potential impacts that the two alternatives could have on the outstandingly remarkable values of the Wekiva Wild and Scenic River System: scenic, recreation, wildlife and habitat, historic and cultural, and water quality and quantity. The consideration of these effects provides a measurable basis for comparing the advantages and disadvantages of each alternative.

The alternatives presented in this document should provide broad direction on how the river system could be managed. Because the potential consequences of the alternatives are sometimes broad and conceptual, they can be analyzed only in general terms. More detailed environmental documents may need to be prepared before undertaking some specific actions in this environmental assessment.

For each impact topic, a description of the potential positive and adverse effects that could result from the actions proposed in each alternative is presented. This is followed by an explanation of cumulative effects \. A conclusion that assesses the overall impact of both alternatives and provides a justification for selecting the preferred alternative follows those discussions.

METHODS OF ASSESSING EFFECTS

When assessing the potential impacts on the outstandingly remarkable values of the Wekiva Wild and Scenic River System, several impact parameters must be analyzed. The potential impacts of the two alternatives are described in terms of four impact measurement criteria: type, context, duration, and intensity.

Type: The beneficial and adverse impacts on the river system's values are determined by comparing the anticipated changes resulting from implementing alternative B to the results of continuing current management direction (alternative A).

Context: The scope of impacts considered are limited to those that could potentially affect values of the Wild and Scenic River System. The context refers to the setting or geographic scope of the impact to the river resource or value. In this analysis, impacts are measured relative to the following two context levels:

- Localized: Impacts would be limited to a specific site or specific segment of river within a 0.25-mile distance from the river.
- Widespread: Impacts would occur over a larger area or in multiple areas within the Wekiva River System basin, springshed, or ecological corridor.

Duration: Duration refers to the length of time the impact affects the resource or value. In this analysis, impact duration is defined as follows:

- Short-term: Impacts would be one year or less in duration.
- Long-term: Impacts would extend beyond one year. Impacts may last for many years, or may be permanent.

Intensity: Intensity refers to the degree of the impact to the river resource or value. Impact intensity is measured for adverse effects, and quantified as negligible, minor, moderate, and major. Because the definitions of *intensity* varies by type of resource value, the various intensities are defined separately for each impact topic analyzed in this document. However, the definitions for *duration, type*, and *context* apply to all impact topics.

CUMULATIVE EFFECTS

The regulations of the CEQ, which administers NEPA, require that cumulative effects be assessed in the decision-making process for federal projects. Cumulative effects are defined in 40 CFR 1508.7 as follows:

> *. . . the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or non-federal) or person undertakes such other actions.*

In this document, cumulative impacts have been considered for all impact topics and both alternatives.

To determine potential cumulative impacts, other projects and actions in the Wekiva River watershed, springshed, and ecological corridor that contribute impacts to the Wekiva Wild and Scenic River System were identified. Staff from various agencies were consulted and research was conducted to develop the list below.

Current and Reasonably Foreseeable Actions

Other planning or development activity now being implemented or that would be implemented in the reasonably foreseeable future was considered in identifying cumulative actions. Such actions are considered in conjunction with the effects of each alternative to determine if they would have any additive effects on a particular natural resource, cultural resource, or visitor use. Some of these actions are in the early planning stages, so the evaluation of cumulative effects was based on a general description of the project. Because the specific effects of some actions cannot be determined at this time, the cumulative impact analysis is qualitative and general.

Land Use and Development. Urban and suburban land development in unincorporated lands of Lake, Orange, and Seminole counties, as well as in several municipal jurisdictions, has had and will continue to have effects. Nearby communities such as Apopka to the southwest, Altamonte Springs to the south, Lake Mary to the east, and the unincorporated area of Sorrento to the west have had considerable expansion over the last several decades. Residential subdivisions, such as in the Markham Woods area, have been constructed on previously undeveloped lands east of the Wekiva River. Current county regulations and other building codes require a setback from the river's edge for houses, but there are direct impacts to the river when access (docks, boat ramps, etc.) is created.

Continued urban and suburban growth and development could lead to the following:

- increased light pollution and adverse effect on dark night skies
- more recreation pressure

- increased demands for water from the aquifer or surface waters that could reduce water quantity.
- higher concentrations of chemicals (fertilizers, pesticides, etc.) to the watershed and springshed from development and agriculture that could impact water quality.
- more traffic on roads in the area and that cross the river system that could fragment habitat or sever wildlife corridors, and could create more noise and pollution.
- more development that could fragment habitat or sever wildlife corridors
- an increase in impervious surfaces from development that could impact groundwater recharge.

These potential effects are generally associated with growth and development. It should be noted that several agency regulatory programs (such as the consumptive use permit and environmental resource permit programs) are intended to limit adverse impacts on water resources. (See the description of agency regulatory roles in Chapter 2 under Alternative A.)

Wekiva Parkway. The Orlando-Orange County Expressway Authority and the Florida Department of Transportation are in the planning process for the Wekiva Parkway, a multilane facility that would traverse the planning area and cross the Wekiva River at the location of the existing SR 46 bridge. The 2004 Wekiva Parkway and Protection Act provides guiding principles for the planning and design of this major new road construction project and requires that the parkway help protect natural resources in several ways:

- *Extensive wildlife crossings:* Currently, two wildlife tunnels under SR 46 in east Lake County provide a total of 78 feet of safe crossing for animals such as deer, bobcat, coyote and bear. As presently planned, the Wekiva Parkway/SR46 redesign would replace these two tunnels with wildlife bridges totaling nearly 6,000 feet — more than 76 times the current crossing space. These crossings will enhance habitat connectivity by providing animals with greater opportunities to safely move between Rock Springs Run State Reserve and Seminole State Forest. An 800-foot-long bridge is also planned for part of the Wekiva Parkway that bisects one of the properties acquired for conservation as part of the project.
- *Longer bridge across the Wekiva River:* The parkway plan proposed a new bridge where SR46 crosses the Wekiva Rver. (The current bridge is about 561 feet long.) This new bridge will span approximately 1800 feet and should enhance habitat connectivity and animal movement within the riparian corridor.
- *Realignment of County Road 46A:* Closing CR 46A through Seminole State Forest will reduce the number of animals harmed by vehicles and provide greater habitat connectivity in the forest. As planned, CR46A would be realigned to connect with SR46 farther west, outside of Seminole State Forest.

Recreation Development. Facilities at three state parks and Seminole State Forest, county parks, and private enterprises have created outlets for outdoor recreation in the region. Various improvements can be anticipated.

- Possible expansions in facility development and commercial uses on various private properties have been proposed (e.g., amenities and facilities for recreation and

other active commercial uses at sites such as Wekiva Falls Resort, Wekiva Island, and other similar commercial operations.)

- Improvements at the Wekiva River Basin State Parks (e.g., Katie's Landing access and picnic area development) allow for safer and more convenient access to the river for recreationists and may increase the level of use. Planned development of a new interpretive center convenient to the three state parks would increase the level of information and education visitors receive about the area and the river system. This could lead to an increased stewardship ethic among river users.
- The Florida Division of Recreation and Parks is working with partners to maintain the Florida National Scenic Trail in Lower Wekiva River Preserve State Park and is planning to develop an extension of the West Orange Trail along the western perimeter of Wekiwa Springs State Park.
- Lake County, Seminole County, Orange County and private interests are planning development of public recreational trails through the basin and crossing the Wekiva River. Crossings at both the Wekiva Parkway bridge and along the old railway crossing south of SR 46 have been discussed. The Florida Department of Transportation completed a feasibility study in 2010 which provided cost estimates for incorporating the trail crossing with the Parkway bridge.

Public Land Management. Various state and local agencies manage public lands for conservation and will continue to do so. (See the description of agency land management roles in chapter 2 under alternative A.)

Agency Regulatory Actions. Numerous federal, state, and local agencies have and will continue to have a regulatory role in the protection of natural resources affecting the Wekiva River system including the quality and quantity of surface and ground water, wildlife, habitat, and land use. (See the description of agency regulatory roles in chapter 2 under alternative A.) These agencies include:

- Florida Department of Environmental Protection
- Florida Fish and Wildlife Conservation Commission
- Florida Department of Agriculture and Consumer Services
- Florida Department of Health
- St Johns River Water Management District
- Seminole, Lake, and Orange counties and various municipalities
- Lake County Water Authority
- National Park Service (pursuant to the Wild and Scenic River Act)
- U.S. Fish and Wildlife Service
- U.S. Army Corp of Engineers

Past Actions

The following past actions have contributed to cumulative effects on the Wekiva Wild and Scenic River System:

Agriculture. In the past, lands throughout the Wekiva River System watershed and springshed were directly and indirectly affected by agricultural land uses that ranged from intensive citrus farming to cattle and sheep grazing. As a result, large acreages of native vegetation communities have been

displaced to accommodate these uses. These land use activities have led to the loss and fragmentation of habitat and wildlife populations, caused an alteration of soil strata, and introduced several nonnative plant species to the area. One of the most significant and long-lasting impacts from agricultural land uses in the Wekiva River basin and springshed stems from the use of fertilizers. Because the Wekiva River System is very dependent on groundwater discharge (i.e., spring flow), the river system's water quality is directly correlated to the water quality of the groundwater throughout the river system's springshed. Nitrogen from agricultural fertilizers that migrates into the groundwater of the springshed continues to discharge into the surface water via the many springs in the area. This nitrogen feeds algal blooms and other invasive vegetation that can displace native aquatic vegetation and reduce dissolved oxygen in the river system and springs.

Because groundwater may take several years or even decades to move horizontally and vertically through the deep and shallow aquifers in the springshed, fertilizer use from past years continues to have adverse effects on surface water quality in the basin. Although most large agricultural operations have been replaced, there are plant nurseries and tree farms in the area using fertilizers and pesticides.

Urban and Suburban Development. A variety of widespread development actions have occurred in the region.

Over time, privately owned land that was previously undeveloped or in some form of agriculture (such as citrus groves, orchards and livestock operations, or silviculture) have been gradually replaced by residential, commercial, and industrial development. Much of this development has occurred in an inefficient pattern of urban and suburban sprawl that has negatively affected natural resources, including species, habitat, and water resources. This pattern of development has been coupled with an extensive network of roads and infrastructure that has contributed to habitat fragmentation. Furthermore, septic systems, wastewater treatment plants, fertilizers, and pollution have contributed to degradation of surface and ground water quality.

The creation of Walt Disney World and other major tourist attractions in the Orlando area in the 1970s greatly accelerated the spread and level of development.

Construction of the SR 46 bridge over the Wekiva River has altered the river channel and inhibited natural growth of shoreline vegetation under the bridge.

The greatest offset to the negative impacts of development in the region has been the public acquisition of land for preservation surrounding the Wekiva River System; however, critical gaps remain in this conservation landscape.

Assumptions

Several assumptions have been made about past, present, and future conditions in the region so that the cumulative effects could be analyzed, particularly in regard to future actions. The following assumptions apply to this assessment:

- The types of river uses that are occurring now will continue, and in addition there may be new, different future uses.
- Additional land development for commercial and residential land

uses, recreation, tourism, agriculture, and road construction have occurred, are occurring, and will continue to occur, which could put greater stress upon values of the Wekiva River System because of habitat loss, fragmentation, degradation of water resources, and recreational impacts.

- In order of controlling jurisdiction, federal, state, regional, and local regulations affecting stormwater and recharge will continue to manage how water is released from or retained by development in the watershed and springshed.
- The growing population in the region will generate increased recreation and public access pressure on the river system. This growing pressure will result from the decline in other available natural areas and the preference of more local residents to use the Wekiva River System as a community and/or neighborhood recreation area.
- Although efforts to minimize impacts are occurring, land uses in rural areas of the watershed and the springshed, such as agriculture, wastewater disposal, and the application of landscape fertilizers, will continue to be a source of nutrient loading and pollutants into the surface and ground waters that feed the Wekiva River System.
- The flows of surface and ground water in the Wekiva River System will continue to be directly affected by weather patterns and trends that will increase or decrease flows (floods, hurricanes, droughts, etc.).
- Public land managers will continue to implement and revise management plans that describe intended management activities, including the use of prescribed fire.

SCENIC VALUES

METHODS OF ASSESSING EFFECTS

To provide a measurement for quantifying the intensity of the impacts on scenic values, the definitions for impact intensity and thresholds are included below.

Negligible: The action would not have any noticeable or measureable changes to natural scenery, natural sounds, or other natural aesthetics on the river system, as seen or heard from the river system or from adjacent vantage points along the shorelines.

Minor: The effects on scenic or aesthetic value would be detectable and measurable, but very limited in scale and degree. The action would change natural scenery, natural sounds, or other natural aesthetics on the river system, but the effects would be of little consequence and would not disturb or improve the visitors' experience on the river system or its shorelines.

Moderate: The effects on scenic or aesthetic value would be apparent and would have some influence on the visitor experience. The action would change natural scenery, natural sounds, or natural aesthetics that would have notable consequences that are either intrusive or beneficial to the visitors' experience on the river system or along shorelines. However, the consequences are not widespread, severe, or exceptionally favorable.

Major: The effects on scenic or aesthetic value would be very apparent and would have direct and substantial influence on visitor experience. The action would result in considerable changes to natural scenery, natural sounds, or natural aesthetics that would have widespread, severe, or exceptionally favorable consequences that are either very intrusive or very beneficial to the visitors' experience on the river system or along shorelines.

EFFECTS OF ALTERNATIVE A

Analysis

The scenic values and aesthetic resources of the Wekiva Wild and Scenic River System could be affected by the following.

Invasive and Exotic Vegetation. Despite active, multiagency control efforts, the proliferation of invasive and/or exotic vegetation is a continuing challenge throughout the basin in all waters of the Wekiva River System. This threat would likely continue in the future and might worsen over time if the native natural communities become further stressed by encroaching development, public use, and nutrient loading of the river system, or if existing state funding levels for exotic control are not maintained. If invasive vegetation became dominant, it could outgrow and replace existing native vegetation, destroy native plant diversity, and take over entire reaches of the river system, thus diminishing scenic values. Also, although the cattail (*Typha latifolia*) is considered a native plant, it has posed recurrent problems to the river system by choking off various segments of the rivers from time to time.

A significant threat to scenic value is the proliferation of algae often seen coating native eel grass beds within the river system and rocks near the springs. Excessive growth of algae, hydrilla, and other invasive aquatic species could be caused by elevated nitrate levels within the

springshed and surface water drainage basin.

Alternative A would continue the current multiagency control efforts and expand these efforts if and when additional funding becomes available.

Contractors for the Bureau of Invasive Plant Management do much of the exotic vegetation control, with assistance from the Florida Park Service and the Wekiva River Aquatic Preserve. These existing efforts are aggressive, intensive, and because of the prolific nature of exotics, often temporarily successful in controlling various invasive species. Occasionally, the efforts are not enough in some river segments (e.g., in years when invasive plant proliferation is substantial)..

Litter. Litter on the surface, bottom, and shoreline of the Wekiva River System is a recurring problem in several areas. This litter diminishes the scenic and aesthetic value for people accessing the river system for its scenery and wild surroundings. Alternative A would continue the current litter cleanup efforts, which are effective and successful when conducted. However, these efforts are not enough to control litter to a point where it does not affect scenic value. Aquatic preserve staff conducts about 12 cleanups per year with assistance from volunteers. The aquatic preserve staff also assists in cleaning litter on the water surface and shoreline during other management activities on the river system. Divers and snorkelers are periodically used to clean up litter off the bottom of the river. Independent volunteer groups, such as Keep Seminole Beautiful and the Seminole Environmental Restoration Volunteers also perform cleanups.

Shoreline Vegetation. The loss of natural shoreline and riparian vegetation caused by residential development is quite evident along the Wekiva River in the recreational segment north and south of the SR 46 bridge. Houses, associated residential structures, docks, shoreline decks, and the cleared vegetation around such structures have considerable adverse effects on the scenic and aesthetic values of the river system. Because alternative A maintains the status quo of agency involvement and action on this issue, this alternative would have no new effect on the preservation of natural shorelines. The shoreline impact is particularly noticeable on residential developments that were constructed before the implementation of local government and agency regulations that require setbacks and riparian habitat protection. The wild and scenic segments of the river system are generally free of these visual disturbances.

In addition to residential development, public access and recreational uses also contribute to the loss of natural shorelines and riparian vegetation in some areas. Impacts are seen at public access points or commercial locations, and also in undeveloped areas. This site-specific shoreline impact often results from vegetation trampling by boaters taking breaks off the river. These impacts occur at unofficial canoe takeouts, at social trails along the shoreline, and at active, unofficial shoreline recreation sites (e.g., rope swings, wading areas, etc.).

Impacts to shoreline vegetation could become worse with anticipated future increases in recreation demands on the river system and development. Alternative A would not change current protection of the scenic quality of natural shorelines from these recreation and land development activities.

Middens. Similar to the previous issue of shoreline development and vegetation trampling, the many shell

middens along these waterways also contribute to the scenic and aesthetic value of the Wekiva River System. However, vandalism, disturbances, vegetation trampling, and the use of the middens as on-river restrooms all result in a notable visual disturbance to the resource. These activities and their impacts are currently monitored by various state agency staff. However, enforcement is limited, resulting in a continued adverse effect on scenic and aesthetic values. Impacts to middens could become worse with anticipated future increase in recreation demands on the river system.

Recreation Demand and Crowding. The scenic and aesthetic value of the river system is diminished on busy recreation days when many motorboaters, canoeists, kayakers, and/or tubers populate the Wekiva River, Wekiwa Springs Run, and/or Rock Springs Run. Adverse visual impacts of many boats in the viewshed and noise disturbances from loud boats and individuals are common on heavily used river segments on such days. This visual and aesthetic impact would continue to be an issue because the river system has several access points (both public and private), and because a systemwide user capacity limit has not been established. Furthermore these impacts could become worse in the future with anticipated increases in population and recreation demand. Alternative A would maintain the status quo in terms of managing these impacts, and therefore would have a negligible effect on controlling visual and noise disturbances from recreational use and crowding on the river system.

Motorized Watercraft. The noise, gasoline fumes, and water disturbances caused by motorized watercraft on the Wekiva River could generate adverse impacts on the river's scenic and aesthetic value. In particular, loud motors, gasoline fumes, and wakes from fast-moving watercraft (boats or personal watercraft) disrupt the otherwise serene air and water conditions that are common to the Wekiva River. These impacts could become even worse if the use of motorized watercraft on the river system increases in the future. Alternative A would not result in a reduction of these impacts.

Roads, Bridges, and Trails in the River Viewshed. The proposed Wekiva Parkway and its proposed bridge to replace the existing SR 46 bridge might add to the intrusiveness of human impact on the river system, both visually and audibly. The Wekiva Parkway and the new bridge will be larger than the existing two-lane road and bridge. This could create a notable increase in visual disturbance to the river corridor's viewshed. In addition, the anticipated higher speeds and volume of vehicles on the new bridge, particularly trucks, could create additional noise disturbances in this segment of the river. The Wekiva Parkway bridge is currently in the design and review stage. To date, various agencies and organizations with interests in the Wekiva River System have raised concerns regarding the bridge design in an attempt to minimize and mitigate impacts. The SR 44, CR 44A, and Lake Norris Road bridges over Black Water Creek also disturb the scenic values of the river system on Black Water Creek. Members of the advisory management committee would continue to work with state and local agencies concerning road, trail, and bridge construction to mitigate adverse impacts on scenic and aesthetic values of the river system..

Also, a regional trail connection across the Wekiva River is being planned. Crossing locations that have been discussed include the proposed Wekiva Parkway bridge, as well as a possible trail bridge across the Wekiva River at the old railroad crossing south of SR 46. To date,

members of the advisory management committee have been involved in the trail planning discussions. Some members have expressed concerns about the impacts of a trail bridge at the old railroad crossing on the Wekiva Wild and Scenic River System. Other members have expressed that recreational use and public appreciation of the Wekiva Wild and Scenic River System could be enhanced by such a crossing. Alternative A would maintain the existing level of involvement in the planning, design, and review of the Wekiva Parkway bridge and a possible regional trail.

Although significant coordination has occurred between transportation agencies, conservation agencies and nonprofit organizations on the Wekiva Parkway, this same high level of coordination has not occurred with respect to other transportation facilities impacting the Wekiva River System. A more holistic approach would be beneficial to ensure that Piecemeal decisions regarding transportation infrastructure do not have adverse impacts on scenic values over time. Alternative A would not address this issue to the extent that it could be addressed under alternative B.

