

Analysis and Determination

Pursuant to Section 7(a) of the Wild and Scenic Rivers Act



SR 429/SR 46 - Wekiva Parkway
Crossing over the Wekiva River

Wekiva Parkway Section 6
Lake and Seminole Counties, Florida

FDOT FPID: 238275-7-52-01

February, 2015

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Executive Summary

In October, 2000, the Wekiva River was officially designated as a “partnership” Wild and Scenic River. This designation, passed by Congress and signed by the President

Completion of the expressway loop around the Orlando Metropolitan area has been a longstanding goal for the region, with roots extending back to 1970. The project has advanced over the years, culminating in the designation of the Wekiva River as a National Wild and Scenic River (2000), the enactment of the Wekiva Parkway and Protection Act (2004), and ultimately the approval of a Federal Highway Administration (FHWA) environmental assessment (EA) document and issuance of a Finding of No Significant Impact (FONSI) in 2012 related specifically to the Wekiva River crossing.

This determination is specific to the planned Wekiva River crossing, as its designation as a National Wild and Scenic River requires evaluation in accordance with Section 7(a) of the Wild and Scenic Rivers Act. The determination must be completed to assure that the characteristics of the Wekiva River are preserved or enhanced and there are no adverse impacts to the free flow, water quality, and identified “Outstandingly Remarkable Values” (ORVs). The ORV’s are identified in the Wekiva Wild and Scenic River System Comprehensive Management Plan prepared by the Wekiva River System Advisory Management Committee (WRSAMC) in partnership with the National Park Service (NPS).

Five ORVs have been identified as relevant to this project:

Scenic. Much of the focus of the design and coordination for the Wekiva Crossing done to date has been on “minimizing contrast”, working to minimize the visual and auditory impact of the bridge and river crossing. Measures such as a long-span, elimination of piers from the waterway, complimentary colors to the surrounding environment, and a context-appropriate bridge aesthetic have been applied and thoroughly coordinated with local stakeholders and environmental groups. In addition, an elevated profile and noise-reducing bridge type have been proposed to further separate traffic from the river itself and ultimately reduce noise impacts to river users.

Recreation. Recreational capabilities of the river within this area are enhanced through the removal of piers in the river itself, improving flow and opening up the river channel for unobstructed use and enjoyment. The wildlife fencing connecting this structure to the other wildlife crossing structures east and west of the Rock Springs Run entrance on SR 46 will also deter human access and entry in areas along the Wekiva River Bridge that have been problematic from a litter and vegetation standpoint. The proposed fencing will be ten feet tall and will run the length of the proposed right-of-way on both sides of the road, connecting under the bridge.

From an auditory standpoint, the higher bridge crossing will move noise further away from users directly under and adjacent to the bridge, and noise levels will not increase based on modeling. This is due in part to the fact that the expansion joints that generate much of the noise when vehicles pass over them will be moved further away from the river, and the segmental bridge structure design with the hollow center also deadens noise. This is discussed in more detail within the prepared noise study memorandum included as Appendix B.

Recreational opportunities for the river will also be enhanced by the construction of a multi-use trail across the river as part of the bridge crossing where there currently is none. This will provide trail users the opportunity to enjoy the Wekiva River's ORVs without actually being on the water.

Historic and Cultural. No historic or cultural impacts are anticipated, as the Environmental Assessment document performed all necessary coordination and clearances.

Water Quality and Quantity. The Wekiva River is designate as an Outstanding Florida Waterway (OFW) by Florida Administrative Code 62-302.700. No degradation of water quality is permitted. As described within this document, water quality is unaffected (or improved) as part of this project through the introduction of stormwater treatment ponds, and any additional runoff created as part of the project will be captured and attenuated within local drainage systems, contributing no additional water quantity to the Wekiva River than there is today. Both items are permit requirements, and will be thoroughly reviewed and ultimately approved by the Florida Department of Environmental Protection (FDEP) prior to the project being constructed.

Wildlife and Habitat. A major component of the project is to greatly widen available wildlife connectivity, both through a longer bridge and by reducing impacts within the waterway itself. This project is part of a much larger system connecting wildlife corridors throughout Central Florida. Comprehensive shade studies and environmental surveys have been completed as part of the design effort.

In light of the work performed, the partnership between all stakeholders, and measures taken to preserve the values of the river crossing, no direct and adverse impacts as defined within Section 7(a) of the National Wild and Scenic Rivers Act are anticipated.

Introduction and Purpose

In 2004, Florida's legislature authorized the Wekiva Parkway and Protection Act (Chapter 369, Part III Florida Statute), paving the way for completion of the Parkway. This act, developed in close collaboration with local, Federal, and State environmental groups, focused on the implementation of this important regional connector which will complete the bypass loop system around the Orlando Metropolitan area while prioritizing environmental preservation and enhancing wildlife connectivity.

Prior to this legislation taking effect, the Wekiva River was designated by the United States Congress as a National Wild and Scenic River (October 2000). In accordance with the Wild and Scenic Rivers Act, the ORVs, the river system's free flow characteristics, water quality, 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." This means that it is jointly managed by a consortium of local stakeholder groups, referred to as the Wekiva River System Advisory Management Committee (WRSAMC) with oversight and coordination provided by the National Park Service (NPS).

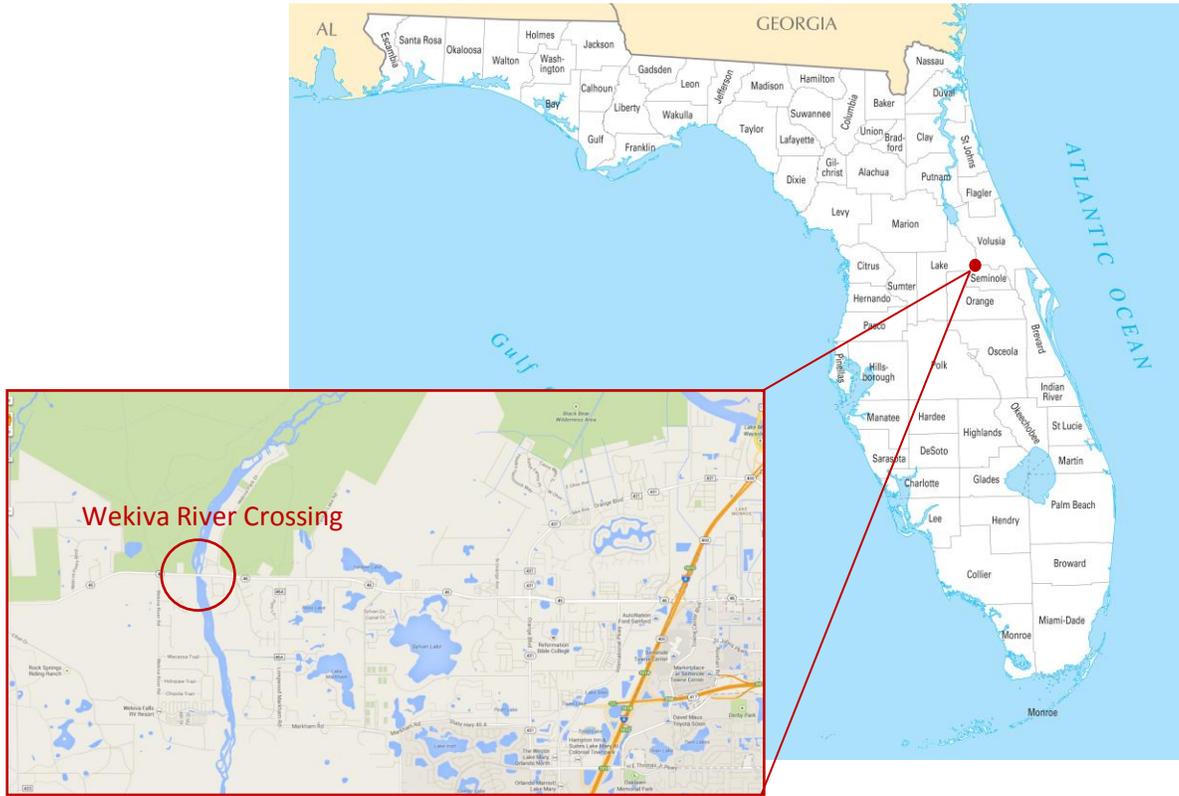
Section 3(d)(1) of the Wild and Scenic Rivers Act requires that a comprehensive management plan be developed to serve as the basis for protecting a designated river's values. This plan is included as Appendix I.

As a result of this national designation, and in accordance with Section 7(a) of the Wild and Scenic Rivers Act, the National Park Service is obligated to determine that the project will have no direct and adverse effects on free flow, water quality or the ORVs for which the river was designated. This document is intended to support that effort and has been developed jointly by the National Park Service and the Florida Department of Transportation in accordance with policy guidance from the Interagency Wild and Scenic River Coordinating Council (IWSRCC) (see www.rivers.gov/council.php).

Project proponent(s). This project is sponsored by the Florida Department of Transportation, Florida's Turnpike Enterprise, and the Central Florida Expressway Authority (CFX, formerly known as the Orlando-Orange County Expressway Authority).

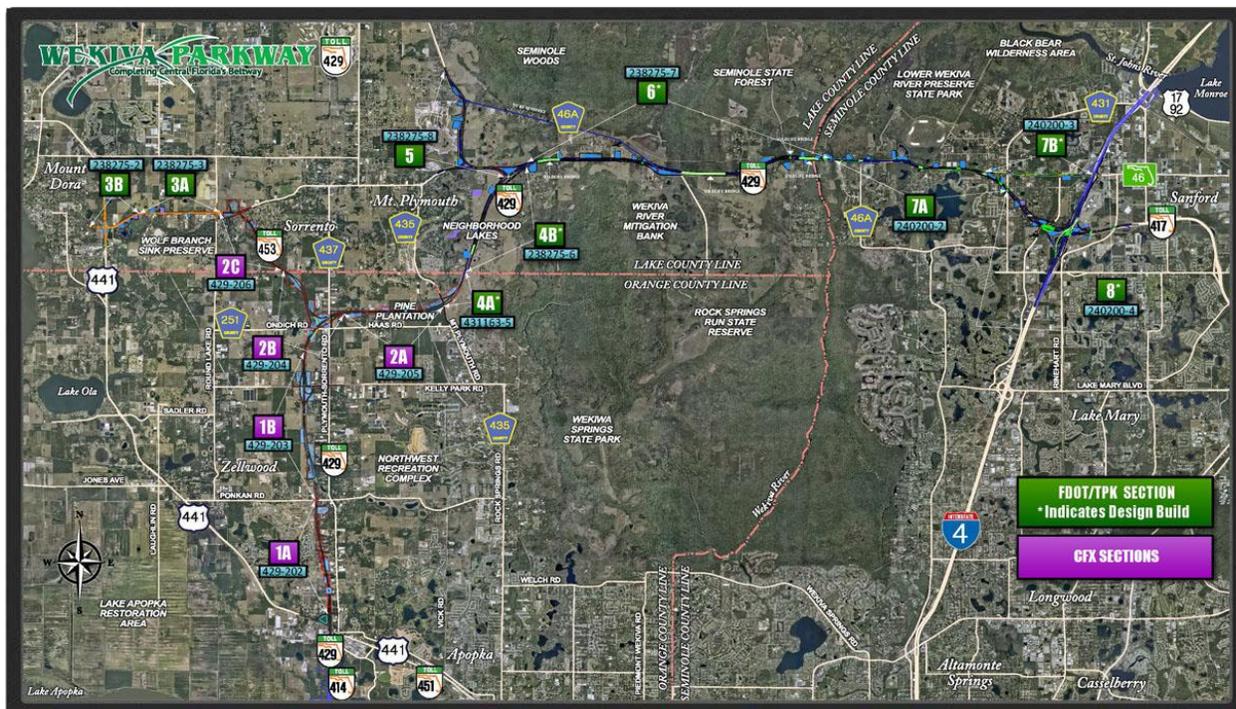
The Wekiva Parkway project requires coordination among the following federal agencies: Federal Highway Administration, U.S. Fish and Wildlife Service, U.S. Coast Guard, U.S. Army Corps of Engineers, United States Environmental Protection Agency and the National Park Service.

