Florida Department of Transportation
RE-EVALUATION FORM

1. GENERAL INFORMATION (originally approved Environmental Document)

a. Re-evaluation Type: Preliminary Engineering Phase

b. Document Type and Date of Approval: EA 12/16/1998

c. Project Numbers:

N/A	201210-1-21-01	0041-130-I
ETDM (if applicable)	Financial Management	Federal-Aid

d. Project Name, Location and Limits (from original document):

Name: I-4 FROM HILLSBOROUGH C/L TO OSCEOLA C/L
Location: FDOT District 5 (Polk County)
Limits: SR 400 (I-4) from west of SR 25/US 27 to west of CR 532 (Polk/Osceola County)

e. Segments of Highway Being Advanced:

FAP Number	FM Number	Description	Funding
0041-231-I	201210-3	SR400 (I-4) W. OF US 27 (SR 25) E. OF CR 532	Federal

f. Prior Re-evaluations:

FM Number	Type	Date District Approved	Date Lead Agency Concurred	Consultation Date
201210-1-21-01	Construction Advertisement	01/28/2002	02/13/2002	05/14/2002
201214-3-52-01	Design Change	11/06/2013	11/12/2013	
201215-3-32-01	Preliminary Engineering	10/23/2014	10/29/2014	
201217-8-32-01	Preliminary Engineering	03/07/2016	03/29/2016	
201214-3-52-01	Construction Advertisement	12/16/2011	01/11/2012	06/21/2012

g. Project Segment Planning Consistency. If more than one segment is being advanced additional tables should be added. Table does not need to include past/completed phases.

Segment FM Number: 201210-3

Currently Adopted CFP-LRTP	COMMENTS
Yes	2040 LRTP Final Report Appendix B, Page B-1

PHASE	Currently Approved TIP	Currently Approved STIP	TIP/STIP $	TIP/STIP FY	COMMENTS
PE (Final Design)	Y	Y	4090116	2017	The funding is for design phase of the project. The design phase is ongoing.
R/W					No current funding for this phase.
Construction					No current funding for this phase.

**** Include pages from current TIP/STIP/LRTP***

Project Segment Planning Consistency Documentation:
None

h. Name and Title of FDOT Preparer: Beata Stys-Palasz, Senior Project Manager

2. EVALUATION OF CHANGES IN IMPACTS

	YES	NO	COMMENTS
A. SOCIAL & ECONOMIC			
1. Social	☐	☒	
2. Economic	☐	☒	
3. Land Use Changes	☒	☐	Please see attachment. [Att 1]
4. Mobility	☐	☒	
5. Aesthetic Effects	☐	☒	
6. Relocation Potential	☒	☐	Please see attachment. [Att 1]
7. Farmlands	☐	☒	
B. CULTURAL			
1. Section 4(f)	☐	☒	
2. Historic Sites/Districts	☒	☐	Please see attachment. [Att 2]
3. Archaeological Sites	☒	☐	Please see attachment. [Att 2]
4. Recreation Areas	☐	☒	
C. NATURAL			
1. Wetlands and Other Surface Waters	☒	☐	Please see attachment. [Att 3]
2. Aquatic Preserves and Outstanding	☐	☒	
3. Water Quality	☐	☒	
4. Wild and Scenic Rivers	☐	☒	
5. Drainage and Floodplains	☒	☐	Please see attachment. [Att 3]
6. Coastal Zone Consistency	☐	☒	
7. Coastal Barrier Resources	☐	☒	
8. Protected Species and Habitat	☒	☐	Please see attachment. [Att 3]
9. Essential Fish Habitat	☐	☒	
D. PHYSICAL			
1. Highway Traffic Noise	☒	☐	Please see attachment. [Att 4]
2. Air Quality Analysis	☐	☒	
3. Contamination	☒	☐	Please see attachment. [Att 4]
4. Utilities and Railroads	☒	☐	Please see attachment. [Att 4]
5. Scenic Highways	☐	☒	
6. Construction	☐	☒	
7. Bicycles and Pedestrians	☒	☐	Please see attachment. [Att 4]
8. Navigation	☐	☒	

3. EVALUATION OF MAJOR DESIGN CHANGES AND REVISED DESIGN CRITERIA (e.g., Typical Section Changes, Alignment Shifts, Right of Way Changes, Bridge to Box Culvert, Drainage Requirements, Revised Design Standards)

See attachment.

Evaluation of Major Design Changes and Revised Design Criteria Documentation:
- Attachment 5

4. COMMITMENT STATUS

See Project Commitment Record, Attachment 10

Commitment Status Documentation:
- Attachment 10

5. STATUS OF PERMITS

The Southwest Florida Water Management District Individual Environmental Resource Permit will be obtained at the appropriate time during the design and permitting phase.

The U.S. Army Corps of Engineers Individual Wetland Dredge and Fill Permit will be obtained at the appropriate time during the design and permitting phase.

The Florida Department of Environmental Protection NPDES Permit will be secured prior to construction.

6. CONCLUSION

☐ The above Environmental Document has been re-evaluated as required by 23 CFR § 771.129. It has been determined that there have been no changes to the project that affect the original environmental determination. Therefore, the Administrative Action remains valid.

It is recommended that the project identified herein be advanced to the next phase.

7. REVIEWER SIGNATURE BLOCK

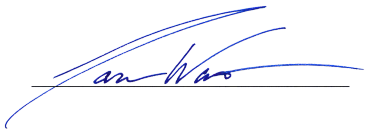
The environmental review, consultation, and other actions required by applicable federal environmental laws for this project are being, or have been, carried out by the Florida Department of Transportation (FDOT) pursuant to 23 U.S.C. §327 and a Memorandum of Understanding dated December 14, 2016 and executed by the Federal Highway Administration and FDOT.

William G. Walsh	June 6, 2017
FDOT Environmental Manager or Designee	Date

8. OFFICE OF ENVIRONMENTAL MANAGEMENT CONCURRENCE

OEM Signature Required? ☒ Yes ☐ No Date of Consultation:

Jason Watts	June 12, 2017
Print Name	Date



Director of the Office of Environmental Management or Designee

9. ATTACHMENTS

1 - 20121012101-EA-D5-Attachment_1_-_2.A._Social_&_Economic-2017-0517.pdf
2 - 20121012101-EA-D5-Attachment_2_-_2.B._Cultural-2017-0517.pdf
3 - 20121012101-EA-D5-Attachment_3_-_2.C._Natural-2017-0517.pdf
4 - 20121012101-EA-D5-Attachment_4_-_2.D._Physical-2017-0517.pdf
5 - 20121012101-EA-D5-Attachment_5_-_3._Evaluation_of_Major_Design_Changes-2017-0526.pdf
6 - 20121012101-EA-D5-Attachment_6_-_Project_Location_Map-2017-0517.pdf
7 - 20121012101-EA-D5-Attachment_7_-_Typical_Sections-2017-0517.pdf
8 - 20121012101-EA-D5-Attachment_8__-_US_27_Interchange-2017-0517.pdf
9 - 20121012101-EA-D5-Attachment_9_-_Pond_Site_Locations-2017-0517.pdf
10 - 20121012101-EA-D5-201210-1_PCR_5_26_17-2017-0526.pdf

ATTACHMENT 1

Evaluation of Changes in Social & Economic Impacts - Section 2.A.

A.3. AND A.6. Land Use and Right-of-Way Acquisitions, and Relocation Potential

The proposed improvements to I-4 Segment 5 will follow the existing alignment and will require acquisition of right-of-way for the roadway mainline and interchange improvements, stormwater management facilities and floodplain compensation sites. The total anticipated right-of-way impacts for the recommended alternative involve full or partial acquisition of 29 parcels for a total of approximately 32 acres (11 acres for roadway and 21 acres for stormwater/FPC). One of these parcels in the project study area may be impacted by both roadway and stormwater acquisitions. The right-of-way impacts due to stormwater management facilities, including floodplain compensation sites were determined in the *Pond Siting Report Segment 5: West of SR 25/US 27 to West of CR 532 (Polk/Osceola County Line) (March 2016).*

Right-of-way acquisition for the proposed improvements associated with I-4 Segment 5 involves partial or complete purchase of parcels within the project study area which may result in displacement of residential and non-residential land uses.

Of the 29 parcels anticipated for acquisition, 15 are improved with existing developments and two parcels are being utilized as existing roadways or access drives. The potentially impacted existing developments consist of commercial uses such as shopping/retail, gas stations, hotels and restaurants. Other impacted parcels are either vacant, agricultural use, or existing ponds/surface waters or municipal/utility facilities. The majority of right-of-way impacts to parcels are related to stormwater management (4 parcels, approximately 21 acres) and the remaining impacts are related to roadway improvements (26 parcels, approximately 11 acres). One parcel in the project study area is impacted by both roadway and stormwater management acquisitions. Of the 29 unique parcel IDs, five parcels are developed/occupied and may require partial or full acquisitions involving potential relocation of or business damages to existing commercial properties. No residential relocations or displacements are anticipated within I-4 Segment 5.

To minimize the unavoidable effects of right-of-way acquisition and displacement of people, FDOT will carry out a relocation assistance program in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Public Law 91-646, as amended, for Federal and Federally Assisted Programs (23 CFR and 49 CFR, Part 24, Sections 334.048, 339.09 and 421.55, Florida Statutes Rule 14-66, Florida Administrative Code). The recommended alternative for I-4 Segment 5 is not anticipated to result in any residential displacements, however a review of real estate listings using internet search engines shows there is an ample number of sites available for potential displacees to relocate to within the project study area. None of the proposed relocations are to facilities that provide distinct or unique services to disadvantaged populations protected under the Civil Rights Act of 1964 (as amended), Executive Order 12898, or FHWA Order 6640.23a. Additional information pertaining to the potentially displaced properties, including resources available to facilitate relocation and socio-economic impacts to the surrounding neighborhoods are identified in the *Conceptual Stage Relocation Plan (November 2015)* prepared for this project.

The original PD&E Study identified right-of-way impacts for Segments 7 and 9 (which contain I-4 BtU Segment 5) of 97.9 acres for roadway and 17 acres for pond sites. Much of the proposed right-of-way acquisition for the roadway was already acquired during the I-4 from SR 557 to Osceola County Line Project (Original US 27 interchange improvements and mainline 6-laning FM #201204-1).

ATTACHMENT 2

Evaluation of Changes in Cultural Resources Impacts – Section 2.B.

B.2. AND B.3. HISTORIC SITES/DISTRICTS, ARCHEOLOGICAL SITES

A Cultural Resource Assessment Survey (CRAS) in support of proposed improvements to I-4 from west of SR 25/US 27 to west of CR 532 (Polk/Osceola County Line), in Polk County, Florida was conducted to comply with Section 106 of the National Historic Preservation Act (as amended) and its implementing regulation 36 CFR Part 800 (Protection of Historic Properties). All work was performed in accordance with Part 2, Chapter 12, of the Florida Department of Transportation (FDOT) PD&E Manual (revised January 1999) and the Cultural Resource Management Handbook (revised November 2004) and is consistent with the Florida Division of Historical Resources (FDHR) recommendations for such projects as stipulated in the FDHR's *Cultural Resource Management Standards & Operations Manual, Module Three: Guidelines for Use by Historic Preservation Professionals*. The CRAS study also complied with Chapter 267 of the Florida Statutes and Rule Chapter 1A-46, Florida Administrative Code.

The CRAS served as an addendum to the report titled *Cultural Resource Assessment Survey Interstate 4 Project Development and Environment Study, Polk County, Florida* (Florida Master Site File [FMSF] Survey No. 4249) (ACI 1995). The purpose of this survey was to update the previous I-4 corridor studies, which involved locating, identifying and bounding archaeological resources within proposed pond locations and updating the inventory of historic structures and potential districts within the project Area of Potential Effect (APE). Previously undocumented resources identified in the APE were assessed for their potential for listing in the National Register of Historic Places (NRHP).

The APE was defined as the area within which the roadway improvements and subsequent maintenance may have physical, visual, audible, or atmospheric effects on historic properties. The APE as defined for this project included the existing ROW along I-4 and was extended to the back or side property lines of parcels adjacent to the corridor, limited to a distance of no more than 100 meters (330 feet) from the ROW. The APE also included the proposed pond footprints plus a 100-foot buffer. Archaeological survey was conducted within the proposed pond footprints, and the architectural study included the entire APE.

Field investigations consisted of pedestrian surface inspection and the excavation of 62 subsurface shovel tests within the footprint of the proposed ponds. Five prehistoric ceramic artifacts were recovered from three shovel tests within FPC 500C, representing a newly identified archaeological site (8PO07986). It was deemed that 8PO07986 is ineligible for the NRHP. One archaeological occurrence (AO) was also identified in FPC 500C. This AO did not meet the criteria for significance required for inclusion in the NRHP. No further archaeological survey is recommended for the proposed ponds.

The architectural survey resulted in the identification of three historic structures constructed before 1971 and located within the I-4 Segment 5 APE. The identified historic resources were evaluated to determine their significance and potential for listing in the NRHP. The historic resources within the I-4 Segment 5 APE lacked the architectural distinction and significant historical associations necessary to be considered for listing in the NRHP and were recommended ineligible. No potential NRHP districts were identified due to the lack of concentration of historic structures.

In addition to the aforementioned historic resources constructed before 1971, the Polk County Property Appraiser's records were reviewed, which indicated that 15 structures that date from 1971 to 1974 are located within the APE. Depending on the progression of the project (i.e., how much time elapses between the current study and the eventual design/construction of the project),

it may become necessary to inventory and assess these resources. Detailed evaluation of the cultural resources within the study area, including survey methodology, previously recorded resources and FMSF documentation are provided in the supplementary report, *Technical Memorandum: Cultural Resource Assessment Survey of Proposed Improvements to Segment 5: SR 400 (I-4) from West of SR 25/US 27 to West of CR 532 (Polk/Osceola County Line) in Polk County, Florida (March 2016)* prepared for this project.

Based upon the results of this study and through coordination with SHPO, it was determined the project will have no effect on resources listed or eligible for listing in the NRHP (CRAS was submitted to SHPO on March 24, 2016; SHPO Concurrence letter dated April 8, 2016 is included). The original PD&E Study determined the project would have no effect upon any properties protected under Section 106 in a letter dated August 2, 1995.

ATTACHMENT 3

Evaluation of Changes in Impacts to Natural Resources – Section 2.C.

C.1 Wetlands

A Wetlands Evaluation Report (WER) was prepared following the guidelines presented in the FDOT PD&E Manual, Part 2, Chapter 18 (FDOT, April 22, 2013) to identify jurisdictional wetlands and other surface waters along the project corridor and to document potential project related impacts. The jurisdictional extent of onsite wetlands and other surface water systems within the project corridor were evaluated through the review of current and historic aerial photography of the study area and ground-truth activities. Jurisdictional limits were identified and limits established in general accordance with the *1987 Corps of Engineers Wetlands Delineation Manual (Technical Report Y-87-1)*, the *November 2010 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region* and the *State of Florida's Delineation of the Landward Extent of Wetlands and Surface Waters (Chapter 62-340, Florida Administrative Code)*. Preliminary estimates suggest that 19.01 acres of jurisdictional wetland communities and 1.82 acres of other surface waters will be impacted by the proposed I-4 Segment 5 improvements. These estimates are based on field assessment of jurisdictional limits and preliminary plan preparation for design. Details regarding the wetlands and proposed wetland impacts can be found in the *Wetland Evaluation Report (April 2016*) prepared for this project. Impacts to jurisdictional areas will be refined as design details are finalized. Mitigation will be provided to offset the impacts satisfying the requirements of Part IV Chapter 373, F.S. and 33 U.S.C.s. 1344. The conceptual mitigation plan created for the study identified four permitted mitigation banks that provide service to the project area and currently have sufficient herbaceous and forested UMAM credits that can offset the proposed project impacts. The original PD&E Study identified 15.4 acres of wetland impacts within Segments 7 and 9 (those segments that contain the I-4 BtU Segment 5 project area). A mitigation to offset wetland impacts for the project was prepared and consisted of the following options: 'in-kind' replacement, wetland enhancement, and/or mitigation banking, which would be finalized during project permitting.

Commitments pertaining to Wetlands can be found in the Project Commitment Record.

C.5. Floodplains and Drainage

Floodplains

The Federal Emergency Management Agency (FEMA) has developed Flood Insurance Rate Maps (FIRM) for Polk County. According to FEMA Map Numbers 12105C0100F, 12105C0125F and 12105C0225F, portions of the roadway are located within Zone A of the 100-year floodplain. Based on the FEMA floodplain lines, the roadway widening will impact the floodplain on both sides of the roadway. There are no regulatory floodways within the project corridor.

There are two basins within the project limits that encroach upon the 100-year floodplain: Basins 505 and 506. Compensation is provided in proposed floodplain compensation ponds (FCP). The total project floodplain impacts equal 18.65 acre-feet and the total project floodplain compensation equals 19.13 acre-feet. Detailed floodplain impacts and compensation calculations are provided in *the Pond Siting Report, Segment 5: West of SR 25/US 27 to West of CR 532 (Polk/Osceola County Line), (March 2016).*

The original PD&E Study identified 82.39 acre-feet of impacts, though it was not broken down by project segment, so it is unable to be determined what the impacts for the segments within the I-4 BtU project would have been.

Drainage

The original PD&E Study designed the stormwater management system to meet the Southwest Florida Water Management District criteria. The project is separated into nine (9) basins in the existing condition, all of which are open except two. Most of the basins consist of the pond sites and the full roadway right-of-way. The project lies within two (2) primary basins: Ocklawaha River Basin and Kissimmee River Basin.

This section of I-4 includes an interchange with SR 25/US 27 and an overpass at CR 54. The stormwater runoff, from the beginning of the project to west of the SR 25/US 27 interchange, is treated with wet detention ponds and eventually discharges to the Ocklawaha River Basin. The basin located in the north section of the interchange is treated with dry retention ponds and retains the runoff from the 100-year/24-hour storm event; therefore, this basin is considered a closed basin. The basins located east of the SR 25/US 27 interchange are designed as wet detention ponds and discharge to the Kissimmee River drainage basin. Typically, as I-4 was expanded beyond its original four lanes, water quality treatment was provided for the existing impervious area. There are portions of existing I-4 that currently receive no water quality treatment.

The original PD&E Study proposed both a drainage plan for the urban typical section and one for the rural typical section. For the rural section (which this segment of the BtU falls within), the project proposed to have storm water runoff be directed to the outside and collected in roadside ditches. Roadway storm water runoff to the inside would be collected in median inlets and conveyed to the outside roadside ditches. Stormwater would be conveyed by the roadside ditches to storm water management ponds generally situated outside the proposed right-of-way in close proximity to outfall stations. It was anticipated that all of the outfall drainage structures, including cross-drains, would be removed and/or replaced as part of the improvements of this project.

This I-4 BtU project will make improvements to the water quality along the roadway corridor. The stormwater runoff from both the new and existing impervious areas will be treated in existing and proposed stormwater facilities. The stormwater runoff will be collected by storm sewer systems and roadside ditches. The water quality treatment and attenuation will be achieved through the expansion and construction of both infield ponds and offsite ponds, some of which will require acquisition of additional right-of-way (21.1 acres). The stormwater will be routed to existing and proposed dry retention and wet detention stormwater ponds. In areas with poor soils and high water table, only wet detention ponds were considered. The ponds were sized based on the assumption that most of the offsite runoff would be drained through separate systems. For a majority of the ponds, the location of where the proposed basins begin and end is the same as the existing condition. The location of the outfall in the proposed condition is the same as the existing. None of the basins discharge to an Outstanding Florida Water (OFW).

One existing pond site and one proposed pond site will provide water quality treatment and peak discharge attenuation from the beginning of the project to west of the I-4 and SR 25/US 27 Interchange. The basins are open and treatment will be provided in the form of wet detention ponds that ultimately discharge to the Ocklawaha River Basin. Two basins within the project discharge to Horse Creek, which ultimately discharge to the Kissimmee River Basin. A combination of five existing and proposed pond sites (two regional ponds and three infield ponds) will provide water quality treatment and peak discharge attenuation from the I-4 and SR 25/US 27 Interchange to west of CR 54. There is one basin within the project that discharges to the Davenport Creek, which ultimately discharges to the Kissimmee River Basin. One existing pond site will provide water quality treatment and peak discharge attenuation from just west of CR 54 to the end of the project. The basin is open and treatment will be provided in a wet detention pond.

This section of I-4 includes the SR 25/US 27 interchange; all of the existing interchange ponds will be expanded and/or regraded as necessary. The interchange ponds consist of two closed basins and one open basin. There will be floodplain impacts from the proposed improvements to the I-4 Mainline (18.65 acre-feet).

Proposed pond sites

Nineteen potential stormwater management facilities were evaluated for this segment (sixteen potential pond sites and three potential floodplain compensation ponds (FCP)). Eleven are existing facilities which were previously permitted and are being modified or enlarged to meet the requirements of the project. Eight new pond sites are proposed. The following 16 pond sites are recommended to be carried forward (see Pond Site Map in **Attachment 9**).

Pond Site FPC 506 (Recommended)

Pond Site FPC 506 is a 5.95 acre size pond located west of the US 27 interchange, along the westbound roadway. This is a proposed new floodplain compensation pond. The pond site is currently a mix of ditches and swales with associated berms, maintained right-of-way dominated by Bahia grass, and wetlands west of the right-of-way primarily comprised of pines with areas of cypress and standing water. Vegetation in the ditches and swales is comprised primarily of cattails, Carolina willow, primrose, and broomsedge. The construction of this pond will result in the impact to 3.27 acres of wetlands and 0.26 acres of surface waters. There will be no listed species involvement, no contamination involvement, and no cultural resource impacts (SHPO concurrence letter dated April 8, 2016). This pond is within the existing right-of-way and will not require further acquisitions.

Pond Site 506 (Recommended)

Pond Site 506 is a 5.35 acre size pond located west of the US 27 interchange, west of the right-of-way. This is a proposed new pond site. The pond site is primarily used for pasture and is comprised pines with some saw palmetto in the understory. An open area comprised of Bahia grass is present at the southern portion of the site. This pond site will result in 0.37 acres of wetland impacts and 0.20 acres of surface water impacts. There will be no listed species involvement, no contamination involvement, and no cultural resource impacts (SHPO concurrence letter dated April 8, 2016). This pond will require additional right-of-way (6.07 acres) for construction.

Pond Site 500 (Recommended)

Pond Site 500 is a 3.94 acre size pond located southwest of the US 27 interchange, along the westbound roadway. This is an existing pond site, proposed to be regraded. The pond site is primarily dominated by cattails at the north end and has a mix of duck potato, torpedo grass, primrose, and Carolina willow in the shallower south end. The banks are dominated by cogon grass and weedy herbaceous species. The pond site does not propose any wetland impacts, has no listed species involvement, no cultural resource impacts (SHPO concurrence letter dated April 8, 2016), and no contamination involvement. This pond is within the existing right-of-way and will not require further acquisitions.

Pond Site 501A (Recommended)

Pond Site 501A is 4.86 acre size pond located within the US 27 and I-4 interchange in the west quadrant. This is an existing pond site, proposed to be reduced in size and regraded. The pond site is primarily maintained Bahia grass with some patches of cogon grass with some planted trees for landscaping. The pond site does not propose any wetland impacts, has no listed species involvement, no cultural resource impacts (SHPO concurrence letter dated April 8, 2016), and no contamination involvement. This pond is within the existing right-of-way and will not require further acquisitions.

Pond Site 501B (Recommended)
Pond Site 501B is a 8.91 acre size pond located within the US 27 and I-4 interchange in the west quadrant. This is an existing pond site, proposed to be enlarged and regraded. The pond site is primarily maintained Bahia grass with some patches of cogon grass with some planted trees for landscaping. The pond site does not propose any wetland impacts, has no listed species involvement, no cultural resource impacts (SHPO concurrence letter dated April 8, 2016), and no contamination involvement. This pond is within the existing right-of-way and will not require further acquisitions.

Pond Site 501C (Recommended)
Pond Site 501C is a 0.48 acre size pond located within the US 27 and I-4 interchange in the west quadrant. This is an existing pond site, proposed to be regraded. The pond site is primarily maintained Bahia grass with some patches of cogon grass with some planted trees for landscaping. An active gopher tortoise burrow was observed to the east of the pond site within the right-of-way. The pond site does not propose any wetland impacts, has no listed species involvement, no cultural resource impacts (SHPO concurrence letter dated April 8, 2016), and no contamination involvement. This pond is within the existing right-of-way and will not require further acquisitions.

Pond Site 502 (Recommended)
Pond Site 502 is located southwest of the intersection of Frontage Road and Southwest Access Road. This is an existing permitted pond site with no modifications proposed. The pond site is primarily maintained Bahia grass. The pond site does not propose any wetland impacts, has no listed species involvement, no cultural resource impacts (SHPO concurrence letter dated April 8, 2016), and no contamination involvement. This pond is within the existing right-of-way and will not require further acquisitions.

Pond Site 504 (Recommended)
Pond Site 504 is a 3.51 acre size pond located west of US 27, along the south side of Heller Brothers Boulevard. This is an existing pond site; no modifications are proposed. The pond site is primarily maintained Bahia grass. Two active gopher tortoise burrows and one inactive burrow were observed within this pond site. Two additional active gopher tortoise burrows were observed along the southwestern fence line of the pond site. The pond site does not propose any wetland impacts, has no listed species involvement, no cultural resource impacts (SHPO concurrence letter dated April 8, 2016), and no contamination involvement. This pond is within the existing right-of-way and will not require further acquisitions.

Pond Site 503A (Recommended)
Pond Site 503A is a 1.56 acre size pond located within the US 27 and I-4 interchange in the northeast quadrant. This is an existing pond site, proposed to be reduced in size and regraded. The pond site is primarily maintained Bahia grass and planted trees for landscaping. The pond site does not propose any wetland impacts, has no listed species involvement, no cultural resource impacts (SHPO concurrence letter dated April 8, 2016), and no contamination involvement. This pond is within the existing right-of-way and will not require further acquisitions.

Pond Site 503B (Recommended)
Pond Site 503B is a 12.35 acre size pond located within the US 27 and I-4 interchange in the northeast quadrant. This is an existing pond site which is proposed to be enlarged and regraded. The pond site is primarily maintained Bahia grass with some patches of cogon grass and planted trees for landscaping. The pond site does not propose any wetland impacts, has no listed species involvement, no cultural resource impacts (SHPO concurrence letter dated April 8, 2016), and no contamination involvement. This pond is within the existing right-of-way and will not require further acquisitions.

Pond Site 503C (Recommended)
Pond Site 503C is a 2.47 acre size pond located within the US 27 and I-4 interchange in the northeast quadrant. This is the western half of an existing pond site which is proposed to be modified and regraded. The pond site is primarily maintained Bahia grass with some patches of cogon grass and torpedo grass with some planted trees for landscaping. The pond site does not propose any wetland impacts, has no listed species involvement, no cultural resource impacts (SHPO concurrence letter dated April 8, 2016), and no contamination involvement. This pond is within the existing right-of-way and will not require further acquisitions.

Pond Site 503D (Recommended)
Pond Site 503D is a 2.85 acre size pond located within the US 27 and I-4 interchange in the northeast quadrant. This is the eastern half of an existing pond site which is proposed to be modified and regraded. The pond site is primarily maintained Bahia grass with some patches of cogon grass and torpedo grass with some planted trees for landscaping. The pond site does not propose any wetland impacts, has no listed species involvement, no cultural resource impacts (SHPO concurrence letter dated April 8, 2016), and no contamination involvement. This pond is within the existing right-of-way and will not require further acquisitions.

Regional Pond 1 (Recommended)
Regional Pond 1 is located northwest of the US 27 interchange, to the west of the right-of-way. This is a proposed new 2.20 acre pond site. The existing site is entirely planted pines with some small fallow citrus, persimmon, cherry, scrub live oak, and weedy herbaceous species in the understory. The pond site does not propose any wetland impacts, no cultural resource impacts (SHPO concurrence letter April 8, 2016), and no contamination involvement. This pond site contains areas determined to be occupied sand skink habitat based upon the sand skink survey and habitat criteria established by the USFWS. Formal Consultation with USFWS has been completed (Biological Opinion February 21, 2017) to address the impacts to the sand skink and blue-tailed mole skink from the project. This pond will require additional right-of-way (in combination with Regional Pond 2, it will require 10.79 acres).

Regional Pond 2 (Recommended)
Regional Pond 2 is a 5.85 acre size pond located northwest of the US 27 interchange, to the west of the right-of-way. This is a proposed new pond. The existing site is entirely planted pines with some small fallow citrus, persimmon, cherry, scrub live oak, and weedy herbaceous species in the understory. The pond site does not propose any wetland impacts, no cultural resource impacts (SHPO concurrence letter dated April 8, 2016), and no contamination involvement. This pond site contains areas determined to be occupied sand skink habitat based upon the sand skink survey and habitat criteria established by the USFWS. Formal Consultation with USFWS has been completed (Biological Opinion February 21, 2017) to address the impacts to the sand skink and blue-tailed mole skink from the project. This pond will require additional right-of-way (in combination with Regional Pond 2, it will require 10.79 acres).

Pond Site FPC 500D (Recommended)
Pond Site FPC 500D is a 3.08 acre size pond located east of the US 27 interchange, to the west of the right-of-way. This is a proposed new floodplain compensation pond. The existing site is entirely planted pines with some small fallow citrus, persimmon, cherry, scrub live oak, and weedy herbaceous species in the understory. The pond site does not propose any wetland impacts, no cultural resource impacts (SHPO concurrence letter dated April 8, 2016), and no contamination involvement. This pond site contains areas determined to be occupied sand skink habitat based upon the sand skink survey and habitat criteria established by the USFWS. Formal Consultation with USFWS has been completed (Biological Opinion February 21, 2017) to address the impacts to the sand skink and blue-tailed mole skink from the project. This pond will require additional right-of-way to construct (4.24 acres).

Pond Site 100 (Segment 1) (Recommended)

Pond Site 100 is a 5.62 acre size pond located to the east of I-4, just northeast of the Ronald Reagan Parkway overpass. It is part of I-4 Segment 1, but is included in this report as well. This pond is proposed to be expanded. The existing pond is about half open water and half cattails and is surrounded by primrose, maidencane, torpedo grass, salt bush, and wax myrtle. The banks are primarily composed of mowed Bahia grass and some cogon grass. The area just north of the pond is forested with red maple, cabbage palm, wax myrtle, and salt bush. The pond site does not propose any wetland impacts, has no listed species involvement, no cultural resource impacts (SHPO concurrence letter dated April 8, 2016), and no contamination involvement. This pond is within the existing right-of-way and will not require further acquisitions.

Cross Drains:

There are four cross drains within the project corridor. Through hydraulic analysis, it was determined that all cross drains need to be upsized. Detailed information including analysis and calculations relating to the drainage along the project corridor are provided in the supplemental reports: *Location Hydraulic Report Segment 5: West of SR 25/US 27 to West of CR 532 (Polk/Osceola County Line) (March 2016)* and *Pond Siting Report Segment 5: West of SR 25/US 27 to West of CR 532 (Polk/Osceola County Line) (March 2016).*

C.8. Protected Species and Habitat

A supplemental *Endangered Species Biological Assessment Segment 5: SR 400 (I-4) from West of SR 25/US 27 to West of CR 532 (Polk/Osceola County Line) (April 2016)* was prepared to identify wildlife species of known or potential occurrence and natural habitat types along the I-4 BtU Segment 5 project corridor and to document potential project-related impacts. The methodology used to conduct the wildlife assessment included research of existing records and review of literature published by the Florida Natural Areas Inventory (FNAI), the Florida Fish and Wildlife Conservation Commission (FFWCC), the U.S. Fish and Wildlife Service (USFWS) and other relevant scientific publications. Based on these sources, 33 species of animals and 71 species of plants have been identified as potentially occurring in Polk County, though suitable habitat may not be available for all of the species along the project corridor. Of these species, 11 are federally listed animals, 20 are federally listed plants, 22 are state listed animals and 50 are state listed plants. The results of the field surveys allowed for the preparation of the effects determinations for the species with the potential to occur within the corridor and be potentially impacted by the project. The project is anticipated to impact the federally listed sand skink, blue-tailed mole skink, and scrub plum. Consultation with the USFWS to analyze the potential impacts to these species was initiated via email from FHWA on June 24, 2016. Further information was supplied at USFWS request, and Formal Consultation was initiated on October 14, 2016. The results of this are presented in a Biological Opinion (BO) which was completed on February 21, 2017.

