

Everglades National Park  
Florida

U.S. Department of the Interior  
National Park Service



# Old Tamiami Trail Modifications

ENVIRONMENTAL ASSESSMENT



December 2017





**United States Department of the Interior  
National Park Service  
Everglades National Park**

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Environmental Assessment**

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The National Park Service (NPS), in cooperation with the Jacksonville District of the US Army Corps of Engineers (USACE), proposes to modify an original 5.7-mile segment of Old Tamiami Trail located along the northern boundary of Everglades National Park (the park) as proposed in the Central Everglades Planning Project (CEPP) (USACE 2014).

NPS prepared this environmental assessment (EA) to evaluate two action alternatives, describe the environment that would be affected by the alternatives, and assess the environmental consequences of implementing the alternatives. NPS also evaluated the impacts of a no-action alternative, which would not alter the 5.7-mile segment of the Old Tamiami Trail. This EA examines potential impacts on hydrology and water quality, vegetation and wetlands, special-status species, cultural resources, and visitor use and experience.

This EA has been prepared in accordance with the National Environmental Policy Act and its implementing regulations (40 Code of Federal Regulations [CFR] 1500–1508) and Director’s Order 12: *Conservation Planning, Environmental Impact Analysis, and Decision-making* (NPS 2011) and its accompanying handbook (NPS 2015a) to assess the alternatives and their impacts on the environment.

**Public Review and Comment**

This EA will be available for public review for 30 days. If you wish to comment, you are encouraged to submit your comments directly through the NPS Planning, Environment, and Public Comment (PEPC) website: <http://parkplanning.nps.gov/ever>. You may also mail written comments to:

Everglades National Park  
Attention Agnes McLean  
Old Tamiami Trail Modifications EA  
950 N. Krome Avenue, Homestead FL 33030

Before including your address, phone number, email address, or other personal identifying information in your comment, you should be aware that your entire comment, including your personal identifying information, may be made publicly available. While you can ask in your comment to withhold your personal identifying information from public review, NPS cannot guarantee that it will be able to do so.

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# CHAPTER 1: PURPOSE AND NEED

## INTRODUCTION AND PROPOSED ACTION

The National Park Service (NPS), in cooperation with the Jacksonville District of the US Army Corps of Engineers (USACE), proposes to modify an original 5.7-mile segment of Old Tamiami Trail located along the northern boundary of Everglades National Park (the park) as proposed in the Central Everglades Planning Project (CEPP) (USACE 2014).

This environmental assessment (EA) has been prepared in accordance with the National Environmental Policy Act (NEPA) and its implementing regulations (40 Code of Federal Regulations [CFR] 1500–1508) and Director’s Order 12: *Conservation Planning, Environmental Impact Analysis, and Decision-making* (NPS 2011) and its accompanying handbook (NPS 2015a). This EA analyzes the proposed action and alternatives and their impacts on the environment.

## BACKGROUND

Everglades National Park was authorized as a national park by the US Congress in 1934 and formally established in 1947. The park covers 1.5 million acres and encompasses approximately 2,350 square miles of freshwater sloughs, sawgrass prairies, mangrove forests, and estuaries extending from US Highway 41 south into Florida Bay (figure 1). It was the first national park in the United States set aside foremost for its biological resources rather than its scenic or historic values. In 1978, nearly 86 percent, or approximately 1.3 million acres of the park, was designated as permanent wilderness, preserving essential primitive conditions, including the natural abundance, diversity, behavior, and ecological integrity of the unique flora and fauna. More than 60 years after the park was established, protection of natural resources and the ecosystem remains a primary focus of park management.

Historically, the greater Everglades ecosystem has been heavily altered by an intricate series of canals, levees, and drainage systems in an attempt to drain the landscape. Beginning in the 1880s and continuing through the 1930s, mostly local drainage efforts transformed large tracts of land from wetland to agricultural land. As south Florida grew, developers cut more canals, built new roads, and removed mangroves from the shorelines and replaced them with palm trees. Canals, roads, and buildings gradually displaced native habitats. Surface flow from the north into the Northeast Shark River Slough was substantially reduced by the construction of Tamiami Trail (US Highway 41) in the late 1920s.

The Central and Southern Florida (C&SF) project, a multipurpose project first authorized by Congress in 1948, includes an elaborate system of canals, levees, and water-control structures stretching throughout south Florida. The primary system includes about 2,000 miles of canals, 1,000 miles of levees, and almost 200 water-control structures. These features have divided the greater Everglades into areas designated for urban and agricultural development, areas for fish and wildlife benefits, natural system preservation, and water storage. Three water conservation areas (WCAs) are located north of Tamiami Trail, with WCAs 3A and 3B immediately north of the park. Today, human intervention is required to mitigate the hydrologic changes that have altered the natural hydrologic regime.

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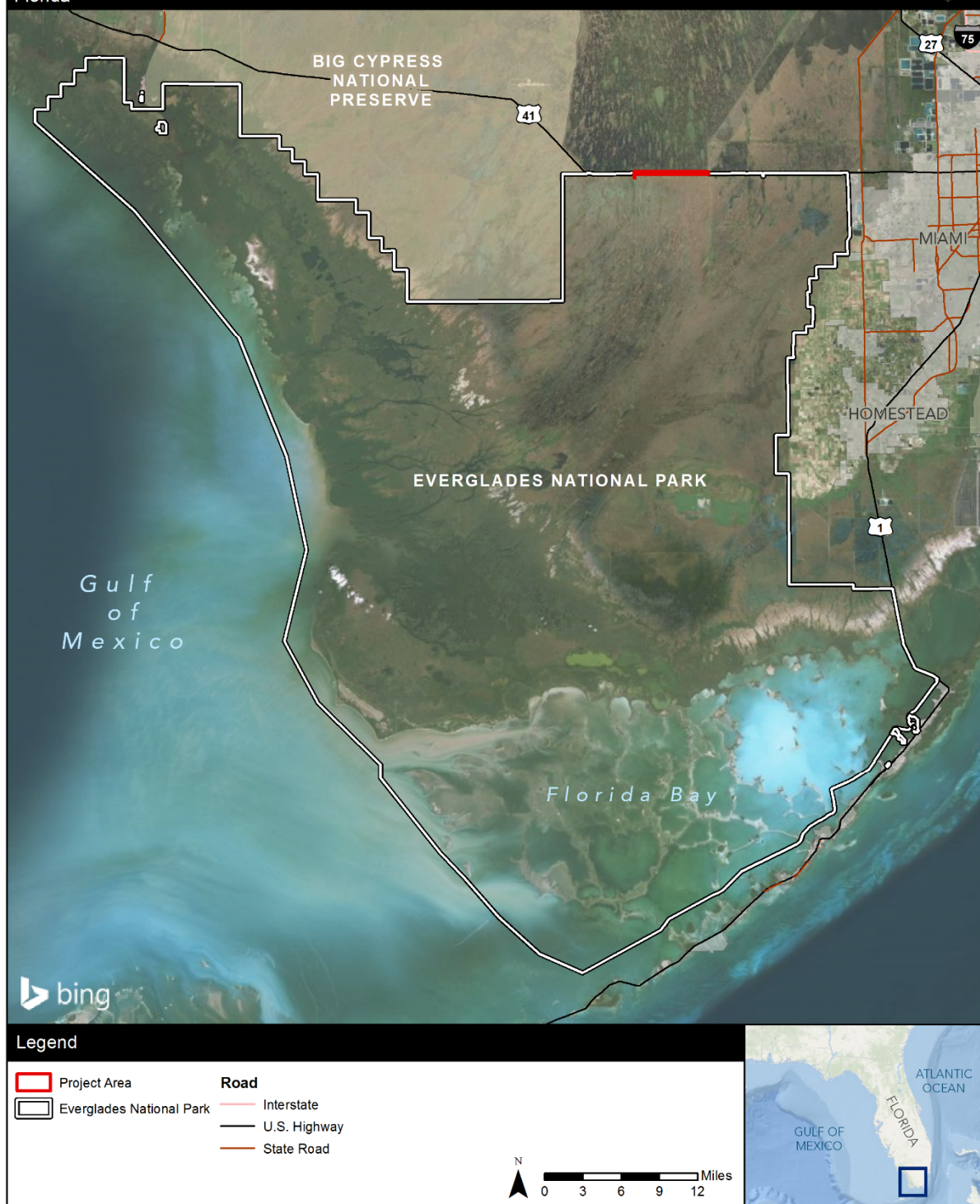


FIGURE 1. EVERGLADES NATIONAL PARK AND VICINITY

Multiple plans to restore natural conditions to the Everglades exist and inform the proposed action described in this EA. These include:

- Everglades Restoration Transition Plan (ERTP)
- Modified Water Deliveries to the Everglades National Park (MWD) Project
- Tamiami Trail Next Steps Project
- Comprehensive Everglades Restoration Plan (CERP)
- Central Everglades Planning Project (CEPP)

### **EVERGLADES RESTORATION TRANSITION PLAN**

The ERTP, implemented in 2012, has been the current operating plan for selected C&SF project features that directly affect the WCAs and the park. This plan incorporates operating criteria to better manage WCA 3A, which is directly north of the park, with objectives that include improving conditions for the endangered Everglade snail kite (*Rostrhamus sociabilis*), wood stork (*Mycteria americana*), and wading bird species and their habitats, while maintaining protection for the endangered Cape Sable seaside sparrow (*Ammodramus maritimus mirabilis*). The US Fish and Wildlife Service (USFWS) biological opinion for the ERTP expired in July 2016, and USFWS issued a new biological opinion. USACE implemented the first elements of the reasonable and prudent alternative from the biological opinion in March 2017.

### **MODIFIED WATER DELIVERIES PROJECT**

The MWD project is a modification of the C&SF project's system. The goal of this initiative is to help restore the natural hydrologic conditions of the park by providing a way for additional water to flow from WCA 3 under Tamiami Trail and into the park. A specific goal of the MWD project is to restore the historical hydrologic conditions in the Shark River Slough basin by redistributing flows from the Western Shark River Slough to the Northeast Shark River Slough. Project features would allow for improved quantity, quality, timing, and distribution of water flows into the Northeast Shark River Slough, while mitigating for potential flooding impacts from the project. Construction of the 1-mile Tamiami Trail bridge to meet the Design High Water was completed in March 2013. The rest of the 10.7-mile highway corridor was raised in December 2013 to meet the interim water level and allow increased water flow under Tamiami Trail and into the park.

### **TAMIAMI TRAIL NEXT STEPS PROJECT**

The Tamiami Trail Next Steps project builds on the 1-mile Tamiami Trail bridge and Tamiami Trail road improvements, as discussed under the MWD project. Within the 10.7-mile improved section of the Tamiami Trail (adjacent to the Northeast Shark River Slough) under the MWD project, the selected alternative for the Next Steps project includes an additional 5.5 miles of bridging and road raising. The additional bridging would allow higher stages to be maintained in the canal, which can increase water flows into the park and provide additional hydrological and ecologic restoration of significant park resources. The Next Steps project was approved and authorized by Congress in 2011. Construction of the western 2.6-mile bridge began in January 2017 with expected completion in December 2018.

### **COMPREHENSIVE EVERGLADES RESTORATION PLAN**

The CERP was authorized to accomplish regional restoration, protection, and preservation of the Greater Everglades ecosystem. While providing a framework for the restoration of the Everglades, the CERP also provides for other water-related needs of the region, including water supply and flood protection. A



partnership among USACE; the South Florida Water Management District (SFWMD); and many other federal, state, local, and tribal partners are responsible for implementing the CERP.

Since the CERP was approved, three projects were authorized in the 2007 Water Resources Development Act and proceeded into construction, and a fourth project was implemented under the programmatic authority in the Water Resources Development Act 2000. An additional four CERP projects were authorized in the 2014 Water Resources Reform and Development Act and are either in design or under construction. Despite this progress, ecological conditions and functions in the central portion of the Everglades ridge and slough community continue to decline because of a lack of sufficient quantities of clean freshwater flow into the central Everglades and timing and distribution problems.

## **CENTRAL EVERGLADES PLANNING PROJECT AND ALTERNATIVE 4R2**

USACE and SFWMD combined six of the components of the CERP into the CEPP in November 2011 in response to the ecological concerns described above. The purpose of the CEPP is to improve the quantity, quality, timing, and distribution of water flows to the northern estuaries, central Everglades (WCA 3 and the park), and Florida Bay, while enhancing water supply for municipal, industrial, and agricultural users.

An environmental impact statement (EIS) for the CEPP was developed to evaluate the alternatives for restoring ecosystem conditions and opportunities for providing other water-related needs in the region. The recommended alternative, alternative 4R2, is a conceptual plan that includes guidelines for future coordination requirements and programmatic consultations to ensure the project avoids and minimizes impacts on resources to the extent practicable. Alternative 4R2 also includes adaptive management and water quality, hydrometeorologic, and ecological monitoring activities to ensure that the intended purposes of the project will be achieved through long-term operations.

Alternative 4R2 also meets the Seminole Tribe of Florida's compacts and achieves the goal of reestablishing hydrologic and ecologic connectivity of WCA 3A, WCA 3B, and the park by degrading the L-67C and L-29 levees west of the Blue Shanty levee. The planned flowway will restore sheetflow consistent with the landscape patterns of the natural system, which is characterized by long, continuous and uninterrupted patterns of sheetflow from north to south. This planned flowway will also require the construction of a new Blue Shanty levee extending from Tamiami Trail north to the L-67A levee. This will include construction of three new gated-control structures along the L-67A levee.

As part of the effort to achieve and facilitate additional deliveries of water from WCA 3A directly to the park by way of the S-12D and S-12C outflow structures (see figures 2–5), alternative 4R2 also includes a proposal to remove approximately 6 miles of Old Tamiami Trail between the Shark Valley Entrance Road and the L-67 extension levee. The final CEPP Project Implementation Report and EIS was completed in 2014. The USACE Record of Decision, signed on August 31, 2015, selected the recommended plan, alternative 4R2, for implementation. Congress authorized the CEPP as part of the Water Infrastructure Improvements Act (Public Law 114-322) on December 15, 2016. The current implementation schedule shows construction of the first projects beginning in 2020.

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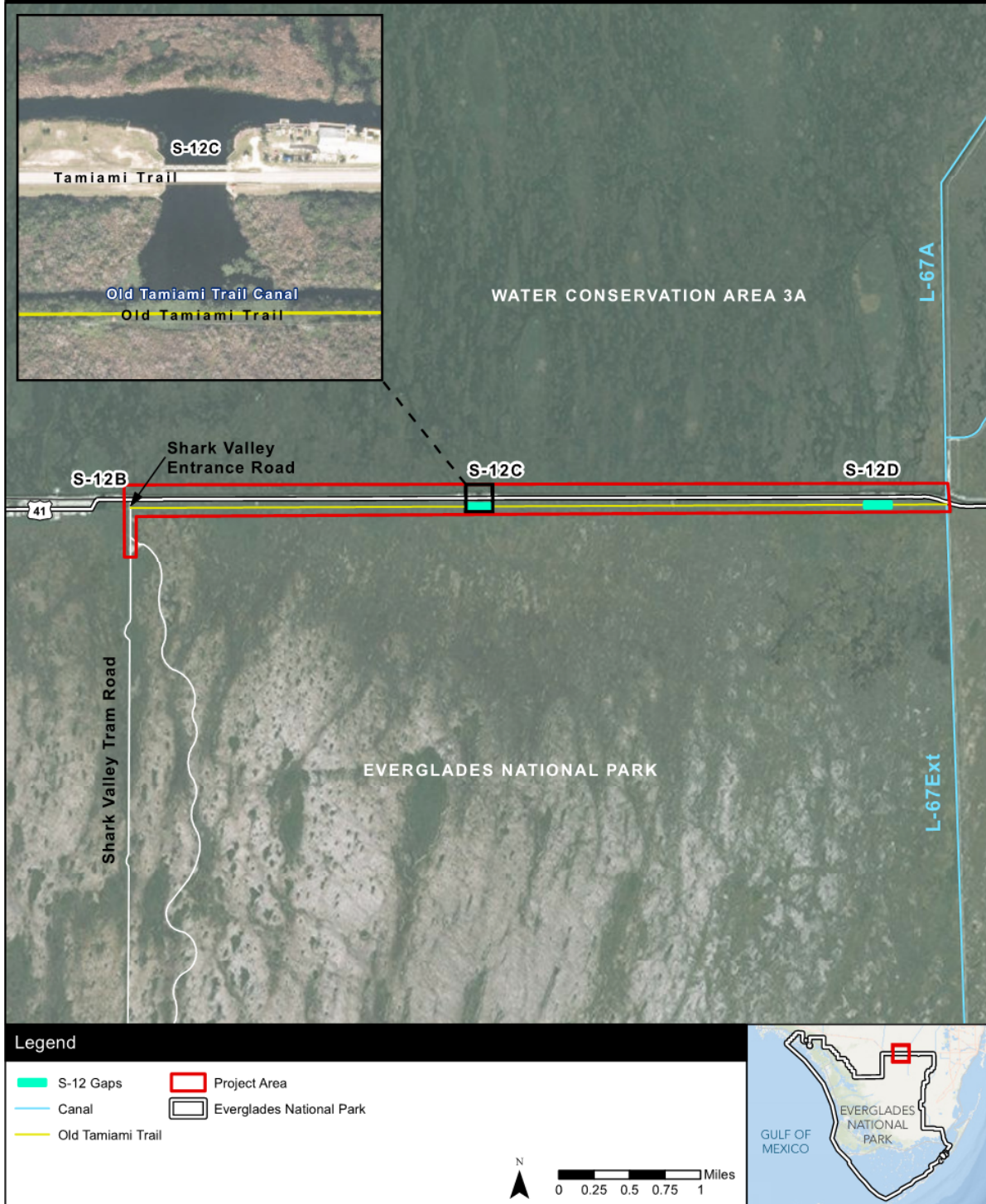


FIGURE 2. PROJECT AREA OVERVIEW



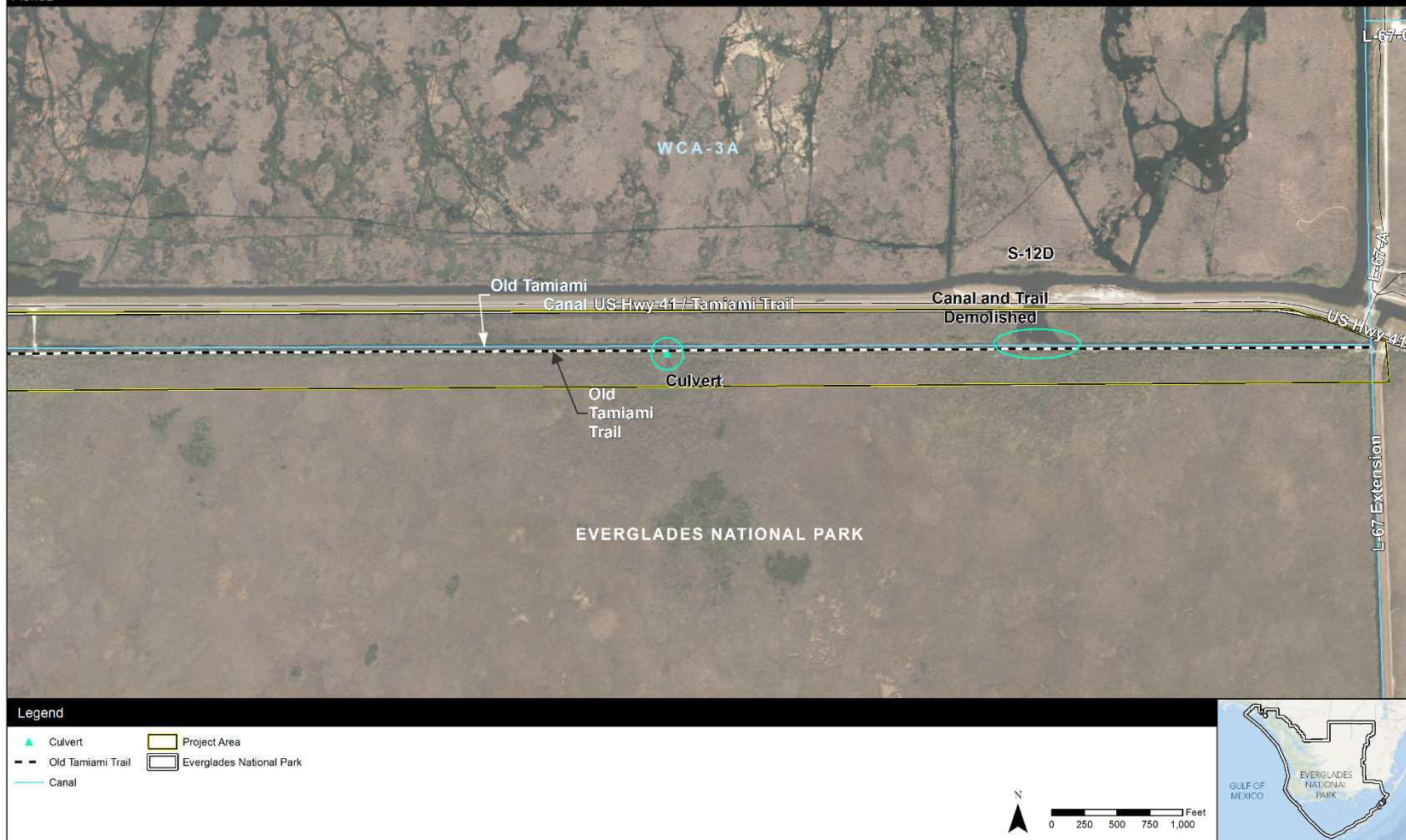
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**FIGURE 3. PROJECT AREA (1 OF 3)**





**FIGURE 4. PROJECT AREA (2 OF 3)**



**FIGURE 5. PROJECT AREA (3 OF 3)**



## **ADOPTION OF THE CEPP FINAL ENVIRONMENTAL IMPACT STATEMENT**

On August 21, 2017, NPS formally adopted the CEPP Final EIS (FEIS) and Selected Plan. The CEPP FEIS is available for review at <http://www.saj.usace.army.mil/Missions/Environmental/Ecosystem-Restoration/Central-Everglades-Planning-Project/>. NPS participated in the development of the CEPP FEIS and has determined that the environmental conditions and impacts described in the document are still valid. The Record of Decision for adopting the CEPP FEIS is available for review at: <https://parkplanning.nps.gov/documentsList.cfm?projectID=68602>.

This EA tiers off the CEPP FEIS and incorporates it by reference. “Tiering” refers to the coverage of general matters in broader or programmatic NEPA documents and focusing successive NEPA processes on the particular issues ripe for decision (40 CFR 1508.28). The CEPP FEIS generally analyzes the impacts associated with removing up to 5.7 miles of the Old Tamiami Trail in the park to improve hydrologic sheetflow. This EA analyzes site-specific impacts on hydrologic sheetflow, the Old Tamiami Trail, and other resources from a range of alternatives that would remove different amounts of roadway.

## **PURPOSE OF THE ACTION**

The purpose of the Old Tamiami Trail Modifications Project is to enhance sheetflow from WCA 3A into the Shark River Slough via the S-12C and S-12D water-control structures, as envisioned in the CEPP. The purpose is also to enhance the natural resources of the park and WCA 3A by improving marsh connectivity and wetland functioning.

## **NEED FOR THE ACTION**

Action is needed because the CEPP FEIS, which proposes complete removal of the Old Tamiami Trail segment to increase sheetflow, does not include site-specific information needed to analyze a full range of alternative modifications. The needs for this project also include the following:

- Facilitate improved deliveries of water from WCA 3A into the Shark River Slough.
- Reduce the ecological effects of point-source water discharges into the Shark River Slough.
- Remove artificial fill from a natural wetland area.

## **OBJECTIVES IN TAKING ACTION**

While purpose and need statements articulate the broad goals that a proposed action should achieve, objectives provide more specific goals that may help determine how well alternatives will accomplish the purpose of the project. Objectives also help accomplish the overall NPS mission to preserve unimpaired the natural and cultural resources and values of the national park system for the enjoyment, education, and inspiration of this and future generations. Objectives for this proposed action include:

- Improve water quality by providing improved distribution and sheet flow across natural lands and eliminating point source discharge system (canal flow through the existing culverts).
- Enhance hydrologic connectivity between WCA 3A and the park.
- Eliminate artificial barriers to the movement of fish and other aquatic animals.
- Remove the artificial substrate that is subject to invasion by exotic/invasive flora and fauna.

- Minimize adverse impacts on the eligibility of Old Tamiami Trail for listing in the National Register of Historic Places (National Register) (36 CFR Part 60.4).
- Enhance visitor experiences through increased understanding and appreciation of Old Tamiami Trail's historic role in early south Florida's overland transportation and development.

## **ISSUES AND IMPACT TOPICS**

Issues are environmental or cultural problems, concerns, and opportunities that may occur if the proposed action or any of the alternatives are implemented. These issues may describe concerns or obstacles to achieving the purpose of the proposed action or that may result from the actions under consideration. To facilitate understanding of the environmental impacts of the alternatives being considered, NPS organizes the discussions of affected environment and environmental consequences by "impact topics," which are headings that represent the affected resources associated with the issues that are analyzed in detail. Issues and impact topics for this EA were developed and refined during internal and agency scoping.

## **IMPACT TOPICS ANALYZED IN THIS ENVIRONMENTAL ASSESSMENT**

### **HYDROLOGY AND WATER QUALITY**

Taking action would change the water flow and distribution in the project area and in the park downstream of the project area, which is a primary purpose of the proposed action. However, the alternatives would result in different impacts on the hydrology. In addition, changes to water flow and distribution could increase periods of saturation and inundation in the project area and downstream. Increased distribution and flow could potentially increase the phosphorus load in the marsh and affect compliance with water quality regulations. The CEPP FEIS notes that impacts on water quality in the park are uncertain. Removal of the old roadway could also release naturally occurring arsenic into the water column that could result in short-term, adverse impacts.

### **VEGETATION AND WETLANDS**

Removal of or modification to the roadway could result in changes to hydrology and sediments, which could affect wetlands and other vegetation in the project area and possibly farther downstream. Water flow is currently channelized through the flow control structures along US Route 41 and via culverts under the old road. When the more rapidly flowing water encounters the slower-moving water beyond the culverts, sediments drop out of the water column and build up just downstream of the culvert discharge locations. This sedimentation has encouraged the establishment of woody vegetation concentrated in fans where sediment has accumulated, and the bathymetry of the wetlands has changed (referred to as vegetation halos). Removal of a portion or all of the Old Tamiami Trail, however, would result in a gain of up to 31 acres of wetlands and reduce this anthropogenic effect on vegetation and wetlands.

### **CULTURAL RESOURCES**

Old Tamiami Trail and the adjacent borrow canal, or Old Tamiami Trail Canal, are eligible for listing in the National Register. Any modification of the roadway or the canal would affect these historic resources. Because the Old Tamiami Trail is constructed on fill, the potential for unknown archeological resources that exist in the area to be disturbed by the project is very low. However, two previously recorded archeological sites are located on tree islands within 1 mile downstream from the Old Tamiami Trail, and they may be affected by the potential increase in water level with the removal of the roadbed.

## **SPECIAL-STATUS SPECIES**

Several species of fish and wildlife occur in the Everglades that are listed as rare, threatened, or endangered under the Endangered Species Act (ESA) or are listed as special-status species by the state. Most of these species do not occur in the immediate project area, and other species would likely avoid the area during construction, so while they could be affected, they would not be adversely affected. Construction noise could carry beyond the project area and disturb other wildlife species, including special-status species. A full list of special-status species and the rationale for inclusion or dismissal from EA analysis is provided in appendix A.

## **VISITOR USE AND EXPERIENCE**

The action alternatives have the potential to introduce new visitor experiences in the project area. Additionally, temporary closures or impacts on visitors at Shark Valley may occur during construction.

## **IMPACT TOPICS DISMISSED FROM FURTHER ANALYSIS**

NEPA and the Council on Environmental Quality (CEQ) regulations direct agencies to prepare NEPA documents that are “concise, clear, and to the point” (1500.2(b)). NEPA reviews should focus on important environmental issues and avoid “amassing needless detail” (1500.1(b)). Furthermore, agencies are directed to discuss non-significant issues only in enough detail to show why more study is not warranted (40 CFR 1502.2 and Section 4.2(E) of the NPS NEPA handbook). During internal scoping, the interdisciplinary team reviewed all impact topics analyzed in the CEPP FEIS and considered the impacts that could potentially result from the tiered action under consideration. Impacts that would not change from the CEPP FEIS analysis were dismissed from analysis in this EA. In addition, in cases where impacts are not anticipated, expected to be minimal, or are not different among alternatives, the impact topics were dismissed from detailed analysis, and the rationale for dismissal is included below.

## **GEOLOGY AND SOILS**

Soils in the project area are dominated by hydric soils. Effects on soils from an increased hydrologic connectivity would be beneficial. Specific impacts on hydric soils as they relate to wetlands are analyzed under vegetation and wetlands. There would be no impacts on geology.

## **ETHNOGRAPHIC RESOURCES**

Ethnographic resources include landscapes, objects, plants and animals, or sites and structures that are important to a people’s sense of purpose or way of life. Although ethnographic resources important to the area’s American Indian Tribes exist in the Everglades, they do not exist in the project area, or they are captured under other analyses. No museum collections or designated cultural landscapes are located in the project area.

## **FLOODPLAINS**

Executive Order 11988 requires federal agencies to avoid to the extent possible the long- and short-term, adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative. The entire project area is considered to be within the floodplain. The proposed action, however, would include removing development from within the floodplain and would help restore natural flows to benefit floodplains. As a result, floodplains were dismissed for full analysis. A floodplains statement of findings is not required because Director’s Order 77-2 applies to proposed development in the floodplain that would adversely

affect the natural resources and functions of a floodplain or increase flood risks. NPS is not proposing development in the floodplain, and the proposed action would not have any detectable long-term, adverse impact on floodplain values and would not result in potentially hazardous conditions associated with flooding; therefore, a statement of findings is not required.

## **AIR QUALITY AND CLIMATE CHANGE**

Modification of Old Tamiami Trail would not affect air quality or result in the discharge of greenhouse gases to the atmosphere that affect climate change. There would be temporary impacts during the construction period from the use of heavy equipment, but these impacts would be small in scale and only occur while equipment is in use.

## **WILDLIFE**

The project area does not provide quality terrestrial habitat because of the high level of previous disturbance. During the construction period, there would be short-term impacts on wildlife in the project area from increased noise and disturbance from construction equipment; however, these impacts would occur only during the construction period, which would last approximately one year.

## **ESSENTIAL FISH HABITAT**

Essential fish habitat is not present in the project area; therefore, no impacts would occur.

## **HAZARDOUS, TOXIC AND RADIOACTIVE WASTE**

No hazardous, toxic, or radioactive waste issues exist in the project area. Arsenic occurs naturally in the Everglades and is analyzed as part of water quality.

## **NOISE**

Construction equipment would have short-term impacts in the project area during the construction period. Any impacts on visitors in Shark Valley from noise is analyzed under “Visitor Use and Experience”; noise impacts on wildlife are not expected to be more than minimal and are analyzed under “Special-status Species.”

## **AESTHETICS**

Modifying Old Tamiami Trail could minimally change the aesthetics in the project area. No alternative elements, however, would alter the overall character of the project area.

## **LAND USE**

Modifying Old Tamiami Trail would not change or affect land use.

## **SOCIOECONOMICS**

Modifying Old Tamiami Trail would not affect socioeconomics. Visitation to the park would not increase because of the proposed action. Short-term impacts during construction could include a drop in visitation, but visitation and associated spending would recover after the project is complete.

## **INVASIVE SPECIES**

Some exotic and potentially invasive species of fish exist in the deeper water habitat of the borrow canal. These species could more readily move out of the canal if the roadway is removed, which could adversely affect the ecosystem if not managed appropriately. However, park staff indicate that management of these species is possible without causing impacts and that these species can already move from the canal to the marsh through existing culverts.

Woody vegetation halos, described under vegetation, have developed adjacent to the human-made features in the project area and around the discharge areas. For the most part, vegetation in this area is native, although exotic and potentially invasive vegetation can become established in the project area near disturbed areas. Given the existing patterns of exotic vegetation along US Route 41 and on the Old Tamiami Trail, the park does not expect that exotic and invasive vegetation would increase because of the proposed action.



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## CHAPTER 2: ALTERNATIVES

NEPA requires federal agencies to explore a range of reasonable alternatives aimed at addressing the purpose of and need for the proposed action. Reasonable alternatives include alternatives that are “technically and economically practical or feasible and meet the purpose and need of the proposed action” (43 CFR § 46.420(b)). The alternatives under consideration must include a no-action alternative as prescribed by CEQ regulations for implementing NEPA (40 CFR Part 1502.14).

The alternatives analyzed in this document, in accordance with NEPA, are based on the result of internal and agency scoping. Alternatives and actions that were considered but would not be technically or economically feasible, would not meet the purpose of and need for the project, would create unnecessary or excessive adverse impacts on resources, or would conflict with the overall management of the park or its resources were dismissed from detailed analysis. These alternatives or alternative elements and their reasons for dismissal are discussed in the “Alternatives Considered but Dismissed” section of this chapter.