Geographic location of the project



Purpose/need for the project.

The overall Wekiva Parkway project has been divided into 14 individual sections for design and construction purposes (shown below). Five of the sections are being constructed by CFX with the remainder being constructed by FDOT. The section of the Wekiva Parkway project that encompasses the river crossing (Section 6) is only one part of this much larger, regional system. This section is crucial to meeting the needs and intent of the project, as it achieves the necessary goal of crossing through environmentally sensitive areas (including passing over the Wekiva River) and greatly expands wildlife connectivity.



The purpose of the proposed Wekiva Parkway (SR 429)/SR 46 Realignment project is to complete the Western Beltway while protecting the rural character of the study area and the unique resources of the Wekiva River Basin. The proposed project will provide needed transportation improvements in an environmentally sensitive manner consistent with the requirements of the Wekiva Parkway and Protection Act, Chapter 369, Part III, F.S.

The need for a beltway around metropolitan Orlando has been recognized for more than thirty years. The Central Florida Beltway" appeared on the first Metropolitan Planning Organization (MPO) Long Range Transportation Plan (LRTP) in 1970. The corridor was gradually pushed outward as the metropolitan area grew. Currently, the SR 417 Eastern Beltway is complete and the SR 429 Western Beltway is almost complete with the exception of the northwest segment shown in the graphic above.

Previous plans to complete the northwest portion (Part B) of the Western Beltway were deferred in response to both environmental and community concerns. Alternate plans to address the needed

connector, including widening SR 46 and building a northwest arterial to provide connectivity between northwest Orange County and northeast Lake County, have been studied but also stalled due to environmental and community concerns. Traffic studies previously conducted by FDOT determined that the existing roadway network is inadequate to serve the travel demand. Traditional widening of SR 46 will also not accommodate projected demand, nor provide an environmentally sensitive option.

The need to complete the beltway, coupled with development pressures on the ecologically sensitive Wekiva River Basin prompted then Governor Jeb Bush to create the Wekiva Basin Area Task Force in September 2002. The task force was asked to evaluate and make recommendations on the most appropriate location for an expressway through the basin in addition to evaluating and recommending a transportation plan that would incorporate elements to ensure protection and preservation of the Wekiva River and its springshed.

In addition to determining the most appropriate study area within which to evaluate alignment alternatives for the expressway, the Wekiva Basin Area Task Force created the SR429 Northwest Extension Working Group to study a limited access expressway linking the proposed “Wekiva Parkway”, as the missing segment of the beltway is now named, to US 441 in Mount Dora. With input from Lake County, Mount Dora, and the communities of Sorrento and Mount Plymouth, the Wekiva Parkway study area was modified to include both a realignment of SR 46 to connect with Wekiva Parkway and improvements to SR 46 between US 441 and the SR 46 realignment.

The recommendations of the Wekiva Basin Area Task Force and the SR 429 Working Group were further evaluated and refined by the Wekiva River Basin Coordinating Committee, also created by Governor Bush in July 2003. The recommendations presented in the Wekiva River Basin Coordinating Committee Final Report: Recommendation for Enhanced Land Use Planning Strategies and Development Standards to Protect Water Resources of the Wekiva River Basin, March 16, 2004, reflected consensus among state and regional agencies, county and municipal representatives within the Wekiva Study Area to citizens groups, the agricultural community, property owners, and environmental organizations. The recommendations were signed into law on June 29, 2004 as the Wekiva Parkway and Protection Act.

The Wekiva Parkway and Protection Act, Chapter 369, Part III, F.S., allows for building the Wekiva Parkway while protecting the natural resources of the Wekiva River Basin. Chapter 369.321 (1) legislates that “local governments within which the Wekiva Parkway is planned shall amend their local government comprehensive plan to include the Wekiva Parkway.” The legislation also directs local governments to amend their comprehensive plans to optimize open space and promote development patterns that protect the Most Effective Recharge Areas, karst features, and sensitive natural habitats.

The priority needs of this project are:

Complete the Western Beltway (SR 429) around metropolitan Orlando. The Wekiva Parkway will complete the Western Beltway (SR 429) from Interstate 4 (I-4) in Osceola County to I-4 in Seminole County. SR 429 currently terminates at US 441 in Apopka. The Wekiva Parkway will provide a system to system connection for regional mobility between the Eastern Beltway (SR 417), the Western Beltway (SR 429), and I-4.

The Wekiva Parkway is a planned addition to Florida's Strategic Intermodal System (SIS). Florida's SIS is an integrated transportation network consisting of statewide and regionally significant transportation facilities, services, modes of transportation and linkages. The SIS was established to focus limited state resources on transportation facilities that are critical to Florida's economy and quality of life.

The regional transportation network in the metropolitan Orlando area currently consists of I-4 (SR 400), Florida's Turnpike, SR 408 (East-West Expressway), SR 528 (Beachline Expressway), SR 417 (Eastern Beltway), and completed portions of the Western Beltway (SR 429), all of which are heavily traveled SIS facilities. The Regional Transportation Network with the current and future heavily congested SIS corridors, is based on 2008 Traffic Data by the FDOT Transportation Statistics Office. Heavy congestion in urban areas is considered bumper to bumper or stop and go traffic movement during peak periods (Level of Service (LOS) "E" or worse). For rural areas, passenger and truck traffic is so heavy during peak periods that changing lanes is very difficult (LOS "D" or worse). The future system includes all cost feasible improvements through 2035. All SIS facilities in the metropolitan Orlando area will be heavily congested by 2035, with the exception of portions of SR 429 (Western Beltway). The segments of SR 429 that are not projected to be heavily congested by 2035 include the recently constructed segment between I-4 in Osceola County and Florida's Turnpike in Orange County and the planned Wekiva Parkway.

Completion of the Western Beltway will allow regional traffic to bypass the most heavily congested segment of I-4 (from south of the Osceola/Orange County line to south of the Seminole/Volusia County line) which travels through the City of Orlando and is the main thoroughfare providing access to Walt Disney World, Sea World, Universal Studios, and other area attractions. In addition to providing relief to regional motorists, the completed Western Beltway will ease congestion on local roadways and provide a needed expressway connection between northwest Orange, eastern Lake, and western Seminole Counties.

Provide a higher capacity east-west travel facility in east Lake County and west Seminole County. Most of the existing roadways within the study area consist primarily of local and collector roads. SR 46 is the only east-west connection between Lake County and Seminole County within the study area. For the most part, SR 46 is a two-lane rural roadway which was constructed prior to current design standards. The majority of SR 46 through Lake and Seminole Counties consists of two 12-foot travel lanes with varying shoulder widths. A safer, higher capacity east-west travel facility is needed. Many roads in the study area are currently operating at conditions below LOS "C". However, for SR 46 in east Lake County and west Seminole County, the existing LOS is "F".

These LOS conditions, especially for SR 46, are projected to worsen considerably under the No-Build scenario. Growth in residential population and employment opportunities has contributed to an increasing travel demand in northwest Orange County, northern Lake County, and western Seminole County. Population and employment projections indicate that travel demand will continue to increase in the area for the foreseeable future. In the 2032 design year for the proposed project, the projected No-Build condition for SR 46 in east Lake County and west Seminole County is a further deteriorated LOS "F", with a 58% increase in traffic on a facility that is currently operating at LOS "F".

The proposed project is a needed link between urbanized areas. Modes of transportation within the Wekiva Parkway study area are generally limited to personal vehicles and vehicles for hire. There are currently no public bus service routes within the study area. Much of the study area traverses rural residential and conservation lands; however, the corridor connects the urbanized areas of Apopka in Orange County, Mount Dora in Lake County, and Sanford in Seminole County. The proposed Wekiva Parkway project would meet increased travel demand from population growth in an environmentally sensitive and compatible manner.

Improve safety to reduce vehicle crash injuries and fatalities. Many of the study area roadways are two-lane roads that do not meet the current design standards for safety and capacity. This is a major contributing factor in the high crash and fatality rates, especially for SR 46 through Lake and Seminole Counties. According to FDOT Crash Data Reports from 2000 to 2004, there were 27 fatalities resulting from vehicle crashes on the 18.5 mile segment of SR 46 from US 441 near Mount Dora in Lake County to I-4.

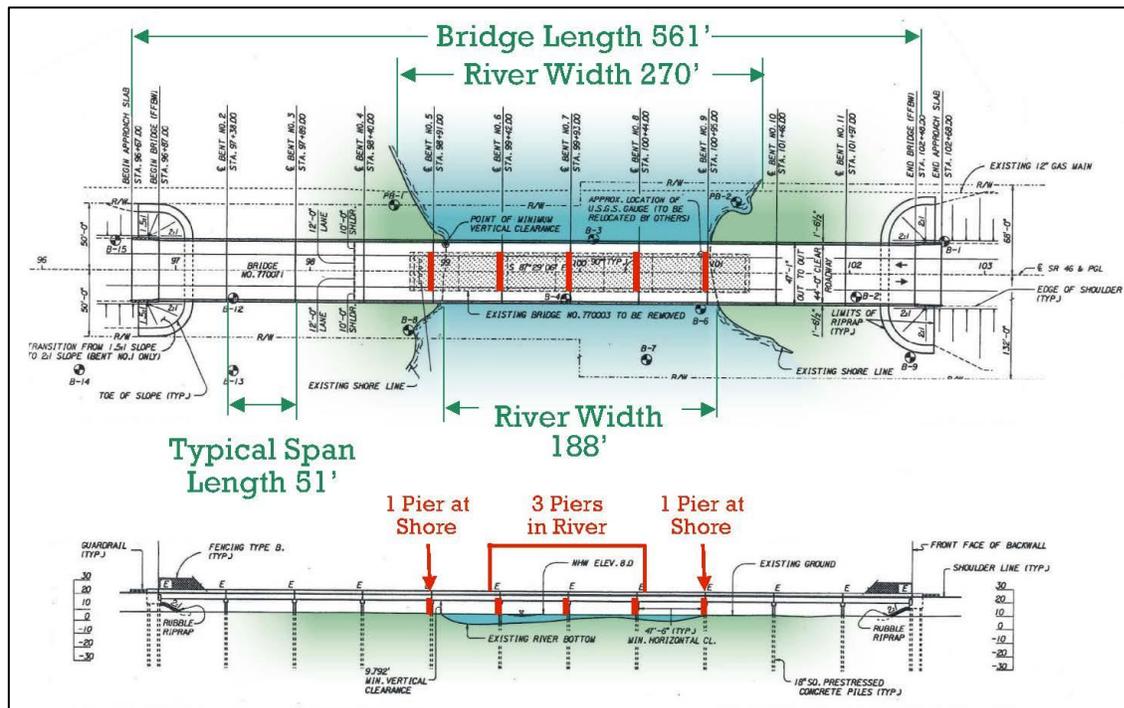
Numerous Florida Black Bears, a state-listed threatened species, have been killed by collisions with vehicles on a six mile segment of SR 46 adjacent to the state conservation lands. From 1994 to 2005 on that same section of SR 46, 23 bears were killed by vehicles. Two wildlife crossings were constructed along SR 46 (in 1994 and 2004) through the Wekiva River protection Area in an effort to reduce the high occurrences of vehicle-bear collisions and the bear mortality rate. These wildlife crossings consist currently of single box culverts and will be expanded significantly under the proposed project.