Light Pollution. Artificial light pollution associated with residential and commercial land development near the Wekiva Wild and Scenic River System has adverse effects on the dark skies over the river corridor and surrounding lands. The effects could be localized or widespread (e.g., lights from developments shining along shorelines or a brightened night sky from nearby urbanized areas, respectively). The current actions under alternative A would have a negligible effect on this threat to the scenic values of the Wekiva River System. The impact of light pollution would likely increase in the future because population growth and continued development is expected in many areas of the Wekiva River basin.

Cumulative Effects

As discussed above, scenic and other natural aesthetic values in the river system corridor could be adversely affected by continued private land development along the shorelines (e.g., docks), road, trail, and bridge development, and light pollution along shorelines and overhead from nearby urbanized areas. In addition, the scenic and aesthetic value of the Wekiva River System would also continue to be adversely affected by noise from commercial jets flying overhead to and from the nearby Orlando Sanford International Airport. Continued and possibly increasing uncontrolled public access to the river system would also continue to have adverse effects on the scenic and aesthetic values of the river system. For example, future expansions of the private commercial boating operations along the river system could have adverse effects (e.g., Wekiva Island, Wekiva Falls Resort). Many of these threats and impacts would likely increase or worsen in the future because of the projected increases in population growth and recreational demand in the future.
Alternative A would continue to maintain the existing level of action on these issues. A continuation and increase of existing impacts to scenic values would be expected under alternative A.

EFFECTS OF ALTERNATIVE B

Analysis

Implementing alternative B, the preferred alternative, would increase management emphasis and interagency coordination on preserving the scenic and aesthetic values on the Wekiva Wild and Scenic River System. This holistic and collaborative approach could strengthen the protection and enhancement of these values when

compared to the current conditions and management efforts. The scenic and aesthetic value of the Wekiva River System could be affected by the following.

Invasive and Exotic Vegetation. As described in alternative A, despite active, multiagency control efforts, the proliferation of invasive and exotic vegetation is a continuing challenge throughout the Wekiva River System. If invasive vegetation becomes dominant, it could outgrow and replace existing native vegetation, destroy native plant diversity, and take over entire reaches of the river system, thus diminishing scenic values.

Alternative B would continue the existing multiagency invasive and exotic vegetation monitoring and control efforts for species such as hydrilla, water hyacinth, water lettuce, wild taro, elephant ear, para grass, Chinese tallow, East Indian hygrophila, and cattail. These efforts would increase if and when additional funding becomes available. The Florida Fish and Wildlife Conservation Commission Invasive Plant Management Section would continue to work with assistance from the Florida Park Service and the Wekiva River Aquatic Preserve on this matter. Alternative B also calls for a coordinated effort by the advisory committee, agencies, and local governments to advance strategies (such as those identified in the Wekiva Basin Management Action Plan when adopted) for reducing nutrient loading from surface and ground water sources, which in turn would limit the excessive growth of algae and other invasive aquatic species.

Litter. Litter on the surface, bottom, and shoreline of the Wekiva River System is a recurring problem in several areas. This litter diminishes the scenic and aesthetic value for people accessing the river system for its scenery and wild surroundings. Alternative B would continue the current litter cleanup efforts, which are effective and successful when conducted (as described in the alternative A analysis above). However, alternative B would also make a distinct effort to establish, support and strengthen Adopt-A-River programs such as has been established by Seminole County, which would provide direct assistance in monitoring and removing litter in the Wekiva River System. As for public education efforts, alternative B would promote events and media announcements that encourage the public to directly experience and learn about the Wekiva Wild and Scenic River System and understand its status and health. An informational "branding initiative" for the Wekiva Wild and Scenic River System would complement these outreach efforts, with unified signs at all river crossings and access points.

Furthermore, this alternative would expand current partnerships with private businesses and concessionaires who operate on the Wekiva River System to ensure that their activities protect wild and scenic river values and provide unified, supportive messages to their clients about the Wekiva River System and guidelines for its use. This active public awareness and outreach effort could help with litter control by making boaters and other river users more aware of the effects of their actions on the river system.

Shoreline Vegetation. The loss of natural shoreline and riparian vegetation caused by residential development is quite evident along the Wekiva River in the recreational segment north and south of the SR 46 bridge. Houses, associated residential structures, docks, shoreline decks, and vegetation clearing around such structures have substantial adverse effects on the scenic values of the river system. Alternative B includes actions aimed at improving the

regulatory control and code enforcement of development near the Wekiva River System. To minimize visual disturbance, alternative B emphasizes the importance of waterfront development regulations that are enforced and effective by working with local governments. These efforts would emphasize the protection of native vegetation along the riparian corridors and limitation and minimization of visual impacts from signs and river-based structures (e.g., docks, launch areas, and overlooks) to the Wekiva River System.

If necessary, alternative B would also promote the improvement or expansion of local government regulations on these riverfront activities and structures (beyond what is currently regulated). These efforts would be complemented by an educational program aimed at local government planners and decision makers to provide information about the river system and strategies for protection. In addition to effects on private land development in the river corridors, alternative B also has an objective to implement and strengthen development guidelines, regulations, and practices related to public recreational areas on the Wekiva River System. These guidelines and practices would emphasize preservation of native vegetation, minimized land clearing, minimized structures, and reclamation plantings.

Secondly, alternative B would help address the problem of shoreline vegetation trampling from public access and recreational use. These impacts often result from boaters taking breaks along the river, and occur at unofficial canoe takeouts, at social trails along the shoreline, and at active shoreline recreation sites. All of these activities have adverse effects on the scenic and aesthetic value of the Wekiva River System. With the projected increase in recreation demand and regional population in the future, these threats to the scenic value would likely increase or worsen if not actively addressed. Alternative B would include an expansion of current partnerships with private businesses and concessionaires who operate on the Wekiva River System and have a public awareness/outreach component.

This alternative would also include efforts to educate the public via events and media announcements that encourage the public to directly experience and learn about the Wekiva Wild and Scenic River System and to understand its status and health. An informational "branding initiative" for the Wekiva Wild and Scenic River System would complement these outreach efforts, with unified signs at all river crossings and access points. These efforts could help reduce shoreline impacts by making boaters and other river users more aware of the implications of their actions on the river system.

Middens. Similar to the previous issue of shoreline development and vegetation trampling, the many shell middens along these waterways also contribute to the scenic and aesthetic value of the Wekiva River System. However, vandalism, disturbances, vegetation trampling, and the use of several easily accessible middens as on-river restrooms all result in a notable visual disturbance. Alternative B includes a series of objectives and actions that would protect the middens as cultural resource sites. This alternative includes enhanced efforts to monitor and protect cultural resources, including middens, as well as to educate the public regarding their significance. In addition, actions described earlier to protect shoreline vegetation as part of alternative B would also have the beneficial effect of protecting midden sites.

Recreation Demand and Crowding. As described in alternative A, the scenic and aesthetic value of the river system is diminished on busy recreation days when many motorboaters, canoeists, kayakers, and/or tubers populate the Wekiva River, Wekiwa Springs Run, and/or Rock Springs Run. Adverse visual impacts of many boats in the viewshed and noise disturbances from loud boats and visitors are common on heavily used river segments on such days. The objectives and actions for recreation management in alternative B could help remedy this issue if they are done effectively. By completing a recreation assessment, creating a recreation facility master plan, partnering with private businesses and concessionaires, assessing and monitoring user capacity (see "User Capacity" section in Chapter 2) establishing thresholds for visitor experience, and developing several public education programs, alternative B could have a positive effect on controlling visual and noise disturbances from heavy recreational use on the river system.

Motorized Watercraft. As in alternative A, the noise, gasoline fumes, and water disturbances caused by motorized watercraft on the Wekiva River could generate adverse impacts on the river's scenic and aesthetic value. The objectives and actions for recreation management, scenic value protection, and public education in alternative B would help minimize these adverse effects from motorized watercraft. The alternative B actions would also include supporting existing motorized watercraft restrictions on Rock Springs Run and additional motorized watercraft restrictions on Black Water Creek. Use and noise levels from watercraft would be assessed and monitored. Regulations affecting the number of watercraft, speed, and noise for various segments of the river system would be improved.

Roads, Bridges, and Trails in the River Viewshed. The proposed Wekiva Parkway bridge (to replace the existing SR 46 bridge) might add to the intrusiveness of human impact on the river, both visually and audibly. The new bridge will be larger than the existing bridge. This could create a notable increase in visual disturbance to the river corridor's viewshed. In addition, the anticipated higher speeds and volumes of vehicles on the new bridge, particularly trucks, could create additional noise disturbances in this segment of the river. The Wekiva Parkway bridge is currently in the design and review stage. Alternative B calls for coordination between the advisory committee, environmental agencies, and transportation agencies regarding design and construction of the Wekiva Parkway.

The SR 44, CR 44A, and Lake Norris Road bridges over Blackwater Creek also disturb the scenic values of the river system on Blackwater Creek. Alternative B includes objectives and actions that encourage the Florida Department of Transportation and Lake County to pursue a new design of the SR 44 and CR 44A junction so that only one bridge crossing of Black Water Creek is necessary at that location.

Alternative B would also include an action that works to ensure that no new roads for motor vehicles are constructed across waters of the Wekiva River System.

Also, as discussed in the impact analysis of alternative A, a regional trail connection across the Wekiva River is being considered by Seminole County and Lake County. Two possible alignments/crossings have been considered: on the proposed Wekiva Parkway bridge and on a new trail bridge south of SR 46 at the old rail-road alignment. Members of the advisory management committee have been involved in the trail planning

discussions. Some members have expressed concerns about the visual and ecological impact of a trail bridge at the old railroad crossing on the Wekiva Wild and Scenic River System. Other members have expressed that recreational use and public appreciation of the Wekiva Wild and Scenic River System could be enhanced by such a crossing. Alternative B includes an action to ensure that any trails for bicycle or pedestrian use across the river system would minimize visual intrusion.

Light Pollution. Artificial light pollution associated with residential and commercial land development near the Wekiva Wild and Scenic River System has adverse effects on the dark skies over the river corridor and surrounding lands. The effects could be localized or widespread (e.g., lights from developments shining along shorelines or a brightened night sky from nearby urbanized areas, respectively). Alternative B includes an action that promotes the establishment of local government regulations that limit the intrusion of artificial light to protect dark skies on the river corridor. These efforts would be complemented by educational programs that would provide information about the wild and scenic river system and the importance of dark nighttime skies. This alternative also includes an action that would discourage exposed lighting on the proposed Wekiva Parkway bridge. As a result, alternative B could result in impacts that are long term, beneficial, and localized to widespread.

Cumulative Effects

As discussed above and in alternative A, scenic and other natural aesthetic values in the river system corridor could be adversely affected by continued private land development along the shorelines (e.g., docks), road, trail, and bridge development, and light pollution along shoreline and overhead from nearby urbanized areas. In addition, the scenic and aesthetic value of the Wekiva River System would also continue to be adversely affected by noise from commercial jets flying overhead to and from the nearby Orlando Sanford International Airport. The continued and possibly increasing uncontrolled public access to the river system would also continue to have adverse effects on the scenic and aesthetic values of the river system. For example, future expansions of the private commercial boating operations along the river system could have adverse effects (e.g., Wekiva Island, Wekiva Falls Resort).

Many of these impacts could worsen in the future because of continued population growth and recreation demand. However, alternative B includes multiple objectives and actions that could help minimize or mitigate the impact of these threats, and thus would contribute to protecting scenic values.

RECREATION VALUES

METHODS OF ASSESSING EFFECTS

To provide a measurement for quantifying the intensity of the impacts on recreation values, the definitions for impact intensity and thresholds are included below:

Negligible: The action would not have any noticeable or measureable changes to available recreational opportunities on the river system or to the recreational experience of visitors. River system users would likely be unaware of any associated effects.

Minor: The effects on recreation values would be detectable and measurable, but very limited in scale and degree. The action would yield changes to available recreational opportunities on the river system or to the recreational experience of visitors, but the effects would be of little consequence.

Moderate: The effects on recreation values would be apparent and would have some influence on the visitor experience. The action would yield changes to available recreational opportunities or to the recreational experience that would have notable consequences that are either intrusive or beneficial to the visitors' experiences on the river system. However, the consequences would not be widespread, severe, or exceptionally favorable.

Major: The effects on recreation values would be very apparent and would have direct and substantial influence on visitor experiences. The action would yield considerable changes to available recreational opportunities or to the recreational experience that would have widespread, severe, or exceptionally favorable consequences that are either very intrusive or very beneficial to the visitors' experiences on the river system.

EFFECTS OF ALTERNATIVE A

Analysis

The recreation values of the Wekiva Wild and Scenic River System could be affected by the following.

Recreation Demand and Crowding. The recreation values of the Wekiva River System become limited or degraded on busy days when many swimmers, motorboaters, canoeists, kayakers, and/or tubers populate high use areas of the Wekiva River, Wekiwa Springs Run, and/or Rock Springs Run. Generally, as the number of river visitors increases, the number of visitor conflicts increases and the quality of the visitor experience decreases. This results from overcrowding in the river system, which limits the available water for free and uninhibited recreation. As population growth continues throughout the region, recreation demands would likely increase, compounding the issue further. Currently, there are no coordinated, interagency systems in place to measure, monitor, and regulate the increasing recreation demands on the overall river system and the competing recreational uses of different sections on the river system. Alternative A would continue current management efforts, but would not comprehensively address this issue to the extent that it could be under alternative B.

Public and Private Access to the River System. Much of the Wekiva River, Wekiwa Springs Run, and Rock Springs Run lie within public lands (e.g., state parks, state forest). Official river system access points on the

public lands are controlled and limited to a very few number of sites. Given the limited number of public access points, visitor use capacity could be effectively monitored and managed at these public access areas. Many of these public access sites already have established restrictions on the numbers of tubes and boat rentals they allow or on the number of vehicles allowed into the respective park. However, in these cases, visitor volume is restricted according to the individual site management plans, which might not take into account the volume of users from other access points along the water.

Private access to the river system exists at many locations, particularly along the Wekiva River. In addition to private boat rental sites and ramps such as Wekiva Island, Wekiva Falls Resort, and Kings Landing (on Rock Springs Run), every private property along the Wekiva River has rights under Florida statute for access to the water. The volume of watercraft is not controlled at these private access sites.

Negative impacts relating to visitor capacity and river system access could become worse as recreation demands increase in the future. Alternative A maintains the current management actions affecting private and public access to the Wekiva River System.

Shoreline Rest Stops and Campsites. Designated shoreline campsites along the river system are quite limited (six total). Rock Springs Run has three designated campsites, the Wekiva River has one, and Black Water Creek has two. Pull-out areas and rest stop sites along these waterways are also limited. The only designated places currently available to pull out, rest, or picnic are at the designated campsites or at park landings and marinas. If the campsites are already occupied, the number of available designated rest stops decreases. Although most boaters only access the rivers via designated entry/exit points, many visitors currently are getting out of their boats and using nondesignated sites for resting, picnicking, and camping (including some easily accessible midden sites). Some areas are being used heavily as party spots by various groups. This uncontrolled access often has other adverse impacts on natural and cultural resources and aesthetic values of the river system. This issue would be compounded as recreational use increases.

Alternative A would continue current management and enforcement efforts related to shoreline camping and resting sites, but would not address this issue to the extent that it could be under alternative B.

Navigational Hazards. Boat navigation hazards, such as downed trees and other vegetation, are a recurring problem and are removed as soon as possible by various land and water management agencies according to established policy. Immediately after storms, however, there might be multiple areas that are blocked by fallen trees or other debris. During times of low water levels, navigation can be very difficult in some areas when underwater logs, branches, and other obstructions are closer to the water surface. However, this challenging setting can contribute to the "wild" nature of the boating experience. Alternative A would continue managing and removing navigational hazards in the Wekiva River System.

Motorized Watercraft. Motorized watercraft could disturb and compete with more passive recreational visitors such as canoeists and kayakers, particularly those going on the river system for nature appreciation and wildlife observation. The noise and wake generated by most motorized boats have adverse effects

on these users. Use of motorized watercraft on the Wekiva River System also could cause disturbance to submerged vegetation, such as eelgrass beds, and create shoreline wake impacts that cause erosion. These effects would likely increase as boating demands on the river system increase in the future.

An increase in the use of personal watercraft (e.g., jet skis) along the river corridor is also likely. Jet skis contribute to user conflicts and environmental damage. The ability of jet skis to access very shallow water allows them to access areas where only nonmotorized boats could otherwise access. The noise from these crafts also disturbs other people on the waterway. The availability, small size, and speed of these craft make them attractive to young or inexperienced operators and can lead to serious safety concerns.

No coordinated effort is currently in place to regulate the volume of motorized watercraft use where it is permitted. To date, jet skis have been limited primarily to several watercraft operated by residents with property on the river system and indidivudals entering the Wekiva River from the St Johns River.

Restroom Facilities. With the exception of the centralized restroom facilities at adjacent state parks, sanitary facilities are currently lacking along the river system. Lack of funding to provide and maintain sanitary facilities has been a factor in preventing this issue from being addressed. Given the unavailability of restrooms, users who access various shoreline sites throughout the basin for swimming, picnicking, or camping often use the waterways, banks, and immediate uplands and accessible middens as restrooms. This results in unsanitary conditions at several heavily used recreation sites along the shoreline and at middens. Under Alternative A, planning for restroom facilities and seeking funds to address this issue would continue..

Public Education and Interpretation. Education and resource interpretation programs in public recreation areas are integral to making the public aware of various natural and cultural resources and issues, site history, stewardship opportunities, preferred visitor behavior guidelines, and official regulations. Educational and interpretive signs are a common and widespread medium used for such programs. Currently, educational and interpretive signs are relatively limited and/or dispersed along the Wekiva River system. Given the number of river system users and multiple access points, many visitors to the river system might not be informed of important information that might otherwise affect their experience on the river system or might alter their behavior while on the river system. If visitors become more aware of the issues affecting the river system and its values, they might be more willing and likely to avoid behaviors that have adverse impacts on natural and cultural resources and to the experience of other visitors.

Alternative A would maintain the current level of activities and actions that relate to visitor education.

Cumulative Effects

Recreation values of the Wekiva River System could be adversely affected by development and population increases in the region. Expanded or new boating operations along the Wekiva River System could accompany this growth, although new marinas are discouraged in the currently adopted Wekiva River Aquatic Preserve Management Plan. If unrestricted private and public access to the river system occurs in the future (i.e., without visitor use capacity limits), this projected

recreation demand increase could have substantial effects on the recreation values. Overcrowding and user conflicts could become problematic. Because alternative A maintains the current management levels related to the effects of increased recreation demand and river accessibility, a continuation and increase of current impacts on the recreation values could be expected.

However, the expansion and improvement of existing and new water access sites could also have positive effects on the recreation values of the river system. Future expansion of boat launch/takeout sites on both public and private lands could offer visitors improved amenities and opportunities for enjoying the Wekiva River System. For example, the Florida Park Service is in the process of improving the Katie's Landing boat launch/takeout with better shore facilities and amenities (e.g., restrooms, picnic areas, expanded parking). The management plan for the three Florida state parks in the basin includes some future actions that might increase interpretation and educational programs in the parks. Revisions to the Wekiva River Aquatic Preserve Management Plan may also contain an education component, support for more coordinated recreational management, and support for some of the strategies outlined under alternative B.

Except for new strategies that may be included in the revised Wekiva River Aquatic Preserve Management Plan, Alternative A would continue current recreation management efforts and likely have little effect on potential river accessibility improvements. Alternative A would not address recreational coordination and management to the extent that it could be addressed under alternative B.

EFFECTS OF ALTERNATIVE B

Analysis

Implementing alternative B, the preferred alternative, would increase management emphasis and interagency coordination for preserving and improving the recreation values on the Wekiva Wild and Scenic River System. When compared to the current conditions under alternative A, the holistic and collaborative management improvement actions included in alternative B would help enhance visitor experience as well as protect other values of the river system. Visitor recreation on the Wekiva River System could be affected by the following.

Recreation Demand and Crowding. The recreation values of the Wekiva River System become limited or degraded on busy days when many swimmers, motorboaters, canoeists, kayakers, and/or tubers populate certain high use areas along the Wekiva River, Wekiwa Springs Run, and/or Rock Springs Run. This results from overcrowding in the river system, which limits the available open water for free and uninhibited recreation. As population growth continues throughout central Florida, recreation demands would likely increase, compounding the issue further.