USFWS concurred with the FDOT's determination that the project May Affect, and is Likely to Adversely Affect the sand skink, the blue-tailed mole skink, and the scrub plum, and that the project May Affect, but is Not Likely to Adversely Affect the eastern indigo snake, Florida scrub-jay, Audubon's crested caracara, wood stork, and Britton's beargrass.

The BO concluded that the project as proposed will result in the loss of 21.04 acres (8.5 hectares) of occupied skink habitat, and that this will be "moderated" by the acquisition of 42.08 credits at a Service Approved Conservation Bank, where the habitat will be enhanced, managed, and preserved in perpetuity to benefit the sand skink and blue-tailed mole skink. No additional measures or conditions are necessary to reduce the taking of the sand skink and blue-tailed mole

skink. However, the Monitoring and Reporting Requirements and Disposition of Dead and Injured Specimens will be adhered to and have been added as new project commitments.

FDOT has proposed to remove and relocate any viable scrub plum plants prior to the commencement of construction in coordination with staff from the Rare Plant Conservation Program at Bok Tower Gardens in Lake Wales, Florida.

No Conservation Recommendations are proposed by the USFWS in the BO.

The original PD&E Study concluded that the project would impact scrub-jay territories and would be subject to consultation with USFWS. However, during the re-evaluation it was determined that the area where the scrub-jays were previously identified no longer contain scrub-jay habitat. USFWS concurred that the project May Affect, but Not Likely Adversely Affect the Florida scrub-jay as referenced above. The original PD&E Study did not address skinks.

Commitments pertaining to Protected Species and Habitat can be found in the Project Commitment Record.

ATTACHMENT 4

Evaluation of Changes in Physical Impacts – Section 2.D.

D.1. Highway Traffic Noise Impact Analysis

A *Noise Study Report (NSR)* based on procedures established in Part 2, Chapter 17 "Highway Traffic Noise," of the FDOT PD&E Manual was completed for I-4 Segment 5. A new Noise Study Report was completed, due to the original report covering additional areas that are not subject to this segment of I-4 BtU, and this is not an addendum to original study. The NSR was prepared to document predicted noise levels associated with the I-4 Segment 5 improvements and to determine if noise levels will be likely to increase, if noise-sensitive receivers are (or will be) within the project area and if noise impacts will occur. If noise levels reach or exceed 66 decibels (dB), or increase 15 dB over existing noise, noise abatement must be considered. The FHWA's *Traffic Noise Modeling (TNM) Version 2.5* computer program was used to determine if noise abatement was warranted, and if so, considered reasonable and feasible for any noise-sensitive sites. The noise analysis was prepared using guidance based on regulatory material found in 23 Code of Federal Regulations (CFR), Part 772, and entitled *"Procedures for Abatement of Highway Traffic Noise and Construction Noise"* and section 335.17, Florida Statutes (F.S.), State Highway Construction; Means of Noise Abatement.

Three noise sensitive areas (NSA) that have the potential to be impacted by the project were identified within the study corridor. The potential noise-sensitive sites identified for this segment consist of single family residences, multi-family vacation residences, hotels and a campground. The TNM analysis of noise sensitive areas predicted that a total of 105 noise-sensitive sites may be impacted: 14 sites within NSA A, 1 site within NSA B and 90 sites within NSA C (Refer to the *Noise Study Report* for details on the locations of each NSA and their respective receptors).

The results of the noise barrier analysis indicate that two noise barriers in NSA C will provide the best noise abatement and meet the requirements as reasonable and feasible, and are recommended for further consideration during the design phase of this segment of the project. The recommended barrier configuration for the Phase I Festival Orlando Resort within Noise Sensitive Area C includes either:

- a 16-foot tall, 898-foot long ground mounted barrier (estimated cost $430,862 for an average cost of $13,464 per benefited receptor), or
- a 14-foot tall, 954-foot long shoulder mounted barrier (estimated cost $400,523 for an average cost of $12,516 per benefited receptor)

The recommended barrier for the Phase II Festival Orlando Resort within Noise Sensitive Area C includes either:

- a 16-foot tall, 1,157-foot long ground mounted barrier (estimated cost $555,597 for an average cost of $11,575 per benefited receptor), or
- a 12-foot tall, 1,552-foot long shoulder mounted barrier (estimated cost $558,711 for an average cost of $7,550 per benefited receptor)

The barrier analysis also indicated that no reasonable or feasible measures are achievable for the impacted sites within NSA A. Noise barriers were not modeled for NSA B, as this area was predicted to have only a single impacted receiver. Details on noise abatement criteria, noise-sensitive areas, traffic noise modeling and noise abatement measures are provided in the supplemental report, *Noise Study Report Segment 5: SR 400 (I-4) from West of SR 25/US 27 to West of CR 532 (Polk/Osceola County Line) (April 2016*) prepared for this project.

Commitments pertaining to noise and noise barriers can be found in Section 4.

The original PD&E Study did not identify any noise barriers that were reasonable and feasible for noise abatement within the segment of the project that contains Segment 5 of the I-4 BtU project.

D.3. Contamination

A Contamination Screening Evaluation Report (CSER) is used to determine the likelihood of petroleum or other hazardous substance impacts to the project. The CSER, completed in accordance with Part 2, Chapter 22 (January 17, 2008 revision) of the PD&E Manual contains results from a physical site investigation of the project corridor, a limited investigation of properties along the corridor adjacent to the ROW as viewed from areas of public access, a review of Florida Department of Environmental Protection (FDEP) files, Polk County records and available environmental databases.

As part of the CSER, a review of the FDEP Oculus Database was conducted to determine locations of contaminated sites followed by visual inspection of properties adjacent to the corridor and properties within half a mile of the roadway. Known contamination sites and properties with potential contamination were identified and assigned a risk rating based on the degree of concern for potential contamination problems. A total of 38 sites or properties within 1/2 mile of the current I-4 right-of-way and proposed pond sites were identified by searches in the FDEP contamination database or by field inspections. Of these sites, one had a high risk rating, 13 had a medium risk rating and the remaining 24 sites received a low risk rating. All medium and high risk sites will be subject to a Level 2 Assessment.

Pond sites were inspected via pedestrian transects and rated for their potential to have contamination. Out of the nineteen pond sites (11 existing facilities and eight new/proposed sites), 14 pond sites were given a medium risk rating and the remaining five sites were given a low risk rating. Three sites were identified as groundwater contamination plumes of ethylene dibromide (EDB) and encompass 23 other listed contamination sites in addition to pond sites 500, 501A, 502, 503A, 503B, 503C, 503D, and 506. Pond Site 501B is located adjacent to a delineated groundwater contamination plume and Pond 504 is located near active and historic citrus groves. Pond Sites FPC 500D, Pond 505 A3/Regional Pond 2, and Regional Pond 1 have fallow citrus trees and were likely groves. All fourteen pond sites that have the potential to have EDB contamination were given medium risk ratings. However, existing pond sites which are not proposed to be modified and were identified as having the potential to have groundwater contamination may not warrant additional testing based on depth to groundwater and/or not having proposed modifications. At a minimum, all pond sites selected for final design will be tested for metals. As such, Level II testing will be performed at those sites selected by the best available current data for contaminants of concern. Furthermore, additional testing may be required at these or other sites during the design phase based upon the construction plans. Additional details can be found in *the Contamination Screening Evaluation Report Segment 5: SR 400 (I-4) from West of SR 25/US 27 to West of CR 532 (Polk/Osceola County Line) (April 2016)*.

Based on historic aerials, land use in the area before the construction of I-4 consisted of rural citrus groves, pasture land, and natural lands. Potential contamination impacts from anthropogenic activities include additional EDB contamination and pesticide/herbicide/fertilizer contamination from the citrus groves and arsenic contamination from potential cattle dipping vats associated with the pastures. However, the existence, exact location and severity of these potential sources of contamination are unknown.

The original PD&E Study identified four Medium risk sites within the entire project corridor, three of which occur within the vicinity of the US 27 / I-4 Interchange which was subject to the current contamination screening evaluation.

D.4. Utilities

Numerous utility companies have utilities located within the project corridor. Utility impacts were carefully evaluated when considering the proposed roadway improvements and stormwater pond locations. The location of overhead utilities, existing power poles and access issues were also evaluated to minimize impacts. However, smaller gas lines and other buried utilities may involve relocation.

Most utility companies have the capability to adjust their services without causing major inconveniences to the customers. As a result, mitigation measures, to the maximum extent feasible, will include the following:

- Maintaining utility connections in temporary locations;
- Minimizing the time without service;
- Installing alternative or new service before disconnecting the existing service; and
- Allowing service disruption only during periods of non-usage or minimum usage.

A *Utility Impact Assessment (September 2015)* report has been prepared concurrently with this effort and submitted under separate cover. Exact locations of existing utilities will be determined during the design of the proposed improvements. Coordination with the known utility companies during the final design phase will assist in minimizing relocation adjustments and disruptions of service to the public.

The original PD&E Study identified the known utility systems and potential impacts within the corridor. Exact locations and conflicts were to be determined during the design phase. Potential relocation costs were considered during the alternatives analysis process and the selection of the preferred alternative.

D.6. Bicycles and Pedestrians

Plans for future bicycle and pedestrian accommodations were evaluated by reviewing the Polk County TPO's *2035 MVP.* Four roadway segments within Segment 5 were identified as sidewalk and bicycle facility needs in the *2035 MVP*, though none are within the top 100 sidewalk or bicycle facility needs for projects in 2035. According to Polk County TPO's Multi-Use Trail Network Map, there are no planned multi-use trails (paved or unpaved) within the Segment 5 study area.

The original study proposed pedestrian and bicycle accommodations on the non-interchange cross-roads and on the cross-roads at the interchanges. The only area where this was applicable was at US 27, which proposed a 5-foot sidewalk and 4-foot bike lanes. The existing configuration along US 27 over I-4 contains sidewalks which are separated by barrier from the roadways that will remain for the proposed I-4 BtU project. No changes to these sidewalks are proposed in the BtU project as they were constructed during the US 27 Interchange improvement project.

Attachment 5

3. EVALUATION OF MAJOR DESIGN CHANGES AND REVISED DESIGN CRITERIA

(e.g., Typical Section Changes, Alignment Shifts, Right of Way Changes, Bridge to Box Culvert, Drainage Requirements, Revised Design Standards)

This reevaluation is to open the design phase and document design changes made to the I-4 Beyond the Ultimate (BtU) Segment 5 project. The segment that comprises the I-4 BtU Segment 5 PD&E Study Update Project (FPN 201210-1) limits are from west of SR 25/US 27 to west of CR 532 (Polk/Osceola County Line) from Milepost (MP) 27.145 to MP 31.607 in Polk County (See location map in **Attachment 6**). The limits of the original EA/FONSI project were from west of Memorial Boulevard to the Polk/Osceola County Line (from MP 2.565 to MP 32.022 for a total of 29.5 Miles). The original project was comprised of 8 segments (Segments 2 – 9). This reevaluation correlates to Segment 7 (from east of US 27 to Polk/Osceola County Line) and Segment 9 (US 27 Interchange from west of US 27 to East of US 27) from the original EA/FONSI project limits. There are no changes to the other segments of the original project covered under the EA/FONSI as a part of this re-evaluation. The I-4 BtU Segment 5 is a single design project.

- **201210-3**: SR 400 (I-4) from west of SR 25/US 27 to west of CR 532 (Polk/Osceola County Line)

A previous reevaluation for Design Change and Construction Authorization (02/13/2002) was completed for the interim project consisting of the 6-laning (widening from 4 to 6 lanes with a new General Use Lane in each direction to the outside of the existing lanes) of I-4 in which construction was completed. This re-eval also reduced the median width for a rail corridor from 66 feet to 44 feet.

This reevaluation involves revising the original design concept showing 6 General Use Lanes (GUL) + 4 Special Use Lanes (SUL) for High Occupancy Vehicles (HOV) from west of SR 25/US 27 to west of CR 532 (Polk/Osceola County Line, as recommended in the FONSI for SR 400 (I-4) from West of Memorial Boulevard (SR 546) to the Polk/Osceola County Line (FPN 201210-1, December 1998), to the current proposed design of 6 general use and 4 express lanes (EL). The express lanes are tolled lanes and will extend the full length of the project. The access to/from the tolled lanes will be evaluated as part of this effort to determine if changes are needed from the previously approved concept for access to/from the SUL/HOV Lanes.

The original I-4 PD&E Studies involved physical separation between the general use lanes and the SUL/HOV lanes on I-4, with demand management in the HOV lanes. The original demand management strategy was to control the use of the HOV lanes by requiring a minimum number of occupants per vehicle to maintain an acceptable level of service (Level of Service D). This reevaluation also addresses revising the demand management tool to convert the HOV lanes to tolled express lanes.

*Note: The project is being designed to match the segments of the I-4 BtU project adjacent to this segment (Segments 1 and 2) and the I-4 Ultimate Project (From SR 435 (Kirkman Road) to SR 434) to the east. During a design re-evaluation for the I-4 Ultimate project in 2005, the Special Use Lanes (which were described as HOV lanes) were converted to Tolled-Express Lanes. Since no existing HOV lanes were present on I-4, this change was approved by FHWA for the project moving forward. For I-4 BtU Segment 5 (the subject of this re-evaluation), the same situation occurs: there are no HOV lanes on I-4 to be considered, so the design change from Special Use Lanes to Tolled-Express Lanes is similarly being proposed.

Design Changes:

Typical Section

The original study proposed two typical sections, one urban section for the section of the project west of Memorial Blvd. to east of SR 33, and a rural typical section from SR 33 to the Polk/Osceola County line. Both contained the same configuration of 6 GUL and 4 SUL/HOV (see **Attachment 7**). The difference between the two is the overall width of the proposed right-of-way (ROW), which is a minimum of 300 feet in the urban section, and 422 feet in the rural section. For the purposes of this reevaluation, only the rural typical section is relevant as this I-4 BtU design segment (Segment 5) does not extend into the section with the urban typical design. The following features are included in the original rural typical section:

- 12-foot wide GUL and SUL lanes
- Inside and outside paved shoulders
- Barrier walls separating SUL from GUL
- 66-foot wide median for future rail

The recommended general mainline typical section for I-4 BtU Segment 5 will have a total of ten dedicated lanes (6 GUL + 4 Express Lanes) and includes a 44-foot rail envelope in the median within a minimum 300-foot ROW.

The typical section for I-4 provides a design speed of 70 mph; other common features of the typical section include:

- 12 foot paved outside shoulders (general use lanes and express lanes),
- 12 foot paved inside shoulders for the general use lanes
- 10 foot paved inside (median) shoulders for express lanes (where applicable) and
- A 2-foot-wide barrier wall between the general use and express lanes.

Design Traffic & Systems Access Modification (SAMR) Re-evaluation

Development of project traffic for I-4 and surrounding arterials within the study limits of Segment 5 was based on the procedures outlined in the *Methodology Letter of Understanding (MLOU) (October 2014 Update)* and are provided in the *I-4 SAMR Re-Evaluation – Traffic Volumes Development Report (June 2015)* prepared for this project. Both of these documents are included as an appendix to the *I-4 Beyond the Ultimate Systems Access Management Report Re-evaluation, South Section from West of US 27 to East of SR 528* prepared for this project. The SAMR was submitted to FHWA August 12, 2016 for review and approval. The approval date from FHWA was May 9, 2017.

Interchanges

The original study identified interchange configurations at Memorial Blvd, Kathleen Road (SR 539), US 98 (SR 35 and 700), Socrum Loop Road (CR 582), SR 33, SR 559, CR 557, and US 27. Only the interchange at US 27 falls within the project limits of Segment 5 of the I-4 BtU project.

US 27 – Original Study

The preferred alternative selected during the PD&E Study was Alternative 4, which proposed an expansion of the existing partial cloverleaf interchange configuration. The ramps in the northwest and southeast quadrants would be expanded outward. The ramp terminals would be moved north and south, respectively, of the existing locations. The south ramp terminal would be aligned with the relocated frontage road intersection with US 27. The limited access right-of-way would be

extended in the southeast quadrant to a point north of the taper for US 27 southbound to I-4 westbound entrance ramp. The limited access right-of-way in the northeast and southwest quadrants would not be extended along US 27 northward and southward, respectively, beyond the intersections of the US 27 and I-4 mainline rights-of-way thus maintaining access from US 27 to the adjacent businesses and eliminating the need for back access roads.

This interchange configuration was constructed in the interim between the completion of the original project study and the I-4 BtU project.

The recommended alternative for the I-4 BtU Segment 5 provides an interchange design at only 1 location: US 27.

US 27 – BtU Study

The existing I-4 and US 27 interchange is a full service partial cloverleaf with loop ramps in the northwest and southeast quadrants. Existing frontage roads are located in the northwest and southwest quadrants. The northwest quadrant frontage road is an access road that runs parallel to the I-4 westbound on ramp, providing access to parcels. The southwest quadrant frontage road runs parallel to eastbound I-4 and intersects with US 27 at two locations near the eastbound loop ramp. The preferred alternative is a full service partial cloverleaf interchange with loop ramps in the northwest and southeast quadrants. Eleven new bridges, modifications to the ramp terminal intersections and improvements to Posner Boulevard are associated with this alternative. Direct access to and from the express lanes is provided at the US 27 ramp terminals, rather than at the US 27 bridge (see **Attachment 8**).

US 27 Bridge Summary

In the northbound direction on US 27, two new bridges are proposed, one over Posner Boulevard and one over the I-4 eastbound ramps. The bridge over the Interstate (eastbound and westbound I-4) will be replaced. In the southbound direction on US 27, three new bridges are proposed: over the I-4 westbound ramps, one over Posner Boulevard and one U-turn ramp just north of Ernie Caldwell Boulevard.

I-4 Eastbound Ramp Terminal

At the I-4 eastbound ramp terminal, a new two-lane on ramp from US 27 northbound to I-4 eastbound will diverge as it approaches the loop ramp in the southeast quadrant. The left split will connect to the two-lane on ramp that bridges over the eastbound GULs and connects directly to I-4 eastbound ELs. The right split will continue as a two-lane on-ramp to the eastbound GULs. Traffic from US 27 southbound and the Frontage Road will use an on ramp that goes under the US 27 northbound lanes, over two other ramps in the southeast quadrant and onto a left and right split to access the eastbound ELs and GULs, respectively. The new southeast quadrant loop off ramp is three lanes which diverges to provide access via dual lefts to US 27 southbound, one through lane to align with Frontage Road and two lanes curving around to merge with US 27 northbound.

I-4 Westbound Ramp Terminal

At the westbound ramp terminal, I-4 westbound GULs will be accessed by a new two-lane on ramp in the northwest quadrant. The exit loop ramp in the northwest corner will be modified to be tighter and will diverge, with the left split going under two on-ramp bridges and under the US 27 southbound lanes before merging with US 27 northbound. The right split will curve around and diverge also, with one lane eastbound (commercial property access) and two lanes southbound (merging with US 27).

US 27 and Posner Boulevard Intersection

Improvements to the US 27 and Posner Boulevard intersection include grade separation with US 27 going over Posner Boulevard. The east approach (Posner Boulevard) will be modified to triple lefts and two through lanes, with right turn movements eliminated. The triple lefts will provide access to US 27 southbound and to a two lane frontage road which will carry traffic to the new U-turn loop ramp for access to US 27 northbound. The west approach (Home Run Boulevard) has been modified to two through lanes and dual rights, with left turn movements eliminated. Right turn traffic has the option to utilize the frontage road to U-turn loop ramp for access to US 27 northbound or use a separate merge lane to travel to US 27 southbound.

Right-of-way acquisition (9.56 acres) will be necessary in the southeast quadrant of US 27 and Ernie Caldwell Boulevard, along both sides of US 27 and Home Run Boulevard, in the northeast quadrant of the interchange and along the northwest side of I-4 in order to construct this alternative.

Access Management

The proposed improvements will not modify the existing interchange spacing. US 27 is currently categorized as a Class 3 roadway north and south of I-4 according to FDOT's Access Management classification. The proposed improvements in Segment 5 do not affect the access class of US 27. Much of the access will remain as it is today with the signalized intersections being used to cross from one side of US 27 to the other. Access to the Raceway, 7-11, Way Out Western Outfitters, Verizon Wireless, The Shamrock and the Tropicana Resort Hotel will be from a frontage road on the west side of US 27 that is accessed from US 27 southbound. Due to the required geometry for the elevated U-turn just north of Ernie Caldwell Boulevard, access to the Central Florida Visitor Center will be eliminated from US 27. In accordance with Chapter 335.199, F.S., all proposed changes to access were identified at the Public Meeting on November 20, 2014 and at the Public Hearing on May 9, 2017..

Land Use and Right-of-Way Acquisitions, and Relocation Potential

Land Use changes for the project involve new pond sites, a new interchange alternative at US 27, and new right-of-way for roadway and ponds. The results of the analysis for Land Use Changes and Potential Relocations is described in **Attachment 1**.

Historic and Archeological Sites

As a result of the design changes and new drainage system, an updated cultural resource assessment survey was conducted for the project. The results of this assessment are documented in **Attachment 2**.

Wetlands and Other Surface Waters

The proposed design changes and new pond sites were evaluated for potential impacts to wetlands and surface waters which is discussed in **Attachment 3**.

Floodplains and Drainage

The project was evaluated for impacts to floodplains in comparison to the original PD&E Study because of both land use changes and the updates to the FEMA floodplain maps that have occurred in the interim. The evaluation results are discussed in **Attachment 3**.

The original PD&E Study designed the stormwater management system to meet the standards and criteria of the SWFWMD at that time. An updated design has been provided to meet current standards and is discussed in **Attachment 3**.

Protected Species and Habitat

The project was re-evaluated for potential impacts to protected species and habitat as many changes to listed species have occurred since the original study was completed. The results of the assessment are documented in **Attachment 3.**

Highway Traffic Noise
An updated Noise analysis was conducted for the project to address design changes, land use changes, and to identify new noise sensitive sites along the project corridor. This was treated as a new Noise Study Report due to the original report covering additional areas that are not subject to this segment of I-4 BtU, and is not an addendum to the original study. The results of this analysis are detailed in **Attachment 4**.

Contamination
An updated screening for the potential involvement with contamination was conducted, with the results documented in **Attachment 4**.

Utilities
An updated analysis of potential utility conflicts was conducted to correspond to the design changes and new pond sites and is detailed in **Attachment 4**.

Bicycles and Pedestrians
An updated analysis of potential impacts to bicycles and pedestrians was conducted and is described in **Attachment 4**.

Additional Information:

Public Hearing Summary:
The Public Hearing was held on May 9, 2017.

Other Design Segments:
FM # 201210-2 is for the FDOT D5 PD&E Reevaluation and update project to advance it to the Design Segment 201210-3-32-01.

Other Projects from within the EA/FONSI Limits:
201204-1 – I-4 from SR 557 to Osceola Co. Line (Original US 27 Interchange and mainline 6-laning – Construction Complete)

201205-1 – I-4 from E. of US 27 to Osceola Co. Line (Ultimate design – 60% Plans only)

201209-1 – I-4 from E. of US 98 to E. of SR 33 (Ultimate design – 60% Plans only)

201209-2 – I-4 from E. of US 98 to CR 557 (6-Laning – Construction Completed)

201210-3 – I-4 from W. of US 27 to CR 532 (I-4 BtU Segment 5 Design)

201213-1 – I-4 at US 98 Interchange (Ultimate minus Express Lanes – Construction Complete)

201214-1 – I-4 from E. of SR 33 to E. of SR 559 (Ultimate design – 60% Plans only)

201214-3 – I-4 at SR 559 Interchange (Construction Complete)

201215-1 – I-4 from E. of SR 559 to E. of SR 557 (Ultimate design – 60% Plans only)

201215-3 – I-4 at SR 557 Interchange (Ultimate Construction minus Express Lanes – under design)

201216-1 – I-4 from E. of SR 557 to W. of US 27 (Completed DBB)

201217-1 – I-4 from W. of Memorial Blvd. to W. of US 98 (Ultimate Design – 60% plans only)

201217-2 – I-4 from W. of Memorial Blvd. to W. of US 98 (6-laning – Construction Complete)

201217-8 – I-4 at CSX RR (Originally part of 201217-1, now stand alone – Under Design)

430185-3 – I-4 at SR 33 Interchange (Ultimate Design minus Express lanes – Under Design)

Other Re-evaluations of projects within the original project limits

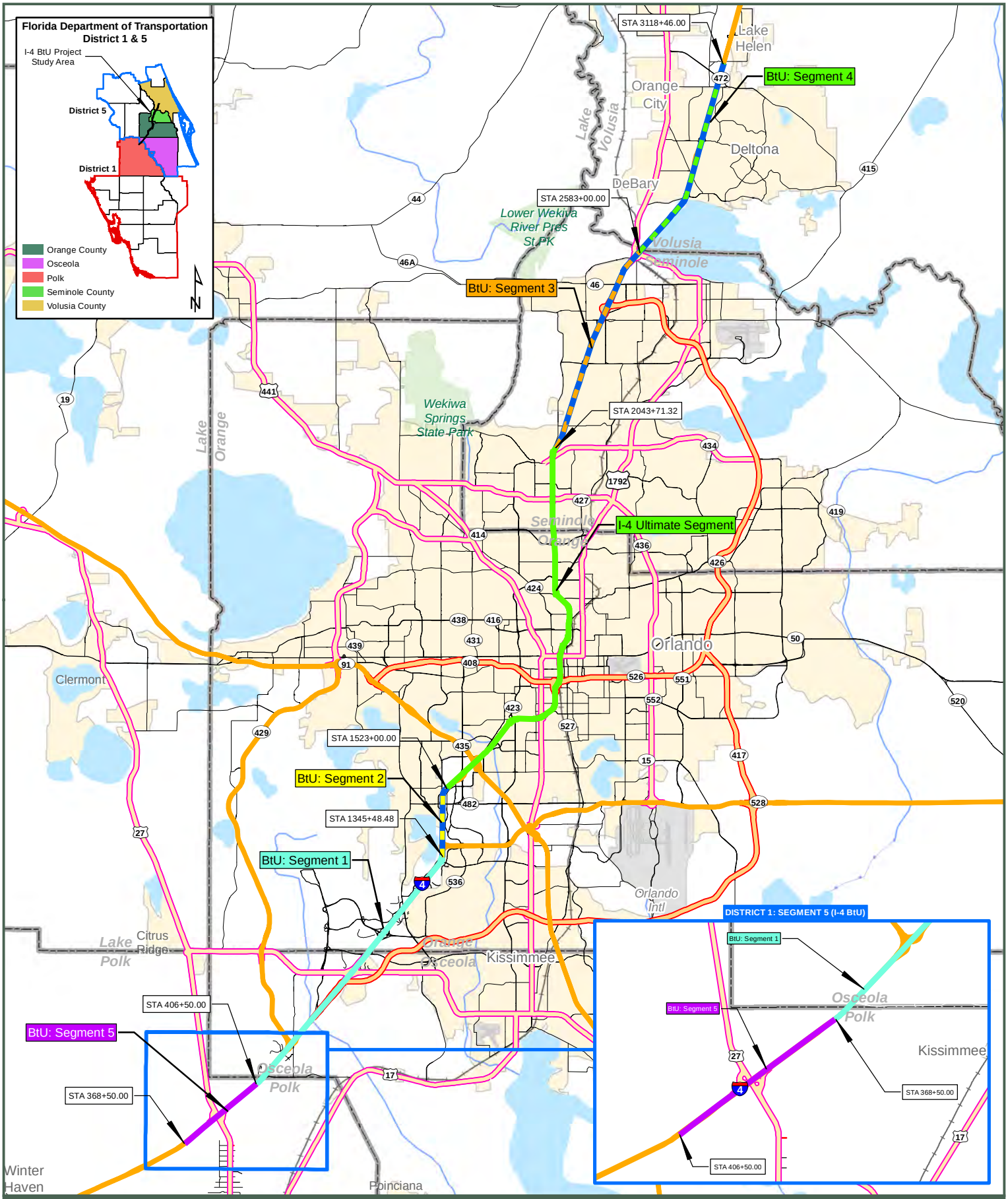
201214-3-52-01 – I-4 at SR 559 Interchange Improvements; Signed on 11/12/13

201215-3 – I-4 at SR 557 Interchange; signed on 10/28/14

201217-8-32-01 – I-4 at CSX RR Bridge Replacement; Signed 3/29/16

201214-3 – I-4 at SR 559 Interchange Improvements; Signed on 1/11/12

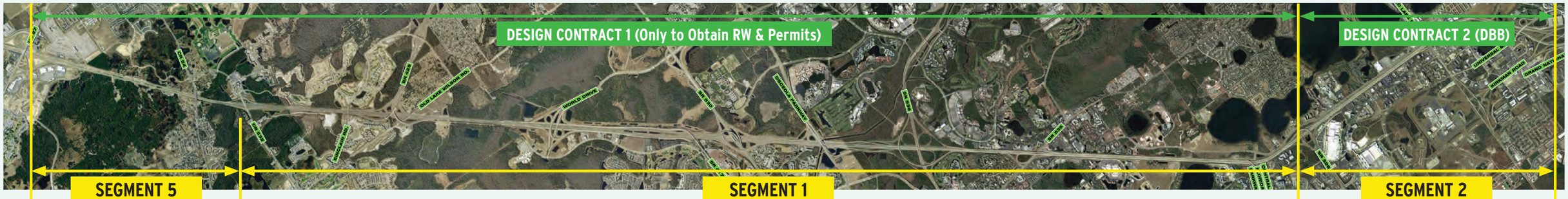
201210-1 – I-4 from Memorial Blvd to Polk/Osceola County Line; Signed 2/13/02



PROJECT LIMITS: I-4 BEYOND THE ULTIMATE

I-4 BEYOND the ULTIMATE

I-4 South Section from West of US 27 to West of SR 435



SEGMENT 5

SR 400 (I-4) from West of SR 25/US 27 to West of CR 532 (Polk/Osceola County Line) Polk County (16320)

EA/FONSI - 1998
(201210) West of Memorial Boulevard (SR 546) to the Polk/Osceola County Line

DESIGN - MARCH 2015
(201210-3-32-01) I-4 (SR 400) from West of US 27 to West of CR 532 (Polk/Osceola County Line) - Polk County
(431456-1) I-4 (SR 400) from West of CR 532 (Polk/Osceola County Line) to East of SR 522 (Osceola/Orange County Line) - Osceola County

CONSTRUCTION

SEGMENT 1

SR 400 (I-4) from West of CR 532 (Polk/Osceola County Line) to West of SR 528 Beachline Expressway Osceola County (92130) and Orange County (75280)

EA/FONSI - 1999
(242526 & 242483) CR 532 (Polk/Osceola County Line) to West of SR 528 Beachline Expressway

DESIGN - MARCH 2015
(242484-8) SR 400 (I-4) from East of SR 522 Osceola Parkway (Osceola/Orange County Line) to West of SR 528 Beachline Expressway – Orange County