The proposed project will improve the connectivity of the existing wildlife corridor by providing enhanced wildlife bridging and by leaving open only those sections of SR 46 and CR 46A needed for local access as recommended by the Wekiva Basin Area Task Force and incorporated into the Wekiva Parkway and Protection Act. CR 46A will be realigned to connect with SR 46 west of the interchange with Wekiva Parkway on the Neighborhood Lakes property. Both the proposed Wekiva Parkway and a parallel service road in Lake County East incorporate four wildlife bridges to enhance wildlife habitat connectivity between state conservation lands, which will greatly reduce the number of vehicle-wildlife conflicts.

Proposed Activity.

As part of Section 6 of the Wekiva Parkway project, a new crossing is planned to replace the existing SR 46 crossing. The existing river bridge that will be replaced as part of this project consists of the following (see below figure):

- Eleven (11) spans at 51' for total bridge length of 561'
 - Three (3) existing bridge piers are located within the Wekiva River.
 - Two (2) existing bridge piers are located on the river's edge.
 - All 10 existing bridge piers are located within the floodplain.
- Existing bridge currently provides approximately 9' to 10' of vertical clearance.



The proposed structure will be significantly higher in elevation, significantly longer, and have far fewer piers within the area of the bridge (including no piers within the river itself, see below):



Magnitude/extent of the proposed activities.

The project includes the replacement and removal of an existing bridge crossing. The existing two-lane structure will be replaced by three bridges that will carry a 6-lane expressway, two lane service road, and 12' multi-use trail. The proposed bridge crossing will span the entire width of the river and surrounding floodplain, and will improve on the existing condition by not having any pier locations in the river.

The extent of the analysis includes the project area, which is defined by the limits described below. The analysis also includes the Wekiva River corridor as defined in the Section 7(a) guidelines.

The project area is defined as the proposed improvements, including the river crossing, roadway approaches from approximately 45 feet east of the center line of Wekiva River Road to approximately 222 feet east of the center line of River Oaks Circle, and the stormwater ponds that provide water quality treatment and attenuation of runoff generated from proposed bridge crossing. For the purposes of this analysis, evaluation of offsite impacts is limited to properties immediately adjacent to the project area and the Wekiva River corridor as defined in the Section 7(a) guidelines. It is not anticipated that there will be any effects beyond the adjacent properties unless otherwise noted.

The proposed right-of-way width varies between approximately 280 feet and 326 feet within the project limits. The project limits also include the proposed Florida Gas Transmission Company, LLC easement which is located north of the proposed right-of-way, and varies between 50 feet and 70 feet wide. The proposed right-of-way is contiguous with the proposed Florida Gas Transmission Company, LLC easement. The total width of the project area (including both the proposed right-of-way and easement, and excluding pond areas) within the project limits varies between approximately 350 feet and 396 feet.

Relationship to past and future management activities.

In evaluating past and future management activities based on the Wekiva Wild and Scenic River System Comprehensive Management Plan (Management Plan), it is clear that this project will improve the management and protection of free flow and the Outstandingly Remarkable Values (ORV) of the Wekiva River in the vicinity of the SR 46 bridge crossing. From a scenic standpoint, the new bridge crossing will open the view-shed of the river with a taller and more open bridge structure. Contrast with the surrounding area will be lessened through design and application of color to help it blend in with the surroundings.

In addition to free flow, five relevant ORVs that apply to this project have been clearly defined in the Wekiva River Wild and Scenic River System Comprehensive Management Plan, included as Appendix I to this document. Specifically:

Scenic. Much of the focus of the design and coordination done to date has been on “minimizing contrast”, working to minimize the visual and auditory impact of the bridge and river crossing. Measures such as a long-span, elimination of piers from the waterway, complimentary colors to the surrounding environment, and a context-appropriate bridge aesthetic have been applied and thoroughly

coordinated with local stakeholders and environmental groups. In addition, an elevated profile and noise-reducing bridge type have been proposed to further separate traffic from the river itself and reduce noise impacts to river users.

Recreation. Recreational capabilities of the river within this area are enhanced through the removal of piers in the river itself, improving flow and opening up the river channel for unobstructed use and enjoyment. The wildlife fencing connecting this structure to the other wildlife crossing structures east and west of the Rock Springs Run entrance on SR 46 will also deter unwanted human access and entry in areas along the Wekiva River Bridge that have been problematic from a litter and a destruction of vegetation standpoint. The proposed fencing will be ten feet tall and will run the length of the proposed right-of-way on both sides of the road, connecting under the bridge (see figure below). This will direct river users to locations specifically designed to provide access in accordance with the Comprehensive River Management Plan.



The proposed bridge will also offer recreational opportunities for bicyclists and pedestrians with the addition of a new trail along the alignment which does not currently support a trail. This trail will open up this ORV to a new set of users not currently able to cross the current bridge due to unsafe conditions.

From an auditory standpoint, the higher bridge crossing will move noise further away from users directly under and adjacent to the bridge, and noise levels will not increase based on modeling. This is due in part to the fact that the expansion joints that generate much of the noise when vehicles pass over them will be moved further away from the river, and the segmental bridge structure design with the hollow center also deadens noise. This is discussed in more detail within the prepared noise study memorandum included as Appendix B.

Historic and Cultural. Although historic and cultural resources are found in abundance throughout the Wekiva corridor no historic or cultural impacts are anticipated as part of this project. The Environmental Assessment document performed all necessary coordination and clearances as part of that effort.

Water Quality and Quantity. The Wekiva River was designated as an Outstanding Florida Waterway (OFW) in 2006 by Florida Administrative Code 62-302.700. This designation affords the Wekiva River additional protection that no degradation of water quality will be permitted. As described within this document, water quality is unaffected (or improved) as part of this project through the introduction of stormwater treatment ponds. Any additional runoff created as part of the project will be captured and attenuated within local drainage systems, contributing no further water quantity to the Wekiva River than there is today. Both items are permit requirements, and will be thoroughly reviewed and measures ultimately approved by FDEP prior to the project to moving forward. Proposed pond locations are illustrated in the figure below.

Two small ponds are located within the bridge footprint at the eastern limits of the Wekiva River crossing in order to meet permit requirements for water quality. Wildlife passage experts were consulted to identify locations that would minimize any impacts to wildlife passage. Based on this consultation, the ponds are set back from the river crossing as far as possible, and located adjacent to the local roadway at the eastern limits of the Wekiva River crossing. The pond footprints have been minimized, and these will be dry facilities that do not hold water except following storm events, as well as shallow with gentle slopes that capture and rapidly percolate runoff into the soil. It is anticipated that the runoff generated from the mean annual, 24-hour storm and conveyed to these ponds will percolate into the soil within 6 hours following the end of the storm event.



Wildlife and Habitat. A major component of the project is to greatly widen available wildlife connectivity, both through a longer bridge and by reducing impacts within the waterway itself. This project is part of a much larger system that will connect public lands and create wildlife corridors throughout Central Florida, thereby promoting wildlife connectivity (see the following figure). Wekiwa Springs State Park and Rock Springs State Reserve, through the proposed wildlife crossings, will maintain connection to conservation lands to the north, including Lower Wekiva State Preserve, Seminole State Forest, all of which are eventually connected to the Ocala National Forest. Comprehensive shade

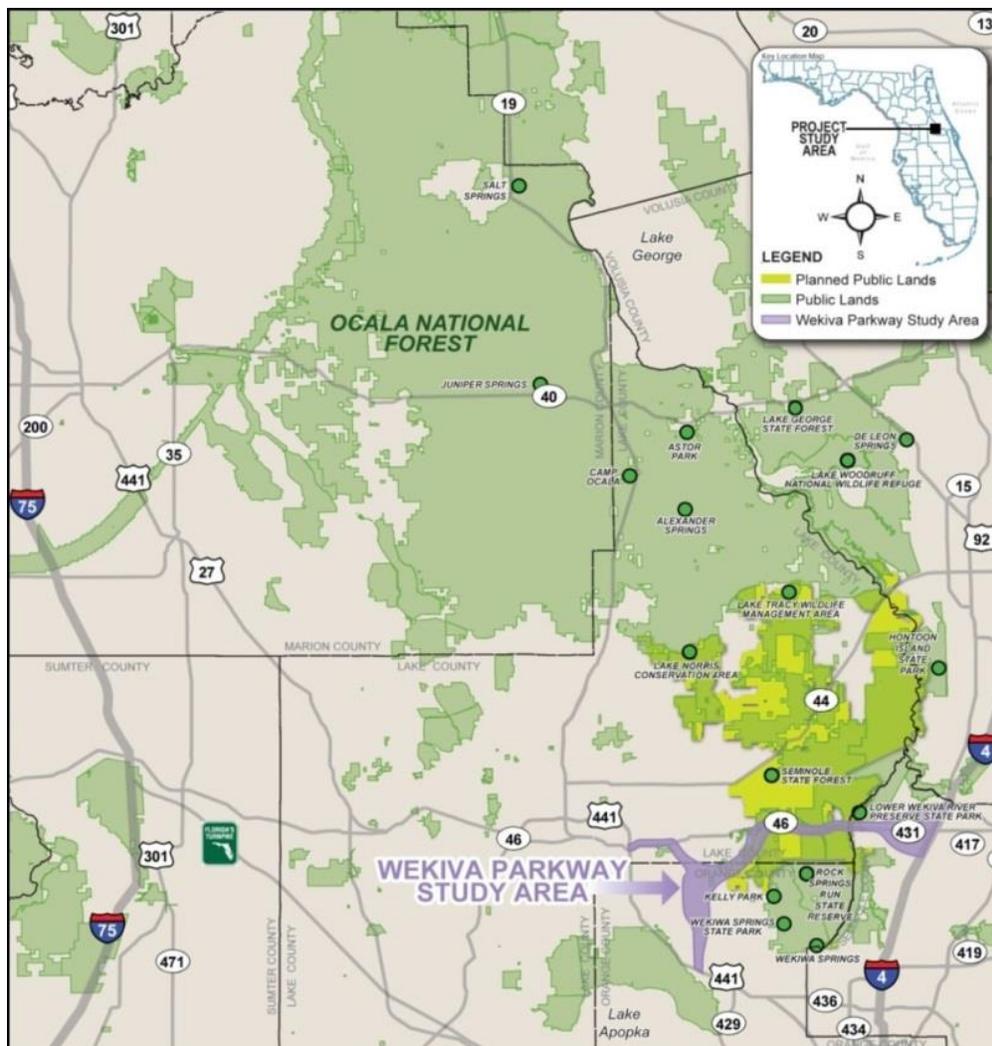
studies and environmental surveys have been completed as part of the design and study effort, with the primary focus on minimizing or eliminating adverse impacts to this important ORV.