Alternative B includes a series of objectives and actions that would generate: (1) a recreation assessment, (2) a facilities master plan, (3) a recreation monitoring and management plan; and (4) an education program that could help river system users understand the value, status, and health of the Wekiva River System. Collectively, these actions would assess current resource and recreation conditions, determine which resource are in need of protection, and establish user capacity (see "User Capacity" section in Chapter 2) for various resources, values, and impacts

(natural resources, visitor experience, litter, etc.) that would be used as monitoring and enforcement thresholds. This overall effort would create indicators and standards that would help identify appropriate visitor use capacities on the river system.

Public and Private Access to the River System. Although many of the public river system access sites already have established restrictions on the numbers of tubes and boat rentals they allow or on the number of vehicles allowed into the park, their respective visitor volumes are restricted according to the individual site management plans (which might not take into account the volume of users from other access points along the water). Furthermore, private access to the water exists at many locations, particularly along the Wekiva River.

An intergovernmental effort to measure, assess, monitor, and control total visitor use volume (via both public and private access points) would help alleviate many of the adverse resource impacts and diminished visitor experience quality. Alternative B includes actions that target the visitor capacity issue (e.g., the recreation assessment and the monitoring and management plan). In addition, this alternative includes actions that emphasize public agency purchase of commercial properties with private access to the river system (if and when the properties and necessary they become available). This would allow public agencies to maintain and improve public access to the water, and would allow the agencies to better monitor and control visitor use volumes on the river system. To be most effective, this effort should include identifying total capacity and determining appropriate control mechanisms for both private and public access points.

Shoreline Rest Stops and Campsites. Designated shoreline campsites, pullouts, and rest stops along the river system are quite limited. Use of nondesignated sites generates multiple adverse effects on natural and cultural resources, as well as the scenic quality of the river system. Via the proposed recreation assessment and the facilities master plan efforts, alternative B would include actions that assess the existing use patterns at both designated and nondesignated sites and determine the appropriate number, location, and allowed use at camping, picnic, and rest stop sites along the shorelines of the river system. By implementing such a plan, adverse impacts on other river resources and values could be contained and possibly reduced.

Navigational Hazards. Boat navigation hazards, such as downed trees and other vegetation, are a recurring problem and are removed as soon as possible by various land and water management agencies according to established policy. As with alternative A, alternative B would continue the current level of managing and removing navigational hazards in the Wekiva River System.

Motorized Watercraft. The noise and wake generated by most motorized boats and personal watercraft (e.g., jet skis) have adverse effects on the more passive recreational activities of canoeists and kayakers, particularly those using the river system for nature appreciation and wildlife observation. Use of motorized watercraft on the Wekiva River System could also disturb submerged vegetation and create shoreline wake impacts that cause erosion. These effects would likely increase if boating on the river system increases in the future.

Various actions included in alternative B would aim to provide better monitoring and management of

motorized watercraft and their impacts. The proposed recreation assessment would help determine appropriate volumes, speeds, sizes, and locations of motorized watercraft use in the river system. The proposed recreation impact monitoring and management plan would subsequently help quantitatively monitor the effects of motorized watercraft on the Wekiva River by establishing resource and value impact thresholds.

Alternative B would also support the existing prohibition of gasoline powered watercraft on Rock Springs Run and the additional prohibition of gasoline powered watercraft on Black Water Creek. Lastly, alternative B includes actions that would establish partnerships with private businesses and concessionaires who operate boat rentals and boat ramps on the Wekiva River System. These partnerships could help encourage these businesses to educate their customers on watercraft regulations and appropriate behavior.

Restroom Facilities. With the exception of the centralized restroom facilities at adjacent state parks, sanitary facilities are currently lacking along the river system. Given the unavailability of restrooms along the river system, boaters who access various shoreline sites throughout the basin for swimming, picnicking, or camping often use the waterways, banks, and the immediate uplands and middens as restrooms. Alternative B includes actions that would assess current public use facilities such as restrooms, generate a facilities master plan, and seek ways to fund the implementation of the plan. These actions could collectively improve restroom availability.

Public Education and Interpretation. Education and resource interpretation programs in public recreation areas are integral to making the public aware of various natural and cultural resources and issues, site history, stewardship opportunities, preferred visitor behavior guidelines, and official regulations. Educational and interpretive signs are common and widespread medium used for such programs, but educational and interpretive signs are somewhat limited along the Wekiva River System. Given the number of river system users and multiple access points, many visitors to the river system might not be informed of important information that might otherwise affect their experience on the river system or might alter their behavior while on the river system.

Alternative B would include provisions that establish partnerships with private businesses, concessionaires, agencies and other appropriate entities, which could foster visitor education. This alternative would also include efforts to educate the public via events and media announcements that encourage the public to directly experience and learn about the Wekiva Wild and Scenic River System and understand its status and health. Also, an informational "branding initiative" for the Wekiva Wild and Scenic River System would complement these outreach efforts, with unified signs at all river crossings and access points.

Cumulative Effects

Recreation values of the Wekiva River System could be adversely affected by anticipated development and population increases in the region. Expanded or new boating operations along the Wekiva River System could accompany this growth. If unrestricted private and public access to the river system continues (i.e., without visitor use capacity limits), this projected recreation demand increase could have substantial effects on the recreation values. Overcrowding and user conflicts could become problematic. The management plan for the three Florida state parks in the basin

includes some future actions that might increase interpretation and educational programs in the parks, which could have a positive effect on recreation values. Revisions to the Wekiva River Aquatic Preserve Management Plan may also contain an education component, support for more coordinated recreational management, and support for some of the strategies outlined under this alternative.

Alternative B includes multiple actions and provisions that could help minimize the impact of these threats by assessing current recreation conditions, determining appropriate recreation use levels and impact thresholds for various resources, and managing the uses accordingly. Thus, alternative B would contribute to preserving and enhancing recreation values.

In addition, the expansion and improvement of existing and new river system access sites, where appropriate, could have positive effects on the recreation values. Future expansion of boat launch/takeout sites on both public and private lands could offer improved amenities and opportunities for enjoying the Wekiva River System that are complimented by other alternative B actions. Some examples of such improvements are mentioned in the analysis of alternative A.

WILDLIFE AND HABITAT VALUES

This section includes analyses that discuss the impacts of the alternatives on the outstandingly remarkable value of wildlife and habitat that contribute to the Wekiva River System. This analysis is based on the very close ecological interconnectedness of the diverse species and habitats in this riparian corridor. Only those species that would be affected by the river management plan are addressed in this environmental assessment.

METHODS OF ASSESSING EFFECTS

To provide a measurement for quantifying the intensity of the impacts on wildlife and habitat values, the definitions for impact intensity and thresholds are included below:

Negligible: The action would not have any noticeable or measureable changes to habitat or individual species. For special status species, the change would result in a *no effect* opinion from the U.S. Fish and Wildlife Service.

Minor: The effects on wildlife and habitat would be detectable and measurable, but very limited in scale and degree. The action would yield changes to habitat value or individual species that are minimal and of little consequence. For special status species, the action would result in a *not likely to adversely affect* opinion from the U.S. Fish and Wildlife Service.

Moderate: The effects on wildlife and habitat would be apparent and would have some influence on the ecology of the river system. The action would yield changes to habitat value or species that have notable consequences, but that are not widespread, severe, or highly favorable. For special status species, a measurable change to a population or individuals of a species could occur, and it would be of consequence to the species, but it probably would result in a *not likely to adversely affect* opinion from the U.S. Fish and Wildlife Service.

Major: The effects on wildlife and habitat would be very apparent and would have direct and substantial influence on the ecology of the river system. The action would yield considerable changes to habitat value and multiple species that have widespread or substantial consequences. For special status species, a noticeable, measurable change could occur in a population or individuals of a species, resulting in a severely adverse or majorly beneficial and possibly permanent effect on the species. The action would result in a *likely to adversely affect* opinion from the U.S. Fish and Wildlife Service if adverse, or a *not likely to adversely affect* opinion if the impact is beneficial.

EFFECTS OF ALTERNATIVE A

Analysis

The wildlife and habitat values of the Wekiva Wild and Scenic River System could be affected by the following.

Loss or degradation of Riparian and Aquatic Plant Communities. The riparian and aquatic plant communities along the waterways of the Wekiva River System are integral to the wildlife habitat quality of the entire river system. In some areas, plant communities are adversely affected by recreational use of the river system and by development along certain segments of the river system. The loss or degradation of riparian vegetation

caused by public access and recreational use primarily results from vegetation trampling by boaters accessing the water or taking shoreline breaks. These impacts, which often occur at unofficial canoe takeouts and at several active shoreline recreation sites (e.g., rope swings, wading areas, etc.),contribute to the fragmentation, loss and/or degradation of riparian habitat along the Wekiva River System.

Similarly, the loss or degradation of native aquatic vegetation could result from recreational uses such as motorboating and jet skiing. Boat propellers, anchors, and jet ski engines chop or churn up native aquatic plant communities, causing the aquatic plants to lose their flowering upper portion or become uprooted or otherwise damaged. In certain shallow areas of the Wekiva River System, damage to eel grass has occurred. Under current conditions, most damaged areas located in-stream recover over time, however this may not continue to be the case if use increases.

In addition, recreational use of the river system could introduce more nonnative, invasive vegetation to the river system (e.g., via boat motors and trailers). Once introduced, invasive, exotic plants often outcompete native plants and subsequently displace the native riparian plant communities of the river system.

Threats of loss and degradation of riparian vegetation in and along the Wekiva River System are also caused by land development along certain segments , particularly along privately-owned section of the Wekiva River in the recreational segment north and south of the SR 46 bridge. The wildlife habitat in these areas has been degraded by development such as houses and associated structures, residential landscaping, docks, and shoreline decks. Alternative A would continue the current level of recreation management and development controls, and thus would not likely contribute notable new measures to further protect riparian plant communities from these threats.

Loss or degradation of aquatic and riparian communities can also occur as the result in changes to water quality caused by nutrient loading or pollution or changes to flow. These effects are discussed under "Water Quality and Quantity Effects on Wildlife and Habitat."

In the future, negative impacts upon riparian and aquatic plant communities could increase with anticipated growth in the region, potential new development along the river system corridor, and recreation demand in the basin.

Recreation Disturbances to Wildlife. Wildlife and habitat in the Wekiva River System is directly affected by the proximity, frequency, and degree of human recreation activities along the river corridor. Likewise, the behavior of individual birds, reptiles, mammals, and fish is directly affected by the presence of humans. Aquatic and riparian habitat along the river corridors in the system could be adversely affected by recreational uses such as boating, swimming, tubing, fishing, or even wildlife or nature viewing depending on how loud, how often, and how close the recreational use is to the wildlife habitat or individual. The degree of habitat impact might also have a temporal component, when the timing of the human disturbance coincides with critical wildlife behaviors (nesting, feeding, migrating, etc.).

A secondary (or indirect) effect could also result when wildlife species that are more sensitive to human disturbances are displaced and replaced by higher numbers of more

adaptive, generalist species (e.g., raccoons), which might further disrupt the local ecology. Biodiversity typically diminishes over time under these conditions. The recreational use impact on wildlife and habitat could be compounded if the population-driven recreation demand increases in the future.

Litter and dangerous materials discarded along the river system also pose a threat to wildlife. Food materials that are poisonous to wildlife or are enclosed in nondigestible wrapping can harm or kill. Foreign objects, such as plastic bags, soda can rings, lead sinkers, rope, and metal with sharp edges, can hurt or entangle wildlife. Unretrieved fishing line and lures caught in the water or in overhanging vegetation can also hurt, entangle, and in some cases prevent and animal from feeding, which can result in death.

Alternative A would maintain the current levels of recreation management and litter control.

Invasive and Exotic Vegetation. The proliferation of invasive and exotic vegetation is a continuing challenge throughout the Wekiva River System. This proliferation could have widespread and detrimental effects on wildlife and habitat. Species that continue to require attention include, but are not limited to, hydrilla, water hyacinth, water lettuce, wild taro, elephant ear, para grass, Chinese tallow, East Indian hygrophila, and cattail. Although several state agencies have contributed to aggressively fighting this threat, the challenge would likely continue in the future. If exotic plant infestations increase, the diversity and health of the native plant communities could decrease, resulting in diminished fish and wildlife habitat. When infestations are severe, a complete loss of habitat for some sensitive species might occur.

Alternative A would continue the current multiagency control efforts and expand these efforts if and when additional funding becomes available. The Fish and Wildlife Conservation Commission Invasive Plant Management Section is responsible for invasive exotic vegetation control, with assistance from the Florida Park Service and the Wekiva River Aquatic Preserve. These efforts are often successful in controlling various invasive species, but occasionally efforts are not adequate in some river segments (e.g., in years when invasive plant proliferation is severe or widespread). Currently invasive aquatic exotic plants are under maintenance control.

Invasive and Exotic Fish and Invertebrates. In addition to the threat of invasive plant proliferation in the Wekiva River System, exotic fish and exotic invertebrates threaten the habitat and populations of the many native plant and wildlife species. These exotic species include the armored catfish, brown hopolo, and could include the channeled apple snail (see Chapter 3 for more information).

Alternative A would continue the current levels of monitoring and invasive species removal (e.g., armored catfish removal in Wekiwa Spring). If the populations of armored catfish or brown hopolo increase substantially, or if an infestation of channeled apple snail occurs, the current levels of invasive species control might not be adequate to mitigate their impacts.

Multijurisdictional Approach to Habitat Management. Wildlife and habitats in or affecting the Wekiva River System cross many jurisdictional and property ownership boundaries. This has sometimes resulted in

inconsistent habitat management practices and varying regulatory controls across the basin. Given the number of public land and water management agencies with proprietary and regulatory interests in the Wekiva River basin (local, state, and federal), an opportunity exists for an intergovernmental, collaborative effort that considers wildlife and habitat protection issues from a more regional approach. Although interagency coordination exists on some levels and on some management issues in the Wekiva basin and ecological corridor, it is not inclusive to all jurisdictions, all land ownerships, all management issues, and/or all habitats. Alternative A would continue the current level of coordination, including through the Wekiva Basin Working Group and Wekiva coalition of environmental organizations, but would not have the same comprehensive level of coordination that could be achieved under alternative B.

Habitat Fragmentation. Over the past 50 years, several habitats and natural communities in the Wekiva River basin have been fragmented by roads, residential and commercial development, and public or private recreation sites. Fragmentation is the result of larger blocks of contiguous habitat being broken into smaller patches. For example, maintaining a diversity of wildlife along the Wekiva River system that includes the Florida black bear relies on protecting a corridor of functionally connected habitat to the Ocala National Forest.

Fragmentation has occurred on and between upland habitats, wetland habitats, riparian habitats, and even on some aquatic habitats. Fragmentation also occurs if patches of required avian habitat are not located within sufficient distances for population dispersion. Fragmentation causes both a direct and indirect loss of wildlife habitat. Black bears, for example, favor large blocks of natural habitat and tend to avoid small or isolated patches, roads, and developed areas. Thus a divided landscape — even one consisting of quality habitat — might lose functionality. Fragmentation also hinders the ability to maintain natural communities and manage habitat for wildlife use through processes such as prescribed fire. The ultimate results of fragmentation are diminished biodiversity and a loss of usable habitat for wildlife.

Another negative consequence of fragmentation is an increased difficulty in managing lands for habitat value. For example, it is more challenging to apply prescribed fire to smaller patches of land and to lands interspersed with or located next to developed areas.

To date, managing agencies and environmental organizations have achieved certain measures to limit habitat fragmentation in the Wekiva River basin (e.g., incorporation of wildlife underpasses into the design of SR 46 and the Wekiva Parkway, significant land acquisition, and adoption of riparian habitat protect zone regulations). Although partially successful, however, these efforts have not fully addressed the issue of habitat fragmentation and wildlife mobility at a regional level. Additional work is especially needed to ensure that State Road 44 does not become a barrier to wildlife movement. Alternative A represents a continuation of ongoing efforts. Alternative A would contribute to minimizing habitat fragmentation in the Wekiva River basin, but with the potential for continued development, these efforts may not achieve the same level coordination that could be achieved with alternative B and could become inadequate to achieving necessary habitat connectivity.

Wildlife Mortality on Roads. Traffic on the numerous public roads and highways that intersect wildlife habitat and ecological corridors creates a serious hazard for many wildlife species. Wildlife mortality on roads (or roadkill) is an ongoing problem in the Wekiva River basin. Black bears have been particularly vulnerable in past years. This wildlife threat would only worsen as traffic volumes on roads increase with anticipated population growth in the region and potential development in the area. To date, various public land agencies and organizations, such as the Wekiva Coalition, have worked with transportation agencies to minimize the threat and impact of wildlife mortality on roads in the area. These efforts have included the installation of wildlife underpasses on existing State Road 46 and planning for more effective crossing structures on the proposed Wekiva Parkway. Even greater efforts and coordination may be required on other roads, such as State Road 44, however to protect wildlife as traffic volume and development pressure increases.

Water Quality and Quantity Effects on Wildlife and Habitat. Impacts on water quality and quantity could have several adverse effects on aquatic systems and wildlife habitat.

As described in the analysis of water quality impacts, certain recreational activity degrades water quality and thereby has adverse impacts on wildlife and habitat values. Examples of this include localized erosion and sedimentation due to trampling of aquatic vegetation and shoreline areas, leaking fuel and turbidity caused by watercraft, and some forms of litter in the waterway.

Nutrients from within the basin and springshed of Lake, Seminole, and Orange counties contribute to the degradation of aquatic communities. This has resulted in the formation of algal blooms, infestations of invasive exotic vegetation, and direct population loss of some sensitive endemic aquatic invertebrate species. Higher order species on the food chain, such as the limpkin, which feeds on the native apple snail, could also be negatively impacted.

If not adequately addressed, nutrient loading might affect more springs and river segments and to greater degrees in the future. In the Wekiva River System, nitrogen has been determined to be the controlling factor and therefore the most important to address. Collectively, the many nutrient sources in the Wekiva watershed and springshed have considerable adverse effects on water quality. These sources include but are not limited to fertilizers used on lawns and landscaping in residential and commercial areas, fertilizers used by agriculture, effluent from septic systems, and effluent from wastewater treatment plants.

Pollution from automobile fluids, commercial and industrial waste, household chemicals, and medical substances also pose a threat to the Wekiva River System through surface water drainage and groundwater infiltration.

Finally, reduced flows from the springs and within the waterway threaten the health of the Wekiva River System, and consequently its wildlife and habitat values. A growing population creates increased demands for water which are likely to generate increased utility requests for withdrawals of water from the aquifer for consumption (drinking, irrigation, industry, and personal use), resulting in a reduced volume of water emerging from the springs. This could in turn negatively impact the normal function of aquatic systems and the species using those systems. Water withdrawal could also alter the concentration of nutrients within the spring run and

river system. Similarly, the capture of stormwater that would normally drain naturally to the river system could impact surface water flows, as could the potential extraction of surface water for consumptive use. Impacts to the flows and levels of the Wekiva River System have the potential to alter the extent of submerged areas and wetlands and the overall ecological balance of the river system.

Agencies are currently implementing several measures to protect water quantity. The SJRWMD has adopted minimum flows and levels for the Wekiva River System and associated springs, and administers a consumptive use permit program intended to limit existing and future water withdrawals and prevent unacceptable drawdowns. In addition, the SJRWMD has prepared a regional water supply plan, which includes alternative water supply projects, to meet future water demands and sustain related natural systems. Special Environmental Resource Permit rules by DEP and SJRWMD also require that predevelopment recharge is maintained in high recharge areas.

Likewise, agencies are addressing pollution and nutrient loading in several ways. The SJRWMD Environmental Resource Permit program requires the construction and operation of stormwater management systems to reduce pollutants in receiving waters. Similarly, DEP has adopted TMDLs for nutrients in the Wekiva River System and is currently developing a Basin Management Action Plan. DEP is also pursuing rulemaking to adopt numeric nutrient criteria and more stringent stormwater treatment requirements for new development. The Wekiva Promise initiative is an educational program that DEP supports as well.

Alternative A would continue current management actions and regulatory efforts by various federal, state, and local government agencies with jurisdiction in the Wekiva basin and springshed. These efforts are intended to have a positive effect in limiting water quantity and quality impacts to the Wekiva River System.

However, as development continues to occur in the area, efforts to protect water quality and quantity could become more challenging. Population growth could also bring a notable increase in the number of developed residential properties served by septic systems and an increase in chemically maintained lawns and landscaping. These changes in the local landscape and land uses could continue and collectively increase the threat of water quality impacts on the Wekiva River System, which in turn would adversely affect wildlife and habitat.

Alternative A would continue the current level of water quality and quantity monitoring and regulation by government agencies, but without comprehensive multiagency collaboration specific to Wekiva River System ORVs.