CONSTRUCTION

SEGMENT 2

SR 400 (I-4) from West of SR 528 Beachline Expressway to West of SR 435 Kirkman Road Orange County (75280)

FEIS - 2002
(242486, 242592 & 242703) West of SR 528 Beachline Expressway to SR 472 (Orange, Seminole, Volusia)

DESIGN - MARCH 2015
(242484-7) SR 400 (I-4) from West of SR 528 Beachline Expressway to West of SR 435 Kirkman Road – Orange County

CONSTRUCTION

I-4 North Section from East of SR 434 to East of SR 472

SEGMENT 3

SR 400 (I-4) from 1 Mile East of SR 434 to East of SR 15/600 US 17/92 (Seminole/Volusia County Line) Seminole County (77160)

FEIS - 2002
(242486, 242592 & 242703) West of SR 528 Beachline Expressway to SR 472 (Orange, Seminole, Volusia)

DESIGN - JUNE 2015
(242592-4) SR 400 (I-4) from 1 Mile East of SR 434 to East of SR 15/600 US 17/92 (Seminole/Volusia County Line) – Seminole County

CONSTRUCTION

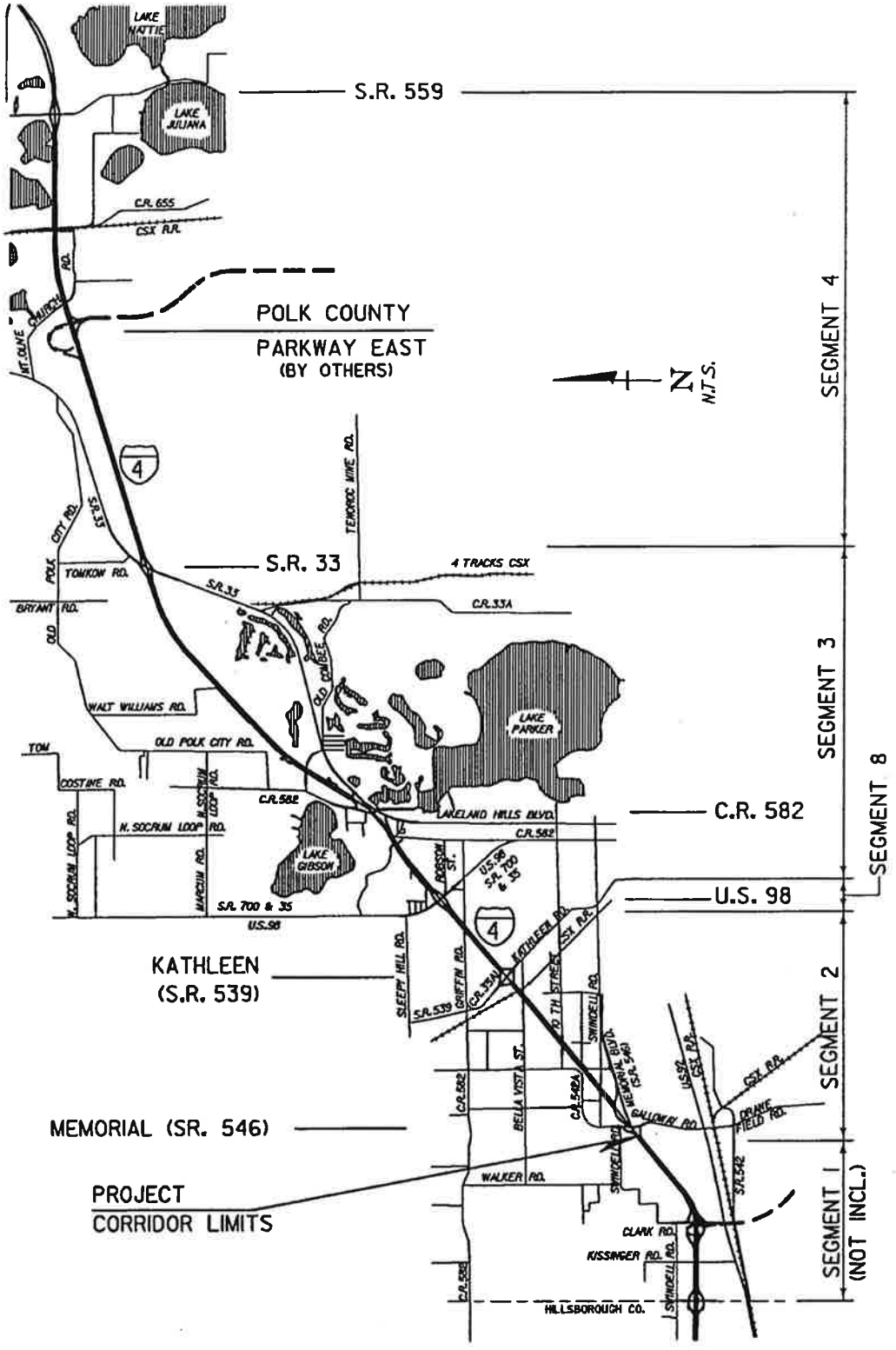
SEGMENT 4

SR 400 (I-4) from East of SR 15/600 US 17/92 (Seminole/Volusia County Line) to 1/2 Mile East of SR 472 Volusia County (79110)

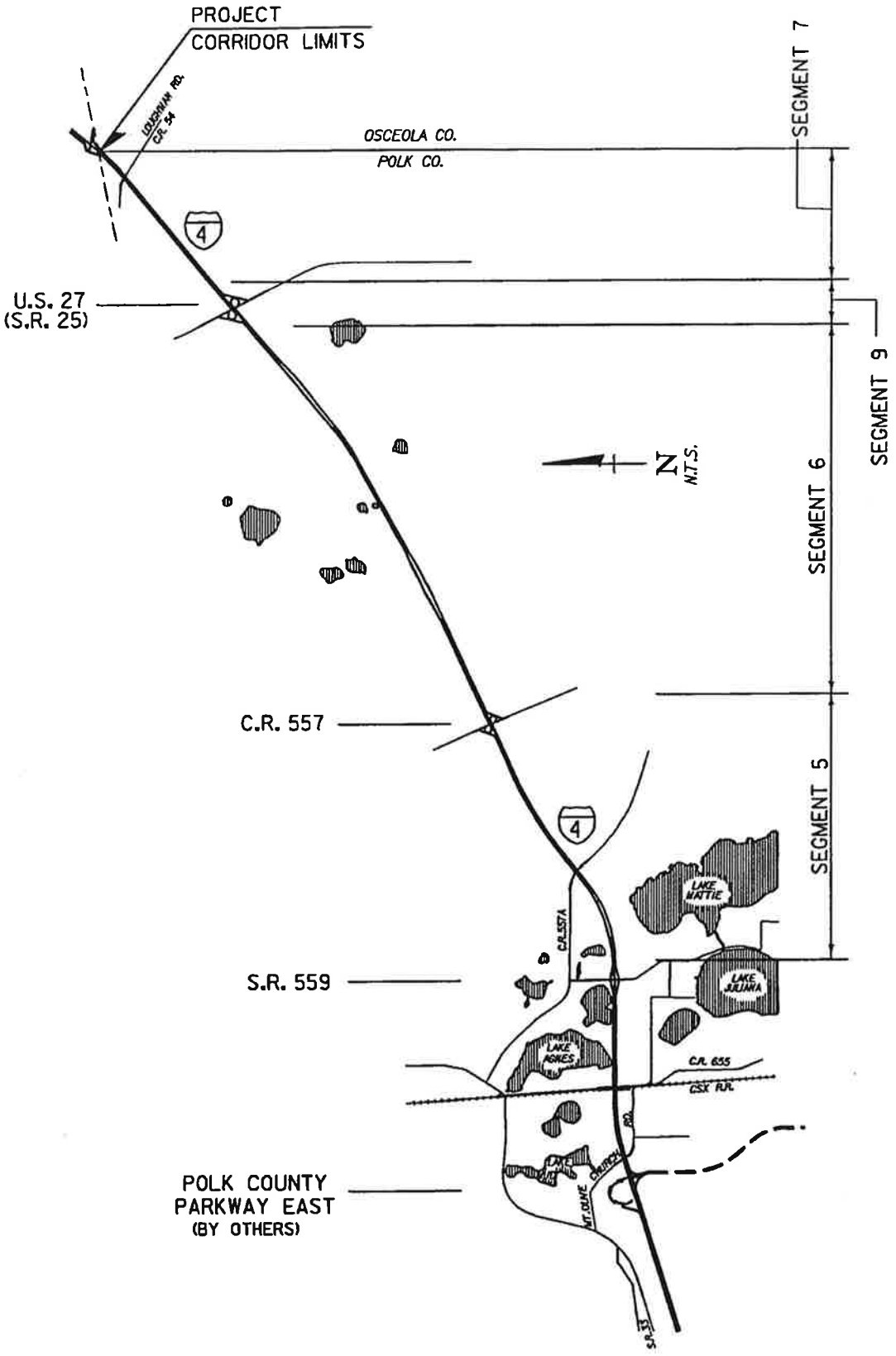
DESIGN - JUNE 2015
(408464-2) SR 400 (I-4) from East of SR 15/600 US 17/92 (Seminole/Volusia County Line) to 1/2 Mile East of SR 472 – Volusia County

CONSTRUCTION

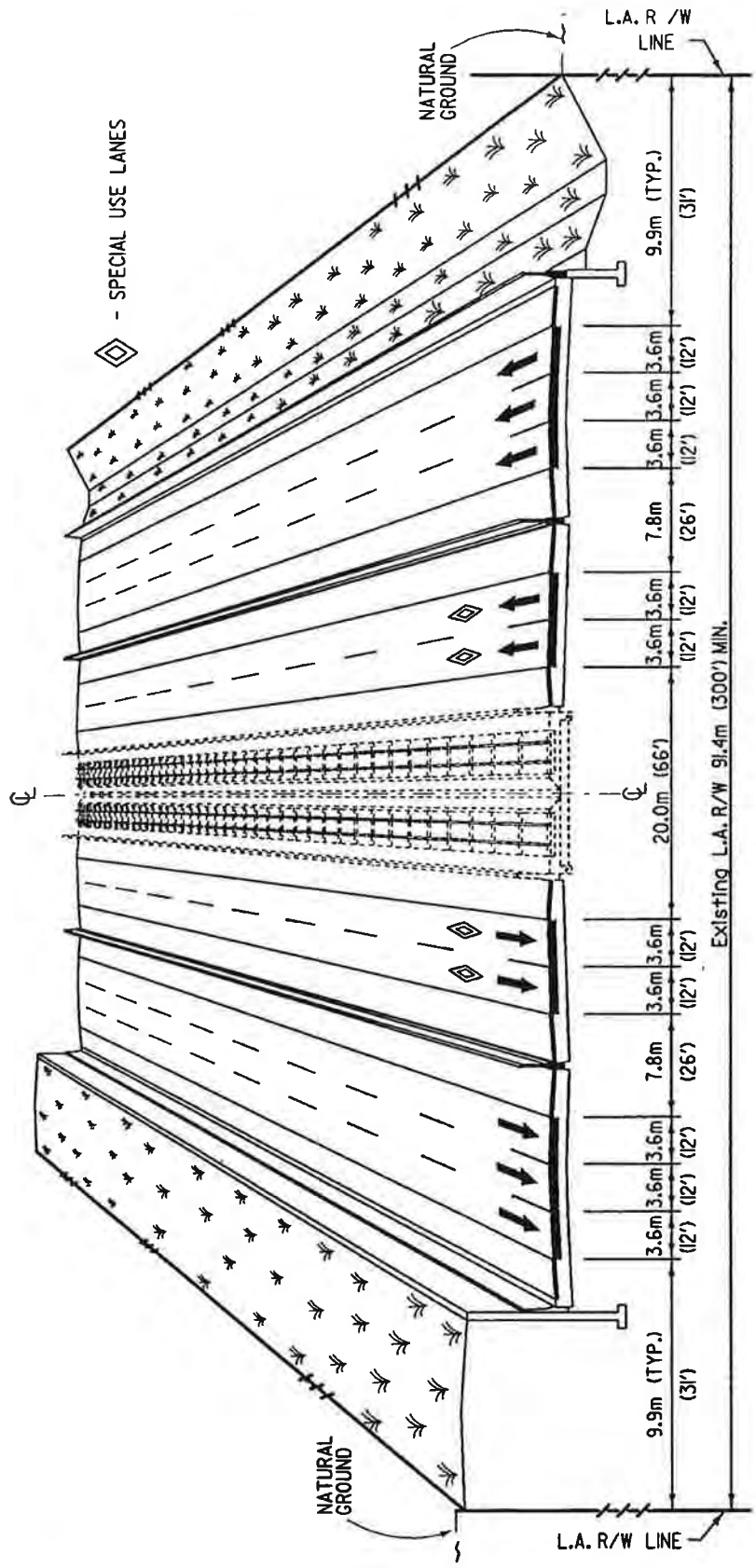
Contract 1 and 2 Advertisement: August 25, 2014
Contract 3 and 4 Advertisement: December 2014



PROJECT CORRIDOR LOCATION MAP	Environmental Assessment State Project No. 16320-1402	Polk County	FIGURE 1-1a

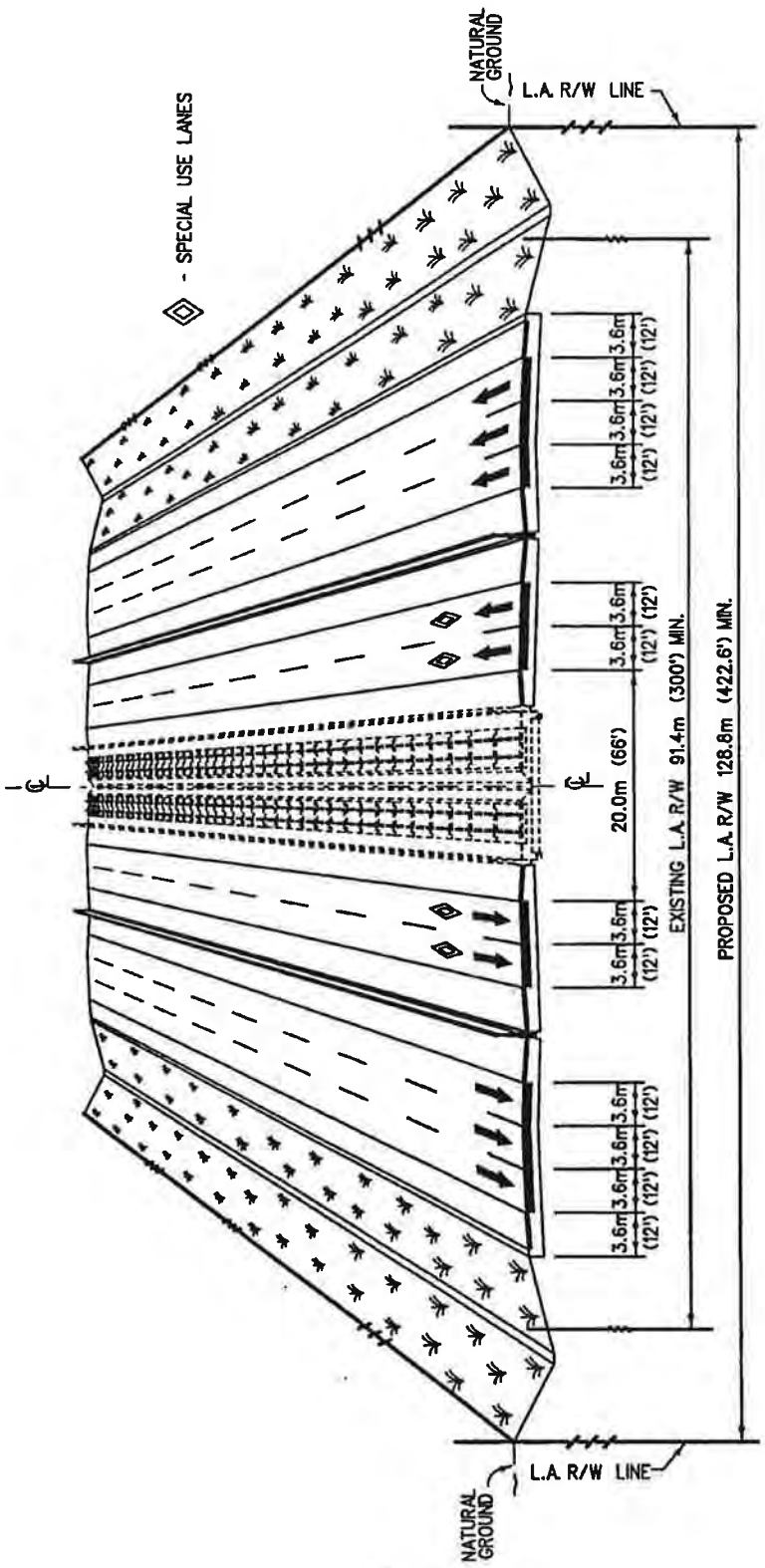


PROJECT CORRIDOR LOCATION MAP	Environmental Assessment State Project No. 16320-1402	4 Polk County	FIGURE 1-1b



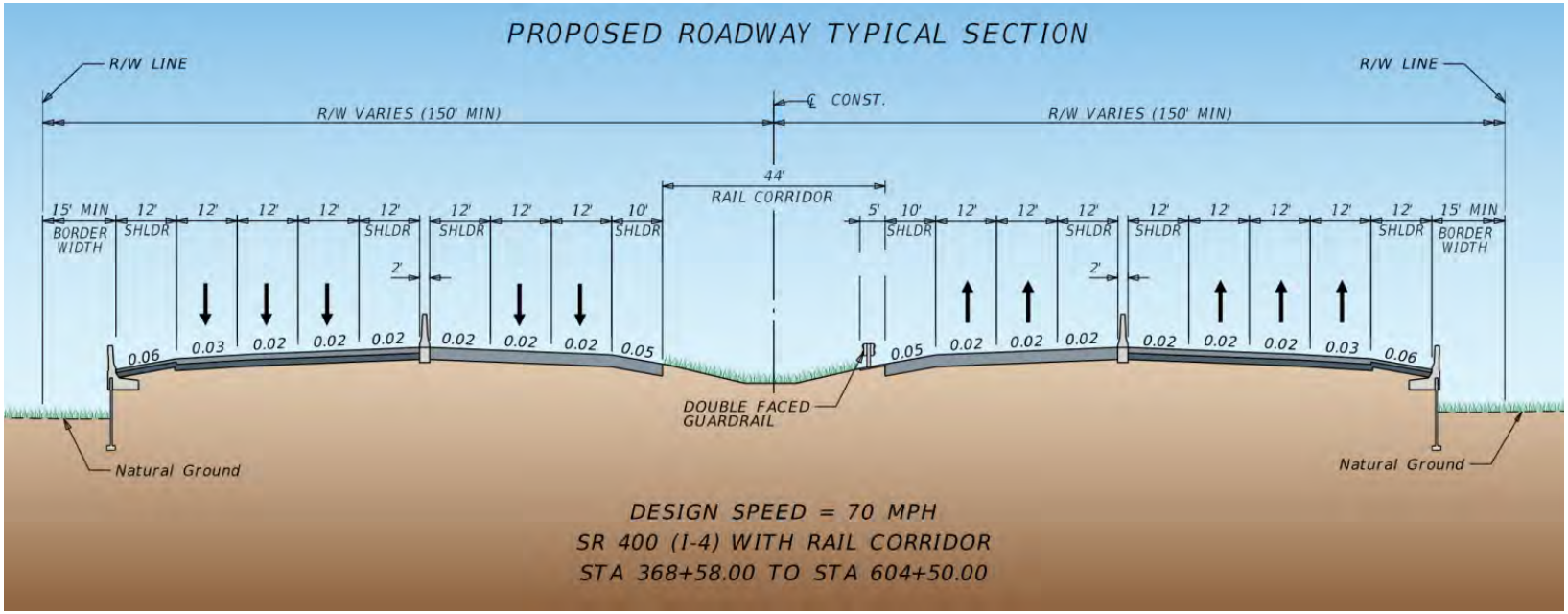
RECOMMENDED I-4
URBAN INTERSTATE TYPICAL SECTION
(WEST OF MEMORIAL BLVD. TO EAST OF S.R. 33)
6 GENERAL PURPOSE LANES
4 SPECIAL USE LANES
RAIL ENVELOPE

RECOMMENDED I-4 MAINLINE 91.4m (300 ft.) URBAN TYPICAL SECTION	Environmental Assessment State Project No. 16320-1402	4 Polk County	FIGURE 1-2

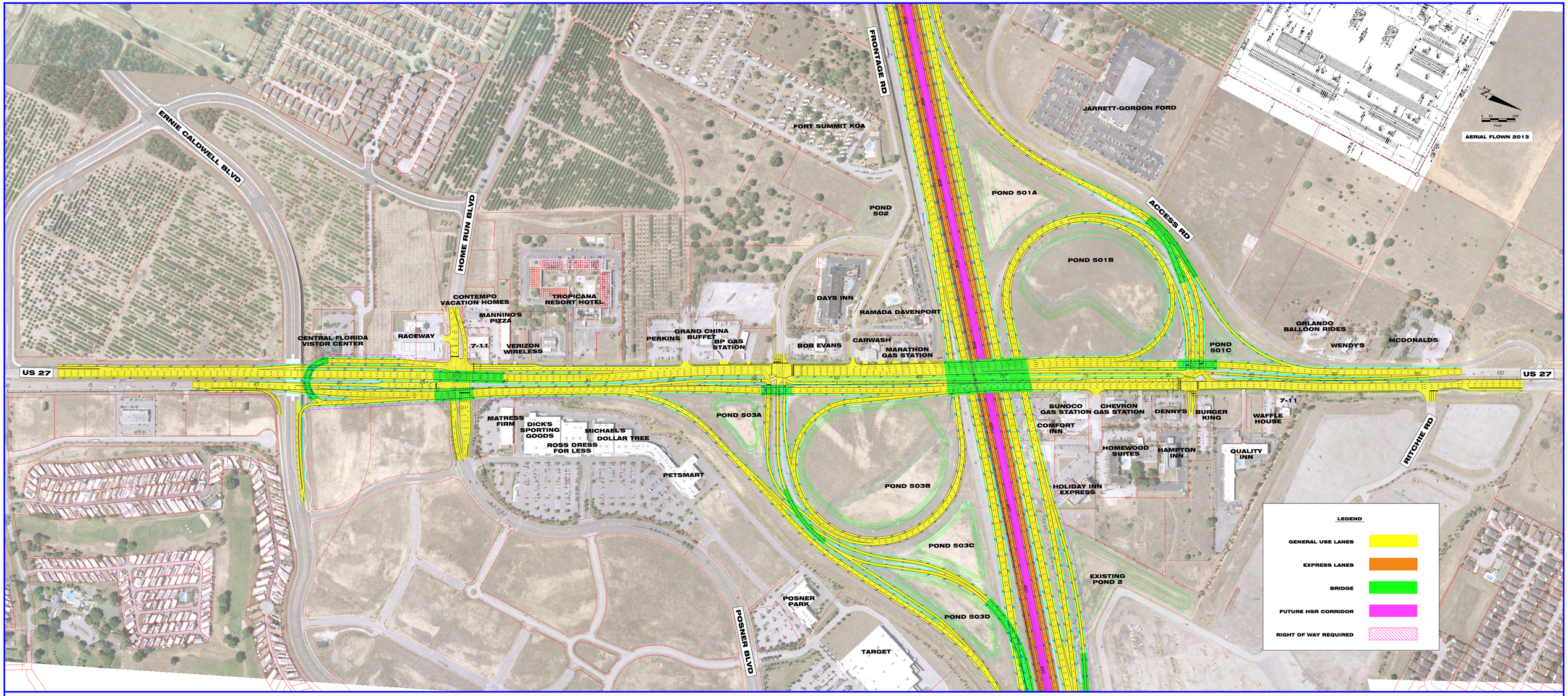


RECOMMENDED I-4
RURAL INTERSTATE TYPICAL SECTION
(S.R. 33 TO THE POLK/OSCEOLA COUNTY LINE)
6 GENERAL PURPOSE LANES
4 SPECIAL USE LANES
RAIL ENVELOPE

RECOMMENDED I-4 MAINLINE 128.8m (422.6 ft.) RURAL TYPICAL SECTION	Environmental Assessment State Project No. 16320-1402	4 Polk County	FIGURE 1-3



SR 400 (I -4) Segment 5 Proposed Typical Section (6+4 with rail envelope)

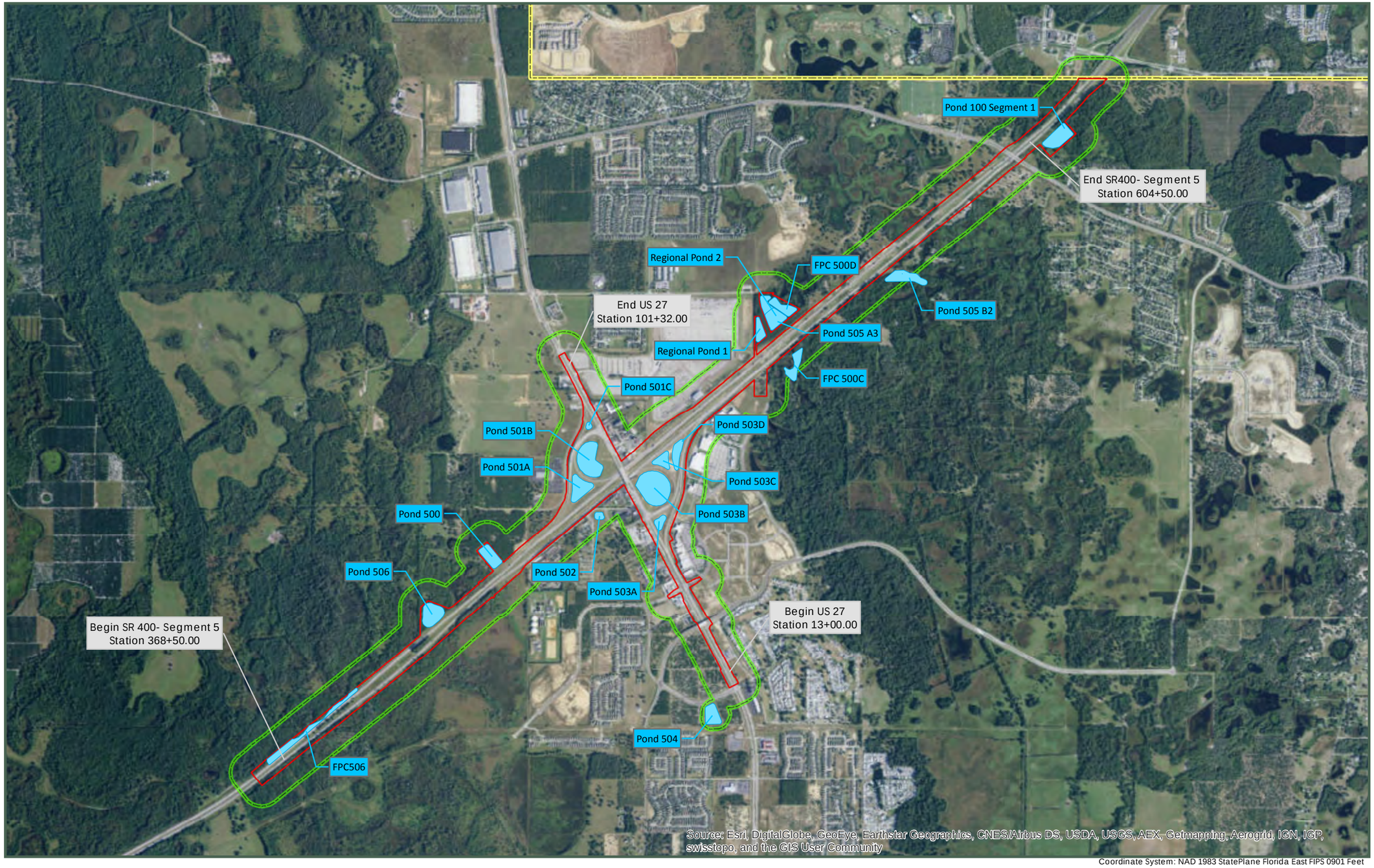


SR-400 (I-4) SEGMENT 5
US 27/SR 25 ALTERNATIVE 7 (RECOMMENDED)

FDOT

4 EXPRESS

I-4 BEYOND THE ULTIMATE



Map Key

- County Boundaries
- SR 400 (I-4) Beyond the Ultimate R/W (8/31/15)
- SR 400 (I-4) Beyond the Ultimate PD&E Study Limits
- Proposed Pond Sites (12/2/15)

Title: ENDANGERED SPECIES BIOLOGICAL ASSESSMENT REPORT: Segment 5 - Stormwater Management Areas Location Map

Client/Project:
Florida Department of Transportation- D5
SR 400 Project Development & Environment Study
Segment 5: SR 400 (I-4) from W of SR 25/US 27 to W of CR 532

Project Location:
16320 Polk County
STA 368+50.00 (Begin)
STA 604+50.00 (End)

Prepared by: mLeonard 12/2/2015
Technical Review by: mDrauer 12/2/2015
Independent Review by: jMoore 12/2/2015

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

0 1,200 2,400 4,800 Feet

Figure D - Stormwater Management Areas Location Map

mleonard \ V:\2024\active\2024230168\100_envrionmental\design\drawing_gis\201210_2\phase5\mxd\rd500_esba_150918.mxd

PROJECT COMMITMENTS RECORD

PROJECT DEVELOPMENT & ENVIRONMENT

Project Name: SR 400 from W of SR 25/US27 to W of CR 532 **Project Manager:** Beata Stys-Palasz **Environmental Document Approval Date:** 12/16/1998 **FM#:** 201210-1 **FAP#:** 0041-130-1