Duration of the proposed activities.

This project will complete a permanent facility that will remain in place indefinitely. Construction is expected to take no more than 3 years. The structure is designed for a minimum 50-year lifespan; however, bridges of this type normally exceed their design life by decades as a result of routine maintenance and conservative design.

Maintenance activities generally comprise of regular inspections, minor “spall” repairs, and miscellaneous items such as joint sealing and repairs to approach slabs. No painting cycle will be required on this bridge, as it will be coated with a penetrating stain. Graffiti removal may be required throughout the life of the project; however, exclusionary measures will be in place to prevent access to the underside of the bridge from outside of the river.

As such, maintenance activities over the lifespan of the bridge are expected to have no adverse impact on the ORVs for the Wekiva River.



Describe How the Proposed Activity Will Directly Alter Within-Channel Conditions.

The position of the proposed activity relative to the streambed and stream banks (Free flow & Wildlife and Habitat ORV).

The proposed bridge crossing will span the entire width of the streambed, and the removal of the existing piers within the streambed and along the river's edge will remove the obstructions currently located in the streambed and stream banks.

There are no new piers proposed within the streambed, which will improve the current condition. There are 3 existing piers located within the streambed, and 2 existing piers located at the river's edge on both stream banks. These existing piers will be removed (cut off below the mud line) as part of the proposed activity.

Any likely resulting changes in:

Active channel location (Water Quality ORV). The removal of the existing piers within the active channel will remove obstructions currently located within the active channel. The pier locations for the proposed bridge crossing will be located outside of the active channel. Due to the low channel velocities of the Wekiva River at the proposed bridge crossing, there are no anticipated changes to the active channel location.

Channel geometry (cross-sectional shape, width/depth characteristics) (Free flow, Wildlife and Habitat, Water Quality and Quantity, and Recreation ORVs). There are no anticipated changes to the cross-sectional shape, width of channel or depth of flow within the channel due to the construction of the proposed bridge crossing. The current channel geometry at the existing bridge crossing is obstructed by the existing piers located within the active channel. Removal of the existing piers will eliminate this obstruction, and restore the active channel.

Historic aerials of the river crossing dating back to 1940 (illustrated later in this document) indicate that the most upstream portion of the island closest to the bridge has remained relatively constant over the years. The island is stabilized with vegetation, including cypress trees, which currently protect the island from erosion. While there is the possibility that the island closest to the river crossing could experience degradation due to the removal of the existing piers, it is anticipated that the effects would be minimal given the low velocities in the river and the improvements to the free flow condition in the river and floodplain.

Channel slope (rate or nature of vertical drop) (Free flow, Wildlife and Habitat, Water Quality and Quantity, and Recreation ORVs). There are no likely changes in channel slope. The proposed improvements are located outside of the active channel.

Channel form (straight, meandering, or braided) (Free flow, Wildlife and Habitat, Water Quality and Quantity, and Recreation ORVs). The Wekiva River is a braided river in the vicinity of the proposed improvements, where islands located in the channel intermittently divide the channel flow along the

river reach. There are no likely changes in channel form as a result of the proposed improvements, as the proposed pier locations will be located outside of the channel.

Relevant water quality parameters (turbidity, temperature, nutrient availability)

There are no likely changes to the relevant water quality parameters due to the proposed improvements. The following provisions will be incorporated into the project:

Turbidity (Water Quality and Quantity ORV). Turbidity in the river will be minimized during construction of the bridge crossing through the incorporation of the following construction approaches and erosion and sediment control measures:

- During construction, the existing embankment bridge approaches will be utilized to assist in the construction of the proposed bridge crossing through a top down approach. This approach will reduce the amount of land disturbance during construction.
- The FDOT will require the contractor to use mats and other means to reduce soil impacts during construction
- Existing bridge piles will be cut-off below the mud line in lieu of removal to reduce the potential for sediment entering the river (see Appendix A - Pile Extraction/Cut-off Analysis).
- Erosion and sediment control measures will be implemented during construction to maintain turbidity within required parameters for direct discharge to an OFW. Specific components that will be incorporated into the erosion and sediment control plan will include:
 - All erosion and sediment control devices for each phase of work will be installed prior to beginning work on that phase.
 - Multiple layers of sediment controls will be utilized in order to provide redundant measures to capture sediment-laden runoff prior to entering the river.
 - Floating and/or staked turbidity curtains will be utilized at pier locations near the river to capture sediment-laden runoff.
 - Stabilization will be required after any construction activity ceases, either permanently or temporarily. Areas affected by the bridge construction will be restored in accordance with approved USACE and FDEP permits.
- The contractor will not be allowed to increase the turbidity of the river downstream of the work area during construction. Water quality monitoring will be required during construction activities to ensure that water quality criteria for discharge to an OFW are being met.

Temperature (Wildlife and Habitat ORV). There are no likely changes to the water temperature due to the proposed improvements. Free flowing water conditions will be improved.

Nutrient Availability (Water Quality and Quantity ORV).

- Water quality will be maintained through the capture and treatment of stormwater runoff within the project right-of-way on both sides of the Wekiva River.
- The post-development nutrient load discharging to the river will be kept at or below the pre-development loading through treatment of stormwater runoff generated from the proposed bridge crossing within the project right-of-way.
- Runoff generated from the proposed bridge crossing within the project right-of-way will be captured and treated prior to discharge to the river. There will be no direct discharge of untreated stormwater runoff from the proposed bridge crossing to the river.
- The proposed improvements will not alter natural nutrient cycles within the system.

Navigation of the river (Recreation ORV).

The river is used by kayaks, canoes and other small craft. Navigation of the river will be improved due to the longer bridge span lengths and removal of the existing piers in the main channel. In addition, the new crossing will be set at a much higher elevation than the existing bridge, which will substantially improve the vertical clearance for boaters traveling under the crossing. The low member elevation of the proposed crossing is approximately 27 feet higher than the low member elevation of the existing bridge crossing.

The water course will not be closed during construction of the new bridge crossing but there will be a redirection of river vessel traffic under the existing bridge during demolition. Demolition of the existing bridge structure over the Wekiva River will be accomplished in two phases, the east half and then the west half. During demolition activities on the east half, river vessel traffic will be shifted to the west side of the river to avoid hazards associated with demolition activities. Floating turbidity barrier will be used as a channelization device to direct traffic away from the active demolition zone.

Once demolition activities on the east side are complete the floating turbidity barrier will be reconfigured to channelize river traffic to the east side of the river, and demolition activities can be begin on the west side of the existing bridge.

The island located near the middle of the river on the north side of the bridge will serve as a natural dividing line for these two temporary traffic phases and will help facilitate the temporary river traffic control plan. Once the demolition activities have been completed all turbidity barriers will be removed from the river and vessel traffic can resume normal traffic patterns.

Describe How the Proposed Activity Will Directly Alter Riparian and/or Floodplain Conditions.

The project is expected to reduce Riparian and Floodplain encroachments, as described below:

The position of the proposed activity relative to the riparian area and floodplain.

Riparian Area (Wildlife and Habitat, Scenic, and Recreation ORVs). The riparian area currently contains embankment bridge approaches to the existing bridge crossing. The proposed improvements will remove the embankment bridge approaches and elevate the bridge crossing above the riparian area of the river, thereby enhancing water flow and levels, recreation along the water, views from the river, wildlife movement, and vegetative structure of the forested wetlands and uplands.



Floodplain (Water Quality and Quantity ORV). All 10 existing bridge piers encroach into the floodplain. These existing piers will be removed as part of the proposed improvements. The removal of the existing piers will remove obstructions currently located within the floodplain. The footprint of the proposed bridge crossing will reduce the impacts to the floodplain by providing longer bridge span lengths, and a reduced number of pier locations within the floodplain.

The abutments of the proposed bridge crossing will be placed outside of the floodplain. The proposed bridge crossing will have 3 pier locations in the floodplain, with 2 of these pier locations placed at the eastern and western edges of the floodplain. It is anticipated that the proposed improvements will increase the conveyance of the floodplain through the removal of the existing piers. The proposed bridge crossing will not change relevant floodplain properties such as width, roughness, bank stability, susceptibility to erosion, or flow velocities within the floodplain.

Likely resulting changes in vegetation:

Composition (Wildlife and Habitat ORV). Composition adjacent to the existing bridge crossing is similar on both banks of the Wekiva and extends hundreds of feet from the bridge on both the north and south sides. Community structure is predominantly made up of canopy trees consisting of laurel oak (*Quercus laurifolia*) and cabbage palm (*Sabal palmetto*), sweet gum (*Liquidambar styraciflua*), red maple (*Acer rubrum*), and American elm (*Ulmus americana*) with approximately 80% canopy closure. Subcanopy consists of younger cabbage palm and dahoon holly (*Ilex cassine*). The understory was comparatively sparsely populated with younger cabbage palm, dahoon holly, and Carolina ash (*Fraxinus caroliniana*). Shrub and groundcover species were minimal and consisted of small clumps of panic grasses, and royal fern (*Osmunda regalis*) however the groundcover was largely absent and covered with leaf litter from

overstory canopy trees. The limited loss of trees and vegetation due to construction will not adversely affect the composition of the remaining forest.

Age Structure (Wildlife and Habitat ORV). The age of the trees to be removed is the same age class as the trees on both sides of the existing bridge for hundreds of feet. The limited loss of trees and vegetation due to construction will not adversely affect the age structure of the remaining forest.

Quantity (Wildlife and Habitat ORV). The number of trees lost during construction will represent only a minimal loss of the total number of trees present along the Wekiva River in the vicinity of the project. Mature trees will be protected to the extent feasible as part of this project, with a site-specific clearing plan put in place to precisely identify what trees can be removed, those that shall remain in place, and those which can be trimmed. The contractor will be required to have a licensed arborist on-site during tree trimming to assure minimal impacts to trees. Some areas cleared to accommodate construction can and will be replanted to enhance the return of native vegetation in those areas. The limited loss of trees and vegetation due to construction will not adversely affect the remaining forest.

Vigor (Wildlife and Habitat ORV). Vigor of the remaining vegetation adjacent to the existing bridge crossing is not anticipated to be adversely affected by construction of the proposed bridge crossing or stormwater treatment ponds. The SR 46/Wekiva Parkway Wekiva River Bridge Shade Study (Appendix E) indicates that direct sunlight will still reach these trees after completion of the project. The area affected is approximately 0.03 acre of the 1.48 acre island or approximately 2%. There are 30 trees located within that 0.03 acre area of effect: 15 cabbage palms, 5 laurel oaks, 6 red maples, 2 dahoon hollies, 1 sweetgum and 1 elm. Except for sweetgum, all of these species are shade tolerant. Of the 30 trees, 4 will be trimmed and 26 can remain in place with no alteration.

Likely resulting changes to relevant soil properties such as compaction or percent bare ground (Wildlife and Habitat ORV).