Natural Resource Inventories and Monitoring. The flora and fauna of the Wekiva River basin is spread across a mosaic of lands managed by multiple state and local agencies, as well as large and small tracts of interspersed private lands that are within these jurisdictions. As a result, counting and monitoring of wildlife and plant populations throughout the basin is challenging without a centralized effort. Without a collective, basinwide inventory and monitoring program, decision-making on issues that affect wildlife and habitat is difficult. Currently, federal, state, and local agencies monitor selected species populations on a jurisdiction basis and support or permit a variety of other research and monitoring efforts that contribute to the knowledge base. Alternative A

would continue this level of wildlife and plant inventorying and monitoring.

Prescribed Fire. Wildfire is an important attribute in maintaining healthy, diverse natural communities. Fire helps prevent the proliferation of invasive, exotic plant species and maintain a healthy distribution and density of native species. In fact, some plant species even require fire to facilitate seed propagation as part of their natural life cycle. Because wildfire has historically been suppressed, various land management agencies in the Wekiva basin have incorporated prescribed fires into their land management activities to replicate natural process. Alternative A would continue current prescribed fire actions according to existing management plans.

Cumulative Effects

As discussed above, many existing and foreseeable future effects and trends in the Wekiva River System, basin and ecological corridor could adversely impact wildlife and habitat, including special status species. Examples of these include degradation of habitat and disturbance of wildlife from increased recreational use, invasive and exotic species, habitat fragmentation caused by roads and development, wildlife mortality on road, and water resource impacts. Many of these threats and impacts would likely increase or worsen with increases in population, development, roads and traffic volume, and recreational demand.

Alternative A would continue and maintain the existing level of action on these issues. Because existing management and regulatory efforts would continue, alternative A would be *not likely to adversely affect* special status species (determined as per compliance with Section 7 of the Endangered Species Act).

EFFECTS OF ALTERNATIVE B

Analysis

Implementing alternative B, the preferred alternative, would increase management emphasis and interagency coordination on protecting wildlife and habitat of and affecting the Wekiva River System. The actions associated with this collaborative, holistic approach of alternative B could have positive effects on wildlife and habitat when compared to current conditions and management efforts. Wildlife and habitat could be affected by the following.

Loss or degradation of Riparian and Aquatic Plant Communities. As described in the impact analysis of alternative A, the riparian and aquatic plant communities along the waterways of the Wekiva River System are integral to the wildlife habitat quality of the entire river system. Recreational use along the river system and development are adversely affecting these plant communities in several areas. The loss or degradation of riparian vegetation results from vegetation trampling by boaters accessing the water or taking shoreline breaks along the river system. As mentioned in the alternative A analysis, the loss or degradation of native aquatic vegetation and introduction of invasive or exotic plants could also result from recreational uses such as motorboating and jet skiing. Loss or degradation of aquatic and riparian communities can also occur as the result of changes to water quality caused by nutrient loading or pollution or changes to water volume, as discussed under "Water Quality and Quantity Effects on Wildlife and Habitat."

Alternative B would help address the problem of damage to riparian vegetation from recreational use. With the projected increase in recreation

demand and regional population in the future, these threats to habitat would likely increase if not actively addressed. Alternative B would include analysis of the extent of damage to riparian habitats, an expansion of current partnerships with private businesses and concessionaires who operate on the Wekiva River System, and involve a public awareness/outreach component. This alternative would also include efforts to educate the public via events and media announcements that encourage the public to directly experience and learn about the Wekiva Wild and Scenic River System and understand its status and health. An informational "branding initiative" for the Wekiva Wild and Scenic River System would complement these outreach efforts with unified signs at all river system crossings and access points. These efforts could help reduce shoreline and instream impacts by making boaters and other river system users more aware of the effects of their actions on the river system. In addition to these educational efforts, alternative B encourages patrols by off-duty law enforcement officers to assist in the enforcement of motorboat restrictions.

As described in alternative A, vegetation and wildlife habitat in some parts of the Wekiva River System has been degraded by development such as houses, residential landscaping, docks, and shoreline decks. Alternative B includes actions aimed at improving the regulatory control and code enforcement of development near the Wekiva River System, as necessary. (See also Scenic Values Goal 2, Objective A). As a way to minimize impacts to wildlife habitat along shorelines and riparian corridors, alternative B would promote waterfront development regulations that are enforced and effective by emphasizing collaboration by local governments and agencies. These efforts would focus in part on the protection of native vegetation along the riparian corridors.

If necessary, alternative B would also promote the improvement or expansion of local government regulation of riverfront activities and structures (beyond what is currently regulated). These efforts would be complemented by an educational program that would be aimed at local government planners and decision-makers to provide information about the river system and its social and ecological values.

Alternative B also has an objective to support implementation and strengthening development regulations and practices at publicly owned recreation areas on the Wekiva River System. These guidelines for public agencies would emphasize the preservation of native vegetation, minimized land clearing, minimized structures, and reclamation plantings.

Recreation Disturbances to Wildlife. As described in the impact analysis for alternative A, wildlife and habitat values of the Wekiva River System are affected by the proximity, frequency, and degree of human recreation activities on or near the river system. A secondary effect could also result when wildlife species that are more sensitive to human disturbances are displaced and replaced by higher numbers of more adaptive, generalist species. Biodiversity typically diminishes over time under these conditions. In addition, litter and dangerous materials discarded along the river system threaten wildlife that might ingest or be hurt by these foreign materials.

The impact of recreational use on wildlife and habitat could be compounded if the population-driven recreation demand increases in the future.

Alternative B would include an expansion of current partnerships with private businesses and concessionaires who operate on the Wekiva River System, which includes a public awareness/outreach component. This alternative would also include efforts to educate the public via events and media announcements that encourage the public to directly experience and learn about the Wekiva Wild and Scenic River System and understand its status and health. An informational "branding initiative" for the Wekiva Wild and Scenic River System would complement these outreach efforts, with unified signs at all river system crossings and access points. These efforts could help minimize recreational disturbances on wildlife by making boaters and other river system users more aware of the implications of their actions on the river system. Alternative B also supports the tenets of the Wekiva Promise initiative.

In addition to education, alternative B would address recreation disturbances to wildlife through actions such as regulating or restricting the use of motorized watercraft, reestablishing an "adopt-a-river program" to assist in river cleanups, using animal-proof garbage containers,and implementing user-capacity thresholds to limit disturbance.

Invasive and Exotic Vegetation. The proliferation of invasive and exotic vegetation is a continuing challenge throughout the Wekiva River System. Managing agencies work to prevent most common exotic species from dominating any one part of the river system. When invasive vegetation becomes dominant, they typically crowd out more diverse native plants. This could decrease, or perhaps even eliminate, the value of native habitat in some areas. Alternative B would continue the existing multiagency invasive and exotic vegetation monitoring and control efforts in the Wekiva basin. Species that continue to require attention include, but are not limited to, hydrilla, water hyacinth, water lettuce, wild taro, elephant ear, para grass, Chinese tallow, East Indian hygrophila, and cattail. Increasing these efforts would occur if and when additional funding becomes available. The Fish and Wildlife Conservation Commission Invasive Plant Management Section would continue to work with assistance from the Florida Park Service and the Wekiva River Aquatic Preserve on this matter.

Invasive and Exotic Fish and Invertebrates. As discussed in the alternative A impact analysis, exotic fish and exotic invertebrates also threaten the habitat and populations of many native plant and wildlife species. These exotic species include the armored catfish, brown hopolo, and could include the channeled apple snail in the future.

Alternative B would continue and expand the current levels of monitoring and invasive species removal. This alternative includes actions that would directly assess the impacts associated with the proliferation of invasive exotic fishes and invasive exotic invertebrates within the Wekiva River System and develop actions for expanding monitoring and control strategies.

Multijurisdictional Approach to Habitat Management. As described in the impact analysis of alternative A, the different wildlife and habitat being addressed in this environmental assessment cross many jurisdictional and property ownership boundaries. This has resulted in sometimes inconsistent habitat management practices and varying regulatory controls

Alternative B would result in a comprehensive land and water management effort that applies a more

holistic approach. In addition to coordinating river management goals and objectives, the river management plan would also promote collaborative management of upland, wetland, riparian, and aquatic habitat by providing the management agencies in the basin an additional support mechanism that facilitates interagency cooperation. The plan could also encourage consistent, resource-based land use regulations across local government jurisdictions, where appropriate. This could have positive effects on wildlife and habitat values. These efforts would be complemented by an educational program aimed at local government planners and decision-makers to provide information about the river system and its social and ecological values.

Habitat Fragmentation. As described in the impact analysis for alternative A, several habitats and natural communities in the Wekiva basin have been fragmented by roads, residential and commercial development, developed recreation sites, and some recreation activities. The negative results of fragmentation are diminished biodiversity and a loss of usable habitat for wildlife. Another adverse impact is the increased difficulty in managing lands for habitat value. For example, it is more challenging to apply prescribed fire to smaller patches of land and to lands interspersed with or located next to developed areas.

Alternative B would provide greater focus and emphasis on the importance of intergovernmental coordination to achieve habitat contiguity than alternative A. In addition to providing a broad, interagency mechanism for land management, the proposed management plan under alternative B includes objectives that

(1) promote the acquisition of public lands or conservation easements on lands that are gaps in critical wildlife movement corridors or that possess unique habitat features throughout the Wekiva basin and ecological corridor;
(2) encourage the incorporation of habitat connection corridors on property development plans ;
(3) discourage additional new road construction within the Wekiva basin that could impede the normal movement of wildlife and avoid the construction of new roads through conservation lands;
(4) establish smoke corridors and improve interagency cooperation regarding prescribed fire;
(5) address the potential impact of road construction on such wildlife movement through design for wildlife crossings and other mitigative measures; and
(6) educate local government planners, decision makers, and the public on the importance of ecosystem connectivity and strategies to protect it.

Wildlife Mortality on Roads. Traffic on the numerous public roads and highways that intersect the area creates a serious hazard for many wildlife species. This wildlife threat would only worsen as traffic volumes on roads increase with anticipated population growth in the region and potential development in the area. As discussed in the alternative A analysis, various public land agencies and organizations, such as the Wekiva Coalition, have worked with transportation agencies to minimize the threat and impact of wildlife mortality on roads in the area. These efforts have included the installation of wildlife underpasses on existing State Road 46 and planning for more effective crossing structures on the proposed Wekiva Parkway.

Alternative B would promote and improve such efforts and would also pursue mitigation or removal of existing impediments or threats to

wildlife movement from roads, particularly between the Wekiva basin and the Ocala National Forest. This alternative would also discourage additional new road construction within the Wekiva basin that could impede wildlife movement or notably increase the risk for wildlife mortality.

Water Quality and Quantity Effects on Wildlife and Habitat. As discussed in the impact analysis of alternative A, impacts to water quality and quantity have several adverse effects on aquatic systems and wildlife and habitat.

As described in the analysis of water quality impacts, certain recreational activity degrades water quality and thereby adversely impacts wildlife and habitat values. Examples of this include erosion and sedimentation due to trampling of aquatic vegetation and shoreline areas, leaking fuel and turbidity caused by watercraft, and litter in the waterway.

Nutrients from contributing areas of Lake, Seminole, and Orange counties have resulted in degradation of aquatic communities in the form of algal blooms, infestations of invasive exotic vegetation, and direct population loss of some sensitive endemic aquatic invertebrate species. Higher order species in the food chain that rely upon aquatic species could also be negatively impacted. Many nutrient sources in both the Wekiva watershed and springshed collectively contribute to adverse effects on water quality. These sources include but are not limited to fertilizers used on lawns and landscaping in residential and commercial areas, fertilizers used by agriculture, effluent from septic systems, and effluent from wastewater treatment plants.

Pollution from automobile fluids, commercial and industrial waste, household chemicals, and medical substances also pose a threat to the Wekiva River System through surface water drainage and groundwater infiltration.

Finally, reduced flows from the springs and within the waterway threaten the health of the Wekiva River System, and consequently its wildlife and habitat values. A growing population creates increased demands for water which are likely to generate increased utility requests for withdrawal of water from the aquifer for consumption (drinking, irrigation, industry, and personal use), resulting in a reduced volume of water emerging from the springs. This could in turn negatively impact the normal function of aquatic systems and the species using those systems. Water withdrawal could also alter the concentration of nutrients within the spring run and river system. Similarly, the capture of stormwater that would normally drain naturally to the river system impacts surface water flows, as could the potential extraction of surface water for consumptive use. Impacts to the flows and levels of the Wekiva River System have the potential to alter the extent of submerged areas and wetlands, and the overall ecological balance of the river system.

As discussed in the alternative A analysis, agencies are currently implementing several measures to protect water quantity. The SJRWMD has adopted minimum flows and levels for the Wekiva River System and associated springs, and administers a consumptive use permit program intended to limit existing and future water withdrawals and prevent unacceptable drawdowns. In addition, the SJRWMD has prepared a regional water supply plan, which includes alternative water supply projects, to meet future water demands and sustain related natural systems. Special Environmental Resource Permit rules by DEP and SJRWMD also require

that predevelopment recharge is maintained in high recharge areas.

Likewise, agencies are addressing pollution and nutrient loading in several ways. The SJRWMD Environmental Resource Permit program requires the construction and operation of stormwater management systems to reduce pollutants in receiving waters. Similarly, DEP has adopted TMDLs for nutrients in the Wekiva River System and is currently developing a Basin Management Action Plan. DEP is also pursuing rulemaking to adopt numeric nutrient criteria and more stringent stormwater treatment requirements for new development. The Wekiva Promise initiative is an educational program that DEP supports as well.

Alternative B would continue and, as appropriate, improve management actions and regulatory controls that are administered by various federal, state and local government entities. In addition, alternative B would promote a collaborative and expanded effort of water quality monitoring and control in the Wekiva basin and springshed. This alternative includes several actions that target reduced nutrient loading of the river system by minimizing existing nutrient sources and avoiding future sources.

Alternative B would also continue and, as appropriate, improve management actions and regulatory controls to protect the flow regime of the Wekiva River System. These include actions related to monitoring, management, and water conservation. Alternative B would also promote a multiagency collaborative effort to enhance protection of the water quantity of the Wekiva River System. The proposed actions in this alternative could affect current and future land uses throughout the Wekiva watershed and springshed.

Alternative B includes many actions that would improve water quality and quantity. Refer to the analysis of water quality and quantity impacts of alternative B for an explanation of these actions.

Natural Resource Inventories and Monitoring. As described in alternative A, the flora and fauna of the Wekiva basin are spread across a mosaic of lands managed by multiple state and local agencies, as well as large and small tracts of interspersed private lands that are within these jurisdictions. Counting and monitoring of wildlife and plant populations throughout the basin can be challenging. Currently, federal, state, and local agencies monitor selected species populations on a jurisdiction basis and support or permit a variety of other research and monitoring efforts that contribute to the knowledge base.

Alternative B would promote an increased level of wildlife and plant inventory and monitoring. This alternative includes objectives that would pursue

(1) species-specific surveys followed by annual monitoring for aquatic invertebrates in the Wekiva River System and springs such as Wekiwa Springs hydrobe, Wekiwa siltsnail, and Orlando cave crayfish;
(2) a continued effort to monitor the condition of, and any changes to, submerged aquatic vegetation beds, particularly eelgrass beds;
(3) monthly bird surveys on the Wekiva River System and surrounding riverine systems, and an annual report that assesses trends in bird populations;
(4) an assessment of the extent to which West Indian manatees use the Wekiva River and the various factors associated with their feeding, movement, and other behaviors in relation to the St. Johns River;

(5) annual monitoring programs for reptiles and amphibians;
(6) actions to monitor movement and behavior patterns of bears and other wildlife, including the use of wildlife crossings;
(7) consultation with local governments, environmental agencies, and conservation organizations to identify critical and unique features for protection; and
(8) expansion of monitoring of invasive and exotic vegetation, fish, and invertebrates within the Wekiva River System in conjunction with control efforts.

Prescribed Fire. Wildfire is an important attribute in maintaining healthy, diverse natural communities. Fire helps prevent the proliferation of invasive, exotic plant species and maintain a healthy distribution and density of native species. Some plant species even require fire to facilitate seed propagation as part of their natural life cycle. As described in the impact analysis of alternative A, various land management agencies in the Wekiva River basin have incorporated prescribed fires into their land management activities to replicate the natural process that has been historically suppressed. Alternative B would continue and improve these current prescribed fire actions in the basin. Furthermore, as this land management tool becomes more accepted and understood by the public, more widespread use of prescribed fire might occur in the Wekiva basin.

Cumulative Effects

Many existing and foreseeable future effects and trends could continue to adversely affect wildlife and habitat, including special status species. Examples of these include degradation of habitat and disturbance of wildlife from increased recreational use, invasive and exotic species, habitat fragmentation caused by roads and development, wildlife mortality on road, and changes to water quality and quantity. Many of these threats and impacts could increase or worsen in the future with increases in population, development, roads and traffic volume, and recreational demand.

Alternative B would address these effects and trends through specific actions and a focus on greater coordination among agencies and partners. Because existing management efforts would continue in addition to these actions, alternative B would be *not likely to adversely affect* special status species (determined as per compliance with Section 7 of the Endangered Species Act).

HISTORIC AND CULTURAL RESOURCE VALUES

METHODS OF ASSESSING EFFECTS

In this environmental assessment, impacts on historic and cultural resource values are described in terms of type, context, duration, and intensity, which is consistent with the regulations of the CEQ that implement NEPA. These impact analyses are intended to comply with the requirements of both NEPA and Section 106 of the National Historic Preservation Act (NHPA). The NPS must comply with these laws for federal undertakings. Actions by a state or county agency would need to comply with Florida state laws and regulations.

In accordance with the Advisory Council on Historic Preservation's regulations (36 CFR Part 800, Protection of Historic Properties), a determination of either *adverse effect* or *no adverse effect* must also be made for affected National Register listed or eligible cultural resources. An *adverse effect* occurs whenever an impact alters, directly or indirectly, any characteristic of a cultural resource that qualifies it for inclusion in the National Register, e.g. diminishing the integrity (or the extent to which a resource retains its historic appearance) of its location, design, setting, materials, workmanship, feeling, or association. Adverse effects also include reasonably foreseeable effects caused by the alternatives that would occur later in time, be farther removed in distance, or be cumulative (36 CFR 800.5, Assessment of Adverse Effects). A determination of *no adverse effect* means there may be an effect, but the effect would not diminish the characteristics of the cultural resource that qualify it for inclusion in the National Register.

Because this environmental assessment is written by a federal agency, a Section 106 summary is included in the impact analysis sections. The Section 106 summary is **an assessment of the effect of the undertaking (implementation of the alternative)** based on the criterion of effect and criteria of adverse effect found in the advisory council's regulations.

To provide a measurement for quantifying the intensity of the impacts on historic and cultural resource values, the definitions for impact intensity and thresholds are included below.

Negligible: The effects on the resource(s) would be barely measurable, with no perceptible consequences on the historic and cultural resource values of the river system. The Section 106 determination of effect for properties listed or eligible for listing on the National Register would be *no adverse effect*.

Minor: The effects on the resource(s) would be discernible, but would not diminish or benefit the historic and cultural resource values of the river system. The determination of effect for Section 106 would be *no adverse effect*.

Moderate: The effects on the resource(s) would be discernible, and would diminish or benefit the historic and cultural resource values of the river system. If resources are diminished, the determination of effect for Section 106 would be *adverse effect*. A memorandum of agreement is executed among the NPS and applicable state or tribal historic preservation officer and, if necessary, the Advisory Council on Historic Preservation in accordance with 36 CFR 800.6(b). Measures identified

in the memorandum of agreement to minimize or mitigate adverse impacts reduce the intensity of impact under NEPA from major to moderate.

Major: The effects on the resource(s) would be immediately discernible, and would severely diminish or greatly benefit the historic and cultural resource values of the river system. If resources are diminished, the determination of effect for Section 106 would be *adverse effect*. Measures to minimize or mitigate adverse impacts cannot be agreed upon, and the NPS and applicable state or tribal historic preservation officer and/or advisory council are unable to negotiate and execute a memorandum of agreement in accordance with 36 CFR 800.6(b).

EFFECTS OF ALTERNATIVE A

Analysis

As stated in Chapter 1, this environmental assessment addresses primarily archeological resources that are the physical evidence of past human activity and can represent both prehistoric and historic occupations. The following would affect these resource values.

Research and Surveys. The historic and cultural resources of the Wekiva River basin are spread across a mosaic of lands managed by various state and local agencies, as well as large and small tracts of interspersed private lands. Some of the lands within Seminole State Forest have been surveyed for archeological resources. Only portions of the three state parks (Lower Wekiva River Preserve State Park, Rock Springs Run State Reserve, and Wekiwa Springs State Park) have been systematically surveyed due to the high cost of surveying and lack of funding. Some public and private lands have been selectively examined by professional archeologists, however, additional undocumented sites may exist in the basin.