NPS explores and objectively evaluates three alternatives in this EA:

- No-action Alternative
- Alternative 1—Remove 4 Miles of the Roadbed
- Alternative 2—Remove 5.45 Miles of the Roadbed (Proposed Action and Preferred Alternative)

### NO-ACTION ALTERNATIVE

Under the no-action alternative, no changes would be made to the existing Old Tamiami Trail roadbed, including the pavement, the underlying fill supporting the road, and the underlying culvert system. As a result, the existing sheetflow in the project area would not change. Currently, water in the project area flows from WCA 3A into the Northwest Shark River Slough through two water control structures, S-12C and S-12D. The current Tamiami Trail roadway is bridged at the structures with flow control gates located to the north that allow water managers to control the flow of water from WCA 3A into the park. Water flows through the control structures, under the modern Tamiami Trail and into the Old Tamiami Trail Canal. From the canal, water flows through the gaps in the roadbed across from the structures or through each of the five culverts that extend from the canal under the Old Tamiami Trail. An approximately a 1-foot difference in topography exists from the west to the east, resulting in higher flows through the S-12D structure and road gap than through the S-12C structure and road gap. Figure 6 displays the location of the existing roadbed gaps and culverts (more information on the existing flow regime is provided in the “Hydrology and Water Quality” section of chapter 3). Vegetation would be cleared from the roadway infrequently, whenever Florida Power and Light needs to access the existing powerlines.

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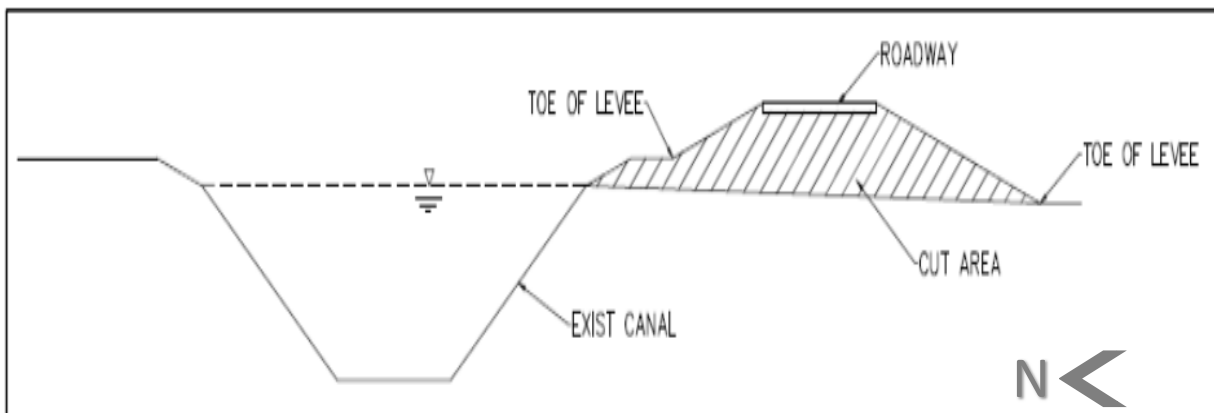
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FIGURE 6. NO-ACTION ALTERNATIVE

## ALTERNATIVE 1—REMOVE 4 MILES OF THE ROADBED

Under alternative 1, 4 miles of the existing Old Tamiami Trail would be removed. To minimize impacts on cultural resources and provide for enhanced visitor experiences, 1.7 miles of the Old Tamiami Trail adjacent to the Shark Valley Entrance Road would be retained. One culvert would be left in place in the remaining segment of roadbed. The 4 miles of roadbed that would be removed would be excavated down to the weathered, native limestone bedrock, on the north side of the roadway, which averages between 3 to 4 feet below the current surface of the road. On the southern side, the roadbed, embankment, and fill slope (collectively discussed as the road levee) would be removed to the marsh level, approximately 2 to 3 feet below the current surface of the road. There would be approximately a 1-foot incline downward from north to south where the berm is removed. Figure 7 presents a sample cross section. The volume of fill to be removed corresponds with the trapezoid shaded area in figure 7 and roughly corresponds to the area above a horizontal line drawn from the toe of the levee on the south side to the top of the canal on the north side. Approximately 91,900 cubic yards of fill would be anticipated from the removal of 4 miles of the road. The existing borrow canal cross-section would not be modified with the implementation of alternative 1. Appendix B includes 30% designs.



Source: AECOM 2015

**FIGURE 7: SAMPLE CROSS SECTION WITH PROPOSED AREA OF FILL REMOVAL**

Vegetation would be cleared from the remaining portion of the Old Tamiami Trail roadbed with mechanical equipment. Vegetation would also be removed from the canal and the fill slope of the removed roadbed. The remaining road surface would be maintained as gravel or asphalt and would be adapted for visitor use, including walking, jogging, wildlife observation, fishing, and photography. The road could potentially include interpretive opportunities, with interpretive displays and ranger-led tours to enhance visitor understanding and appreciation of the history of the trail. Canoe and kayak access would be provided at the west and east ends of the canal.

In addition to removing 4 miles of the Old Tamiami Trail, a portion of the Shark Valley Entrance Road canal would be plugged starting at the Shark Valley Entrance Road and extending south for a third of a mile. The canal is located directly adjacent to the west side of the Shark Valley Entrance Road (see figure 3). The canal would be plugged using fill from the removed roadbed, and muck would be removed from the canal prior to plugging. This would provide an additional access lane for emergency vehicles during peak visitation periods to Shark Valley. Figure 8 provides the location of the proposed road removal and canal plug.

Construction would occur over approximately one year. During road removal, construction staging areas would occur in up to three locations in the project area: at the Shark Valley Entrance Road, at the top of the L-67 extension levee, and on a small pull-off area located on the south side of modern Tamiami Trail between the S-12 control structures. Figure 9 shows the general staging areas in the project area; only disturbed upland locations in these staging areas would be used. Figures 10–12 show the detail of each general staging area. Any fill beyond what is needed to plug the canal could be stockpiled in the staging locations, but it could also be placed on SFWMD-owned lands, such as S-333, or may be used as beneficial fill for other CERP or tribal projects. Fill could also be used for non-CERP projects. Additional NEPA analysis would be completed, as needed. Gravel fill would be placed across the canal to provide temporary access for construction equipment and would occur at the far east and west ends of the canal where equipment may not readily access the section of the road that would be removed. Design and location of the temporary gravel access roads would occur during the engineering phase of this project. No construction equipment would operate on the portion of the Old Tamiami Trail that would remain in place under alternative 1. Construction equipment may include excavators, dump trucks, tractor-trailers (for bringing in equipment), and chain saws for any hand removal of vegetation. The Shark Valley Entrance Road would remain open during the construction period.

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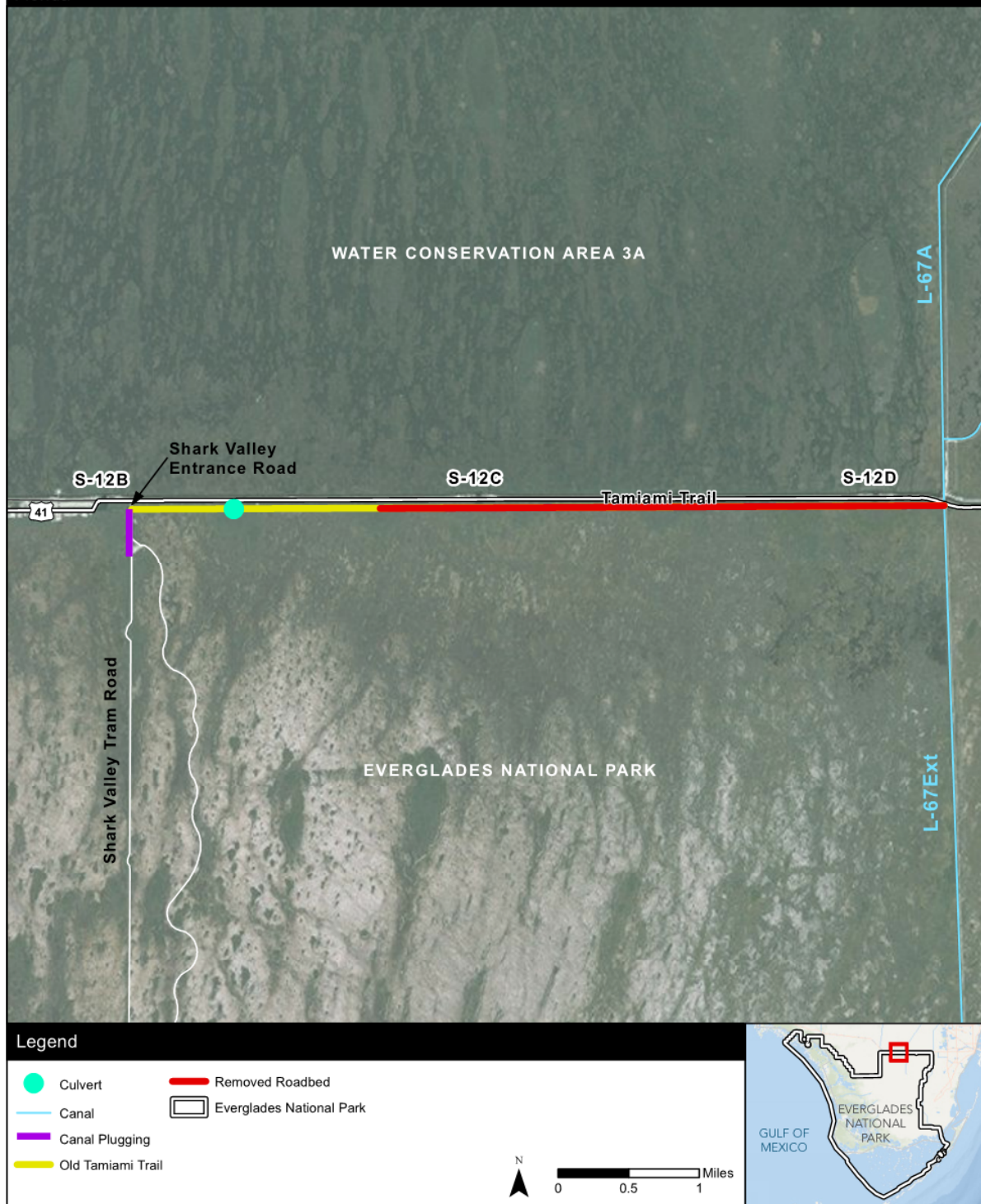


FIGURE 8. ALTERNATIVE 1





**FIGURE 9. PROPOSED STAGING AREAS**





**Legend**

- |                   |                   |
|-------------------|-------------------|
| Canal             | Removed Roadbed   |
| Old_Tamiami_Canal | streetscarto_clip |
| Old Tamiami Trail | Staging Area      |



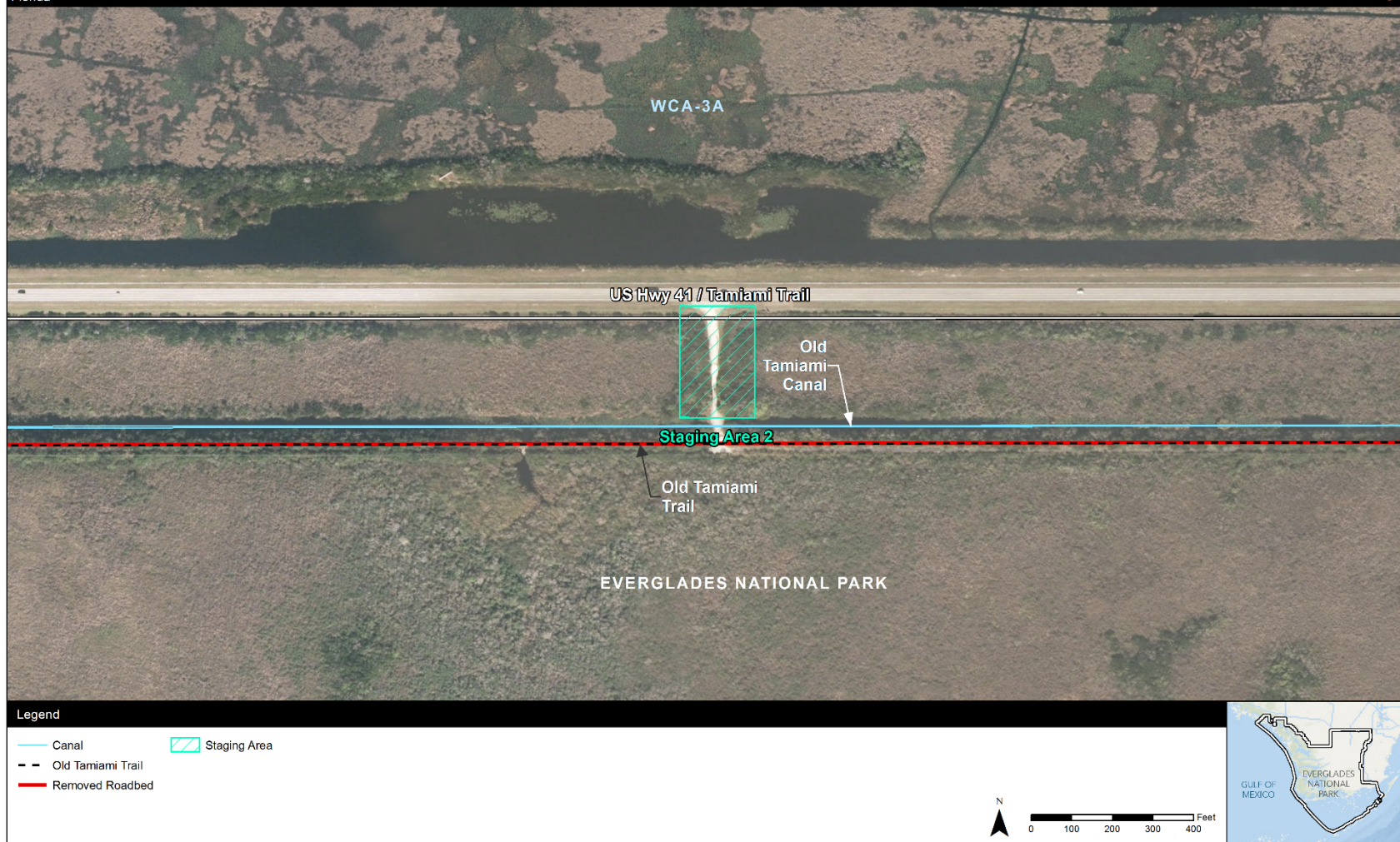
0 100 200 300 400 Feet



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**FIGURE 10. PROPOSED STAGING AREA 1**





**FIGURE 11. PROPOSED STAGING AREA 2**





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**FIGURE 12. PROPOSED STAGING AREA 3**

## **ALTERNATIVE 2—REMOVE 5.45 MILES OF THE ROADBED (PROPOSED ACTION AND PREFERRED ALTERNATIVE)**

Under alternative 2, nearly the entire length of the Old Tamiami Trail roadbed in the project area would be removed. In the CEPP FEIS, full removal of the roadbed is proposed. To minimize impacts on cultural resources and provide maximum hydrologic connectivity, this alternative was slightly revised to retain a quarter of a mile of the Old Tamiami Trail adjacent to the Shark Valley Entrance Road. Removal would occur to the same depth described under alternative 1 and is expected to occur over approximately one year, potentially using more construction equipment to achieve more road removal in the same time period. The staging areas would be the same as those described under alternative 1. Vegetation removal and potential visitor uses would be the same as those described under alternative 1 but would occur on the shorter remaining section of the roadway. Approximately 125,100 cubic yards of fill would be anticipated from the removal of 5.45 miles of the road.

The Shark Valley Entrance Road Canal would be plugged in the same location described under alternative 1. Figure 13 provides the location of all elements under alternative 2, and Table 1 compares the alternatives.

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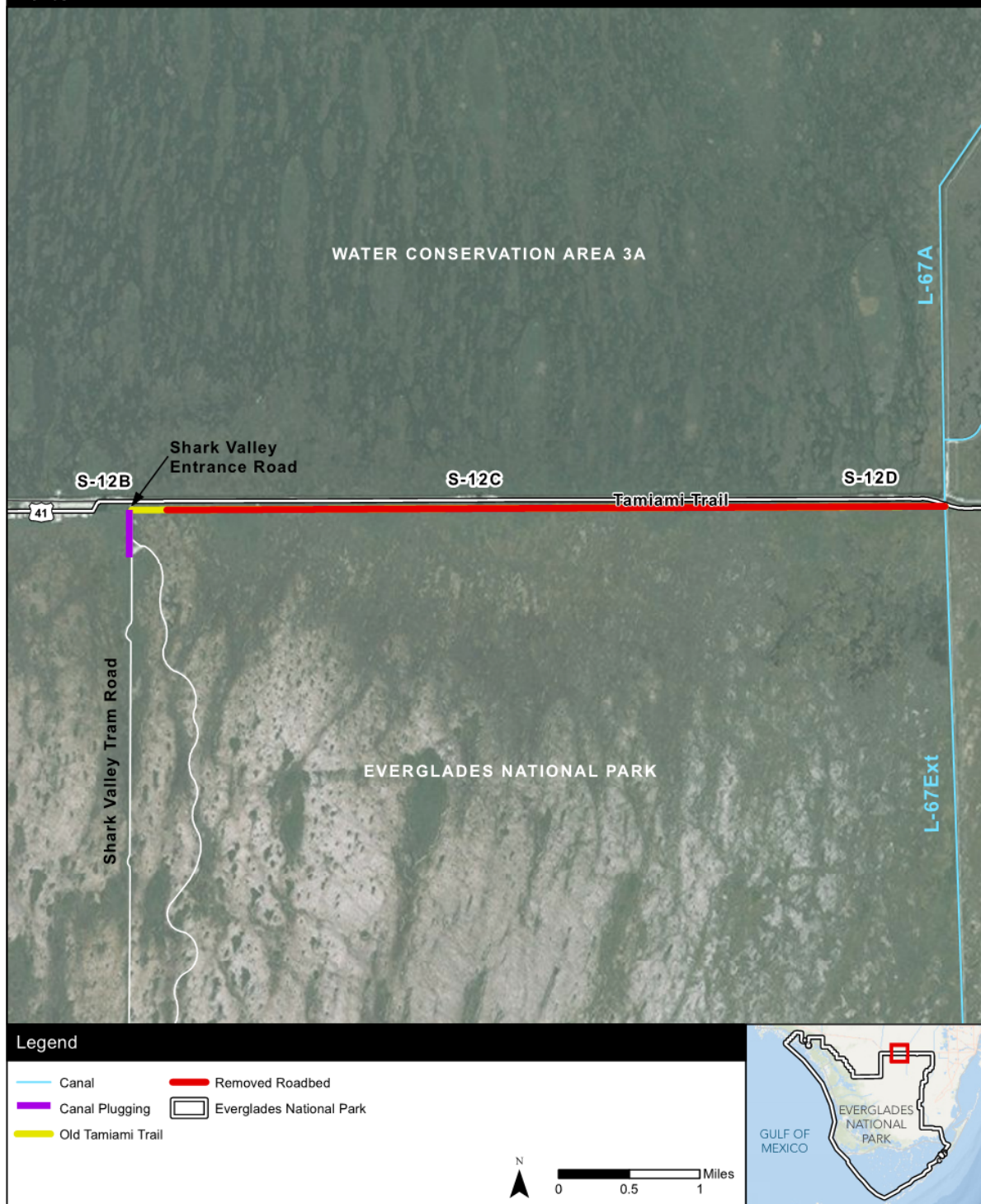


FIGURE 13. ALTERNATIVE 2



## ESTIMATED PROJECT COSTS

Appendix B-7-37 of the CEPP FEIS contains estimated project costs for all CEPP projects. These costs were estimated in July 2013 and are considered plan formulation costs. Further refinement is expected during the preconstruction, engineering, and design phases for each project. Costs for full removal of the Old Tamiami Trail from L-67 extension levee west to the Shark Valley Entrance Road were estimated to be \$11,760,000, assuming full removal of the road. Costs per mile of removal are approximately \$1,960,000. Costs under alternative 1, which involves 4 miles of road removal, are therefore estimated at \$7,840,000. Costs for alternative 2, the preferred alternative, which involves removing 5.45 miles of roadway, are estimated at \$10,682,000.

**TABLE 1. COMPARISON OF ALTERNATIVE ELEMENTS**

	<b>No-Action</b>	<b>Alternative 1</b>	<b>Alternative 2</b>
Miles of Old Tamiami Trail removed	0 miles	4 miles	5.45 miles
Miles of Old Tamiami Trail remaining	5.7 miles	1.7 miles	0.25 mile
Acres of wetland restored	0	21.5	31
Culverts remaining	5	1	0
Length of Shark Valley Entrance Road Canal plug	No plug	0.33 mile	0.33 mile
Estimated Cost	N/A	\$7,840,000	\$10,682,000

## MITIGATION MEASURES FOR THE PROPOSED ACTION

NPS places strong emphasis on avoiding, minimizing, and mitigating potentially adverse environmental impacts. To help ensure the protection of natural and cultural resources and the quality of the visitor experience, the following protection measures would be implemented as part of the proposed action.

### HYDROLOGY AND WATER QUALITY

- Implement pre- and post-construction erosion control best management practices to prevent sediments from entering the water column. These practices include installing and inspecting silt fences, straw bale barriers, sediment traps, vehicle tracking pads, turbidity booms, or other equivalent measures, and revegetating the area (where feasible) to control erosion, preserve water quality, protect wildlife and habitat, and prevent soil contamination.
- Inspect and maintain erosion and sediment control best management practices on a regular basis and after each measurable rainfall to ensure they are functioning properly.
- Implement spill prevention, control, and countermeasure procedures and stormwater pollution prevention measures to protect water quality/soils from erosion and contamination. Limit areas used for refueling to areas where these activities currently occur. Regularly inspect equipment containing fuels for leaks.

- Implement a water quality monitoring plan to ensure compliance with state permitting requirements. Comply with federal and state water quality standards, per the CEPP FEIS (appendix C, page C.4-26).
- Test and clean fill from the removed roadbed in compliance with Florida Department of Environmental Protection (FDEP) permit requirements before being used to plug the Shark Valley Entrance Road canal. Based on the results of soil testing, other disposal options may be pursued for clean dredged or excavated material for other CEPP projects (CEPP FEIS, appendix C, page C.4-21). Soil would be tested prior to construction of each CEPP component, including any removal of the Old Tamiami Trail, in accordance with the CEPP FEIS mitigation measures.

## **VEGETATION AND WETLANDS**

- Per the CEPP FEIS (annex G, page G-27), conduct surveys of the Old Tamiami Trail prior to construction to identify priority plant species that may be spread by construction activities and treat such species prior to the beginning of construction. Survey remaining spoil, roadway remnants, and degraded areas during construction and treat and/or remove priority species. Conduct monitoring for invasive species of apple snail and implement control measures if effective control measures are identified.
- Prior to filling any portion of the Shark Valley Entrance Road Canal, the park botanist will conduct surveys for water horn ferns. If plants are detected, document the occurrence and determine if some or all of the plants in the area to be filled should be relocated to a point farther south in the canal (see appendix A).

## **CULTURAL RESOURCES**

- Develop an archeological monitoring and preservation plan in consultation with the state historic preservation office (SHPO) and other consulting parties.

## **SPECIAL-STATUS SPECIES**

[Pending FWS review of the EA/BA].

## **VISITOR USE AND EXPERIENCE**

- Avoid or limit construction during peak visitor-use periods to the extent possible.
- Place closure signage and construction fencing at the Shark Valley Entrance Road and around the construction area to discourage visitors from entering an active construction site.

## **ALTERNATIVES CONSIDERED BUT DISMISSED FROM DETAILED ANALYSIS**

A number of alternatives were identified during internal and agency scoping. During internal project development, these options did not meet the purpose and need of the project and were not carried forward for analysis in this EA. They are described below.

### **CONSTRUCT ADDITIONAL CULVERTS**

During internal scoping and alternatives development, the team reviewed an alternative that would include installing 15 additional culverts under the Old Tamiami Trail and would not remove any additional roadbed. This alternative would increase the number of point-source water discharges into the



Shark River Slough because water would still be forced through the culverts. While this alternative would minimize adverse impacts on the National Register-eligible Old Tamiami Trail roadbed, it would not eliminate artificial barriers to the movement of fish and other aquatic animals, spread out phosphorus loading into the park, or enhance the hydrologic connectivity between WCA 3A and the park. As a result, the team dismissed this alternative from full EA analysis.

### **INSTALL HALF-MILE GAPS**

This alternative would expand each of the existing gaps in the Old Tamiami Trail roadbed at the S-12C and S-12D control structures to 0.5 mile long. Hydrologic modeling results determined that 0.5-mile gaps in the existing road would not noticeably enhance the sheetflow or improve the overall hydrologic connectivity between WCA 3A and the Shark River Slough. The alternative would partially meet the objectives to remove artificial substrate and eliminate artificial barriers, but not to the degree that other alternatives would. As a result, the team dismissed this alternative from full EA analysis.

### **REMOVE 2.5 MILES OF ROADWAY**

Under this alternative, 1.25 mile of roadway would be removed below each of the S-12 structures in the project area. The alternative would have adverse impacts on cultural resources by removing 2.5 miles of roadway, although 3.2 miles of the existing roadbed would remain between S-12C and S-12D. After a full team discussion, cultural resource experts from the park noted that no value would be added by retaining the small, disconnected segment of the roadway that would remain between S-12C and S-12D. Therefore, this alternative was dismissed from further analysis.

### **REMOVE ENTIRE LENGTH BUT AT A SHALLOWER DEPTH**

The team discussed an alternative treatment that would remove the surface of the roadbed but leave the support structure in place. The remaining roadbed, under the surface of the water, would produce a berm that would create an intermediate step up from the canal bottom to the bottom of the marsh. During low water conditions, a berm could function as a sediment trap for nutrients that, once high flows returned, could be flushed and spread downstream into the marsh. As a result, the team dismissed this alternative in favor of a deeper roadbed removal with a gradual change upward from the canal to the marsh.

### **NATIONAL PARK SERVICE PREFERRED ALTERNATIVE**

The preferred alternative is the alternative that “would best accomplish the purpose and need of the proposed action while fulfilling [the NPS] statutory mission and responsibilities, giving consideration to economic, environmental, technical, and other factors” (46.420(d)). The preferred alternative ultimately may not be the selected alternative, and identification of the preferred alternative is not a final agency decision.

Having considered all available information, including public, agency, and tribal comments on the CEPP FEIS, NPS has identified alternative 2 (removal of all but 0.25 mile of the Old Tamiami Trail roadbed) as the alternative that best meets the purpose and need for this action. This preferred alternative better meets the project planning objectives when compared to alternative 1. The Old Tamiami Trail acts as a barrier to water flows from the upstream marsh (i.e., WCA 3A) into the Western Shark River Slough in the park. The preferred alternative does the most for enhancing marsh flows (e.g., largest flow volume increase and best flow distribution) and has better ecological benefits (e.g., eliminating artificial barriers and removing unnatural fill), compared to alternative 1. While alternative 2 would have a greater impact on the old roadway’s eligibility for listing in the National Register, it would still allow NPS to enhance visitor

experiences through interpretation and education and increase visitor understanding and appreciation of the significance of the Old Tamiami Trail's place in south Florida's history.

In discussions of this project with stakeholder agencies, the prevailing opinion was that removing more of the roadbed would provide the greatest hydrologic and ecological benefits. Retaining a larger portion of the roadway would create long-term maintenance concerns, with little added benefit. The prevailing view was that the old roadway has long contributed to the degradation of the marsh, and its removal would begin to reverse that trend, leading to long-term marsh sustainability.

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## CHAPTER 3: AFFECTED ENVIRONMENT

The “Affected Environment” chapter describes existing conditions for those elements of the human environment that would be affected by the implementation of the alternatives considered in this EA. The components addressed include hydrology and water quality, soils, vegetation and wetlands, cultural resources, special-status species, and visitor use and experience. Impacts for each of these topics are analyzed in “Chapter 4: Environmental Consequences.”

Because this document tiers off the CEPP FEIS, readers are directed to the detailed discussion of the affected environment in that document, which is incorporated herein by reference and can be found at <http://www.saj.usace.army.mil/Missions/Environmental/Ecosystem-Restoration/Central-Everglades-Planning-Project/>. The affected environment discussion in this EA updates information available since the FEIS was completed in 2014.

### HYDROLOGY AND WATER QUALITY

This section provides a brief, high-level overview of the hydrology and water quality of the Everglades. With respect to hydrology, the section discusses the relevant aspects of the hydrology of WCA 3A immediately north of the project area; the Western Shark River Slough, in which the project area is located; and available site-specific hydrology directly in the project boundary. Further detail about hydrology in WCA 3A and the Western Shark River Slough, as well as throughout the Everglades, is available in the CEPP FEIS (appendix C.1.1.8, page 22).

The discussion of water quality provides an overview of key water quality issues that could be affected by the removal of the Old Tamiami Trail, completely or in part, as they relate to the Everglades overall and to the project area itself. The CEPP FEIS (appendix C.1, page 51) provides a broad overview of water quality issues in the Everglades. For the proposed action, the overarching water quality issues are nutrients (phosphorus) and possibly arsenic that naturally occurs in the soils in the Everglades and can be released if disturbed. While methylation of mercury in the Everglades is a system-wide issue, it is not expected to be a specific issue for this proposed action because neither action alternative would involve extensive and repetitive drying and rewetting of wetland soils that increase methylation.

### HYDROLOGY

The Everglades once covered nearly 4,000 square miles from Lake Okeechobee to Florida Bay and the Gulf of Mexico. The original Everglades was a flow-way from Lake Okeechobee southward. Shallow water derived from direct rainwater and overflows from Lake Okeechobee moved south as sheet flow, rather than as channelized flow associated with rivers and streams (NPS 2010a).

The natural hydrologic regime and the ridge and slough landscape that once characterized much of the Everglades are highly degraded in the Shark River Slough (NPS 2010a). As noted in the CEPP FEIS (appendix C, page C.1-22), the current hydrology is dominated by local rainfall, evapotranspiration, flat topography, and a highly permeable surficial aquifer, as well as the system of canals and levees that regulate modern flow through the system. The placement of canals, levees, and other hydrological engineering structures in key areas throughout the greater Everglades ecosystem since the 1950s has divided the Everglades into areas designated for development, fish and wildlife benefits, natural system preservation, and water storage. Undeveloped areas include the WCAs north of the park and the park itself. The WCAs provide detention storage for floodwaters and water supply for East Coast communities and improve groundwater recharge.

The historical flow patterns brought water from Lake Okeechobee south into the Everglades. The construction of the canal and levee system and subsequent operation of the new system changed the distribution of flow into the headwaters of Shark River Slough along the northern boundary of the park, at Tamiami Trail. This area within the park is now commonly referred to as the headwaters of Shark River Slough and is divided into the northeast and northwest sides. The historical flow into Shark River Slough passed primarily through the northeast section with a much smaller amount passing through the northwest section. Current water management, however, has shifted the distribution of flow to the west, so 80% of the flow is discharged to the west side rather than the east side (NPS 2016a). One overarching objective of the Everglades restoration planning efforts is to redirect flows back to the east (the historical center of the slough) to more closely resemble historical flows. As a result, the system is currently evolving as projects from the MWD project and CEPP are implemented and flows are redirected. However, many of these projects have not yet been implemented, so flows into the headwaters of Shark River Slough still predominantly go (80%) to the west, with 20% flowing to the east. Once the MWD project is complete (increment 1/1.2 will be complete in March 2018 with the beginning of increment 2, and the Combined Operating Plan [increment 3] is scheduled to begin in December 2019) the balance will shift to 55% of flows in the west. After implementation of all CEPP projects, flows will more closely resemble historical flows, with 35% of flows to the west and 65% of flows to the east.

### **WCA 3A**

Appendix C of the CEPP FEIS describes the hydrology of WCA 3A north of the park in detail (section C.1.1.8.7 on page C.1-26). For this EA, it is important to note that WCA 3A provides water supply to the park, lower parts of the east coast of Florida, and the South Dade Conveyance System in accordance with the WCA 3A Regulation Schedule. The Rainfall-Based Management Plan provides water supply in accordance with the Rainfall Plan and the WCA 3A Regulation Schedule (USACE 2005). As a result of its limited discharge capacity, compared to the watershed from which it receives water, consecutive rainfall events have the potential to quickly use potential storage in WCA 3A, triggering discharges from WCA 3A to the Shark River Slough and/or the South Dade Conveyance System via the S-12 flow control structures and/or S-333 and S-334. Stage variability follows an annual cycle, primarily driven by rainfall, and stage levels are high in the late fall and early winter and low in late spring before the wet season begins. Water depth in WCA 3A is typically between 1 and 2.5 feet.

WCA 3A is underlain by the Biscayne aquifer, which covers an area of approximately 3,000 square miles in southeast Florida. Groundwater in this area flows from the northwest to southeast, and there is extensive seepage across the levees, although flow is influenced by canals, rainfall, and other features.

### **Western Shark River Slough and the Hydrology of the Project Area**

The project area is in the Western Shark River Slough immediately adjacent to the L-67 extension canal that divides the eastern part of the park from the west and prevents flows from moving to the east (figure 14). It is bounded on the north by the modern Tamiami Trail (see CEPP FEIS, appendix C, page C.1-31). Two structures in the project area, S-12C and S-12D, regulate discharge from WCA 3A immediately to the north of the park. The Old Tamiami Trail roadway has been removed downstream of these structures so that water can flow directly into the park. Structure S-12B is immediately west of the project area and the Shark Valley Entrance Road, across from the Miccosukee Reserve Area. Old Tamiami Trail is separated from the modern road by a borrow canal and currently has seven culverts that allow water to flow beneath the remaining sections of Old Tamiami Trail. Five of these culverts are located in the project area.