During construction, the existing embankment bridge approaches will be utilized to assist in the construction of the proposed bridge crossing through a top down approach. This construction approach will reduce new impacts to adjacent wetlands within the floodplain of the river. The FDOT will require the contractor to use mats and other means to reduce soil impacts and restore soil elevation with surrounding natural areas once construction is completed. Areas of bare ground will be replanted with shade-tolerant, native species to reduce erosion and sedimentation both during and after construction. Areas affected by the bridge construction will be restored in accordance with an approved USACE and FDEP permits. Areas within the shade of the proposed bridge crossing will be planted with shade-tolerant, native species. Upon completion of construction, the raised embankments will be removed to return the ground to its natural state.

Likely resulting changes to relevant floodplain properties such as width, roughness, bank stability, or susceptibility to erosion (Water Quality and Quantity ORV).

The location and configuration of the proposed bridge crossing will improve or maintain the floodplain properties in the following ways:

- The capture of stormwater runoff from the proposed bridge crossing within the project right-of-way will provide attenuation of peak flows to the river.
- Due to the longer bridge spans, removal of pier locations in the active channel and reduced number of pier locations in the floodplain, the proposed bridge crossing will not have any adverse effect on the floodplain elevation. It is not anticipated that there will be any significant change to the channel velocities or flow distribution within the floodplain.
- The clear-spanning of the river by the proposed bridge crossing and removal of the existing piers will result in improved flow conditions through a reduction in obstructions located within the floodplain. The proposed improvements will not change relevant floodplain properties such as width, roughness, bank stability, susceptibility to erosion, or flow velocities within the floodplain.
- It is anticipated that the conveyance of the river will improve due to the removal of the existing piers, which will remove obstructions currently located within the floodplain.

Describe How the Proposed Activity Will Directly Alter Upland Conditions.

The position of the proposed activity relative to the uplands (Wildlife and Habitat ORV).

The existing bridge crossing is located at the narrowest point in the river. Alternative alignments would necessitate filling and/or new bridges across a wider wetland reach that would result in greater wetland and upland impacts. The proposed project includes all practical measures to minimize harm to the river and adjacent uplands such as a lengthened and heightened channel span over the river and a lengthened bridge span over the floodplain. In addition, the embankment bridge approaches supporting the abutments of the existing bridge crossing will be removed, which will enhance wildlife connectivity.

The FDOT proposes to replace the existing bear crossings in Lake County which include a 52-foot wide wildlife underpass built in 2004 and a 26-foot wide bear underpass built in 1996 along State Road (SR) 46. These structures will be replaced with longer wildlife bridges of approximately 1,800 feet (western bridges) and 3,872 feet (eastern bridges). There will also be an additional 100-foot long wildlife crossing structure placed between the eastern bridges and the proposed Wekiva River Bridges. The existing 561-foot bridge crossing over the river will be replaced with a longer, higher bridge crossing approximately 2,068 feet in length. The low member elevation of the proposed crossing is approximately 27 feet higher than the low member elevation of the existing bridge crossing. The longer bridge crossing will remove fill from the adjacent uplands, restoring the wildlife corridor between the Rock Springs Run State Reserve and the Seminole State Forest, and enhance habitat connectivity. Low mobility species that could not previously get around the fill sections of SR 46 will now be able to successfully cross on either side of the river, allowing many more species of wildlife to safely move between the two public conservation areas. All of these bridge spans will function as wildlife crossings and will greatly improve the wildlife habitat connectivity and reestablish movement corridors to the surrounding area. In addition to the above bridges on this section of the Wekiva Parkway, an 800-foot bridge will span a large floodplain within the

recently acquired Neighborhood Lakes parcels on the 4A/4B section of the Wekiva Parkway. This bridge will also serve to maintain wildlife connectivity.

An early coordination meeting with local environmental stakeholders introduced a question regarding potential bird strikes as a result of migratory patterns through the area. This was further evaluated as part of our bridge development process to assure bird strikes would not pose concern as a result of the proposed bridge height. No adverse impacts to birds were found as a result of a commissioned study, which is included as Appendix G.

Likely resulting changes in Vegetation.

Changes to vegetation will be limited to those items listed below:

Vegetation composition (Wildlife and Habitat ORV). Composition adjacent to the existing bridge crossing is homogenous for hundreds of feet from the bridge on both the north and south sides. The limited loss of trees and vegetation due to construction will not adversely affect the composition of the remaining forest.

Age Structure (Wildlife and Habitat ORV). The age of the trees to be removed is the same age class as the trees on both sides of the existing bridge for hundreds of feet. Specimen trees along the corridor have been surveyed and a majority of these trees will be saved. The limited loss of trees and vegetation due to construction will not adversely affect the age structure of the remaining forest.

Quantity (Wildlife and Habitat ORV). The number of trees lost during construction will represent only a minimal loss of the total number of trees present along the Wekiva River in the vicinity of the project. Mature trees will be protected to the extent feasible as part of this project, with a site-specific clearing plan put in place to precisely identify what trees can be removed, those that shall remain in place, and those which can be trimmed. The contractor will be required to have a licensed arborist on-site during tree trimming to assure minimal impacts to trees. Some areas cleared to accommodate construction can and will be replanted to enhance the return of native vegetation in those areas. The limited loss of trees and vegetation due to construction will not adversely affect the remaining forest.

Vigor (Wildlife and Habitat ORV). Vigor of the remaining vegetation adjacent to the existing bridge crossing is not anticipated to be adversely affected by construction of the proposed bridge crossing or stormwater treatment ponds. The tree shade study indicates that direct sunlight will still reach these trees after completion of the project.

Likely resulting changes to relevant soil properties such as compaction or percent bare ground (Wildlife and Habitat ORV).

Soil compaction will be minimized through a top down construction approach to reduce the project's temporary footprint. Mats and other means will be installed to reduce soil compaction.

Areas affected by the bridge construction will be restored in accordance with an approved USACE and FDEP permits. Areas within the shade of the proposed bridges will be planted with shade-tolerant, native species.

Likely resulting changes to relevant hydrologic properties such as drainage patterns or the character of surface and subsurface flows (Wildlife and Habitat, Water Quality and Quantity ORVs).

The relevant hydrologic properties will remain unchanged or be improved as noted below:

- Water quality will be maintained through the capture and treatment of stormwater runoff from improved upland areas within the project right-of-way on both sides of the river.
- Runoff generated from the proposed improvements within the project right-of-way will be captured and treated prior to discharge to the river. There will be no direct discharge of untreated stormwater runoff generated from improved upland areas to the river.
- Capture of stormwater runoff from improved upland areas within the right-of-way will provide attenuation of peak flows to the river.
- Stable conveyance of runoff generated from the improved upland areas within the right-of-way to the river will be provided.
- Drainage patterns of offsite areas outside of the project right-of-way will remain unchanged between the existing and proposed condition.
- Treatment of stormwater runoff generated from the proposed bridge crossing within the project right-of-way will provide recharge of groundwater, thereby improving subsurface flows.

Potential changes in upland conditions that would influence archaeological, cultural, or other identified significant resource values.

Archeological (Historic and Cultural ORV). Archeological survey of the Wekiva Parkway (SR 429)/SR 46 Realignment Project Development and Engineering (PD&E) Study project APE resulted in the identification and evaluation of one new archaeological site (8LA3353) and one archaeological occurrence. No evidence of the four previously recorded archaeological sites (8LA532, 8SE80, 8SE1723, and 8SE1775) was discovered. None of these sites were located within the project vicinity therefore changes in upland conditions will not affect these resource values.

Historic Structures (Historic and Cultural ORV). The architectural/historical survey resulted in the identification and evaluation of 15 historic resources, including one previously recorded resource (8OR7946). However, none of these resources are located within or adjacent to the Wekiva River within the project vicinity therefore changes in upland conditions will not affect these resource values.

Discoveries of Undocumented Resources During Construction (Historic and Cultural ORV). If resources are discovered during construction, work will be stopped and the State Historic Preservation Office will be notified. Construction notes will contain this provision which is a requirement of both state and federal permit conditions. Notices regarding this issue will be posted on site and construction staff advised.

Noise (Recreational, Historic and Cultural ORV). Analysis limits were analyzed at ¼ mile in each direction of the river bank. Residential land uses lay within these limits; impacts to these land uses have been assessed within our study (see Appendix B). As a result of this study, we do not anticipate that the build alternative traffic noise will noticeably increase over existing conditions; therefore, there will be no noise impact to this ORV. Reasons for this result are that the higher proposed bridge crossing will move noise further away from users directly under and adjacent to the bridges. Noise as it travels tends to dissipate upwards reducing the impact further up and downstream.

A source of noise on the existing bridge crossing is the expansion joints located in the bridge deck on either end of the bridge. Bridge expansion joints are necessary to allow the bridge to freely expand and contract due to temperature; however, they create tire/pavement interaction noise due to vehicles passing over the joint. For the proposed bridge crossing, this tire/pavement interaction noise will be reduced by locating the expansion joints on the bridge farther away from the Wekiva River. The expansion joints for the proposed bridge crossing are located 100' farther to the west and 200' farther to the east of the river. The deck elevation of the proposed bridge crossing is as much as 40' higher in elevation when compared to the deck elevation of the existing bridge crossing.

Another source of noise mitigation is due to the inherent acoustic characteristics of concrete box girder sections. Noise directly below the bridge crossing will be reduced by replacing the current concrete I-girder bridge spans over the river with a structure utilizing segmental concrete box girders. This is a result of the way the tire/pavement interaction noise is able to pass through the concrete deck of the current AASHTO girder bridge deck without any additional buffer zone. With a segmental box girder, the hollow core of the cross section allows for significant noise reduction by dampening the noise on the inside of the box girder. While the outside wings of the box girder section would allow for tire/pavement interaction noise to pass directly through the bridge deck similar to the existing bridge, these areas are generally designated as roadway shoulders and would not have traffic passing directly over them.

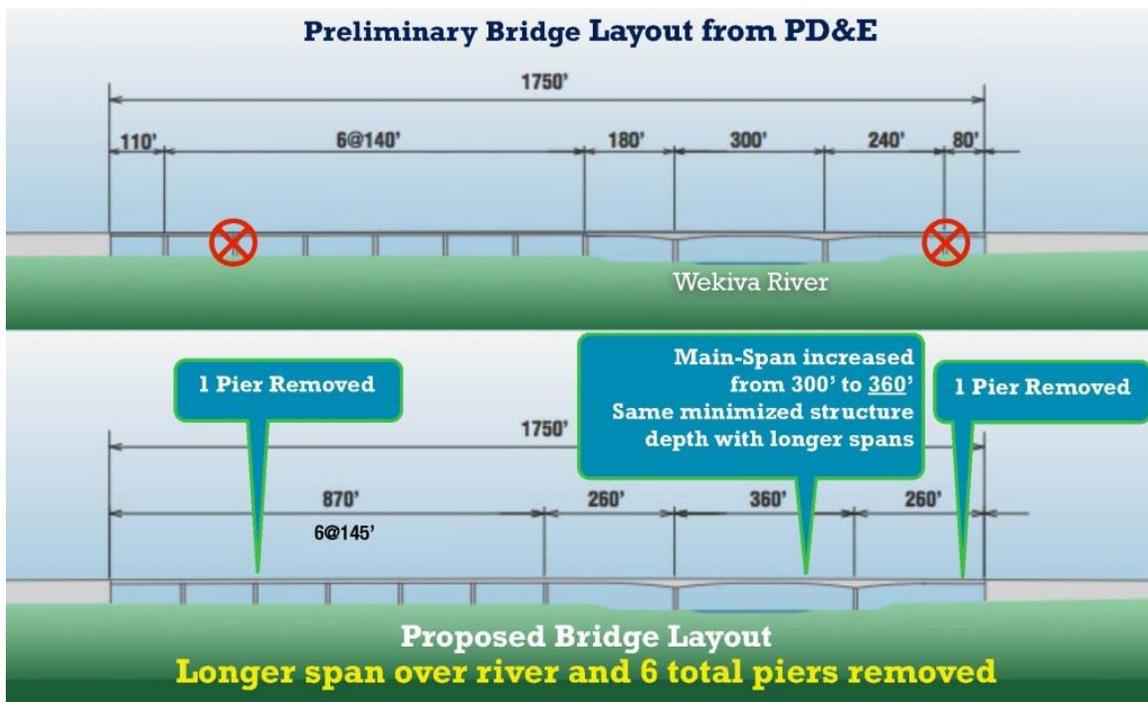
Minimizing Contrast (Scenic ORV). An important aspect of this project is the ultimate aesthetics, minimizing contrast of the bridge crossing with its surroundings. This aspect has been thoroughly evaluated and coordinated with area stakeholders (Wekiva River Advisory Management Committee (WRSAMC)) and the National Park Service (NPS) to develop consensus on an acceptable solution. This consensus was built through a collaborative, Charette process (summarized in Appendix E), and several conversations with the NPS (Appendix D). This process successfully compared the existing span to various proposed options. It was clear that the old span created a significant level of contrast with its surrounding environment and was widely perceived as a blockage, or visual barrier, within the river corridor. This was due to its low profile and multiple piers located with the river's channel.