As a result of this limited approach, gaining an understanding about historical resources within a larger regional context is challenging. The existing archeological and historical data point to a long and rich human history in the river basin, extending over 10,000 years. However, without a basinwide understanding of the historic resources in the region, decision-making on issues that might affect these properties becomes more difficult.

Alternative A would continue the current agency and project-specific survey approach.

Monitoring Archeological Resources. Impacts on archeological resources are a result of both natural and human causes. Naturally occurring impacts include erosion, animal burrowing, slumpage, and tree fall. Human activities also play a role in the degradation of both submerged and terrestrial archeological sites. Shell middens are particularly vulnerable to the effects of people, which include vandalism, looting, shell mining, bulldozing, vegetation trampling, and littering. Several midden sites represent the only visible and accessible high ground along various river segments. At least 18 shell middens on the riverbanks in the state parks have been impacted by these activities.

Although most boaters only access the rivers via designated entry/exit points, many visitors are getting out of their boats and using nondesignated areas, including midden sites, for resting, or picnicking. Some areas are also being used heavily as party spots for various groups. Boaters who access various shoreline sites often use the riverbanks, including several middens, as restrooms. The use of archeological

sites in this manner results in the continuing degradation of these resources.

Agencies with jurisdiction under existing state law and regulation are required to monitor and protect archeological resources. Under alternative A, these actions would continue. The three state parks, Seminole State Forest, and the St. Johns River Water Management District all have guidelines and personnel trained to recognize sites and to monitor ground-disturbing activities in consultation with the Florida Division of Historical Resources. The St. Johns River Water Management District has one archeologist and uses consultants as needed. Seminole State Forest also has one archeologist. Law enforcement personnel would receive training in archeological resource protection as staff time and budgets permitted. The state agencies also have access to the Bureau of Archaeological Research Stewardship Volunteer Program and the Sitewatch Program.

Unlike state land holdings, county and municipal laws and regulations generally do not provide a legal framework for law enforcement in regard to archeological and historic sites, although some land use codes require that these resources be taken into account for planned ground-disturbing activities associated with land development. With the exception of human burials, private lands are generally exempt from state and federal laws governing historical and archeological resources. Land development activities that require federal funding or permitting are subject to federal preservation laws.

Because of the fragmented jurisdiction in the river system under alternative A, monitoring would be sporadic and protection limited, resulting in a continued adverse effect on historic and cultural resource values. These impacts could become worse with anticipated future increases in recreation demand and regional population growth.

Public Education and Interpretation. Education and resource interpretation programs in public recreation areas are integral to making the public aware of various cultural resource issues, site history, stewardship opportunities, visitor guidelines, and official regulations. Currently, educational and interpretive signs regarding the history and culture of the region are relatively limited in the Wekiva River basin. For example, in the Rock Springs Run State Reserve, there is an interpretive boardwalk built next to a midden known as Twin Mounds.

The management plan for the three Florida state parks in the basin includes some future actions that might increase interpretation and educational amenities in the parks. However, given the number of river system users and the multiple access points, many visitors to the river system might not be aware of important information that might affect their experience or might alter their behavior while on the river system. If visitors become more aware of the river system's cultural history, they might be more likely to avoid behaviors that have adverse impacts to shell middens and other archeological sites. Over the past year, a new partnership between Rollins College and the Wekiva River Aquatic Preserve has resulted in several inspections and clean-up activities at Shell Island. Aquatic preserve staff have posted "No Trespassing" signs and educational signs advising users of the importance of resources on Shell Island; however these signs have been repeatedly torn down by adamant offenders. Law enforcement actions are necessary to remedy this situation. Alternative A maintains the current

level of activities and actions that relate to visitor education..

Cumulative Effects

The historic and cultural resource values of the river corridor has been and could continue to be adversely affected by private land development along the shorelines, public projects, and increased recreational use due to population growth in the region. The ongoing and possibly increasing public access to the river system would also continue to have long-term, minor to moderate, adverse, and localized to widespread impacts on the archeological sites and historic landscapes of the river system. Alternative A would continue and maintain the existing level of action on these issues.

Actions taken by agencies might affect cultural resources. For example, prescribed fires could adversely affect surface artifacts or historic structures, if any are present. Agencies are encouraged to conduct cultural resource surveys or clearances before commencing potentially disturbing activities to avoid or mitigate adverse effects caused by such actions.

Alternative A would result in no new effects on historic and cultural resource values but would continue *adverse effects* on some cultural resources under Section 106.

EFFECTS OF ALTERNATIVE B

Analysis

Implementing alternative B, the preferred alternative, would increase management emphasis and interagency coordination to preserve the historic and cultural resources of the Wekiva Wild and Scenic River System. When compared to the current conditions and management efforts, this holistic and collaborative approach could strengthen resource protection and enhance this value. The following would affect historic and cultural resource values.

Research and Surveys. As stated in alternative A, the historic and cultural resources of the Wekiva River basin are spread across a mosaic of lands managed by various state and local agencies, as well as large and small tracts of interspersed private lands that are within multiple local government jurisdictions. Given the number of agencies with proprietary and regulatory interests in the Wekiva River basin, an opportunity exists for a collaborative, intergovernmental effort that considers cultural resource protection issues from a more holistic, regional perspective. Because alternative B would institute a river system management plan that relates to many of the surrounding public and private lands, this alternative could result in a comprehensive resource management effort.

To date, under this alternative, the following research studies have been identified:

- Native American cultural heritage in the region
- a comprehensive history of public lands, including all known historic and cultural properties
- the history of industry and transportation development in the context of economic activities such as farming, timber, turpentine production, and tourism
- land conservation, private land grants, and public land acquisition and development (e.g., state parks and forests, the role of the Apopka Sportsmen’s Club, the Seminole Woods property, and the Spanish Land grants)

Under alternative B, areas that have not been previously surveyed would be identified and prioritized. These areas would be surveyed and documented, and a record of each resource (site, building, landscape or historic district) would be recorded with the Florida Division of Historical Resources. Also under alternative B, a system to prioritize significant resources would be established for monitoring and protection purposes (see following monitoring section).

This alternative would involve a multijurisdictional, coordinated approach to survey and research, providing the information needed for agencies and private landowners to make informed decisions about land management practices and protection of historic properties. Information from these regional studies could also be used by state agencies, tribes, local governments, and communities to educate local residents and visitors about the rich cultural heritage of the Wekiva River System and surrounding area.

Monitoring Archeological Resources. Numerous archeological sites including shell middens are present along the waterways and contribute to the historic and cultural resource values of the Wekiva River System. As stated in alternative A, impacts on archeological resources are a result of both natural and human causes.

Alternative B includes a series of objectives and actions that would help to protect these archeological sites. These include assigning at least one trained public agency staff member ("Cultural Resource Coordinator") to regularly monitor resources and implement protection and management strategies. In addition, this alternative includes the implementation of the state Division of Historical Resources (Bureau of Archaeological Research Division's) "Best Management Practices (BMPs) Guide to Protecting Archaeological Sites" to stabilize and protect, at a minimum, the high priority sites. A memorandum of understanding could be created to establish this position through a partnership of multiple agencies.

Also, additional law enforcement personnel could receive training in archaeological resource protection through the Bureau of Archaeological Research. Off-duty law enforcement officers could patrol high priority sites on weekends and holidays.

This alternative emphasizes shoreline vegetation stabilization, which would also contribute to the protection and stabilization of shell middens and other archeological sites. Alternative B would include continued consultation with the Florida Division of Historical Resources, particularly in regard to planned ground-disturbing activities.

Alternative B also has an objective to implement and strengthen development regulations and practices at publicly owned recreation areas along the Wekiva River System. These guidelines for public agencies would emphasize preservation of native vegetation, minimized land clearing and facilities construction, and reclamation plantings. Where feasible, current and future trails would be rerouted at least 50 feet from archeological sites and have adequate vegetative barriers to discourage access. These actions would help to preserve or improve the condition of both archeological sites and historic landscapes.

Public Education and Interpretation. Education and resource interpretation programs in public recreation areas are integral to making the public aware of cultural resource issues, site history, stewardship opportunities, preferred visitor behavior guidelines, and official

regulations. Educational and interpretive signs are typically the most common medium used for such programs. Currently, educational and interpretive signs are somewhat limited in the Wekiva River basin.

The management plan for the three Florida state parks in the basin includes some future actions that might increase interpretation and educational amenities on public lands. However, given the number of river system users and multiple access points, many visitors to the river system might not be aware of important information that might affect their experience or might alter their behavior while on the river system. Alternative B would include provisions that establish partnerships with private businesses, concessionaires, and other appropriate entities that could foster visitor education. As part of this effort, local and state agencies in the basin could cooperatively establish a systemwide educational and interpretive program that sends a consistent message to visitors about river use and behavior, as well as educates them on the Wekiva River System's natural and cultural resources, its history, and threats.

Cumulative Effects

Historic and cultural resource values of the Wekiva Wild and Scenic River System have been and could continue to be adversely affected by private land development along the shorelines (e.g., docks), public projects, and increased recreational use due to population growth in the region. The continued and likely increasing public access to the river system would also continue to have adverse effects on the historic and cultural resource values of the river system.

Actions taken by agencies might affect cultural resources. For example, prescribed fires could adversely affect surface artifacts or historic structures, if any are present. Agencies would be encouraged to conduct cultural surveys or clearances before commencing potentially disturbing activities to avoid or mitigate adverse effects caused by such actions.

Alternative B includes multiple actions and provisions that could help minimize or mitigate the impact of various threats, and thus would help protect resources that contribute to the value of the river system. Overall, implementing alternative B would have *no adverse effect* on cultural resources and values under Section 106 of the National Historic Preservation Act.

WATER QUALITY AND QUANTITY VALUES

METHODS OF ASSESSING EFFECTS

To provide a measurement for quantifying the intensity of the impacts on water quality and quantity values, the definitions for impact intensity and thresholds are included below.

Negligible: The action would not have any noticeable or measureable changes on water quality or water quality conditions.

Minor: The effects on water resources would be detectable and measurable, but very limited in scale and degree. The action would yield changes to water quality or water quantity that are minimal and of little consequence.

Moderate: The effects on water resources would be apparent and would have some influence on river health. The action would yield changes to water quality or water quantity that have notable consequences, but that are not widespread, severe, or highly favorable.

Major: The effects on water resources would be very apparent and would have direct and substantial influence on river system health. The action would yield considerable changes to water quality or water quantity that have widespread and severe or exceptionally favorable consequences.

EFFECTS OF ALTERNATIVE A

Analysis

The water quality and quantity values of the Wekiva Wild and Scenic River System could be affected by the following.

Effects of Recreational Uses on Instream Water Quality. The water quality of the Wekiva River System has been degraded by various recreation activities in high use areas. Boaters, swimmers, and tubers who access the shorelines and middens while recreating throughout the river system have contributed to shoreline erosion and sedimentation in the water by climbing and walking on unstable slopes. These activities have also displaced shoreline vegetation in several areas in the system. Once the shoreline vegetation is lost, the slopes are even more susceptible to erosion and sedimentation. Irresponsible users have also deposited litter (e.g., cans, plastic waste) in the water. Over time littering can contribute to degradation in water quality.

Motorized watercraft also have adverse effects on instream water quality through lost engine fuel, turbidity, and propeller damage to native aquatic vegetation . (Healthy aquatic vegetation, including eel grass beds, can benefit water quality.)

In the future, these impacts could become worse with anticipated increases in regional population and recreation demand. Alternative A would maintain current actions in terms of managing the impact of recreation.

Effects of Land Use on Instream Water Quality. Nutrient loading and pollution have several adverse effects on aquatic systems. Nutrients from contributing areas of Lake, Seminole, and Orange counties are causing degradation of the aquatic communities that were key factors in the Wekiva Wild and Scenic River designation. Nutrient loading and pollution could threaten the river system to even greater degrees in the future.

High nutrient levels contribute to algal blooms, infestations of invasive or exotic vegetation, and direct population loss of some sensitive endemic species. Measuring, reducing, and mitigating these water quality effects is challenging because nutrient loading to the river system has many sources. Nutrient loading of the river system occurs through th both surface water and groundwater flows. Thus, to fully assess impacts from nutrient loading, land uses throughout the surface watershed and the groundwater springshed must be considered. Depending on the location within the basin or springshed and the topography or underground composition, a particular land use could contribute nutrient loading to the surface water (via runoff), to the groundwater (via groundwater recharge), or both. The watershed and springshed of the Wekiva River System cover a very large land area. Complicating matters, the watershed and springshed boundaries extend across several government jurisdictions and a variety of land use types (e.g., from high-density, urban residential lands to open, agricultural lands). Different land uses and land use practices contribute different levels of nutrient loading.

In the Wekiva River System, nitrogen has been determined to be the controlling factor and therefore most important from the standpoint of nutrient loading. Collectively, the many nitrogen sources in the Wekiva watershed and springshed have considerable adverse effects on water quality. These sources include, but are not limited to, fertilizers used on lawns and landscaping in residential and commercial areas, fertilizers used by agriculture, effluent from septic systems, and effluent from wastewater treatment plants. In addition to nutrient loading, pollution from automobile fluids, commercial and industrial waste, household chemicals, and medical substances pose a threat to the Wekiva River System through surface water drainage and groundwater infiltration.

As new development occurs in the Wekiva basin and springshed, the effects of land use and land use practices on water quality could become worse. Future population growth could also bring an increase in the number of residential properties served by septic systems and an increase in chemically maintained and fertilized lawns and landscapes. Both of these changes in the local landscape could increase the threat of adverse water quality impacts on the Wekiva River System.

Alternative A would continue the current management actions and regulatory efforts of the various state and local government agencies that have jurisdiction in the Wekiva River basin and springshed, including the TMDL program, development of a Wekiva Basin Management Action Plan, actions required in the Wekiva area by special state legislation, and support of the Wekiva Promise initiative.

Effects of Land Use on Flow Regimes (Water Quantity Conditions). Instream flow throughout the Wekiva River System is affected by several factors throughout the watershed and springshed. Land development, increasing water demand, and climatic variations and events are notable factors that affect flows in the Wekiva River System.

As development continues, the amount of impervious surface area would continue to increase. This landscape alteration could directly diminish groundwater recharge, which in turn, diminishes spring flows into the river system. An increase in impervious surfaces can also alter the surface flow regimes of an area due to greater evaporation loss and the redirection of stormwater.

Because the Wekiva River System is heavily dependent on spring flows, it is more sensitive to changes in groundwater levels. An increasing regional population and expanding urban area would continue to increase demands on central water supply systems that rely on groundwater wells. Impacts on the Wekiva system may also occur if surface waters from the Wekiva River System are used as a supply source for future water demands.

Although citrus and crop production are in decline, other forms of agriculture, such as indoor foliage nurseries, continue to use significant quantities of water as well.

Ultimately, instream flows also directly affect several other values of the Wekiva Wild and Scenic River System. The condition of water quality, historic and cultural resource values, wildlife and habitat, and recreational uses are all dependent on adequate instream flows. Thus, major alterations to flows in the Wekiva River System could affect several other values that contribute to the Wild and Scenic River designation.

Agencies have implemented several programs to address the potential impacts of land use on flow regimes. These include existing consumptive use and environmental resource permitting programs with special Wekiva basin and springshed recharge criteria, floodplain protection criteria, minimum flows and levels requirements, and water conservation requirements.

Alternative A would continue these current actions to protect the flow regime of the Wekiva River System. However, with land use changes, population growth and the increased water demand that would accompany this growth, additional comprehensive, intergovernmental coordination and, as appropriate, additional actions would be beneficial, enhancing the protection of the Wekiva River System and all of its associated resource values.

Cumulative Effects

A variety of state, regional, and local government policies and regulatory actions have contributed to the protection of water quality and flow regimes. To date, management actions by multiple agencies have helped protect the flow regime in the Wekiva River System. In 2007 the district concluded that the existing assigned minimum flows and levels for these springs were adequate to protect the system from "significant harm". A district reevaluation of the Wekiva River minimum flows and levels is scheduled for 2013. Although minimum flows and levels are being met presently, increased water demand in the basin and springshed could contribute to reduced flows. This pressure would likely be compounded by the increased demand from future population growth in the region.

Currently, various agencies are taking steps to reduce pollution and nutrient loading in the Wekiva basin and springshed. Some examples of existing agency actions are as follows:

(1) The St. Johns River Water Management District has developed Pollutant Load Reduction Goals (PLRGs) for Wekiwa Springs, the Wekiva River, Rock Springs, and Rock Springs Run that establishes nutrient loading targets and analyzes discharges into waters that have impaired water quality. FDEP has used these PLRGs to adopt Total Maximum Daily Load (TMDL) thresholds.
(2) The Florida Consumer Task Force has recommended a model ordinance for local governments to enforce fertilizer levels.

(3) The Florida Department of Environmental Protection has established requirements for advanced wastewater treatment in the Wekiva Study Area.
(4) The Florida Department of Health has proposed draft nutrient load reduction rules for domestic onsite wastewater disposal systems. (These are on hold pending legislative action).
(5) The Florida Department of Environmental Protection has adopted Total Maximum Daily Loads for Wekiwa Springs, the Wekiva River, Rock Springs, and Rock Springs Run, as well as several lakes and stream sections within the basin and outside of the Wild and Scenic designated waterways. Under existing law, FDEP will develop a Basin Management Action Plan to meet TMDLs.

As discussed above, water quality and water quantity conditions of the river system could be adversely affected by increased recreational use, increased development, and increased water demands due to population growth.

Alternative A would continue the implementation of existing programs to address these issues.

EFFECTS OF ALTERNATIVE B

Analysis

Implementing alternative B, the preferred alternative, would enhance actions and interagency coordination on protecting the water quality and quantity in the Wekiva River System. When combined with the ongoing management efforts described by alternative A, the actions associated with the collaborative, holistic approach of alternative B could have positive effects on water quality and water quantity issues. The water quality and water quantity conditions in the Wekiva River System could be affected by the following.

Effects of Recreational Uses on Instream Water Quality. As described in alternative A, recreation in the Wekiva River System has contributed to a degradation of water quality. Boaters, swimmers, and tubers who access the shorelines and middens have contributed to shoreline erosion and sedimentation in the river system by climbing and walking on unstable slopes. These activities have also displaced shoreline vegetation in several areas. Irresponsible users have also deposited litter in the water, which contributes to degradation in water quality. Motorized watercraft also have adverse effects on water quality through spilled engine fuel and propeller damage to native aquatic vegetation (which impacts water quality). With the projected increase in recreation demand and regional population in the future, these threats to water quality would likely increase or worsen if not adequately addressed.

The objectives and actions for recreation management in alternative B could help remedy or minimize this issue if they are funded and implemented effectively. By completing a recreation assessment, creating a recreation facility master plan, and assessing and monitoring user capacity thresholds for water quality, alternative B could have a positive effect on maintaining or improving water quality conditions related to recreational use in the river system. The expansion of partnerships with private businesses and concessionaires who operate on the Wekiva River System (which would include a public awareness/outreach component) could serve as a preventive measure to reduce shoreline impacts by making users more aware of the implications of their actions on the river system.

Another preventive measure under this alternative would be the development of events and media announcements that

encourage the public to experience and learn about the Wekiva Wild and Scenic River System and understand its status and health.

Effects of Land Use on Instream Water Quality. As described in alternative A, nutrient loading and pollution have several adverse effects on aquatic systems, including the degradation of the aquatic communities that were key factors in the Wekiva Wild and Scenic River designation. Nutrient loading and pollution might threaten the river system to even greater degrees in the future.

Deteriorated water quality conditions in the Wekiva River System caused by high nutrient levels can contribute to algal blooms, infestations of invasive exotic vegetation, and direct population loss of some sensitive endemic species. Measuring, reducing, and mitigating these water quality effects is challenging because nutrient loading to the river system has many sources. The watershed and springshed of the Wekiva River System cover a very large land area. Complicating matters, the watershed and springshed boundaries extend across several government jurisdictions and a variety of land use types.

Sources of nutrient loading include but are not limited to fertilizers used on lawns and landscaping in residential and commercial areas, fertilizers used by agriculture, effluent from septic systems, and effluent from wastewater treatment plants. In addition, pollution from automobile fluids, commercial and industrial waste, household chemicals, and medical substances pose a threat to the Wekiva River System through surface water drainage and groundwater infiltration.