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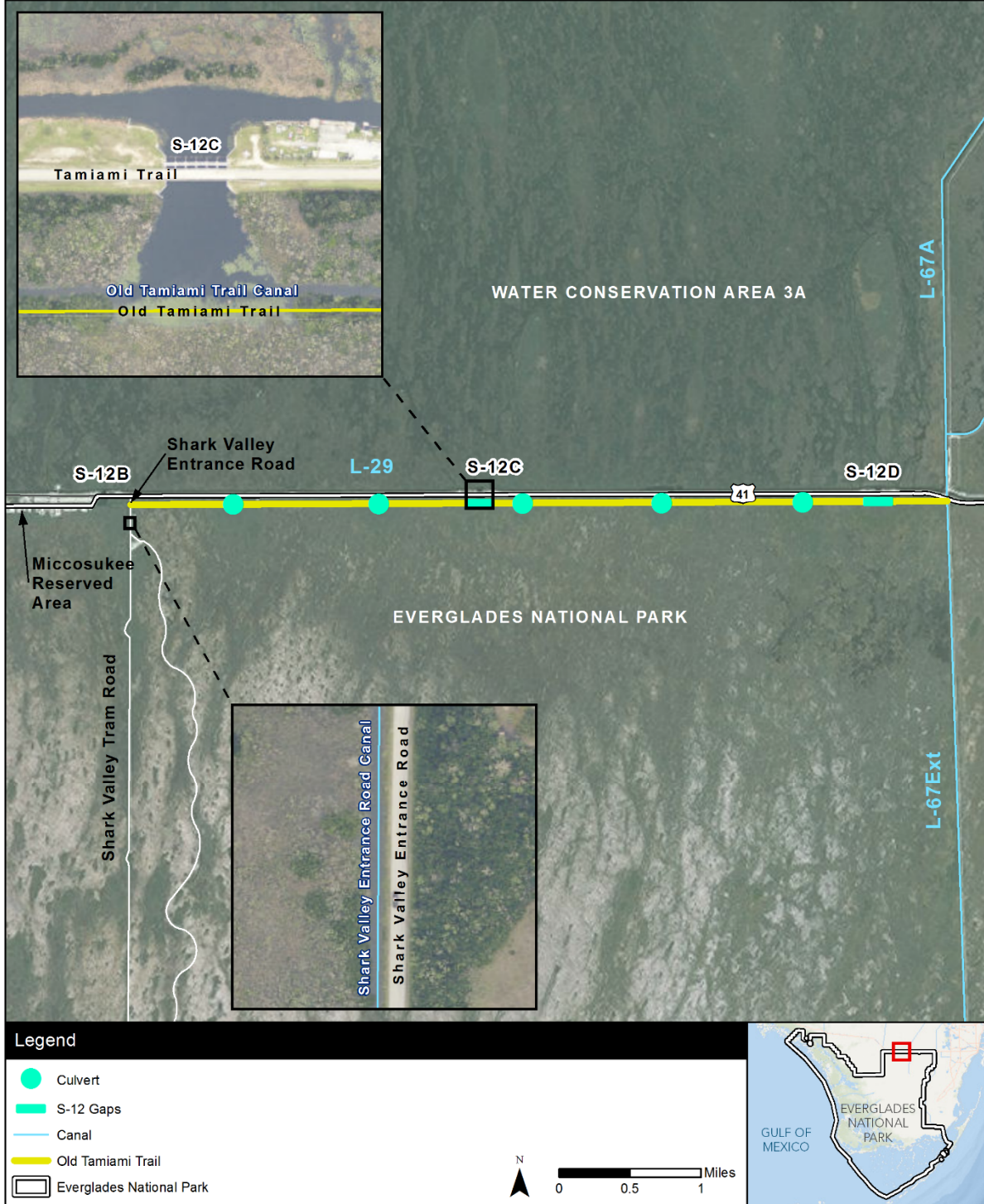
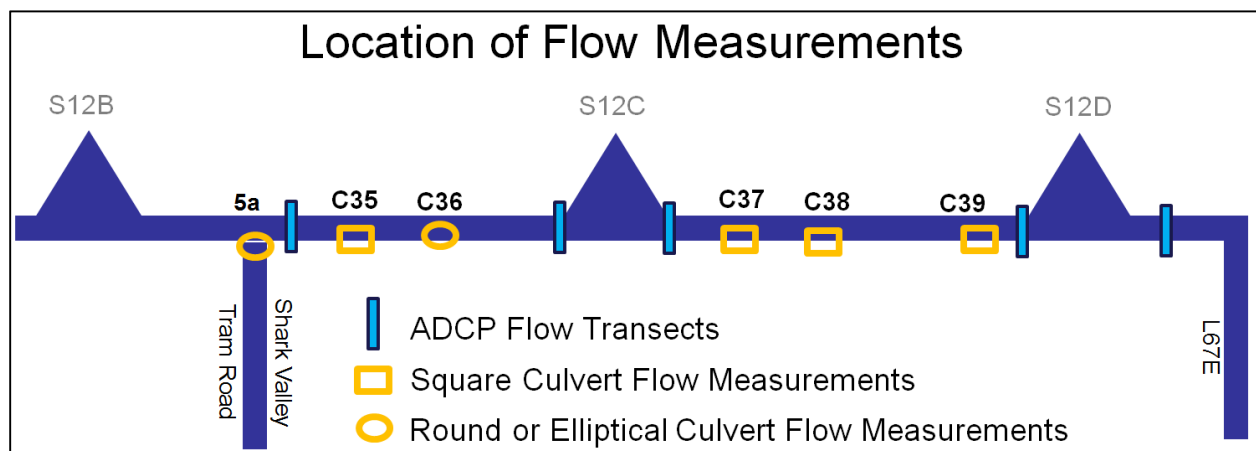


FIGURE 14. HYDROLOGIC FEATURES

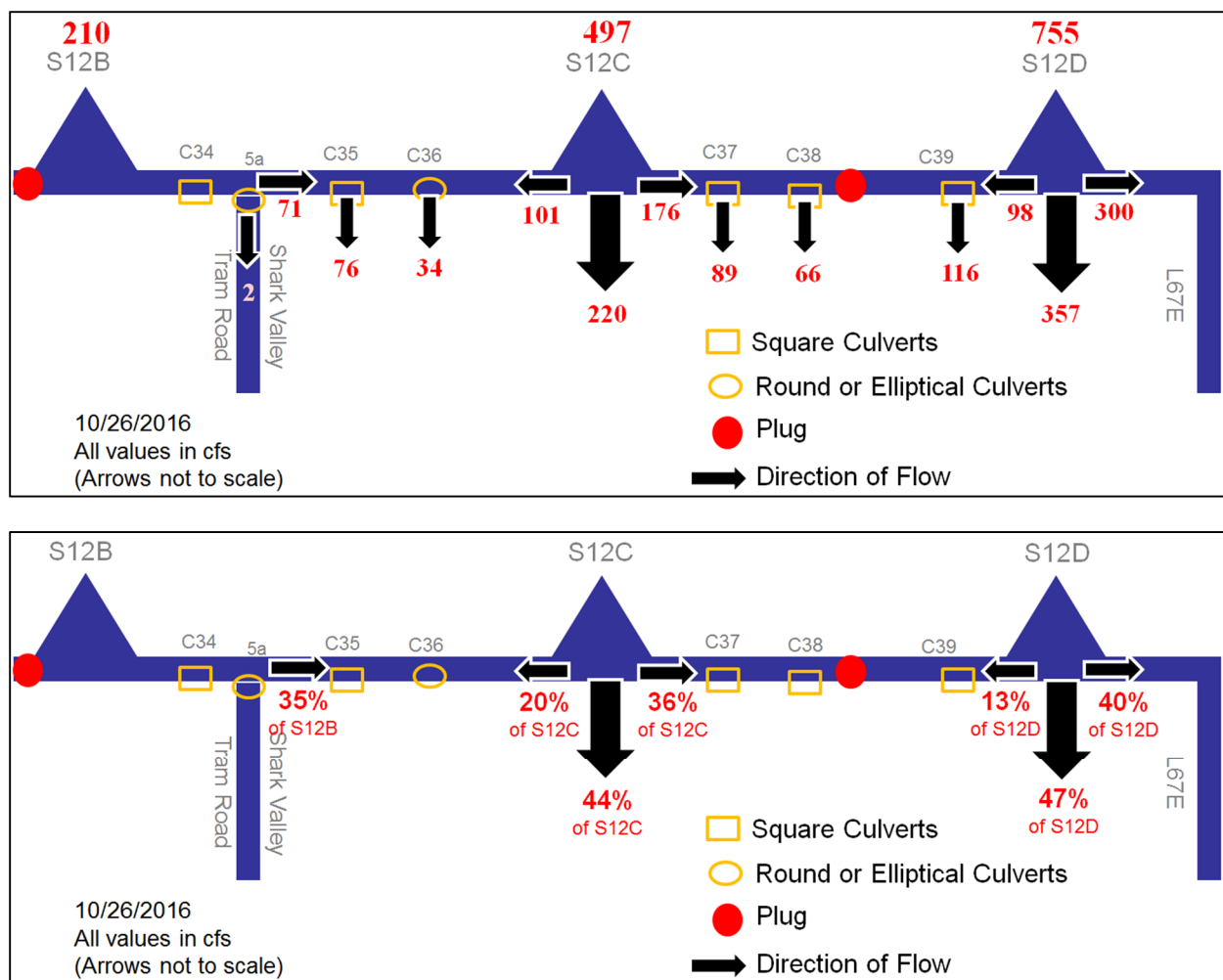
Flow through the S-12 structures is managed to enhance conditions for the Cape Sable seaside sparrow, whose habitat is on higher ground south and west of the project area; it is also managed to move water from WCA 3A into the park. Elevation just downstream of the flow structures at the western end of the project area is approximately 6.1–6.5 feet North American Vertical Datum of 1988, while elevations at the eastern end at S-333 are 5.3–5.6 feet North American Vertical Datum of 1988, a difference of approximately 1 foot (NPS 2016a).

The differences in elevation of the S-12 structures result in S-12D having the highest flow capacity, followed by S-12C, S-12B, and S-12A. The S-12 structures are managed to minimize water releases near S-12A and S-12B during the Cape Sable seaside sparrow breeding season to protect this endangered species. As a result, structures S-12D and S-12C are used more than any of the S-12 structures to pass the highest flow volumes (40% and 30%, respectively); the S-12 structures to the west of the project area are used to pass approximately 30% of the annual flow volume. According to the ERTTP and the Rainfall-Based Management Plan, sequential closures of these structures annually release water farther to the east. The target flow distribution under the ERTTP is to direct 55% through S-333 into the Northeast Shark River Slough and 45% through the S-12 structures into Western Shark River Slough west of the L-67 extension levee, which includes the project area. Figure 15 illustrates the layout of the canal network south of the Tamiami Trail in the project area. Water is released from WCA 3A through the S-12 structures and subsequently flows into the park directly south of each structure or into the Old Tamiami Trail borrow canal. From the Old Tamiami Trail borrow canal, the water can flow into the park through the culverts under the Old Tamiami Trail roadbed. Recent flow measurements from 2016 (appendix C—Hydrologic Analysis) are shown in figure 16. The measurements illustrate how, when the S-12 gates are all fully open, the S-12 structure flow capacities are highest toward the east and lowest in the west. The measurements also illustrate how a portion of the water flowing into the project area from WCA 3A is directed through the Old Tamiami Trail borrow canal before flowing through the culverts under the roadbed and into the park.



Source: NPS 2017a

**FIGURE 15. LAYOUT OF WATER MANAGEMENT FEATURES IN THE PROJECT AREA AND LOCATION OF FLOW MEASUREMENTS ALONG THE OLD TAMIAMI TRAIL BORROW CANAL**



Source: NPS 2017a

**FIGURE 16. TAMIA MI FLOW DISTRIBUTION AND PERCENTAGES (OCTOBER 2016)**

Relatively high volumes of water with high flow rates move through the structures and culverts. This water slows dramatically as it meets resistance in the form of shallower water depth and more dense vegetation in the park. Sediments suspended in the water column settle out, creating an elevated substrate and encouraging woody vegetation to become established. These areas are known as vegetation halos and contain vegetation similar to that found on the lower portions of tree islands in the sloughs.

## WATER QUALITY

Historically, the central and southern Everglades were a phosphorus-limited, oligotrophic system in which ambient levels of phosphorus were less than 10 parts per billion (Lodge 2005; McCormick et al. 1996) within a very slow-flowing system. Phosphorus limitation historically allowed for extreme competition for biologically available phosphorus. Hydrologic changes in the Everglades and the development that has occurred in south Florida since the late 19th century have resulted in a variety of changes to water quality in the park. Important water quality chemicals and parameters in the Everglades include nutrients, sulfate, mercury, pesticides, major ions and total dissolved solids, and dissolved organic matter (USACE 2005;

NPS 2010a; Aiken et al. 2011; Aiken et al. 2003). Excess nutrients, specifically phosphorus, can be of particular concern, given the Everglades' naturally phosphorus-limited and oligotrophic character.

Currently, water quality in the Everglades is influenced and degraded by nonpoint source runoff from development and agriculture to the north and the alteration of natural drainage patterns over time from the construction of levees and canals. Nutrients are still a principal cause of water quality concern in the Everglades. While the Everglades watershed is influenced by nutrients from agriculture and development, this particular area of the western Tamiami Trail has no direct runoff issues. The limiting nutrient in the project area continues to be phosphorus. Excess fertilizers and decomposition of peat in the soils contribute to high levels of phosphorus. In turn, high levels of phosphorus and other nutrients can affect soil composition and the balance of flora and fauna and decrease dissolved oxygen in surface waters. The ultimate effect of increased total phosphorus levels is the eutrophication of the marsh that causes subtle but important changes in soil chemistry and a noticeable change in the plant and animal communities over time, with cascading ecological effects (Gaiser et al. 2005; Gaiser et al. 2007). Ultimately, this process can lead to the reduction or loss of a waterbody's value as habitat and/or as a recreational area.

In recognition of the nutrient-related issues in the Everglades, surface waters in the Loxahatchee National Wildlife Refuge (WCA 1) and Everglades National Park have been designated as Outstanding Florida Waters. The Everglades is subject to both surface water quality numeric-nutrient criteria for all Florida waterbodies and is regulated by the "Phosphorus Rule" (62-302.540 Florida Administrative Code). Water quality issues in the Everglades are also addressed through legal agreements such as the 1991 Consent Decree (which calls for constructing stormwater treatment areas to regulate phosphorus flows, establishing a regulatory program, and requiring agricultural best management practices) and the 2012 Consent Order between SFWMD and FDEP (which includes a suite of corrective actions and deadlines to be implemented by SFWMD to achieve discharge limits for phosphorus). Concurrent with the 2012 Consent Order, FDEP established a water quality-based effluent limitation for total phosphorus. The limitation was developed to ensure that discharges from the stormwater treatment areas into the park do not result in exceedances of the "Phosphorus Rule." The water quality-based effluent limitation consists of a maximum total phosphorus annual flow-weighted mean and a total phosphorus long-term flow-weighted mean. Flows into the Miccosukee Reserved Area are protected by the Miccosukee water quality standards, which were adopted in December 1997.

As noted in the CEPP FEIS (appendix C.1, page C.1-52), soil phosphorus concentrations in pristine areas of the park are approximately 100 to 200 milligrams per kilogram (mg/kg), while soil phosphorus concentrations exceed 500 mg/kg in affected areas of the WCAs near canals (USACE 2014). The discharge of surface water with elevated concentrations of total phosphorus into the WCAs (mostly in the northern sections) has resulted in sufficient soil phosphorus concentrations (< 650 mg/kg) to support cattail invasion into formerly sawgrass- and bulrush-dominated areas. Studies have demonstrated that the biological community structure in the Northeast Shark River Slough adjacent to the project area is altered even by very small (5 micrograms per liter or 5 parts per billion above ambient conditions) phosphorus inputs to the system from increased total phosphorus loading (Gaiser et al. 2005; Gaiser et al. 2007). Within the spikerush/periphyton community in the Central Shark River Slough, a phosphorus input of this magnitude caused changes in the periphyton and floc in the Everglades after two months, in soils after three years, in fish after four years, and in macrophytes in the fifth year (Gaiser et al. 2005; 2007).

Arsenic is a metal that has been recognized as a human carcinogen used in agriculture and industry. However, arsenic also occurs naturally in the soils in the Everglades. Soils south of Lake Okeechobee through the Everglades tend to be histosols. Soils in this soil order contain naturally higher levels of arsenic than other soils (Chen et al. 2001). Therefore, soils in the project area could contain arsenic, although site-specific analysis would be required. Arsenic can leach into the water column if those soils are disturbed and proper practices are not followed.

## VEGETATION AND WETLANDS

Wetlands include areas inundated or saturated by surface or groundwater for a sufficient length of time during the growing season to develop and support characteristic soils and vegetation. Most of the Everglades can be classified as wetlands, with only a few upland areas. The CEPP FEIS (appendix C.1, page C.1-1) describes the wetlands vegetation communities in the different areas in the park in some detail and in the greater Everglades, which includes the Western Shark River Slough, in particular. The affected environment in this document for wetlands and vegetation provides a brief overview of the existing conditions in the Western Shark River Slough and the project area in particular.

As noted in the CEPP FEIS (appendix C.1, page C.1-1, the Everglades landscape is dominated by a complex of freshwater wetland communities, including open water sloughs and marshes, forested marshes, and wet marl prairies. The project area contains a combination of open water in the canal, marshes, woody vegetation halos that have developed over time downstream of the flow control structures, and upland vegetation along the banks of the modern road and on the Old Tamiami Trail segment.

The woody vegetation halos resemble the communities present on the lower portion of the tree islands and, as noted in the “Hydrology” section, have formed as sediments drop out of the water column as water flowing through the S-12 structures slows abruptly, resulting in slightly higher ground elevation in the wetlands. The lower portions of these halos are dominated by hydrophytic, broad-leaved, evergreen hardwoods, with a dense shrub layer. Dominated by coco-plum (*Chrysobalans icaco*), hardwood species include red bay (*Persea palustris*), dahoon holly (*Ilex cassine*), and pond apple (*Annona glabra*).

Although much of the surrounding marsh is sawgrass marsh, according to Florida Land Use Cover and Forms Classification System data, the majority of the marsh near the project area is freshwater graminoid prairie marsh, rather than sawgrass marsh. Freshwater graminoid prairie marsh contains a combination of grasses, canes, and other vegetation. These species may include sawgrass (*Cladium jamaicense*), cattail (*Typha domingensis*), maidencane (*Panicum hemitomon*), buttonbush (*Cephalanthus occidentalis*), cordgrass (*Spartina alterniflora*), giant cutgrass (*Zizaniopsis miliacea*), switchgrass (*Panicum virgatum*), and other species.

Upland areas along both the modern road and Old Tamiami Trail include a mix of turfgrass along the verge of the road and woody vegetation, similar to vegetation on the hammocks and tree islands. Staging areas would be located in previously disturbed upland areas that consist of grasses or woody vegetation. Vegetation observed during field work for the October 2015 Cultural Resource Assessment included dense clusters of coco-plum interspersed with Brazilian pepper (*Schinus terebinthifolius*); patches of ferns, cane, or marsh grasses; gumbo limbo (*Bursera simaruba*); palmetto (*Sabal* spp. or *Serenoa repens*); wild grape (*Vitis* spp.); and other vines. Investigators also saw winged sumac (*Rhus copallinum*) (NPS 2017b). Vegetation south of Old Tamiami Trail varies along the segment but consists of the species described above for woody vegetation halo communities or freshwater graminoid prairie marsh. The majority of the vegetation located on the toe slope of Old Tamiami Trail includes exotic plant species that are not native to the park.

## SPECIAL-STATUS SPECIES

Special-status species include federally and state-listed species or state species of special concern. Federally listed species are those designated by USFWS as threatened or endangered under the ESA. State-listed species are those given separate or additional protection at the state level in Florida under the Florida Endangered and Threatened Species Act, as designated by the Florida Fish and Wildlife Conservation Commission (FWC).

The Everglades supports an abundance of biological diversity and provides habitat for a number of special-status species. The project area for the proposed action consists of a 5.7-mile segment of Old Tamiami Trail located along the northern boundary of the park and surrounding habitat. Special-status species that are known to occur or may potentially occur in the project area or area of analysis are described below. A full list of all federally and state-listed species for the project area is provided in appendix A. Species that do not exist in the project area or would not be affected by the proposed action were dismissed from EA analysis.

## **FEDERALLY LISTED SPECIES**

### **Cape Sable Seaside Sparrow (*Ammodramus maritimus mirabilis*)**

The Cape Sable seaside sparrow is a federally endangered subspecies of the seaside sparrow. Its distribution is primarily restricted to the southern portion of the greater Everglades ecosystem, where it occupies short-hydroperiod wetland and marl prairie habitats. This species nests in early spring and is highly dependent on hydrologic conditions in the southern Everglades. Habitat inundation (water depth in wetland and marl prairie habitat) affects the sparrow's ability to forage, nest, shelter, and avoid predation and influences plant species' composition and density in the southern Everglades. Hydrologic conditions in the southern Everglades are influenced by both natural and anthropogenic processes such as rainfall, climate patterns, and water-management activities. Habitat for the Cape Sable seaside sparrow is also affected by the fire regime, and the interaction between hydrologic conditions and the fire regime are the two most important factors in determining the suitability of its habitat in the Everglades. Major threats to this species include wildfires, flooding events, predation by invasive Burmese pythons, climate change, and sea level rise. Additional information about the biology and status of this species is provided in the Programmatic Biological Opinion that was prepared for the CEPP FEIS (annex A, pages 805–818).

Surveys conducted from 1992–2017 documented the Cape Sable seaside sparrow in two areas of marl prairies east and west of the Shark River Slough in the Everglades region and at the edge of Taylor Slough in the Southern Glades Wildlife and Environmental Area, south of the project area. Therefore, this species is not likely to be present in the project area. Results of these surveys are reported in the CEPP FEIS (appendix C, pages C.2.1-34–46). Critical habitat has been designated for the Cape Sable seaside sparrow, south and east of the project area.

### **Everglade Snail Kite (*Rostrhamus sociabilis plumbeus*)**

The Everglade snail kite is a federally endangered subspecies of the snail kite. The range of the Everglade snail kite is limited to central and southern Florida and Cuba. This species is nomadic within its range and moves frequently in search of suitable foraging conditions and food resources. It nests in small trees from December to July, with a peak in March through June. The Everglade snail kite is a specialist feeder, an unusual characteristic for a raptor species. Its diet consists primarily of the Florida apple snail (*Pomacea paludosa*). Snail kite habitat consists of freshwater marshes and the shallow vegetated edges of lakes where its prey is abundant and foraging conditions are favorable. The Florida apple snail requires specific hydrologic conditions of shallow palustrine, emergent wetlands with a long hydroperiod. Because this is its primary prey resource, the Everglade snail kite's survival is directly dependent on the hydrology of its habitat and the associated abundance of Florida apple snails (CEPP FEIS, appendix C.2, page C.2.1-30). Major threats to this species include loss and degradation of wetland habitats and changes in hydrologic conditions, which may affect its prey resources. Additional information about the biology and status of this species is provided in the Programmatic Biological Opinion that was prepared for the CEPP FEIS (annex A, pages 818–835).



The project area contains designated Everglade snail kite critical habitat, and the species is known to occur in the project area. However, while snail kites may occur in project area, no snail kite nesting has been documented in the project area in the past 10 years. A detailed description of Everglade snail kite critical habitat is provided below in the “Critical Habitat” section.

### **Wood Stork (*Mycteria americana*)**

The wood stork is a federally threatened wading bird found in coastal regions of the southeastern United States from South Carolina to Texas. This species was previously listed as endangered but was reclassified as threatened in 2014 because of increased abundance and range of breeding populations (79 *Federal Register* [FR] 37077). The wood stork occupies wetlands and other aquatic habitats where it forages on small fish, reptiles, and amphibians. Wood stork nesting habitat consists of mangroves as low as 3 feet, cypress as tall as 100 feet, and various other live or dead shrubs or trees located in or near standing water (CEPP FEIS, annex A, page 836). Wood storks nest colonially, often in conjunction with other wading bird species. In south Florida, wood storks begin nesting in January.

The wood stork is highly dependent on hydrologic conditions, which regulate both the amount of suitable foraging habitat and abundance of prey. Historically, the short hydroperiod wetlands in the park have provided important foraging habitat for the wood stork during the pre-breeding season, with the storks shifting to longer hydroperiod wetlands as the dry season progresses. Water depth and recession rate are considered the two most important hydrological variables for determining the suitability of wood stork habitat (CEPP FEIS, appendix C.2, page C.2.1-46). Loss and degradation of wetland habitats in central and south Florida, including draining of nearly half of the Everglades for agriculture and urban development, have historically been the main drivers of wood stork population decline. Wetland habitat loss and degradation continue to be the primary threats to this species. Additional information about the biology and status of this species is provided in the Programmatic Biological Opinion that was prepared for the CEPP FEIS (annex A, pages 836–845).

The project area contains suitable wood stork nesting and foraging habitat. However, no nests are currently known to exist in the project area. No critical habitat has been designated for the wood stork.

### **Florida Panther (*Puma* (= *felis*) *concolor coryi*)**

The federally endangered Florida panther is a subspecies of *Puma concolor* (also known as mountain lion, cougar, or puma). The Florida panther was historically the most widely distributed mammal in North and South America, but it is now nearly extirpated in the United States. Its distribution is limited to a single breeding population in southern Florida (USFWS 2016). Panthers are generalist carnivores and prey on small and large mammals. Habitat for the Florida panther consists of forests, swamps, grassland prairies, agricultural lands, and other large contiguous areas of open habitat suitable for stalking and capturing prey (USFWS 2016).

The major cause of the Florida panther's decline has been habitat loss and fragmentation. This led to isolation of breeding populations, resulting in limited geneflow among populations. Inbreeding in the remaining Florida panther population has caused genetic flaws such as heart defects and sterility, furthering the threat to this species' continued existence. USFWS developed a recovery plan that aims to establish additional breeding populations and conserve panther habitat (USFWS 2008a).

Panthers may occur throughout the park, and occasionally occur in the project area, but most commonly frequent the pinelands of Long Pine Key and surrounding drier areas. No critical habitat has been designated for this species.

### **Florida Bonneted Bat (*Eumops floridanus*)**

The federally endangered Florida bonneted bat is Florida's largest and only endemic bat species, reaching up to 6.5 inches long and having a wingspan of up to 20 inches (FWC 2017a). This species is characterized by its large broad ears that project forward over its eyes. The Florida bonneted bat is extremely rare and its distribution is limited to south and southwest Florida (Timm and Genoways 2004; FWC 2017a). Relatively little is known about the habitat requirements for the Florida bonneted bat, but it has previously been documented in semitropical forests with tropical hardwood, pineland, and mangrove habitats; wetlands; and residential and other urban areas (Timm and Genoways 2004; FWC 2017a). Florida bonneted bats roost in trees but have also been known to use artificial structures such as bat houses (FWC 2017a). The Florida bonneted bat is insectivorous and forages over wetlands or open water habitats, using echolocation to detect its prey. Breeding occurs during the summer; however, data also suggest that this species may have an additional breeding season each year in January and February (Timm and Genoways 2004). Threats to this species include habitat loss and degradation as a result of urban and agricultural development. Climate change and sea level rise are likely to further limit available habitat for this species in the future (78 FR 61004).

The Florida bonneted bat has been documented in the park but outside the project area (78 FR 61004). The closest known location for bonneted bats in relationship to the project area is approximately 11 miles from the Shark Valley Entrance Road. To confirm the presence or absence of the Florida bonneted bat in the project area, a survey was conducted in January 2017, covering approximately 6 miles of the Old Tamiami Trail from the Shark Valley Entrance Road to the L-67 extension levee (NPS 2017b). No individual Florida bonneted bats were found during the survey. Similarly, no potential roosting sites or evidence of bats (guano) were documented during the survey. Therefore, this species is not anticipated to be present within the project area. Critical habitat has not been designated for this species, although the final rule for the species' listing under the ESA states that USFWS intends to designate critical habitat in the future (78 FR 61004).

### **West Indian Manatee (*Trichechus manatus*)**

The federally threatened West Indian manatee (Florida manatee) is a large migratory marine mammal characterized by a large, seal-shaped body with paired flippers and a round, paddle-shaped tail. They are typically grey with coarse, single hairs sparsely distributed over the body. Adult manatees, on average, are about 9 feet long and weigh about 1,000 pounds. Manatees are herbivores and will consume any aquatic vegetation available to them, including sometimes grazing on the shoreline vegetation. They consume 4 to 9% of their body weight in vegetation each day (USFWS 2008b).

The range of the West Indian manatee includes the Gulf of Mexico, Caribbean Sea, and the Atlantic coast of United States. Between October and April, manatees concentrate in the warmer waters of Florida and the Caribbean, south to Venezuela. During the summer, the species migrates as far west as the Texas coast on the Gulf of Mexico (USFWS 2008b) and as far north as Massachusetts on the Atlantic coast (Dauphin Island Sea Lab 2016). Manatees can be found in shallow, slow-moving rivers, estuaries, saltwater bays, canals, and coastal areas, particularly in areas with seagrass beds or other abundant aquatic vegetation. West Indian manatees have no natural predators; the primary threat to this species is collision with watercraft.

Manatees have been observed using conveyance canals as travel corridors between lakes and estuaries within the greater Everglades area. Manatees also depend on canals as a source of freshwater, resting sites, and thermal refuge. However, manatees have not been documented in the project area. The nearest report of a manatee was a carcass found in 1971, 4.7 miles east of the L-67 extension canal. Critical

habitat for the West Indian manatee has been designated along coastal portions of south Florida, including within the park. However, the project area does not contain designated critical habitat for this species.

### **Eastern Indigo Snake (*Drymarchon corais couperi*)**

The federally threatened eastern indigo snake is the largest non-venomous snake in North America, reaching lengths of up to 8.5 feet. This species is characterized by its bluish-black color with smooth scales and red or brown chin, cheeks, and throat. The historical range of the eastern indigo snake includes Florida, the coastal plain of southern Georgia, extreme southern Alabama, and extreme southeastern Mississippi, although the species is believed extirpated throughout much of its historical range (ADCNR 2017). Distribution of this species is currently believed to be restricted to peninsular Florida and southeastern Georgia (FWC 2017b). Habitat for the eastern indigo snake includes pine flatwoods, scrubby flatwoods, high pine, dry prairie, tropical hardwood hammocks, edges of freshwater marshes, agricultural fields, coastal dunes, and human-altered habitats.

This snake is a generalist predator and is known to feed on fish, frogs, toads, snakes (venomous and non-venomous), lizards, turtles, turtle eggs, small alligators, birds, and small mammals. Eastern indigo snakes breed between November and April and nest between May and August. They frequently deposit their eggs in gopher tortoise burrows. Primary threats to this species include loss, degradation, and fragmentation of habitat from urban development (FWC 2017b). Additional information about the biology and status of this species is provided in the Programmatic Biological Opinion that was prepared for the CEPP FEIS (annex A, pages 845–847).

The eastern indigo snake has the potential to occur, although there are no known occurrences in the project area. This species is not likely to occur in the project area because of the vast amount of wetland habitat and limited amount of upland habitat. No critical habitat has been designated for this species.

## **CRITICAL HABITAT**

### **Everglade Snail Kite Critical Habitat**

Everglade snail kite critical habitat is the only designated critical habitat in the project area. Critical habitat for the Everglade snail kite was designated in 1977 (50 CFR 17.95) and consists of 841,635 acres divided among nine critical habitat units (42 FR 40685). The project area is located entirely within Everglade snail kite critical habitat. Because this designation was one of the earliest under the ESA, primary constituent elements were not defined. A figure displaying the location of the critical habitat is provided in appendix A.

## **STATE-LISTED SPECIES**

### **Little Blue Heron (*Egretta caerulea*)**

FWC lists the little blue heron as a threatened species at the state level in Florida. The little blue heron is a small wading bird characterized by a grayish-blue body and a dark red head during breeding periods, and a purplish head and neck during non-breeding periods. In the United States, the range of the little blue heron can include Missouri, east to Virginia, south to Florida, and west to Texas. This species is relatively common throughout peninsular Florida, but somewhat rare in the Panhandle. Habitat for the little blue heron includes fresh, salt, and brackish water environments, including swamps, estuaries, ponds, lakes, and rivers where it forages on small fish and aquatic invertebrates. This species nests in colonies, often with other species of long-legged waders such as egrets, ibis, and storks. Nesting habitat includes trees and shrubs in or near water. Threats to the little blue heron include coastal development, disturbance at

foraging and breeding sites, degradation of feeding habitat, reduced prey availability, and predation. Other threats may include exposure to pesticides, toxins, and infection by parasites (FWC 2017c).

The little blue heron has been documented to nest in colonies with other wading birds in the project area. The project area contains suitable nesting, loafing, roosting, and foraging habitat for this species. Therefore, this species is likely to be present in the project area.

### **Tricolored Heron (*Egretta tricolor*)**

FWC lists the tricolored heron as a threatened species at the state level in Florida. The tricolored heron is a medium-sized wading bird characterized by dark slate-blue colored head and upper body, a purple chest, a white underside, and a long, slender neck and bill. The range of the tricolored heron extends from Massachusetts, south throughout the Gulf of Mexico and Caribbean, to northern Brazil. Breeding sites can also be found on the Pacific coast from Baja, California, south to Ecuador. Tricolored herons are widespread, permanent residents in Florida, although they are less common in some parts of the Panhandle. Habitat for this species consists of fresh and saltwater marshes, estuaries, mangrove swamps, lagoons, and river deltas where they feed primarily on small fish. Tricolored herons breed in colonies, often with other species of long-legged waders such as egrets, ibis, and storks. Nesting habitat includes trees and shrubs in or near water. Nesting occurs between February and August. Threats to this species include habitat loss and degradation from alterations to hydrology, reduced prey abundance, and exposure to pollutants and pesticides (FWC 2017d).