The existing bridge
that will be removed.

Subsequent renderings of the proposed new span were iteratively composed and evaluated through the charrette process in order to attain an optimal design that minimized contrast and fit the context of the setting. The results of that coordination are:

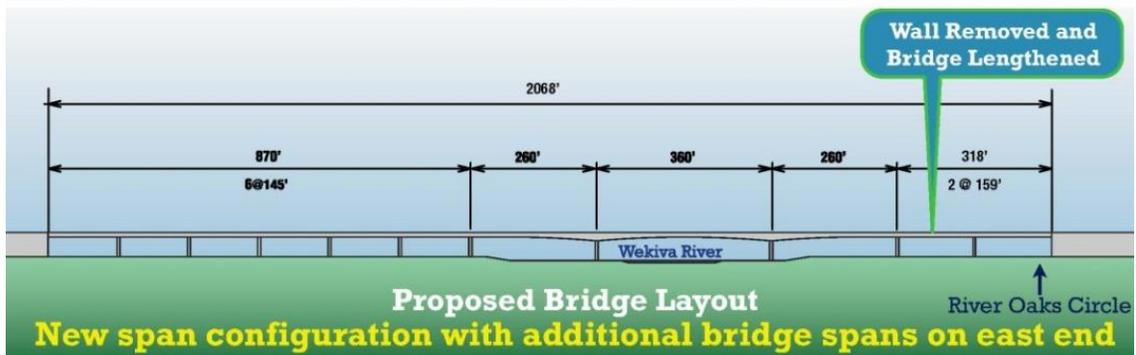
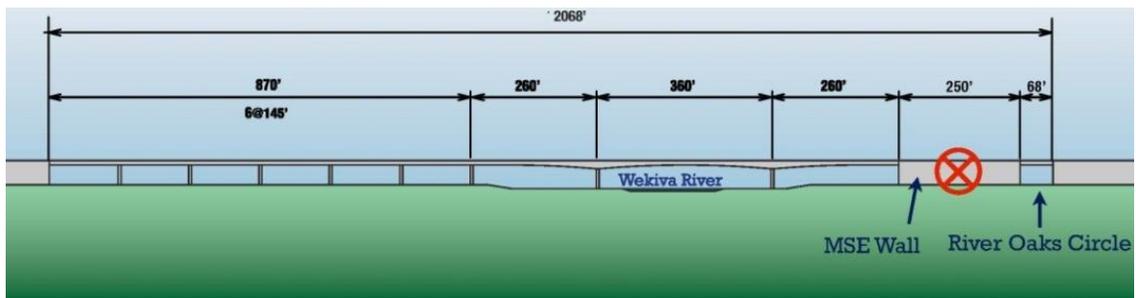
- The commitment from the prior PD&E study provided a 300' main span over the Wekiva River. The new proposed main span length has been increased to 360' which moves the main span piers farther from the River's edge.



- Proposed main span piers will be approximately 40' and 116' from the River's edge on the west and east sides of the River, respectively.



- Substantially increased span length will provide additional openness under the bridge crossing for recreational users of the River.
- Mechanically Stabilized Earth (MSE) wall was removed on the east end of the existing bridge crossing between the east abutment and the River Oaks Circle overpass. These additional spans provide more opportunities for wildlife crossings under the bridge crossing.



- Based on design studies and decisions made during the Design Charette process, a vertical profile for the proposed bridge crossing was chosen where the bridge deck is at a maximum final elevation of 61.5' to keep vehicles within the canopy of the trees.

Bridge Aesthetics (Scenic ORV). NPS provided guidelines that the proposed structure should minimize contrast by mimicking form, line, color, and texture of the surrounding landscape. Each of these items was considered when evaluating the pier shape and color of the proposed bridge crossing.



Pier Shape (Scenic ORV). The bridge design theme of “Celebration of Trees on the River’s Edge” was the preferred theme identified by the stakeholders at the December 11, 2013 Bridge Design Charette 1. This theme served as inspiration for the pier concepts that were developed.

- The following pier shape was identified by the stakeholders as the preferred concept at the January 28, 2014 Bridge Design Charette 2.



- The use of Eco-Staining was identified by the stakeholders at the December 11, 2013 Bridge Design Charette 1. The color palette for the proposed bridge crossing was narrowed down to a range of Brown/Tan color tones by the stakeholders at the January 28, 2014 Bridge Design Charette 2. The range of color tones identified will not increase contrast and will, in fact, provide much less contrast compared to the existing bridge crossing.

The final bridge color will be chosen during construction based on the preliminary color discussion performed during the second charette. The contractor, working with FDOT staff, will prepare several shades to be painted onto the actual bridge. The project stakeholders (WRSAMC and NPS) will be invited out to the bridge site to view the colors from the river. Through discussion with the stakeholders, consensus will be obtained on the final color.



- A fully open railing concept was identified by the stakeholders at the January 28, 2014 Bridge Design Charette 2. There are a wide variety of colors to choose from for the bridge railing, and this can be determined as the project progresses with input from the project stakeholders.



This was determined to be the preferred option as it minimizes contrast to river users, and provides the best opportunity for trail users to view and experience the beauty of the Wekiva River.

Evaluate and Describe How Changes in On-Site Conditions Can/Will Alter Existing Hydrologic or Biologic Processes.

The ability of the channel to change course, re-occupy former segments, or inundate its floodplain (Free flow, Wildlife and Habitat, Water Quality and Quantity ORVs).

The location and configuration of the proposed bridge will reduce the man-made obstructions within the floodplain.

- All 10 existing bridge piers encroach into the floodplain. These existing piers will be removed as part of the proposed improvements. The removal of the existing piers will remove obstructions currently located within the floodplain. The footprint of the proposed bridge crossing will reduce the impacts to the floodplain by providing longer bridge span lengths, and a reduced number of pier locations within the floodplain.
- The abutments of the proposed bridge crossing will be placed outside of the floodplain. The proposed bridge crossing will have 3 pier locations in the floodplain, with 2 of these pier locations placed at the eastern and western edges of the floodplain.
- It is anticipated that the conveyance of the river will improve due to the removal of the existing piers, which will remove obstructions currently located within the floodplain.
- The proposed improvements will not change relevant floodplain properties such as width, roughness, bank stability, or susceptibility to erosion.

Stream bank erosion potential, sediment routing and deposition, or debris loading (Free flow, Wildlife and Habitat, Water Quality and Quantity ORVs).

The potential for stream bank erosion, sediment routing or deposition, and debris loading will be maintained or improved as noted below:

- The bridge opening area provided at the proposed bridge crossing results in no substantial change to the channel velocities between existing and proposed conditions. In both cases, channel velocities in the vicinity of the bridge crossing are approximately one (1) foot per second, which will not adversely affect the likely potential for stream bank erosion or sediment transport.
- The improved flow through clear-spanning of the river main channel and removal of the existing pier bents within the active channel will reduce the potential for debris loading at the proposed bridge crossing.

The amount or timing of flow in the channel (Wildlife and Habitat, Water Quality and Quantity ORVs).

The proposed improvements will not affect the amount or timing of flow in the channel. The capture of stormwater runoff from the improved areas within the project right-of-way will provide attenuation of

peak flows to the river, and the proposed bridge opening area provided will not impound water or affect the flow timing of runoff through the proposed bridge crossing.

Existing flow patterns (Water Quality and Quantity ORV).

While existing flow patterns of the improved areas outside of the proposed bridge crossing within the project right-of-way will be altered in order to direct stormwater runoff to stormwater treatment facilities prior to discharge into the river, stable conveyances will be provided at all locations. Drainage patterns from offsite areas outside of the project right-of-way will remain the same.

Surface and subsurface flow characteristics (Water Quality and Quantity ORV).

Surface and subsurface flow characteristics will remain unchanged or be improved as noted below:

- Water quality will be maintained through the capture and treatment of stormwater runoff from improved upland areas within the project right-of-way on both sides of the river.
- Runoff generated from the proposed improvements within the project right-of-way will be captured and treated prior to discharge to the river. There will be no direct discharge of untreated stormwater runoff generated from improved upland areas runoff to the river.
- Capture of stormwater runoff from improved upland areas within the right-of-way will provide attenuation of peak flows to the river.
- Stable conveyance of runoff generated from the improved upland areas within the right-of-way to the river will be provided.
- Drainage patterns from offsite areas outside of the project right-of-way will remain unchanged between the existing and proposed condition.
- Treatment of stormwater runoff generated from the proposed bridge crossing within the right-of-way will provide recharge groundwater, thereby improving subsurface flows.

Flood storage (detention storage) (Water Quality and Quantity ORV).

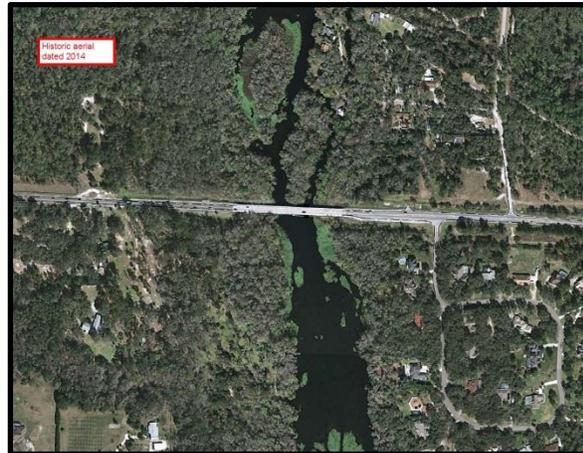
Flood storage (detention storage) within the project right-of-way will be provided through capture of stormwater runoff generated from improved upland areas, and flows will be attenuated to pre-development levels prior to discharge to the river.

Aggradation/degradation of the channel (Water Quality and Quantity, Recreational, Wildlife and Habitat ORVs).

