SR 710 FROM US 441 TO L-63 CANAL
OKEECHOBEE COUNTY, FLORIDA
FPID NO. 419344-3-32-01

Biological Assessment

Prepared for
FDOT District One

August 2018

Prepared by
ESA Scheda Corporation

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 (MOU) dated December 14, 2016 and executed by the Federal Highway Administration and FDOT.

TABLE OF CONTENTS

Biological Assessment

List of Figures

List of Tables

Appendices

SECTION 1
Introduction

This document details the Biological Assessment for effects on federally threatened and endangered species associated with the proposed construction of SR 710 from US 441 to the L-63 Canal in Okeechobee County, Florida (**Figure 1**). The project is located within the following sections: Sections 9, 10, 11, 13, 14, 15, 16, 24; Township 37 South; Range 35 East. This Biological Assessment has been prepared in accordance with Section 7 of the Endangered Species Act of 1973, as amended (Act: ref. 16 U.S.C. 1531 et seq.; 50 CFR 17) to complete consultation with the USFWS. **Table 1** summarizes the Florida Department of Transportation (FDOT), District One's effect determinations regarding each of the federally-listed species potentially occurring within the project area. During the SR 710 from US 441 to CR 714 Project Development and Environmental (PD&E) Study consultation with U.S. Fish and Wildlife Service (USFWS) was initiated (**Appendix A**) and the USFWS issued a Biological Opinion (BO) on September 9, 2015 (**Appendix B**).

The BO concluded the SR 710 project may affect but is not likely to adversely affect the endangered Florida bonneted bat (*Eumops floridanus*), the threatened eastern indigo snake (*Drymarchon corais couperi*), and the threatened wood stork (*Mycteria americana*). An incidental take statement was issued for Audubon's crested caracara (*Polyborus plancus audubonii*) for a nest located on another segment of SR 710. The FDOT made the following commitments that pertain to each species:

- To reinitiate consultation for the Florida bonneted bat with USFWS prior to advancing the project to construction.
- To implement USFWS' Standard Protection Measures for the Eastern Indigo Snake during construction.
- To provide mitigation for the wood stork that is acceptable to the USFWS and FDOT.
- To resurvey for Audubon's crested caracara prior to construction and provide mitigation that is acceptable to the USFWS and FDOT for unavoidable impacts (if any) to nesting trees and/or habitat within the primary protection zone (300-meters) of nests.

Proposed Action and Action Area

The proposed project is to extend the existing SR 710 from US 441 to the L-63 Canal which includes a new urban roadway (SR 710) consisting of four 12-foot travel lanes (two in each direction), a 12-foot multi use path, and a 5-foot sidewalk from US 441 to the L-63 Canal. A new intersection will be created at NE 32nd Avenue just north of NE 11th Lane. In addition, an intersection within the existing SR 710 right-of-way (ROW) will be created at Center Street.

The action area is defined as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action. The project will result in the extension of an existing highway (SR 710 from US 441 to the L-63 Canal). The proposed extension will provide new access to undeveloped lands. Therefore, the presence of a new paved roadway extension may result in a variety of indirect and cumulative effects within lands adjacent to the roadway extension. The new access to undeveloped lands provided by the proposed roadway extension is likely to stimulate new development (e.g., commercial and residential subdivisions, additional road infrastructure) and increase the local human population in lands adjacent to the roadway extension. Such development is likely to increase the loss of habitat in lands adjacent to the project extension. However, the extent of the project's effects to surrounding lands is difficult to discern. Species specific action areas are discussed in **Appendix C** and **Appendix D**.

Project Purpose and Need

The purpose of the project is to extend SR 710 from SR 70 to the L-63 Canal. The need to extend SR 710 is to reduce traffic congestion at SR 70 and US 441 and reduce through truck traffic in the City of Okeechobee. Additionally, the proposed project is designed to meet several needs of Okeechobee County, detailed below (Florida Department of Transportation 2011).

- Improve Regional Connectivity: As stated in the (Project Development and Environment) PD&E Study, SR 710 is part of the Strategic Intermodal System (SIS) and connects to other SIS or Emerging SIS facilities at each end (SR 70 in Okeechobee County, SR 76 in Martin County, Florida's Turnpike and I-95 in Palm Beach County). The project will enhance the ability to ship freight and goods by improving access to local agricultural and ranching operations, and also to freight activity centers located near the populated coastal areas east of Okeechobee. The Fiscal Year (FY) 2009/2010-FY 2013/2014 Adopted SIS Five Year Plan, Capacity Improvement Projects – Highway (July 2009) District 1 Non-Interstate Plan identifies SR 710 from US 441 to the Martin County Line as being a SIS Capacity Improvement Project with SIS funds being used to fund the PD&E Study.
- Enhance Emergency Evacuation Capabilities: SR 710 is a hurricane evacuation route and is one of the few east-west roadways in this area connecting Florida's east coast to inland areas.
- Accommodate Future Population and Growth: The population of Okeechobee County is projected to grow from 35,910 in 2000 to 51,100 in 2030 and employment is expected to increase from 13,050 in 2000 to 17,000 by 2030.