The tricolored heron has been documented to nest in colonies with other wading birds in the project area. The project area contains suitable nesting, loafing, roosting, and foraging habitat for this species. Therefore, this species is likely to be present in the project area.

### **Reddish Egret (*Egretta rufescens*)**

FWC lists the reddish egret as a threatened species at the state level in Florida. This medium-sized wading bird is characterized by a grayish-brown body, with a reddish head and neck, dark blue legs and feet, and a pink bill with a black tip. Individuals of this species can also be solid white. Distribution of the reddish egret occurs primarily in coastal regions of the southern United States, including both the Atlantic and Gulf coasts of Florida and the Keys. This species also occurs throughout the Caribbean and in parts of Central and South America. Habitat for the reddish egret includes estuaries and lagoons especially near mangroves, but they may inhabit dredge spoil islands. The diet of the reddish egret consists primarily of small fish. In mainland Florida, the reddish egret nests between February and June, with the Florida Bay and Keys populations nesting from November to May. Threats to this species include habitat loss and degradation from coastal development, disturbance at foraging and breeding sites, and loss of genetic diversity (FWC 2017e).

The reddish egret has been observed in the freshwater marshes of the park and may occur in parts of the project area. However, the project area does not contain high quality breeding habitat. While this species is likely to occur in the project area on occasion, it is not likely to be present in great abundance or with regular frequency.

### **Roseate Spoonbill (*Platalea ajaja*)**

The roseate spoonbill is listed as threatened at the state level in Florida. This large wading bird is characterized by its pink coloration and large spoon-shaped bill. The range of the roseate spoonbill includes the Gulf coast of the United States, the Caribbean, and parts of Central and South America. In Florida, this species is most abundant in south Florida including the Keys and around Tampa Bay. Habitat

for this species includes freshwater and estuarine wetlands, mangrove islands, and occasionally dredge spoil islands. The diet of the roseate spoonbill consists of small fish and crustaceans. This species nests in colonies, often with other species of long-legged waders such as egrets, ibis, and storks. Habitat loss and degradation from coastal development are the primary threats to this species (FWC 2017f).

The roseate spoonbill has been observed in the freshwater marshes of the park and may occur in parts of the project area, but is not believed to breed in the project area. While this species may be occasionally present in the project area, it is not likely to occur in great abundance or with regular frequency.

### **Florida Sandhill Crane (*Grus canadensis pratensis*)**

The Florida sandhill crane is listed as threatened at the state level in Florida. This large wading bird can reach over 40 inches tall and have a wingspan of nearly 80 inches. The Florida sandhill crane is a subspecies of the sandhill crane (*Grus canadensis*) and is characterized by its gray plumage and a bald spot of red skin on the top of its head (FWC 2017g). Unlike other sandhill crane subspecies, the Florida sandhill crane is a non-migratory resident species. This species occurs throughout peninsular Florida north to the Okefenokee Swamp in southern Georgia and is most abundant in Florida's Kissimmee and Desoto prairie regions. The statewide population was estimated to be around 4,594 individuals in 2003 (FWC 2011). Habitat for the Florida sandhill crane includes freshwater marshes, prairies, and pastures. Nesting occurs during late winter and spring. This species is omnivorous and its diet may consist of seeds, berries, small mammals and reptiles, and insects and other invertebrates (FWC 2017g).

The Florida sandhill crane is relatively uncommon in the Everglades region but has been documented in the freshwater marshes of the park and could potentially breed there. While this species is not likely to be present in the project area with regular frequency, it may occasionally forage or breed in parts the project area.

### **Southeastern American Kestrel (*Falco sparverius paulus*)**

The southeastern American kestrel is listed as threatened at the state level in Florida. The southeastern American kestrel is a non-migratory falcon found in the southeastern United States from South Carolina to Texas and is the smallest falcon species found in the United States (NatureServe 2015). Habitat for the southeastern American kestrel includes open pine savannahs, sandhills, prairies, and pastures. This species nests primarily in large, dead trees in cavities previously excavated or hollowed out by woodpeckers, and breeding occurs from mid-March to early June. In Florida, the diet of the southeastern American kestrels consists primarily of grasshoppers and small lizards, although they will opportunistically prey on other insects and small vertebrates. Threats to this species include loss of nesting and feeding habitat from residential and agricultural development, removal of trees in agriculture fields, and fire suppression. Kestrels are also vulnerable to pollutants such as polychlorinated biphenyls, pesticides, and heavy metals (FWC 2017h).

The southeastern American kestrel occurs throughout south Florida and has been documented in the freshwater marshes of the park. Breeding populations have not been documented in the project area, but this species may be occasionally present in parts the project area.

### **White-crowned Pigeon (*Patagioenas leucocephala*)**

The white-crowned pigeon is listed as threatened at the state level in Florida. This medium-sized bird is characterized by its gray body, distinctive white head, and green feathers on its back and neck. In the United States, the white-crowned pigeon is only found in Florida, and its distribution is primarily restricted to Florida Bay, Biscayne Bay, and the Florida Keys. This species also occurs in the Bahamas,



Greater and Lesser Antilles, and the Caribbean coast of southeastern Mexico and Central America. Habitat for the white-crowned pigeon consists of low-lying forest habitats with ample fruiting trees. Its diet primarily consists of tropical hardwood tree fruits. Breeding occurs during May to September, with major breeding periods occurring from May to early June and July to early August. The primary threats to this species are habitat loss and degradation, specifically the loss of tropical hammocks that provide their preferred feeding grounds (FWC 2017i).

The white-crowned pigeon may occasionally use habitats in the park, but the project area lacks high quality feeding and nesting habitat. While this species is likely to occur in the project area on occasion, it is not likely to be present in great abundance or with regular frequency.

## CULTURAL RESOURCES

The project area includes a 6-mile segment of the Old Tamiami Trail, the first highway to cross the Everglades. Initial interest in developing a route across the Everglades in south Florida began in 1915. At that time, the only way to cross the Everglades was along Indian trails, and trips could take anywhere from three to seven days. Construction of the highway began in 1916 but proceeded slowly because of construction issues and delays caused by World War I; by 1923 the project had stalled with a 100-mile stretch of highway remaining to be constructed across swamp and saw grass (figure 17). In 1923, the Trail Blazers group was organized in an attempt to renew interest in the project through an overland expedition of the route. The expedition proved to be no small undertaking, taking three and a half weeks instead of the originally estimated seven days, but it was effective and construction resumed the following year. The Tamiami Trail officially opened in April 1928.



**FIGURE 17. CONSTRUCTING THE OLD TAMIAMI TRAIL**

The Everglades section of the trail was constructed by dredging the limestone bedrock and stacking it to create the roadway (figure 18). This resulted in the construction of a canal immediately adjacent to the road. Even with the use of the dredged material, the road was only two lanes wide when completed with no shoulder or barriers separating it from the swamp or canal (figure 19). In 1946, a number of bridges were added to the road, many of which were replaced with culverts beginning in 1951. In 1956, the road was upgraded to include shoulders, and at some point after, the road was paved with asphalt. Between 1959 and 1963, the road was rerouted, and a 9.5-mile segment was abandoned. The current project area includes a portion of that 9.5-mile segment and is one of the only remaining original alignments for the Tamiami Trail, now called the Old Tamiami Trail.



**FIGURE 18. DREDGING THE LIMESTONE BEDROCK**



**FIGURE 19. CARS PARKED ALONG OLD TAMIAMI TRAIL**

The Old Tamiami Trail and the associated Old Tamiami Trail Canal were previously recorded as cultural resources and recommended as eligible to the National Register. However, the studies documenting these resources did not provide detailed characterization or specifics on the historic character of the resources. The CEPP FEIS (page 5-57 and appendix C.2.2) acknowledges that these resources could be adversely

affected by the proposed modifications to the trail and that additional study would be needed to characterize the resources in the project area and determine their eligibility for the National Register.

A Phase I cultural resource assessment of the project area was completed in February 2017 (NPS 2017c). After agency scoping and government-to-government consultation with associated tribes, an addendum to the cultural resource assessment was completed in November 2017 (NPS 2017d). The goal of these cultural resource assessments was to complete a detailed consideration of the National Register eligibility of the trail and canal and to identify any additional cultural resources present. A pedestrian reconnaissance was completed for the entire project area. Eleven cultural resources were identified within the area of potential effects (APE), including nine aboveground architectural resources (road features, bridges, culverts, and canals) and two tree island archeological sites. The nine aboveground architectural resources in the APE include the Old Tamiami Trail bridge, the L-67 extension canal and levee, the Shark Valley Entrance Road and associated canal (inventoried separately), and five concrete culverts. One tree island site was found with a Seminole Indian occupation, while the other tree island site has a Native American occupation with uncertain cultural association.

The examination of the Old Tamiami Trail and Old Tamiami Trail Canal found that both of these features retain a high degree of integrity in terms of location, setting, feeling, design, materials, and workmanship. The trail remains in its original location and has been minimally modified since its construction. Previous modifications to the trail include the construction of shoulders, the addition of bridges and culverts, and the conversion from shell rock pavement to asphalt. Most of these changes occurred during the 1940s and 1950s. Additionally, little development has occurred near the trail, and the setting and feeling remain mostly rural, resembling the landscape of the 1920s. Similarly, the Old Tamiami Trail Canal retains a high degree of integrity. Between 1959 and 1963, the main canal was rerouted, leaving this segment mostly intact in its original location. Two lagoons and the Shark Valley Entrance Road disrupt portions of the canal, but the remaining portions remain relatively unchanged since their original construction (figures 20 and 21).

The road and canal are considered eligible under Criterion A (transportation) because of their close connection with the development of south Florida and Criterion C (engineering) because they represent a remarkable achievement of early 20th century engineering. The period of significance for the Old Tamiami Trail is 1923–1963. The period of significance for the Old Tamiami Trail Canal is 1909–1956. The trail remains in its original location and because of its position in the park; it retains much of its 1920s appearance and the feeling of a remote road through the Everglades. The association of the road with the canal is an important aspect of the location and setting of these historic properties.

The nine aboveground architectural resources in the APE were all constructed during the 20th century. The Old Tamiami Trail bridge was assessed in 2001 and was determined not eligible for the National Register (NPS 2017d). The L-67 extension canal was built circa 1952 and was found eligible for the National Register under Criterion A (transportation) and Criterion C (engineering). The Shark Valley Entrance Road and associated canal were built circa 1940–1952 during early oil exploration of the area. The road and canal are a simple, unremarkable design and are commonplace in the Everglades. As a result, the Shark Valley Entrance Road and canal were determined not eligible for listing in the National Register (NPS 2017d). Similarly, the five concrete culverts are commonplace and were determined not eligible for listing in the National Register (NPS 2017d).





**FIGURE 20. CURRENT OLD TAMIAMI TRAIL WITH ENCROACHING VEGETATION**

In addition to the Old Tamiami Trail and canal, small areas of raised vegetation known as tree islands, and hardwood hammock are present downstream from the Old Tamiami Trail. These areas typically include hardwood trees, palms, shrubs, ferns, and epiphytes. These islands form on areas of elevated bedrock that are less subject to seasonal inundation. Previous archeological surveys completed by NPS and others have shown a correlation between tree islands and the presence of both historic and pre-contact archeological resources. These sites often contain shell or black soil midden deposits. Artifact assemblages recovered range from the Archaic period (ca. 5,000 years ago) through the entire prehistoric Glades tradition to 1760. Some sites also contain historic-period artifacts indicating Spanish, Colonial, and Seminole occupation. Two tree island sites with pre-contact occupation are within the APE. The sites are part of the Shark River Slough Archaeological District and have been listed in the National Register (NPS 2017d).





**FIGURE 21. OLD TAMIAMI TRAIL CANAL**

## **VISITOR USE AND EXPERIENCE**

Visitation to the park has remained relatively constant at nearly 1 million visitors per year since 1988, with 930,907 visitors in 2016 (NPS 2017e). Common recreational opportunities in the park include hiking, fishing, boating, biking, camping, and wildlife viewing. Visitation to the Everglades is highly seasonal with a peak season from December to April and a low season from June to September. Peak and low seasons depend on heat, humidity, mosquito levels, and migrating birds congregating in the park.

The project area encompasses the Old Tamiami Trail, a closed roadway that runs parallel but separate from the modern road by nearly 350 feet and the Old Tamiami Trail Canal. Visitors currently do not use the Old Tamiami Trail, which is overgrown with vegetation and not usable for recreation. Additionally, the western boundary of the project area overlaps with the Shark Valley Entrance Road, which leads to Shark Valley and the Shark Valley Visitor Center. The new visitor center and concessions facility opened in 2014. The visitor center offers educational displays, a park video, an underwater camera, and informational brochures. Shark Valley also offers a 15-mile round-trip tram road (not open to private motorized vehicles) that extends into the marsh and is one of the best opportunities for viewing the Everglades environment. Shark Valley Tram Tours offers two-hour guided tours and bicycle rentals. Visitors on the open-air tour are introduced to the River of Grass and the wildlife inhabiting it. At the midway point of the trip, visitors can stroll up the spiral ramp and platform of the Shark Valley observation tower for a panoramic view of the heart of the Everglades. NPS also offers ranger-led bike tours and nature walks. Two short walking trails, (one accessible) are located off the tram road for visitor enjoyment. Shark Valley is a favorite destination for local and out-of-town bicyclists. An observation tower is located at the end of the tram road, 7.4 miles south of the entrance to Shark Valley.



## CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

### GENERAL METHODOLOGY FOR ESTABLISHING IMPACTS

In accordance with CEQ regulations, direct, indirect, and cumulative impacts are described (40 CFR 1502.16), and the impacts are assessed in terms of context and intensity (40 CFR 1508.27). Where appropriate, mitigating measures for adverse impacts are also described and incorporated into the evaluation of impacts.

### GEOGRAPHIC AREA EVALUATED FOR IMPACTS (AREA OF ANALYSIS)

The project area for this assessment is the 5.7-mile segment of the Old Tamiami Trail located along the northern boundary of the park. The project area includes the entire length of the Old Tamiami Trail and associated toe slope, the Old Tamiami Trail Canal, all potential staging areas, and the Shark Valley Entrance Road Canal. The specific study area for each impact topic may include adjacent areas and is defined at the beginning of each topic discussion.

### TYPE OF IMPACT

The potential impacts of the alternatives are described in terms of type, as follows:

**Direct:** Impacts that would occur as a result of the proposed action at the same time and place of implementation (40 CFR 1508.8).

**Indirect:** Impacts that would occur as a result of the proposed action but later in time or farther in distance from the action (40 CFR 1508.8).

**Beneficial:** A positive change in the condition or appearance of the resource or a change that moves the resource toward a desired condition.

**Adverse:** A change that declines, degrades, and/or moves the resource away from a desired condition or detracts from its appearance or condition.

### ASSESSING IMPACTS USING COUNCIL ON ENVIRONMENTAL QUALITY CRITERIA

The impacts of the alternatives are assessed using the CEQ definition of “significantly” (1508.27), which requires consideration of both context and intensity:

**Context:** This means that the significance of an action must be analyzed in several contexts such as society as a whole (human, national), the affected region, the affected interests, and the locality. Significance varies with the setting of the proposed action. For instance, in the case of a site-specific action, significance would usually depend on the effects in the locale rather than in the world as a whole. Both short- and long-term effects are relevant.

**Intensity:** This refers to the severity of impact. Responsible officials must bear in mind that more than one agency may make decisions about partial aspects of a major action.

For each impact topic analyzed, an assessment of the potential significance of the impacts according to context and intensity is provided in the “Conclusion” section that follows the discussion of the impacts under each alternative.

## **CUMULATIVE IMPACTS ANALYSIS METHOD**

To assess cumulative impacts, it is necessary to identify other past, ongoing, or reasonably foreseeable future actions at and around the area of analysis that would affect the resources evaluated in this EA. Cumulative impacts are defined as “the impact on the environment which results from the incremental impact of the action when added to other past, present, or reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions” (40 CFR 1508.7). The specific project analyzed in this EA is part of the larger CEPP FEIS; therefore, it is appropriate to analyze the modifications to the Old Tamiami Trail in the context of the CEPP and the cumulative impacts analysis from the CEPP FEIS. Section 6.3.3 (page 6-34) and appendix C.2.2 (page C.2.2-148) of the CEPP FEIS document the cumulative effects by impact topic, which are summarized and included under each impact topic in this EA.

Cumulative impacts are determined for each impact topic by combining the impacts of the alternative being analyzed and other past, present, and reasonably foreseeable actions. Because some of these actions are in the early planning stages, the evaluation of the cumulative impact is based on a general description of the projects. These other past, present, and reasonably foreseeable actions are summarized below.

## **EVERGLADES RESTORATION TRANSITION PLAN**

The ERTTP, implemented in 2012 but now under a water management deviation (i.e., adaptive management strategy) by MWD Increment 1 Plus, is the current operating plan that directly affects the WCAs and the park, as described on page 3 of this EA. This plan incorporates operating criteria to better manage WCA 3A, which is directly north of the park. Within the project area, the ERTTP requires no closure criteria for S-12C with the inclusion of stoppers in the culverts under the Shark Valley Tram Road. USACE implemented the first elements of the reasonable and prudent alternative from the latest biological opinion in March 2017. As part of the biological opinion, 20 feet of the Old Tamiami Trail Canal will be plugged to improve habitat south and west of the Shark Valley Entrance Road for the Cape Sable seaside sparrow. The plug, referred to as the ERTTP canal plug, will be adjacent to the Shark Valley Entrance Road at the western edge of the project area. Construction of the ERTTP canal plug is anticipated in spring 2018. Figure 22 displays the location of the ERTTP canal plug within the project area.



**FIGURE 22. LOCATION OF EVERGLADES RESTORATION TRANSITION PLAN CANAL PLUG**

## **EVERGLADES RESTORATION PLANS**

Regional Everglades' restoration plans, most involving water management projects in south Florida to modify and add to C&SF project features, have the potential to alter or improve hydrology and water quality in the park, including near the project area. If all these projects were successfully implemented over the next 30 years, their cumulative impact is expected to improve degraded ecological conditions currently experienced in the park. These projects include the MWD Project, Tamiami Trail Next Steps Project, and the CERP. The overview of these projects is included on page 3 of this EA, and specific details are provided beginning on page C.2.2-148 of the CEPP FEIS.

## **SOUTH FLORIDA AND CARIBBEAN PARKS EXOTIC PLANT MANAGEMENT PLAN AND ENVIRONMENTAL IMPACT STATEMENT**

In 2010, NPS completed an exotic vegetation management plan, EIS, and Record of Decision for the control of nonnative plant species in nine south Florida and Caribbean park units. The plan includes NPS goals and methods for the continued control and reduction of nonnative plant species throughout the

Everglades (NPS 2010b). Lands adjacent to the eastern boundary of the park include commercial production of ornamental landscape plants, many of which can become invasive in the subtropical climate found in south Florida. Incompatible land uses in the East Everglades Expansion Area prior to its inclusion in the park boundary have also facilitated nonnative plant species growth in the area.

## **EVERGLADES NATIONAL PARK FIRE MANAGEMENT PLAN**

In October 2015, the park signed a Finding of No Significant Impact for a *Fire Management Plan* and EA that implements a flexible range of options and activities to respond to changes in environmental conditions and the specific needs of individual firefighting efforts (NPS 2015b). Fire management is an integral part of the park's natural and cultural resource management program and supports the park's management objectives and goals for the future condition of park resources. Managing the role of fire in park ecosystems is one of the highest natural resource management priorities in the park. Under the fire management plan, park staff implements a variety of fire management techniques, also called treatments, to accomplish land and resource condition objectives and reduce risk to firefighters, public health and safety, and private property. Under the selected alternative, prescribed fire-fuels treatments are planned for multiple years and occur as part of a slow-moving window of current and out-year treatments in a multi-year fuel treatment plan, within a five-year scope of work.

## **RELOCATE AND BURY POWERLINES AND REMOVE UTILITY POLES**

In addition to larger south Florida and park-wide management plans in the project area, the existing powerlines along the Old Tamiami Trail are slated to be relocated. The powerlines will be removed from the Old Tamiami Trail and placed underground adjacent to the modern Tamiami Trail roadway. Once the powerlines have been relocated, the utility poles will be removed.

## **HYDROLOGY AND WATER QUALITY**

### **METHODOLOGY AND ASSUMPTIONS**

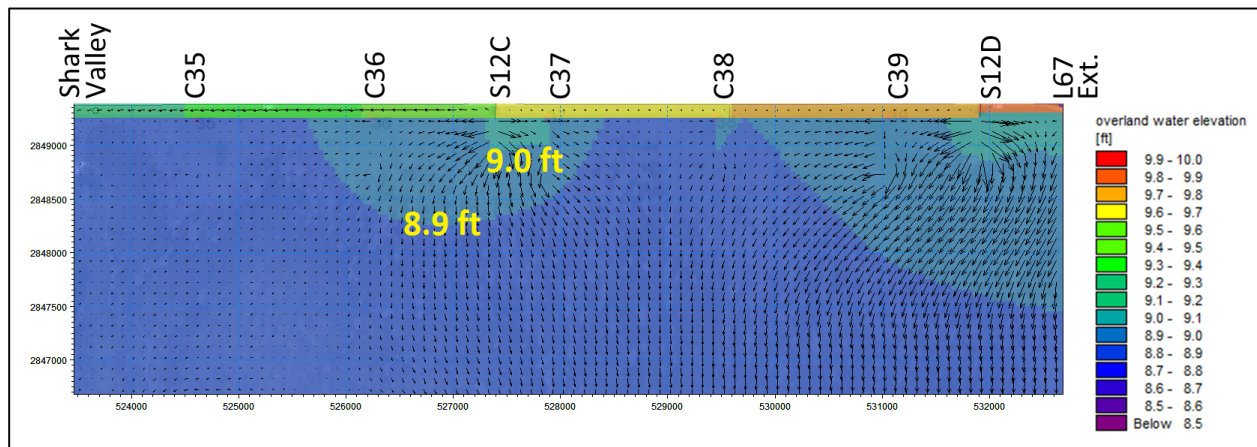
Impacts on hydrology were analyzed through hydrologic modeling to determine the potential change in stages and flow rates in the project area and any anticipated downstream changes. The level of impact on potential flow capacity through S-12C and S-12D and on stages and flow velocities downstream of the Old Tamiami Trail was evaluated. As part of the ERTTP biological opinion, 20 feet of the Old Tamiami Trail Canal will be plugged to improve habitat for the Cape Sable seaside sparrow (i.e., the ERTTP canal plug, discussed under cumulative projects). The hydrologic modeling of alternatives was completed with this feature in place. The hydrologic analysis focused on changes in flow capacity of the S-12C and S-12D structures because of the removal of the Old Tamiami Trail under varying upstream conditions in WCA 3A. It also focused on changes in the marsh stages and flow velocities south of the Old Tamiami Trail. The full hydrological analysis for this project is included in appendix C.

Potential impacts on water quality are determined based on impacts on the chemical, physical, or biological constituents of the water column. The analysis of possible impacts on water quality is based on a review of existing literature and maps, information provided by NPS and other agencies, experience related to construction-related effects of the removal of berms in the Everglades, and professional judgment.

**Study Area.** The study area for hydrology includes the areas that would be directly affected by the removal of the Old Tamiami Trail and any areas that could be affected downstream by the alternatives. The study area for cumulative impacts includes the south central Florida region affected by water control projects, including WCA 3A and the northeastern part of the park.

## NO-ACTION ALTERNATIVE

**Analysis.** Under the no-action alternative, the Old Tamiami Trail and associated culverts would not be removed; the canal would remain in place, and existing patterns of flow from WCA 3A through the S-12 structures would remain the same. Relatively faster flows through the S-12 structures would continue to slow once they reach the park, and sediments would continue to settle out just south of the Old Tamiami Trail and in the S-12 spillways. Stages within and immediately downstream of the project area were modeled for all alternatives, including the no-action, for wet, average, and dry conditions. An area for analysis extends between the Shark Valley Tram Road on the west and the L-67 extension canal on the east, and from the Old Tamiami Trail in the north and extends south 1.6 miles. Results for this area for simulations of the no-action alternative are displayed in figure 23. This figure shows calculated stages and flow vectors for the condition when WCA 3A is at 10.5 feet National Geodetic Vertical Datum of 1929 (NGVD29) and S-12C and S-12D are fully open. The contour lines for the 8.9- and 9.0-foot-NGVD29 stage are noted. The percentage of this area that would have stages at 8.9 feet NGVD29 or above during high water conditions was 25% for the no-action alternative. The percentage of this area that would have stages at 9.0 foot NGVD29 or above during high water conditions was 2% for the no-action alternative. Stages and flow patterns would remain similar to current conditions as described in chapter 3; therefore, there would be no new impacts on hydrology.



**FIGURE 23. MODELED DOWNSTREAM STAGES AND FLOW VECTORS—NO-ACTION ALTERNATIVE**

Similar to current conditions, phosphorus would continue to enter the park in a more concentrated fashion through the S-12 structures and then through the culverts and S-12 gaps in the Old Tamiami Trail. Current conditions would continue to cause soil eutrophication as water is discharged through the culverts. Because no substrate would be disturbed, sediment and arsenic would not increase, and there would be no new impacts on water quality.

**Cumulative Impacts.** Because the no-action alternative would not have any new impacts, there would be no cumulative impacts.

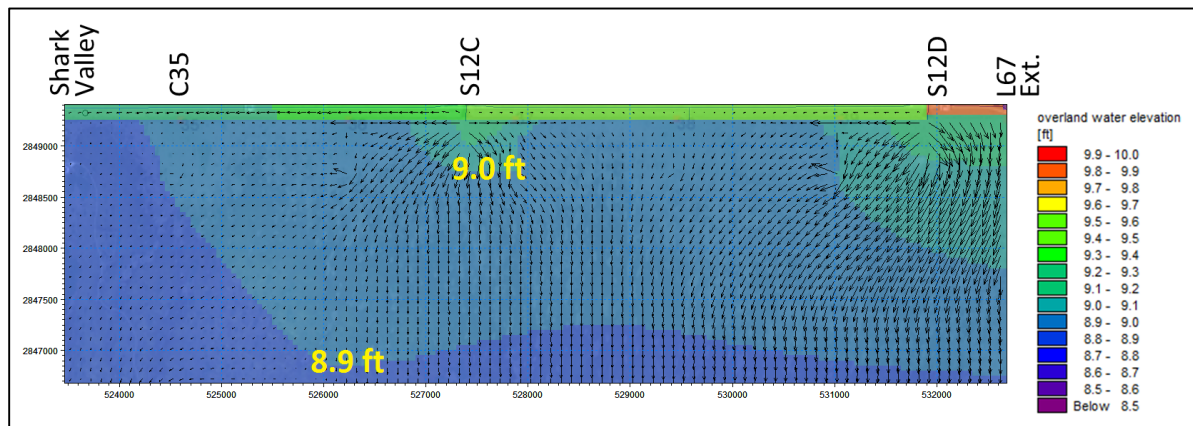
**Conclusion.** The no-action alternative would not have any new impacts on hydrology or water quality because the existing conditions would not change. As a result, there would be no cumulative impacts.

## ALTERNATIVE 1

**Analysis.** Under alternative 1, 4 miles, or approximately two-thirds of the Old Tamiami Trail, would be removed. The removal would noticeably improve the hydrologic connectivity of the canal and the



remainder of the park, south of the project area, over the long term. The removal would establish direct connections between the Old Tamiami Trail Canal and the marsh grasses downstream of the Old Tamiami Trail through increased sheetflow. The removal of the culverts and roadbed would produce less channelized flows associated with sheetflow and, therefore, would spread the phosphorus load throughout the project area and to areas downstream. The remaining culvert would continue to act as a point source for discharged water. Hydrologic modeling of this alternative indicates that flow capacity through S-12C and S-12D would increase under high, normal, and low headwater conditions. When WCA 3A is at 10.5 feet NGVD29 and the water control structures are fully open, the flow rate through S-12C would be 21% higher than under the no-action alternative, and the flow rate through S-12D would be 22% higher than under the no-action alternative. Flow rates through the fully open S-12 structures when WCA 3A is at 9.5 feet NGVD29 would be 25% higher for S-12C and 22% higher for S-12D above the no-action alternative. Stages within and immediately downstream of the project area would increase under this alternative. The increase in stage under wet conditions and maximum flows through the S-12 structures was calculated for an area extending between the Shark Valley Tram Road on the west and the L-67 extension canal on the east, and from the Old Tamiami Trail in the north and extending southward 1.6 miles. This area is shown in figure 24 for the modeled high-water condition in the park and shows results for alternative 1. The contour lines for the 8.9- and 9.0-foot-NGVD29 stage are also shown in figure 24. The percentage of this area that would have stages at 8.9 feet NGVD29 or above during high water conditions would be 25% for the no-action alternative and 78% for alternative 1. The percentage of this area that would have stages at 9.0 feet NGVD29 or above during high water conditions would be 2% for the no-action alternative and 10% for alternative 1. The removal of the Old Tamiami Trail would indirectly increase phosphorus loads discharged from WCA 3A by increasing the flow that can travel south, but the loads would be more evenly distributed, given the changes in the hydrology. Although some adverse impacts would occur from the additional phosphorus loading to areas where it is currently less pronounced, the overall impact from the wider distribution of the phosphorus load would be beneficial. The distribution would benefit water quality and ultimately provide associated ecosystem benefits in the park. Compared to current conditions, fewer dry events are expected, which could have a beneficial effect on soils, water quality, vegetation, and habitat for wildlife.



NOTE: Arrows indicate rate and direction of flow. The longer and larger arrows indicate higher flow rates.

**FIGURE 24. MODELED DOWNSTREAM STAGES AND FLOW VECTORS—ALTERNATIVE 1**

The Shark Valley Entrance Road Canal has very little flow, so the addition of the plug would minimally affect hydrology or sheetflow in the project area, and would not noticeably affect water quality over the long term.

During construction, impacts on both hydrology and water quality would be short term and adverse, occurring intermittently during the estimated one-year construction period. During removal of the roadway, flows through the area could be decreased while fill is removed and the temporary gravel access plugs are in place. During this period, best management practices preventing sedimentation would be implemented to divert flows elsewhere. When fill and road surface are removed, impacts on water quality would be short term and adverse from increased sedimentation in the water column and possible releases of naturally occurring arsenic in the fill material when it is disturbed during construction. However, use of appropriate management practices approved or required by FDEP in the permitting process would minimize the chances that either sediment or arsenic would be released into the water column to a large degree or in excess of any standards, thus protecting areas downstream of the project area and reducing short-term, adverse impacts. Fill reused elsewhere in the project area for the plugs would be tested to ensure it is clean and appropriate to be reused. The use of staging areas would not affect hydrology or water quality; the staging areas would not change flow, and construction management techniques and spill prevention plans would prevent water quality impacts.

**Cumulative Impacts.** With the exception of the relocation of the utility poles, all cumulative projects would affect hydrology and water quality. Activities associated with the ERTTP could result in adverse impacts on water quality from potential changes to phosphorus loading, with an increase between 1 and 7% total phosphorus load to the Shark River Slough and a change in the average flow-weighted annual mean concentration from a decrease of 0.4 parts per billion to an increase of 0.4 parts per billion (USACE 2011). The ERTTP also has the potential for increased or modified flow. Specific to the project area, the ERTTP canal plug would affect hydrology slightly, although it is not clear if the impact would be adverse or beneficial in the project area. West of the project area, the impact would be beneficial. The plug would block westward flow locally so that habitat for the Cape Sable seaside sparrow south and west of the plug would be drier, allowing habitat to be restored. Westward flows along the canal at Shark Valley Entrance Road would be stopped, and water would be directed back to the east. The changes in flows on the eastern side of the plugs would not be noticeable; water would flow slowly back to the east. Therefore, impacts on hydrology in the project area would not be noticeable. The placement of fill associated with the ERTTP canal plug would affect water quality; impacts could include increased sedimentation and possible release of arsenic from the fill materials. Construction practices designed to prevent sedimentation in the water column or the release of arsenic would minimize short-term, adverse impacts on water quality. No long-term impacts are anticipated.

Generally, projects associated with the various Everglades restoration plans have the potential to alter or improve the hydrology and water quality in the park. Over the course of implementation of all projects, degraded ecological conditions are expected to improve, resulting in beneficial impacts on hydrology and water quality in the park, including in the project area.

*The South Florida and Caribbean Parks Exotic Plant Management Plan* would result in localized adverse impacts on water quality from treatments. Impacts could include detectable chemical, physical, or biological changes to water adjacent to the treatment areas, but these impacts would be within water quality standards and criteria. The return to a more natural hydrologic regimen would have long-term benefits on hydrology, including increased sheetflow and a longer hydroperiod with the removal of dense stand of exotics. These benefits would be most noticeable in areas where exotics are removed, but would be more widespread as exotic plant management is completed across the park.

Activities completed under the *Fire Management Plan* would remove decadent sawgrass, altering sheetflow and reducing resistance to sheetflow, which would benefit hydrology park-wide. While prescribed burns may temporarily affect water quality from the release of nutrients, fire is a natural part of the ecosystem function, and these impacts would not be long term.