In the future, as development continues to occur in the Wekiva basin and springshed, the effects of land use and land use practices on water quality could become worse. Future population growth could also bring a notable increase in the number of residential properties served by septic systems and an increase in chemically maintained and fertilized lawns and landscapes. Both of these changes in the local landscape could increase the threat of adverse water quality impacts on the Wekiva River System.

Alternative B would continue and, as appropriate, improve management actions and regulatory controls that are administered by various state and local government entities (see alternative A). In addition, alternative B would promote a collaborative and expanded effort of water quality monitoring and control in the Wekiva basin and springshed. This alternative includes numerous actions that target reduced nutrient loading into the river system by minimizing existing nutrient sources and avoiding future sources. The proposed actions in this alternative would affect current and future land uses throughout the Wekiva watershed and springshed. Some examples of these alternative B objectives and related actions are as follows:

(1) Protect springs, wetlands, surface waters, karst features, and high groundwater recharge areas in the basin and springshed through land acquisition and conservation easements.
(2) Continue to strictly interpret the “Outstanding Florida Waters” statute by reviewing and investigating activities that may degrade water quality.
(3) Evaluate and as appropriate strengthen stormwater management ordinances and regulations.
(4) Support the implementation of the Wekiva River System Total Maximum Daily Loads/Basin Management Action Plan program; and review and comment on future total

maximum daily load evaluations by state agencies.

(5) Develop a communication program for residents, businesses, landscaping professionals, and public employees to address fertilizer application practices and the harm caused by nutrient loading to surface water and groundwater quality. Continue to support the tenets of the Wekiva Promise initiative.

(6) Evaluate and implement feasible stormwater retrofit projects to meet existing requirements and identify new projects to provide innovative nutrient removal treatment.

(7) Assess and as appropriate strengthen local and state regulations on setbacks, buffers, and allowable land uses and discharges near karst features.

(8) Encourage proper maintenance of septic systems and as appropriate retrofitting with performance-based on-site wastewater treatment systems that minimize nutrient loading.

(9) Convert existing urban areas with a high density of individual onsite septic systems to central sewer where feasible and environmentally necessary.

(10) Enforce, assess, and as appropriate strengthen regulations and education efforts of state agencies and local governments relating to lawn and landscaping practices and the responsible use of fertilizer; and promote education on the fertilizer effects of using reclaimed water for irrigation.

(11) Support research and monitoring regarding the impacts of land application of reclaimed water on shallow groundwater and the Floridan Aquifer.

(12) Support additional research relating to the health of aquatic vegetation and algal growth that can be indicators of nutrient levels.

Effects of Land Use on Flow Regime (Water Quantity Conditions). As described in alternative A, instream flow of the Wekiva River System is affected by several factors throughout the watershed and springshed. Land development, increasing water demand, and climatic variations and events are some of the most notable factors that affect instream flows in the Wekiva River System.

As development continues in the Wekiva springshed, the amount of impervious surface area would continue to increase, which could diminish groundwater recharge and spring flows into the river system. An increase in impervious surfaces can also alter the surface flow regimes of an area due to greater evaporation loss and the redirection of stormwater.

Because the Wekiva River System is heavily dependent on spring flows, it is more sensitive to changes in groundwater levels. An increasing regional population and expanding urban area would also continue to increase demands on central water supply systems that rely on groundwater wells. This growth may also have considerable effects on the Wekiva System if surface waters in the basin are used as a supply source for these future water demands.

Although citrus and crop production are in decline, other forms of agriculture, such as indoor foliage nurseries, continue to use significant quantities of water as well.

Agencies have implemented several programs to address the potential impacts of land use on flow regimes. These include existing consumptive use and environmental resource permitting programs with special Wekiva basin and springshed recharge criteria, floodplain protection criteria,

minimum flows and levels requirements, and water conservation requirements.

Alternative B would continue and, as appropriate, improve management actions and regulatory controls to protect the flow regime of the Wekiva River System. In addition, alternative B would promote an expanded, collaborative, intergovernmental effort to protect this hydrologic resource. The proposed actions in this alternative would affect current and future land uses throughout the Wekiva watershed and springshed. Some examples of these alternative B objectives and related actions are as follows:

A. (1) Support planned efforts to update existing minimum flows and levels and determine if additional or revised minimum flows and levels are needed throughout the basin to protect the Wekiva River System.
(2) Evaluate existing and proposed water withdrawals and participate in rulemaking processes that would help strengthen policies and regulations that further limit water consumption, as appropriate.
(3) Evaluate the outstandingly remarkable values of the Wekiva River System that are affected by flows and water levels to determine if additional actions are needed to protect them.
(4) Work with agencies, local governments, and the private sector to promote water conservation measures that relate for example to water rate structures, irrigation systems, fixtures and appliances, landscaping, low-impact development standards, and designs that protect nonirrigated open space.
(5) Promote the efficient use of reclaimed water in the basin and springshed and evaluate whether the use of reclaimed water (including supplemented reclaimed water sources) has an adverse impact; evaluate whether the transport of water outside of the basin or springshed has an adverse impact.
(6) Encourage nurseries, landscaping contractors, and agricultural operations to comply with irrigation best management practices.

Cumulative Effects

As discussed above, the water quality and water quantity conditions of the Wekiva River System could be adversely affected by recreational use, development, water demands, and land use activities. Many of these threats could increase in the future with continued development and population growth throughout the region.

Alternative B includes multiple actions and provisions that could help minimize the impact of these threats and thus could contribute to protecting water quality and the water quantity. In addition, land management agencies in the area have management plans that target the public acquisition of private lands in critical groundwater recharge areas (e.g., Florida State Parks and the St. Johns River Water Management District).

CONCLUSION

Alternative A would result in the continuation of existing programs and management efforts that benefit outstandingly remarkable values including scenic, recreation, wildlife and habitat, historic and cultural resources, and water quality and quantity. However due to various threats to the river system and its values relating largely to greater impacts of regional population growth and recreation demand, some long term adverse impacts to outstandingly remarkable values of the Wekiva Wild and Scenic River System could result that range from minor to moderate, and localized to widespread.

Under Alternative B, existing programs and management efforts would continue as well; however, those efforts would be enhanced by the implementation of several additional goals, objectives and actions intended to further protect outstandingly remarkable values. These actions include but are not limited to research and monitoring, evaluating the efficacy of current regulations and management efforts, and implementing improvements as appropriate. Overall, the coordinated, multiagency actions contained in alternative B would contribute to the protection of scenic values, recreation values, wildlife and habitat values, historic and cultural resources values, and water quality and quantity values.

Another beneficial component of Alternative B is the implementation of a user capacity program to identify potential impacts from resource use and an impact monitoring program to determine whether levels of change are acceptable. This would include a systemwide recreational assessment and the development of a facilities master plan to ensure that outstandingly remarkable values are adequately protected even if recreational demands increase in the future.

Finally, through continuing cooperation with the National Park Service, alternative B provides greater opportunities for federal funding to implement actions identified.

For all of these reasons, Alternative B would result in long-term, localized and widespread beneficial impacts, and is therefore the preferred alternative.

Alternative A corresponds to the continuation of current management activities, and therefore is *not likely to adversely affect* special status species, determined as per compliance with Section 7 of the Endangered Species Act. Alternative B corresponds to the continuation of current management activities, in addition to several new or enhanced initiatives intended to further protect wildlife and habitat associated with the Wekiva River System, and therefore is also *not likely to adversely affect* special status species, determined as per compliance with Section 7 of the Endangered Species Act. Alternative A would result in no new effects on historic and cultural resource values but would continue *adverse effects* on some cultural resources under Section 106 of the National Historic Preservation Act. Overall, the implementation of alternative B would have *no adverse effect* on cultural resources and values under Section 106 of the National Historic Preservation Act.

Chapter 5 - Consultation and Coordination

PUBLIC AND AGENCY INVOLVEMENT

The *Comprehensive River Management Plan / Environmental Assessment* for the Wekiva Wild and Scenic River System represents the work of the Wekiva River System Advisory Management Committee and the NPS. Consultation and coordination among the agencies and the public were an important part of the planning process. Opportunities have existed to comment on the environmental assessment through the advisory management committee, by participation in public meetings, and by submitting comments on the NPS planning website (www.parkplanning.nps.gov).

COMMITTEE AND PUBLIC MEETINGS

The following describes the public involvement and coordination activities that occurred during the Wekiva River System management planning process through February 2011. (All meetings were held at Sylvan Lake Park in Seminole County unless otherwise noted.) The advisory management committee meetings were open to the public.

- 02/08/2006 Wekiva River System Advisory Management Committee meeting
- 04/04/2006 Wekiva River System Advisory Management Committee meeting
- 07/12/2006 Wekiva River System Advisory Management Committee meeting
- 12/05/2006 Wekiva River System Advisory Management Committee meeting
- 02/07/2007 Wekiva River System Advisory Management Committee meeting
- 03/10/2007 Wekiva River Fest at Wekiwa Springs State Park (annual public event)
- 03/28/2007 Wekiva River System Advisory Management subcommittee meeting to work on the scope of work for the Wekiva River System Management Plan (held at Wekiwa Springs State Park)
- 04/03/2007 Wekiva River System Advisory Management Committee meeting
- 06/06/2007 Wekiva River System Advisory Management Committee meeting
- 08/07/2007 Wekiva River System Advisory Management Committee meeting
- 09/26/2007 Wekiva Wild and Scenic River Community Workshop at Wekiwa Springs State Park for the public to learn about the river management plan and to solicit public input (100 people attended)
- 11/05/2007 Wekiva River System Advisory Management subcommittee meeting via conference call to work on the Wekiva River System Management Plan
- 12/04/2007 Wekiva River System Advisory Management Committee meeting
- 02/13/2008 Wekiva River System Advisory Management Committee meeting
- 04/15/2008 Wekiva River System Advisory Management Committee meeting
- 06/04/2008 Wekiva River System Advisory Management Committee meeting
- 09/15/2008 Wekiva River System Advisory Management Committee subcommittee meeting to work on finalizing the Draft Wekiva River System Management Plan (held at Wekiwa Springs State Park)
- 12/02/2008 Wekiva River System Advisory Management Committee meeting
- 12/10/2008 National Wild and Scenic Rivers Committee Meeting, Sarasota, Florida: field trip on the Wekiva River with Wekiva River System Advisory Management Committee members
- 02/04/2009 Wekiva River System Advisory Management Committee meeting
- 03/05/2009 Wekiva River System Advisory Management subcommittee conference call to discuss and edit water quantity goals, objectives, and actions
- 03/13/2009 Wekiva River System Advisory Management subcommittee conference call to further edit,

refine and finalize the water quantity goals, objectives, and actions

06/02/2009 Wekiva River System Advisory Management Committee meeting

06/16-17/2009 Wekiva River System Advisory Management Committee participants, Denver Service Center representatives, and other NPS offices met to discuss the planning process and conduct field trip and field study on the Wekiva River system

08/05/2009 Wekiva River System Advisory Management Committee meeting

01/19/2010 Wekiva River System Advisory Management Committee meeting

03/09/2010 Wekiva River System Advisory Management Subcommittee meeting to work on the Environmental Assessment

04/07/2010 Wekiva River System Advisory Management Committee meeting

06/08/2010 Wekiva River System Advisory Management Committee meeting

08/04/2010 Wekiva River System Advisory Management Committee meeting

09/27/2010 Wekiva Project Selection Subcommittee meeting

10/05/2010 Wekiva River System Advisory Management Committee meeting

12/08/2010 Wekiva River System Advisory Management Committee meeting

02/08/2011 Wekiva River System Advisory Management Committee meeting

04/06/2011 Wekiva River System Advisory Management Committee meeting

06/07/2011 Wekiva River System Advisory Management Committee meeting

08/16/2011 Wekiva River System Advisory Management Committee meeting

CONSULTATION WITH OTHER AGENCIES/OFFICIALS AND ORGANIZATIONS (TO DATE)

U.S. Fish and Wildlife Service, Section 7 Consultation

During preparation of this document, NPS staff coordinated with the U.S. Fish and Wildlife Service (USFWS), Jacksonville, Florida, office. A letter was sent to the U.S. Fish and Wildlife Service on July 28, 2009 (see appendix F), initiating informal consultation and requesting a species list. The Park Service received a response from the U.S. Fish and Wildlife Service dated September 1, 2009, with information on federally listed species (see appendix F). The listed species included in this environmental assessment was compiled using information that the USFWS provided (see appendix C).

In accordance with the Endangered Species Act and relevant regulations at 50 CFR Part 402, NPS staff determined that the preferred alternative is *not likely to adversely affect* the eastern indigo snake, Florida scrub-jay, West Indian manatee, or wood stork. NPS managers have provided a copy of this environmental assessment to the U.S. Fish and Wildlife Service with a request for concurrence with NPS findings. The cover letter for the environmental assessment submittal included references to the sections and pages of the environmental assessment that contain a description of the impacts on habitats and species, which will serve as the "Biological Assessment."

In addition, the advisory management committee for the Wekiva River System commits to consult the U.S. Fish and Wildlife Service on future site specific actions conducted under the framework described in this document to ensure that such actions are *not likely to adversely affect* threatened

or endangered species (determination as per compliance with Section 7 of the Endangered Species Act).

Section 106 Consultation (National Historic Preservation Act)

Federal agencies that have direct or indirect jurisdiction over historic properties are required by Section 106 of the National Historic Preservation Act of 1966, as amended (16 USC 270, et seq.), to take into account the effect of any undertaking on properties listed or eligible for listing in the National Register of Historic Places.

Section 106 applies to federal undertakings that are projects that occur on federal land, require federal permits, or involve federal funding. Because this environmental assessment is being prepared by the NPS, it is considered a federal undertaking. However, the specific projects and actions that might be taken to implement this environmental assessment would occur on state or county land and generally would not involve federal funding. These undertakings would be subject to applicable state and county laws and regulations. On state land, the implementing agency must abide by Chapter 267 (Historic Resources) of the *Florida State Statutes*, which requires that agencies consider the effects of undertakings on properties that are listed or eligible for inclusion in the National Register.

The NPS sent a letter to the Florida Division of Historical Resources/State Historic Preservation Office in 2009, inviting their participation in the planning process.

Consultation with Native Americans

The NPS recognizes that indigenous peoples might have traditional interests and rights in lands covered by this environmental assessment. Related Native American concerns are solicited through Native American consultations. The need for government-to-government Native American consultations stems from the historic power of Congress to make treaties with American Indian tribes as sovereign nations. Consultations with American Indians and other Native Americans, such as Native Hawaiians and Alaska Natives, are required by various federal laws, executive orders, regulations, and policies.

A letter was sent to the Miccosukee Indian Tribe of Florida in July 2009 to invite their participation in the planning process. In the letter, the tribe was briefed on the scope of the planning project and asked for comments. The tribe will have an opportunity to review and comment on this environmental assessment.

Consultation with Other Agencies and Organizations

The following agencies and organizations are represented on the Wekiva River System Advisory Management Committee, which was established by the designating legislation and has been a part of the planning process.

(1) The Department of the Interior, represented by the director of the NPS or the director's designee
(2) The East Central Florida Regional Planning Council
(3) The Florida Department of Environmental Protection, Division of Recreation and Parks
(4) The Florida Department of Environmental Protection, Wekiva River Aquatic Preserve
(5) The Florida Department of Agriculture and Consumer Services, Florida Forest Service, Seminole State Forest
(6) Audubon of Florida, a nonprofit organization
(7) The Friends of the Wekiva River, a nonprofit organization
(8) The Lake County Water Authority
(9) Lake County
(10) Orange County
(11) Seminole County
(12) The St. Johns River Water Management District
(13) The Florida Fish and Wildlife Conservation Commission
(14) The City of Altamonte Springs
(15) The City of Longwood
(16) The City of Apopka
(17) The Florida Farm Bureau Federation
(18) The Florida Forestry Association
(19) The Florida Chapter of The Nature Conservancy, a nonprofit organization

AGENCIES, ORGANIZATIONS, AND INDIVIDUALS RECEIVING A COPY OF THIS DOCUMENT

FEDERAL AGENCIES

Advisory Council on
Historic Preservation
U.S. Fish and Wildlife Service
(Jacksonville, Florida Office)

SENATORS AND REPRESENTATIVES

Honorable John L. Mica,
U.S. Representative, 7th District

Honorable Bill Nelson, U.S. Senator
Honorable Marco Rubio, U.S. Senator

Honorable Larry Metz,
State Representative, 25th District
Honorable Bryan Nelson,
State Representative, 38th District
Honorable Scott Plakon,
State Representative, 37th District

Honorable Andy Gardiner,
State Senator, 9th District
Honorable D. Alan Hays,
State Senator, 20th District
David Simmons,
State Senator, 22nd District

STATE, REGIONAL, AND LOCAL AGENCIES

Florida Department of Environmental Protection, Division of Recreation and Parks
Florida Department of Environmental Protection, Wekiva River Aquatic Preserve
Florida Department of Agriculture and Consumer Services, Florida Forest Service, Seminole State Forest
Florida Fish and Wildlife Conservation Commission
Florida Division of Historical Resources (State Historic Preservation Office)
St. Johns River Water Management District
Lake County Water Authority

AMERICAN INDIAN TRIBES TRADITIONALLY ASSOCIATED WITH THE RIVER SYSTEM

Miccosukee Indian Tribe of Florida

LOCAL GOVERNMENTS

Lake County
Orange County
Seminole County
City of Altamonte Springs
City of Longwood
City of Apopka

ORGANIZATIONS AND BUSINESSES

Audubon of Florida
Friends of the Wekiva River
The Nature Conservancy,
Florida Chapter
Florida Farm Bureau Federation
Florida Forestry Association

INDIVIDUALS

(For a list of individuals receiving a copy of this document, contact the Chief of Planning for the NPS Southeast Region.)


Shell Island

Appendixes, Abbreviations and Glossary, References, and Preparers and Consultants

APPENDIX A: AUTHORIZING LEGISLATION

114 STAT. 1050 PUBLIC LAW 106—299—-OCT. 13, 2000

106th Congress

An Act

To amend the Wild and Scenic Rivers Act to designate the Wekiva River and its tributaries of Wekiwa Springs Run, Rock Springs Run, and Black Water [HR. 2773] Creek in the State of Florida as components of the national wild and scenic rivers system.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.
This Act may be cited as the "Wekiva Wild and Scenic River Act of 2000".

SEC. 2. FINDINGS.

The Congress finds the following:
(1) Public Law 104—311 (110 Stat. 3818) amended section 5 of the Wild and Scenic Rivers Act (16 U.S.C. 1276) to require the study of the Wekiva River and its tributaries of Rock Springs Run and Seminole Creek for potential inclusion in the national wild and scenic rivers system.
(2) The study determined that the Wekiva River, Wekiwa Springs Run, Rock Springs Run, and Black Water Creek are eligible for inclusion in the national wild and scenic rivers system.
(3) The State of Florida has demonstrated its commitment to protecting these rivers and streams by the enactment of the Wekiva River Protection Act (Florida Statute chapter 369), by the establishment of a riparian wildlife protection zone and water quality protection zone by the St. Johns River Water Management District, and by the acquisition of lands adjacent to these rivers and streams for conservation purposes.
(4) The Florida counties of Lake, Seminole, and Orange have demonstrated their commitment to protect these rivers and streams in their comprehensive land use plans and land development regulations.
(5) The desire for designation of these rivers and streams as components of the national wild and scenic rivers system has been demonstrated through strong public support, State and local agency support, and the endorsement of designation by the Wekiva River Basin Ecosystem Working Group, which represents a broad cross section of State and local agencies, organizations, and recreational users.
(6) The entire lengths of the Wekiva River, Rock Springs Run, and Black Water Creek are held in public ownership or conservation easements or are defined as waters of the State of Florida.

SEC. 3. DESIGNATION OF WEKIVA RIVER AND TRIBUTARIES, FLORIDA, AS COMPONENTS OF NATIONAL WILD AND SCENIC RIVERS SYSTEM.