The changes to on-site conditions should have no effect on the long-term aggradation or degradation of the channel.

Based on a review of the channel bed elevations from original bridge plans for the Wekiva River crossing (dated 1938), the replacement bridge plans (dated 1994) and the current surveyed channel bed, the channel is relatively stable with no history of channel aggradation or degradation.

Historic aerials of the river crossing dating back to 1940 (see the following page) indicate that the most



upstream portion of the island closest to the bridge has remained relatively constant over the years. The islands are stabilized with vegetation, and cypress knees and cypress trees currently armor the island. While there is the possibility that the island closest to the river crossing could experience degradation due to the removal of the existing piers, it is anticipated that the effects will be minimal given the low velocities in the river and the improvements to the free flow condition in the river and floodplain.

The bridge opening area provided at the river crossing results in no substantial change to the channel velocities between existing and proposed conditions. In both cases, channel velocities in the vicinity of the proposed bridge crossing are approximately one (1) foot per second which will not adversely affect the potential for stream bank erosion or sediment transport. Proposed bridge foundation and substructure improvements will be located outside of the main channel and will have no effect on the long-term aggradation or degradation of the channel.

Reproduction, vigor, growth and/or succession of streamside vegetation (Water Quality and Quantity, Wildlife and Habitat ORVs).

Reproduction, vigor, growth and/or succession of streamside vegetation will not be affected by the project. The area of impact during construction will be minimized through a top down approach, erosion and sedimentation control measures and replanting of native vegetation. Due to the dense nature of the canopy there is little to no ground cover other than some scattered cinnamon fern. Therefore, species to be planted will be the canopy and subcanopy trees that occur including red maple, sabal palm, laurel

oak, and sweetgum. These species occur in dense upland and wetland forests and have adapted to varying levels of shading (see Appendix E, Shade Study). The increase in shading during the winter months will affect a very small number of trees and is anticipated to have a minimal impact to these species due to their shade tolerance.

Nutrient cycling (Water Quality and Quantity, Wildlife and Habitat ORVs).

Nutrient cycling will not be affected by the project. The free flowing conditions of the river will allow for a natural nutrient cycle in the water and adjacent wetlands.

Fish spawning and/or rearing success (Wildlife and Habitat ORV).

Fish spawning and/or rearing success is not likely to be altered by the project. Free flowing conditions in the river will remain after construction. Enhancement at the bridge crossing may be encountered due to the removal of the existing bridge embankment. The bluenose shiner (*Pteronotropis welaka*), a state-listed Species of Special Concern has been documented to occur at the bridge as well as along other portions of the Wekiva River. They inhabit backwaters and river swamps to spring-run streams and are often associated with areas of aquatic vegetation and deep pools (Florida Natural Areas Inventory 2001, Gilbert 1992, Bass et. al. 2004). In Florida, there are two disjunct distributions, the St. Johns River basin and the western panhandle with no known occurrences between the St. Johns and the Apalachicola rivers (Gilbert, 1992). Adverse impacts to this species are not anticipated since construction activities, except for demolition, will not occur within the open water of the river. Best Management Practices (BMPs) to manage water quality will be implemented to protect and preserve the aquatic vegetation in the river needed for their life cycle.

Riparian dependent avian species needs (Wildlife and Habitat ORV).

Riparian-dependent avian species needs will not be affected by the project. Vegetative structure in the riparian area will be maintained and bare ground areas will be replanted with native species. Migratory bird strikes are not anticipated with the proposed bridge crossing due to elevation of the crossing just below the existing tree canopy tops (see Appendix G, Migratory Bird Correspondence). The proposed elevation relative to the canopy is similar to the existing bridge elevation of the State Road 40 bridge over the Ocklawaha River which is considered a significant migratory bird route. FDOT conducted a road kill study of this section of State Road 40 and performed a migratory bird assessment which indicated that migratory bird strikes are not an issue for the Ocklawaha River bridge which has segments of the bridge located just below and within the tree canopy. Migratory species known to use the Wekiva River area include several species of raptors that typically fly at much higher elevations. In addition, the Wekiva Basin is not a major migratory bird route, but a secondary route to the Atlantic fly-way.

Amphibian/mollusk needs (Wildlife and Habitat ORV).

Amphibian/mollusk needs will not be adversely affected by the project. Clear-spanning of the Wekiva River main channel and removal of the existing pier bents will result in enhanced natural conditions at the bridge crossing.

Species composition (diversity) (Wildlife and Habitat ORV).

Species diversity will not be adversely affected by the project. Clear-spanning of the Wekiva River main channel, removal of the existing pier bents and removal of the bridge embankment will enhance the riparian area of the river enhancing conditions for existing native vegetation to thrive which reduces the likelihood that non-native or nuisance vegetation will become established. Species that occur include red maple, sabal palm, laurel oak, and sweetgum. These species occur in dense upland and wetland forest and have adapted to varying levels of shading. The slight increase in shading during the winter months is not anticipated to impact species diversity.

Estimate the Magnitude and Spatial Extent of Potential Off-Site Changes.***Changes that influence other parts of the river system (Scenic, Recreation, Wildlife and Habitat ORVs).***

The current bridge deck, with an approximate elevation of 21.5 NAVD and a low member elevation of approximately 15.6 NAVD, is a visual barrier blocking the user's view of vegetation and wildlife for several hundred feet both north and south of the bridge. The deck elevation of proposed bridge crossing will be built at a maximum elevation of approximately 61.6 NAVD with the low member at approximately elevation 43.0 NAVD. The increase in bridge height will open the view under the bridges, allowing for visual connectivity from one side of the bridge to the other, improving the view from the existing condition. Putting the bridges near the canopy and modifying the color to blend with the background to the greatest degree possible will result in less contrast with the surrounding area versus the high contrast and visibility of the existing bridge.

Although traffic will increase, the nature of the bridge and profile will ultimately reduce noise impacts to river users despite the expected increase in traffic associated with the expanded crossing. As a result of this profile adjustment, noise will be felt less on the river, and dissipated more throughout the surrounding area rather than being concentrated at the crossing as it currently stands. In addition, the expansion joints (that generate much of the noise when vehicles pass over them) will be moved further away from the river. The type of structure proposed also has noise reduction benefits, as the segmental bridge structure design with the hollow center effectively dampens vibrations and deadens noise.

The wider bridge profile will also have a slight effect on the southern 55 feet of a forested island located near the center of the Wekiva River just north of the existing bridge. The area of direct effect, approximately 0.3 acres of the 1.48 acre island north of the bridge crossing, will receive some shading due to construction of the westbound lanes. Based on survey data collected, 4 trees will need to be trimmed to accommodate the northern most bridge section. This minimal impact represents 0.29% of the total trees (approximately 1400 trees) on the island. The remaining 26 trees located at the edge or directly underneath the westbound lanes are shade tolerant species and will not be affected by construction. No erosion of the island is expected from the trimming and shading activities.

Mature trees will be protected to the extent feasible as part of this project, with a site-specific clearing plan put in place to precisely identify what trees can be removed, those that shall remain in place, and

those which can be trimmed. The contractor will be required to have a licensed arborist on-site during tree trimming to assure minimal impacts to trees.

The range of circumstances under which off-site changes might occur (Scenic, Recreation, Wildlife and Habitat ORVs).

These off-site changes are primarily positive for the portions of the Wekiva River adjacent to the proposed project right-of-way. During extreme storm events such as hurricanes or tropical storms, the removal of existing pier bents will allow water to flow under the new bridges more naturally and pollutants from the proposed bridge crossing will be treated prior to discharge to the river. In addition, with the expanded opening under the proposed bridge crossing along with the additional wildlife crossing locations, wildlife will be able to cross safely under the roadway during extreme events.

The likelihood that predicted changes will be realized (Scenic, Recreation, Wildlife and Habitat ORVs).

There is little uncertainty about the changes that will occur. The proposed increase in bridge crossing height will certainly result in nearly three times the opening under the proposed bridge crossing from the existing condition both from an overhead clearance perspective. Noise will be moved further away from users on the river, wildlife will have improved connectivity from south to north and to the adjacent state lands, and currently untreated stormwater from improved upland areas within the project right-of-way will be directed to an improved stormwater system, enhancing conditions for flora such as emergent vegetation and fauna such as the bluenosed shiner.

Affected processes i.e. water and sediment, and the movement of nutrients (Water Quality and Quantity ORVs).

Turbidity will be minimized due to cut-off of the existing bridge piles. Containment and treatment of turbid water from pile cut-off activities will be addressed in the erosion control plan in accordance with approved FDEP and USACE permits.

Reduction of photosynthesis in the affected trees during winter months due to a slight increase in shading may result in slower growth of a small number of trees. Many of these trees, including red maple, sweetgum and sable palm, have adapted to varying amounts of sunlight due to their occurrence in dense upland and wetland forests.

Habitat fragmentation is the result of large blocks being broken into smaller patches, often separated by roads and subdivisions. Although much of the Wekiva River basin is in public conservation, it is not all contiguous. The Wekiva River 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 basin, and into the Ocala National Forest. The overall health of the Wekiva basin ecosystem and the biodiversity of natural communities and wildlife that are contained within it are inextricably linked to this larger conservation landscape. The establishment of a longer Wekiva River Bridge crossing connected to several other wildlife crossings connected by wildlife fence is a significant contribution to the establishment of a secure and contiguous

corridor of public conservation lands within the Management Plan area that will reduce impediments to wildlife movement, increasing habitat connectivity and reducing fragmentation.

Define the Time Scale over which changes are likely to occur.

Time Scale of Altered Riparian and/or Floodplain Conditions (Water Quality and Quantity, Wildlife and Habitat ORVs).

This project will complete a permanent facility that will remain in place indefinitely. Construction is scheduled to start in 2017 and expected to take no more than three years.

Time Scale of Altered Upland Conditions (Water Quality and Quantity, Recreation, Wildlife and Habitat ORVs).

Upland impacts will occur during construction which is expected to take three years. Upland plantings will be installed post-construction. Improved wildlife connectivity in the uplands will occur once the existing bridge approaches are removed, but will not reach full effect until the construction is completed.

Time Scale of Altered Existing Hydrologic or Biologic Processes (Water Quality and Quantity, Wildlife and Habitat ORVs).

Turbidity will be minimized due to cut-off of the existing bridge piles. Containment and treatment of turbid water from pile cut-off activities will be addressed in the erosion control plan in accordance with an approved FDEP and USACE permits. Containment and treatment of turbid water will be inspected and maintained throughout construction, which is expected to take three years.

Only biologic processes within the direct impact area will be altered during construction. Adjacent community structure will not be negatively impacted. Soil compaction will be minimized through a top down construction approach to reduce the construction foot-print. Mats and other means will be installed to further reduce soil compaction. Vegetated areas impacted during construction will be restored in accordance with the USACE and FDEP permits. Areas within the shade of the proposed bridges will be planted with shade-tolerant, native species.

Time Scale of Potential Off-Site Changes (Water Quality and Quantity, Recreation, Wildlife and Habitat ORVs).

Clear-spanning of the Wekiva River main channel, removal of the existing piers and removal of the existing embankment bridge approaches will enhance the surrounding riparian area. Benefits will reach full effect after the construction is completed.

Vegetation composition adjacent to the existing bridge is homogenous and consistent hundreds of feet from the bridge on both the north and south sides. The loss of trees and vegetation due to construction will not adversely affect the composition, age, structure or vigor of the remaining riparian or floodplain area.