Environmental Document Type: ☐ Type 1 CE ☐ Type 2 CE ☑ EA ☐ EIS ☐ NMS ☐ SEIR

Project Segment Number	Commitment	External Stakeholder	Env. Commit.? (yes/no)	Implementation Phase	Status	Transmittal Date	Completion Date	Comments
201210-3	All project construction activities will be accomplished in accordance with the provisions in the Florida Department of Transportation Standard Specifications for Road and Bridge Construction. To minimize impacts to the human and natural environment, FDOT made the following commitments for the project in the original EA/FONSI.		Yes	Construction	Transmitted to Design			FDOT is required to comply with the FDOT Standard Specifications for Road and Bridge Construction. This commitment will no longer be listed in the Commitment Status section of future re-evaluations.
201210-3	Wetland impacts which will result from the construction of this project will be mitigated pursuant to 373.4137 F.S. to satisfy all mitigation requirements of Part IV, Chapter 373, F.S. and 33 U.S.C.s. 1344. The FDOT is committed to minimize the temporary impacts to wetlands within the right-of-way due to clearing activities associated with the construction of the proposed improvements.	WMD/USACE	Yes	Design	Transmitted to Design			During the project reevaluation, a number of approved wetland mitigation banks were identified with credit availability to offset impacts with both SWFWMD and USACE under the regulatory programs. During permitting, mitigation options will be evaluated by FDOT including the use of mitigation banks and working with the Water Management District and USACE on sources of available mitigation to offset the proposed impacts.
201210-3	The FDOT is committed to provide the opportunity for wildlife corridor enhancement by constructing low-level bridges at three locations in Polk County. The locations are shown on the concept plans. These structures will be designed in accordance with the criteria established through coordination with the USFWS and the FGFWFC to allow for their use as wildlife under-crossings. The locations of these structures were determined through a cooperative effort of regulatory and advisory agencies, local environmental interest groups, private consultants, local, state and regional government and the FDOT.	USFWS	Yes	Construction	Transmitted to Design			The locations of the 3 low-level bridges occur within segments from the original study that are outside of the area of I-4 BtU Segment 5. The design segment(s) they occur within have not yet been constructed (FM 201214-1, FM 201215-1) and will be addressed when those projects move forward.
201210-3	The FDOT is committed to mitigate for potential loss of habitat of the Florida scrub-jay through the use of the Highlands County Upland Mitigation Bank property at a ratio of 2:1 for impacts which may occur to scrub-jay territories at the time of construction. Since the construction phase of this project is not included in the current 5-year work program and because of the anticipated resulting delay in construction of the proposed I-4 improvements, a resurvey of the project corridor for the presence of listed species will be made prior to construction of this project.	USFWS	Yes	Design	Transmitted to Design			Field surveys were conducted during this study for listed species in October 2013, April 2014, and September 2015 and concluded that the scrub-jay habitat identified within the project footprint is no longer present. Surveys for scrub-jays were negative during the field studies, therefore the commitment to mitigate for habitat impacts is no longer necessary. All potential listed species involvement was coordinated with USFWS during the project and resulted in the Biological Opinion dated February 21, 2017 being issued. (The BO for this project concluded that the project May Affect but will not Likely Adversely Affect the Florida scrub-jay).
201210-3	The eastern indigo snake (Drymarchon corais couperi) could be present in the project area. In order to minimize harm to this species, the Florida Department of Transportation has committed to implement the following protection measures: 1. The FDOT shall provide eastern indigo snake educational information as contained in the approved District One educational plan to construction employees prior to the initiation of any clearing activities. The FDOT District One educational exhibits shall be posted at sites immediately accessible to all employees. 2. All construction activities shall cease in the immediate vicinity of any live eastern indigo snake found within the project area. Work may resume after the snake or snakes are allowed to leave the area on their own. 3. Location of live sightings shall be reported to the USFWS Vero Beach Office at (561) 562-3909. 4. If a dead eastern indigo snake is found on the project site, the snake shall be frozen as soon as possible and FDOT shall notify the Vero Beach Field Office immediately for further instructions.	USFWS	Yes	Construction	Transmitted to Design			Since eastern indigo snake habitat has been identified within the project area, FDOT will utilize the US Fish and Wildlife Service Standard Protection Measures for the Eastern Indigo Snake, as contained at the USFWS website http://www.fws.gov/northflorida/IndigoSnakes/20130812_Eastern_indigo_snake_Standard_Protection_Measures.htm.
201210-3	The FDOT is committed to the construction of feasible noise abatement measures at the specific locations (2, 6, 7, 11, 15, 16 & 17) contingent upon the following: • The barrier is subjected to a detailed noise analysis during the design phase of this project and the analysis supports the need for the abatement; • Reasonable cost analyses indicates that the economic cost of the barrier will not exceed the guidelines; • The affected property owners are surveyed and a positive desire for the barriers (including type, height, location, and access requirements) is obtained; • Preferences regarding compatibility with adjacent land uses as addressed by local officials has been noted;	Identified Noise Impacted Areas	Yes	Construction	Transmitted to Design			None of the locations for noise barriers from the previous study are located within the limits of the I-4 BtU Segment 5 project. A barrier currently exists at location 6 but not at any of the others listed above. The commitment for these noise barriers will be carried forward with the design segments that include these barrier locations and addressed in those projects at that time. The three noise barrier locations (NSA C, Festival Resort

PROJECT COMMITMENTS RECORD

201210-3	FDOT has completed consultation with the USFWS to address impacts to listed species as proposed by the project. The Biological Opinion dated February 21, 2017 documents the results of the analysis and provides a statement for the Incidental Taking of listed species with the commensurate mitigation measures. Based upon this decision, FDOT commits to acquire 42.08 credits providing 42.08 acres of skink habitat from a USFWS-approved Conservation Bank to compensate for the loss of skinks and 21.04 acres of skink habitat. Prior to construction, provide the USFWS a receipt or letter from the USFWS-approved conservation bank verifying that the 42.08 credits have been acquired. Following land clearing activities with the I-4 BtU Segment 5 project, FDOT must provide a letter or email to the USFWS providing the actual acreage of occupied skink habitat cleared by the project. Should anyone on the project locate a dead, injured, or sick threatened or endangered species, initial notification must be made to the nearest USFWS Law Enforcement Office; Fish and Wildlife Service; 20501 Independence Blvd.; Groveland, Florida 34736-8573; (352) 429-1064. Secondary notification should be made to the Florida Fish and Wildlife Conservation Commission; South Region; 3900 Drane Field Road; Lakeland, Florida; 33811-1299; 1 (800) 282-8002. Care should be taken in handling sick or injured specimens to ensure effective treatment and care or in the handling of dead specimens to preserve biological material in the best possible state for later analysis as to the cause of death. In instances where the amount or extent of incidental take is to be exceeded, any operation must cease and consultation should be reinitiated.	USFWS	Yes	Design	Transmitted to Design			Commitments made during the PD&E Study Update
201210-3	FDOT has completed consultation with the USFWS to address impacts to listed species as proposed by the project. The Biological Opinion dated February 21, 2017 documents the results of the analysis and provides a statement for the Incidental Taking of listed species with the commensurate mitigation measures. Based upon this decision, FDOT commmits that FDOT will coordinate with Bok Tower Gardens Conservation Staff from the Rare Plant Conservation Program to collect the seeds from scrub plum plants and translocate suitable specimens to public conservation lands or other lands acceptable to the USFWS prior to construction. Collected seeds should be under the protection of the Bok Tower Gardens and either stored or used for propagation. Collected plant specimens may be temporarily housed, depending on available space, at the National Collection Beds that exist on-site at the Bok Tower Gardens.	USFWS	Yes	Design	Transmitted to Design			Commitments made during the PD&E Study Update
201210-3	FDOT will ensure that mitigation proposed for wetland impacts in any wood stork suitable foraging habitat (SFH) will adhere to the requirements of the Corps of Engineers and U. S. Fish and Wildlife Service Effect Determination Key for the Wood Stork in South Florida (2010). The mitigation should include at a minimum wetland credits comprised of 12.18 acres of short hydroperiod (< 180 days inundated annually) wetlands and 8.65 acres of long hydroperiod (> 180 days inundated annually) wetlands.	USFWS/USACE	Yes	Design	Transmitted to Design			Commitments made during the PD&E Study Update
201210-3	During permitting, all potential gopher tortoise habitat that could be impacted by the project will be systematically surveyed according to the current guidelines published by the Florida Fish and Wildlife Conservation Commission. If gopher tortoise burrows are found, all practicable design measures will be employed to avoid impacts to the burrows. For burrows which cannot be avoided, a permit will be obtained from FFWCC for relocation of gopher tortoises and commensals, and relocation will be performed at a time as close as practicable to the start of construction activities at the site of the burrows.	FWC	Yes	Design	Transmitted to Design			Commitments made during the PD&E Study Update

DESIGN

Project Name: _____ **Project Manager:** _____ **FM#:** _____ **FAP#:** _____

Project Segment Number	Commitment	External Stakeholder	Env. Commit-ment? (yes/no)	Confirmed no impact to Env. Commit. (yes/no)	Commit-ment Approval Date	Implementation Phase	Status	Trans-mittal Date	Comple-tion Date	Comments

RIGHT OF WAY

Project Name: _____ **Project Manager:** _____ **FM#:** _____ **FAP#:** _____

Project Segment Number	Commitment	External Stakeholder	Env. Commit-ment? (yes/no)	Confirmed no impact to Env. Commit. (yes/no)	Commit-ment Approval Date	Implementation Phase	Status	Trans-mittal Date	Comple-tion Date	Comments

CONSTRUCTION

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

PROJECT COMMITMENTS RECORD

Project Name: _____ **Project Manager:** _____ **FM#:** _____ **FAP#:** _____

Project Segment Number	Commitment	External Stakeholder	Env. Commit-ment? (yes/no)	Confirmed no impact to Env. Commit. (yes/no)	Commit-ment Approval Date	Implementation Phase	Status	Trans-mittal Date	Comple-tion Date	Comments

OPERATION & MAINTENANCE

Project Name: _____ **Project Manager:** _____ **FM#:** _____ **FAP#:** _____

Project Segment Number	Commitment	External Stakeholder	Env. Commit-ment? (yes/no)	Confirmed no impact to Env. Commit. (yes/no)	Commit-ment Approval Date	Implementation Phase	Status	Trans-mittal Date	Comple-tion Date	Comments

Effective Date: 02/17/2016 Florida Department of Transportation Run: 03/16/2016 08.53.32

5 Year TIP

View 5 Year TIP Phase Grouping Crosswalk

POLK TPO

Fund	<2017	2017	2018	2019	2020	2021	>2021	All Years
HIGHWAYS								
Item Number: 197562 1 Project Description: US 98 (BARTOW HWY) FROM BROOKS STREET TO EDGEWOOD DRIVE NORTH *NON-SIS*								
District: 01 County: POLK Type of Work: PRELIM ENG FOR FUTURE CAPACITY Project Length: .718 LRTP: 4-9								
PRELIMINARY ENGINEERING / MANAGED BY FDOT								
-TOTAL OUTSIDE YEARS	612,765	0	0	0	0	0	0	612,765
ENVIRONMENTAL / RESPONSIBLE AGENCY FDOT								
-TOTAL OUTSIDE YEARS	1,600	0	0	0	0	0	0	1,600
Item 197562 1 Totals:	**614,365**	**0**	**0**	**0**	**0**	**0**	**0**	**614,365**
Item Number: 197562 2 Project Description: US 98 (BARTOW HWY) FROM BROOKS STREET TO EDGEWOOD DRIVE *NON-SIS*								
District: 01 County: POLK Type of Work: ADD LANES & RECONSTRUCT Project Length: 1.436 LRTP: 4-9								
RIGHT OF WAY / MANAGED BY FDOT								
-TOTAL OUTSIDE YEARS	1,759,932	0	0	0	0	0	0	1,759,932
RAILROAD & UTILITIES / MANAGED BY FDOT								
-TOTAL OUTSIDE YEARS	60,414	0	0	0	0	0	0	60,414
CONSTRUCTION / MANAGED BY FDOT								
-TOTAL OUTSIDE YEARS	6,608,563	0	0	0	0	0	0	6,608,563
ENVIRONMENTAL / MANAGED BY FDOT								
-TOTAL OUTSIDE YEARS	63,489	0	0	0	0	0	0	63,489
Item 197562 2 Totals:	**8,492,398**	**0**	**0**	**0**	**0**	**0**	**0**	**8,492,398**
Item Number: 197562 4 Project Description: SR 35/700 (US98) FROM EDGEWOOD DRIVE TO E MAIN STREET *NON-SIS*								
District: 01 County: POLK Type of Work: ADD LANES & RECONSTRUCT Project Length: 3.033 LRTP: 4-9								
PRELIMINARY ENGINEERING / MANAGED BY FDOT								
DDR -DISTRICT DEDICATED REVENUE	4,742,486	0	0	0	0	0	0	4,742,486
DIH -STATE IN-HOUSE PRODUCT SUPPORT	79,494	0	0	0	0	0	0	79,494
DS -STATE PRIMARY HIGHWAYS & PTO	51,668	0	0	0	0	0	0	51,668
RIGHT OF WAY / MANAGED BY FDOT								
CM -CONGESTION MITIGATION - AQ	0	0	0	1,386,556	1,945,260	0	0	3,331,816
SA -STP, ANY AREA	0	0	0	81,037	4,079,592	4,359,163	0	8,519,792
CONSTRUCTION / MANAGED BY FDOT								
DS -STATE PRIMARY HIGHWAYS & PTO	778	0	0	0	0	0	0	778
Item 197562 4 Totals:	**4,874,426**	**0**	**0**	**1,467,593**	**6,024,852**	**4,359,163**	**0**	**16,726,034**
Project Total:	**13,981,533**	**0**	**0**	**1,467,593**	**6,024,852**	**4,359,163**	**0**	**25,833,141**

Fund	<2017	2017	2018	2019	2020	2021	>2021	All Years
Item Number: 197620 4 Project Description: CITY OF LAKELAND LEASE OF FIBER OPTIC NETWORK *NON-SIS*								
District: 01 County: POLK Type of Work: TRAFFIC CONTROL DEVICES/SYSTEM Project Length: .000 LRTP: 1-3								
Extra Description: YEARLY MAINTENANCE FEE FOR ATMS FIBER CABLE								
OPERATIONS / MANAGED BY FDOT								
SL -STP, AREAS <= 200K	202,780	20,278	20,278	20,278	20,278	20,278	0	304,170
Item 197620 4 Totals:	**202,780**	**20,278**	**20,278**	**20,278**	**20,278**	**20,278**	**0**	**304,170**
Project Total:	**9,813,874**	**20,278**	**20,278**	**20,278**	**20,278**	**20,278**	**0**	**9,915,264**

Fund	<2017	2017	2018	2019	2020	2021	>2021	All Years
Item Number: 201210 3 Project Description: SR400 (I-4) W. OF US 27 (SR 25) E. OF CR 532 *SIS*								
District: 01 County: POLK Type of Work: ADD LANES & RECONSTRUCT Project Length: 4.022 LRTP: 1-3								

PRELIMINARY ENGINEERING / MANAGED BY FDOT								
ACNP -ADVANCE CONSTRUCTION NHPP	4,090,116	0	0	0	0	0	0	4,090,116
DDR -DISTRICT DEDICATED REVENUE	0	2,000,000	0	0	0	0	0	2,000,000
DIH -STATE IN-HOUSE PRODUCT SUPPORT	131,294	0	0	0	0	0	0	131,294
Item 201210 3 Totals:	**4,221,410**	**2,000,000**	**0**	**0**	**0**	**0**	**0**	**6,221,410**
Project Total:	**5,734,088**	**2,000,000**	**0**	**0**	**0**	**0**	**0**	**7,734,088**

Fund	<2017	2017	2018	2019	2020	2021	>2021	All Years
Item Number: 201215 3 Project Description: I-4 AT SR 557 *SIS*								
District: 01 County: POLK Type of Work: INTERCHANGE IMPROVEMENT Project Length: 1.610					LRTP: 4-9			
PRELIMINARY ENGINEERING / MANAGED BY FDOT								
DI -ST. - S/W INTER/INTRASTATE HWY	3,048,980	0	0	0	0	0	0	3,048,980
DIH -STATE IN-HOUSE PRODUCT SUPPORT	50,033	0	0	0	0	0	0	50,033
RAILROAD & UTILITIES / MANAGED BY FDOT								
ACNP -ADVANCE CONSTRUCTION NHPP	0	0	0	0	4,500,000	0	0	4,500,000
CONSTRUCTION / MANAGED BY FDOT								
ACNP -ADVANCE CONSTRUCTION NHPP	0	0	0	0	55,285,446	0	0	55,285,446
DIH -STATE IN-HOUSE PRODUCT SUPPORT	0	0	0	0	497,345	0	0	497,345
ENVIRONMENTAL / MANAGED BY FDOT								
SA -STP, ANY AREA	0	0	8,000,000	0	0	0	0	8,000,000
Item 201215 3 Totals:	**3,099,013**	**0**	**8,000,000**	**0**	**60,282,791**	**0**	**0**	**71,381,804**
Project Total:	**9,063,626**	**0**	**8,000,000**	**0**	**60,282,791**	**0**	**0**	**77,346,417**

Fund	<2017	2017	2018	2019	2020	2021	>2021	All Years
Item Number: 201217 8 Project Description: I-4 AT CSX RAILROAD *SIS*								
District: 01 County: POLK Type of Work: REPLACE RAILROAD BRIDGE Project Length: .004					LRTP: 2-5			
PRELIMINARY ENGINEERING / MANAGED BY FDOT								
ACNP -ADVANCE CONSTRUCTION NHPP	1,580,201	0	0	0	0	0	0	1,580,201
RAILROAD & UTILITIES / MANAGED BY FDOT								
BRP -STATE BRIDGE REPLACEMENT	50,000	0	0	0	0	0	0	50,000
DI -ST. - S/W INTER/INTRASTATE HWY	0	0	0	0	0	6,000,000	0	6,000,000
SIWR -2015 SB2514A-STRATEGIC INT SYS	0	0	0	0	1,000,000	0	0	1,000,000
CONSTRUCTION / MANAGED BY FDOT								
DI -ST. - S/W INTER/INTRASTATE HWY	0	0	0	0	0	9,823,147	0	9,823,147
DIH -STATE IN-HOUSE PRODUCT SUPPORT	0	0	0	0	0	132,659	0	132,659
ENVIRONMENTAL / MANAGED BY FDOT								
SIWR -2015 SB2514A-STRATEGIC INT SYS	0	0	0	0	50,000	0	0	50,000
Item 201217 8 Totals:	**1,630,201**	**0**	**0**	**0**	**1,050,000**	**15,955,806**	**0**	**18,636,007**
Project Total:	**85,500,543**	**0**	**0**	**0**	**1,050,000**	**15,955,806**	**0**	**102,506,349**

Fund	<2017	2017	2018	2019	2020	2021	>2021	All Years
Item Number: 410666 1 Project Description: SR 542 FROM 1ST STREET SOUTH TO US 27 *NON-SIS*								
District: 01 County: POLK Type of Work: PD&E/EMO STUDY Project Length: 5.958					LRTP: 1-3			
P D & E / MANAGED BY FDOT								
-TOTAL OUTSIDE YEARS	1,484,159	0	0	0	0	0	0	1,484,159
Item 410666 1 Totals:	**1,484,159**	**0**	**0**	**0**	**0**	**0**	**0**	**1,484,159**
Item Number: 410666 2 Project Description: SR 542 FROM 1ST STREET TO BUCKEYE LOOP RD *NON-SIS*								
District: 01 County: POLK Type of Work: ADD LANES & RECONSTRUCT Project Length: 2.305					LRTP: 4-9			
PRELIMINARY ENGINEERING / MANAGED BY FDOT								
DC -STATE PRIMARY PE CONSULTANTS	333	0	0	0	0	0	0	333
DIH -STATE IN-HOUSE PRODUCT SUPPORT	297,118	0	0	0	0	0	0	297,118
DS -STATE PRIMARY HIGHWAYS & PTO	8,613	0	0	0	0	0	0	8,613
EB -EQUITY BONUS	1,309,082	0	0	0	0	0	0	1,309,082
SL -STP, AREAS <= 200K	2,200,207	0	0	0	0	0	0	2,200,207

Effective Date: 09/01/2016

Florida Department of Transportation

Run: 03/03/2017 09.57.46

Approved STIP

View Approved STIP Phase Grouping

Crosswalk

Item Segment: 201210 3

Fund	<2017	2017	2018	2019	2020	>2020	All Years
HIGHWAYS							
Item Number: 201210 3 Project Description: SR400 (I-4) W. OF US 27 (SR 25) E. OF CR 532 *SIS*							
District: 01 County: POLK Type of Work: ADD LANES & RECONSTRUCT Project Length: 4.022							
PRELIMINARY ENGINEERING / MANAGED BY FDOT							
ACNP -ADVANCE CONSTRUCTION NHPP	4,090,116	0	0	0	0	0	4,090,116
DDR -DISTRICT DEDICATED REVENUE	0	1,883,329	0	0	0	0	1,883,329
DIH -STATE IN-HOUSE PRODUCT SUPPORT	102,216	28,440	0	0	0	0	130,656
Item 201210 3 Totals:	**4,192,332**	**1,911,769**	**0**	**0**	**0**	**0**	**6,104,101**
Project Total:	**4,192,332**	**1,911,769**	**0**	**0**	**0**	**0**	**6,104,101**
District 01 Totals:	**4,192,332**	**1,911,769**	**0**	**0**	**0**	**0**	**6,104,101**

Grand Total	**4,192,332**	**1,911,769**	**0**	**0**	**0**	**0**	**6,104,101**

Roadway Projects and Costs (Year of Expenditure Costs)

Project Details							PD&E			Project Engineering			ROW			Construction			Total
Project Tier	ID/ FPN	Facility	From	To	No. of Existing Lanes	Project Type	Cost ($YOE in millions)	Funding Source	YOE	Cost ($YOE in millions)	Funding Source	YOE	Cost ($YOE in millions)	Funding Source	YOE	Cost ($YOE in millions)	Funding Source	YOE	Cost ($YOE in millions)
I (Committed)	329	SR 570 (Polk Parkway)*	S/O CR 546	N/O Eastern Toll Plaza	2	Interstate	-	-	-	4.00	Turnpike	Committed	-	-	-	32.00	Turnpike	Committed	36.00
	Tier I Totals						0.00			4.00			0.00			32.00			36.00
II (Cost Feasible in 2019-2030)	26	SR 542 (Dundee Rd)	Buckeye Loop Rd	US 27	2	Roadway - Widening	2.07	OA	Completed	6.20	OA	Completed	17.39	OA	Completed	47.10	OA	2019-2020	72.76
	42	SR 400 (I-4) "I-4 BEYOND THE ULTIMATE"	W. of US 27	E. of CR 532	6	Interstate	-	SIS	-	3.10	SIS	Committed	29.07	SIS	2019-2020	166.44	SIS	2019-2020	198.61
	64	US 92 (New Tampa Hwy)	Hillsborough Co/L	Wabash Ave	2	Roadway - Widening	1.95	OA	Underway	5.16	OA	2019-2020	2.06	OA	2021-2025	58.35	OA	2026-2030	67.52
	89B	SR 33**	Old Combee Road	University Blvd (excludes interchange)	2	Roadway - Widening	0.95	OA	Underway	2.84	OA	Completed	-	OA	2019-2020	24.07	OA	2021-2025	27.86
	96	US 17/92 (Hinson Ave)	10th St	17th St	2	Roadway - Widening	0.16	OA	Committed	0.48	OA	Committed	1.87	OA	2021-2025	4.07	OA	2021-2025	6.59
	98C	US 27	Presidents Dr	SR 60	4	Roadway - Widening	-	SIS	-	0.78	SIS	Committed	5.57	SIS	Committed	53.59	SIS	2019-2020	59.94
	112	Wabash Ave Extension	Harden Blvd	Ariana St	-	Roadway - New Construction	1.41	Local	Completed	1.05	Local	Underway	7.17	Local	2021-2025	"15.88 14.56 1.32"	Multiple Sources Local TALU	2021-2025	25.51
	114	Wabash Ave	US 92 (Memorial Blvd)	10th St	2	Roadway - New Construction	0.34	Local	2021-2025	1.03	Local	2021-2025	-	Local	2026-2030	8.46	Local	2026-2030	9.83
	115	Wabash Ave Extension	10th St	Interstate Drive	-	Roadway - New Construction	0.41	Local	Completed	1.24	Local	Underway	1.70	Local	Underway	4.53	Local	2021-2025	7.88
	153	I-4	at SR 557		6	Interchange	-	SIS	-	0.04	SIS	Committed	-	SIS	-	63.59	SIS	2019-2020	63.63
	305	Crews Lake Road/E.F. Griffin Road Connector	Crews Lake Road	E.F. Griffin Road	-	Roadway - New Construction	0.44	Developer	Committed	1.32	Developer	Committed	0.53	Developer	Committed	11.17	Developer	2021-2025	13.45
	310	Crevasse - Lakeland Park Drive Connector	Union Drive	Lakeland Park Drive		Roadway - New Construction	0.41	Local	Completed	1.24	Local	Underway	1.50	Local	Committed	5.90	Local	Committed	1.65
	312A	North Ridge Trail	Deen Still Road	Four Corners Blvd	-	Roadway - New Construction	0.84	-	Completed	2.53	-	Completed	16.45	-	Completed	"15.05 5.94 4.56 4.55"	Multiple Sources IF Dist A TRIP Ad Valorem	2021-2025	34.87

Polk Parkway Footnote

* This project includes the Braddock Road/Polk Parkway interchange project which includes an improved 2-lane facility on Braddock Road between Polk Parkway and CR 655 with ROW for 4 lanes.

SR 33 Footnote

** This project also includes the PD&E and Design phases for the Interstate 4 at SR 33 Interchange. Future funding for Row and CST of the interchange will ultimately be allocated from FDOT's SIS Cost-Feasible Plan.

Legend of Funding Sources

OA = Other Arterial funds (State & Federal)
TMA = Transportation Management Area funds (Federal)
SIS = Strategic Intermodal System funds
Turnpike = Florida's Turnpike Enterprise Funds
Local = Local funds
IF District = Impact Fee District (Local)
TRIP = Transportation Regional Incentive Program
TALL = Transportation Alternatives- <200k
TALT = Transportation Alternatives- Any Area
TALU = Transportation Alternatives- >200k

FDOT

Florida Department of Transportation

RICK SCOTT
GOVERNOR

719 S. Woodland Blvd.
DeLand, FL 32720

JIM BOXOLD
SECRETARY

March 24, 2016

Timothy A. Parsons, Ph.D.
Director, Division of Historical Resources
& State Historic Preservation Officer
Florida Department of State
Division of Historical Resources
500 South Bronough Street
Tallahassee, Florida 32399-0250

Attention: Mr. Daniel McClarnon, Transportation Compliance Review Program

RE: SR 400 (I-4) Beyond the Ultimate Project Development & Environment Study
Segment 5 (Polk County)
Financial Management # 201210-2-22-01

Dear Dr. Parsons,

Enclosed please find the report entitled *Technical Memorandum: Cultural Resource Assessment Survey of Proposed Improvements to Segment 5: State Road 400 (SR 400/Interstate 4 (I-4) from West of SR 25/US 27 to West of CR 532 (Polk/Osceola County Line), Polk County, Florida.* The following documents have been included:

- One SHPO package containing one unbound copy of the CRAS final report, one completed Survey Log Sheet, and accompanying documentation.

The archaeological survey included pedestrian inspection and the excavation of 62 shovel tests within proposed/modified pond footprints. Five prehistoric ceramic artifacts were recovered from three shovel tests within FPC 500C, representing a newly identified archaeological site (8PO07986). It is unlikely that additional research of 8PO07986 would yield information important to the prehistory of central Florida. It is the opinion of the District that 8PO07986 is ineligible for the NRHP. One archaeological occurrence (AO1) was also identified in FPC 500C. This AO does not meet the criteria for significance required for inclusion in the NRHP. No further archaeological survey is recommended for the proposed ponds.

The architectural survey resulted in the identification of three historic structures constructed before 1971 located within Segment 5 of the I-4 APE: 43804 US Highway 27 (8PO07962), 43750 US Highway 27 (8PO07963), and 44079 US Highway 27 (8PO07989). The identified historic resources were evaluated to determine their significance and potential for listing in the NRHP. The historic resources within the I-4 Segment 5 APE lack the architectural distinction and significant historical associations necessary to be considered for listing in the NRHP and are

recommended ineligible. No potential NRHP districts were identified due to the lack of concentration of historic structures.

Based on the results of this study, it is the opinion of the District that the proposed undertaking will have no effect on resources listed or eligible for listing in the NRHP. I respectfully request your concurrence with the findings of the enclosed report.

If you have any questions or need further assistance, please contact Catherine Owen, District Cultural Resource Coordinator, at (386) 943-5383 or me at (386) 943-5411.

Sincerely,

FOR William G. Walsh
Environmental Manager
FDOT, District Five

cc: Cathy Kendall, FHWA
Roy Jackson, FDOT SEMO
Beata Stys-Palasz, FDOT District Five
Gwen Pipkin, Vivianne Cross, FDOT District One

The Florida State Historic Preservation Officer:

__√__ finds the attached report complete and sufficient and __√__ concurs/ ___ does not concur with the findings and recommendations contained in this cover letter and the enclosed report.

___ does not find the attached report complete and sufficient and requires additional information in order to provide an opinion on the potential effects of the proposed project on historic resources.

/s/ Deputy SHPO 4/8/16
For: Timothy A. Parsons, Ph.D. **Date**
Director, Division of Historical Resources
& State Historic Preservation Officer

2016.1348
DHR No.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
South Florida Ecological Services Office
1339 20th Street
Vero Beach, Florida 32960

February 21, 2017

Cathy Kendall
Federal Highway Administration
3500 Financial Plaza, Suite 400
Tallahassee, Florida 32312

Service Consultation Code:	04EF2000-2016-F-0379
Date Received:	June 7, 2016
Consultation Initiation Date:	October 14, 2016
Applicant:	Florida Department of Transportation
Project:	Interstate 4 from U.S. Highway 27 to County Road 532
County:	Polk

Dear Ms. Kendall:

The U.S. Fish and Wildlife Service (Service) has received the Federal Highway Administration's (FHWA) email dated June 24, 2016, requesting initiation of formal consultation for their authorization of the widening of Interstate 4 (I-4) from about 2 miles{mi [3.2 kilometers (km)]} west of U.S. Highway 27 to just west of County Road 532 (I-4 Project). The I-4 Project is being proposed by the Florida Department of Transportation (FDOT). This document transmits the Service's biological opinion regarding the likelihood of the I-4 Project to jeopardize the continued existence of the threatened sand skink (*Neoseps reynoldsi*), threatened blue-tailed mole skink (*Eumeces egregius lividus*), and the endangered scrub plum (*Prunus geniculata*). It also provides the Service's concurrences for the FHWA's determinations for the threatened eastern indigo snake (*Drymarchon corais couperi*), Florida scrub-jay (*Aphelocoma coerulescens*), Audubon's crested caracara (*Polyborus plancus audubonii*), wood stork (*Mycteria americana*), and endangered Britton's beargrass (*Nolina brittoniana*). This document is submitted in accordance with section 7 of the Endangered Species Act of 1973, as amended in 1998 (Act) (87 Stat. 884; 16 U.S.C. 1531 *et seq.*).

The Service's biological opinion is based on the biological assessment provided to the FHWA by the FDOT, correspondence, telephone conversations, emails, and other sources of information. A complete record of this consultation is on file at the South Florida Ecological Services Office in Vero Beach, Florida.

Consultation History

In letter to the Service dated June 8, 2016, the FDOT, on behalf of the FHWA, provided a biological assessment for the I-4 Project.

In an email to the Service dated June 24, 2016, the FHWA determined that the I-4 Project may affect and is likely to adversely affect the sand skink, the blue-tailed mole skink, and the scrub plum. The FHWA requested that the Service initiate formal consultation pursuant to section 7 of the Act. The FHWA also determined that the I-4 Project may affect, but is not likely to adversely affect the eastern indigo snake, Florida scrub-jay, Audubon's crested caracara, wood stork, and Britton's beargrass, and requested concurrence for these determinations pursuant to section 7 of the Act.

In an email to the FDOT dated June 13, 2016, the Service requested that the FDOT, on behalf of the FHWA, provide additional information on the I-4 project.

In an email to the Service dated October 14, 2016, the FDOT, on behalf of the FHWA, provided additional information on the I-4 Project.

As of October 14, 2016, the Service has received all the information necessary for initiation of formal consultation on the sand skink, blue-tailed mole skink, and scrub plum for this project as required in the regulations governing interagency consultations (50 CFR § 402.14).

BIOLOGICAL OPINION

This Biological Opinion provides the Service's opinion as to whether the proposed I-4 Project is likely to jeopardize the continued existence of the sand skink, the blue-tailed mole skink, and the scrub plum. Critical habitat has not been designated for the sand skink, the blue-tailed mole skink, or the scrub plum. Therefore, this Biological Opinion will not address destruction or adverse modification of critical habitat.

ANALYTICAL FRAMEWORK FOR THE JEOPARDY DETERMINATIONS

Jeopardy Determination

Section 7(a)(2) of the Endangered Species Act requires that Federal agencies ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of listed species. "Jeopardize the continued existence of" means to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species (50 CFR 402.02).