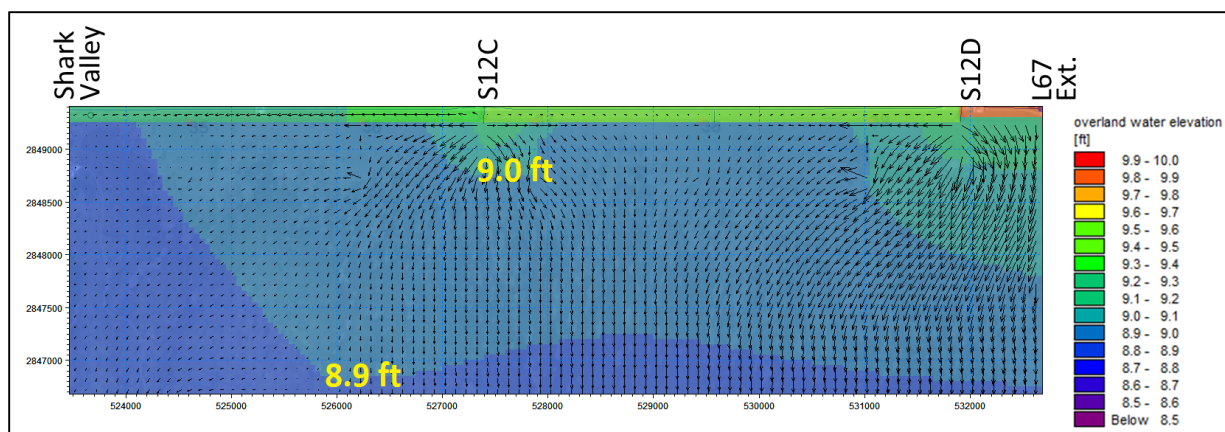
Under the CEPP as a whole, while natural hydrologic conditions would not likely be restored to pre-drainage conditions, improved hydrology would occur on a regional scale. Removal of the Old Tamiami Trail contributes minimally to that overall improved hydrology but would help to improve the quantity and distribution of water flow from WCA 3A to the park. Similarly, while the CEPP would be unlikely to eliminate the human impacts on water quality, water quality is slowly expected to improve over existing conditions. Removal of the Old Tamiami Trail would help more evenly distribute phosphorus, contributing to the overall regional water quality benefits.

When combined with the mostly long-term, beneficial impacts of the cumulative projects, alternative 1 would contribute incremental beneficial impacts. While the ERTTP could have adverse impacts on water quality from increased phosphorus load, the remaining cumulative projects, including removal of 4 miles of the Old Tamiami Trail under alternative 1, would help offset the increased load by improving distribution. Overall, cumulative impacts on hydrology and water quality would be beneficial, with alternative 1 contributing an incremental beneficial impact to the overall regional cumulative impacts.

**Conclusion.** Under alternative 1, the removal of 4 miles of Old Tamiami Trail would increase hydrologic connectivity, improve sheetflow into the park, and increase the capacity for water deliveries to be made to the park—all of which would be beneficial to hydrology and water quality. While there may be an increased phosphorus load, the load would be more evenly distributed. Short-term, adverse construction-related impacts associated with the potential for increased sedimentation and other materials from the removal of the Old Tamiami Trail would be minimized through appropriate construction management practices determined during the permitting process. The Shark Valley Entrance Road Canal plug would minimally affect hydrology or sheetflow, and would not noticeably affect water quality over the long term. There would be mostly beneficial cumulative impacts, with alternative 1 contributing an incremental beneficial impact on hydrology and water quality regionally.

## **ALTERNATIVE 2 (PREFERRED ALTERNATIVE)**

**Analysis.** Impacts on hydrology and water quality under alternative 2 would be similar to those described for alternative 1, but greater in magnitude because 1.45 additional miles of roadbed and all culverts would be removed. Similar to alternative 1, sheetflow would be improved, all point source discharges would be removed, and the phosphorus load would be evenly distributed. Hydrologic connectivity would be substantially improved over the no-action alternative and would be similar to alternative 1. Hydrologic modeling completed for alternative 2 demonstrates that the benefits to flows and distribution would be similar to the improvements described under alternative 1. Hydrologic modeling of alternative 2 indicates that flow capacity through S-12C and S-12D would increase under high, normal, and low headwater conditions. When WCA 3A is at 10.5 feet NGVD29 and the water control structures are fully open, the flow rate through S-12C would be 22% higher than under the no-action alternative, and the flow rate through S-12D would be 22% higher than under the no-action alternative. Flow rates through the fully open S-12 structures when WCA 3A is at 9.5 feet NGVD29 would be 27% higher for S-12C and 22% higher for S-12D. Stages within and immediately downstream of the project area would increase under this alternative. Figure 25 displays the modeled high-water condition in the park and shows results for alternative 2. The contour lines for the 8.9- and 9.0-foot-NGVD29 stage are also shown in figure 25. The percentage of this area that would have stages at 8.9 feet NGVD29 or above during high water conditions would be 25% under the no-action alternative and 82% under alternative 2. The percentage of this area that would have stages at 9.0 feet NGVD29 or above during high water conditions would be 2% under the no-action alternative and 10% under alternative 2. Table 2 compares the results for all alternatives.



**FIGURE 25. MODELED DOWNSTREAM STAGES AND FLOW VECTORS—ALTERNATIVE 2**

**TABLE 2. STAGE DISTRIBUTION AREA PERCENTAGES FOR 8.9 AND 9.0 FEET NGVD29**

	No Action	Alternative 1	Alternative 2
8.9 feet or above	25%	78%	82%
9.0 feet or above	2%	10%	10%

The Shark Valley Entrance Road Canal has very little flow, so the addition of the plug would minimally affect hydrology or sheetflow in the project area, and it would not noticeably affect water quality over the long term.

Short-term construction-related impacts under alternative 2 would also be similar to those described for alternative 1, although the extent of the area disturbed and associated impacts would be more extensive, given that more of the Old Tamiami Trail would be removed. The construction period under alternative 2 is also anticipated to be approximately one year. The use of staging areas would not affect hydrology or water quality; the staging areas would not change flow and construction management techniques and spill prevention plans would prevent water quality impacts.

**Cumulative Impacts.** Cumulative impacts on hydrology would be the same as described for alternative 1, resulting in mostly overall beneficial impacts on hydrology. Similar to alternative 1, the E RTP has the potential for adverse impacts on water quality from increased phosphorus load. The remaining cumulative projects, including removal 5.45 miles of the Old Tamiami Trail under alternative 2, would help offset the increased load by improving distribution. Overall, cumulative impacts on hydrology and water quality would be beneficial, with alternative 2 contributing an incremental beneficial impact to the overall regional cumulative impacts.

**Conclusion.** Under alternative 2, the removal of almost the entire Old Tamiami Trail would increase hydrologic connectivity, improve sheetflow, increase stages, and increase flow capacity at S-12C and S-12D. These impacts would be similar to those under alternative 1 and beneficial to both hydrology and water quality. However, the benefits would be greater in magnitude because a larger segment of roadway would be removed that would allow for higher flows, most notably through the S-12C structure during the 8.5-foot stage. Short-term impacts during the construction period would be the same as those described

for alternative 1. Cumulative impacts would be mostly beneficial, with alternative 2 contributing an incremental beneficial impact on hydrology and water quality regionally.

## **VEGETATION AND WETLANDS**

### **METHODOLOGY AND ASSUMPTIONS**

Maps showing vegetation cover in the project area derived from land cover data (SFWMD 2011) and communications with NPS staff were used to identify baseline conditions for vegetation and wetlands. Available information was taken from other NPS and non-NPS resources to describe these resources in more detail. The analysis of possible impacts on vegetation and wetlands is based on a review of existing literature and maps; information provided by NPS and other agencies; experience with similar construction-related effects; and professional judgment related to the amount of wetlands or other plant communities permanently altered or restored and on the size, integrity, and connectivity of the wetlands or other plant communities affected. Wetlands and other vegetation communities are largely considered together in this section because the vast majority of plant communities in the project area also qualify as jurisdictional wetlands.

No wetlands statement of findings is needed. This action is an excepted action because it is designed to restore degraded or lost wetlands. Within the park, up to 31 acres of wetlands would be restored, but thousands of additional acres above and below the road location would be restored, with the road removal contributing to that restoration. Therefore, short-term disturbances that are necessary for restoration are excepted under Procedural Manual 77-1: Wetland Protection (NPS 2016b).

**Study Area.** The analysis examines vegetation in the project area but also considers the potential for vegetation or wetland changes downstream of the project area. The cumulative impacts analysis study area includes the entire south central Florida region affected by water control projects, including WCA 3A and the northeastern part of the park.

### **NO-ACTION ALTERNATIVE**

**Analysis.** Under the no-action alternative, the Old Tamiami Trail and associated culverts would not be removed. Therefore, there would be no change to the wetlands or vegetation in the project area. The open water wetlands of the canal, woody vegetation on the Old Tamiami Trail berms and immediately downstream of the culverts, and the graminoid prairie marsh south of that would remain as described in chapter 3, so there would be no new impacts on wetlands or vegetation.

**Cumulative Impacts.** Because there would be no new impacts on wetlands or vegetation, there would be no cumulative impacts under the no-action alternative.

**Conclusion.** There would be no new impacts on vegetation or wetlands under the no-action alternative; therefore, there would be no cumulative impacts.

### **ALTERNATIVE 1**

**Analysis.** Four miles of the Old Tamiami Trail would be removed under alternative 1. Approximately 21.5 acres of upland area would be converted to wetlands, although a similar, but slightly smaller area (due to the paved area of the road itself) of upland vegetation would be removed. Wetland connectivity would be established between the canal and the Everglades marshes to the south of the removed section of Old Tamiami Trail, resulting in beneficial impacts on wetlands. Marsh grasses are likely to become established in the area where the Old Tamiami Trail is removed, although it is also likely that the canal



channel would remain largely as open water because of its depth. The Shark Valley Entrance Road Canal plug would convert some open water wetland to upland, but the amount would be minimal compared to the amount of upland from the Old Tamiami Trail converted to wetlands.

More broadly, as noted in the CEPP FEIS analysis of full removal of the Old Tamiami Trail (appendix C.2, page C.2.2-3), or as is the case under alternative 1, removing a large portion of the Old Tamiami Trail would improve conditions over the long term for downstream vegetation communities, specifically tree islands and slough habitat in the park. Resumption of sheetflow and related patterns would help restore the pre-drainage patterns of water depths and complex mosaic of Everglades' vegetation communities. The removal would also aid in restoring historical wetland communities by reducing soil oxidation, decreasing fire potential, and promoting peat accretion. Vegetation shifts driven by water quality and sedimentation would likely be localized. The number of dry events would be reduced, which would extend average hydroperiods by 35 to 90 days.

Prior to the removal of the Old Tamiami Trail roadbed, vegetation would be cleared as necessary to establish construction staging areas in previously disturbed upland areas. During construction, vegetation would be removed from the Old Tamiami Trail with machinery and taken to the staging areas to be ground, chipped, or otherwise disposed of. Efforts would be made to limit the spread of seeds from nonnative, invasive plants using established practices, so construction-related impacts on vegetation would be limited. Wetlands would be protected during construction from extra sediments and other issues by the use of in water-construction management practices, such as silt curtains, so adverse impacts would be limited. Staging areas would be allowed to revegetate naturally after construction is complete.

**Cumulative Impacts.** All cumulative projects would affect vegetation and wetlands. Activities associated with the ERTTP would continue to benefit vegetation and wetlands by providing a means for reducing high water periods and prolonged flooding, restoring vegetation within the area. Although the ERTTP canal plug in the project area would eliminate existing vegetation in the canal, the amount of vegetation loss would be minimal, given the small size of the plug.

Generally, projects associated with the various Everglades restoration plans have the potential to improve the timing, quantity, quality, and distribution of flow, allowing for more natural hydrology and assisting in restoring natural plant communities and wetlands. Over the course of implementation of all projects, degraded ecological conditions are expected to improve, resulting in beneficial impacts on park vegetation and wetlands, including in the project area.

*The South Florida and Caribbean Parks Exotic Plant Management Plan* reduces the number of individual exotic plants to minimize the threat to natural plants, resulting in long-term, beneficial impacts. Impacts during restoration activities may be short term and adverse, but would be localized and allow for complete recovery of native systems. Similarly, the activities completed under the *Fire Management Plan* would perpetuate or recreate a natural fire regime that would benefit most vegetation communities by sustaining natural conditions. Most vegetation communities in the park evolved in the presence of fire, and the *Fire Management Plan* continues those conditions. Fires of unusual intensity could damage vegetation; however, the plan also reduces the likelihood of catastrophic wildfire by reducing fuel loads, resulting in overall beneficial impacts.

Under the CEPP as a whole, noticeable beneficial impacts are anticipated in the park from improved hydroperiods and sheetflow, which would reduce soil oxidation and promote peat accretion necessary to rebuild the complex mosaic of habitats across the landscape. Removing the Old Tamiami Trail would contribute minimally to that overall improved hydrology but would help to improve the quantity and distribution of water flow from WCA 3A to the park and provide associated vegetation and wetlands benefits.

Relocating utility lines would likely have short-term, adverse impacts on the maintained grasses along the modern Tamiami Trail because some vegetation would need to be cleared where the lines would be installed, either using trenching or boring. This clearing would likely be limited because the work would be completed in previously disturbed areas along the right-of-way, and the area would be re-sodded per Florida Department of Transportation guidelines once construction is complete.

When combined with the mostly long-term, beneficial impacts of the cumulative projects, alternative 1 would contribute incremental beneficial impacts regionally. Within the project area, alternative 1 would noticeably improve wetlands by converting 21.5 acres of uplands to wetlands, but the increased wetland acreage is minimal within the larger regional context. Overall, cumulative impacts on vegetation and wetlands would be beneficial, with alternative 1 contributing an incremental beneficial impact to the overall regional cumulative impacts.

**Conclusion.** Alternative 1 would convert 21.5 acres of upland area to wetlands, although a similar, but slightly smaller area (because of the paved area of the road itself) of upland vegetation would be removed. Improved hydrologic connectivity would improve vegetation and wetlands south of the roadway, resulting in beneficial impacts. Impacts on vegetation from staging areas during construction would be short term and adverse; however, disturbed areas would be allowed to re-vegetate naturally once construction is complete. Overall, cumulative impacts on vegetation and wetlands would be beneficial, with alternative 1 contributing an incremental beneficial impact to the overall regional cumulative impacts.

## **ALTERNATIVE 2 (PREFERRED ALTERNATIVE)**

**Analysis.** The impacts of alternative 2 would be similar to those described for alternative 1, but larger in magnitude, with an additional 1.45 miles of Old Tamiami Trail removed (5.45 miles removed overall) and up to 31 acres of upland converted to wetlands, rather than 21.5 acres. The larger area of removal would allow for more connectivity and improved sheetflow that could help restore the historical wetland communities and the pre-drainage patterns of water depths and complex mosaic of Everglades' vegetation communities, resulting in beneficial impacts, especially in the marshlands south of the existing roadway.

**Cumulative Impacts.** Cumulative impacts on vegetation and wetlands would be the same as those described for alternative 1, resulting in mostly long-term, beneficial impacts. Alternative 2 would contribute mostly beneficial impacts from the conversion of uplands to wetlands and natural hydrology for vegetative communities. Overall, cumulative impacts on vegetation and wetlands would be beneficial, with alternative 2 contributing an incremental beneficial impact to the overall regional cumulative impacts.

**Conclusion.** Impacts on wetlands and vegetation under alternative 2 would be similar to those described for alternative 1, except they would be of a slightly greater magnitude because an additional 1.45 miles of trail would be removed with associated vegetation, and an additional 9.5 acres of wetlands would be created. Overall, cumulative impacts on vegetation and wetlands would be beneficial, with alternative 1 contributing an incremental beneficial impact to the overall regional cumulative impacts.

## **SPECIAL-STATUS SPECIES**

### **METHODOLOGY AND ASSUMPTIONS**

Information used to assess impacts on all listed species included: information about species use or presence in areas likely to be affected by actions described in the alternatives; habitat loss or alteration caused by the alternatives; and the potential for the actions to disturb or displace species.

Both federal and state regulations protect threatened and endangered species. The primary regulation is the ESA, 16 United States Code 1531–1543. According to the ESA, the term “take” means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. The state of Florida also has regulations to protect threatened and endangered species. The Florida Endangered and Threatened Species Act (Title 28, Florida Statutes, Natural Resources Conservation, Reclamation, and Use, Chapter 372, Wildlife, Section 372.072) sets the policy to conserve and manage these resources.

The ESA defines the terminology used to assess impacts on federally listed species.

<i>No effect:</i>	When a proposed action would not affect a listed species or designated critical habitat.
<i>May affect / not likely to adversely affect:</i>	When effects on listed species are expected to be discountable, insignificant, or completely beneficial. Beneficial effects are contemporaneous positive effects without any adverse effects to the species. Insignificant effects relate to the size of the impact and should never reach the scale where “take” occurs. Discountable effects are those extremely unlikely to occur. Based on best judgment, a person would not (1) be able to meaningfully measure, detect, or evaluate insignificant effects; or (2) expect discountable effects to occur.
<i>May affect / likely to adversely affect:</i>	When any adverse effect to listed species may occur as a direct or indirect result of the proposed action or its interrelated or interdependent actions, and the effect is not discountable, insignificant, or beneficial. If the overall effect of the proposed action is beneficial to the listed species, but is also likely to cause some adverse effects, the proposed action “is likely to adversely affect” the listed species. If incidental take is anticipated to occur as a result of the proposed action, then it “is likely to adversely affect” the species. Incidental take is the take of a listed species that results from, but is not the purpose of, carrying out an otherwise lawful activity.
<i>Is likely to jeopardize species / adversely modify critical habitat:</i>	The appropriate conclusion when NPS or USFWS identifies an adverse effect that could jeopardize the continued existence of a species or destroy or adversely modify critical habitat of a species within or outside Park boundaries.

This EA will serve as the Biological Assessment in compliance with ESA section 7 consultation requirements. The EA analyzes impacts using the terminology defined above. Each action alternative includes an ESA summary after the conclusion section for each federally listed species to facilitate this compliance.

**Study Area.** The area of analysis for special-status species includes areas that would be directly affected by the removal of a portion of the Old Tamiami Trail. The area of analysis also includes adjacent habitats up to approximately 330 feet outside the project area that could be indirectly affected by noise associated with the alternatives (Rodgers and Smith 1997) and any downstream areas that could be affected by the alternatives, as described in the “Hydrology and Water Quality” section. The cumulative impacts area of analysis includes the entire south central Florida region affected by water control projects, including WCA 3A and the northeastern part of the park.

## NO-ACTION ALTERNATIVE – ALL SPECIES

Effects of the no-action alternative would be the same for all federally listed and state-listed special-status species. Therefore, all special-status species have been grouped together for the analysis below. Alternatives 1 and 2 are analyzed separately for each species or group of species.

**Analysis.** Under the no-action alternative, the Old Tamiami Trail would remain in place, and no construction activities or changes to the project area, including wetlands and hydrology, would occur. Water flow through the S-12 structures would continue to be managed, and all existing habitat would be maintained. The no-action alternative would not represent a change from existing conditions. Therefore, the no-action alternative would not affect special-status species. For purposes of the Biological Assessment, there would be no effect on federally listed species.

**Cumulative Impacts.** Because the no-action alternative would have no impact, there would be no cumulative impacts.

**Conclusion.** The no-action alternative would not represent a change from existing conditions, and therefore, would not affect special-status species. For purposes of the Biological Assessment, there would be no effect on federally listed species. Because there would be no impacts under the alternative, there would be no cumulative impacts.

## FEDERALLY LISTED SPECIES

### Cape Sable Seaside Sparrow

#### Alternative 1

**Analysis.** Alternative 1 would not result in direct impacts on the Cape Sable seaside sparrow because this species is not likely to be present in the project area. The nearest occupied Cape Sable seaside sparrow habitat is located approximately 10 miles outside the project area and outside the range of potential noise or visual disturbances associated with project activities.

Alternative 1 would result in both adverse and beneficial, indirect impacts on the Cape Sable seaside sparrow outside the project area, commensurate with changes in the hydroperiod and flow regime associated with the removal of 4 miles of the Old Tamiami Trail. Successful nesting for this species depends on dry spring conditions. Because this species only builds nests close to the ground, short hydroperiods and low groundwater levels in marl prairie habitats are critical to reproductive success. Results of hydrologic modeling efforts described in the CEPP FEIS (appendix C.2, page C.2.2-23–45) suggest that the removal of a portion of the Old Tamiami Trail under alternative 1 would result in longer hydroperiods in some areas of marl prairie habitat to the south and west of the project area, making conditions slightly less suitable for nesting, but could result in slightly shorter hydroperiods in other areas of marl prairie habitat, resulting in a slight improvement in nesting conditions. However, changes in the hydroperiod in marl prairie habitats outside the project area associated with the removal of a portion of the Old Tamiami Trail are not likely to be measurable because of the distance of these habitats from the project area. Water flow into the park would continue to be managed for the preservation of the species, as prescribed by the ERTTP and carried forward in the CEPP FEIS. The Shark Valley Entrance Road Canal plug would have no long-term impact on this species.

**Cumulative Impacts.** With the exception of the relocation of the utility poles, all cumulative projects would affect the Cape Sable seaside sparrow and/or its habitat. Activities associated with the ERTTP could result in either adverse or beneficial impacts on this species, depending on changes in water regime.

Specific to the project area, the ERTTP canal plug would result in a long-term benefit for this species. The plug would block westward flow locally, resulting in drier conditions in marl prairie habitat south and west of the plug, which would improve nesting conditions for Cape Sable seaside sparrow.

Generally, projects associated with the various Everglades restoration plans have the potential to alter or improve conditions for the Cape Sable seaside sparrow in the park. Over the course of implementation of all projects, degraded ecological conditions are expected to improve, resulting in beneficial impacts where preferred habitat is restored. All of these projects provide for continued protection of the Cape Sable seaside sparrow, which would be an overall benefit.

Actions completed under the *South Florida and Caribbean Parks Exotic Plant Management Plan* would result in localized, adverse impacts on the Cape Sable seaside sparrow from noise and disturbance if treatments were conducted in or near areas where the birds were present. However, exotic plant treatments would be timed to avoid sensitive seasons for wildlife and coordinated to avoid sensitive wildlife areas or nesting sites. Additionally, any actions taken would be preceded by surveys for listed species, and herbicide treatments would be applied by hand to individual weeds within 25 feet of any occupied habitat. Native wildlife, including the Cape Sable seaside sparrow, would experience long-term benefits from the removal of dense stands of exotics and the restoration of native vegetation. These benefits would be most noticeable in areas where exotics are removed, but would be more widespread as exotic plant management and restoration of native vegetation is completed across the park.

Activities completed under the *Fire Management Plan* would be focused on treating four major fuel vegetation types to reduce the risk of large-scale wildfires. Adverse impacts would include direct mortality of individuals and nests from prescribed burning and temporary disturbances associated with noise and the presence of crews. Smoke could also affect the Cape Sable seaside sparrow during prescribed burning activities if birds were present in nearby habitats, causing temporary flight from the area. However, these actions are not anticipated to have adverse effects at the population level. Additionally, application of prescribed fire under carefully planned environmental and fire behavior parameters may result in a mosaic of burned and unburned patches that would support continued sparrow nesting and reduce the risk of catastrophic fire, resulting in long-term, beneficial effects.

Under the CEPP as a whole, natural hydrologic conditions would not likely be restored to pre-drainage conditions; however, improved hydrology would occur on a regional scale and result in the restoration of some Cape Sable seaside sparrow habitat. Other areas could be flooded, may adversely affect the species' preferred marl prairie habitat, but no actions would be taken without consideration of all listed species requirements and protections, so no cumulative adverse effects are anticipated.

When the impacts of the alternative 1 are combined with the effects of other cumulative actions, overall cumulative impacts on the Cape Sable seaside sparrow would be long term and beneficial because habitat to the south and west of the study area would be improved. Alternative 1 would contribute minimally to the overall beneficial cumulative impact because changes in the hydroperiod in marl prairie habitats outside the project area associated with the removal of a portion of the Old Tamiami Trail are not likely to be measurable because of the distance of these habitats from the project area.

**Conclusion.** The removal of 4 miles of the Old Tamiami Trail roadbed under alternative 1 would slightly change the hydroperiod and groundwater levels in marl prairies habitats outside the project area. However, hydrologic changes in Cape Sable seaside sparrow habitat outside the project area associated with alternative 1 are not likely to be measurable because of the distance of these habitats from the project area. Overall, cumulative impacts would be beneficial. Alternative 1 would contribute minimally to the overall beneficial cumulative impact.



### *Determination of Effect*

Based on the analysis above, alternative 1 *may affect, but is not likely to adversely affect* the Cape Sable seaside sparrow.

### **Alternative 2 (Preferred Alternative)**

**Analysis.** Impacts on the Cape Sable seaside sparrow under alternative 2 would be similar to those described under alternative 1. The removal of an additional 1.45 miles would allow for more connectivity and improved sheetflow that could help restore pre-drainage patterns of water depths, but it is not expected to result in any measurable difference in the overall condition of the marl prairie habitat outside the project area. Indirect, adverse and beneficial impacts on Cape Sable seaside sparrow habitat under alternative 2 would be similar to those described in the CEPP FEIS (appendix C.2, page C.2.2-23–45). However, changes in the hydroperiod in marl prairie habitat outside the project area associated with alternative 2 are not likely to be measurable or significant because of the distance of these habitats from the project area.

**Cumulative Impacts.** Cumulative impacts on the Cape Sable seaside sparrow under alternative 2 would be similar to those described for alternative 1, with overall beneficial cumulative impacts over the long term from the various past, present, and reasonably foreseeable future actions identified. Alternative 2 would contribute incremental beneficial and adverse impacts to the overall beneficial cumulative impact because changes in the hydroperiod in marl prairie habitats outside the project area associated with the removal of a portion of the Old Tamiami Trail are not likely to be measurable because of the distance of these habitats from the project area.

**Conclusion.** The removal of 5.45 miles of the Old Tamiami Trail roadbed under alternative 2 would slightly change the hydroperiod and groundwater levels in marl prairies habitats outside the project area. However, hydrologic changes in Cape Sable seaside sparrow habitat outside the project area associated with alternative 2 are not likely to be measurable or significant because of the distance of these habitats from the project area. Overall, cumulative impacts would be beneficial. Alternative 2 would contribute minimal beneficial and adverse impacts to the overall beneficial cumulative impact.

### *Determination of Effect*

Based on the above analysis, alternative 2 *may affect, but is not likely to adversely affect* the Cape Sable seaside sparrow.

## **Everglade Snail Kite**

### **Alternative 1**

**Analysis.** Alternative 1 would result in direct, adverse impacts on the Everglade snail kite from the noise and visual disturbances associated with construction activities. Noise generated by heavy machinery during removal of 4 miles of the Old Tamiami Trail, removal of vegetation, and plugging of a portion of the canal along the west side of the Shark Valley Entrance Road could disturb foraging behavior. Visual disturbance from the presence of work crews during construction may result in additional disruption of foraging. Adult Everglade snail kites would likely avoid the area during periods of active construction. Direct impacts on the Everglade snail kite would be temporary, lasting for the one-year construction period. Upon completion of construction activities, noise and visual disturbances associated with heavy machinery work crews would cease, and snail kites would likely resume use of foraging habitat in the project area.

Alternative 1 would result in indirect, beneficial impacts on the Everglade snail kite over the long term because of an increased abundance of prey resources associated with changes to hydrology. Vegetation shifts in WCA 3A and increased hydroperiods in the park would improve conditions for apple snails, the Everglade snail kite's primary prey item. This would subsequently increase the spatial extent of suitable foraging habitat for snail kites inside and outside the project area. Additionally, removing 4 miles of the Old Tamiami Trail would increase wetland habitat in the project area by 21.5 acres, resulting in a long-term, direct, beneficial impact. Direct and indirect, beneficial impacts on the Everglade snail kite under alternative 1 would be lower in intensity than those described in the CEPP FEIS (appendix C.2, pages C.2.2-19–22) because a smaller portion of the Old Tamiami Trail would be removed, which would limit increases in prey abundance and improvements to foraging habitat. The Shark Valley Entrance Road Canal plug would have no long-term impact on this species.

**Cumulative Impacts.** All identified cumulative projects could impact the Everglade snail kite and/or its habitat and prey base. Activities associated with the ERTTP could result in mainly beneficial impacts on this species that depends on the apple snail, which would benefit from an increase in flow to the area and creation of more wet marsh conditions. However, continued degradation of snail kite habitat is expected to occur to some degree, outside the project area in WCA 3A. Specific to the project area, the ERTTP canal plug would result in short-term impacts from noise and disturbance associated with the presence of machinery and work crews. Temporary disturbances could result in disruption of foraging behavior. Conditions would return to baseline following construction, and no long-term effects are anticipated. These actions would contribute a slight adverse impact on the Everglade snail kite in the project area.

Generally, projects associated with the various Everglades restoration plans have the potential to improve conditions for the Everglade snail kite in the park. Over the course of implementation of all projects, degraded ecological conditions are expected to improve, resulting in beneficial impacts from the restoration of shallow palustrine, emergent wetlands with longer hydroperiods that are prime habitat for the apple snail, its primary prey item.

Actions completed under the *South Florida and Caribbean Parks Exotic Plant Management Plan* would result in localized adverse impacts on the Everglade snail kite from noise and disturbance if treatments were conducted in or near areas where the birds were present. However, exotic plant treatments would be timed to avoid sensitive seasons for wildlife and coordinated to avoid sensitive wildlife areas or nesting sites. Additionally, any actions taken would be preceded by surveys for listed species, and herbicide treatments would be applied by hand to individual weeds within 25 feet of any occupied habitat. These actions would benefit the Everglade snail kite in the long term because exotic vegetation would be removed and native vegetation would be restored throughout a large portion of its habitat across the park.

Activities completed under the *Fire Management Plan* would be focused on treating four major fuel vegetation types to reduce the risk of large-scale wildfires. Adverse impacts would include direct mortality of individuals and nests from prescribed burning and temporary disturbances associated with noise and the presence of crews. Smoke could also affect the everglades snail kite during prescribed burning activities if birds were present in nearby habitats, causing temporary flight from the area. However, prescribed burn treatments would avoid known locations of Everglade snail kite nests. These actions are not anticipated to have adverse effects at the population level and not expected to substantially affect the suitability of habitat over the long term.

Under the CEPP as a whole, while natural hydrologic conditions would not likely be restored to pre-drainage conditions, improved hydrology would occur on a regional scale and likely result in the restoration of marshes and palustrine edges that are prime apple snail habitat, which would indirectly benefit the Everglade snail kite.

Relocating and burying powerlines and removing utility poles could disturb foraging behavior by the Everglade snail kite in the immediate project area. Conditions would return to baseline following construction, and no long-term effects are anticipated.

When the impacts of alternative 1 are combined with the effects of other cumulative actions, overall cumulative impacts on the Everglade snail kite would be long term and beneficial, mainly from the various projects that have been completed or are planned to restore natural flows to the Everglades ecosystem. Alternative 1 would contribute an incremental benefit to the overall cumulative impact because of the increase in foraging habitat and prey abundance that would occur from the changes in hydrology and increases in wetland acreage.

**Conclusion.** Alternative 1 would result in temporary, direct, adverse effects on the Everglade snail kite from noise and visual disturbances associated with construction activities. Alternative 1 would result in direct and indirect, long-term beneficial impacts from increased prey (apple snail) abundance and foraging opportunities associated with increased hydroperiods in the park and increased wetland habitat associated with the removal of 4 miles of the Old Tamiami Trail. Cumulative impacts would be long term and beneficial. Alternative 1 would contribute an incremental beneficial impact to the overall cumulative impact because of the increase in foraging habitat and prey abundance that would occur from the changes in hydrology and increases in wetland acreage.

#### *Determination of Effect*

Based on the above analysis, alternative 1 *may affect, but is not likely to adversely affect* the Everglade snail kite.

#### **Alternative 2 (Preferred Alternative)**

**Analysis.** Under alternative 2, temporary, direct, adverse impacts on the Everglade snail kite associated with construction activities would be the similar to those described for alternative 1. However, impacts would occur over a larger area and involve more machinery and crews in the project areas during the one-year construction period because an additional 1.45 miles of the Old Tamiami Trail would be removed. Long-term, indirect beneficial impacts from increased prey (apple snail) abundance and foraging opportunities associated with increased hydroperiod and shifts in vegetation under alternative 2 would be slightly greater than those described under alternative 1 because an additional 1.45 miles of roadbed would be removed and more flow would be restored. The removal of 5.45 miles of the Old Tamiami Trail would increase wetland habitat by up to 31 acres, resulting in long-term, direct, beneficial impacts to the Everglade snail kite commensurate with increased foraging habitat and prey abundance. Direct and indirect, beneficial impacts on the Everglade snail kite under alternative 2 would be similar to those described in the CEPP FEIS (appendix C.2, pages C.2.2-19–22).

**Cumulative Impacts.** Cumulative impacts on the Everglade snail kite under alternative 2 would be the same as those described for alternative 1. When the impacts of the alternative 2 are combined with the effects of other cumulative actions, overall cumulative impacts on the Everglade snail kite would be long term and beneficial. Alternative 2 would contribute an incremental beneficial impact to the overall cumulative impact because of the increase in foraging habitat and prey abundance that would occur from the changes in hydrology and increases in wetland acreage.

**Conclusion.** Alternative 2 would result in temporary, direct, adverse effects on the Everglade snail kite from noise and visual disturbances associated with construction activities. Removal of 5.45 miles of the Old Tamiami Trail would result in long-term, direct and indirect, beneficial impacts from increased prey (apple snail) abundance and foraging opportunities associated with increased hydroperiods in the park and

a net increase in wetland habitat. Cumulative impacts would be long term and beneficial. Alternative 2 would contribute an incremental beneficial impact to the overall cumulative impact because of the increase in foraging habitat and prey abundance that would result from the changes in hydrology and increase in wetland acreage.

### *Determination of Effect*

Based on the above analysis, alternative 2 *may affect, but is not likely to adversely affect* the Everglade snail kite.