Compare Project Analyses to Management Goals.

Summary of Management Goals.

The Wekiva Wild and Scenic River System Management Plan outlines management goals for the Wekiva Wild and Scenic River that include free flow and five ORVs: scenic; recreation; wildlife and habitat; historic and cultural resources; and water quality and quantity. The goals for scenic resources include the protection of healthy native plant and animal communities and limitation of visual and auditory impacts along the river. Recreational goals include providing environmentally-based recreational opportunities along the river and minimizing natural impacts and user conflicts. Wildlife and habitat goals consist of protection of existing wildlife and habitats, maintaining the quality, diversity and connectivity and reducing the impacts of invasive species. Protection of historic and cultural resources is another of the goals of the management plan. Water quality and quantity goals are defined as protecting the existing quality and flow of the river.

Goals vs. Altered Riparian and/or Floodplain Conditions (Water Quality and Quantity ORV).

The goal for the floodplain condition is to protect the flow of the river. The proposed activity is consistent with the management goal, and will have a beneficial effect on the river's free-flowing condition as noted below:

- Capture of stormwater runoff from improved upland areas within the right-of-way will provide attenuation of peak flows to the river
- The existing bridge crossing has pier locations which encroach into the floodplain. These existing piers will be removed as part of the proposed improvements. The removal of the existing piers will remove obstructions currently located within the floodplain. The footprint of the proposed bridge crossing will reduce the impacts to the floodplain by providing longer bridge span lengths, and a reduced number of pier locations within the floodplain
- The abutments of the proposed bridge crossing will be placed outside of the floodplain. The proposed bridge crossing will have 3 pier locations in the floodplain, with 2 of these pier locations placed at the eastern and western edges of the floodplain.
- It is anticipated that the proposed improvements will increase the conveyance of the floodplain through the removal of the existing piers and bridge approaches, which will remove obstructions currently located within the floodplain.
- The proposed bridge crossing will not change relevant floodplain properties such as width, roughness, bank stability, susceptibility to erosion, or flow velocities.
- The substantial increases in span lengths and vertical clearance over the river will improve the navigational clearances for recreational watercraft that utilize the river. Navigation of the river by kayaks, canoes and other small craft will be improved due to the longer bridge span lengths and removal of the existing piers in the river.

Goals vs. Altered Upland Conditions (Wildlife and Habitat, Recreation and Scenic ORVs).

Uplands adjacent to the proposed bridge crossing will be minimally impacted by construction of the bridges. Any areas adjacent to or under the proposed bridge crossing that do not need to be cleared will be protected or selectively cut to minimize impacts to native plant species and associated scenic values.

In areas that have to be cleared and will not be filled, a planting plan to restore native vegetation will be developed using vegetation that is found in the adjacent upland areas, minimizing impacts.

Goals vs. Altered Existing Hydrologic or Biologic Processes (Water Quality and Quantity, Wildlife and Habitat ORVs).

There are no likely changes in relevant water quality parameters due to the proposed improvements.

- The location and configuration of the proposed bridges will reduce the man-made obstructions to natural flow within the active channel of the river.
- There are no likely adverse changes to biologic processes. However, wildlife connectivity will be enhanced.

Goals vs. Magnitude and Spatial Extent of Potential Off-Site Changes (Recreation, Scenic, Wildlife and Habitat ORVs).

Off-site changes to the island north of the existing bridge structure were minimized by shifting the right of way south to limit direct shading impacts to the southern 55 feet of the island and 30 trees. These trees can remain in place with minimal trimming activity. All but one of these trees are shade tolerant species and they are expected to survive. Therefore there will be no impact to the scenic and recreational value of the island or vegetation located further off-site.

Changes to off-site habitats adjacent to the project will be minimal from a structure standpoint and will maintain their quality and diversity. From a connectivity standpoint the proposed condition will be substantially improved due to removal of the existing bridge causeway and implementation of wildlife fencing that directs wildlife to safe passages between public lands.

Goals vs. Time Scale Over Which Alterations are Likely to Occur (Water Quality and Quantity, Recreation, Wildlife and Habitat ORVs).

Potential off-site changes to the island north of the bridge crossing will be minimal and gradual, occurring over a period of several years. Edge effects to community structure will be reduced through replanting and monitoring.

Clear-spanning of the Wekiva River main channel, removal of the existing piers and removal of the bridge embankment will enhance the native plant and animal communities as well as scenic values.

Section 7(a) Determination.

Summary

The effects of the proposed activity on the river's free flow

The existing bridge crossing of the Wekiva River will be removed and replaced with a proposed bridge crossing with substantially longer spans and greater height over the river. The proposed new bridge crossing will improve the free-flowing condition of the river through the proposed measures identified below.

The removal of the existing piers within the active channel will remove obstructions currently located within the active channel. The pier locations for the proposed bridge crossing will be located outside of the active channel. There are no anticipated changes to the cross-sectional shape, width of channel or depth of flow within the channel due to the proposed bridge crossing.

The abutments for the proposed bridge crossing will be placed substantially further away from the existing streambed and stream banks in comparison to the location of the abutments for the existing bridge crossing. The 5 existing bridge pier locations located within the streambed and along the streambank will be removed, and no piers will be placed within the streambed in the proposed condition. Due to the low channel velocities in the river at the proposed bridge crossing, there are no anticipated resulting changes in active channel location.

The location and configuration of the proposed bridge crossing will protect and enhance the floodplain properties in the following ways:

- Capture of stormwater runoff from improved upland areas within the right-of-way will provide attenuation of peak flows to the river.
- The existing bridge crossing has 10 piers which encroach into the floodplain. These existing piers will be removed as part of the proposed improvements and replaced with 3 pier locations inside of the floodplain – with all outside the river banks. The removal of the existing piers will remove obstructions currently located within the floodplain. The footprint of the proposed bridge crossing will reduce the impacts to the floodplain by providing longer bridge span lengths, and a reduced number of piers within the floodplain.
- The abutments of the proposed bridge crossing will be placed outside of the floodplain. The proposed bridge crossing will have 3 pier locations in the floodplain, with 2 of these pier locations placed at the eastern and western edges of the floodplain.
- It is anticipated that the proposed improvements will increase the conveyance of the floodplain through the removal of the existing piers, which will remove obstructions currently located within the floodplain.
- The proposed bridge crossing will not change relevant floodplain properties such as width, roughness, bank stability, susceptibility to erosion, or flow velocities within the floodplain.

The effects of the proposed activity on the river's water quality.

Water quality will be protected and enhanced through the capture and treatment of stormwater runoff from upland areas on both sides of the river, and through the use of erosion and sediment control Best Management Practices during construction as described below:

- The post-development nutrient load discharging to the river will be kept at or below the pre-development loading through treatment of stormwater runoff generated from improved upland areas within the project right-of-way. Runoff generated from the proposed improvements within the project right-of-way will be captured and treated prior to discharge to the river. There will be no direct discharge of untreated stormwater runoff generated from improved upland areas runoff to the river.
- Capture of stormwater runoff from improved upland areas within the right-of-way will provide attenuation of peak flows to the river.
- Treatment of stormwater runoff from improved upland areas within the project right-of-way will provide recharge of groundwater, thereby improving subsurface flows.
- Erosion and sediment control measures will be implemented during construction to maintain turbidity within required parameters.

The bridge opening area provided at the river crossing results in no substantial change to the channel velocities between existing and proposed conditions. In both cases, channel velocities in the vicinity of the bridge crossing are approximately one (1) foot per second, which will not adversely affect the likely potential for stream bank erosion or sediment transport.

Effects on the ORVs for which the river was designated.

The proposed project will not have any “direct and adverse effects” to the ORVs for which the river was added to the National System.

Scenic. Scenic values of the river will be enhanced in the vicinity of the proposed project through the removal of the existing bridge and replacement with a new bridge. The existing structure is comparatively low to the water with multiple piers in the channel. As viewed from upstream, it forms a visual obstruction within the river corridor and is in contrast with its surrounding. The proposed span has been specifically designed through a stakeholder inclusive process with the overall goal of minimizing contrast while attempting to repeat the local surrounding’s visual components of line, form, color and texture. In order to accomplish this, the span will be raised to height approximately consistent with the top of the forest canopy and it will have no piers in the river channel. This design aspect enhances the current condition by remove, or elevating, the visual obstruction within the corridor. Similarly, the bridge shape and color will blend with its surrounding further reducing contrast. Further, the bridge will have no artificial lighting in order to avoid visual contrast and night or interference with night skies. ***No direct and adverse impact.***

Recreation. Recreational capabilities of the river within this area are enhanced through the removal of piers in the river itself, improving flow, the addition of a multi-use path on the bridge, and the opening

up the river channel for unobstructed use and enjoyment. The wildlife fencing connecting this structure to the other wildlife crossing structures east and west of the Rock Springs Run entrance on SR 46 will also deter human access and entry in areas along the Wekiva River Bridge that have been problematic from a litter and vegetation standpoint. The proposed fencing will be ten feet tall and will run the length of the proposed limited access right-of-way on both sides of the road, connecting under the bridge. **No direct and adverse impact.**

From an auditory standpoint, the higher bridge crossing will move noise further away from users directly under and adjacent to the bridge, and noise levels will not increase based on modeling. This is due in part to the fact that the expansion joints that generate much of the noise when vehicles pass over them will be moved further away from the river, and the segmental bridge structure design with the hollow center also deadens noise. This is discussed in more detail within the prepared noise study memorandum included as Appendix B. **No direct and adverse impact.**

Wildlife and Habitat. A major component of the project is to greatly widen available wildlife connectivity, both through a longer bridge and by reducing impacts within the waterway itself. This project is part of a much larger system connecting wildlife corridors throughout Central Florida and promotes wildlife connectivity as a result. Comprehensive shade studies and environmental surveys have been completed as part of the design and study effort, with the primary focus on minimizing or eliminating adverse impacts to this important ORV. **No direct and adverse impact.**

Historic and Cultural.

Although historic and cultural resources are found in abundance throughout the Wekiva corridor no historic or cultural impacts are anticipated as part of this project. The Environmental Assessment document performed all necessary coordination and clearances as part of that effort. **No direct and adverse impact.**

Water Quality and Quantity. As described within this document, water quality is unaffected (or improved) as part of this project through the introduction of stormwater treatment ponds, and any additional runoff created as part of the project is captured and attenuated within local drainage systems, contributing no further water quantity to the Wekiva River than there is today. Both items are permit requirements, and will be thoroughly reviewed and measures ultimately approved by DEP prior to allowance for the project to move forward. **No adverse impact.**

APPENDIX A

Pile Extraction/Cut-off Analysis

APPENDIX B

Noise Study Memorandum

APPENDIX C

Summary of Design Charette Comparison 2 Bridges vs. 3 Bridges

APPENDIX D

Meeting Minutes from NPS Meetings

APPENDIX E

Shade Study

APPENDIX F

Drainage Design Criteria

APPENDIX G

Migratory Bird Correspondence

APPENDIX H

PD&E Study – Concept Level Studies for the Proposed
Wekiva River Bridges

APPENDIX I
**Wekiva River System Wild and Scenic River Comprehensive
Management Plan**

APPENDIX J

Bridge Hydraulic Report

APPENDIX K
2013/2014 Charette Summary Report