The jeopardy analysis in this biological opinion relies on four components: (1) the Status of the Species, defined as a description of the range wide condition of the species, the factors responsible for that condition, and its survival and recovery needs; (2) the Environmental

Baseline, defined as an analysis of the condition of the species in the action area, the factors responsible for that condition, and the relationship of the action area to the survival and recovery of the species; (3) the Effects of the Action, defined as the direct and indirect impacts of the proposed Federal action and the effects of any interrelated or interdependent activities on the species; and (4) the Cumulative Effects, defined as an evaluation of the effects of future, non-federal activities in the action area on the species.

In accordance with policy and regulation, the jeopardy determination is made by evaluating the effects of the proposed Federal action in the context of the current status of the species, taking into account any cumulative effects, to determine if implementation of the proposed action is likely to cause an appreciable reduction in the likelihood of both the survival and recovery of the species in the wild.

DESCRIPTION OF PROPOSED ACTION

The FHWA proposes to authorize the FDOT to construct improvements to I-4 from about 2 mi (3.2 km) west of U.S. Highway 27 to just west of County Road 532. The existing 4.5-mi (7.2 km) segment of six-lane roadway will be enlarged to 10 paved travel lanes. The 10 travel lanes will each be 12 feet {ft [3.7-meter (m)]} wide and configured as 5 westbound lanes and 5 eastbound lanes. Each 5-lane configuration will consist of 3 general use travel lanes bounded on both sides by 10-ft (3-m) wide paved shoulders, and 2 express travel lanes bounded to the inside by a 12-ft (3.7-m) wide paved shoulder and to the outside by a 10-ft (3-m) wide paved shoulder. The general use lanes and the express lanes will be separated by a 2-ft (0.6-m) tall barrier wall. The eastbound and westbound lanes will be bounded to the outside by a 15-ft (4.6-m) wide grass swale and separated by a 44-foot (13.4-m) wide grass center median. The I-4 Project will also include the construction of 8 new stormwater treatment ponds, and the modification of 11 existing stormwater treatment ponds. The purpose of the I-4 Project is to provide additional lane capacity to reduce traffic congestion associated with expected future population growth, and enhance the movement of freight and goods. The I-4 Project is located in Sections 4, 5, 7 and 8, Township 26 South, Range 27 East; and Sections 1, 23 and 24, Township 26 South, Range 24 East in Polk County, Florida (Figure 1).

The I-4 Project will fill 20.83ac (8.4 ha) of wetlands. To compensate for the loss of wetlands, the FDOT has proposed to acquire credits from an approved wetland mitigation bank.

As described below in the section entitled "Environmental Baseline", the construction of the I-4 Project will incidentally result in take of the sand skink, blue-tailed mole skink and the scrub plum through construction activities associated with the I-4 Project. Construction activities are expected to incidentally injure and kill skinks, result in the permanent loss 21.04 acres (ac [8.5 hectare (ha)]) of skink habitat, and result in the loss of several specimens of the scrub plum.

The FDOT has proposed the following conservation measures to benefit the listed species affected by this action. To compensate for the loss of skinks and 21.04 ac (8.5 ha) of skink habitat, the FDOT will acquire 42.08 credits providing 42.08 ac (17 ha) of skink habitat at a

Service-approved Conservation Bank. Before construction of the I-4 Project can commence: 1) the FDOT will provide the Service a receipt or letter from the Service-approved conservation bank verifying that the 42.08 credits have been acquired, and 2) the Service will provide an email or letter to the FHWA and FDOT indicating that we have received the receipt or letter from the Service-approved conservation bank. To benefit the conservation and recovery of the scrub plum, the FDOT has proposed to work with Bok Tower Gardens (BTG), a participating institution of the National Center for Plant Conservation (NCPC), to collect seeds from scrub plum plants and translocate suitable specimens of the scrub plum to public conservation lands or other lands acceptable to the Service. Collected seeds would be under the protection of the BTG and either stored or used for propagation. Collected plant specimens may be temporarily housed, depending on available space, at the National Collection Beds that exist on-site at the BTG. It may also be possible to use nurseries associated with the Florida Native Plant Society, to temporarily care for collected plant specimens until permanent placement within nearby conservation lands can be coordinated.

Action area

The action area is defined as all areas to be affected directly or indirectly by the Federal action. The I-4 Project will result in the widening of an existing highway, and not provide new access to undeveloped lands. Therefore, the Service finds it unlikely the I-4 Project will induce new development in the project area. Consequently, the Service considers the action area for this I-4 Project as all lands within the project footprint

LISTED SPECIES NOT LIKELY TO BE ADVERSELY AFFECTED BY THE PROPOSED ACTION

Eastern indigo snake

The I-4 Project occurs within the geographic range of the eastern indigo snake. Eastern indigo snakes were not observed within the project site during pedestrian surveys conducted by the FDOT's environmental consultant. To minimize adverse effects to this species during construction, the FDOT has agreed to follow the Service's *Standard Protection Measures for the Eastern Indigo Snake* (Service 2013) during construction of the project. The FHWA has determined the 1-4 Project may affect, but is not likely to adversely affect the eastern indigo snake. Based on the protective measures provided, the Service concurs with the FHWA's determination for the eastern indigo snake.

Florida scrub-jay

The I-4 Project occurs within the geographic range of the Florida scrub-jay. Much of the habitat for the scrub-jay near and within the project corridor has been lost due to development. Florida scrub-jays were not observed within the small area of remaining suitable habitat within the project footprint during call surveys conducted in 2013, and during recent pedestrian surveys the habitat. The FHWA has determined that the I-4 Project may affect but is not likely to adversely

affect the Florida scrub-jay. Based on the information provided, the Service concurs with this determination.

Audubon's crested caracara

The I-4 Project occurs within the geographic range of Audubon's crested caracara (caracara). Suitable nesting habitat for the caracara does not occur in or near the project footprint. Caracaras and caracara nests were not observed in or near the project footprint during pedestrian surveys of the project foot print and immediately adjacent lands conducted by the FDOT's consultant. The FHWA has determined that the I-4 Project may affect but is not likely to adversely affect Audubon's crested caracara. Based on the information provided, the Service concurs with this determination.

Wood stork

The I-4 Project occurs within the geographic range of the wood stork and within the Core Foraging Area [i.e., all lands within 18.6 mi (29.9km)] of two active wood stork nesting colonies. The project will fill 20.83 ac (8.4 ha) of wetlands consisting of 12.18 ac (4.9 ha) of short hydroperiod (≤ 180 days inundated annually) wetlands and 8.65 ac (3.5 ha) of long hydroperiod (>180 days inundated annually) wetlands . Through use of the Service's Wood Stork Foraging Habitat Assessment Methodology (Service 2012a), the FDOT's consultant has determined that the 12.18 ac (4.9 ha) of short hydroperiod wetlands provide 19.47 kilograms{kg [pounds (42.92 lb)]} of wood stork forage, and the 8.65 ac (3.5 ha) of long hydroperiod wetlands provide 26.62 kg (58.69 lb) of wood stork forage. To compensate for the loss of wood stork foraging habitat resulting from the I-4 Project, the FDOT has proposed to acquire credits from an approved wetland mitigation bank that provide at least 19.47 kg (42.92 lb) of wood stork forage from short hydroperiod wetlands and 26.62 kg (58.69 lb) of wood stork forage from long hydroperiod wetlands. The FHWA has determined the I-4 Project may affect, but is not likely to adversely affect the wood stork. Based on the minor impacts to wood stork foraging habitat (i.e., the loss of 20.83 ac [8.4 ha of wetlands]), the Service concurs with the FHWA's determination for the wood stork.

Britton's beargrass

The I-4 Project occurs within the geographic range of Britton's beargrass. Britton's beargrass was observed on and near the I-4 Project site during surveys conducted in the 1990s However, this species was not observed within the I-4 Project footprint during recent surveys of the for Federally listed plants conducted by FDOT's consultant in 2014. The FHWA has determined that the I-4 Project may affect but is not likely to adversely affect Britton's beargrass. Based on the information provided, the Service concurs with this determination.

STATUS OF THE SPECIES RANGE WIDE – SAND SKINK

Please see Enclosure 1 for a detailed Status of the Species for the sand skink. A short summary of the Status of the Species is presented below.

The sand skink is a small, maximum total length of about 5 inches {in [12.7 centimeters (cm)]}, fossorial lizard that occurs in sparsely vegetated, xeric-upland habitats with loosely aggregated, sandy soils. This species spends nearly all its time within the soil and has a variety of morphological adaptations for a fossorial lifestyle. The legs of the sand skink are vestigial and practically nonfunctional, and sand skinks move or swim through the soil by serpentine locomotion. Sand skinks feed on a variety of hard and soft-bodied arthropods that occur below the ground surface, such as: beetles, termites, spiders, ant lions, caterpillars, and roaches, (Myers and Telford 1965; Smith 1982). The range of the sand skink is located on the sandy ridges of interior central Florida from Marion County south to Highlands County, and includes Highlands, Lake, Marion, Orange, Osceola, Polk, and Putnam Counties (Christman 1988; Telford 1998). The current population size of the sand skink is not well known because recent comprehensive, range wide surveys have not been conducted. As of September 2006, 132 records of the sand skink have been documented by the Florida Natural Areas Inventory (Griffin 2007). Threats to the sand skink include the destruction and degradation of its habitat due to commercial and residential development and conversion of habitat due to agricultural activities. Approximately 85 percent of the xeric upland communities historically used by the sand skink have been lost (Turner *et al.* 2006)

STATUS OF THE SPECIES RANGE WIDE – BLUE-TAILED MOLE SKINK

Please see Enclosure 2 for a detailed Status of the Species for the blue-tailed mole skink. A short summary of the Status of the Species is presented below.

The blue-tailed mole skink is a small, maximum total length of 5 in (12.7 cm), fossorial lizard known to occur in sparsely vegetated xeric-upland habitats with loosely aggregated, sandy soils. The legs of the blue-tailed mole skink are somewhat reduced in size and used only for surface locomotion and not for "swimming" through the sand (Christman 1992). Blue-tailed mole skinks eat arthropods, and roaches, crickets, and spiders make up the bulk of the diet (Mount 1963). This species has a small geographic range and has been documented only in the central ridges of Polk County, Osceola County, and Highlands County in Florida. The population size of the blue-tailed mole skink is not known due to the lack of recent range wide surveys, and blue-tailed mole skinks are thought to be less common than the sand skink. Threats to the blue-tailed mole skink are similar to those of the sand skink and include the destruction and degradation of its habitat due to commercial and residential development, and conversion of habitat due to agricultural activities. Much of xeric upland communities historically used as habitat by the blue-tailed mole skink have been lost due to anthropogenic activities.

STATUS OF THE SPECIES RANGE WIDE – SCRUB PLUM

Please see Enclosure 3 for a detailed Status of the Species for the scrub plum. A short summary of the Status of the Species is presented below.

The scrub plum is a highly branched shrub that can reach 6 ft (2 m) in height. This species is andromonoecious (i.e., having male and bisexual flowers are present on the same plant)

(Weekley and Menges 2001), and prefers dry and sunny locations that contain nutrient-poor and acidic sandy soils (entisols). Scrub plums are usually found in oak-dominated scrub and high pine, sandhill and scrub communities. The scrub plum occurs in three general areas on Florida's central ridges: 1) Lake County, west and southwest of Lake Apopka; 2) the southwest and northwest corners of Orange and Osceola Counties, respectively; and 3) Polk and Highlands Counties, from the City of Lake Wales south to the Highlands County/Glades County border (FNAI 1996) on the Lake Wales Ridge. Although the historic range was rather extensive compared to other narrowly endemic plants of Florida's central ridges, this species has declined with destruction and fragmentation of its scrub habitat. Treats to the species include habitat loss due to commercial and residential development and agricultural conversion, removal by plant collectors, and fire suppression.

ENVIRONMENTAL BASELINE

As defined in Service's regulations, "the environmental baseline includes the past and present impacts of all Federal, State, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of State or private actions that are contemporaneous with the consultation in process."

In addition, under the Act's regulatory approach, future Federal actions are not included in either the environmental baseline or the cumulative effects analysis of a biological opinion, because they will be subjected to consultation when they occur [51 Fed. Reg. 19926, 19933 (June 3, 1986 - preamble to FWS consultation regulations)].

Status of the species within the action area

Sand skink and blue-tailed mole skink: The FDOT's consultants surveyed the I-4 Project footprint to determine the status of sand skinks. Pedestrian and coverboard surveys, based on the Service's guidance (Service 2012b), were conducted in March and April of 2015 in areas of suitable soils (i.e., excessively drained, well drained and moderately drained, sandy soils) known to be preferred as habitat by sand skinks throughout their range (Service 2012b). Because sand skinks leave a distinctive sinusoidal (s-shaped) track at the soil surface when they move through the soil, tracks of the sand skink can be used to establish the presence of the sand skink at a site. The pedestrian surveys consisted of visual surveys for sand skink tracks throughout areas that contained suitable skink soils in the I-4 Project site. Coverboard surveys consisted of placing 2-ft x 2 ft x 0.5 in (0.61m by 0.61m x 1.2 cm) squares of plywood, masonite, or a similarly rigid material at a density of 40 per ac (110 per ha), randomly or at regular intervals throughout areas of suitable skink soils on the I-4 Project Site. The coverboards were allowed to sit for one week, and then were visually inspected once per week for the next four consecutive weeks. The inspection protocol consisted of picking up the board, scanning the area underneath the board for sand skink tracks, and replacing the coverboard in its original location until the final inspection of the survey. The use of coverboards for survey purposes enhances the detectability of sand skink tracks because sand skinks shelter under the boards for thermoregulatory purposes. The

survey methods employed can be used to demonstrate presence, and estimate the relative abundance of sand skinks on the I-4 Project site and the extent of the I-4 Project site used by skinks, but do not provide an estimate of the number of sand skink that occur on the site.

Tracks of the sand skink were observed during the surveys conducted within suitable soils conducted on the I-4 Project site. Based on the spatial extent of the tracks observed during the survey, research on sand skink movements conducted by Penney (2001) indicating that about $2/3^{rds}$ of sand skinks in her study were observed to exhibit dispersal movements of at least 188 ft (57.2 m), and the acreage of suitable skink soils found on the I-4 Project site, the Service finds that 21.04 ac (8.51 ha) of the I-4 Project site is occupied by the sand skink. The actual number of skinks that currently occur on the site is not known. Mark-recapture surveys would need to be undertaken for at least a year to obtain this information.

Blue-tailed mole skinks were not observed on the I-4 Project site. However, a reliable survey method has not been developed for this species, and this species is generally difficult to detect. The entire known geographic range of the blue-tailed mole skink occurs within a portion of the known geographic range of the sand skink (i.e., the central ridges of Polk County, Osceola County, and Highlands County in Florida). Blue-tail mole skinks also have soil and habitat preferences that are basically identical to the sand skink. The Service notes that blue-tailed mole skinks are likely to occur wherever sand skinks occur in the range of the blue-tailed mole skink. Therefore, for the purposes of this Biological Opinion, the Service finds that blue-tailed mole skink also reasonably certain to occur within the 21.04 ac (8.51 ha) of the I-4 Project site defined as occupied sand skink habitat discussed above

To compensate for the loss of sand skinks, blue-tailed mole skinks and their habitat, the FDOT has proposed to restore, enhance, and preserve at least 42.08 ac (17.02 ha) of sand skink and blue-tailed mole skink habitat. This habitat will be provided through the purchase of 42.08 skink credits at a Service-approved conservation bank or banks.

Scrub plum: The FDOT's consultant surveyed the I-4 Project footprint to determine the status of Federally listed plants. Three specimens of scrub plum were observed during the survey. As a conservation measure to benefit the scrub plum, the FDOT has proposed to work with BTG, a participating institution of the NCPC, to collect seeds from scrub plum plants and translocate suitable specimens of the scrub plum to public conservation lands or other lands acceptable to the Service. Collected seeds would be under the protection of the BTG and either stored or used for propagation. Collected plant specimens may be temporarily housed, depending on available space, at the National Collection Beds that exist on-site at the BTG. It may also be possible to use nurseries associated with the Florida Native Plant Society to temporarily care for collected plant specimens until permanent placement within nearby conservation lands can be coordinated.

Factors affecting species environment within the action area

Past land clearing related to the construction of the existing I-4 roadway, fire suppression and the presence of invasive and exotic invasive plant species [i.e., cogongrass (*Imperata cylindrical)*]

have all resulted in the degradation and loss of skink habitat and scrub plum habitat in the action area. The I-4 Project will result in the permanent conversion of habitat for the sand skink, the blue-tailed mole skink, and the scrub plum within the I-4 Project footprint into a paved highway, maintained road right-of-way, and stormwater treatment ponds. Suitable habitat for sand skink, blue-tailed mole skink, and the scrub plum is not expected to persist in the action area following completion of the I-4 Project.

Climate change

Our analyses under the Act include consideration of observed or likely environmental effects to the sand skink, blue-tailed mole skink and scrub plum related to ongoing and projected changes in climate. As defined by the Intergovernmental Panel on Climate Change (IPCC), "climate" refers to average weather, typically measured in terms of the mean and variability of temperature, precipitation, or other relevant properties over time. Thus "climate change" refers to a change in such a measure that persists for an extended period, typically decades or longer, due to natural conditions (e.g., solar cycles) or human-caused changes in the composition of the atmosphere or in land use (IPCC 2013, p. 1450). Detailed explanations of global climate change and examples of various observed and projected changes and associated effects and risks at the global level are provided in reports issued by the IPCC (2014 and citations therein). Information for the United States at national and regional levels is summarized in the National Climate Assessment (Melillo *et al.* 2014 entire and citations therein; see Melillo *et al.* 2014, pp.28-45 for an overview). Because observed and projected changes in climate vary regionally and locally from global average conditions, the Service uses "downscaled" climate projections (developed through appropriate scientific procedures), when available, to assess the range wide effects of climate change on a given species (See Melillo *et al.* 2014, Appendix 3, pp. 760-763 for a discussion of climate modeling, including downscaling) . Projections of this type provide higher resolution climatic information and are likely more relevant to our assessment. In our analysis, we use our expert judgment to weigh the best scientific and commercial data available in our consideration of relevant aspects of climate change and related effects on a species through its range.

Climate change may result in sea level rise and altered weather patterns in south Florida. Although inundation of habitat from sea level rise is not anticipated to occur within the action area, altered weather patterns could affect the sand skink, blue tailed mole skink and scrub plum. For example, an increase in precipitation could increase vegetation growth, including root growth, in sand skink and blue-tailed mole skink habitat. This could inhibit the movement of skinks through the soil or potentially make the habitat unsuitable for these species. The effect of an increase or decrease in precipitation on the scrub plum is largely unknown but could benefit other plant species that may compete with the scrub plum.

EFFECTS OF THE ACTION

This section analyzes the direct and indirect effects of the proposed action, and interrelated and independent actions on the sand skink, blue-tailed mole skink, and scrub plum.

Factors to be considered

The sand skink, blue-tailed mole skink, and scrub plum are known to occur, or are likely to occur, within the I-4 Project site. The timing of construction for the I-4 Project, relative to sensitive periods of the life cycles of these species, is unknown. The I-4 project will be constructed in a single, disruptive event and alter soils and the native vegetation within the project site. The time required to complete construction of the I-4 Project is not known, but it is likely the majority of the land clearing will be completed within a few months. The I-4 Project will result in incidental injury or mortality of sand skinks and blue-tailed mole skinks and the permanent loss of habitat for these species. The I-4 Project will also result in the loss of scrub plums from the I-4 Project site. Conversely, the acquisition of 42.08 credits at an approved skink conservation bank will benefit skinks by providing for the perpetual protection and management of 42.08 ac (17 ha) of skink habitat. The removal and relocation of the scrub plums from the I-4 Project site to another location is likely to prevent the mortality of these specimens and may help to establish a new population of this species.

Analyses for effects of the action

Direct effects: Direct effects are those effects that are caused by the proposed action, at the time of construction, and are reasonably certain to occur. The direct effects that the I-4 Project will have on the sand skink, blue-tailed mole skink and scrub plum are discussed below.

The construction of the I-4 Project will convert all potential habitat in the project footprint for the sand skink, blue-tailed mole skink, and scrub plum into paved roadway for motor vehicles, sodded and maintained road right-of-way, and stormwater treatment ponds. Construction activities within the I-4 Project site can crush skinks, skink eggs and scrub plum plants, and incidental mortality of sand skinks and blue-tailed mole skinks is expected to occur from the land clearing associated with the I-4 Project. The scrub plum plants on the I-4 Project site will be removed and relocated to another site prior to the commencement of construction activities. However, stress associated with removal and translocation process has the potential to kill at least some of the plant specimens. As described above, the I-4 project will result in the loss of 21.04 ac (8.5 ha) of habitat currently occupied by the sand skinks and the blue-tailed mole skink and approximately three specimens of the scrub plum. Suitable habitat for these species is not expected to occur in the project footprint following completion of the I-4 Project. Therefore, the project is expected to directly affect the persistence of sand skinks, blue-tailed mole skinks, and scrub plum in the action area. The I-4 Project will also add to the continued fragmentation of sand skink, blue-tailed mole skink, and scrub plum habitat in the region and result in a small reduction of the geographic distribution of each of these species. The Service notes that the impact of habitat loss on the fitness of the sand skink, blue-tailed mole skink, and scrub plum in the action area, and ultimately their range wide populations, can be difficult to discern. However we do not expect the amount of habitat loss due to the project, by itself, to significantly affect the important biological functions of these species (e.g., feeding and breeding, growth and development etc.), or ultimately affect the population size of these species within in the action area or range wide. Nevertheless, we acknowledge that, collectively, habitat loss and degradation

due to development projects, in the action area and range wide, could threaten the survival of the sand skink, blue-tailed mole skink, and scrub plum and their recovery. Therefore, we will continue to monitor the collective effects of habitat loss related to development and other causes on these species as it continues to occur.

Interrelated and interdependent actions: An interrelated activity is an activity that is part of the proposed action and depends on the proposed action for its justification. An interdependent activity is an activity that has no independent utility apart from the action under consultation. Interrelated or interdependent actions are not expected to result from the project.

Indirect effects: Indirect effects are caused by or result from the proposed action, are later in time, and are reasonably certain to occur. The sand skink, blue-tailed mole skink, and scrub plum, and habitat for these species, are not is not expected to exist in the action area following completion of the I-4 Project. Therefore, the I-4 Project is not expected to result in indirect effects to the sand skink, blue-tailed mole skink, and scrub plum.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, County, Tribal, local, or private actions that are reasonably certain to occur in the action area considered in this Biological Opinion. Future Federal actions unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act. The Service has considered cumulative effects within the action area for the sand skink, blue-tailed mole skink, and scrub plum, and, based on the above discussion, we have not identified any additional cumulative effects beyond those already discussed in the Environmental Baseline.

CONCLUSION

After reviewing the current status of the sand skink, blue-tailed mole skink, and scrub plum, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the Service's biological opinion that the I-4 Project, as proposed, is not likely to jeopardize the continued existence of the sand skink, blue-tailed mole skink, or scrub plum. We have reached this conclusion because: only a small amount of habitat [21.04 ac (8.5 ha)] currently used by the sand skink, blue-tailed mole skink, and scrub plum will be permanently lost; this amount only represents a small reduction in the geographic range of the species; and the

habitat lost will not significantly affect the important biological functions of these species or significantly reduce their range-wide populations.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to

engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to, and not intended as part of the agency action, is not considered to be prohibited taking under the Act provided such taking is in compliance with the terms and conditions of the incidental take statement. The terms and conditions described below are nondiscretionary and must be undertaken by the FHWA so they become binding conditions of any grant or permit issued to the FDOT, as appropriate, for the exemption in section 7(o)(2) to apply. The FHWA has a continuing duty to regulate the activity covered by this incidental take statement. If the FHWA (1) fails to assume and implement the terms and conditions or (2) fails to require the FDOT to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protection coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the FHWA or the FDOT must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement [50 CFR § 402.14(i)(3)].

Sections 7(b)(4) and 7 (o)(2) of the Act generally do not apply to listed plant species (i.e., the scrub plum). However, limited protection of listed plants is provided to the extent that the Act prohibits the removal and reduction to possession of Federally listed endangered plants or the malicious damage of such plants on areas under Federal jurisdiction, or the destruction of endangered plants on non-federal areas in violation of State law or regulation or in the course of any violation of a State criminal trespass law. Therefore, the scrub plum will not be mentioned further in this incidental take statement.

AMOUNT OR EXTENT OF TAKE ANTICIPATED

The Service anticipates incidental take of sand skinks and blue-tailed mole skinks in the form of harm (i.e., injury, mortality and habitat loss). Construction activities associated with the I-4 Project will result in the loss of 21.04 ac (8.5 ha) of occupied skink habitat. The Service finds that the number of sand skinks and blue-tailed mole skinks taken by the action will be difficult to quantify for the following reasons: (1) individuals have a small body size and spend the majority of their time underground, making the detection of a dead or impaired specimen unlikely, and (2) extensive mark/recapture surveys would be needed to estimate skink numbers at the I-4 Project site, thus the number of skinks currently occurring in the I-4 Project footprint is not well known. As discussed in the *Status of the species in the action area*, although blue-tailed mole skinks have not been documented within the I-4 Project site, they have similar biological and habitat requirements as sand skinks and are reasonably certain to occur on the I-4 Project site.

Because habitat loss is known to result in take of the sand skinks and blue-tailed mole skinks, and is easily measured and monitored, the Service has decided to express the amount of take resulting from the I-Project in terms of the acreage of habitat lost. The amount of take resulting from the I-4 Project is 21.04 ac (8.5 ha). The Service finds that habitat loss provides a suitable surrogate, as defined in 50 CFR 402.14(i)(1)(i), to express the amount of anticipated take of sand skinks and blue-tailed mole skinks resulting from the I-4 Project, and sets a clear standard for determining when the amount of anticipated take is exceeded. In addition, the Service finds that the amount of incidental take is moderated by the acquisition of 42.08 credits at a Service-approved conservation bank. This habitat will be enhanced, managed, and preserved in perpetuity to benefit the sand skink and blue-tailed mole skink.

REASONABLE AND PRUDENT MEASURES

When providing an incidental take statement, the Service is required to provide: 1) reasonable and prudent measures it considers necessary or appropriate to minimize the take; 2) terms and conditions that must be complied with to implement the reasonable and prudent measures; and 3) procedures to be used to handle or dispose of any individuals taken. The Service finds the FDOT has already designed the I-4 Project to minimize take resulting from the action as described in the "Description of the Proposed Action" section of this Biological Opinion. Therefore, additional reasonable and prudent measure and their implementing terms and conditions are not necessary to reduce take of the sand skink and blue-tailed mole skink resulting from the action, and will not be provided.

MONITORING AND REPORTING REQUIREMENTS

Pursuant to 50 CFR 402.14(i)(3), the FHWA and the FDOT must provide adequate monitoring and reporting to determine if the amount or extent of take is approached or exceeded. Following land clearing associated with the I-4 Project, the FDOT must provide a letter or email to the Service providing the actual acreage of occupied skink habitat cleared by the I-4 Project.

DISPOSITION OF DEAD OR INJURED SPECIMENS

Upon locating a dead, injured, or sick threatened or endangered species, initial notification must be made to the nearest Service Law Enforcement Office; Fish and Wildlife Service; 20501 Independence Boulevard; Groveland, Florida 34736-8573; 352-429-1064. Secondary notification should be made to the FWC; South Region; 3900 Drane Field Road; Lakeland, Florida; 33811-1299; 1-800-282-8002. Care should be taken in handling sick or injured specimens to ensure effective treatment and care or in the handling of dead specimens to preserve biological material in the best possible state for later analysis as to the cause of death. In conjunction with the care of sick or injured sand skinks and blue-tailed mole skinks, or preservation of biological materials from a dead animal, the finder has the responsibility to carry out instructions provided by Law Enforcement to ensure evidence intrinsic to the specimen is not unnecessarily disturbed.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. The Service is not proposing any conservation recommendations at this time.

REINITIATION - CLOSING STATEMENT

This concludes formal consultation on the I-4 Project. As provided in 50 CFR § 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded (see below); (2) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; (3) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. The amount of incidental take authorized by this consultation may be exceeded should impacts from the proposed I-4 Project increase beyond 21.04 ac (8.5 ha) of occupied skink habitat as reported in this Biological Opinion. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

Thank you for your cooperation in the effort to protect fish and wildlife resources. If you have any questions regarding this project, please contact John Wrublik at 772-469-4282.

Sincerely yours,

for Roxanna Hinzman
Field Supervisor
South Florida Ecological Services Office

Enclosures

cc: electronic only
FDOT, DeLand, Florida (Catherine Owen)
FHWA, Orlando, Florida (Luis Lopez)
FWC, Tallahassee, Florida (FWC-CPS)
NOAA Fisheries, St. Petersberg, Florida (David Rydene)
Service, Vero Beach, Florida (Marilyn Knight, David Bender)

LITERATURE CITED

Christman, S.P. 1992. Threatened: bluetailed mole skink, *Eumeces egregius lividus* (Mount). Pages 117-122 in P.E. Moler, editor. Rare and endangered biota of Florida. University Press of Florida; Gainesville, Florida.

Christman, S.P. 1988. Endemism and Florida's interior sand pine scrub. Final project report

Florida Natural Areas Inventory (FNAI). 1996. Element occurrence data for: *Prunus geniculata*. Tallahassee, Florida.

Griffin, J.A. 2007. Personal communication. Data Services Coordinator. Email to the U.S Fish and Wildlife Service dated June 12, 2007. Florida Natural Areas Inventory; Tallahassee, Florida.

Intergovernmental Panel on Climate Change (IPCC). 2014. Climate Change 2014 Synthesis Report. [Pachauri, R.K. *et al.*] 133 pp. http://www.ipcc.ch/pdf/assessment-report/ ar5/syr/AR5 SYR FINAL SPM.pdf

Intergovernmental Panel on Climate Change (IPCC). 2013. Annex III: Glossary Planton,S.(ed.)]. Pp. 1147-1465 In: Clim.ate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovemmental Panel on Climate Change [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, New York, USA.

Krysko, K. L., M. C. Cranatosky, L P. Nunez and D. J. Smith. 2016. A cryptic new species of indigo snake (genus *Drymarchon*) from the Florida platform of the United States. Zootaxa 4138 (3): 549-569.

Melillo J.M., T.C. Richmond, and G. W. Yohe, Eds. 2014. Climate Change Impacts in the United States: The Third National Clim.ate Assessment. U.S. Global Change Research Program. http://nca2014.globalchange.gov/downloads

Mount, R.H. 1963. The natural history of the red-tailed sk.ink, Eumeces egregius (Baird). American Midland Naturalist 70:356-385.

Myers, C.W., and S.R. Telford, Jr. 1965. Food of Neoseps, the Florida sand skink. Quarterly Journal of the Florida Academy of Science. 28: 190-194.

Penney, K. M. 2001. Factors affecting translocation success and estimates of dispersal and movement patterns of the sand skink (Neoseps reynoldsi) on restored scrub. Unpublished thesis,. University of South Florida, Tampa, Florida. 71 pages.

Smith, C.R. 1982. Food resource partitioning of fossorial Florida reptiles. Pages 163-171 in NJ. Scott, editor. Herpetological communities. U.S. Fish and Wildlife Service, Wildlife Research Report No. 13; Washington, D.C.

Telford, S.R., Jr. 1998. Monitoring of the sand skink (Neoseps reynoldsi) in Ocala National Forest. Final report submitted to U.S. Forest Service, Ocala National Forest, Silver Springs, Florida.

Turner, W. R., D. S. Wilcove, and H. M. Swain. 2006. Assessing the effectiveness of reserve acquisition programs in protecting rare and threatened species. Conservation Biology 20(6): 1657- 1669.