Section 3(a) of the Wild and Scenic Rivers Act (16 U.S.C. 1274(a)) is amended by adding at the end the following new paragraph:
"(161) WEKIVA RIVER, WEKIWA SPRINGS RUN, ROCK SPRINGS RUN, AND BLACK WATER CREEK, FLORIDA—The 41.6-mile segments referred to in this paragraph, to be administered by the Secretary of the Interior:

"(A) WEKIVA RIVER AND WEKIWA SPRINGS RUN.—The 14.9 miles of the Wekiva River, along Wekiwa Springs Run from its confluence with the St. Johns River to Wekiwa Springs, to be administered in the following classifications:

> "(i) From the confluence with the St. Johns River to the southern boundary of the Lower Wekiva River State Preserve, approximately 4.4 miles, as a wild river.
> "(ii) From the southern boundary of the Lower Wekiva River State Preserve to the northern boundary of Rock Springs State Reserve at the Wekiva River, approximately 3.4 miles, as a recreational river.
> "(iii) From the northern boundary of Rock Springs State Reserve at the Wekiva River to the southern boundary of Rock Springs State Reserve at the Wekiva River, approximately 5.9 miles, as a wild river.
> "(iv) From the southern boundary of Rock Springs State Reserve at the Wekiva River upstream along Wekiwa Springs Run to Wekiwa Springs, approximately 1.2 miles, as a recreational river.

"(B) ROCK SPRINGS RUN—The 8.8 miles from the confluence of Rock Springs Run with the Wekiwa Springs Run forming the Wekiva River to its headwaters at Rock Springs, to be administered in the following classifications:

"(i) From the confluence with Wekiwa Springs Run to the western boundary of Rock Springs Run State Reserve at Rock Springs Run, approximately 6.9 miles, as a wild river.
"(ii) From the western boundary of Rock Springs Run State Reserve at Rock Springs Run to Rock Springs, approximately 1.9 miles, as a recreational river.

"(C) BLACK WATER CREEK.—The 17.9 miles from the confluence of Black Water Creek with the Wekiva River to outflow from Lake Norris, to be administered in the following classifications:

"(i) From the confluence with the Wekiva River to approximately .25 mile downstream of the Seminole State Forest road crossing, approximately 4.1 miles, as a wild river.
"(ii) From approximately .25 mile downstream of the Seminole State Forest road to approximately ..25 mile upstream of the Seminole State Forest road crossing, approximately .5 mile, as a scenic river.
"(iii) From approximately .25 mile upstream of the Seminole State Forest road crossing to approximately .25 mile downstream of the old railroad grade crossing (approximately River Mile 9), approximately 4.4 miles, as a wild river.
"(iv) From approximately .25 mile downstream of the old railroad grade crossing (approximately River Mile 9), upstream to the boundary of Seminole State Forest (approximately River Mile 10.6), approximately 1.6 miles, as a scenic river.
"(v) From the boundary of Seminole State Forest (approximately River Mile 10.6) to approximately .25 mile downstream of the State Road 44 crossing, approximately .9 mile, as a wild river.
"(vi) From approximately .25 mile downstream of State Road 44 to approximately .25 mile upstream of the State Road 44A crossing, approximately .6 mile, as a recreational river.
"(vii) From approximately .25 mile upstream of the State Road 44A crossing to approximately .25 mile downstream of the Lake Norris Road crossing, approximately 4.7 miles, as a wild river.
"(viii) From approximately .25 mile downstream of the Lake Norris Road crossing to the outflow from Lake Norris, approximately 1.1 miles, as a recreational river.".

SEC. 4. SPECIAL REQUIREMENTS APPLICABLE TO WEKIVA RIVER AND TRIBUTARIES.

(a) DEFINITIONS.—In this section and section 5:
(1) WEKIVA RIVER SYSTEM—The term "Wekiva River system" means the segments of the Wekiva River, Wekiwa Springs Run, Rock Springs Run, and Black Water Creek in the State of Florida designated as components of the national wild and scenic rivers system by paragraph (161) of section 3(a) of the Wild and Scenic Rivers Act (16 U.S.C. 1274(a)), as added by this Act.
(2) COMMITTEE—The term "Committee" means the Wekiva River System Advisory Management Committee established pursuant to section 5.
(3) COMPREHENSIVE MANAGEMENT PLAN—The terms "comprehensive management plan" and "plan" mean the comprehensive management plan to be developed pursuant to section 3(d) of the Wild and Scenic Rivers Act (16 U.S.C. 1274(d)).
(4) SECRETARY—The term "Secretary" means the Secretary of the Interior.

(b) COOPERATIVE AGREEMENTS.—
(1) USE AUTHORIZED—In order to provide for the long- term protection, preservation, and enhancement of the Wekiva River system, the Secretary shall offer to enter into cooperative agreements pursuant to sections 10(e) and 11(b)(1) of the Wild and Scenic Rivers Act (16 U.S.C. 1281(e), 1282(b)(1)) with the State of Florida, appropriate local political jurisdictions of the State, namely the counties of Lake, Orange, and Seminole, and appropriate local planning and environmental organizations.
(2) EFFECT OF AGREEMENT—Administration by the Secretary of the Wekiva River system through the use of cooperative agreements shall not constitute National Park Service administration of the Wekiva River system for purposes of section 10(c) of such Act (10 U.S.C. 1281(c)) and shall not cause the Wekiva River system to be considered as being a unit of the National Park System. Publicly owned lands within the boundaries of the Wekiva River system shall continue to be managed by the agency having jurisdiction over the lands, in accordance with the statutory authority and mission of the agency.
(d) COMPLIANCE REVIEW.—After completion of the comprehensive management plan, the Secretary shall biennially review compliance with the plan and shall promptly report to the Committee on Resources of the House of Representatives and the Committee on Energy and Natural Resources of the Senate any deviation from the plan that could result in any diminution of the values for which the Wekiva River system was designated as a component of the national wild and scenic rivers system.
(d) TECHNICAL ASSISTANCE AND OTHER SUPPORT—The Secretary may provide technical assistance, staff support, and funding to assist in the development and implementation of the comprehensive management plan.
(e) LIMITATION ON FEDERAL SUPPORT—Nothing in this section shall be construed to authorize funding for land acquisition, facility development, or operations.

SEC. 5. WEKIVA RIVER SYSTEM ADVISORY MANAGEMENT COMMITTEE.
(a) ESTABLISHMENT.—The Secretary shall establish an advisory committee, to be known as the Wekiva River System Advisory Management Committee, to assist in the development of the comprehensive management plan for the Wekiva River system.
(b) MEMBERSHIP.—The Committee shall be composed of a representative of each of the following agencies and organizations:
(1) The Department of the Interior, represented by the Director of the National Park Service or the Director's designee.
(2) The East Central Florida Regional Planning Council.
(3) The Florida Department of Environmental Protection, Division of Recreation and Parks.
(4) The Florida Department of Environmental Protection, Wekiva River Aquatic Preserve.
(5) The Florida Department of Agriculture and Consumer Services, Division of Forestry, Seminole State Forest.
(6) The Florida Audubon Society.
(7) The nonprofit organization known as the Friends of the Wekiva.
(8) The Lake County Water Authority.
(9) The Lake County Planning Department.
(10) The Orange County Parks and Recreation Department, Kelly Park.
(11) The Seminole County Planning Department.
(12) The St. Johns River Water Management District.
(13) The Florida Fish and Wildlife Conservation Commission.
(14) The City of Altamonte Springs.
(15) The City of Longwood
(16) The City of Apopka.
(17) The Florida Farm Bureau Federation.
(18) The Florida Forestry Association.

(c) ADDITIONAL MEMBERS.— Other interested parties may be added to the Committee by request to the Secretary and unanimous consent of the existing members.

(d) APPOINTMENT—Representatives and alternates to the Committee shall be appointed as follows:
(1) State agency representatives, by the head of the agency.
(2) County representatives, by the Boards of County Commissioners.
(3) Water management district, by the Governing Board.
(4) Department of the Interior representative, by the Southeast Regional Director, National Park Service.
(5) East Central Florida Regional Planning Council, by Governing Board.
(6) Other organizations, by the Southeast Regional Director, National Park Service.

(e) ROLE OF COMMITTEE.—The Committee shall assist in the development of the comprehensive management plan for the Wekiva River system and provide advice to the Secretary in carrying out the management responsibilities of the Secretary under this Act. The Committee shall have an advisory role only, it will not have regulatory or land acquisition authority.
(f) VOTING AND COMMITTEE PROCEDURES. Each member agency, agency division, or organization referred to in subsection (b) shall have one vote and provide one member and one alternate. Committee decisions and actions will be made with consent of three-fourths of all voting members. Additional necessary Committee procedures shall be developed as part of the comprehensive management plan.

SEC. 6. AUTHORIZATION OF APPROPRIATIONS.
There are authorized to be appropriated such sums as may be necessary to carry out this Act and paragraph (161) of section 3(a) of the Wild and Scenic Rivers Act (16 U.S.C. 1274(a)), as added by this Act.

Approved October 13, 2000.

APPENDIX B: EXAMPLES OF ORDINANCES, GUIDELINES AND PROGRAMS THAT PROMOTE WATER RESOURCE PROTECTION

Design Guidelines for Boat Launches and Take-outs

In 2004 the National Park Service's Rivers, Trails and Conservation Assistance Program generated a report that provides recommendations and design guidelines for canoe and kayak launch and take-out sites. The document is called "Logical Lasting Launches: Design Guidance for Canoe and Kayak Launches." This NPS release provides numerous design options that are functional and long-lasting while minimizing impacts on river and shoreline resources.

Source: National Park Service. Spring 2004. "Logical Lasting Launches: Design Guidance for Canoe and Kayak Launches." Rivers, Trails & Conservation Assistance Program.

Example of a Local Government Fertilizer Use Ordinance in Florida

In 2008 Marion County, Florida, adopted an ordinance that has the intent of protecting the Rainbow River and its springshed by setting efficiency-based controls on fertilizer use (a primary nitrogen source) in the county. The ordinance includes controls that are based on best management practices, such as fertilizer application rates per lawn type, restrictions for fertilizer use on impervious surfaces, mandatory fertilizer-free zones (e.g. near waterways, karst sinkholes), and restrictions for placement of grass clippings and other vegetation matter near waterways or storm sewers.

Source: Marion County, FL. 2008. *Marion County Ordinance for Florida Friendly Fertilizer Use on Urban Landscapes*. Marion County Code of Ordinances. Chapter 19: Water and Sewers, Article V: Florida Friendly Fertilizer Use on Urban Landscapes, Sections 19-241 to 19-255. [Ordinance No. 08-35, § 1-15, 11-4-2008].

Example of a Local Government River Protection Ordinance in Florida

Marion County, Florida, also has an ordinance that specifically aims to protect the Rainbow River by taking preventive measures on trash and motorized boating impacts on the river and its resources. Under this ordinance, the possession of food or alcoholic and nonalcoholic beverages in disposable containers is prohibited on the Rainbow River. This includes bottles, cans, paper sacks, boxes, breakable plastic utensils, paper napkins, and paper towels. In addition to prohibiting disposable containers on the Rainbow River, this ordinance also includes restrictions for motorized boating in environmentally sensitive areas and a "no wake – idle speed only zone" on the Rainbow River. Private boating concessionaires as well as the public parks remind river users of these Marion County laws.

Source: Marion County, FL. 2008. *Marion County Ordinance for Florida Friendly Fertilizer Use on Urban Landscapes*. Marion County Code of Ordinances. Chapter 5: Boats, Docks and Waterways, Article IV: Rainbow River and K.P. Hole, Sections 5-51 to 5-55. [Ordinance No. 85-17, § 2-8, 10-22-1985; Ordinance No. 94-4, § 2-3, 2-1-1994].

Examples of a Partnership Watershed Management Structures

In 2005 the Coastal Management Branch of the U.S. Environmental Protection Agency generated a report that documents numerous examples of effective partnership watershed management structures throughout the United States. The National Estuary Program (NEP) has been set up to guide the development of volunteer, interagency, and community-based watershed management in the United States. This document identifies effective management strategies, governance structures, and possible pitfalls and solutions in the development and management of a partnership watershed organization.

Source: U.S. Environmental Protection Agency (U.S.E.P.A). February 2005. *Community-Based Watershed Management: Lessons from the National Estuary Program*. EPA-842-B-05-003. U.S.E.P.A. Coastal Management Branch, Office of Wetlands, Oceans, and Watersheds, National Estuary Program.

Also, in addition to the many NEP partnerships throughout the United States, several other examples of active, well-developed, and effective watershed management partnerships exist throughout North America. Some examples are as follows:

- Walla Walla Watershed Management Partnership (Walla Walla, WA) http://www.wallawallawatershed.org/
- Superior Watershed Partnership (Marquette, MI) http://www.superiorwatersheds.org/
- Papillion Creek Watershed Partnership (Omaha, NE) http://www.papiopartnership.org/
- Anacostia Watershed Restoration Partnership (Washington, D.C.) http://anacostia.net/
- Yahara Lakes Legacy Partnership (Madison, WI) http://www.danewaters.com/YaharaLakesLegacyPartnership.aspx
- Hawai'i Association of Watershed Partnerships — the umbrella organization for nine watershed partnerships throughout Hawai'i (Honolulu, HI) http://hawp.org/

Examples of Sewer Expansion Programs in Florida

During the past decade or two, numerous municipalities, counties, and private utility companies across Florida and the United States have implemented various forms of sewer and water expansion programs to bring modern utility services to older developments that previously only had individual septic systems and wells. Many of these programs are voluntary and/or neighborhood-driven. Local sewer programs were often prompted by the need to protect groundwater aquifers from contamination caused by large numbers and high concentrations of septic systems in the community. Although the goals and

objectives of these sewer expansion programs may be similar, each program has a unique implementation strategy and funding mechanism. Some examples of local governments and utility companies that implemented sewer expansion programs in Florida are as follows:

- Emerald Coast Utilities Authority — Sewer Expansion Program (Pensacola, FL)
  http://www.ecua.org/services/sewer-services.asp

- City of Jacksonville Water and Sewer Expansion Authority (Jacksonville, FL)
  http://www.coj.net/Departments/Independent+Boards+and+Agencies/Water + and+Sewer+Expansion+Authority/default.htm

- City of Cape Coral — Utility Extension Program (Cape Coral, FL)
  http://www.capecoralutilityexpansion.com

- City of Port St. Lucie — Sewer and Water Expansion Program (Port St. Lucie, FL)
  http://www.cityofpsl.com/utility/index.html

APPENDIX C: LISTED SPECIES IN THE WEKIVA BASIN AREA

PLANTS *

Scientific Name	Common Name	Federal Status	State ofFlorida Status
PLANTS AND LICHENS			
Bonamia grandiflora	Florida bonamia	*Threatened*	*Endangered*
Calopogon multiflorus	many-flowered grasspink		*Endangered*
Carex chapmanii	Chapman's sedge		*Endangered*
Centrosema arenicola	sand butterfly pea		*Endangered*
Chionanthus pygmaeus	pygmy fringe tree	*Endangered*	*Endangered*
Clitoria fragrans	scrub pigeon-wing	*Threatened*	*Endangered*
Coelorachis tuberculosa	Piedmont jointgrass		*Threatened*
Cucurbita okeechobeensis	Okeechobee gourd	*Endangered*	*Endangered*
Deeringothamnus pulchellus	beautiful pawpaw	*Endangered*	*Endangered*
Dennstaedtia bipinnata	hay-scented fern		*Endangered*
Drosera intermedia	spoon-leaved sundew		*Threatened*
Eriogonum longifolium var. gnaphalifolium	scrub wild buckwheat	*Threatened*	*Endangered*
Hartwrightia floridana	hartwrightia		*Threatened*
Hasteola robertiorum	Florida hasteola		*Endangered*
Illicium parviflorum	star anise		*Endangered*
Lechea cernea	nodding pinweed		*Threatened*
Lupinus aridorum	scrub lupine	*Endangered*	*Endangered*
Monotropa hypopithys	pinesap		*Endangered*
Najas filifolia	narrowleaf naiad		*Threatened*
Nemastylis floridana	celestial lily		*Endangered*
Nolina atopocarpa	Florida beargrass		*Threatened*
Nolina brittoniana	Britton's beargrass	*Endangered*	*Endangered*
Ophioglossum palmatum	hand fern		*Endangered*
Panicum abscissum	cutthroat grass		*Endangered*
Paronychia chartacea pulvinata	papery whitlow-wort	*Threatened*	*Endangered*
Pecluma plumula	plume polypody		*Endangered*
Polygala lewtonii	Lewton's polygala	*Endangered*	*Endangered*
Polygonella myriophylla	sandlace (Small's jointweed)	*Endangered*	*Endangered*
Prunus geniculata	scrub plum	*Endangered*	*Endangered*
Pteroglossaspis ecristata	giant orchid		*Threatened*
Salix floridana	Florida willow		*Endangered*
Sideroxylon alachuense	silver buckthorn		*Endangered*
Stylisma abdita	scrub stylisma		*Endangered*
Vicia ocalensis	Ocala vetch		*Endangered*
Warea amplexifolia	clasping (wide-leaf) warea	*Endangered*	*Endangered*
Warea carteri	Carter's warea	*Endangered*	*Endangered*
Zephyranthes simpsonii	rain lily		*Threatened*

* Not all species may occur in the Wekiva basin. Refer to FNAI and DACS for best information.

ANIMALS*

Scientific Name	Common Name	Federal Status	State of Florida Status
FISH			
Pteronotropis welaka	Bluenose shiner		*Species of Special Concern*
Cyprinodon hubbsi	Lake Eustis pupfish **		*Species of Special Concern*
Acipenser brevirostrume	Shortnose sturgeon	*Endangered*	*Endangered*
Etheostoma olmstedi maculaticeps	Southern tessellated darter		*Species of Special Concern*
AMPHIBIANS			
Lithobates capito	Gopher frog **		*Species of Special Concern*
REPTILES			
Alligator mississippiensis	American alligator	*Threatened (due to similarity of appearance)*	*Threatened (due to similarity of appearance)*
Drymarchon couperi	Eastern indigo snake	*Threatened*	*Threatened*
Gopherus polyphemus	Gopher tortoise		*Threatened*
Pituophis melanoleucus mugitus	Florida pine snake		*Species of Special Concern*
Neoseps reynoldsi	Sand skink	*Threatened*	*Threatened*
Stilosoma extenuatum	Short-tailed snake		*Threatened*
BIRDS			
Ammodramus savannarum floridanus	Florida Grasshopper sparrow	*Endangered*	*Endangered*
Aphelocoma coerulescens	Florida scrub-jay	*Threatened*	*Threatened*
Aramus guarauna	Limpkin **		*Species of Special Concern*
Athene cunicularia	Burrowing owl		*Species of Special Concern*
Egretta caerulea	Little blue heron		*Species of Special Concern*
Egretta rufescens	Reddish egret		*Species of Special Concern*
Egretta thula	Snowy egret **		*Species of Special Concern*
Egretta tricolor	Tricolored heron		*Species of Special Concern*
Eudocimus albus	White ibis **		*Species of Special Concern*
Falco sparverius paulus	Southeastern American kestrel		*Threatened*
Grus canadensis pratensis	Florida sandhill crane		*Threatened*
Mycteria americana	Wood stork	*Endangered*	*Endangered*
Pelecanus accidentalis	Brown pelican **		*Species of Special Concern*
Picoides borealis	Red-cockaded woodpecker	*Endangered*	*Species of Special Concern*
Platalea ajaja	Roseate spoonbill		*Species of Special Concern*
Polyborus plancus audubinii	Audubon's crested caracara	*Threatened*	*Threatened*
Rostrhamus sociabilis plumbeus	Everglade snail kite	*Endangered*	*Endangered*
Sterna antillarum	Least tern		*Threatened*
MAMMALS			
Podomys floridanus	Florida mouse **		*Species of Special Concern*
Sciurus niger shermani	Sherman's fox squirrel		*Species of Special Concern*
Trichechus manatus latirostrist	West Indian (Florida) manatee	*Endangered/ Critical Habitat*	*Endangered*
Ursus americanus floridanus	Florida black bear **		*Threatened*
INVERTEBRATES			
Promcambaris pictus	Black Creek crayfish		*Species of Special Concern*

* Animal species identified are based on FNAI occurrence data, TNC Wekiva-Ocala conservation targets, and field observations. Not all species may occur in the Wekiva basin. Refer to FNAI and FWC for best information.