## **Wood Stork**

### **Alternative 1**

**Analysis.** Removal of 4 miles of the Old Tamiami Trail, removal of vegetation, and plugging of a portion of the canal under alternative 1 would result in direct, adverse impacts on the wood stork. Wood storks are known to forage near the project area. Noise generated by heavy machinery and visual disturbances associated with the presence of work crews during removal activities could temporarily disturb wood storks that may be foraging in the project area. However, most individuals would likely avoid the project area during construction. Therefore, noise and visual disturbances associated with construction activities would result in temporary, direct, adverse impacts on the wood stork, lasting for the duration of the construction period.

Alternative 1 is expected to improve foraging conditions in the project area, resulting in long-term, indirect, beneficial impacts on the wood stork. Wood storks rely on both short and long hydroperiod wetlands for successful reproduction. Changes in hydrology associated with the removal of 4 miles of the Old Tamiami Trail would be closer to pre-drainage conditions, resulting in a net improvement in foraging conditions over the long term. Additionally, the removal of 4 miles of the Old Tamiami Trail would result in an increase of 21.5 acres of wetland habitat in the project area. The Shark Valley Entrance Road Canal plug would have no long-term impact on this species.

**Cumulative Impacts.** All identified cumulative projects could impact the wood stork. Activities associated with the ERTTP could result in mainly beneficial impacts on this species because of flow regime management. Specific to the project area, the ERTTP canal plug would result in short-term impacts from noise and disturbances associated with the presence of machinery and work crews. Temporary disturbances could disrupt foraging behavior. Conditions would return to baseline following construction, and no long-term effects are anticipated. These actions would contribute an overall beneficial effect on the wood stork in the project area.

Generally, projects associated with the various Everglades restoration plans have the potential to improve the conditions for the wood stork in the park. Over the course of implementation of all projects, degraded ecological conditions are expected to improve, resulting in beneficial impacts from the restoration of wood stork habitat.

Actions completed under the *South Florida and Caribbean Parks Exotic Plant Management Plan* would result in localized adverse impacts on the wood stork from noise and disturbance if treatments were conducted in or near areas where the birds were present. However, exotic plant treatments would be timed to avoid sensitive seasons for wildlife and coordinated to avoid sensitive wildlife areas or nesting sites. Additionally, any actions taken would be preceded by surveys for listed species, and herbicide treatments would be applied by hand to individual weeds within 25 feet of any occupied habitat. There would be long-term benefits on all native wildlife, including the wood stork with the removal of dense stands of

exotics and restoration of native vegetation. These benefits would be most noticeable in areas where exotics are removed, but would be more widespread as exotic plant management and restoration of native vegetation is completed across the park.

Prescribed burning under the *Fire Management Plan* would not occur in wood stork habitat. Any impacts on individuals present in adjacent areas from smoke or general disturbance from noise and treatment activities would be temporary, lasting only for a few hours to a few days. These actions would not adversely affect this species or its habitat over the long term.

Under the CEPP as a whole, while natural hydrologic conditions would not likely be restored to pre-drainage conditions, improved hydrology would occur on a regional scale, which would indirectly benefit the wood stork.

Relocating and burying powerlines and removing utility poles could disturb wood stork foraging behavior in the immediate project area. Conditions would return to baseline following construction, and no long-term effects are anticipated.

When the impacts of alternative 1 are combined with the effects of other cumulative actions, overall cumulative impacts on the wood stork would be long term and beneficial, mainly from the various projects that have been completed or are planned to restore natural flows to the Everglades ecosystem. Alternative 1 would contribute an incremental benefit to the overall cumulative impact because of the increase in foraging habitat that would result from the changes in hydrology and increases in wetland acreage.

**Conclusion.** Alternative 1 would result in temporary, direct, adverse effects on the wood stork from noise and visual disturbances associated with construction activities and the presence of crews in the project area. Expansion of wetland habitat and partial restoration of pre-drainage hydrologic conditions in the park would improve foraging conditions and result in long-term, direct and indirect, beneficial impacts. Cumulative impacts would be long term and beneficial, with alternative 1 contributing a slight beneficial increment to the overall cumulative impact.

#### *Determination of Effect*

Based on the above analysis, alternative 1 *may affect, but is not likely to adversely affect* the wood stork.

#### **Alternative 2 (Preferred Alternative)**

**Analysis.** Under alternative 2, temporary, direct, adverse impacts on the wood stork associated with construction activities would be similar to those described for alternative 1. However, impacts would occur over a larger area and involve more construction equipment and crews in the project area because an additional 1.45 miles of the Old Tamiami Trail would be removed. Disturbances associated with construction activities would last for the one-year construction period. Removing 5.45 miles of the Old Tamiami Trail under alternative 2 would increase wetland habitat in the project area by up to 31 acres and partially restore pre-drainage hydrologic condition in the park, resulting in a net improvement in foraging conditions for wood storks over the long term. Impacts on the wood stork under alternative 2 would be similar to those described in the CEPP FEIS (appendix C.2, pages C.2.2-45–50).

**Cumulative Impacts.** Cumulative impacts on the wood stork under alternative 2 would be the same as those described for alternative 1. When the impacts of alternative 2 are combined with the effects of other cumulative actions, overall cumulative impacts on the wood stork would be long term and beneficial.



Alternative 2 would contribute an incremental beneficial impact to the overall cumulative impact that would result from the changes in hydrology and increases in wetland acreage.

**Conclusion.** Alternative 2 would result in temporary, direct, adverse effects on the wood stork from noise and visual disturbances associated with construction activities and the presence of crews in the project area. Removing 5.45 miles of the Old Tamiami Trail would increase wetland habitat in the project area by up to 31 acres and partially restore pre-drainage hydrologic conditions in the park, resulting in improved foraging conditions over the long term. Cumulative impacts would be long term and beneficial, with alternative 2 contributing an incremental beneficial amount to the overall cumulative impact because of the changes in hydrology and increases in wetland acreage.

#### *Determination of Effect*

Based on the analysis above, alternative 2 *may affect, but is not likely to adversely affect* the wood stork.

### **Florida Panther**

#### **Alternative 1**

**Analysis.** Potential direct, adverse impacts on Florida panthers under alternative 1 could include noise or visual disturbances associated with the use of heavy machinery and the presence of crews in the project area during construction activities. These impacts would be temporary, occurring in the one-year construction period. However, panthers would likely avoid the area during construction.

Partial removal of the Old Tamiami Trail under alternative 1 would convert upland habitats to wetlands. This would represent a loss of potential habitat that panther could use to traverse the area; however, adverse impacts under alternative 1 would be minimal because the project area does not contain their preferred habitat and they would likely avoid the area during construction. The Shark Valley Entrance Road Canal plug would have no long-term impact on this species.

**Cumulative Impacts.** All identified cumulative projects could impact the Florida panther and/or its habitat. As part of the ERTTP, changes in water deliveries could result in some loss of upland habitat. However, management of extreme events is expected to improve overall habitat conditions for Florida panthers and their prey species. Specific to the project area, the ERTTP canal plug could result in short-term impacts from noise and disturbances associated with the presence of machinery and work crews if panthers were present in the area. However, Florida panthers are not likely to be adversely impacted because the project area does not contain their preferred habitat, and they would likely avoid the area during construction. Activities under the ERTTP would have an overall long-term, beneficial impact on the Florida panther because of improved habitat conditions.

Generally, projects associated with the various Everglades restoration plans have the potential to improve the habitat conditions for the Florida panther and its prey base in the park. Over the course of implementation of all projects, degraded ecological conditions are expected to improve.

Actions completed under the *South Florida and Caribbean Parks Exotic Plant Management Plan* would result in long-term benefits for the Florida panther because exotic vegetation would be removed and native vegetation would be restored, resulting in improved quality of upland habitats. These benefits would be most noticeable in areas where exotics are removed but would be more widespread as exotic plant management and native vegetation restoration are completed across the park.

Activities completed under the *Fire Management Plan* would be focused on treatment of four major fuel vegetation types to reduce the risk of large-scale wildfires. Adverse impacts would include the risk of injury or mortality during prescribed burning and temporary disturbances associated with noise and the presence of crews. Planned fire management activities are not expected to have a cumulative adverse effect because appropriate best management practices would be implemented to minimize the risk of impacts on special status species and may have an overall long-term, beneficial effect from potential increased foraging habitat.

Under the CEPP as a whole, while natural hydrologic conditions would not likely be restored to pre-drainage conditions, improved hydrology would occur on a regional scale and likely result in the restoration of habitat suitable for the Florida panther and its prey base. Improved habitat and prey abundance would have a long-term benefit for the Florida panther.

Relocating and burying powerlines and removing utility poles could result in direct, adverse impacts on the Florida panther from the noise and visual disturbances associated with the presence of heavy machinery and crews in the project area and temporary disturbance of upland habitats. These actions would have a slight short-term, adverse impact on the Florida panther in the project area. Conditions would return to baseline following construction, and no long-term effects are anticipated.

When the impacts of alternative 1 are combined with the effects of other cumulative actions, overall cumulative impacts on the Florida panther would be long term and beneficial, mainly from the various projects that have been completed or are planned to restore natural flows to the Everglades ecosystem. Alternative 1 would contribute minimally to the overall cumulative impact because no long-term effects are expected to occur in Florida panther preferred habitat; the small area of upland that would be lost is marginally suitable habitat.

**Conclusion.** Potential direct, adverse impacts on Florida panthers would include temporary noise or visual disturbances during construction activities and permanent loss of potentially suitable upland habitat from the removal of 4 miles of the Old Tamiami Trail and subsequent conversion to wetland habitat. However, adverse impacts would be minimal because the project area does not contain preferred habitat for panthers and they would likely avoid the area during construction. Cumulative impacts would be long term and beneficial. Alternative 1 would contribute minimally the overall cumulative impact because no long-term effects are expected to occur in Florida panther preferred habitat.

#### *Determination of Effect*

Based on the above analysis, alternative 1 *may affect, but is not likely to adversely affect* the Florida panther.

#### **Alternative 2 (Preferred Alternative)**

**Analysis.** Potential direct, adverse impacts on the Florida panther under alternative 2 would be similar to those described for alternative 1. However, impacts would occur over a larger area and involve more machinery and crews in the project areas during the one-year construction period because an additional 1.45 miles of the Old Tamiami Trail would be removed. Potential disturbances from construction activities would be temporary and limited to the one-year construction period. Permanent loss of potential habitat under alternative 2 would be greater because 5.45 miles of the Old Tamiami Trail would be removed. However, adverse impacts on the Florida panther would be minimal because the project area does not contain preferred habitat for panthers, and they would likely avoid the area during construction.

**Cumulative Impacts.** Cumulative impacts on the Florida panther under alternative 2 would be the same as those described for alternative 1. When the impacts of alternative 2 are combined with the effects of other cumulative actions, overall cumulative impacts on the Florida panther would be long term and beneficial. Alternative 2 would contribute minimally to the overall cumulative impact because no long-term effects are expected to occur in Florida panther preferred habitat.

**Conclusion.** Potential direct and adverse impacts on Florida panthers include temporary noise or visual disturbances during construction activities and permanent loss of potentially suitable upland habitat from the removal of 5.45 miles of the Old Tamiami Trail and subsequent conversion to wetland habitat. However, adverse impacts would be minimal because the project area does not contain preferred habitat for panthers, and they would likely avoid the area during construction. Cumulative impacts would be long term and beneficial. Alternative 2 would contribute minimally to the overall cumulative impact because no long-term effects are expected to occur in Florida panther preferred habitat.

#### *Determination of Effect*

Based on the above analysis, alternative 2 *may affect, but is not likely to adversely affect* the Florida panther.

### **Florida Bonneted Bat**

#### **Alternative 1**

**Analysis.** Alternative 1 would not result in any impacts because this species is not known to occur in the project area and the project area does not contain suitable roosting habitat. A visual survey conducted in January 2017 (NPS 2017b) did not detect any evidence that Florida bonneted bats are present in the project area; the nearest documented occurrence is approximately 11 miles outside the project area and outside the range of potential noise or visual disturbances associated with project activities.

**Cumulative Impacts.** Because no measurable impacts would occur under alternative 1, no cumulative impacts on this species would occur.

**Conclusion.** Alternative 1 would have not affect the Florida bonneted bat because this species does not occur in the project area. Because no impacts would occur under alternative 1, no cumulative impacts on this species would occur.

#### *Determination of Effect*

Based on the above analysis, alternative 1 would have *no effect* on the Florida bonneted bat.

#### **Alternative 2 (Preferred Alternative)**

Alternative 2 would have the same impacts as alternative 1; the Florida bonneted bat would not be affected under alternative 2 because this species is not known to occur in the project area and the project area does not contain suitable roosting habitat.

**Cumulative Impacts.** Cumulative impacts on the Florida bonneted bat under alternative 2 would be the same as those described for alternative 1. Because alternative 2 would not affect the Florida bonneted bat, no cumulative impacts on this species would occur.

**Conclusion.** Alternative 2 would have no impacts on the Florida bonneted bat because this species does not occur in the project area. Because the Florida bonneted bat would not be affected under alternative 2, no cumulative impacts on this species would occur.

#### *Determination of Effect*

Based on the above analysis, alternative 2 would have *no effect* on the Florida bonneted bat.

### **West Indian Manatee**

#### **Alternative 1**

**Analysis.** The West Indian manatee is not known to occur in the project area. The nearest reported occurrence of a manatee was a carcass found 4.7 miles east of the L-67 extension canal in 1971. In the unlikely event that manatees are present, potential adverse impacts would be short term and direct, resulting from noise and visual disturbances during removal of 4 miles of the Old Tamiami Trail, removal of vegetation, and plugging of a portion of the canal to the west of the Shark Valley Entrance Road. However, if present, manatees would likely avoid the area during construction. Therefore, adverse impacts would not likely occur under alternative 1. The Shark Valley Entrance Road Canal plug would have no long-term impacts on this species.

**Cumulative Impacts.** Several of the identified cumulative projects could affect the West Indian manatee. The ERTF canal plug could result in short-term impacts from noise and disturbances associated with the presence of machinery and work crews if manatees are present in the area. However, manatees are not likely to be adversely affected because they are not likely to be present in the project area and would likely avoid the area during construction.

Projects associated with the Everglades restoration plans have the potential to improve water quality and habitat conditions for the West Indian manatee, resulting in long-term, beneficial impacts.

Actions completed under the *South Florida and Caribbean Parks Exotic Plant Management Plan* would result in long-term benefits for the West Indian manatee because exotic vegetation would be removed and native vegetation, including aquatic and shoreline vegetation, which comprises the diet of manatees, would be restored.

Activities completed under the *Fire Management Plan* would not result in cumulative impacts on West Indian manatees because all activities would be conducted in upland habitats and are not expected to affect aquatic habitats.

Under the CEPP as a whole, restoration of marsh connectivity and improved wetland functioning may result in improvements to water quality and aquatic habitats, resulting in long-term, beneficial impacts on manatees.

Relocating and burying powerlines and removing utility poles could result in temporary, adverse impacts on the West Indian manatee associated with the presence of heavy machinery and crews, if activities occur near canals where manatees could be present. However, these actions are not expected to affect aquatic habitats, and no long-term effects are anticipated.

When the impacts of alternative 1 are combined with the effects of other cumulative actions, overall cumulative impacts on the West Indian manatee would be long term and beneficial because of the anticipated improvements to water quality and aquatic habitats within the park. Alternative 1 would

contribute minimally to the overall cumulative impact because no long-term impacts on aquatic habitats are anticipated.

**Conclusion.** Potential direct, adverse impacts on the West Indian manatee include temporary noise or visual disturbances during construction activities. However, adverse impacts are not likely to occur because this species is not likely to be present in the project area and, if present, would avoid the area during construction activities. Overall, cumulative impacts would be beneficial with alternative 1 contributing a minimal adverse increment to the overall cumulative impact.

#### *Determination of Effect*

Based on the above analysis, alternative 1 *may affect, but is not likely to adversely affect* the West Indian manatee.

#### **Alternative 2 (Preferred Alternative)**

**Analysis.** Potential direct, adverse impacts on the West Indian manatee under alternative 2 would be the same as those described for alternative 1. Potential disturbances from construction activities would be temporary and limited to the one-year construction period. However, adverse impacts are not likely to occur because this species is not likely to be present in the project area and would avoid the area during construction activities.

**Cumulative Impacts.** Cumulative impacts on the West Indian manatee under alternative 2 would be the same as those described for alternative 1. When the impacts of alternative 2 are combined with the effects of other cumulative actions, overall cumulative impacts on the West Indian manatee would be beneficial because of the anticipated improvements to water quality and aquatic habitats within the park. Alternative 2 would contribute minimally to the overall cumulative impact because no long-term impacts on aquatic habitats are anticipated.

**Conclusion.** Potential direct, adverse impacts on the West Indian manatee include temporary noise or visual disturbances during construction activities. However, adverse impacts are not likely to occur because this species is not likely to be present in the project area and would avoid the area during construction activities. Overall, cumulative impacts would be beneficial, with alternative 2 contributing a minimal adverse increment to the overall cumulative impact.

#### *Determination of Effect*

Based on the above analysis, alternative 2 *may affect, but is not likely to adversely affect* the West Indian manatee.

### **Eastern Indigo Snake**

#### **Alternative 1**

**Analysis.** Under alternative 1, removing 4 miles of the Old Tamiami Trail and associated vegetation and plugging a portion of the Shark Valley Entrance Road Canal could result in direct, adverse impacts on the eastern indigo snake if it is present. Potential direct impacts on the eastern indigo snake during construction include mortality if individual snakes are crushed by heavy machinery, burrow collapse, or individual displacement. The risk of these impacts would be temporary, lasting for the duration of the one-year construction period.



Partial removal of the Old Tamiami Trail would convert upland habitats to wetlands (21.5 acres). This would represent a loss of habitat and a permanent, direct, adverse impact on the eastern indigo snake if they were present in the project area. Although the eastern indigo snake could potentially occur in the project area, it has not been documented there and is unlikely to occur because of the limited amount of upland habitat and the extent of surrounding wetland habitat. Therefore, direct, adverse impacts on the eastern indigo snake are not likely to occur under alternative 1.

Alternative 1 could result in indirect, adverse impacts on eastern indigo snakes south of the study area because the hydroperiods in the park would increase over the long term, reducing the amount of available dry habitat. However, adverse impacts would be minimal because this species is not abundant throughout most of the greater Everglades area. The Shark Valley Entrance Road Canal plug would have no long-term impact on this species because the canal plug would not create suitable upland habitat.

**Cumulative Impacts.** All identified cumulative projects could affect the eastern indigo snake. Under the ERTTP, changes in water deliveries could result in some loss of upland habitat. However, actions under the ERTTP would reduce high-water events around tree islands and other upland habitats preferred by this species, resulting in long-term, beneficial effects. Specific to the project area, the ERTTP canal plug could result in short-term impacts from noise and disturbances associated with the presence of machinery and work crews if individuals were present in the area. However, eastern indigo snakes are not expected to occur in this area because of the limited amount of upland habitat and the extent of surrounding wetland habitat. Activities under the ERTTP would have an overall long-term, beneficial impact on eastern indigo snake from a reduction in extreme high-water events.

Generally, projects associated with the various Everglades restoration plans have the potential to improve the habitat conditions for the eastern indigo snake in the park. Over the course of implementation of all projects, degraded ecological conditions are expected to improve.

Actions completed under the *South Florida and Caribbean Parks Exotic Plant Management Plan* would result in localized adverse impacts on the eastern indigo snake from noise and disturbance if treatments were conducted in or near areas where the snakes were present. However, exotic plant treatments would be timed to avoid sensitive seasons for wildlife and coordinated to avoid sensitive wildlife areas or nesting sites. Additionally, any actions taken would be preceded by surveys for listed species, and herbicide treatments would be applied by hand to individual weeds within 25 feet of any occupied habitat. All native wildlife, including the eastern indigo snake, would experience long-term benefits with the removal of dense stands of exotics and restoration of native vegetation, resulting in improved quality of upland habitats. These benefits would be most noticeable in areas where exotics are removed, but would be more widespread as exotic plant management and native vegetation restoration are completed across the park.

Activities completed under the *Fire Management Plan* would be focused on treatment of four major fuel vegetation types to reduce the risk of large-scale wildfires. Adverse impacts would include injury or mortality during prescribed burning and temporary disturbances associated with noise and the presence of crews. However, these actions are not anticipated to have adverse effects at the population level because adult indigo snakes can escape and find refugia during prescribed fires and preparation work for fires. Therefore, actions under the *Fire Management Plan* are not expected to contribute to the overall cumulative impact.

Under the CEPP as a whole, while natural hydrologic conditions would not likely be restored to pre-drainage conditions, improved hydrology would occur on a regional scale and likely result in the restoration of habitat suitable for the eastern indigo snake and its prey base. Improved habitat and prey abundance would have a long-term benefit for the eastern indigo snake. However, the loss of

upland habitat suitable for the eastern indigo snake would have an overall unavoidable long-term, adverse impact.

Relocating and burying powerlines and removing utility poles could result in direct, adverse impacts on the eastern indigo snake if present in the project area, including mortality if individual snakes are crushed by heavy machinery, burrow collapse, individual displacement, and temporary habitat disturbance. Additional temporary adverse impacts could include noise and visual disturbances associated with the presence of heavy machinery and crews in the project area and temporary disturbance of upland habitats. However, eastern indigo snakes are not expected to occur in this area because of the limited amount of upland habitat and the extent of surrounding wetland habitat. No long-term, adverse effects are anticipated.

When the impacts of alternative 1 are combined with the effects of other cumulative actions, overall cumulative impacts on the eastern indigo snake would be long term and adverse, mainly from the loss of upland habitat. Alternative 1 would contribute a minimal adverse increment to the overall cumulative impact because of the loss of marginal upland habitat.

**Conclusion.** Potential direct, adverse impacts on the eastern indigo snake under alternative 1 include injury, mortality, or displacement during construction activities. The conversion of upland habitat to wetlands could result in long-term, direct, adverse impacts. Potential indirect, adverse impacts include loss of habitat outside the project area from increased hydroperiods in the park. However, adverse impacts are not likely because this species is not likely to occur in the project area and is not abundant in the greater Everglades area. Cumulative impacts would be long term and adverse. Alternative 1 would contribute a minimal adverse increment to the overall cumulative impact because of the loss of marginal upland habitat.

#### *Determination of Effect*

Based on the analysis above, alternative 1 *may affect, but is not likely to adversely affect* the eastern indigo snake.

#### **Alternative 2 (Preferred Alternative)**

**Analysis.** Potential direct, impacts adverse on the eastern indigo snake under alternative 2 would be the same as those described under alternative 1. However, these impacts would occur over a larger area because of the removal of an additional 1.45 miles of the Old Tamiami Trail and creation of up to 31 acres of wetland habitat. Similarly, potential indirect, adverse impacts on the eastern indigo snake would be the same as those described for alternative 1 from increased hydroperiods in the park, south of the project area, associated with the removal of 5.45 miles of the Old Tamiami Trail. However, this species is not likely to occur in the project area and is not abundant in the greater Everglades area, so potential direct, adverse impacts would be minimal.

**Cumulative Impacts.** Cumulative impacts on the eastern indigo snake under alternative 2 would be the same as those described under alternative 1. When the impacts of the alternative 2 are combined with the effects of other cumulative actions, overall cumulative impacts on the eastern indigo snake would be long term and adverse. Alternative 2 would contribute a minimal adverse increment to the overall cumulative impact from the loss of marginal upland habitat.

**Conclusion.** Potential adverse impacts on the eastern indigo snake under alternative 2 include temporary risk of injury, mortality, or displacement during construction activities and permanent loss of habitat in the project area from the conversion of upland habitat to wetlands. Potential indirect, adverse impacts

include loss of habitat outside the project area from increased hydroperiods in the park. However, adverse impacts are not likely because this species is not likely to occur in the project area and is not abundant in the greater Everglades area. Cumulative impacts would be long term and adverse. Alternative 2 would contribute a minimal adverse increment to the overall cumulative impact from the loss of marginal upland habitat.

### *Determination of Effect*

Based on the analysis above, alternative 2 *may affect, but is not likely to adversely affect* the eastern indigo snake.

## **CRITICAL HABITAT**

### **Everglade Snail Kite Critical Habitat**

#### **Alternative 1**

**Analysis.** Removal of 4 miles of the Old Tamiami Trail under alternative 1 would result in beneficial effects on Everglade snail kite critical habitat, which includes the entire project area, commensurate with improved conditions for the Florida apple snail, the Everglade snail kite's primary prey. Partial removal of the Old Tamiami Trail would increase flow from WCA 3A into the park, resulting in vegetation shifts in WCA 3A and increased hydroperiods. Results of modeling efforts described in the CEPP FEIS (appendix C.2, page C.2.2-19–22) suggest that these changes increase distribution and abundance of apple snails, resulting in improved foraging conditions in Everglade snail kite critical habitat over the long term. These beneficial changes would occur over time and would be considered long-term, indirect impacts. The conversion of upland habitat to wetlands (21.5 acres) following removal of 4 miles of the Old Tamiami Trail would also expand potential foraging habitat in designated Everglade snail kite critical habitat, resulting in long-term, direct, beneficial impacts.

**Cumulative Impacts.** Cumulative impacts on snail kite critical habitat in the project area are described above and include mostly beneficial effects from the various restoration projects intended to restore flows to the Everglades ecosystem from the north and enhance marsh and open water wetlands in the area. This, in turn, would increase the distribution and abundance of apple snails, resulting in improved foraging conditions in Everglade snail kite critical habitat over the long term.

When the impacts of alternative 1 are combined with the effects of other cumulative actions, overall cumulative impacts on Everglade snail kite critical habitat would be long term and beneficial. Alternative 1 would contribute a beneficial increment to the overall cumulative impact because of the increase in wetlands and improvements to foraging habitat.

**Conclusion.** Removal of 4 miles of the Old Tamiami Trail under alternative 1 would result in long-term, direct, beneficial impacts on Everglade snail kite critical habitat because additional wetland habitat would be created. Alternative 1 would improve foraging conditions in Everglade snail kite critical habitat from the increased abundance of Florida apple snails, which would result in long-term, indirect, beneficial impacts. Cumulative impacts would be long term and beneficial. Alternative 1 would contribute a beneficial increment to the overall cumulative impact because additional wetland habitat would be created, and foraging conditions would be improved.

### *Determination of Effect*

Based on the above analysis, alternative 1 would result in *no destruction or adverse modification* of Everglade snail kite critical habitat.

### **Alternative 2 (Preferred Alternative)**

**Analysis.** Under alternative 2, long-term, direct, beneficial impacts on Everglade snail kite critical habitat would be similar to those described for alternative 1. However, improvements to foraging conditions would be greater because an additional 1.45 miles of the Old Tamiami Trail would be removed, allowing habitat to return to closer to pre-drainage conditions. The removal of 5.45 miles of the Old Tamiami Trail under alternative 2 would increase wetland habitat by up to 31 acres.

**Cumulative Impacts.** Cumulative impacts on Everglade snail kite critical habitat under alternative 2 would be the same as those described for alternative 1. When the impacts of alternative 2 are combined with the effects of other cumulative actions, overall cumulative impacts on Everglade snail kite critical habitat would be long term and beneficial. Alternative 2 would contribute a beneficial increment to the overall cumulative impact because of the increase in wetlands and improvements to foraging habitat.

**Conclusion.** Removal of 5.45 miles of the Old Tamiami Trail under alternative 2 would improve foraging conditions in Everglade snail kite critical habitat by increasing the abundance of Florida apple snails and creating wetland habitat, which would result in long-term, direct and indirect, beneficial impacts. Cumulative impacts would be long term and beneficial. Alternative 2 would contribute a beneficial increment to the overall cumulative impact because additional wetland habitat would be created, and foraging conditions would be improved.

### *Determination of Effect*

Based on the above analysis, alternative 2 would result in *no destruction or adverse modification* of Everglade snail kite critical habitat.

### **STATE-LISTED SPECIES**

Because of similarities in biology and habitat requirements among species, some of the state-listed species have been grouped for the purposes of this analysis.

### **Colonial Waterbirds—Little Blue Heron, Tricolored Heron, Reddish Egret, and Roseate Spoonbill**

For the analysis below, colonial waterbirds include the little blue heron, tricolored heron, reddish egret, and roseate spoonbill. These species are analyzed together because of their overlap in habitat use and similar behavioral characteristics. The little blue heron, tricolored heron, reddish egret, and roseate spoonbill are wading species that often congregate in colonies near wetland and marsh habitats. Of the colonial waterbird species analyzed below, only the little blue heron and tricolored heron are known to nest in the project area.

### **Alternative 1**

**Analysis.** Under alternative 1, noise generated by heavy machinery and the presence of work crews in the project area during removal of 4 miles of the Old Tamiami Trail, removal of vegetation, and plugging of a portion of the canal to the west of the Shark Valley Entrance Road could disturb colonial waterbirds.

These disturbances could disrupt foraging, roosting, or nesting behaviors, including nest abandonment or missed breeding opportunities. Potential disruption of nesting or breeding behavior would be limited to the little blue heron and tricolored heron because the reddish egret and roseate spoonbill do not nest in the project area. Most individuals would likely avoid the area during the construction period; therefore, construction activities would be unlikely to adversely affect them. Direct impacts on these species would last for the duration of the construction period. Upon completion of construction activities, noise and visual disturbances associated with heavy machinery work crews would cease, and individuals would likely return to the project area.

Alternative 1 would expand wetland habitat in the project area (by 21.5 acres) and is expected to somewhat improve foraging conditions from the partial restoration of pre-drainage hydrologic conditions in the park. Changes in hydrology associated with the removal of 4 miles of the Old Tamiami Trail would be closer to pre-drainage conditions, resulting in a net improvement in foraging conditions and habitat over the long term. Additionally, removing 4 miles of the Old Tamiami Trail would increase wetland habitat in the project area, resulting in beneficial impacts over the long term. The Shark Valley Entrance Road Canal plug would have no long-term impact on these species.

**Cumulative Impacts.** All identified cumulative projects could affect colonial waterbirds. Continuation of the ERTTP could result in mainly beneficial impacts on these species from flow regime management. Specific to the project area, the ERTTP canal plug would result in short-term impacts from noise and disturbance associated with the presence of machinery and work crews. Temporary disturbances could disrupt foraging, nesting, or breeding behaviors (little blue heron and tricolored heron only). Conditions would return to baseline following construction, and no long-term effects are anticipated. These actions would have an overall beneficial effect on colonial waterbirds in the project area.

Generally, projects associated with the various Everglades restoration plans have the potential to improve the conditions for colonial waterbirds in the park. Over the course of implementation of all projects, degraded ecological conditions are expected to improve, resulting in beneficial impacts from the restoration of wetland habitat and associated improvement of foraging conditions in the park.

Actions completed under the *South Florida and Caribbean Parks Exotic Plant Management Plan* would result in localized adverse impacts on colonial waterbirds from noise and disturbance if treatments were conducted in or near areas where birds were present. However, exotic plant treatments would be timed to avoid sensitive seasons for wildlife and coordinated to avoid sensitive wildlife areas or nesting sites. Additionally, any actions taken would be preceded by surveys for listed species, and herbicide treatments would be applied by hand to individual weeds within 25 feet of any occupied habitat. All native wildlife, including colonial waterbirds, would experience long-term benefits from the removal of dense stands of exotics and restoration of native vegetation. These benefits would be most noticeable in areas where exotics are removed but would be more widespread as exotic plant management and native vegetation restoration are completed across the park.

Activities completed under the *Fire Management Plan* would be focused on treatment of four major fuel vegetation types to reduce the risk of large-scale wildfires. Adverse impacts would include direct mortality of individuals and nests from prescribed burning and temporary disturbances associated with noise and the presence of crews. Smoke could also affect colonial waterbirds during prescribed burning activities if birds were present in nearby habitats, causing temporary flight from the area. These actions are not anticipated to have adverse effects on colonial waterbirds at the population level and are not expected to substantially affect the suitability of habitat over the long term.

Under the CEPP as a whole, while natural hydrologic conditions would not likely be restored to pre-drainage conditions, improved hydrology would occur on a regional scale, which would indirectly benefit colonial waterbirds.

Relocating and burying powerlines and removing utility poles could disturb foraging, nesting, or breeding behavior in the immediate project area. Conditions would return to baseline following construction, and no long-term effects are anticipated.

When the impacts of alternative 1 are combined with the effects of other cumulative actions, overall cumulative impacts on colonial waterbirds would be long term and beneficial, mainly from the various projects that have been completed or are planned to restore natural flows to the Everglades ecosystem.

**Conclusion.** Alternative 1 would result in temporary, direct, adverse impacts from the noise and visual disturbances associated with construction activities. Creation of an additional 21.5 acres of wetland habitat and partial restoration of pre-drainage hydrologic conditions in the park would improve foraging conditions in the project area, resulting in long-term, direct and indirect, beneficial impacts. Cumulative impacts would be long term and beneficial. Alternative 1 would contribute an incremental benefit to the overall cumulative impact because of the increase in foraging habitat and prey abundance that would result from the changes in hydrology and increase in wetland acreage.

#### **Alternative 2 (Preferred Alternative)**

**Analysis.** Under alternative 2, temporary, direct, adverse impacts on colonial waterbirds from disturbances associated with construction activities would be the similar to those described for alternative 1. However, these impacts would occur over a larger area and involve more construction crews and equipment to complete the job because an additional 1.45 miles of the Old Tamiami Trail would be removed. Temporary impacts would be limited to the one-year construction period.

Removing 5.45 miles of the Old Tamiami Trail under alternative 2 would increase wetland habitat by up to 31 acres in the project area and partially restore pre-drainage hydrologic conditions in the park, resulting in a net improvement in foraging conditions over the long term.