U.S. Fish and Wildlife Service (Service). 2013. Standard protection measures for the eastern indigo snake. Fish and Wildlife Service, South Florida Ecological Services Office; Vero Beach, Florida. Available from: https://www.fws.gov/ verobeach/Reptiles PDFs/ 20130812_EIS%20Standard %20Protection%20Measures_final.pdf

U.S. Fish and Wildlife Service (Service). 2012a. Wood Stork Foraging Habitat Assessment Methodology, South Florida Ecological Services Office; Vero Beach, Florida. Available from https://www.fws.gov/verobeach/BirdsPDFs/20120712_WOST%20Forage %20 Assessment%20Methodology_Appendix.pdf

U.S. Fish and Wildlife Service (Service). 2012b. Species Conservation Guidelines, South Florida - Sand Skink and Bluetail Mole Skink. U.S. Fish and Wildlife, South Florida Ecological Services Office; Vero Beach, Florida [cited October 29, 2008]. Available from: http://www.fws.gov/verobeach/ReptilesPDFs/20120206 Skink%20CCG Final.pdf

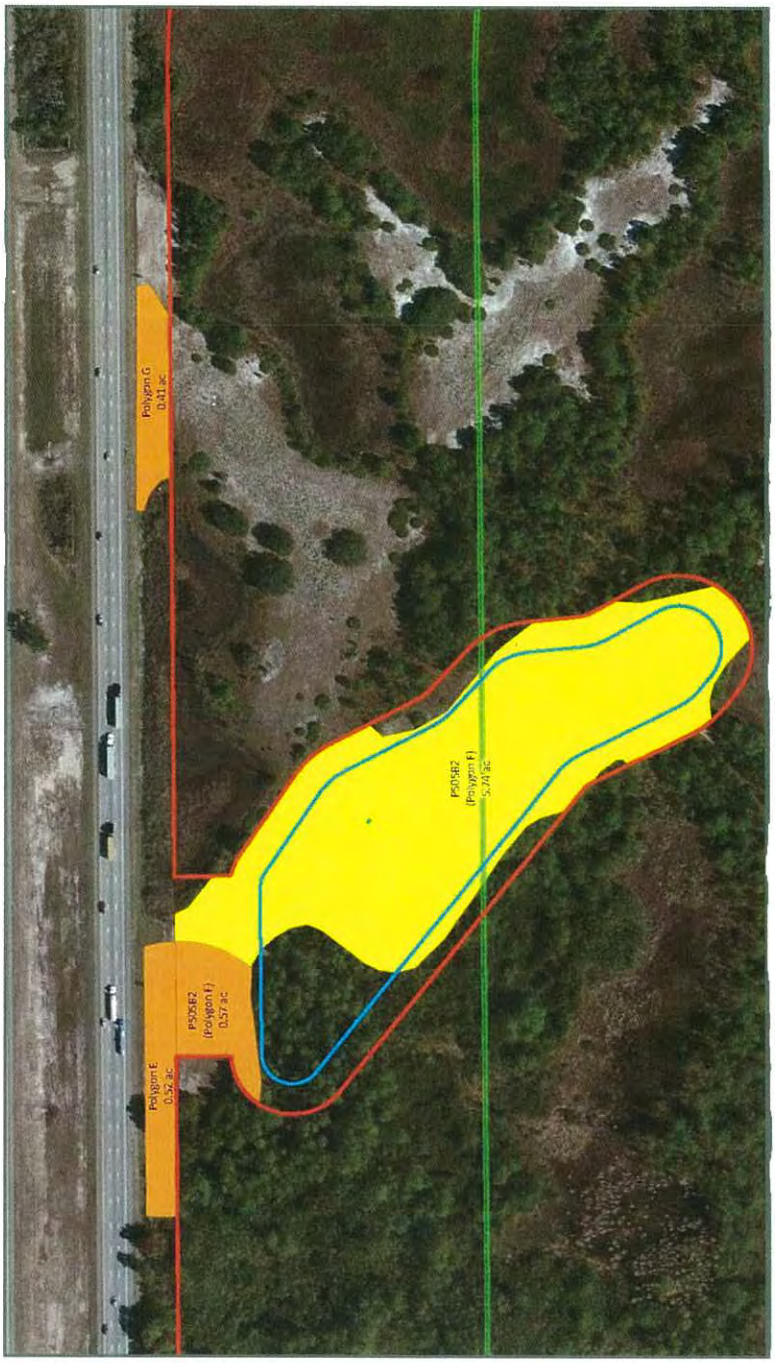
Weekley, C. W. and E. S. Menges 2001. Demography, floral biology, and breeding system of scrub plum (*Prunus geniculata*), a Federally listed endangered plant. Report to U.S. fish and Wildlife Service, Jacksonville, Fla. 14+ pages.

Figure 1. Location map of the I-4 Project site in Polk County, Florida.

Figure 2. Aerial maps of lands within the I-4 Project site determined to be occupied by the sand skink and the blue-tailed moles skink (as indicated by shading).

Figure 2, Continued

Figure 2, Continued



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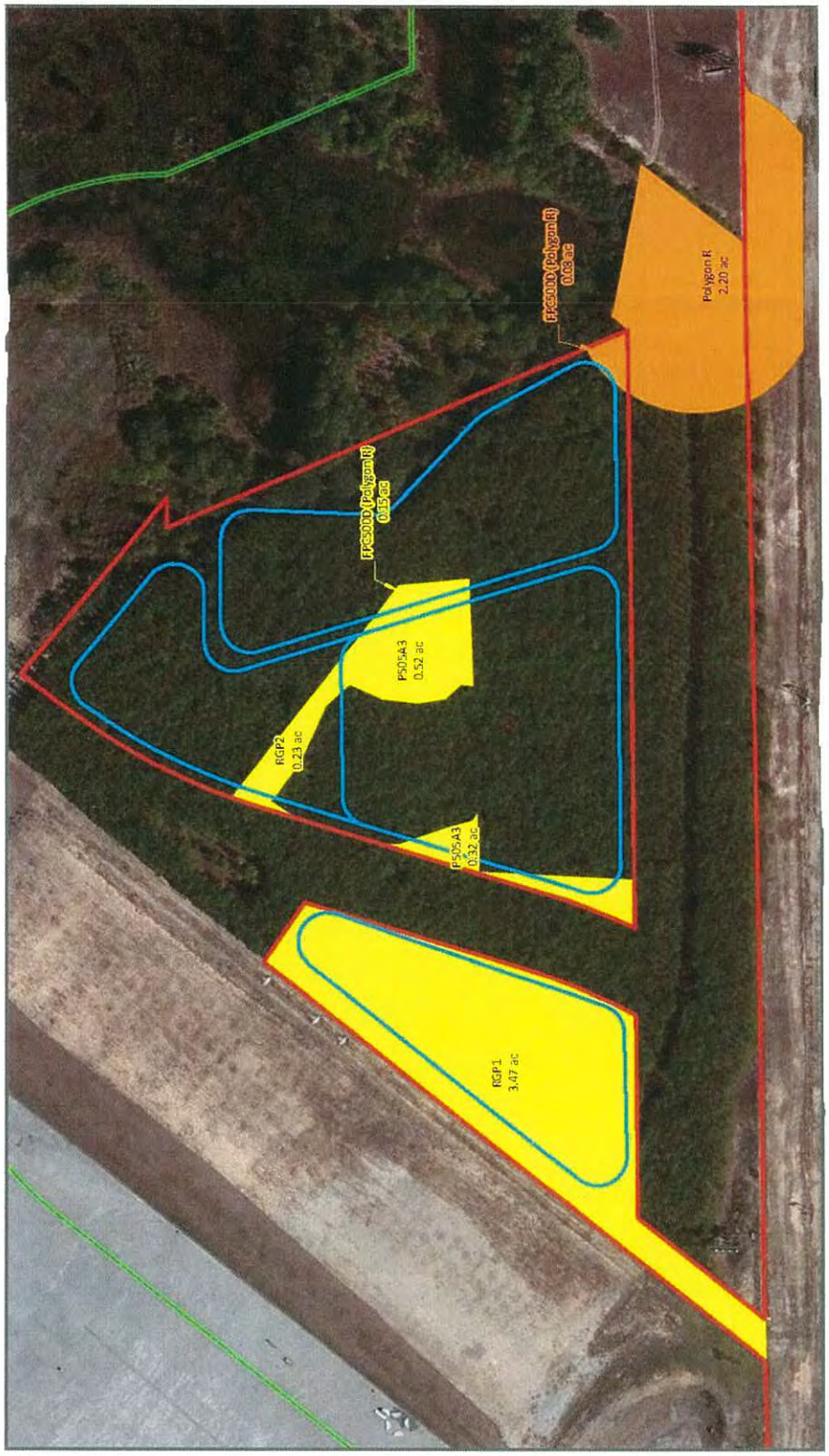

Figure 2, Continued

STATUS OF THE SPECIES – sand skink (*Neoseps reynoldsi*)

Legal Status

The sand skink was listed as threatened under the Endangered Species Act in 1987 (52 FR 42658), and is listed as federally-designated threatened by the state. Critical habitat has not been designated for the sand skink.

Species Description

Appearance/Morphology

The sand skink is a small, fossorial lizard that reaches a maximum length of about 5 inches (in) (12.7 centimeters [cm]). The tail makes up about half the total body length. The body is shiny and usually gray to grayish-white in color, although the body color may occasionally be light tan. Hatchlings have a wide black band located along each side from the tip of the tail to the snout. This band is reduced in adults and may only occur from the eye to snout on some individuals (Telford 1959). Sand skinks contain a variety of morphological adaptations for a fossorial lifestyle. The legs are vestigial and practically nonfunctional, the eyes are greatly reduced, the external ear openings are reduced or absent (Greer 2002), the snout is wedge-shaped, and the lower jaw is countersunk.

Taxonomy

The taxonomic classification of the sand skink has been reevaluated since it was listed as *Neoseps reynoldsi* in 1987 (52 FR 42658), and the commonly accepted scientific name for the sand skink is now *Plestiodon reynoldsi* (Brandley et al. 2005; Smith 2005). A detailed description of the recent taxonomic review can be found in Service (2007). We continue to use the scientific name as published in the final listing rule (52 FR 42658).

The sand skink is believed to have evolved on the central Lake Wales Ridge (LWR) and radiated from there (Branch et al. 2003). Analysis of mitochondrial DNA indicates populations of the sand skink are highly structured with most of the genetic variation partitioned among four lineages: three subpopulations on the LWR characterized by high haplotype diversity and a single, unique haplotype detected only on the Mount Dora Ridge (MDR) (Branch et al. 2003). Under the conventional molecular clock, the 4.5 percent divergence in sand skinks from these two ridges would represent about a 2-million year separation. The absence of haplotype diversity on the MDR would suggest this population was founded by only a few individuals or severely reduced by genetic drift of a small population (Branch et al. 2003).

Life History

The sand skink is usually found below the soil surface burrowing through loose sand in search of food, shelter, and mates. Sand skinks feed on a variety of hard and soft-bodied arthropods that occur below the ground surface. The diet consists largely of beetle larvae and termites (*Prorhinotermes* spp.). Spiders, larval ant lions, lepidopteran larvae, roaches, and adult beetles are also eaten (Myers and Telford 1965; Smith 1982).

Sand skinks are most active during the morning and evening in spring and at mid-day in winter, the times when body temperatures can easily be maintained at a preferred level between 82 and 88 degrees Fahrenheit in open sand (Andrews 1994). During the hottest parts of the day, sand skinks move under shrubs to maintain their preferred body temperatures in order to remain active near the surface. With respect to season, Telford (1959) reported skinks most active from early March through early May, whereas Sutton (1996) found skinks most active from mid-February to late April. Based on monthly sampling of pitfall traps, Ashton and Telford (2006) found captures peaked in March at Archbold Biological Station (ABS), but in May at the Ocala National Forest (ONF). All of these authors suggested the spring activity peak was associated with mating. At ABS, Ashton and Telford (2006) noted a secondary peak in August that corresponded with the emergence of hatchling sand skinks.

Telford (1959) assumed sand skinks become sexually mature during the first year following hatching, at a size of 1.78 in (4.52 cm) snout-vent length. He suspected most of the breeders in his study were in their second year and measured between 1.78 and 2.24 in (4.52 and 5.69 cm) snout-vent length. However, Ashton (2005) determined sand skinks become sexually mature between 19 and 23 months of age and have a single mating period each year from February through May. Sand skinks first reproduce at 2 years of age and females produce a single clutch in a season, although some individuals reproduce biennially or less frequently (Ashton 2005). Sand skinks lay between two and four eggs, typically under logs or debris, in May or early June (Ashton 2005; Mushinsky in Service 2007), approximately 55 days after mating (Telford 1959). The eggs hatch from June through July. Sand skinks can live at least to 10 years of age (Meneken et al. 2005). Gianopulos (2001) found the sex ratio of sand skinks did not differ significantly from 1:1, which is consistent with the findings of Sutton (1996).

Most sand skinks move less than 130 feet (ft) (39.6 meters [m]) between captures, but some have been found to move over 460 ft (140.2 m) in 2 weeks (Mushinsky et al. 2001). Limited dispersal ability has been suggested to explain the relatively high degree of genetic structure within and among sand skink populations (Branch et al. 2003; Reid et al. 2004). Analysis of blood and fecal samples obtained from 20 sand skinks in ONF demonstrated that no blood parasites were present and only normal protistan and helminth symbiotes were observed, with no evidence of effect on survival of individuals or the population (Telford 1998). Similarly, a species of nematode (*Parapharyngodon ocalaensis*) was collected from the intestinal tracts of 22 sand skinks (Bursey

and Telford 2002). It is not known to be a threat to the species. In a subsequent paper, Telford and Bursey (2003) found 3 species of endoparasites in 45 sand skinks from ONF.

Habitat

The sand skink is widespread in native xeric uplands with excessively well-drained soils (Service 2012), principally on the ridges listed above at elevations greater than 80 ft (24.4 m) above mean sea level. Commonly occupied native habitats include Florida scrub variously described as sand pine scrub, xeric oak scrub, rosemary scrub and scrubby flatwoods, as well as high pine communities that include sandhill, longleaf pine/turkey oak, turkey oak barrens and xeric hammock (see habitat descriptions in Myers 1990 and Service 1999). Coverboard transects extended from scrub or high pine (sandhill) through scrubby flatwoods to pine flatwoods revealed that sand skinks left more tracks in scrub than the other three habitats and did not penetrate further than 130 ft (39.6 m) into scrubby flatwoods or 65 ft (19.8 m) into pine flatwoods (Sutton et al. 1999). Sand skinks also use disturbed habitats such as citrus groves, pine plantations, and old fields, especially when adjacent to existing scrub (Pike et al. 2007; 2008).

Various authors have attempted to characterize optimal sand skink habitat (Telford 1959; 1962; Christman 1978; 1992; Campbell and Christman 1982). Literature descriptions of scrub characteristics have not proven very useful to predict sand skink abundance, but expert opinion was more successful (McCoy et al. 1999). McCoy et al. (1999) used trap-out enclosures to measure sand skink densities at seven scrub sites and attempted to rank each area individually based on eight visual characteristics to identify good habitat: (1) root-free, (2) grass-free, (3) patchy bare areas, (4) bare areas with lichens, (5) bare areas with litter, (6) scattered scrubs, (7) open canopy, and (8) sunny exposure. None of the individual literature descriptions of optimal habitat (or any combination thereof) accurately predicted the rank order of actual sand skink abundance at these sites, which ranged in density from 52 to 270 individuals per acre (ac) (Sutton 1996). However, knowledgeable researchers, especially as a group, appear to be able to visually sort out the environmental variables important to sand skinks, but had difficulty translating their perceptions into a set of rules that others could use to identify optimal sand skink habitat (McCoy et al. 1999).

Multiple studies (Collazos 1998; Hill 1999; Mushinsky and McCoy 1999; Gianopulos 2001; Mushinsky et al. 2001) have determined the relationship between sand skink density and a suite of environmental variables. These studies have found sand skink relative density was positively correlated with low canopy cover, percent bare ground, amount of loose sand and large sand particle size, but negatively correlated with understory vegetation height, litter cover, small sand particle size, soil moisture, soil temperature, and soil composition. In an unburned sandhill site at ABS, Meshaka and Lane (2002) captured significantly more sand skinks in pitfall traps set in openings without shrubs than at sites with moderate to heavy shrub density. Telford (1959) suggested scattered debris and litter provided moisture that was important to support an abundant

food supply and nesting sites for sand skinks. Cooper (1953) noted the species was most commonly collected under rotting logs, and Christman (1992) suggested they nest in these locations. Christman (2005) found skinks continue to occupy scrub with a closed canopy and thick humus layer, although at lower densities. Recent surveys have also shown sand skinks may occupy both actively managed lands, such as citrus groves and pine plantations, and old-field communities (Pike et al. 2007), particularly if these sites are adjacent to patches of native habitat that can serve as a source population for recolonization.

Experimental studies have been conducted to investigate the effects of management techniques, such as mechanical treatment and prescribed burning, on sand skink abundance. Several studies found a decrease in relative abundance of skinks immediately following both mechanical and burning treatments (Mushinsky and McCoy 1999; Gianopulos 2001; Gianopulos et al. 2001; Mushinsky et al. 2001; Sutton et al. 1999). Gianopulos (2001) and Gianopulos et al. (2001) reported a significant increase in skink captures in mechanical treatment plots over the 5-year period following the treatment. However, a clear increase in skink numbers following a burn was not observed (Navratil 1999; Gianopulos et al. 2001; Mushinsky et al. 2001). Christman (2005) conducted trap surveys at sites with a known burn history on the LWR in Polk and Highlands Counties and did not observe a strong correlation between skink density and number of years since the site was burned. Mushinsky et al. (2001) noted significantly larger skinks were captured in burned plots, indicating more insect prey may have been available from decaying logs or older skinks inhabited these sites.

Habitat size may be a factor in maintaining viable skink populations. Pike et al. (2006) monitored sand skinks and quantified vegetation change in six areas from 5 to 69 ac (2 to 27.9 hectare [ha]) that were restored to a more natural state using fire and canopy thinning, and set aside for conservation in residential areas. Pike et al. (2006) documented a severe decline in occupancy and relative density of sand skinks, and hypothesized indirect impacts from surrounding development, such as changes in soil hydrology, may have caused the decline. Hydrologic changes in the soil may have occurred as a result of construction of retention ponds or run-off from neighborhoods that caused a rise in the groundwater level (Pike et al. 2006). The population decline of skinks noted may also have been caused by prescribed burning used to restore these sites (Mushinsky in Service 2007).

Distribution

The sand skink occurs on the sandy ridges of interior central Florida from Marion County south to Highlands County. The extant range of the sand skink includes Highlands, Lake, Marion, Orange, Osceola, Polk, and Putnam Counties (Christman 1988; Telford 1998). Principal populations occur on the LWR and Winter Haven Ridges (WHR) in Highlands, Lake, and Polk Counties (Christman 1992; Mushinsky and McCoy 1991). The sand skink is uncommon on the MDR, including sites within the ONF (Christman 1970; 1992). Despite intensive sampling

efforts in scrub habitat with similar herpetofauna, the sand skink has not been recorded at Avon Park Air Force Range on the Bombing Range Ridge (Branch and Hokit 2000). Although we do not have estimates of acreage for all of the ridges, we do know the largest of these, the LWR, encompasses approximately 517,303 ac (209,300 ha) (Weekley et al. 2008). According to the Florida Natural Areas Inventory (FNAI) database, updated as of September 2006, there were 132 locality records for the sand skink, including 115 localities on the LWR, 7 on the MDR, and 4 on the WHR (Griffin 2007). FNAI also reports four localities for this species west of the MDR in Lake County and two localities between the LWR and the Lake Hendry Ridge.

Population Dynamics

Abundance (historical and current), population estimates, stability/viability

The current status of the sand skink throughout its geographic range is unclear because recent comprehensive, rangewide surveys have not been conducted. At the time of Federal listing in 1987, FNAI had recorded 31 known sites for the sand skink. By September 2006, 132 localities were known by FNAI (Griffin 2007). This increase is largely the result of more intensive sampling of scrub habitats in recent years and does not imply this species is more widespread than originally supposed. Nonetheless, except for a few locations where intensive research has been conducted, limited information about the presence or abundance of sand skinks exists. Reptile surveys in a variety of scrub habitats in the ONF did not detect sand skinks (Greenberg et al. 1994). Telford (1998) cited the ephemeral nature of early successional scrub habitats due to dynamic changes as an important confounding factor in the evaluation of the sand skink's present status in the ONF. At least two persistent populations are known from the ONF (Telford 1998), where sand skinks have been collected for genetic analysis (Branch et al. 2003) and population studies (Ashton and Telford 2006). Additional studies have provided presence/absence information that has been used to determine the extant range of the species (Mushinsky and McCoy 1991; Stout and Corey 1995). However, few long-term monitoring efforts have been undertaken to evaluate the population size, or population trends, of sand skinks at these sites, on remaining scrub habitat on private lands, or rangewide.

The population dynamics of sand skinks within their extant ranges are not well known because the skinks' small size and secretive habits make their study difficult. Sand skinks are known to exhibit life-history traits that are also found in a number of other fossorial lizard species, such as: delayed maturity, a small clutch size of relatively large eggs, low frequency of reproduction, and a long lifespan (Ashton 2005). Such character traits may have resulted from, and be indicative of, high intraspecific competition or predation.

Threats

Present or Threatened Destruction, Modification or Curtailment of its Habitat or Range

The modification and destruction of xeric upland communities in central Florida were a primary consideration in listing the sand skink as threatened. By some estimates, as much as 90 percent of the scrub ecosystem has already been lost to residential development and conversion to agriculture, primarily citrus groves (Kautz 1993; Turner et al. 2006a). Xeric uplands remaining on private lands are especially vulnerable to destruction because of increasing residential and agricultural pressures.

Approximately 85 percent of xeric upland communities historically used by sand skinks on the LWR are estimated to have been lost due to development (Turner et al. 2006b). It is likely continued residential and agricultural development of xeric upland habitat in central Florida has destroyed or degraded habitat containing sand skinks. Protection of the sand skink from further habitat loss and degradation provides the most important means of ensuring its continued existence. Of the 73 locations examined by Turner et al. (2006a) on which sand skinks were reported, 39 are protected and, as of 2004, 27 were managed. Current efforts to expand the system of protected xeric upland communities on the LWR, coupled with implementation of effective land management practices, represent the most likely opportunity for assuring the sand skink's survival.

The 5-year review found no justification for change in the threatened status (Service 2007).

Ongoing Conservation Efforts

Over the last 20 years, a concerted effort by public and private institutions to protect the remaining undeveloped areas of the LWR has resulted in the acquisition of 21,498 ac (8,700 ha) of scrub and sandhill habitat (Turner et al. 2006). A variety of state and federal agencies and private organizations are responsible for management of these areas. The Service has also acquired portions of several tracts totaling 1,800 ac (728.4 ha) as a component of the LWR National Wildlife Refuge (Service 1993). Private organizations, such as The Nature Conservancy and ABS, have acquired and currently manage xeric uplands within the LWR. All of these efforts have greatly contributed to the protection of imperiled species including skinks on the LWR (Turner et al. 2006).

The Service has also certified six conservation banks totaling nearly 1,500 ac for sand and blue-tailed mole skinks, two in Highlands County and four in Polk County. Conservation banking provides an avenue for collaboration of private/public partnerships to maintain and preserve habitat, providing for the conservation of endangered species. These banks conserve and manage land in perpetuity through a Conservation Easement to offset impacts occurring elsewhere to the same resource values on non-bank lands. The certification of these banks should help reduce the piece-meal approach to skink conservation that can result from separate evaluation of individual projects by establishing larger reserves and improving connectivity of habitat.

Recovery of the skink may also require rehabilitation of suitable but unoccupied habitat or restoration of potentially suitable habitat. Translocation efforts may also be needed. Comparisons of persistence, recruitment, and survival were used to determine translocation success of sand skinks on two restored scrub sites for 6 years following relocation (Mushinsky et al. 2001; Penney 2001; Penney et al. 2001). One site established a self-sustaining population, while the other did not. It was determined that site location, habitat suitability, and initial propagule size were the factors affecting success; researchers concluded the chances of long-term survival may improve when habitat is restored and skinks are introduced to sites close to intact scrub, rather than to isolated sites (Mushinsky et al. 2001; Penney 2001). In another study, Osman (2010) found that survival of sand skinks was significantly greater on translocation sites with low soil moisture and no shade-providing object, and evidence of reproduction was observed more readily on sites with lower soil compaction and light intensities over the two-year study. He concluded that sand skinks can do well in multiple microhabitat conditions and microhabitat heterogeneity in and around these sites is important. Emerick (2015) monitored and analyzed long-term translocation success of sand skinks over a total of 7 years. He confirmed survival success of the offspring of founding individuals born on the site and determined those individuals were also successfully reproducing.

References Cited

Andrews R.M. 1994. Activity and thermal biology of the sand-swimming skink Neoseps reynoldsi: Diel and seasonal patterns. Copeia 1: 91-99.

Ashton, K.G. 2005. Life history of a fossorial lizard, Neoseps reynoldsi. Journal of Herpetology 39(3): 389-395.

Ashton, K.G. and S.R. Telford, Jr. 2006. Monthly and daily activity of a fossorial lizard, Neoseps reynoldsi. Southeastern Naturalist 5(1): 175-183.

Branch, L.C., and D.G. Hokit. 2000. A comparison of scrub herpetofauna on two central Florida sand ridges. Florida Scientist 63(2):108-117.

Branch, L.C., A.M. Clark, P.E. Moler, and B.W. Bowen. 2003. Fragmented landscapes, habitat specificity, and conservation genetics of three lizards in Florida scrub. Conservation Genetics 4: 199-212.

Brandley, M.C., A. Schmitz, and T.W. Reeder. 2005. Partitioned Bayesian analysis, partition choice and phylogenetic relationships of scincid lizards. Systemic Biology 54(3):373-390.

Bursey, C.R., and S.R. Telford, Jr. 2002. *Parapharyngodon ocalaensis* n. sp. (Nematoda: Pharyngodonidae) from the sand skink, *Neoseps reynoldsi* (Scincidae), of Florida. The Journal of Parasitology 88(5):929-931.

Campbell, H.W. and S.P. Christman. 1982. The herpetological components of Florida sandhill and sand pine scrub associations. Pp. 163-171 In: N.J. Scott, ed. Herpetological communities: A symposium of the Society for the Study of Amphibians and Reptiles and the Herpetologist's League, August, 1977. U.S. Fish and Wildlife Service, Wildlife Research Report No. 13.

Christman, S.P. 1970. The possible evolutionary history of two Florida skinks. Quarterly Journal of the Florida Academy of Science 33(4): 291-293.

Christman, S.P. 1978. Threatened: sand skink, Neoseps reynoldsi (Stejneger). Pages 40-41 *in* R.W. McDiarmid, ed. Rare and endangered biota of Florida. Volume 3: amphibians and reptiles. University Press of Florida; Gainesville, Florida.

Christman, S.P. 1988. Endemism and Florida's interior sand pine scrub. Final project report no. GFC-84-010, Florida Game and Fresh Water Fish Commission; Tallahassee, Florida.

Christman, S.P. 1992. Threatened: sand skink, Neoseps reynoldsi (Stejneger). Pages 135-140 *in* P.E. Moler, ed. Rare and endangered biota of Florida. University Press of Florida; Gainesville, Florida.

Christman, S.P. 2005. Densities of Neoseps reynoldsi on the Lake Wales Ridge. Final Report, Part 1. Cooperative Agreement No. 401813J035 between U.S. Dept. of Interior, Fish and Wildlife Service and Steven P. Christman, Ph.D.

Collazos, A. 1998. Microhabitat selection in Neoseps reynoldsi: The Florida sand swimming skink. Master's Thesis. University of South Florida, Tampa.

Cooper, B.W. 1953. Notes on the life history of the lizard, *Neoseps reynoldsi* Stejneger. Quarterly Journal of the Florida Academy of Sciences. 16(4):235-238.

Emerick, A.R. 2015. Status of a translocated Florida sand skink population after six years: Establishing and evaluating criteria for success. M.S. Thesis. University of South Florida, Tampa, Florida.

Gianopulos, K.D. 2001. Response of the threatened sand skink (*Neoseps reynoldsi*) and other herpetofaunal species to burning and clearcutting in the Florida sand pine scrub habitat. M.S. Thesis, University of South Florida; Tampa, Florida.

Gianopulos, K.D., H.R. Mushinsky, and E.D. McCoy. 2001. Response of the threatened sand skink (*Neoseps reynoldsi*) to controlled burning and clear-cutting in Florida sand pine scrub habitat. Proceedings from the Florida Scrub Symposium; Orlando, Florida.

Greenberg, C.H., D.G. Neary, and L.D. Harris. 1994. Effect of high-intensity wildfire and silvicultural treatments on reptile communities in sand-pine scrub. Conservation Biology 8:1047-1057.

Greer, A.E. 2002. The loss of the external ear opening in scincid lizards. Journal of Herpetology 36(4):544-555.

Griffin, J.A. 2007. Personal communication. Data Services Coordinator. Email to the U.S Fish and Wildlife Service dated June 12, 2007. Florida Natural Areas Inventory; Tallahassee, Florida.

Hill, K. 1999. Responses of released populations of the sand skink, Neoseps reynoldsi, to scrub habitat translocation in Central Florida. Master's Thesis. University of South Florida, Tampa.

Kautz, R.S. 1993. Trends in Florida wildlife habitat 1936-1987. Florida Scientist 56(1): 7-24.

McCoy, E.D., P.E. Sutton, and H.R. Mushinsky. 1999. The role of guesswork in conserving the threatened sand skink. Conservation Biology 13(1):190-194.

Meneken, B.M., A.C.S. Knipps, J.N. Layne, and K.G. Ashton. 2005. Neoseps reynoldsi. Longevity. Herpetological Review 36: 180-181.

Meshaka Jr., W.E., and J.N. Layne. 2002. Herpetofauna of a long unburned sandhill in south-central Florida. Florida Scientist 65(1): 35-50.

Mushinsky, H.R. and E.D. McCoy. 1991. Vertebrate species compositions of selected scrub islands on the Lake Wales Ridge of central Florida. Final report no. GFC-87-149. Florida Game and Fresh Water Fish Commission, Nongame Wildlife Program; Tallahassee, Florida.

Mushinky, H.R. and E.D. McCoy. 1999. Studies of the sand skink (Neoseps reynoldsi) in Central Florida. Final Report, prepared for: Walt Disney Imagineering, Kissimmee, Florida.

Mushinsky, H.R., E.D. McCoy, K. Gianopulos, K. Penney, and C. Meyer. 2001. Biology of the threatened sand skink of restored scrub habitat and their responses to land management practices. Final report to the Disney Wildlife Conservation Fund.

Myers, R.L. 1990. Scrub and high pine. Pages 150-193 *in* R.L. Myers and J.J. Ewel, eds. Ecosystems of Florida. University Presses of Florida; Gainesville, Florida.

Myers, C.W. and S.R. Telford, Jr. 1965. Food of Neoseps, the Florida sand skink. Quarterly Journal of the Florida Academy of Science. 28: 190-194.

Navratil, G. 1999. A study of selected land management practices on the sand pine scrub habitat of Florida: A measure of the effects of land management on the sand skink, *Neoseps reynoldsi.* M.S. Thesis, University of South Florida, Tampa, Florida.

Osman, N.P. 2010. Experimental translocation of the Florida sand skink (Plestiodon[=Neoseps] reynoldsi): Success of a restricted species across diverse microhabitats. M.S. Thesis. University of South Florida, Tampa, Florida.

Penney, K.M. 2001. Factors affecting translocation success and estimates of dispersal and movement patterns of the sand skink *Neoseps reynoldsi* on restored scrub. M.S. Thesis. University of South Florida, Tampa, Florida.