** Species proposed for delisting within Florida by FWC

APPENDIX D: INVENTORY OF CURRENT CONDITIONS FOR HISTORIC AND CULTURAL RESOURCE VALUES

HISTORIC AND CULTURAL			
Criterion (# sites)	**Current Conditions***	**Management Authority**	**Current Actions**
Sites on Public Lands			
Underwater Shipwreck (1)	Poor	FDHR, FPS, CAMA	Conduct ground-disturbing activities in accordance with FDHR guidelines; educate; enforce agency rules.
Middens (32)	Good (5) Fair (8) Poor (13) Unknown (5) 18 are often inaccessible because of high water conditions 3 are inaccessible due to overgrowth/heavy vegetation	FDHR, FPS, CAMA	Conduct ground disturbing activities in accordance with FDHR guidelines; educate; enforce agency rules.
Prehistoric Village Site (1)	Poor	FDHR, FPS	Conduct ground-disturbing activities in accordance with FDHR guidelines; educate; enforce agency rules.
Pre-ceramic Lithic Waste Scatter (4)	Fair (2) Unknown (2) 2 sites are often inacces-sible because of to high water conditions and/or overgrowth.	FDHR, FPS, CAMA	Conduct ground-disturbing activities in accordance with FDHR guidelines; educate; enforce agency rules.
African American Sites from Town of Markham (3)	Fair (1 cemetery) Poor (1 historic site) Destroyed (1 church)	FDHR, FPS	Conduct ground-disturbing activities in accordance with FDHR guidelines; educate; enforce agency rules.
Artifact Scatter (1)	Unknown Often inaccessible because of high water conditions and/or heavy vegetation and overgrowth.	FDHR, FPS, CAMA	Conduct ground-disturbing activities in accordance with FDHR guidelines; educate; enforce agency rules.
Isolated Finds (4)	Not Applicable — these finds were collected.	FDHR, FPS	Conduct ground-disturbing activities in accordance with FDHR guidelines; educate; enforce agency rules.
Cemetery from Ethel settlement (1)	Fair	FDHR, FPS	Conduct ground-disturbing activities in accordance with FDHR guidelines; educate; enforce agency rules.
Burial Mound (1)	Destroyed	FDHR, FPS	Conduct ground-disturbing activities in accordance with FDHR guidelines; educate; enforce agency rules.
Logging Trail circa 1940s (1)	Fair Often inaccessible because of high water conditions.	FDHR, FPS	Conduct ground-disturbing activities in accordance with FDHR guidelines; educate; enforce agency rules.

HISTORIC AND CULTURAL			
Criterion (# sites)	**Current Conditions***	**Management Authority**	**Current Actions**
Windmill Remains (1)	Poor Often inaccessible because of high water conditions.	FDHR, FPS, CAMA	Conduct ground disturbing activities in accordance with FDHR guidelines; educate; enforce agency rules.
Pottery — limited surface scatter (1)	Unknown	FDHR, FFS	Conduct ground-disturbing activities in accordance with FDHR guidelines.
Type unknown (1)	Unknown	FDHR, SJRWMD	Identify and monitor sites for any disturbances; Any ground-disturbing activities will be coordinated with FDHR.
Evidence of Pre-European Contact Settlement	Unknown	FDHR, Orange County	Unknown
Early Homestead Site (1)	Unknown	FDHR, Orange County	Unknown
Sites on Private Lands			
Middens (7)	Unknown (7)	FDHR	Unknown
Prehistoric Habitation (3) (Shell Island, Wekiva Hillside, and Serenity)	Unknown (Wekiva Hillside and Serenity) Shell Island has evidence of pilfering, sanitary issues, and general deterioration.	FDHR Rollins College owns Shell Island site.	Unknown (Wekiva Hillside and Serenity) Shell Island is unmanaged.
Lithic Waste Scatter (1)	Unknown	FDHR	Unknown
Artifact Scatter (15)	Unknown (15)	FDHR	Unknown
Isolated Finds (5)	Unknown	FDHR	Unknown
Burial Mound (1) (Rock Springs Burial Mound)	Unknown	FDHR	Unknown
Windmill Remains (1)	Unknown	FDHR	Unknown
19th Century American Homestead (1) (Twin Oaks)	Unknown	FDHR	Unknown
Wilson's Cypress Company Black Water Creek Sawmill Remains (1) (includes segment of railroad grade and historic road)	Unknown	FDHR	Unknown
Unknown, 20th Century American Site (1)	Unknown	FDHR	Unknown

*Evaluative scale:

Good = structural stability and physical wholeness, where no obvious deterioration other than normal occurs.

Fair = there is discernable decline in condition between inspections, and the wholeness or physical integrity is and continues to be threatened by factors other than normal wear.

Poor = describes an unstable condition where there is physical integrity from year to year; suggests immediate action to reestablish physical stability.

(Source of evaluative scale: Wekiva River Basin State Park Multi-unit Management Plan.)

Note: This table, slightly modified, is from the draft 2008 *Wekiva Wild and Scenic River System Management Plan*.

APPENDIX E: SUMMARY OF HISTORICAL WATER QUALITY AVERAGE DATA FROM THE WEKIVA RIVER AND ROCK SPRINGS RUN IN COMPARISON TO FLORIDA CLASS III SURFACE WATER CRITERIA

Note: Values are averages (means) of available data for the period of record indicated.

Analyte	Wekiva River at SR 46 (1954-2003)	Rock Springs Run above Wekiva River (1973-2003)	Class III Surface Water Criterion (*62.302-500* FAC)
Conductivity (µmhos/cm)	624	244	Shall not be increased more than 50% above background or to 1275, whichever is greater.
pH (units)	7.42	7.31	> 6; see (1)
Alkalinity (mg/L as $CaCO_3$)	94.9	86.6	> 20
Color (pcu)	61.5	203	NA
Turbidity (NTU)	3.34	1.60	NA
Dissolved O_2 (mg/L)	7.10	5.84	Shall not be less than 5.0. Normal daily and seasonal fluctuations shall be maintained.
Total Organic Carbon (mg/L)	8.31	21.9	NA
Total Nitrogen (mg/L)	1.25	1.68 e	See (2)
Total Kjeldahl Nitrogen (mg/L)	0.632	0.896	See (2)
Nitrate as NO_3/NO_2-N (mg/L)	0.578	0.784	See (2) and (3)
Ammonia (mg/L)	0.045	0.047	< 0.02
Orthophosphorus (mg/L)	0.108	0.084	See (2)
Total Phosphorus (mg/L)	0.141	0.118	See (2)
Chlorophyll a - corrected (µg/L)	1.70	2.90	NA; See (4)
Fecal Coliform (#/100ml)	100	54.2	See (5)
Total Coliform (#/100 ml)	1,351	1,649	NA

Analyte = chemical substance being analyzed

NA = no criterion is stated in the rule for this analyte (chemical substance being analyzed).

e = estimated by adding TKN (Total Kjeldahl Nitrogen) and NOx-N.

µmhos = a unit of measurement for conductivity expressed in either microSiemens (µS/cm) or micromhos (µmho/cm), which is the reciprocal of the unit of resistance, the ohm. The prefix "micro" means that it is measured in millionths of a mho. MicroSiemens and micromhos are equivalent units. Distilled water has a range of conductivity from 0.5 to 2 µmhos/cm. Drinking water is generally between 50 to 1500 µmhos/cm, and domestic wastewater may have conductivities above 10,000 µmhos/cm.

mg/L = milligrams/liter; 1 µg/L or microgram per liter represents 1 part per billion (ppb).

NTU = Nephelometric turbidity unit

#/100ml = number per 100 milliliters or per 3.4 fluid ounces

(1) Not to vary more than one unit above or below natural background of predominantly fresh waters and coastal waters as defined in Section 62-302.520(3)(b), *Florida Administrative Code* or more than two-tenths unit above or below natural background of open waters as defined in Section 62-302.520(3)(f), *Florida Administrative Code*, provided that the pH is not lowered to less than 6 units in predominantly fresh waters, or less than 6.5 units in predominantly marine waters, or raised above 8.5 units. If natural background is less than 6 units in predominantly fresh waters or 6.5 units in predominantly marine waters, the pH shall not vary below natural background or vary more than one unit above natural background of predominantly fresh waters and coastal waters, or more than two-tenths unit above natural background of open waters. If natural background is higher than 8.5 units, the pH shall not vary above natural background or vary more than one unit below natural background of predominantly fresh waters and coastal waters, or more than two-tenths unit below natural background of open waters.

(2) Nutrients include total nitrogen, Kjeldahl-nitrogen, NO_2/NO_3 –N, total phosphorus, and orthophosphate. The Class III criterion is in narrative form: “The discharge of nutrients shall continue to be limited as needed to prevent violations of other standards contained in this chapter. Man-induced nutrient enrichment (total nitrogen or total phosphorus) shall be considered degradation in relation to the provisions of Sections 62-302.300, 62-302.700, and 62-4.242, *Florida Administrative Code*. In no case shall nutrient concentrations of a body of water be altered so as to cause an imbalance in natural populations of aquatic flora or fauna.”

(3) There is no Class III standard for nitrate. The Class I (drinking water) standard is 10 mg/L. FDEP’s Ground Water section uses a concentration of 0.45 mg/L to indicate potential ground water-surface water impacts based on this level’s potential to increase chlorophyll growth in surface waters. A concentration of 0.20 mg/L is widely cited as a “background concentration” for Florida springs, although in a sample of Florida springs unaffected by human population centers, the median value was found to be 0.08 mg/L (FDEP 2006).

(4) Impairment may be indicated in streams with chlorophyll-a greater than 20 ug/L or an increase of over 50% over historical values is observed for at least two consecutive years (62-303.352, *Florida Administrative Code*)

(5) Not to exceed a monthly average of 200, nor exceed 400 in 10% of the samples, nor exceed 800 on any one day.

NOTE: This table, slightly modified, is from the draft 2008 *Wekiva Wild and Scenic River System Management Plan.*

APPENDIX F: U.S. FISH AND WILDLIFE SERVICE CORRESPONDENCE

United States Department of the Interior

NATIONAL PARK SERVICE
DENVER SERVICE CENTER
12795 W. ALAMEDA PARKWAY
P.O. BOX 25287
DENVER, COLORADO 80225-0287

In reply refer to:

D18 Wekiva

July 27, 2009

MEMORANDUM

TO Field Supervisor, USFWS, North Florida Field Office

FROM Planning Project Manager

RE Wekiva Wild and Scenic River Comprehensive Management Plan

The National Park Service is working with the Wekiva Wild and Scenic River System Advisory Management Committee to develop a comprehensive river management plan (CRMP) and environmental assessment for the Wekiva Wild and Scenic River in Lake, Orange, and Seminole counties, Florida (see map attached). The wild and scenic river designation includes Wekiwa Springs Run, Rock Springs Run, Black Water Creek, and the Wekiva River.

The process of developing a river management plan is intended to build consensus among stakeholders and the public to assure logic and consistency in plan proposals, and provide for rational decision making. The plan will provide a framework to guide resources management and visitor use. Public involvement from all constituencies is being sought throughout the course of the planning process.

In compliance with the National Environmental Policy Act and NPS policy, the river management plan will be developed concurrent with preparation of an environmental assessment (EA). The CRMP/EA will identify significant management and operational issues confronting the rivers, and present management alternatives for addressing these issues consistent with the rivers' legal and policy mandates. The environmental impacts associated with implementing each of the management alternatives will be fully analyzed.

In accordance with consultation requirement of Section 7 of the Endangered Species Act and NPS policy, we wish to notify you of the CRMP/EA process and invite your participation. Below is a list of federally-listed endangered or threatened species for the river that we are considering using for the project. Please review for its adequacy and provide

advice to ensure adequate evaluation of the potential impacts that the plan could have on federally-listed endangered and threatened species.

Alligator mississippiensis - American Alligator
Drymarchon corais couperi - Eastern Indigo Snake
Aphelocoma coerulescens - Florida Scrub-jay
Mycteria americana - Wood Stork
Trichechus manatus latirostius - West Indian Manatee

When it becomes available, you will receive a copy of the CRMP/EA that will include the findings of the NPS in regards to potential effects on listed species from the alternatives.

We look forward to working closely with you throughout plan development and welcome your comments and advice regarding protection and preservation of Wekiva River's diverse natural resources. Should you have any questions or wish to discuss this project in more detail, please contact Matthew Safford in our Planning Division at 303-969-2898 or at matthew_safford@nps.gov.

Attachment
Map of Wekiva Wild and Scenic River

Candace Martino/R4/FWS/DOI
09/01/2009 03:31 PM

To
matthew_safford@nps.gov

cc
Jay Herrington/R4/FWS/DOI@FWS, John Milio/R4/FWS/DOI@FWS, Paula Sisson/R4/FWS/DOI@FWS, Erin Gawera/R4/FWS/DOI@FWS

Subject
Fw: 09-FA-0060 Wekiva Wild and Scenic River Management Plan

Hello Matthew,

Thank-you for notifying the U.S. Fish and Wildlife Service (Service) in a July 28, 2009, memorandum about the Wekiva Wild and Scenic River System Advisory Management Committee's intent to develop a Comprehensive River Management Plan and Environmental Assessment (CRMP/EA) for the Wekiva Wild and Scenic River in Lake, Orange and Seminole counties. Based on the map showing the designations of the Wekiva Springs Run, Rock Springs Run, Black Water Creek, and the Wekiva River, and the species that were identified in the letter, we have provided comments relative to those species. Also, we refer you to our website located at www.fws.gov/northflorida/ to find more information, guidelines, regulatory and landowner tools that may be useful in the development of the plan.

Eastern Indigo Snake — The Service considers all habitats except open water and salt marsh, suitable habitat for indigo snakes. We are currently working on a survey protocol with our Vero Beach Field Office and hope to have it completed within several months. We currently have the Eastern Indigo Snake Protection Measures available on the website.

Florida Scrub-Jay — The Seminole State Forest scrub-jay population and the Northeast Lake County scrub-jay metapopulation occurs in relative proximity to the Seminole and Lake County Blackwater Creek designated segments. Our website referenced above contains all the necessary information for incorporation into the plan - Reference Materials, the 5-Year Status Review, the Florida Umbrella Habitat Conservation Plan, Biological Information, Survey Guidelines, and etc.

West Indian Manatee — Occurs within the Wekiva River Basin. We have listed some of the basic impact considerations for manatees and their habitat:

- the type (powerboat, canoe, kayak, sailboat, etc.) density, and speed of watercraft utilizing the designated waters;
- the type, density and location of in-water structures (boat docks and ramps, canoe/kayak launches, fishing/observation platforms, etc.) within the designated waters;
- the type, density and location of contiguous land use as it affects water quality and quantity (withdrawals), possible entrapment of manatees within water control structures, direct and indirect impacts to aquatic vegetation, etc.;
- physical, chemical, and biological changes to the river, stream and creek systems as a result of dredging, habitat enhancement/ restoration, spread of nuisance and invasive aquatic vegetation, etc.

Wood Stork — the Lake County Mud Lake (Hontoon Island) wood stork colony with the coordinates of 28 58.0 & 81 23.0 is within 15 miles (a regulatory criteria) of some of the designated focus areas in the plan. However, this colony has not been active in the last three years. All wood stork colonies in the state are listed with activity status under the heading of wood storks on our website.

Our wood stork effect determination key located on the Jacksonville Army Corps of Engineers (Corps) website was designed primarily for use by the Corps project managers and State Regulatory agencies; however, other federal agencies, project permit applicants and co-sponsors of civil works projects may find this key and its supporting documents useful in identifying potential impacts to wood storks, and planning how best to avoid, minimize, or compensate for any identified adverse effects.

The American Alligator is not a federally-listed species so we do not provide comments relative to that species.

We look forward to reviewing a draft copy of the CRMP/EA when it becomes available. Thank-you for your coordination with our agency.

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ABBREVIATIONS AND GLOSSARY

Coastal and Aquatic Managed Areas (CAMA)

Florida Department of Agriculture and Consumer Services (FDACS)
Florida Forest Service (FFS)
(Note: This name changed in July 2011 from the Division of Forestry, which is cited in the Wild and Scenic Act)
Florida Department of Environmental Protection (FDEP)
Florida Division of Recreation and Parks (aka Florida Park Service or FPS)
Office of Coastal and Aquatic Managed Areas (or Coastal and Aquatic Managed Areas (CAMA)

Florida Department of Health (FDOH)

Florida Department of Transportation (FDOT)

Florida Division of Historical Resources (FDHR)

Florida Fish and Wildlife Conservation Commission (FWC)
Invasive Plant Management Section (IPMS)

Florida Natural Areas Inventory (FNAI)

Lake County Water Authority (LCWA)

National Register — The National Register of Historic Places

Orange County Community and Environmental Services Department
Orange County Parks and Recreation Division

St. Johns River Water Management District (SJRWMD or the district)

U.S. Fish and Wildlife Service (USFWS)

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headspring — A spring that serves as the headwaters of a stream. Wekiwa and Rock springs are examples of headsprings.

minimum flows and levels (MFLs) — The St. Johns River Water Management District defines MFLs as follows: "MFLs are the minimum water levels and/or flows adopted by the District Governing Board as necessary to prevent significant harm to the water resources or ecology of an area resulting from water withdrawals permitted by the District. MFLs define how often and for how long high, average and low water levels and/or flows should occur to prevent significant harm." Found at www.sjrwmd.com, "Minimum Flows and Levels," dated 5/22/01.

mg/L — milligrams/liter

Outstanding Florida Waters (OFWs) — Bodies of water in Florida that have been designated by the Florida Department of Environmental Protection (under authority of Section 403.061 (27), Florida Statutes) as *worthy of special protection because of their natural attributes.* Outstanding Florida Waters have restrictions on new activities that would reduce water quality or otherwise degrade the body of water.

outstandingly remarkable values (ORVs) — Rare or exemplary features or characteristics that are directly related to the river. A river must possess at least one outstandingly remarkable value to be eligible for Wild and Scenic River designation. The outstandingly remarkable values identified for the Wekiva River System are scenic, recreation, wildlife and habitat, historic and cultural resources, and water quality and quantity.

pollutant load reduction goals (PLRGs) — Estimated numeric reductions in pollutant loadings needed to preserve or restore designated uses of receiving bodies of water and maintain water quality consistent with applicable state water quality standards. PLRGs are established by the water management districts.

springshed — The recharge area of a spring, within which all precipitation that falls on the surface will percolate through the ground and eventually resurfaces through the spring.

total maximum daily load (TMDL) — The maximum amount of a pollutant that a body of water can receive and still meet water quality standards.

Wekiva Parkway and Protection Act — *Florida Statutes*, Chapter 369, Part III (originally adopted by the Florida legislature in 2004 and subsequently amended)

Wekiva River Aquatic Preserve (the aquatic preserve) — Waters and associated wetlands and floodplains of the Wekiva River, Middle St. Johns River, portions of Black Water Creek, Little Wekiva River, and Rock Springs Run. The Wekiva River Aquatic Preserve was established by the Florida legislature on June 23, 1975, through the Florida Aquatic Preserve Act (Chapter 258.35-258-45, *Florida Statutes*). The primary purpose of the designation is to preserve the biological resources of this riverine system.

Wekiva River Basin Working Group (WBWG) — A working group of agencies, local governments, and non-profit conservation organizations that periodically meet to share information and collaborate on efforts to protect natural resources of the Wekiva basin.

Wekiva River Buffer Conservation Area — A designated buffer area that includes mainly seasonally flooded wetlands in the floodplain between the Wekiva and Little Wekiva rivers. Protection of this area in a natural condition helps preserve the water quality of the Wekiva and Little Wekiva rivers.

Wekiva River Protection Act — *Florida Statutes*, Chapter 369, Part II (originally adopted by the Florida legislature in 1988 and subsequently amended)

Wekiva River Protection Area (WRPA) — The area designated by the Florida legislature in the Wekiva River Protection Act for special planning and regulation efforts.

Wekiva Wild and Scenic River System Advisory Management Committee (the advisory management committee) — The advisory committee authorized by the federal Wild and Scenic Rivers Act as amended in 2000 to recommend management strategies for the Wekiva Wild and Scenic River System. Unlike most national wild and scenic rivers that are managed exclusively by either a federal or state agency, the Wekiva River System is considered a "partnership wild and scenic river", meaning that it is jointly managed by a consortium of local stakeholder groups (the Wekiva River System Advisory Management Committee) with oversight and coordination provided by the National Park Service.

Wekiva Study Area (WSA) — The area designated by the Florida legislature in the Wekiva Parkway and Protection Act for special planning and regulation efforts.

Wekiva Wild and Scenic River Study Area — The area originally studied for potential federal Wild and Scenic River designation.

Wekiva springshed — The springshed of the Wekiva River System.

REFERENCES

Note: Many of the following references are from the 2008 "Draft Wekiva Wild and Scenic River System Management Plan." As text/information from that study was used in this plan, the associated references were also brought into this plan. Dates of access to Internet sites relate to the preparation of the draft plan. Many personal communications were also listed in that plan, and some of that information has also been used in this plan. Several people contributed information to the 2008 plan, such as the following:

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Melissa Gibbs, Professor, Stetson University, Orlando, FL
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Gregg Walker, Biologist, Florida Department of Environmental Protection, Wekiva Basin State Parks

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Committee members provided review and comment.

As the nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering sound use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historical places; and providing for the enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

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