**Cumulative Impacts.** Cumulative impacts on colonial waterbirds under alternative 2 would be the same as those described under alternative 1. When the impacts of the alternative 2 are combined with the effects of other cumulative actions, overall cumulative impacts on colonial waterbirds would be long term and beneficial. Alternative 2 would contribute an incremental benefit to the overall cumulative impact because of the increase in foraging habitat and prey abundance that would result from the changes in hydrology and the increase in wetland acreage.

**Conclusion.** Alternative 2 would result in temporary, adverse impacts on colonial waterbirds from the noise and visual disturbances associated with construction activities, which could disrupt foraging or nesting (little blue heron and tricolored heron only) behaviors. Removing 5.45 miles of the Old Tamiami Trail would increase wetland habitat in the project area by up to 31 acres and partially restore pre-drainage hydrologic conditions in the park, resulting in improved foraging conditions and long-term, direct and indirect, beneficial impacts. Cumulative impacts would be long-term and beneficial. Alternative 2 would contribute an incremental benefit to the overall cumulative impact because of the increase in foraging habitat and prey abundance that would result from the changes in hydrology and the increase in wetland acreage.



## Florida Sandhill Crane

### Alternative 1

**Analysis.** Under alternative 1, noise generated by heavy machinery and the presence of work crews in the project area during removal of 4 miles of the Old Tamiami Trail, removal of vegetation, and plugging of a portion of the canal to the west of the Shark Valley Entrance Road could disturb the Florida sandhill crane, if present in the project area. Noise and the presence of heavy equipment and crews could disrupt foraging, roosting, or nesting behaviors including nest abandonment or missed breeding opportunities. Most individuals would likely avoid the area during the construction period; therefore, construction activities would be unlikely adversely affect them. Direct impacts on these species associated with construction activities would last for the duration of the one-year construction period. Upon completion of construction activities, noise and visual disturbances associated with heavy machinery work crews would cease, and individuals would likely return to the project area. The Florida sandhill crane is relatively uncommon in the park and is not likely to be present in the project area with regular frequency, reducing the potential for adverse impacts on this species.

Removing 4 miles of the Old Tamiami Trail under alternative 1 would result in long-term, direct and indirect, beneficial impacts on the Florida sandhill crane because a portion of upland habitat in the project area would be converted to wetlands (21.5 acres), resulting in a net increase in foraging and potential breeding habitat. The associated loss of upland habitat along the Old Tamiami Trail could have long-term, adverse impacts on the Florida sandhill crane because this species also uses upland habitats on occasion. However, the Florida sandhill crane typically nests in stands of emergent vegetation in marsh habitats. Therefore, conversion of upland habitat to wetlands would not result in a loss of preferred breeding habitat. Overall, the benefits associated with an increase in wetland habitat and improved foraging conditions associated with partial restoration to pre-drainage conditions would outweigh the loss of upland habitat, resulting in net long-term, beneficial effects.

**Cumulative Impacts.** All identified cumulative projects could impact the Florida sandhill crane. Activities associated with the ERTTP could result in mainly beneficial impacts on this species from flow regime management. Specific to the project area, the ERTTP canal plug would result in short-term impacts from noise and disturbances associated with the presence of machinery and work crews. Temporary disturbances could disrupt foraging, nesting, or breeding behaviors. Conditions would return to baseline following construction, and no long-term effects are anticipated. These actions would contribute an overall beneficial effect to the Florida sandhill crane, if present in the project area.

Generally, projects associated with the various Everglades restoration plans have the potential to improve conditions for the Florida sandhill crane in the park. Over the course of implementation of all projects, degraded ecological conditions are expected to improve, resulting in beneficial impacts from the restoration of wetland habitat and associated improvement of foraging and breeding conditions in the park.

Actions completed under the *South Florida and Caribbean Parks Exotic Plant Management Plan* would result in localized adverse impacts on Florida sandhill cranes from noise and disturbance if treatments were conducted in or near areas where the birds were present. However, exotic plant treatments would be timed to avoid sensitive seasons for wildlife and coordinated to avoid sensitive wildlife areas or nesting sites. Additionally, any actions taken would be preceded by surveys for listed species, and herbicide treatments would be applied by hand to individual weeds within 25 feet of any occupied habitat. All native wildlife, including the Florida sandhill crane, would experience long-term benefits from the removal of dense stands of exotics and restoration of native vegetation. These benefits would be most

noticeable in areas where exotics are removed, but would be more widespread as exotic plant management and native vegetation restoration are completed across the park.

Activities completed under the *Fire Management Plan* would be focused on treatment of four major fuel vegetation types to reduce the risk of large-scale wildfires. Adverse impacts would include direct mortality of individuals and nests from prescribed burning and temporary disturbances associated with noise and the presence of crews. Smoke could also affect Florida sandhill cranes during prescribed burning activities if they were present in nearby habitats, causing temporary flight from the area. These actions are not anticipated to have adverse effects on the Florida sandhill crane at the population level and are not expected to substantially affect the suitability of habitat over the long term.

Under the CEPP as a whole, while natural hydrologic conditions would not likely be restored to pre-drainage conditions, improved hydrology would occur on a regional scale, which would indirectly benefit the Florida sandhill crane.

Relocating and burying powerlines and removing utility poles could disturb foraging, nesting, or breeding behavior for the Florida sandhill crane in the immediate project area. Conditions would return to baseline following construction, and no long-term effects are anticipated.

When the impacts of alternative 1 are combined with the effects of other cumulative actions, overall cumulative impacts on the Florida sandhill crane would be long term and beneficial, mainly from the various projects that have been completed or are planned to restore natural flows to the Everglades ecosystem.

**Conclusion.** Alternative 1 could result in short-term, direct, adverse impacts on the Florida sandhill crane from the noise and visual disturbances associated with construction activities, potentially disrupting foraging, nesting, or breeding behaviors. Most individuals would likely avoid the area during the one-year construction period; therefore, construction activities would be unlikely to adversely affect them. Converting upland habitat to wetlands following the removal of 4 miles of the Old Tamiami Trail would result in potential long-term, adverse impacts associated with the loss of upland habitat. However, these effects would be outweighed by the long-term, direct and indirect, beneficial impacts associated with the creation of 21.5 acres of wetland habitat and improved foraging conditions due to the partial restoration of pre-drainage conditions. Alternative 1 would contribute a beneficial increment to the overall cumulative impact.

### **Alternative 2 (Preferred Alternative)**

**Analysis.** Under alternative 2, short-term, direct, adverse impacts on the Florida sandhill crane associated with construction activities would be the similar to those described for alternative 1. However, these impacts would occur over a larger area and involve more construction crews and equipment in the project area during the construction period because an additional 1.45 miles of the Old Tamiami Trail would be removed. Short-term impacts would be limited to the one-year construction period.

Removing 5.45 miles of the Old Tamiami Trail under alternative 2 would result in long-term, direct and indirect, beneficial impacts on the Florida sandhill crane because up to 31 acres of upland habitat in the study area would be converted to wetlands, resulting in an increase in foraging and potential breeding habitat. The associated loss of upland habitat along the Old Tamiami Trail could have long-term, adverse impacts on the Florida sandhill crane because this species also uses upland habitats on occasion. However, the benefits associated with the increase in wetland habitat and improved foraging conditions associated with partial restoration to pre-drainage conditions would outweigh the loss of upland habitat, resulting in net long-term, beneficial effects.

**Cumulative Impacts.** Cumulative impacts on the Florida sandhill crane under alternative 2 would be the same as those described for alternative 1. When the impacts of alternative 2 are combined with the effects of other cumulative actions, overall cumulative impacts on the Florida sandhill crane would be long term and beneficial.

**Conclusion.** Alternative 2 could result in short-term, direct, adverse impacts on the Florida sandhill crane, from the noise and visual disturbances associated with construction activities. Most individuals would likely avoid the area during the one-year construction period; therefore, construction activities would be unlikely to affect them. Converting upland habitat to wetlands following the removal of 5.45 miles of the Old Tamiami Trail would result in potential long-term, adverse impacts associated with the loss of upland habitat. However, these effects would be outweighed by the long-term, direct and indirect, beneficial impacts associated with the creation of up to 31 acres of wetland habitat and improved foraging conditions from the partial restoration of pre-drainage conditions. Alternative 2 would contribute a beneficial increment to the overall cumulative impact.

## **Southeastern American Kestrel**

### **Alternative 1**

**Analysis.** Alternative 1 could result in direct, adverse impacts on the southeastern American kestrel from the noise and visual disturbances associated with construction activities. Most individuals would avoid the area during the construction period and would be unlikely to be adversely affected by ongoing construction activities. The southeastern American kestrel has been documented in the freshwater marshes of the park, but it is not known to breed in the project area, so breeding behavior would not be disrupted.

Removing 4 miles of the Old Tamiami Trail under alternative 1 would result in long-term, direct and indirect, adverse impacts because a portion of upland habitat in the project area would be converted to wetlands (21.5 acres). Kestrels forage primarily in upland habitats. This species is not likely to be present in the project area with regular frequency; therefore, adverse effects would be minimal.

**Cumulative Impacts.** All identified cumulative projects could impact the southeastern American kestrel. Under the ERTTP, changes in water deliveries could result in some loss of upland habitat, resulting in long-term, adverse effects from a reduction in foraging area. Specific to the project area, the ERTTP canal plug would result in short-term impacts from noise and disturbances associated with the presence of machinery and work crews. Temporary disturbances could disrupt foraging behavior. Activities under the ERTTP would have an overall long-term, adverse effect on the southeastern American kestrel from a reduction in foraging habitat associated with changes in flow regime.

Generally, projects associated with the various Everglades restoration plans have the potential to improve foraging conditions for the southeastern American kestrel in the park because degraded ecological conditions are expected to improve. However, conversion of upland habitats to wetlands would result in a long-term, adverse effect on the southeastern American kestrel because this species is associated with upland habitats.

Actions completed under the *South Florida and Caribbean Parks Exotic Plant Management Plan* would result in localized adverse impacts on the southeastern American kestrel from noise and disturbance if treatments were conducted in or near areas where the birds were present. However, exotic plant treatments would be timed to avoid sensitive seasons for wildlife and coordinated to avoid sensitive wildlife areas or nesting sites. Additionally, any actions taken would be preceded by surveys for listed species, and herbicide treatments would be applied by hand to individual weeds within 25 feet of any

occupied habitat. All native wildlife, including the southeastern American kestrel, would experience long-term benefits from the removal of dense stands of exotics and restoration of native vegetation, resulting in improved foraging conditions. These benefits would be most noticeable in areas where exotics are removed, but would be more widespread as exotic plant management and native vegetation restoration are completed across the park.

The activities completed under the *Fire Management Plan* would be focused on treatment of four major fuel vegetation types to reduce the risk of large-scale wildfires. Adverse impacts could include injury or mortality from prescribed burning and temporary disturbances associated with noise and the presence of crews. Smoke could also affect the southeastern American kestrel during prescribed burning activities if the birds were present in nearby habitats, causing temporary flight from the area. These actions are not anticipated to have adverse effects on the southeastern American kestrel at the population level and would reduce the risk of large-scale wildfires over the long term.

Under the CEPP as a whole, while natural hydrologic conditions would not likely be restored to pre-drainage conditions, improved hydrology would occur on a regional scale. Conversion of upland habitats to wetlands under the CEPP would result in a long-term, adverse effect on the southeastern American kestrel because this species is associated with upland habitats.

Relocating and burying powerlines and removing utility poles could result in adverse impacts on southeastern American kestrel foraging behavior from disturbances in the immediate project area. Conditions would return to baseline following construction, and no long-term effects are anticipated.

When the impacts of alternative 1 are combined with the effects of other cumulative actions, overall cumulative impacts on the southeastern American kestrel would be adverse from the conversion of upland habitat to wetlands. Alternative 1 would contribute a minimal adverse increment to the overall cumulative impact because of the loss of upland habitat.

**Conclusion.** Alternative 1 could result in temporary, direct, adverse effects on the southeastern American kestrel from the noise and visual disturbances associated with construction activities. However, these impacts are unlikely because individuals would likely avoid the area during construction. Loss of preferred foraging habitat from the conversion of upland habitat to wetlands following the removal of 4 miles of the Old Tamiami Trail would result in long-term, direct and indirect, adverse impacts. However, this species is not likely to be present in the project area with regular frequency, which would minimize adverse impacts. Cumulative impacts would long term and adverse because of the loss of upland habitat. Alternative 1 would contribute an adverse increment to the overall cumulative impact because upland habitat would be permanently converted to wetlands.

### **Alternative 2 (Preferred Alternative)**

**Analysis.** Under alternative 2, temporary, direct, adverse impacts on the southeastern American kestrel associated with construction activities would be similar to those described under alternative 1. However, these impacts would occur over a larger area and involve more construction crews and equipment in the project area during the construction period because an additional 1.45 miles of the Old Tamiami Trail would be removed. Temporary impacts would be limited to the one-year construction period.

Removing 5.45 miles of the Old Tamiami Trail roadbed under alternative 2 would result in long-term, direct and indirect, adverse impacts on the southeastern American kestrel because up to 31 acres of upland habitat in the project area would be converted to wetlands, representing a net loss of preferred foraging habitat. However, adverse impacts are unlikely because this species is not likely to occur in the project area with regular frequency.

**Cumulative Impacts.** Cumulative impacts on the southeastern American kestrel under alternative 2 would be the same as those described for alternative 1. When the impacts of alternative 2 are combined with the effects of other cumulative actions, overall cumulative impacts on the southeastern American kestrel would be long term and adverse as a result of the conversion of upland habitat to wetlands. Alternative 2 would contribute an adverse increment to the overall cumulative impact because of the loss of upland habitat.

**Conclusion.** Alternative 2 could result in temporary, direct, adverse effects on the southeastern American kestrel from the noise and visual disturbances associated with construction activities and the presence of crews in the project area. However, these impacts are unlikely because this species is unlikely to be present with regular frequency and would likely avoid the area during construction. Loss of preferred foraging habitat from the conversion of upland habitat to wetlands following the removal of 5.45 miles of the Old Tamiami Trail would result in long-term, direct and indirect, adverse impacts. However, this species is not likely to be present in the project area with regular frequency and is not likely to be adversely impacted. Cumulative impacts would long term and adverse because of the loss of upland habitat. Alternative 2 would contribute an adverse increment to the overall cumulative impact because upland habitat would be permanently converted to wetland.

## **White-crowned Pigeon**

### **Alternative 1**

**Analysis.** Alternative 1 could result in direct, adverse impacts on the white-crowned pigeon from noise and visual disturbances associated with construction activities. Most individuals would likely avoid the area during construction and would not be adversely affected by construction activities. No long-term impacts would be anticipated. However, the project area does not contain high quality feeding or nesting habitat for the white-crowned pigeon, and this species is not likely to occur in the project area with regular frequency. Therefore, the potential for adverse impacts would be minimal.

**Cumulative Impacts.** All identified cumulative projects could impact the white-crowned pigeon. The white-crowned pigeon does not nest in the project area, so breeding behavior would not be disrupted. Activities associated with the ERTTP could result in mainly beneficial impacts on this species from flow regime management, which would reduce high-water events around tree islands, mangroves, and forested habitats preferred by this species. Specific to the project area, the ERTTP canal plug would result in short-term impacts from noise and disturbances associated with the presence of machinery and work crews. Temporary disturbances could disrupt foraging behavior if this species is present in the project area. Conditions would return to baseline following construction, and no long-term effects are anticipated.

Generally, projects associated with the various Everglades restoration plans have the potential to improve the conditions for the wildlife in the park, including the white-crowned pigeon. Over the course of implementation of all projects, degraded ecological conditions are expected to improve, resulting in beneficial impacts.

Actions completed under the *South Florida and Caribbean Parks Exotic Plant Management Plan* would result in localized adverse impacts on the white-crowned pigeon from noise and disturbance if treatments were conducted in or near areas where the birds were present. However, exotic plant treatments would be timed to avoid sensitive seasons for wildlife and coordinated to avoid sensitive wildlife areas or nesting sites. Additionally, any actions taken would be preceded by surveys for listed species, and herbicide treatments would be applied by hand to individual weeds within 25 feet of any occupied habitat. All native wildlife, including the white-crowned pigeon, would experience long-term benefits from the removal of dense stands of exotics and restoration of native vegetation. These benefits would be most

noticeable in areas where exotics are removed, but would be more widespread as exotic plant management and native vegetation restoration are completed across the park.

Activities completed under the *Fire Management Plan* would be focused on treatment of four major fuel vegetation types to reduce the risk of large-scale wildfires. Adverse impacts could include direct mortality of individuals and nests from prescribed burning and temporary disturbances associated with noise and the presence of crews. Smoke could also affect the white-crowned pigeon during prescribed burning activities, if the birds were present in nearby habitats, causing temporary flight from the area. These actions are not anticipated to have adverse effects on this species at the population level and not expected to substantially affect the suitability of habitat over the long term.

Under the CEPP as a whole, while natural hydrologic conditions would not likely be restored to pre-drainage conditions, improved hydrology would occur on a regional scale. Actions under the CEPP would not result in long-term impacts on the white-crowned pigeon.

Relocating and burying powerlines and removing utility poles could result in temporary, direct, adverse impacts from the noise and visual disturbances associated with the presence of heavy machinery and crews in the project area. Conditions would return to baseline following construction, and no long-term effects are anticipated.

When the impacts of alternative 1 are combined with the effects of other cumulative actions, overall cumulative impacts on the white-crowned pigeon would be adverse because of disturbances to individuals and their habitat. Alternative 1 would contribute minimally to the overall adverse cumulative impact because this species is not likely to be present in the project area with any regular frequency and would likely avoid the area during construction.

**Conclusion.** Alternative 1 could result in temporary, direct, adverse impacts on the white-crowned pigeon from the noise and visual disturbances associated with construction activities and the presence of crews in the project area. However, these potential impacts may not occur because this species is unlikely to be present with regular frequency and is expected to avoid the area during construction. Cumulative impacts would be adverse. Alternative 1 would contribute minimally to the overall adverse cumulative impact.

## **Alternative 2 (Preferred Alternative)**

**Analysis.** Under alternative 2, temporary, direct, adverse impacts on the white-crowned pigeon associated with construction activities would be similar to those described under alternative 1. However, these impacts would occur over a larger area and involve more construction crews and equipment in the project area during the construction period because an additional 1.45 miles of the Old Tamiami Trail would be removed. Temporary impacts would be limited to the one-year construction period. However, adverse impacts are unlikely because the project area does not contain high quality feeding or nesting habitat for the white-crowned pigeon, and this species is not likely to be present with regular frequency.

**Cumulative Impacts.** Cumulative impacts on the white-crowned pigeon under alternative 2 would be the same as those described under alternative 1. When the impacts of alternative 2 are combined with the effects of other cumulative actions, overall cumulative impacts on the white-crowned pigeon would be adverse. Alternative 2 would contribute minimally to the overall adverse cumulative impact because this species is not likely to be present in the project area with any regular frequency and would likely avoid the area during construction.

**Conclusion.** Alternative 2 would potentially result in temporary, direct, adverse impacts on the white-crowned pigeon from the noise and visual disturbances associated with construction activities. However,



these potential impacts may not occur because the species is unlikely to be present with regular frequency and is expected to avoid the area during construction. Cumulative impacts would be adverse. Alternative 2 would contribute minimally to the overall adverse cumulative impact.

## **CULTURAL RESOURCES**

### **METHODOLOGY AND ASSUMPTIONS**

This analysis assesses the impacts of the alternatives on all historic properties that have been determined eligible to the National Register and are located in the study area. Direct and indirect impacts can be either adverse or beneficial. Adverse impacts are those that alter the character-defining features of a historic property in a way that could change its eligibility to the National Register. Archeological sites are also evaluated for their potential to yield information important to history or prehistory. Beneficial impacts are those that promote the retention of important characteristics or setting associated with a historic property. Impacts are analyzed within the context of a particular resource and the intensity or severity of the impact. In this instance, the context is the Old Tamiami Trail and associated Old Tamiami Trail Canal. Intensity is considered the degree to which a historic property would be altered and whether that alteration would change its eligibility to the National Register.

This analysis relies on the determinations of eligibility made as part of the National Historic Preservation Act (NHPA), section 106 process, which is occurring separately from this NEPA process. Five historic properties are located in the study area that have been determined eligible as part of the section 106 process: the Old Tamiami Trail and the Old Tamiami Trail Canal (NPS 2017c), the L-67 extension canal and levee, and two tree island archeological sites (NPS 2017d). The potential impacts on these resources from each alternative are described below.

**Study Area.** The study area for cultural resources encompasses a 5.7-mile by 1,200 foot-wide area centered on the Old Tamiami Trail between the Shark Valley Entrance Road and the L-67 extension canal. This area includes a segment of US Highway 41, which parallels the Old Tamiami Trail to the north where staging areas would be located, a portion of the Shark Valley Entrance Road, and tree islands within a mile south of the project area. The study area for cumulative impacts is the same.

### **NO-ACTION ALTERNATIVE**

**Analysis.** The no-action alternative would have no impact on historic properties. The five cultural resources would remain in place and would likely maintain their current conditions. The Old Tamiami Trail roadway and canal would remain intact, and Florida Power and Light would remove vegetation whenever it needs to access the existing powerlines for maintenance activities. The no-action alternative would not affect the L-67 canal and levee or tree island archeological sites.

**Cumulative Impacts.** Because there would be no impacts under the no-action alternative, there would be no cumulative impacts.

**Conclusion.** The no-action alternative would have no impacts on the Old Tamiami Trail, the Old Tamiami Trail Canal, the L-67 extension canal and levee, or the two tree island archeological sites; therefore, there would be no cumulative impacts.

### **ALTERNATIVE 1**

**Analysis.** Alternative 1 would result in long-term, moderate, adverse impacts on both the Old Tamiami Trail and Old Tamiami Canal. Impacts would be adverse from the physical removal of 4 miles of the Old

Tamiami Trail and the connection of the Old Tamiami Trail Canal to the Everglades to the south. The physical removal of the roadway and alteration of the canal would reduce the integrity of the characteristics that contribute to the eligibility of these resources to the National Register, remove the association between the two properties and their surroundings, and lead to a loss of integrity of setting and feeling. The degree to which the historic properties would be altered could result in loss of their eligibility for listing in the National Register.

The setting and feeling would remain along the 1.7-mile segment that is retained under alternative 1 and could be experienced by visitors. Clearing the vegetation from this segment of the trail would have a beneficial impact on the roadway because it would remove potentially damaging vegetation and restore this section to a condition more similar to what it would have looked like during its period of significance. This benefit would be furthered by public use of the area and interpretation of the historic properties to inform people of the importance of these resources. Public use of the roadway and canal for recreational activities such as walking or canoeing would not affect these resources.

Alternative 1 would result in no adverse impacts on the L-67 extension canal and levee. Construction activity would not directly affect the resource; however, the setting of the resource would be affected over the long-term from the removal of adjoining resources (Old Tamiami Trail and the Old Tamiami Trail Canal). The setting of the L-67 extension canal and levee would also be affected over the short term by the presence of a nearby staging area. The staging area would be immediately north and east of the L-67 extension canal and levee. Alternative 1 would lead to a short- and long-term loss of integrity of setting for the L-67 extension canal and levee; however, the impacts would be very minimal and would not affect National Register eligibility.

The Shark Valley Entrance Road Canal plug and the use of staging areas along the modern Tamiami Trail would not affect the historic properties located in the study area. The Shark Valley Entrance Road and associated canal have been determined not eligible for listing in the National Register.

Additionally, an archeological survey of the area determined that there is little potential for subsurface archeological deposits in the study area (NPS 2017c).

The potential for archeological sites on tree islands to be affected because of an increase in water level with the partial removal of the roadbed is considered to be slight and is not expected to adversely impact site condition or integrity. Previous archeological studies have shown that the water level has fluctuated over time, but overall, is currently lower than historical conditions in the early 20th century when construction of water control devices and other infrastructure began to affect the water flow. The water discharge under alternative 1 would be limited and localized to meet flood control and water supply demands. The hydrological study completed by the park indicates that the maximum increase in water level would range from 0 to 4.5 centimeters (1.77 inches), with the greater increase located on the eastern edge of the project area east of the S-12D structure (NPS 2017a). The maximum expected increase in stage would be less than 3 centimeters (1.18 inches) outside the immediate vicinity of S-12D, and less than 2 centimeters (0.78 inch) 1 mile south of the Tamiami Trail. Therefore, adverse impacts on archeological resources would be expected to be very slight, and the archeological sites in the study area would not be inundated.

**Cumulative Impacts.** Present and reasonably foreseeable projects that have the potential to contribute cumulative impacts to cultural resources include the ERTP canal plug and the removal of powerlines from the Old Tamiami Trail. Under the ERTP, a 20-foot segment of the Old Tamiami Trail Canal would be plugged. The canal plug could contribute adverse impacts to these historic properties by introducing a new element to the setting of the properties and altering the physical nature and appearance of the canal itself. However, the plug would be removable; therefore, the adverse impacts could be reversed. The

powerlines located along the Old Tamiami Trail would be removed and buried along US Highway 41. The removal of the powerlines from the Old Tamiami Trail would have beneficial impacts on historic properties by removing an intrusive feature and increasing the integrity of the setting and feeling of the roadway. When combined with the beneficial and adverse impacts from cumulative projects, alternative 1 would contribute noticeable adverse impacts, resulting in overall adverse cumulative impacts on cultural resources.

**Conclusion.** Impacts on the Old Tamiami Trail and Old Tamiami Trail Canal from removing a 4-mile segment of the roadway and modifying the canal to connect it to the Everglades to the south would be permanent and adverse and could result in loss of their eligibility for listing in the National Register. The retention of the remaining 1.7-mile segment of the Old Tamiami Trail and Old Tamiami Trail Canal would allow for the setting and feeling associated with these resources to be retained along this segment. There would be some beneficial impacts on the remaining segment of roadway from the removal of vegetation and interpretation of the historic properties. Alternative 1 would lead to a short- and long-term loss of integrity of setting for the L-67 extension canal and levee; however, the impacts would be very minimal and would not affect National Register eligibility. Archeological resources located on tree islands south of the project area would experience slight adverse impacts from increased water levels. Overall, cumulative impacts would be adverse, with alternative 1 contributing a noticeable adverse incremental impact.

## **ALTERNATIVE 2 (PREFERRED ALTERNATIVE)**

**Analysis.** Impacts on the Old Tamiami Trail and Old Tamiami Trail Canal under alternative 2 would be similar to those described for alternative 1; impacts on these historic properties would be permanent and adverse from removing the roadway and modifying the canal. However, under alternative 2, the intensity of these impacts would be greater than under alternative 1 because only 0.25 mile of the Old Tamiami Trail and Old Tamiami Trail Canal would remain. With only 0.25 mile of roadway and canal retained, the setting and feeling of these resources with each other and the surrounding landscape would be noticeably reduced compared with alternative 1, which would retain 1.7 miles of roadway. The degree to which the historic properties would be altered would result in loss of their eligibility for listing in the National Register.

Impacts on the L-67 extension canal and levee would be the same as those described for alternative 1. Minor changes to the resource setting would not result in any adverse impacts.

Similar to alternative 1, the Shark Valley Entrance Road Canal plug and the use of staging areas along US Highway 41 would not affect the historic properties located in the study area.

Impacts on archeological resources on tree islands south of the Old Tamiami Trail would be the same as those described for alternative 1, resulting in slight long-term, adverse impacts.

**Cumulative Impacts.** Present and reasonably foreseeable future projects with the potential to affect historic properties are the same as those described for alternative 1. When combined with the beneficial and adverse impacts from cumulative projects, alternative 2 would contribute noticeable adverse impacts, resulting in overall adverse cumulative impacts on cultural resources.

**Conclusion.** This alternative would result in permanent, adverse impacts on the Old Tamiami Trail and Old Tamiami Trail Canal. The removal of 5.45 miles of the 5.7-mile roadway and the modification of the canal to connect it to the Everglades to the south would reduce the integrity of setting and feeling associated with these resources and would result in loss of their eligibility for listing in the National Register. The retention of 0.25 mile of the road would ensure that some of the integrity of the two historic

properties is retained. Alternative 2 would lead to short- and long-term loss of integrity of setting for the L-67 extension canal and levee; however, the impacts would be very minimal and would not affect National Register eligibility. Archeological resources located on tree islands south of the project area would experience slight adverse impacts from increased water levels. Overall, cumulative impacts would be adverse, with alternative 2 contributing a noticeable adverse incremental impact.

## VISITOR USE AND EXPERIENCE

### METHODOLOGY AND ASSUMPTIONS

The potential for changes to visitor experience was evaluated by assessing the limitations and assumed changes to visitor access and associated visitor uses related to the proposed alternatives and determining whether these projected changes would affect the visitor experience.

**Study Area.** The study area for visitor use is the project area, including the Shark Valley Entrance Road. The study area for cumulative impacts includes the project area and the entire Shark Valley visitor use area.

### NO-ACTION ALTERNATIVE

**Analysis.** Under the no-action alternative, visitor use and experience in the project area would not change. The Old Tamiami Trail would continue to be overgrown with vegetation, and no visitor use would occur. During peak visitation periods, a queue of cars would continue to extend from the fee collection booth along the Shark Valley Entrance Road. Visitor use and experience would not be affected.

**Cumulative Impacts.** Because there would be no impacts under the no-action alternative, there would be no cumulative impacts.

**Conclusion.** There would be no new impacts to visitor use and experience under the no-action alternative. The Old Tamiami Trail would remain in place, but no visitor use of Old Tamiami Trail would occur. Interpretation would be limited to existing exhibit panels at the intersection of Old Tamiami Trail and the Shark Valley Entrance Road. There would be no cumulative impacts.

### ALTERNATIVE 1

**Analysis.** Alternative 1 would retain 1.7 miles of the Old Tamiami Trail and provide opportunities for recreation and interpretation, thereby expanding visitor use at Shark Valley. Once vegetation is removed from the roadbed, the Old Tamiami Trail segment would be used for walking, jogging, wildlife observation, fishing, and photography. Interpretive media along the roadbed could provide information about the construction of Old Tamiami Trail and explain how the roadway was an important connection across southern Florida. It would also provide an opportunity for visitors to view wildlife. Visitors could use the canoe and kayak access locations, expanding formal canoe and kayak trails into the Shark Valley section of the park. Expanded visitor opportunities in Shark Valley would have a beneficial impact on visitor use and experience.

During the construction period, short-term impacts from increased presence of construction equipment and any temporary closures needed while moving heavy equipment would be adverse, lasting for approximately one year and occurring periodically depending on the construction schedule. The operation of construction equipment in the project area would result in more noise and air emissions and would potentially disrupt visitor experience. This disruption would be most noticeable when equipment is operating on the Old Tamiami Trail segment adjacent to the Shark Valley Entrance Road and when the

associated canal is plugged. Intermittent impacts on visitors entering Shark Valley could occur if construction equipment needs to occupy one of the lanes of the entrance road while plugging the canal. Full closure of Shark Valley is not anticipated, so visitors would only be delayed in their entry or exit from the site.

Once construction is complete, the plug along the Shark Valley Entrance Road would also serve as an additional access lane for emergency vehicles. The additional access lane would benefit visitor experience in the event of an emergency, allowing first responders to bypass traffic along the entrance road and quickly access the site.

**Cumulative Impacts.** All of the cumulative projects have the potential to affect visitor use and experience in the park, specifically in the Shark Valley visitor use area. Generally, the ERTTP and the overall CEPP have the potential to alter or improve existing hydrology in the park. Over the course of implementation of all projects, degraded ecological conditions are expected to improve, resulting in beneficial impacts on park resources that would allow visitors to experience a more natural ecological condition and provide additional wildlife viewing opportunities. This improvement would be especially beneficial in Shark Valley, the portion of the park that provides one of the best opportunities for viewing the Everglades environment.

Relocating powerlines is unlikely to adversely affect visitor use or experience, with the exception of potential short-term impacts during construction from increased equipment along the modern Tamiami Trail. There may be long-term, beneficial impacts from the removal of the powerlines and improvement to the natural aesthetics of the area.

When combined with the long-term beneficial impacts of the cumulative projects, alternative 1 would contribute additional beneficial impacts. While short-term impacts from cumulative projects and alternative 1 may be adverse, those impacts may not overlap and would all be temporary. Overall, cumulative impacts on visitor use and experience would be beneficial, with alternative 1 contributing an incremental benefit to overall cumulative impacts.

**Conclusion.** Alternative 1 would result in long-term, beneficial impacts on visitor use and experience from increased recreational and interpretive opportunities in the project area. While impacts from disruptions during construction would be short term, these impacts would cease after the one-year construction period. Creation of an additional access lane would have long-term benefits for visitor use and experience. Overall, cumulative impacts would be beneficial, with alternative 1 contributing an incremental beneficial impact.

## **ALTERNATIVE 2 (PREFERRED ALTERNATIVE)**

**Analysis.** Impacts on visitor use and experience under alternative 2 would be similar to those described under alternative 1. The beneficial impacts described under alternative 1 would be slightly decreased under alternative 2 because a much smaller segment of the trail (0.25 mile as opposed to 1.7 miles) would be available for recreational and interpretive opportunities. Overall, impacts would be beneficial from expanded opportunities in Shark Valley and the addition of formal canoe and kayak access near the Old Tamiami Trail.

Short-term, adverse impacts from construction and beneficial impacts from the canal plug would be the same as those described for alternative 1.

**Cumulative Impacts.** Impacts from cumulative projects would be the same as those described for alternative 1. When combined with the beneficial impacts from cumulative projects, alternative 2 would contribute incremental beneficial impacts, resulting in overall beneficial cumulative impacts on visitor use and experience.