Penney, K.M., H.R. Mushinsky, and E.D. McCoy. 2001. Translocation success of the threatened sand skink [Internet]. Pages 26-28 *in* D. Zattau, editor. Proceedings of the Florida Scrub Symposium 2001; Orlando Florida [cited October 29, 2008]. Available from: http://www.fws.gov/northflorida/Scrub-Jays/Docs/Proceedings-07-2001.pdf

Pike, D.A., R.S. Mejeur, W.D. Lites, and J.H. Exum. 2006. Do neighborhood conservation areas work? A drastic reduction in lizard occupancy coinciding with improved habitat quality and surrounding development. Abstract in Joint Meeting of the 22nd Annual Meeting of the American Elasmobranch Society, 86th Annual Meeting of the American Society of Ichthyologists and Herpetologists, 64th Annual Meeting of the Herpetologists' League, and the 49th Annual Meeting of the Society for the Study of Amphibians and Reptiles; 12–17 July 2006; New Orleans, Louisiana.

Pike, D.A., K.S. Peterman, and J.H. Exum. 2007. Use of altered habitats by the endemic *Plestiodon reynoldsi* Stejneger (sand skink). Southeastern Naturalist 6:715–726.

Pike, D.A, K.S. Peterman, and J.H. Exum. 2008. Habitat structure influences the presence of sand skinks (*Plestiodon reynoldsi*) in altered habitats. Wildlife Research 35:120–127.

Reid, D.T., K.G. Ashton, and K.R. Zamudio. 2004. Characterization of microsatellite markers in the threatened sand skink (Neoseps reynoldsi). Molecular Ecology Notes 4: 691-693.

Smith, C.R. 1982. Food resource partitioning of fossorial Florida reptiles. Pages 173-178 *in* N.J. Scott, ed. Herpetological communities: A symposium of the Society for the Study of Amphibians and Reptiles and the Herpetologist's League, August, 1977. U.S. Fish and Wildlife Service, Wildlife Research Report No. 13.

Smith, H.M. 2005. Plestiodon: A replacement name for most members of the genus Eumeces in North America. Journal of Kansas Herpetology 14: 15-16.

Stout, I.J. and D.T. Corey. 1995. Effects of patch-corridor configurations on nongame birds, mammals, and herptiles in longleaf pine-turkey oak sandhill communities. Nongame Project Report No. RFP-86-003, Florida Game and Fresh Water Fish Commission; Tallahassee, Florida.

Sutton, P.E. 1996. A mark and recapture study of the Florida Sand skink Neoseps reynoldsi and a comparison of sand skink sampling methods. Master's thesis, University of South Florida; Tampa, Florida.

Sutton, P.E., H.R. Mushinsky, and E.D. McCoy. 1999. Comparing the use of pitfall drift fences and cover boards for sampling the threatened sand skink (Neoseps reynoldsi). Herpetological Review 30(3): 149-151.

Telford, S.R., Jr. 1959. A study of the sand skink, Neoseps reynoldsi. Copeia 1959 (2):100-119.

Telford, S.R. 1962. New locality records for the sand skink, Neoseps reynoldsi Stejneger. Copeia 1959: 110-119.

Telford, S.R., Jr. 1998. Monitoring of the sand skink (*Neoseps reynoldsi*) in Ocala National Forest. Final report submitted to U.S. Forest Service, Ocala National Forest, Silver Springs, Florida.

Telford, S.R., Jr., and C.R. Bursey. 2003. Comparative parasitology of squamate reptiles endemic to scrub and sandhills communities of north-central Florida, U.S.A. Comparative Parasitology 70:172–181.

Turner W.R., D.S. Wilcove, and H.M. Swain. 2006a. State of the Scrub: Conservation progress, management responsibilities, and land acquisition priorities for imperiled species of Florida's Lake Wales Ridge [Internet]. Archbold Biological Station; Lake Placid, Florida [cited October 29, 2008]. Available from: www.archbold-station.org/ABS/publicationsPDF/Turner_etal-2006-StateotScrub.pdf

Turner, W. R., D. S. Wilcove, and H. M. Swain. 2006b. Assessing the effectiveness of reserve acquisition programs in protecting rare and threatened species. Conservation Biology 20(6):1657-1669.

U.S. Fish and Wildlife Service. 1993. Recovery plan for the sand skink and the blue-tailed mole skink. Atlanta, Georgia.

U.S. Fish and Wildlife Service. 1999. South Florida multi-species recovery plan. Atlanta, Georgia.

U.S. Fish and Wildlife Service. 2007. Blue-tailed mole skink (*Eumeces egregius lividus*) and sand skink (*Neoseps reynoldsi*) [Internet]. 5-year review: summary and evaluation. South Florida Ecological Services Office, Vero Beach, Florida [cited October 29, 2008]. Available from: http://ecos.fws.gov/docs/five_year_ review /doc1071.pdf

U.S. Fish and Wildlife Service. 2012. Draft Species Conservation Guidelines, South Florida – Sand Skink and Blue-tailed Mole Skink [Internet]. U.S. Fish and Wildlife, South Florida Ecological Services Office; Vero Beach, Florida [cited October 29, 2008]. Available from: http://www.fws.gov/verobeach/ReptilesPDFs/20120206_Skink%_Final.pdf

STATUS OF THE SPECIES – blue-tailed mole skink (*Eumeces egregius lividus*)

Legal Status – Federal: *threatened*, 1987; State: *threatened*

The blue-tailed mole skink was listed as threatened under the Endangered Species Act of 1973, as amended (Act) (87 Stat. 884; 16 U.S.C. 1531 *et seq*.) on December 7, 1987 (52 FR 42658- 52 FR 42662), and is listed as threatened by the State of Florida. The historic and anticipated future modification and destruction of xeric upland communities in central Florida were primary considerations in listing. Almost 90 percent of the xeric upland communities on the Lake Wales Ridge (LWR) have already been lost because of habitat destruction and degradation due to residential development and conversion to agriculture, primarily citrus groves (Turner et al. 2006). Remaining xeric habitat on private lands is especially vulnerable because projections of future human population growth suggest additional demands for residential development within the range of the blue-tailed mole skink. Critical habitat has not been designated for the blue-tailed mole skink.

Species Description

Appearance/Morphology

The blue-tailed mole skink (*Eumeces egregius lividus*) is a small, fossorial lizard that occupies xeric upland habitats of the southern LWR in central Florida (Mount 1965; Christman 1992). It reaches a maximum length of about 5 inches (in) (12.7 centimeters [cm]), and the tail makes up about half the body length (Christman 1978; 1992). The body is shiny, and brownish to pink in color, with lighter paired dorsolateral stripes diverging posteriorly (Christman 1978; 1992). Males develop a colorful orange pattern on the sides of the body during breeding season (Christman 1992). Juveniles usually have a blue tail (Christman 1978; 1992). Regenerated tails and the tails of older individuals are typically pinkish. The legs are somewhat reduced in size and used only for surface locomotion and not for "swimming" through the sand (Christman 1978; 1992).

Taxonomy

Mount (1965) described the blue-tailed mole skink largely on the basis of a bright blue tail in juveniles and restricted this subspecies to the southern LWR in Polk and Highlands Counties. Christman (1978) also limited the range of blue-tailed mole skink to these two counties, but later added Osceola County to the range, based on the collection of a single blue-tailed mole skink juvenile just north of the Polk County line on the LWR (Christman 1992). Analysis of mitochondrial DNA (Branch et al. 2003) supports Mount's (1965) hypotheses that blue-tailed mole skink from the lower LWR represents the ancestral stock, which radiated from there. Genetic analysis also indicates substantial population variability with limited dispersal in mole skinks among sandy habitats (Branch et al. 2003). Based on conventional estimates of molecular evolutionary clocks, these authors suggest a separation of approximately 4 million years between mole skinks occurring on the two oldest ridges (LWR and MDR), which overlaps the proposed Pliocene origin of scrub habitats (Webb 1990).

Five subspecies of mole skinks have been described, all of which occupy xeric upland habitats of Florida, Alabama, and Georgia (Mount 1965), but only the blue-tailed mole skink (*Eumeces egregius lividus*) is federally listed as threatened (52 FR 42658). The taxonomic classification of the mole skink has been reevaluated, and there is evidence to suggest that it should be revised (Griffith et al. 2000; Brandley et al. 2005; Smith 2005). Brandley et al. (2005) and Smith (2005) formally proposed that the name *Plestiodon* be used to describe the Genus of the North American skinks. However, until such time as it can be officially designated through the Federal Register process, the Service continues to use the scientific name as published in the final listing rule (52 FR 42658). A detailed description of the recent taxonomic review can be found in Service (2007a).

Life History

Blue-tailed mole skinks are typically found in a variety of xeric upland communities, including rosemary and oak-dominated scrub, turkey oak barrens, high pine, and xeric hammocks (Christman 1992). They are primarily found within the top 2 in (5 cm) of the soil surface (Mount 1963). Roaches, crickets, and spiders make up the bulk of the diet (Mount 1963; Smith 1982; McCoy et al. 2010). Smith (1982) suggested that their diet is more generalized than that of the fossorial sand skink (*Neoseps reynoldsi*), which probably reflects their tendency to feed at the surface. However, McCoy et al. (2010) suggest that the dietary diversity of mole skinks is very similar to sand skinks or perhaps even more specialized. Also, like sand skinks, mole skinks show an activity peak in spring (Mount 1963; Smith 1982).

The reproductive biology of the blue-tailed mole skink is poorly known. Reproduction is presumably very much like that of the peninsula mole skink (*Eumeces egregius onocrepis*) where courtship and mating occur in the fall and winter (Mount 1963; Christman 1978). In the peninsula mole skink, individuals probably become reproductively active at 1 to 2 years of age (Mount 1963; Christman 1978). Two to nine eggs are laid in a shallow nest cavity less than 12 in (30.5 cm) below the surface (Mount 1963; Christman 1978). The eggs incubate for 31 to 51 days, during which time the female tends the nest (Mount 1963; Christman 1978). Females have a large clutch size (maximum nine) of relatively small eggs (Mount 1963).

Habitat

A variety of xeric upland communities provide habitat for the blue-tailed mole skink, including rosemary and oak-dominated scrub, turkey oak barrens, high pine, and xeric hammocks (Christman 1992). Areas with few plant roots, open canopies, scattered shrub vegetation, and patches of bare, loose sand provide optimal habitats (Christman 1988; 1992). Within these habitat types, blue-tailed mole skinks are typically found under leaves, logs, palmetto fronds, and other ground debris (Christman 1992). Shaded areas presumably provide suitable microhabitat conditions for thermoregulation, egg incubation, and foraging (Mount 1963).

Specific physical structures of habitat that sustain sand skink populations, and likely blue-tailed mole skink populations as well, include a well-defined leaf litter layer on the ground surface and

shade from either a tree canopy or a shrub layer, but not both (McCoy 2011, University of South Florida, pers. comm.). Leaf litter likely provides important skink foraging opportunities. Shade provided by a tree canopy or a shrub layer likely helps skinks regulate body temperature to prevent overheating. However, having both a tree canopy and a shrub layer appears to be detrimental to skinks (McCoy 2011, University of South Florida, pers. comm.).

Turner et al. (2006) reported that development and agriculture have resulted in the loss of approximately 85% of the scrub and sandhill habitats on the LWR, and what remains contains high concentrations of imperiled species. Over the last 20 years, more than 87 square kilometers (km^2) (48.9%) of the remaining 187 km^2 of these habitat types on the Lake Wales Ridge have been acquired and protected (Turner et al. 2006). Therefore, only 6.3% of pre-settlement scrub and sandhill habitats are currently protected (Turner et al. 2006).

In addition to the need for these remaining scrub and sandhill habitats to be protected, these habitats along with those on sites that have already been acquired for conservation depend upon active management, most often prescribed fire, to persist long-term (Turner et al. 2006). Much of the remaining habitat occurs in small, isolated fragments surrounded by residential areas or citrus groves, making them difficult to protect and manage. Many of these fragments are overgrown and in need of restoration. It is unknown whether or not small, fragmented properties are able to maintain viable populations.

Either natural fire started by lightning or prescribed fire is necessary to maintain habitat in natural scrub ecosystems. However, if fire occurs too frequently, leaf litter might not build up sufficiently to support skink populations. At Archbold Biological Station (ABS), fossorial sand skinks appear to be most abundant after 10 years of leaf litter development. The ideal fire frequency to maintain optimal leaf litter development for skinks likely varies by site and other environmental conditions (Mushinsky 2011, University of South Florida, pers. comm.). Although this information is specific to sand skinks, the same may be true for blue-tailed mole skinks.

Distribution

The blue-tailed mole skink historically occurred on the LWR in Highlands, Polk, and Osceola Counties (Service 1999). Despite intensive sampling efforts in scrub habitat with similar herpetofauna, neither the sand skink nor blue-tailed mole skink have been recorded at Avon Park Air Force Range on the Bombing Range Ridge (Branch and Hokit 2000). It appears that skinks are still distributed throughout their historic range, although we believe their numbers have likely declined substantially because of habitat loss and degradation.

Turner et al. (2006) reported that blue-tailed mole skinks are known to occur in 23 locations, 22 of which are on the LWR. The authors did not indicate where the single site occurs from which blue-tailed mole skink is reported off of the LWR, but we believe that this record may be in error. The subspecies has not been documented elsewhere off of the LWR and is believed to be restricted to this ridge alone (Moler 2007; Mushinsky 2007).

Blue-tailed mole skinks often seem absent or rare on the same LWR study sites where sand skinks are common, and when present, are patchily distributed (Christman 1988, 1992; Mushinsky and McCoy 1995). Mount (1963) noted peninsula mole skinks also are patchily distributed and mostly occurred on xeric sites greater than 100 acres (ac) (40 hectares [ha]) in size. The distribution of the blue-tailed mole skink appears to be closely linked to the distribution of surface litter and, in turn, suitable microhabitat sites. Campbell and Christman (1982) characterized blue-tailed mole skinks as colonizers of a patchy, early successional, or disturbed habitat, which may occur as a result of natural or anthropogenic factors. Susceptibility of mature sand pine to windthrow may be an important factor in maintaining bare, sandy microhabitats required by blue-tailed mole skinks and other scrub endemics (Myers 1990).

Population Dynamics

The population dynamics of the blue-tailed mole skink are not well known because the skinks' diminutive size and secretive habits make their study difficult. The best current method available to detect blue-tailed mole skinks involves the raking of sand and organic liter and intensive searching, or the use of pit-fall traps and drift fences. Because these methods are laborious and time-consuming, they are not well suited for use over large areas. Unfortunately, cover board surveys used to detect sand skinks are not useful for specifically detecting the presence of blue-tailed mole skinks. As such, assessing the abundance and population trends of the blue-tailed mole skink over large areas is problematic.

Early maturity and a large clutch size of relatively small eggs (Mount 1963) suggest the population dynamics of mole skinks are different from sand skinks. Blue-tailed mole skinks appear to be far less common than sand skinks A survey of seven protected sites conducted in 2004-2005 by Christman (2005) reported a density of 1.3 individuals per acre (0.53 per ha), compared to 56 sand skinks per acre (22.7 per ha), or a ratio of 1 blue-tailed mole skink for every 43 sand skinks collected. Previous studies indicated lower blue-tailed mole skink to sand skink ratios of 1:1.89 based on 54 total skinks captured in six trap arrays (Christman 1988), 1:4.3 based on 332 total skinks in 58 trap arrays (Mushinsky and McCoy 1991) and 1:2.7 based on 49 total skinks in 31,640 pitfall trap-days (Meshaka and Lane 2002). Christman (1992) suggested only 1 blue-tailed mole skink is encountered for every 20 sand skinks.

Peninsula mole skinks tend to be clumped in distribution with variable densities that may approach 25 adults per acre (10.12 per ha) (Mount 1963); however, it appears that blue-tailed mole skinks are much rarer (Christman 1992). Telford (2007) suggests that this disparity in relative abundance of the two species may be explained by seasonal variation in activity and movements and year-round surveys should be conducted over an adequate number of years to minimize the effect of variation in rainfall in order to obtain better estimates.

Unfortunately, determining population stability and viability is unattainable with current information. Because of the ongoing habitat loss and degradation on the LWR, it is likely that overall populations are declining (Moler 2007).

Critical habitat

Critical habitat is not designated for this species.

Threats

Present or Threatened Destruction, Modification or Curtailment of its Habitat or Range

It is likely that ongoing residential and agricultural development of xeric upland habitat in central Florida has destroyed or degraded extensive tracts of habitat containing the blue-tailed mole skink. Continued habitat loss, fragmentation, and changes in land use threaten the existence of the subspecies. Unlike sand skinks, their tracks cannot be easily detected in the sand, and most of the extant scrub, including protected sites, on the LWR has not been adequately surveyed for blue-tailed mole skinks. Populations on private sites are threatened with destruction or habitat modification due to improper or lack of management.

The LWR encompasses approximately 517,303 ac (209, 345 ha) (Weekley et al. 2008*)*. Roughly 69,683 ac of this area is protected in refuges, parks, State forests, wildlife and environmental areas, and on private lands, and, therefore, protected from general destruction (Turner et al. 2006). However, Turner et al. (2006) indicated that blue-tailed mole skinks seem to be underrepresented in the reserve network of protected public lands, but the authors could not determine if their absence reflects actual exclusion or a lack of survey effort. If the former is true, then additional lands must be protected and managed in perpetuity to ensure the survival of this subspecies (Turner et al. 2006).

Another concern is whether relatively small, isolated properties are able to maintain viable populations. There is evidence of an edge effect on sand skink distribution on isolated scrub fragments bordered by non-scrub habitat (Gianopulos 2001, Mushinsky et al. 2001). Gianopulos (2001) found that on scrub fragments bordered by non-scrub habitat, sand skinks were found more frequently within the middle of the sites than along the edges bordered by non-scrub habitat, and this difference was detected as far as 50 m (164 ft) into the sites. This could be a concern for blue-tailed mole skinks, as well.

Between 2005 and 2060 Florida's population is projected to double from approximately 18 to 36 million people (Zwick and Carr 2006). Assuming a similar pattern of development at current gross urban densities for each county, this translates into the need to convert an additional 7 million ac of undeveloped land into urban land uses (Zwick and Carr 2006). Over most of the range of the sand and blue-tailed mole skinks in the central region of Florida from Marion County southward to northern Polk and Osceola Counties, human population growth and the conversion of previously undeveloped lands to urban use is expected to be explosive (Zwick and Carr 2006). It is predicted that Osceola County is among the counties that will experience the greatest transformation from rural to urban land over the next 50 years (Zwick and Carr 2006). This is expected to be the result of population spillover from the build-out in Orange County (Zwick and Carr 2006).

The protection and recovery of blue-tailed mole skinks will require that habitat loss be limited to disturbed areas, and that suitable unoccupied habitat be restored. Current efforts to expand the system of protected xeric upland habitats on the LWR, in concert with implementation of aggressive land management practices, represent the most likely opportunity for securing the future of this species.

Inadequacy of Existing Regulatory Mechanisms

In addition to protections associated with the Act and existing regulations on refuges and other protected lands where skinks occur, the blue-tailed mole skink is listed by the Florida Fish and Wildlife Conservation Commission as federally-designated threatened (Chapter 39-27, Florida Administrative Code). This legislation prohibits take, except under permit, but does not provide any direct habitat protection. Wildlife habitat is protected on Florida Fish and Wildlife Conservation Commission wildlife management areas and wildlife environmental areas according to Florida Administrative Code 68A-15.004. Therefore, the Act provides additional protection for these species and their habitat through section 7 (interagency cooperation), as well as through the prohibitions of section 9(a)(l) and the provisions of section 4(d) and recovery planning. Although section 7 and 9(a)(l) provide some regulatory protection, these provisions do not adequately protect against habitat loss. In addition, existing regulations are not specific enough to guard against loss of genetic integrity of the species. Research has shown that it is important to preserve certain areas of the historic range to maintain genetic diversity.

Other Natural or Manmade Factors Affecting its Continued Existence

Improper habitat management and invasion by nonnative and invasive species threaten the existence of blue-tailed mole skinks. Active management is necessary to maintain suitable habitat for skinks. Management of scrub habitat is problematic because much of the remaining habitat occurs in small fragmented areas surrounded by residential areas where prescribed burning may not be feasible. These residential areas are also often a source of nonnative plants that invade native habitat. Many of the fragments are overgrown and in need of restoration.

Habitat degradation on protected and private sites continues to be a threat because vegetation restoration and management programs are costly and depend upon availability of funding. Where prescribed fire is not feasible as a management technique because of smoke management and other concerns, mechanical treatment is sometimes used. However, heavy machinery disturbs the soil more than prescribed burning, and it removes often limited nutrients from the soil (Mushinsky et al. 2001). This changes the nutrient levels in the topsoil, affecting the vegetative composition of the site, whereas fire releases nutrients (Mushinsky et al. 2001). Also, if logs are removed from a site after mechanical treatment, prey abundance (termites) may be lower than it would be after a fire (Mushinsky et al. 2001).

Another threat to skinks is the loss of genetic diversity. Branch et al.'s (1999; 2003) work on sand skinks identified genetic distinctions among populations from the Mt. Dora Ridge, the northern LWR, the central LWR, and the southern LWR. Because each site where more than five individuals were sampled contained unique haplotypes, populations on isolated ridges

should be protected to avoid the loss of genetic diversity. This likely applies to blue-tailed mole skinks, as well.

Climate Change and Sea Level Rise

According to the Intergovernmental Panel on Climate Change Report (IPCC) (2007), warming of the earth's climate is "unequivocal," as is now evident from observations of increases in average global air and ocean temperatures, widespread melting of snow and ice, and rising sea level. The 2007 IPCC report describes changes in natural ecosystems with potential wide-spread effects on many organisms, including marine mammals and migratory birds. The potential for rapid climate change poses a significant challenge for fish and wildlife conservation. Species' abundance and distribution are dynamic, relative to a variety of factors, including climate. As climate changes, the abundance and distribution of fish and wildlife will also change. Highly specialized or endemic species are likely to be most susceptible to the stresses of changing climate. Based on these findings and other similar studies, the Department of the Interior requires agencies under its direction to consider potential climate change effects as part of their long-range planning activities (Service 2007b).

Climate change at the global level drives changes in weather at the regional level, although weather is also strongly affected by season and local effects (*e.g.*, elevation, topography, latitude, proximity to the ocean, etcetera). Temperatures are predicted to rise from 2º C to 5º C for North America by the end of this century (IPCC 2007). Other processes to be affected by this projected warming include rainfall (amount, seasonal timing and distribution), storms (frequency and intensity), and sea level rise. However, the exact magnitude, direction, and distribution of these changes at the regional level are not well understood or easy to predict. Seasonal change and local geography make prediction of the effects of climate change at any location variable. Current models offer a wide range of predicted changes.

Climatic changes in south Florida could amplify current land management challenges involving habitat fragmentation, urbanization, invasive species, disease, parasites, and water management (Pearlstine 2008). Global warming will be a particular challenge for endangered, threatened, and other "at risk" species. It is difficult to estimate, with any degree of precision, which species will be affected by climate change or exactly how they will be affected. The Service will use Strategic Habitat Conservation planning, an adaptive science-driven process that begins with explicit trust resource population objectives, as the framework for adjusting our management strategies in response to climate change (Service 2006).

For the blue-tailed mole skink, sea level rise is likely to increase man-made effects, as the human population moves from the coast to central parts of the State. This human migration will increase the demand for development and could lead to increased loss of upland xeric habitat. In addition, the increased human population would likely increase the threats associated with human interactions, such as fire suppression, habitat degradation, and nonnative species described above.

Ongoing Conservation Efforts

Over the last 20 years, a concerted effort by public and private institutions to protect the remaining undeveloped areas of the LWR has resulted in the acquisition of 21,498 ac (8,700 ha) of scrub and sandhill habitat (Turner et al. 2006). A variety of state and federal agencies and private organizations are responsible for management of these areas. The Service has also acquired portions of several tracts totaling 1,800 ac (728.4 ha) as a component of the LWR National Wildlife Refuge (Service 1993). Private organizations, such as The Nature Conservancy and ABS, have acquired and currently manage xeric uplands within the LWR. All of these efforts have greatly contributed to the protection of imperiled species including skinks on the LWR (Turner et al. 2006).

The Service has also certified six conservation banks totaling nearly 1,500 ac for sand and blue-tailed mole skinks, two in Highlands County and four in Polk County. Conservation banking provides an avenue for collaboration of private/public partnerships to maintain and preserve habitat, providing for the conservation of endangered species. These banks conserve and manage land in perpetuity through a Conservation Easement to offset impacts occurring elsewhere to the same resource values on non-bank lands. The certification of these banks should help reduce the piece-meal approach to skink conservation that can result from separate evaluation of individual projects by establishing larger reserves and improving connectivity of habitat.

Recovery of the skink may also require rehabilitation of suitable but unoccupied habitat or restoration of potentially suitable habitat. Translocation efforts may also be needed. Although blue-tailed mole skinks have not been translocated, we may be able to infer likelihood of success based upon success of similar species. Comparisons of persistence, recruitment, and survival were used to determine translocation success of skinks on two restored scrub sites for 6 years following relocation (Mushinsky et al. 2001; Penney 2001; Penney et al. 2001). One site established a self-sustaining population, while the other did not. It was determined that site location, habitat suitability, and initial propagule size were the factors affecting success; researchers concluded the chances of long-term survival may improve when habitat is restored and skinks are introduced to sites close to intact scrub, rather than to isolated sites (Mushinsky et al. 2001; Penney 2001). In another study, Osman (2010) found that survival of sand skinks was significantly greater on translocation sites with low soil moisture and no shade-providing object, and evidence of reproduction was observed more readily on sites with lower soil compaction and light intensities over the two-year study. He concluded that sand skinks can do well in multiple microhabitat conditions and microhabitat heterogeneity in and around these sites is important. Emerick (2015) monitored and analyzed long-term translocation success of sand skinks over a total of 7 years. He confirmed survival success of the offspring of founding individuals born on the site and determined those individuals were also successfully reproducing.

References Cited

Branch, L.C., and D.G. Hokit. 2000. A comparison of scrub herpetofauna on two central Florida sand ridges. Florida Scientist 63 (2): 108- 117.

Branch, L.C., A.M. Clark, P.E. Moler, and B.W. Bowen. 2003. Fragmented landscapes, habitat specificity, and conservation genetics of three lizards in Florida scrub. Conservation Genetics 4: 199-212.

Brandley, M.C., A. Schmitz, and T.W. Reeder. 2005. Partitioned Bayesian analyses, partition choice, and the phylogenetic relationships of Scincid lizards. Systematic Biology 54(3):373-390.

Campbell, H.W. and S.P. Christman. 1982. The herpetological components of Florida sandhill and sand pine scrub associations. Pp. 163-171 In: N.J. Scott, ed. Herpetological communities: A symposium of the Society for the Study of Amphibians and Reptiles and the Herpetologist's League, August, 1977. U.S. Fish and Wildlife Service, Wildlife Research Report No. 13.

Christman, S.P. 1978. Threatened: bluetailed mole skink, Eumeces egregius lividus (Mount). Pages 38-40 *in* R.W. McDiarmid, ed. Rare and endangered biota of Florida. Volume 3: amphibians and reptiles. University Press of Florida; Gainesville, Florida.

Christman, S.P. 1988. Endemism and Florida's interior sand pine scrub. Final project report no. GFC-84-010, Florida Game and Fresh Water Fish Commission; Tallahassee, Florida.

Christman, S.P. 1992. Threatened: bluetailed mole skink, Eumeces egregius lividus (Mount). Pages 117-122 *in* P.E. Moler, ed. Rare and endangered biota of Florida. University Press of Florida; Gainesville, Florida.

Christman, S.P. 2005. Densities of Neoseps reynoldsi on the Lake Wales Ridge. Final Report, Part 1. Cooperative Agreement No. 401813J035 between U.S. Dept. of Interior, Fish and Wildlife Service and Steven P. Christman, Ph.D.Emerick, A.R. 2015. Status of a translocated Florida sand skink population after six years: Establishing and evaluating criteria for success. M.S. Thesis. University of South Florida, Tampa, Florida.

Emerick, A.R. 2015. Status of a translocated Florida sand skink population after six years: Establishing and evaluating criteria for success. M.S. Thesis. University of South Florida, Tampa, Florida.

Gianopulos, K.D. 2001. Response of the threatened sand skink (Neoseps reynoldsi) and other herpetofaunal species to burning and clearcutting in the Florida sand pine scrub habitat. M.S. Thesis, University of South Florida, Tampa, Florida.

Griffin, J.A. 2007. Personal communication. Data Services Coordinator. Email to the U.S Fish and Wildlife Service dated June 12, 2007. Florida Natural Areas Inventory; Tallahassee, Florida.

Griffith, H., A. Ngo, and R.W. Murphy. 2000. A cladistic evaluation of the cosmopolitan

genus Eumeces Wiegmann (Reptilia, Squaniata, Scincidae). Russian Journal of Herpetology 7(1): 1-16.

Intergovernmental Panel on Climate Change Fourth Assessment Report. 2007. Climate Change 2007: Synthesis Report. Summary for Policy Makers. Draft.

McCoy, E.D. 2011. Personal communication. Professor and Associate Chair in the Department of Biology, University of South Florida. Sand skink scrub-jay scrub management field trip to Lake Marion. May 16.

McCoy, E.D., N. Ihasz, E.J. Britt, and H.R Mushinsky. 2010. Is the Florida sand skink (*Plestiodon reynoldsi*) a dietary specialist? Herpetologica 66(4): 432-442.

Meshaka Jr., W.E., and J.N. Layne. 2002. Herpetofauna of a long unburned sandhill in south-central Florida. Florida Scientist 65(1): 35-50.

Moler, P. 2007. Peer review comments to U.S. Fish and Wildlife Service, Vero Beach, FL. June 4.

Mount, R.H. 1963. The natural history of the red-tailed skink, Eumeces egregius (Baird). American Midland Naturalist 70: 356-385.

Mount, R.H. 1965. Variation and systemics of the scincoid lizard, Eumeces egregious(Baird) Bulletin of the Florida State Museum. University of Florida; Gainesville, Florida. Vol. 9(5): 183-213.

Mushinsky, H. 2007. Peer review comments to U.S. Fish and Wildlife Service, Vero Beach, FL. June 1.

Mushinsky, H.R. 2011. Personal communication. Professor and Graduate Director in the Department of Biology, University of South Florida. Sand skink scrub-jay scrub management field trip to Lake Marion. May 16.

Mushinsky, H.R. and E.D. McCoy. 1991. Vertebrate species compositions of selected scrub islands on the Lake Wales Ridge of central Florida. Final report no. GFC-87-149. Florida Game and Fresh Water Fish Commission, Nongame Wildlife Program; Tallahassee, Florida.

Mushinsky, H.R. and E.D. McCoy. 1995. Vertebrate species compositions of selected scrub islands on the Lake Wales Ridge of Central Florida. Florida Game and Fresh Water Fish Commission, Nongame Wildlife Program; Tallahassee, Florida.

Mushinsky, H.R., E.D. McCoy, K. Gianopulos, K. Penney, and C. Meyer. 2001. Biology of

the threatened sand skink on restored scrub habitat and its responses to land management practices. Final report to the Disney Wildlife Conservation Fund. University of South Florida, Tampa, Florida.

Myers, R.L. 1990. Scrub and high pine. Pages 150-193 *in* R.L. Myers and J.J. Ewel, eds. Ecosystems of Florida. University Presses of Florida; Gainesville, Florida.

Osman, N.P. 2010. Experimental translocation of the Florida sand skink (Plestiodon[=Neoseps] reynoldsi): Success of a restricted species across diverse microhabitats. M.S. Thesis. University of South Florida, Tampa, Florida.

Pearlstine, L.G. 2008. Ecological consequences of climate change for the Florida Everglades: An initial summary. Technical memorandum, South Florida Natural Resources Center, Everglades National Park; Homestead, Florida.

Penney, K.M. 2001. Factors affecting translocation success and estimates of dispersal and movement patterns of the sand skink *Neoseps reynoldsi* on restored scrub. M.S. Thesis. University of South Florida, Tampa, Florida.

Penney, K.M., H.R. Mushinsky, and E.D. McCoy. 2001. Translocation success of the threatened sand skink. Proceedings from the Florida Scrub Symposium, Orlando, Florida.

Smith, C.R. 1982. Food resource partitioning of fossorial Florida reptiles. Pages 173-178 *in* N.J. Scott, ed. Herpetological communities: A symposium of the Society for the Study of Amphibians and Reptiles and the Herpetologist's League, August, 1977. U.S. Fish and Wildlife Service, Wildlife Research Report No. 13.

Smith, H.M. 2005. Plestiodon: A replacement name for most members of the genus Eumeces in North America. Journal of Kansas Herpetology 14: 15- 16.

Turner W.R., D.S. Wilcove, and H.M. Swain. 2006. State of the Scrub: Conservation progress, management responsibilities, and land acquisition priorities for imperiled species of Florida's Lake Wales Ridge [Internet]. Archbold Biological Station; Lake Placid, Florida [cited October 29, 2008]. Available from: www.archbold-station.org/ABS/publicationsPDF/Turner_etal-2006-StateotScrub.pdf

U.S. Fish and Wildlife Service. 1993. Recovery plan for the sand skink and the blue-tailed mole skink. Atlanta, Georgia.

U.S. Fish and Wildlife Service. 2006. Strategic Habitat Conservation. Final Report of the National Ecological Assessment Team to the U.S. Fish and Wildlife Service and U.S. Geologic Survey.

U.S. Fish and Wildlife Service. 2007a. Bluetail mole skink (*Eumeces egregius lividus*)

and sand skink (*Neoseps reynoldsi*). 5-year review: summary and evaluation. South Florida Ecological Services Office, Vero Beach, Florida.

U.S. Fish and Wildlife Service. 2007b. Draft communications plan on the U.S. Fish and Wildlife Service's Role in Climate Change.

Webb, S.D. 1990. Historical biogeography. Pages 70-100 *in* Meyers, R.L. and J.J. Ewel, eds. Ecosystems of Florida. University of Central Florida Press, Orlando, Florida.

Weekley, C.W., E.S. Menges, and R.L. Pickert. 2008. An ecological map of Florida's Lake Wales Ridge: A new boundary delineation and an assessment of post-Columbian habitat loss. Florida Scientist 71(1): 45-64.

Zwick, P.D., and M.H. Carr. 2006. Florida 2060. A population distribution scenario for the State of Florida. A research project prepared for 1000 Friends of Florida. Prepared by the Geoplan Center at the University of Florida, Gainesville, Florida.

STATUS OF THE SPECIES/CRITICAL HABITAT RANGEWIDE – SCRUB PLUM

The following discussion is summarized from the South Florida Multi-Species Recovery Plan (MSRP) (Service 1999), as well as from recent research publications and monitoring reports. A complete scrub plum life history discussion may be found in the MSRP. Critical habitat has not been designated for scrub plum.

Description

Scrub plum is a highly branched shrub that can reach 2 meters (6 feet) in height, although 0.5 meters (1.5 feet) is more typical at sites with frequent fires. It forms gnarled, half-buried trunks and contains twigs that are strongly geniculate (zigzag shaped). The lateral branches are either short, stubby, spur shoots bearing leaves and flowers, or are strongly tapering and spine-like. The bark of old stems is thin, gray, usually lichen-encrusted, and forms small rectangular or square plates. The bark of new shoots is lustrous reddish-brown or purplish and smooth.

The scrub plum's leaves are crowded on the spur shoots (an arrangement typical of the Rosaceae family) and are widely spaced on the normal shoots. The flowers of scrub plum are distinctive in being sessile, without flower stalks. They are fragrant, five-petaled, and 11 to 13 mm (0.43 to 0.51 in) across when open. The flowers have "numerous stamens with conspicuous yellow anthers that are exerted well above the floral cup. Some flowers have a well-developed pistil equal in height to the stamens, while in other flower the pistil is vestigial and nonfunctional." (Archbold Biological Station 2003). The fruit of the scrub plum is an ovoid or ellipsoidal drupe, 12 to 25 mm (0.47 to 0.98 inch) long, and dull reddish or "vaguely peachy" (Archbold Biological Station 2003) in color. It has a thin, bitter flesh and a slightly flattened seed.

Although it is distinctive as the only plum with crooked twigs, scrub plum can be casually mistaken for other scrub and sandhill plants. Several have a similar geniculate, thorny habit of growth, including tough bumelia (*Sideroxylon tenax*), hog plum (*Ximenia americana*), Florida ziziphus (*Ziziphus celata*), and a local hawthorn, a variant of *Crataegus lepida* (Judd and Hall 1984). Hog plum has yellow fruit, straight twigs, and thorns only in the angles of leaf and stem. Florida ziziphus has entire leaf margins and yellow fruit (and is exceedingly rare). Buckthorns have thorns and clustered leaves, but the leaves or twigs are very hairy (Florida Natural Areas Inventory 2000).

Life History

Scrub plum has a very unusual breeding system called andromonoecy, in which male and bisexual flowers are present on the same individual (Weekley and Menges 2001). Flowering occurs in January to February, leafing occurs from late February to March, fruit begins to develop in late February and may continue to early May, seed dispersal is in early May, but germination dates are unknown (Harper 1911, Ward 1979, C. Weekley, Lake Wales Ridge SF, personal communication 1998). Archbold Biological Station's plant ecology lab reports that flowering occurs in February-March when the plants are largely leafless. Individuals drop most of their leaves in the winter dry season.

Scrub plum is believed to be self-incompatible and pollinators are essential for fruit set (Weekley 1997). The fragrant white flowers attract insect visitors and insects may disseminate the pollen of the scrub plum. Flowering occurs in January to February, leafing occurs from late February to March, fruit begins to develop in late February and can continue to early May. Fruit maturation is low in comparison to flowering due to high levels of premature abscission and predation. Seed dispersal is in early May, but little is known about germination dates (Archbold Biological Station 2003). Birds and possibly mammals disperse the seeds.

Plants add new stems every year, especially after fire (Archbold Biological Station 2003). Fire stimulates growth and flowering; flowering and fruit production gradually declines until the next fire (Menges et al. 2005). Seedlings have not yet been observed in the wild.

Population Dynamics

Scrub plum plants nearly always resprout after fire (Menges and Kohfeldt 1995, Menges et al. 2005, Weekley and Menges 2001, 2003a, 2003b). Three years after a fire, more than 98 percent of burned plants had survived, though they had lesser height and crown diameter than unburned control plants). In three years of collecting demographic data, four plants died from fire effects, six from other causes. Twelve plants near the study area boundaries were inadvertently damaged during site maintenance in 2004, but are expected to recover (Menges et al. 2005).

Status and Distribution

Scrub plum occurs in three general areas on Florida's central ridges: Lake County, west and southwest of Lake Apopka; the southwest and northwest corners of Orange and Osceola Counties, respectively; and Polk and Highlands Counties, from the City of Lake Wales south to the Highlands County/Glades County border (FNAI 1996) on the LWR. It is absent from the Bombing Range Ridge of Avon Park Air Force Range.

Scrub plum prefers dry, sunny, nutrient-poor sites of acidic, entisols (deep, nearly featureless, sand soils). It is most typically associated with oak-dominated scrub and high pine communities. Scrub plum has a very unusual breeding system called andromonoecy, in which male and bisexual flowers are present on the same individual. Scrub plum is native to sandhills (high pineland) and Florida scrub. Sandhill vegetation is usually though of as having a grassy understory, although the abundance of scrub palmetto (*Sabal etonia*) and shrubs like scrub plum and pygmy fringe tree (*Chionanthus pygmaeus*) at areas like the Lake Wales Ridge National Wildlife Refuge tract at Carter Creek indicate that high pinelands on the Ridge may not historically have had the lawn-like appearance of many high pinelands farther north. High pineland is subject to low-intensity, frequent fires (every one to five years). Scrub has shrubby vegetation and is subject to high-intensity, infrequent fires. Fires maintain both habitats. In the absence of frequent fires, high pine vegetation is typically invaded by sand pines and evergreen oaks, eventually becoming upland hardwood forest (Myers 1985). Similarly, scrub may become upland hardwood forest if fire is absent (Myers 1985).

Sandhills plants that can be found in the vicinity of scrub plum include Chickasaw plum (*Prunus angustifolia*), tallowwood (*Ximenia americana*), wiregrasses (*Aristida stricta* var. *beyrichiana* and others), broomsedges (*Andropogon* spp.), slenderleaf clammyweed (*Polanisia tenuifolia*), and largeflower wireweed (*Polygonella robusta*). The trees are turkey oak (*Quercus laevis*), the dominant tree, and longleaf pine (*Pinus palustris*). Listed species that co-occur with scrub plum in sandhills include pygmy fringe tree, pigeon wings (*Clitoria fragrans*), scrub buckwheat (*Eriogonum longifolium* var. *gnaphalifolium*), Britton's beargrass (*Nolina brittoniana*), wide-leaf warea (*Warea amplexifolia*), Carter's mustard (*Warea carteri*), and Florida ziziphus (*Ziziphus celata*).

Scrub plum is present on nearly all conservation lands within its that have scrub or high pineland vegetation (FNAI 1985, Stout 1982). In Polk County, protected sites containing scrub plum exist at the Arbuckle and the Lake Walk-in-the-Water tracts of Lake Wales Ridge State Forest, at the Pine Ridge Nature Preserve of Historic Bok Sanctuary, at the Allen David Broussard Catfish Creek State Preserve, and at The Nature Conservancy's Tiger Creek Preserve and probably at the Saddle Blanket Lakes Preserve. In Highlands County, the scrub plum is protected on the Carter Creek tract and Apthorpe, Holmes Avenue, Lake Placid, and Gould Road areas of the Lake Wales Ridge Wildlife and Environmental Area; the Carter Creek and Flamingo Villas tracts of Lake Wales Ridge National Wildlife Refuge; Archbold Biological Station; and Lake June in Winter Scrub State Park.

Although the historic range was rather extensive compared to other narrowly endemic plants of Florida's central ridges, this species has declined with destruction and fragmentation of its scrub habitat. Habitat loss due to conversion to agriculture and residential development continue to threaten this species. Removal by plant collectors has been an additional threat that land acquisitions and conservation areas are alleviating. Fire suppression has degraded the habitat required by this species. This federally endangered species apparently requires periodic fire or other disturbances to maintain suitable habitat.

LITERATURE CITED

Archbold Biological Station, plant ecology laboratory. 2003. *Eriogonum longifolium* species account. http://www.archbold-station.org/abs/plantspp/erilonsppacc.htm and *Prunus geniculata* species account. http://www.archbold-station.org/abs/plantspp/prugensppacc.htm

Florida Natural Areas Inventory (FNAI). 2000. Field guide to the rare plants and animals of Florida online. Scrub plum, *Prunus geniculata.* http://www.fnai.org/FieldGuide/pdf/Prunus_geniculata.PDF

Florida Natural Areas Inventory (FNAI). 1996. Element occurrence data for: *Prunus geniculata*. Tallahassee, Florida.

Florida Natural Areas Inventory [FNAI]. 1985. Element occurrence data for *Prunus geniculata*. Tallahassee, Florida.

Harper, R. 1911. A new plum from the Lake Region of Florida. Torreya 11:64-67.

Judd, W.S., and D.W. Hall. 1984. A new species of *Ziziphus* (Rhamnaceae) from Florida. Rhodora 86:38l-387.

Menges, E.S. and N. Kohfeldt. 1995. Life history strategies of Florida scrub plants in relation to fire. Bulletin of the Torrey Botanical Club 122(4):282-297.

Menges, E. S., C. W. Weekley, and M. A. Rickey. 2005. Sandhill restoration studies and experimental introduction of *Ziziphus celata* at Lake Wales Ridge National Wildlife Refuge (Carter Creek). Annual report, project NG02-002, contract 03148. 68 pages.

Myers, R. 1985. Fire and the dynamic relation between Florida sandhill and sand pine scrub vegetation. Bulletin of the Torrey Botanical Club 112:241-252.

Stout, I.J. 1982. Descriptions of 84 stands of Florida sand pine scrub vegetation. Unpublished report prepared for U.S. Fish and Wildlife Service; Jacksonville, Florida.

U.S. Fish and Wildlife Service (Service). 1999. South Florida multi-species recovery plan [Internet]; Atlanta, Georgia [cited October 29, 2008]. Available from: http://www.fws.gov/verobeach/index.cfm?Method=programs&NavProgramCategoryID=3&programID=107&ProgramCategoryID=3

Ward, D. 1979. Rare and endangered biota of Florida, vol. 5: Plants. University Presses of Florida; Gainesville, Florida.

Weekley, C. 1997. *Prunus geniculata* Monitoring Report Report to Florida Statewide Endangered and Threatened Plant Conservation Program. Florida Department of Agriculture and Consumer Services, Division of Forestry. Tallahassee.

Weekley, C. S. and E. S. Menges 2003a. Species and vegetation responses to prescribed fire in a long-unburned, endemic-rich Lake Wales Ridge scrub. Journal of the Torrey Botanical Society 130 (4): 265–282.

Weekley, C. W. and E. S. Menges. 2003b. Demography, floral biology, and breeding system of scrub plum (*Prunus geniculata*), a federally listed endangered plant. Report to U.S. fish and Wildlife Service, Jacksonville, Fla. 9+ pages

Weekley, C. W. and E. S. Menges 2001. Demography, floral biology, and breeding system of scrub plum (*Prunus geniculata*), a federally listed endangered plant. Report to U.S. fish and Wildlife Service, Jacksonville, Fla. 14+ pages.

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SR-400 (I-4) PROJECT DEVELOPMENT AND ENVIRONMENT STUDY
SEGMENT 5, WEST OF US 27/SR 25 TO WEST OF CR 532
OSCEOLA/POLK COUNTY LINE

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PUBLIC HEARING

DATE: MAY 9, 2017
REPORTER: VICTORIA GOMEZ
PLACE: CHURCH OF JESUS CHRIST OF LATTER-DAY SAINTS
1001 DUNSON ROAD
DAVENPORT, FLORIDA 32746

APPEARANCES

COLLEEN T. JARRELL
HNTB CORPORATION
ASSISTANT DEPARTMENT MANAGER

PROJECT MANAGERS:
CAMILA AMAYA
ROBERT DENNEY
LUIS DIAZ
MIKE DRAUER
CHRISTY DYNN
HEATHER JOHNSON
BERNIE MASING
JOHN MOORE
SANAM REI
BEATA STYS-PALASZ

PUBLIC:
MARION RYAN
SIERRA CLUB
P.O. BOX 773
WINTER HAVEN, FLORIDA 33882

MIKE NOLEN, JR.
122 LAKE MARIAN WAY
WINTER HAVEN, FLORIDA 33881

MIKE NOLEN, SR.
P.O. BOX 1439
WINTER HAVEN, FLORIDA 33882

STEVE NAPPINGE
315 EAST ROBINSON STREET
ORLANDO, FLORIDA 32801

CHRIS NOLEN
530 SOUTH MAIN STREET
WINTER GARDEN, FLORIDA

PROCEEDINGS

MS. STYS-PALASZ: Okay. Good evening. The Florida Department of Transportation would like to welcome you to the open hearing for the Interstate 4, Beyond the Ultimate Project. This is development and environment study. My name is Beata Stys-Palasz. I am the project manager for the Florida Department of Transportation for the PD&E design. This public hearing is related to financial project management number 201210-2-22-01 and federal aid project number 0041-227-I. The proposed improvements involve widening Interstate 4 to ten lanes, with six general use lanes in both directions and four into express lanes for to go back and forth in both directions from west of US 27 to west of County Road 532 in Polk County. This hearing being held to provide you with the opportunity to comment on this project. Here with me is Colleen Jarrell, who is the consultant project manager. We also have Heather Johnson, who is the design project manager for this section. At this time -- and of course, all the team with -- all the DOT persons to help you understand this project. At this time, we would like to recognize any federal, state, county, or city official who may be present at this time. Are

there any official who would like to be recognized? Right now, I would like to start the presentation. Thank you.

AUDIO PRESENTATION: The State of Florida Department of Transportation, also known as FDOT, would like to welcome you to the Public Hearing for the Interstate 4, Beyond the Ultimate Project Development and Environment Study. This public hearing is being held relative to FDOT Financial Project ID Number 201210-2-22-01 and Federal Aid Project Number 0041-227-I. This public hearing was advertised consistent with federal and state requirements and is being conducted consistent with the Americans with Disabilities Act of 1990. Advertisements for this public hearing included letters to elected and agency officials, letters to property owners, newspaper ads, notifying local media, and advertising in the Florida Administrative Register. The Florida Department of Transportation is required to comply with various nondiscrimination laws and regulations, including Title VI of the Civil Rights Act of 1964. This hearing is being held to give all interested persons the right to understand the project and comment on their concerns to the Department. Public Participation at this

hearing is solicited without regard to race, color, national origin, age, sex, religion, disability or family status. Persons wishing to express their concerns about Title VI may do so by contacting the individuals listed on this slide which is also provided in the project newsletter and on a board displayed at this hearing. The proposed improvement involves adding express lanes on I-4, from US 27 to Kirkman Road to the west and from SR 434 to SR 472 to the east. The purpose of this Public Hearing is to share information with the general public about the alternatives under consideration, the proposed improvements, and their potential environmental impacts. This public hearing also serves as an official forum providing an opportunity to the public to express their opinions and concerns regarding the location, conceptual design and potential social, economic and environmental effects of the proposed improvement on the community. There is a court reporter present at this hearing and tonight's proceedings are being recorded. An official transcript of the hearing will be produced. Following this presentation, the floor will be open for public comments. All written material received at this public hearing and at the Florida Department

of Transportation office, postmarked no later than May 19, 2017 or through the project website will become a part of the public record for this hearing. The Project Development and Environment Study or PD&E is the second step of the Project Development process that the Florida Department of Transportation follows to evaluate social, cultural, economic and environmental impacts associated with a planned transportation improvement project. The PD&E process was established by the FDOT as the state's procedure for complying with the National Environmental Policy Act or NEPA of 1969 and Florida Statutes. NEPA is a United States environmental law that requires federal agencies to assess the environmental effects of their proposed actions prior to making decisions. This phase involves the preparation of all preliminary engineering and environmental documentation required for study approval and subsequent funding. During a PD&E Study, several alternatives are developed to meet the purpose and need for the project. These alternatives are developed with input from the public, local government and environmental agencies throughout the study process. Keeping the public involved and informed throughout the study is

paramount to the success of a PD&E study. This study is a reevaluation of PD&E studies that were previously done 14 to 17 years ago. The section from State Road 435, Kirkman Road, to State Road 434 in Orange and Seminole Counties received approval from the Federal Highway Administration and is currently under construction to include the addition of express lanes. The study limits are along Interstate 4, from West of State Road 25/US 27 to West of County Road 532. This study proposes to widen Interstate 4 to ten lanes. This includes six general use lanes and four express lanes. The study corridor is approximately four-and-a-half miles in length and is located in Polk County. The Polk Transportation Planning Organization, TPO, works with the Florida Department of Transportation and local governments to fund and implement projects identified through various plans developed by the TPO. The I-4 BtU project's Segment 5 is identified on the Polk TPO Long Range Transportation Plan, Momentum 2040. The project is consistent with the State Transportation Improvement Program. The purpose of this study is to accommodate future traffic needs based on anticipated population and employment growth, and enhance safety and mobility

along the study corridor. The original PD and E study included high occupancy vehicle or HOV lanes in the median. This re-evaluation includes six general use lanes, three in each direction, and four express lanes, two in each direction. The widening of I-4 is proposed to meet the design year 2040 projected traffic volumes. The goal of the project is to maintain acceptable levels of service along the corridor for the design year 2040. Levels of service are measured on an "A" through "F" grading scale with "A" being the best and "F" failing. Drivers will experience levels of service "E" and "F" under the "Original Build" condition in the design year 2040 along some portions of the corridor. Levels of service can be improved to "D" or better with the Express Lanes widening improvements of the recommended "Build" alternative. Typical sections are detailed cross section depictions of a roadway's principal elements that are standard between certain segment limits and show typical conditions only. The existing typical section consists of three twelve-foot travel lanes in each direction with ten-foot paved inside and outside shoulders. The roadways are separated by a grass median that varies in width from 64 feet to

164 feet. The existing right-of-way varies, but is typically 430-feet. Meetings and presentations with local agencies and other stakeholders were held to discuss the study, including the Polk County Planning Division, Polk County TPO, North Ridge CRA, various utility companies and the Southwest Florida Water Management District. A project website, www.i4express.com, was developed to allow the public to communicate with the study team and provide comments. An Alternatives Public Meeting was held on November 20, 2014. Fourteen members of the public and 23 project team members attended this meeting and one written comment was received. Public input from these meetings has factored into the study decision making process.

Today's hearing will provide the public with another opportunity to comment on the proposed improvements under consideration. A 'No-Build' and 'Build' alternative are being considered as part of this PD&E study. The 'No-Build' alternative maintains the existing facility as-is. No improvements are made and there is no congestion relief along the corridor. The No-Build alternative is also evaluated as a baseline for comparison with the 'Build' alternative. We will now discuss the

recommended 'Build' Alternative which proposes to widen Interstate 4 to ten lanes with five lanes in each direction: three general use lanes and two express lanes. An evaluation matrix comparing the 'No-Build' alternative with the recommended roadway 'Build' alternative is on display here tonight. The proposed I-4 typical section consists of two 12-foot wide express lanes with 12-foot inside and outside shoulders and three 12-foot wide general use lanes with 12-foot inside and outside shoulders, in each direction. A 2-foot wide barrier wall separates the general use from the express lanes. A 44-foot rail corridor is reserved in the median of I-4. The minimum right of way width required to accommodate this typical section is 300 feet. The proposed horizontal alignment of I-4 Segment 5 closely follows the existing I-4 alignment. Right-of-way will be required for the roadway mainline improvements, storm water management facilities and floodplain compensation sites. The total anticipated right-of-way impacts involve full or partial acquisition of 29 parcels for a total of approximately 32 acres. The recommended alternative for the SR 25/US 27 Interchange proposes a full service partial cloverleaf interchange with loop

ramps in the northwest and southeast quadrants. Eleven new bridges, substantial modifications to the ramp terminal intersections and improvements to Posner Boulevard are associated with this alternative. Direct access to and from the express lanes only to the east and from the east is provided at the US 27 ramp terminals, rather than at the US 27 bridge. The existing drainage systems will be enhanced to accommodate storm water runoff from the proposed roadway improvements. The storm water management systems, proposed by this study, have been designed to meet the current requirements of the Southwest Florida Water Management District and the Florida Department of Transportation. Storm water treatment will be provided in wet detention and dry retention ponds, located on- or off-site. The treatment facilities and locations are on exhibit here this evening, as well as in the documents on display. In accordance with current FDOT standards for road and bridge construction, all best management practices for erosion control and water quality considerations will be adhered to during the construction phase of the project. Pond siting evaluation criteria were developed to screen the various potential pond sites. Each of the

criteria are evaluated for impacts which are then used for comparison in order to identify overall suitability and select recommended ponds. Design criteria as set forth by the Southwest Florida Water Management District and FDOT was used to determine pond sizing. The recommended pond sites for this study are labeled and illustrated on the design concept boards on display. To comply with various executive orders and other federal and state requirements, engineering and environmental information was reviewed and evaluated to determine if there were any substantial impacts to social and economic, cultural, physical, and natural resources that may result from construction of the proposed improvements. The project improvements will have positive socio-economic impacts on the study area as it improves mobility and relieves congestion. An archaeological survey was performed within the existing and proposed right of way. The results indicate that there were 5 prehistoric artifacts and one archaeological occurrence in a newly identified archaeological site, within the study limits. There are three historic resources constructed before 1971 within the study area.

Neither the archeological occurrences nor the

historic resources meet the criteria for significance required for inclusion in the National Register of Historic Places. No adverse effects to cultural resources are anticipated. The project was evaluated in accordance with Executive Order 11990 entitled Protection of Wetlands. There are approximately 19.01 acres of direct wetland impacts and 1.82 acres of other surface water impacts associated with the recommended alternative. This project was evaluated for impacts to wildlife and habitat resources, including protected species, in accordance with Title 50 Code of Federal Regulations Part 402 of the Endangered Species Act of 1973, as amended. It was determined that the project has a "may affect, and is likely to adversely affect" three federal-listed species: the sand skink, the blue-tailed mole skink and the scrub plum. Compensatory mitigation will be provided at a ratio of 2:1 at a Service-approved Conservation Bank to offset impacts to occupied skink habitat in Segment 5. To avoid and/or minimize impacts to wildlife, FDOT will continue to coordinate with the U.S. Fish and Wildlife Service and the Florida Fish and Wildlife Conservation Commission during the permitting phase of the project. The proposed storm

water facilities will be designed to meet the current requirements of the Southwest Florida Water Management District. Storm water treatment will be provided by a combination of wet detention or dry retention ponds, located on- or off-site. The pond locations are on exhibit here this evening as well as in the documents on display. In accordance with Executive Order 11988 entitled "Floodplain Management" a floodplain analysis was performed. It was determined that approximately 18.65 acre-feet of floodplain impacts are anticipated. Highway traffic noise impacts were evaluated in accordance with the Code of Federal Regulation, Part 772. Based on the results of the noise analysis, a noise barrier appears to be a reasonable and cost feasible noise abatement method for two locations within Segment 5: in two areas within the Festival Orlando Resort adjacent to the I-4 westbound lanes, west of CR 54. Potentially contaminated sites in the vicinity of the project corridor were identified and evaluated to determine if impacts would occur as a result of the proposed improvements. 38 potential contamination sites have been identified. One is ranked as high risk, thirteen as medium risk, and 24 as low risk of potential contamination. An Air

Quality Analysis was performed on the project. The analysis was conducted using the established FDOT Air Quality Screening Model. Air quality impacts are not expected to occur as a result of this project. Right-of-way acquisition is anticipated for the recommended alternative for roadway and drainage improvements. Approximately eleven acres of additional right-of-way is anticipated for roadway improvements and approximately 21 acres of additional right-of-way is anticipated for off-site ponds. In addition, there is a potential for five business/commercial relocations; no residential relocations are anticipated within Segment 5. These anticipated relocations are displayed on the aerials available at tonight's hearing. All right-of-way acquisition will be conducted in accordance with the Federal Uniform Relocation Assistance and Real Property Acquisition Act of 1970 and FDOT Real Estate Acquisition Process. Right-of-way requirements for the project are on display here tonight. One of the unavoidable consequences on a project such as this is the necessary relocation of families or businesses. All right-of-way acquisition will be conducted in accordance with the federal Uniform Relocation Assistance and Real

Property Acquisition Policies Act of 1970, commonly known as the Uniform Act. If you are required to make any type of move as a result of a Department of Transportation project, you can expect to be treated in a fair and helpful manner and in compliance with the Uniform Relocation Assistance Act. If a move is required, you will be contacted by an appraiser who will inspect your property. We encourage you to be present during the inspection and provide information about the value of your property. You may also be eligible for relocation advisory services and payment benefits. If you are being moved and you are unsatisfied with the Department's determination of your eligibility for payment or the amount of that payment, you may appeal that determination. You will be promptly furnished necessary forms and notified of the procedures to be followed in making that appeal. A special word of caution - if you move before you receive notification of the relocation benefits that you might be entitled to, your benefits may be jeopardized. The relocation specialists who are supervising this program are here tonight. They will be happy to answer your questions and will also furnish you with copies of relocation assistance

brochures. The estimated total cost for the recommended alternative will be approximately 387 million dollars. This includes 290 million dollars for construction and utility relocations, 48 million dollars for right-of-way acquisition for roadway and pond improvements, and 46 million dollars for final design and construction engineering and inspection. Over the next several months, FDOT will continue to finalize the analysis and will seek to approve the documents and improvements presented here at tonight's public hearing. Following approval, FDOT will continue with the design phase. Currently, there is no funding available for the right-of-way or construction phases. The study is anticipated to be completed in May 2017. Design is fully funded for this segment of I-4. Draft Documents for this public hearing were available for review starting April 18, 2016 and will remain on display until May 19, 2017 at the Cagan Crossing Community Library, and also on the study website www.i4express.com. These documents are also on display here tonight. No final decisions will be made until after we review your comments. You may provide your comments in several ways. You may provide an oral statement to the court reporter present here tonight. Complete

a speaker card and make an oral statement at the microphone during the public comment period. Complete a comment form and drop it in the comment box provided here at the hearing or mail your comments to the FDOT project manager at the address shown on the comment form. You may email your comments to the FDOT at the address shown on the comment form or visit the project website and submit comments electronically. There is a dedicated page on the website for comments. All written material received at this public hearing and at the Florida Department of Transportation office, postmarked no later than ten days following the date of this public hearing, or through the project website will become a part of the public record for this hearing. This concludes our presentation. Thank you.

MS. JARRELL: At this time, the presentation is over. I do want to make one correction. It said that the documents were available on April 18, 2016 and, obviously, that was 2017, not '16. If you've got a public comment or you want to make a statement for the record, there's -- as the presentation said, you've got a couple options. We've got a speaker card that I'll ask you to fill out, and you can come up and present your comment or you can talk directly

with the court reporter here tonight. So does anybody want a speaker card?

MARION RYAN: I filled one out.

MS. JARRELL: You did? Awesome. Would you like to go ahead and come up and speak now?

MARION RYAN: Oh, sure. Why not?

MS. JARRELL: Thank you.

MARION RYAN: Hi, I'm Marion Ryan. I'm the Conservation Chair for the Ancient Islands Group for the Sierra Club. This is outside of our district, but I've been in consultation with the Sierra Club group that is in this area, which is the Central Florida group, and I just wanted to say that we wholeheartedly endorse the Reedy Creek wildlife underpass that's going to be a part of this project because, I mean, we've been fighting for 20 to 25 years to get wildlife underpasses under that hard barrier known as I4, so we really appreciate work along those lines. And I was just wondering: Do you have any idea what mitigation banks you're going to be using for sandscapes? Thank you.

MS. JARRELL: Any more public comments? Seeing none, I'll close the hearing, but again, you're welcome to look around at the boards and we've got plenty of project team members. If you do have

comments that you want to let the court reporter know, feel free to come up and talk to her or you can fill out a comment form here and leave it in the box with us. All right. Thank you.

(PUBLIC HEARING CONCLUDED AT 6:30 P.M.)

C E R T I F I C A T E

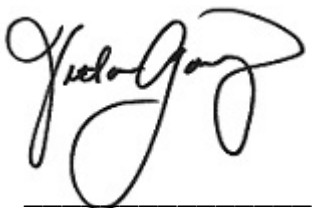
STATE OF FLORIDA)

COUNTY OF ORANGE)

I, VICTORIA GOMEZ, Court Reporter and Notary Public for the State of Florida at Large, do hereby certify that I was authorized to and did report the foregoing proceeding, and that said transcript is a true record of the testimony given by the witness.

I FURTHER CERTIFY that I am not of counsel for, related to, or employed by any of the parties or attorneys involved herein, nor am I financially interested in said action.

Submitted on: May 19, 2017.



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VICTORIA GOMEZ

Court Reporter, Notary Public

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