**Conclusion.** Alternative 2 would result in long-term, beneficial impacts on visitor use and experience from increased recreational and interpretive opportunities in the project area, but these impacts would not be as beneficial as those described for alternative 1. While impacts from disruptions during construction would be short term, these impacts would cease after the one-year construction period. Creation of an additional access lane would provide long-term benefits for visitor use and experience. Overall, cumulative impacts would be beneficial, with alternative 2 contributing an incremental beneficial impact.



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## **CHAPTER 5: CONSULTATION AND COORDINATION**

This “Consultation and Coordination” chapter describes the public involvement and agency and tribal consultation used during the preparation of the EA.

### **PLANNING AND PUBLIC INVOLVEMENT**

#### **SCOPING**

Internal scoping for this EA began on September 13, 2016, when representatives from the park, the NPS Denver Service Center, and their consultants met to discuss the purpose and need of the project, potential alternatives that could meet these needs, and resource conditions and issues in the project area. The group also initiated plans for adopting the CEPP FEIS and involving the public, agencies, and tribes during the preparation of this EA, which tiers to the CEPP FEIS. An agency scoping meeting was held on September 15, 2016, to brief stakeholder agencies and tribes on the EA process and obtain input on the project purpose, need for action, objectives, preliminary alternatives, and environmental issues to consider in the EA. Public notification of NPS intent to prepare this EA was announced during the recirculation and adoption of the CEPP EIS as discussed below.

#### **PUBLIC INVOLVEMENT**

##### **Public Involvement in the CEPP EIS**

NPS participated actively in the CEPP NEPA process, which included extensive coordination with the public; federal, state, and local agencies; and tribes. The South Florida Ecosystem Task Force’s Working Group sponsored 18 public workshops throughout the CEPP study to give the public opportunities to provide input to the task force, which in turn informed the study team. Formal consultation with the task force also occurred throughout the study.

Initial public and agency comments received in response to a December 2, 2011, public notice of intent to prepare an EIS were mostly supportive of the project. Comments focused on the uncertainty in the expedited planning process, specific features, links to other CERP projects, and planning constraints. Two NEPA public scoping workshops were held in December 2011. Five public workshops were held in December 2012 to receive comments on the final array of alternatives. Stakeholders, local governments, and representatives of nongovernmental environmental organizations provided written comments and statements. Primary concerns focused on (1) the need to move as much water south as possible, (2) reducing releases to the Caloosahatchee and St. Lucie estuaries, (3) the effect of water levels on recreational opportunities, (4) impacts on Biscayne Bay and Florida Bay, and (5) water supply.

Similar issues, as well as new concerns, were raised in response to the public and agency review and comment of the CEPP Draft EIS, for which a notice of availability was published in the *Federal Register* on August 30, 2013. During the 64-day review period, the planning team presented a project overview and answered questions at five public meetings held in south Florida. While there was significant support for the project and the expedited planning process, additional concerns included the implementation schedule, water supply, and operating plans. Detailed descriptions of agency and public involvement, including comment letters and responses, are presented in Section 7.1 and appendix C.3 of the CEPP FEIS.

## **Recirculation and Adoption of the CEPP FEIS**

Prior to adopting the CEPP EIS, NPS recirculated it to the public for a period of 30 days in accordance with CEQ NEPA regulations (40 CFR 1506.3). The recirculation period began on December 2, 2016, with the publication of a Notice of Availability in the *Federal Register* by the US Environmental Protection Agency. The park also announced its intent to adopt the CEPP EIS via a *Federal Register* notice; electronic mail sent to the park's mailing list; letters sent to federal, state, local and tribal governments; and posts on the NPS Planning, Environment, and Public Comment (PEPC) website at <https://parkplanning.nps.gov/projectHome.cfm?projectId=68602>.

The public notices also announced that following the adoption of the CEPP FEIS, NPS would prepare an EA evaluating potential modifications to Old Tamiami Trail that would tier to the FEIS. The EA would be available for a 30-day public comment period.

Three comments were received during the 30-days of recirculation. Letters from the US Environmental Protection Agency and the Florida Department of Transportation stated that the agencies look forward to working with NPS and other stakeholders on any subsequent NEPA actions. USACE stated its support for NPS's detailed planning for the Tamiami Trail component of CEPP and requested to be a cooperating agency in preparing the NPS Old Tamiami Trail Modifications EA. The Record of Decision for adopting the CEPP FEIS was approved by the NPS Southeast Regional Director on August 21, 2017.

## **Environmental Assessment Review**

This EA is available for a 30-day public comment period. The public comment period was announced by a press release, posts on the PEPC website, and by electronic mail sent to the park mailing list. Agencies and tribes were also notified by letter. Hardcopies of the document are available for review at park headquarters. During this time, the public is encouraged to post comments online at <http://parkplanning.nps.gov/ever> or mail comments to Everglades National Park, Attention: Agnes McLean, Old Tamiami Trail Modifications EA, 950 N. Krome Avenue, Homestead, FL 33030. Following the close of the comment period, all public comments will be reviewed and analyzed prior to the release of a decision document. NPS will issue responses to substantive comments received during the comment period and will make appropriate changes to the EA as needed.

## **AGENCY CONSULTATION**

Consultation with relevant agencies, including SFWMD, FWC, FDEP, USACE, the SHPO, and USFWS began during scoping and continued during preparation of the EA. All agencies will be provided a copy of the EA for review and comment. This consultation is discussed in more detail below.

## **ENDANGERED SPECIES ACT CONSULTATION**

During the CEPP FEIS process, USACE entered into formal consultation with USFWS on the Everglade snail kite and its designated critical habitat, Cape Sable seaside sparrow and its designated critical habitat, wood stork, Florida bonneted bat, West Indian manatee, and eastern indigo snake. In a Programmatic Biological Opinion dated April 19, 2014, USFWS provided a preliminary determination that the recommended plan was not likely to jeopardize the continued existence of nor modify designated critical habitat for species listed under the ESA. The Biological Opinion states that further consultation will be needed when more specific project details are finalized during project design and implementation activities.

In accordance with section 7 of the ESA, NPS continued to coordinate with USFWS and FWC throughout the planning process for this EA. Both agencies were invited to the agency scoping meeting in September 2016; however, only USFWS was able to attend. In October 2016, NPS held a follow-up briefing meeting with FWC to gather input on the project. On December 3, 2016, NPS sent both agencies a letter notifying them of its intention to adopt the CEPP FEIS. Consultation with USFWS continued on May 12, 2017, when the Biological Resources Branch Chief for the park, Tylan Dean, emailed the USFWS biologist assigned to this project. Mr. Dean provided a brief background on how this EA would tier off the CEPP FEIS and then provided the proposed approach for the Biological Assessment. NPS recommended analyzing only those species with the potential to exist in the project area and to dismiss from EA analysis all species that would not be affected. On May 16, 2017, USFWS concurred with the recommended approach. USFWS will be provided a copy of this EA for its review. Consultation is ongoing. Please see appendix A for the full list of species and the rationale for inclusion or dismissal in this EA.

## **NATIONAL HISTORIC PRESERVATION ACT CONSULTATION**

The CEPP FEIS (page 5-55) determined that removing up to 5.7 miles of the Old Tamiami Trail to improve sheetflow would result in major long-term, adverse effects on the historic roadway and canal and could result in loss of its eligibility for listing in the National Register. The effect determinations on the historic roadway and canal are considered preliminary findings, and potential mitigation measures could reduce the effects. USACE initiated consultation under section 106 of the NHPA with the SHPO, the Seminole Tribal Historic Preservation Office, the Miccosukee Tribe of Indians of Florida's Native American Graves Protection and Repatriation Act representative, the Advisory Council on Historic Preservation, the park, and interested parties. During consultation, the following conclusions were drawn: (1) additional surveys are needed to identify cultural resources within specific areas of potential effect, (2) as the CEPP project progresses, additional surveys may be needed, specifically during the Pre-Construction Engineering Design phase, when feature designs are finalized and construction staging areas are determined, and (3) section 106 compliance with the NHPA would be conducted separately from NEPA and would not be completed during the feasibility phase of the project; however, it would be completed prior to construction of each feature.

On November 9, 2016, NPS sent a letter to the SHPO continuing section 106 consultation from the CEPP FEIS, in compliance with the NHPA. On March 16, 2017, NPS continued consultation and provided the SHPO with additional information, including the APE, noting previously recorded historic resources, and the cultural resources assessment report that assessed the Old Tamiami Trail, Old Tamiami Trail Canal, and the Shark Valley Entrance Road and associated canal for their eligibility on the National Register. On May 1, 2017, the SHPO replied and requested additional clarifying information. Section 106 consultation is ongoing and occurring separately from the NEPA process.

## **TRIBAL CONSULTATION**

Tribal consultation was initiated as part of the CEPP FEIS and continued as part of this project. On December 8, 2016, letters were sent to four tribal representatives, Miccosukee Tribe of Indians of Florida, Seminole Tribe of Florida, Seminole Nation of Oklahoma, and the Council of Original Miccosukee Simanolee Nation Aboriginal Peoples, regarding continued consultation. The Council of Original Miccosukee Simanolee Nation Aboriginal Peoples replied that it would like to consult on the project and arrange for a face-to-face meeting in a letter dated December 13, 2016.

On July 18, 2017, NPS sent letters to the tribal representatives inviting them to consult regarding the removal of portions of Old Tamiami Trail and to help identify any issues relating to the project's potential effects on traditional cultural properties or cultural resources. A package of background information about the project was enclosed for review and further discussions.

On August 8, 2017, the Miccosukee Tribe of Indians of Florida sent a letter to the park superintendent expressing interest in using the excess fill available from the removed roadway to create housing pads in the tribal housing area in the Miccosukee Reserved Area, located directly west of the project area. On August 16, 2017, the tribe's cultural resources coordinator notified the park that the tribe has no cultural resource concerns with removal of the fill within the footprint of the old roadway. Disturbance outside of the footprint should be avoided because cultural sites are alongside the old road. The tribe's primary concern is the need to maintain the Florida Power and Light power line that runs along the old roadbed and provides electricity to the tribe's administrative and housing complex adjacent to the project area.

On August 11, 2017, representatives of the Seminole Tribal Historic Preservation Office met with park staff at the Old Tamiami Trail project area. The group discussed the history of the roadway, the cultural resource assessments that have been completed, and the proposed removal to enhance water flow and restore the original wetland character. The Seminole Tribe's representatives expressed that their primary concern was high water impacts on cultural resources on the downstream tree islands that could be affected by rising water levels. They requested that NPS provide information that highlights the drying conditions based on paleo-ecological changes, as well as changes in measured water levels and in tree island conditions. The requested information was included in this EA analysis. Tribal consultation is ongoing, and NPS will provide the EA for review and comment.

On August 24, 2017, NPS sent the draft EA via electronic mail to the Miccosukee Tribe's water resources director inviting informal review and comments. Comments from the water resources director were received by electronic mail on September 7, 2017. On September 20, 2017, NPS extended the informal comment period through September 29 because of the disruption of Hurricane Irma. On October 3, 2017, NPS express mailed the draft EA to tribal chairpersons with a letter inviting consultation and the opportunity for informal review and comment on the EA.

## **CHAPTER 6: LIST OF PREPARERS**

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## CHAPTER 7: ACRONYMS AND ABBREVIATIONS

<b>APE</b>	area of potential effect
<b>C&amp;SF project</b>	Central and Southern Florida project
<b>CEPP</b>	Central Everglades Planning Project
<b>CEPP FEIS</b>	Central Everglades Planning Project Final Environmental Impact Statement
<b>CERP</b>	Comprehensive Everglades Restoration Plan
<b>CEQ</b>	Council on Environmental Quality
<b>CFR</b>	Code of Federal Regulations
<b>EA</b>	environmental assessment
<b>EIS</b>	environmental impact statement
<b>ERTP</b>	Everglades Restoration Transition Plan
<b>ESA</b>	Endangered Species Act
<b>FDEP</b>	Florida Department of Environmental Protection
<b>FEIS</b>	final environmental impact statement
<b>FR</b>	Federal Register
<b>FWC</b>	Florida Fish and Wildlife Conservation Commission
<b>mg/kg</b>	milligrams per kilogram
<b>MWD</b>	Modified Water Deliveries
<b>National Register</b>	National Register of Historic Places
<b>NEPA</b>	National Environmental Policy Act
<b>NGVD29</b>	National Geodetic Vertical Datum of 1929
<b>NHPA</b>	National Historic Preservation Act
<b>NPS</b>	National Park Service
<b>park</b>	Everglades National Park

<b>PEPC</b>	Planning, Environment, and Public Comment
<b>SFWMD</b>	South Florida Water Management District
<b>SHPO</b>	State Historic Preservation Office
<b>USACE</b>	US Army Corps of Engineers
<b>USFWS</b>	United States Fish and Wildlife Service
<b>WCA</b>	water conservation area

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## **APPENDIX A—THREATENED AND ENDANGERED SPECIES**

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# Everglades National Park – Old Tamiami Trail Modifications

## Special Status Species Lists and Dismissals

The species lists below were developed using the US Fish and Wildlife Service (USFWS) Information, Planning, and Consultation system (IPAC) as well as state species lists and other guidance provided the USFWS and park staff. The presence or absence of species within the project area was determined according to guidance from park biologists. Species that are not likely to occur in the project area or would not be affected by the proposed action were assigned a determination of “No effect” and were dismissed from further analysis, unless otherwise indicated. A full analysis of species assigned a determination other than “No effect” is provided in chapter 4 of the environmental assessment (EA).

### Federal Species List

COMMON NAME*	SCIENTIFIC NAME	FEDERAL STATUS	CEPP EIS BA DETERMINATION	PRELIMINARY DETERMINATION	NOTES
<b>Birds</b>					
Bachman’s warbler	<i>Vermivora bachmanii</i>	Endangered	Not assessed	No effect	Occurs in low, wet, forested areas. The last sighting of Bachman’s warbler in Florida was reported in 1977.
Cape Sable seaside sparrow	<i>Ammodramus maritimus mirabilis</i>	Endangered	May affect, and is likely to adversely affect	Include in EA/BA for full analysis	Cape Sable seaside sparrows are not anticipated to be in the project area but flow through the structures under the trail is managed to enhance conditions for its habitat. The closest occupied Cape Sable seaside sparrow habitat is approximately 10 miles south of the project area.
Everglade snail kite	<i>Rostrhamus sociabilis plumbeus</i>	Endangered	May affect, and is likely to adversely affect	Include in EA/BA for full analysis	Final Designated Critical habitat within the project area. Short-term, adverse impacts are expected to be limited to the timeframe of construction and Everglade snail kites would be expected to fully return to project area following completion of construction. Long-term benefits on habitat expected.
Florida grasshopper sparrow	<i>Ammodramus savannarum floridanus</i>	Endangered	Not assessed	No effect	Occurs in prairies. Not known to occur in the project area.

COMMON NAME*	SCIENTIFIC NAME	FEDERAL STATUS	CEPP EIS BA DETERMINATION	PRELIMINARY DETERMINATION	NOTES
Florida scrub-jay	<i>Aphelocoma coerulescens</i>	Threatened	Not assessed	No effect	Occurs in scattered, often small and isolated patches of sand pine scrub, xeric oak scrub, and scrubby flatwoods, which occur on well-drained, sandy ridges in peninsular Florida. They have very specific habitat requirements: short, shrubby oaks, open patches of sand, and few trees. Not known to occur in the project area.
Ivory-billed woodpecker	<i>Campephilus principalis</i>	Endangered	Not assessed	No effect	Occurs in riparian habitats. Not known to occur in the project area. No recent records in the park.
Kirtland's warbler	<i>Setophaga kirtlandii</i>	Endangered	Not assessed	No effect	Nest in Jack pine ( <i>Pinus banksiana</i> ) and inhabit dense scrub during the winter. Not known to occur in the project area. No recent records in the park.
Piping plover	<i>Charadrius melodus</i>	Threatened	No effect	No effect	Shorebird that occurs on the Gulf of Mexico and Atlantic coasts; habitat includes beaches, mudflats, and sandflats, as well as barrier island beaches and spoil islands. Not known to occur in the project area.
Red knot	<i>Calidris canutus rufa</i>	Threatened	Not assessed	No effect	Shorebird that occurs in coastal marine and estuarine habitats. Not known to occur in the project area.
Red-cockaded woodpecker	<i>Picoides borealis</i>	Endangered	No effect	No effect	Occurs in mature pine forests. Not known to occur in the project area. No recent records in the park.
Wood stork	<i>Mycteria americana</i>	Threatened	May affect, and is likely to adversely affect	Include in EA/BA for full analysis	No nests in project area, but could be temporary disturbance of foraging birds during construction resulting in temporary behavioral changes and changes in habitat use.
<b>Ferns and Allies</b>					
Florida bristle fern	<i>Trichomanes punctatum ssp. floridanum</i>	Endangered	No effect	No effect	Suitable habitat (sheltered rockland habitats) not present in project area.

COMMON NAME*	SCIENTIFIC NAME	FEDERAL STATUS	CEPP EIS BA DETERMINATION	PRELIMINARY DETERMINATION	NOTES
<b>Fishes</b>					
Smalltooth sawfish	<i>Pristis pectinata</i>	Endangered	May affect, but is not likely to adversely affect	No effect	Occurs at southern extent of Everglades, within coastal wetlands and nearshore habitats of the bay.
<b>Flowering Plants</b>					
Blodgett's silverbush	<i>Argythamnia blodgettii</i>	Threatened	No effect	No effect	This species occurs in pine rocklands of the Long Pine Key region of the park. This species is not found in project area.
Cape Sable thoroughwort	<i>Chromolaena frustrata</i>	Endangered	No effect	No effect	Occurs in open canopy habitats in coastal berms and coastal rock barrens, and in semi-open to closed canopy habitats, including buttonwood forests, coastal hardwood hammocks, and rockland hammocks. This species is restricted to the Flamingo region of the park and does not occur in the project area.
Crenulate lead-plant	<i>Amorpha crenulata</i>	Endangered	No effect	No effect	Occurs in plant communities that were historically associated with seasonally hydrated soils and frequent burning, including wet pinelands, transverse glades, and hammock edges; current distribution is within a 20 square mile area from Coral Gables to Kendall, Miami-Dade County. Formally cultivated in the park, but is no longer present.
Everglades bully	<i>Sideroxylon reclinatum ssp. austrofloridense</i>	Proposed Threatened	Not assessed	No effect	Within the park, Everglades bully is found in pinelands, pineland/prairie ecotones, and marl prairies. This species does not occur in project area.
Florida Pineland crabgrass	<i>Digitaria pauciflora</i>	Proposed Threatened	No effect	No effect	Occurs in pine rocklands, marl prairies, and in the ecotone between the two habitats within the Long Pine Key region of the park in Miami-Dade County and the Lostman's Pines region of Big Cypress National Preserve in mainland Monroe County. This species does not occur in project area.

COMMON NAME*	SCIENTIFIC NAME	FEDERAL STATUS	CEPP EIS BA DETERMINATION	PRELIMINARY DETERMINATION	NOTES
Florida prairie-clover	<i>Dalea carthagenensis floridana</i>	Proposed Endangered	No effect	No effect	Occurs in pine rocklands, edges of rockland hammocks, coastal uplands, and marl prairie; only 5 populations are known, with a total of fewer than 1,000 plants; all are in conservation areas. In the park, Florida prairie clover was collected once in the Context Road area of East Everglades. This species is considered extirpated from the park flora and does not occur in the project area.
Garber's spurge	<i>Chamaesyce garberi</i>	Threatened	May affect, but is not likely to adversely affect	No effect	This species is restricted to pine rocklands of Long Pine Key and coastal grasslands of Cape Sable region of the park. Does not occur in project area.
Pineland sandmat	<i>Chamaesyce deltoidea pinetorum</i>	Proposed Threatened	No effect	No effect	This species is restricted to pine rocklands of Long Pine Key region of the park. Does not occur in project area.
<b>Insects</b>					
Bartram's hairstreak butterfly	<i>Strymon acis bartrami</i>	Endangered	No effect	No effect	This species is restricted to pine rocklands of the Long Pine Key region of the park and does not occur in project area.
Florida leafwing butterfly	<i>Anaea troglodyta floridalis</i>	Endangered	No effect	No effect	This species is restricted to pine rocklands of the Long Pine Key region of the park and does not occur in project area.
Miami blue butterfly	<i>Cyclargus (=hemiargus) thomasi bethunebakeri</i>	Endangered	No effect	No effect	Inhabits tropical hardwood hammocks and their associated margins, beachside scrub, and tropical pine rocklands. Miami blue butterfly is currently considered extirpated from the park.

COMMON NAME*	SCIENTIFIC NAME	FEDERAL STATUS	CEPP EIS BA DETERMINATION	PRELIMINARY DETERMINATION	NOTES
<b>Mammals</b>					
Florida bonneted bat	<i>Eumops floridanus</i>	Endangered	No effect	No effect <sup>a</sup>	Not known to occur in the project area. Visual survey of the area in 2017 did not detect any evidence of bats, potential roosting sites, or bat evidence (e.g., guano). Closest known location for bonneted bats in relation to the project area is approximately 11 miles from the Shark Valley Entrance Road. The bonneted bat was included in the EA analysis at the request of USFWS.
Florida panther	<i>Puma (=felis) concolor coryi</i>	Endangered	May affect, but is not likely to adversely affect	Include in EA/BA for full analysis	Project would result in loss of potential habitat through conversion of upland habitat that could be potentially used by Florida panther to transverse the area to wetland habitat (CEPP). However, the project area is not the preferred habitat, and panthers are not known to occur in the area.
West Indian manatee (Florida manatee)	<i>Trichechus manatus</i>	Endangered	May affect, but is not likely to adversely affect	May affect, but is not likely to adversely affect	Unlikely to be found in project area. In 1971, a manatee carcass was found 4.7 miles east of the L-67 extension canal. This was prior to the installation of gates in some of the canals that allowed manatees to enter some of the interior canals. The likelihood of that happening now would be extremely minimal.
<b>Reptiles</b>					
American alligator	<i>Alligator mississippiensis</i>	Similarity of Appearance (Threatened)	May affect, but is not likely to adversely affect	No effect	Alligators would be present in project area but are highly mobile and would avoid project area during construction activity.
American crocodile	<i>Crocodylus acutus</i>	Threatened	May affect, but is not likely to adversely affect	No effect	Occurs in coastal areas. Not known to occur in the project area.
Eastern indigo snake	<i>Drymarchon corais couperi</i>	Threatened	May affect, and is likely to adversely affect	Include in EA/BA for full analysis	Potential to occur, although there are no known occurrences in the project area. Not likely to occur in project area due to the extent of surrounding wetland habitat.



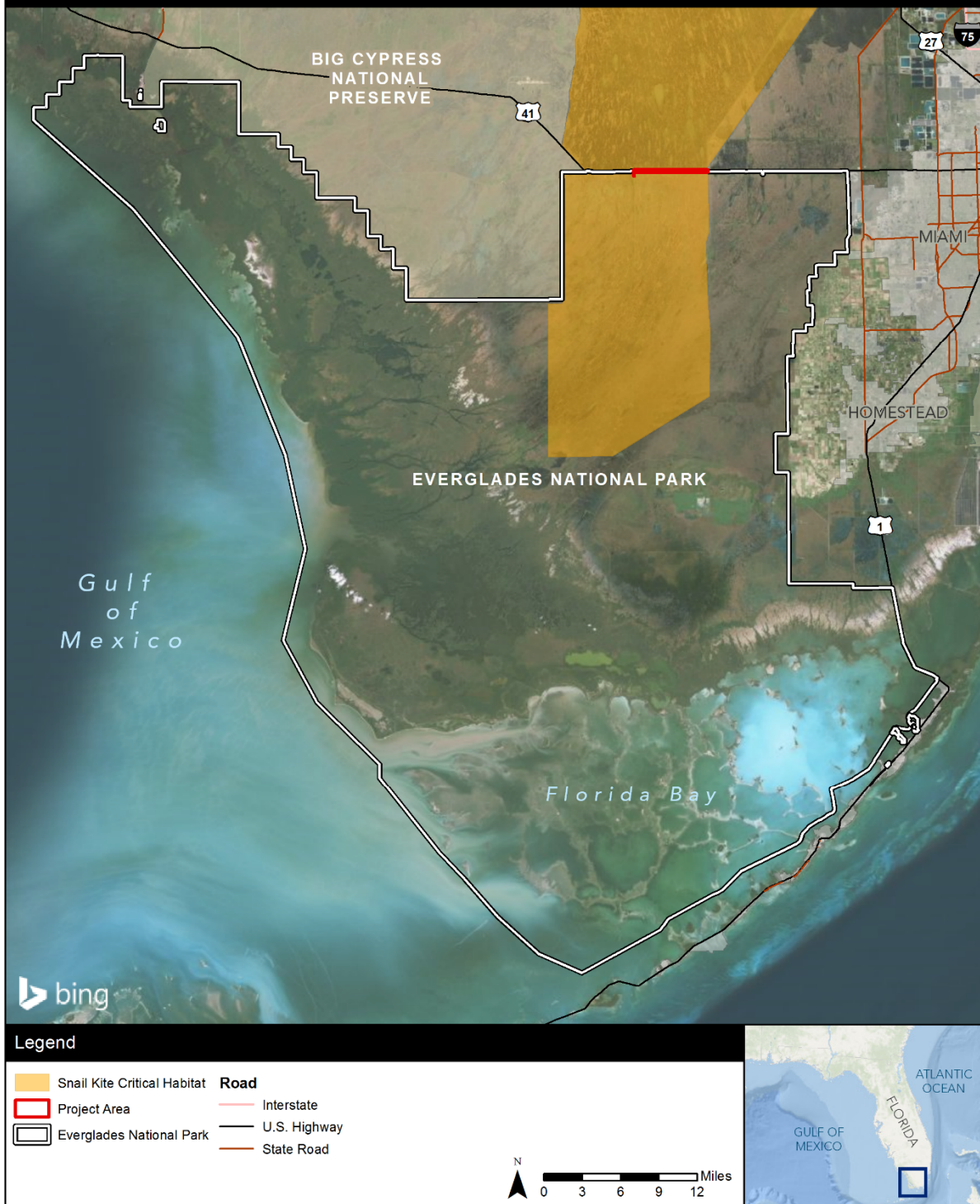
COMMON NAME*	SCIENTIFIC NAME	FEDERAL STATUS	CEPP EIS BA DETERMINATION	PRELIMINARY DETERMINATION	NOTES
Hawksbill sea turtle	<i>Eretmochelys imbricata</i>	Endangered	May affect, but is not likely to adversely affect	No effect	Occurs at southern extent of Everglades, within nearshore habitats of the bay. Not known to occur in the project area.
Leatherback sea turtle	<i>Dermochelys coriacea</i>	Endangered	May affect, but is not likely to adversely affect	No effect	Occurs at southern extent of Everglades, within nearshore habitats of the bay. Not known to occur in the project area.
Loggerhead sea turtle	<i>Caretta caretta</i>	Threatened	May affect, but is not likely to adversely affect	No effect	Occurs at southern extent of Everglades, within nearshore habitats of the bay. Not known to occur in the project area.
<b>Snails</b>					
Stock Island tree snail	<i>Orthalicus reses</i>	Threatened	No effect	No effect	Occurs in tropical hardwood hammocks.
<b>Critical Habitat</b>					
Everglade Snail Kite Critical Habitat		Final designated	May affect, and is likely to adversely affect	Include in EA/BA for full analysis	Final designated critical habitat within the project area. Long-term benefits to habitat expected. See figure A-1.

<sup>a</sup> Included in full analysis based on agency recommendation.

# Everglades National Park

Old Tamiami Trail Modifications Environmental Assessment  
Florida

National Park Service  
U.S. Department of the Interior



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**FIGURE A-1. SNAIL KITE CRITICAL HABITAT**

# Everglades National Park – Old Tamiami Trail Modifications

## State Listed Species (not already included on Federal Species List)

COMMON NAME	SCIENTIFIC NAME	STATE STATUS	PRELIMINARY DETERMINATION	NOTES
<b>Birds</b>				
Marsh wrens	<i>Cistothorus palustris spp.</i>	Species of Special Concern	No effect	Not reported as breeding within Northeast Shark River Slough, the park, and not likely to occur in project area.
Little blue heron	<i>Egretta caerulea</i>	Threatened	Include in EA for full analysis	Project could result in impacts to nesting, loafing, roosting, and foraging habitat.
Reddish egret	<i>Egretta rufescens</i>	Threatened	Include in EA for full analysis	Previously observed within the freshwater marshes of the park but limited use of habitat in the project area. Potential to occur in Northeast Shark River Slough but the park does not constitute key breeding grounds.
Tricolored heron	<i>Egretta tricolor</i>	Threatened	Include in EA for full analysis	Project would result in impacts on nesting, loafing, roosting, and foraging habitat.
Southeastern American kestrel	<i>Falco sparverius paulus</i>	Threatened	Include in EA for full analysis	Not reported as breeding in Northeast Shark River Slough, the park, but previously observed within the freshwater marshes of the park. Not likely, but potential to occur in Northeast Shark River Slough.
Florida sandhill crane	<i>Grus canadensis pratensis</i>	Threatened	Include in EA for full analysis	Occurs in freshwater marshes, prairies, and pastures. Relatively uncommon in the park but previously observed in freshwater marshes of the park and have also previously bred in the park. Not likely, but potential to occur/ breed/forage in Northeast Shark River Slough.
White-crowned pigeon	<i>Patagioenas leucocephala</i>	Threatened	Include in EA for full analysis	Limited use of habitat in freshwater marshes of the park; not breeding in the project area.
Roseate spoonbill	<i>Platalea ajaja</i>	Threatened	Include in EA for full analysis	Previously observed in the freshwater marshes of the park but limited use of habitat in the project area. Potential to occur in Northeast Shark River Slough, but the park does not constitute key breeding grounds.

COMMON NAME	SCIENTIFIC NAME	STATE STATUS	PRELIMINARY DETERMINATION	NOTES
Snowy plover	<i>Charadrius alexandrius</i>	Threatened	No effect	Shorebird that utilizes coastal beaches.
Least tern	<i>Sterna antillarum</i>	Threatened	No effect	Shorebird that utilizes coastal beaches.
American oystercatcher	<i>Haematopus palliatus</i>	Threatened	No effect	Shorebird that utilizes coastal beaches.
Black skimmer	<i>Rynchops niger</i>	Threatened	No effect	Shorebird that utilizes coastal beaches.
Osprey	<i>Pandion haliaetus</i>	Species of Special Concern	No effect	Occurs in coastal habitats and freshwater lakes and rivers.
<b>Mammals</b>				
Everglades mink	<i>Mustela vison evergladensis</i>	Threatened	No effect	Not detected in a recent wildlife camera monitoring study conducted near the Tamiami Trail culverts. Not likely to occur in project area.
Big Cypress fox squirrel	<i>Sciurus niger avicennia</i>	Threatened	No effect	Occurs in pine forests, cypress swamp forests, tropical hardwood forests, oak woodlands, coastal broadleaf evergreen hammocks, and mangrove swamps; found west of the park.
Sherman's fox squirrel	<i>Sciurus niger shermani</i>	Species of Special Concern	No effect	Occurs in the open piney woods of central and northeastern Florida.
<b>Reptiles</b>				
Rim rock crowned snake (Miami black headed snake)	<i>Tantilla oolitica</i>	Threatened	No effect	Occurs along the southeastern Atlantic Coast of Florida and the Keys in tropical hardwood hammocks and pine rocklands with shallow, sandy soils over underlying limestone, near fresh water.
Gopher tortoise	<i>Gopherus polyphemus</i>	Threatened	No effect	Occurs in well-drained sandy areas

COMMON NAME	SCIENTIFIC NAME	STATE STATUS	PRELIMINARY DETERMINATION	NOTES
<b>Plants</b>				
Pine-pink orchid	<i>Bletia purpurea</i>	Threatened	No effect	Species is found near swamps or freshwater marshes. If present in the project area, this species would not be restricted in distribution or otherwise vulnerable from removing the old Tamiami Trail roadbed and restoring wetlands. Therefore, it was not carried forward for analysis.
Lattice-vein fern	<i>Thelypteris reticulata</i>	Endangered	No effect	Occurs in Frog Pond natural area.
Wright's Pineland Fern	<i>Anemia wrightii</i>	Endangered	No effect	Occurs in Frog Pond natural area.
Mexican vanilla plant	<i>Vanilla mexicana</i>	Endangered	No effect	Occurs on tree islands in the upper Southern Glades region.
Eaton's spikemoss	<i>Selaginella eatonii</i>	Endangered	No effect	

### Other Species of Concern

One additional plant species that could occur in the project area is water horn fern (*Ceratopteris pteridoides*). This species is not listed by any regulatory agency but is considered critically imperiled in South Florida (SF1) by the Institute for Regional Conservation and a species of management concern by Everglades National Park biologists. Within Everglades National Park, water horn fern is only known to occur within the borrow canal adjacent to Shark Valley Tram Road. The species was last documented in 2007 within a stretch of the canal approximately 1 mile (1.5 km) south of the fee station. Surveys for this species have been conducted on a few occasions since 2007, the most recent of which took place in March 2017. No plants were detected. Therefore, this species is not expected to be present in the project area and was not carried forward for analysis. Mitigation to prevent adverse effects should the species be present is included in the EA.

## **APPENDIX B—PRELIMINARY SITE DESIGN**

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## **APPENDIX C—HYDROLOGIC ANALYSIS**

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As the nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering wise use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historic places, and providing for the enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people. The department also promotes the goals of the Take Pride in America campaign by encouraging stewardship and citizen responsibility for the public lands and promoting citizen participation in their care. The department also has major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

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