SECTION 2
Methodology

Data Collection

Readily available data sources were reviewed to determine if any protected species or their habitats occur within or adjacent to the project corridor. The primary information sources utilized for protected species occurrences within the project areas included: Florida Fish and Wildlife Conservation Commission (FWC) bald eagle nest locations; FWC threatened and endangered species observation records; Florida Natural Areas Inventory (FNAI) data records; Florida Atlas of Breeding Sites for Herons and Their Allies; USFWS Consultation Areas (CA) for protected species and also species by county reports; Florida Department of Agriculture and Consumer Services (FDACS) endangered, threatened, and commercially exploited plants of Florida; and field observations. Field surveys for listed flora and fauna were conducted on the following dates: September and October 2013; April 2015; and January, February, March, April, and May 2017. Listed and non-listed species observed are included in **Table 2** and a protected species map is provided in **Figure 2**. Species specific surveys are discussed in the individual attached reports.

Land Use and Land Cover

Natural biological features and land use within the survey boundary were initially reviewed using the 2014 Florida Land Use, Cover and Forms Classification System (FLUCFCS) Geographic Information System (GIS) data layer available from the South Florida Water Management District (SFWMD) and which was subsequently field verified. Land use within the project limits is comprised of the following categories: Residential Low Density (FLUCFCS 1130), Residential Medium Density (FLUCFCS 1210), Commercial and Services (FLUCFCS 1400), Industrial (FLUCFCS 1550), and Institutional Development (FLUCFCS 1700); Improved Pasture (FLUCFCS 2110), Unimproved Pasture (FLUCFCS 2120), Woodland Pasture (FLUCFCS 2130), Horse Farm (FLUCFCS 2510), Herbaceous Dry Prairie (FLUCFCS 3100), Hardwood-Conifer Mixed Forest (FLUCFCS 4340), Channelized Waterways (FLUCFCS 5120), Mixed Wetland Hardwood Forest (FLUCFCS 6170), Wetland Forested Mixed (FLUCFCS 6300), Freshwater Marshes (FLUCFCS 6410), Dikes and Levees (FLUCFCS 7470), Roads and Highways (FLUCFCS 8140), Communications (FLUCFCS 8200), and Sewage Treatment Facilities (FLUCFCS 8330).

SECTION 3
Listed and Protected Species Summary

Based on the literature/database review and field surveys, the following protected and listed species were considered to potentially occur within the project area. Findings related to the species are summarized below. USFWS coordination letters and the Formal Section 7 Biological Opinion are included in **Appendices A and B**.

Federally Listed or Federally Protected Faunal Species

Bald eagle (*Haliaeetus leucocephalus*): This species is protected under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. The nearest active nest location is approximately 1,000 feet south of the project (#OK022; last documented active in 2013). No new bald eagle nests were documented within the 660-foot protection buffer of the project area. During field surveys, bald eagles were observed flying over the project area and also perching on trees and power poles outside of but adjacent to the project. Because no bald eagle nests are located within 660 feet of the project area; therefore, it's anticipated that there will be no impacts to the bald eagle.

Osprey (*Pandion haliaetus*): This species is protected under the Migratory Bird Treaty Act. No osprey nests were documented within or adjacent to the project area during field surveys. Ospreys were observed flying over the project area or perching on trees outside of, and adjacent to, the project area. Because no osprey nests are located within the project area; therefore, it's anticipated that there will be no impacts to the osprey.

Wood stork: The ESBA listed the wood stork as endangered by the USFWS and FWC. Effective July 30, 2014, the USFWS reclassified the U.S. breeding population of wood storks from endangered to threatened under the Endangered Species Act of 1973, as amended. This project is located within the Core Foraging Area (CFA) of one wood stork colony: Cypress Creek Bluefield Road (ID #616047). The USFWS South Florida Ecological Services Office documented the action area for wood storks as an 18.6-mile radius of the CFA around all known wood stork colonies in south Florida which have been active in the last ten years. Wood storks are likely to utilize the SR 710 project area for foraging purposes given the overlapping CFA of the wood stork colony and the extent of foraging habitat that exists within wetlands and surface waters within and outside of the project area. According to the USFWS database, the Cypress Creek Bluefield Road (ID #616047) wood stork colony is located approximately 10.6 miles east of the project area (well beyond the 0.47-mile threshold for a "may affect" determination for the USFWS). Because greater than 5.0 acres of wetland impacts will occur to Suitable Foraging Habitat (SFH) within the CFA of a colony site, the project proposes to provide adequate SFH compensation within the CFA to offset these impacts. It is anticipated the project will more than compensate for the SFH loss through the purchase of wetland mitigation credits to satisfy all mitigation requirements of Part IV, Chapter 373.4137 F.S. and the Clean Water Act (CWA) section 404(b)(1). In addition, it's anticipated that

SFH will be created by the construction of linear dry ponds and swales and also the littoral areas of wet retention ponds created for the SR 710 project. A wood stork biological assessment has been prepared for this project and it is included in **Appendix C**.

Audubon's crested caracara: The Audubon's crested caracara is a federally threatened species, and the project is located within the USFWS CA for this species. Because potential nest trees were documented north of the project area, a caracara survey was conducted in accordance with the 2016 USFWS Crested Caracara Draft Survey Protocol. Crested caracaras were observed flying over the project area and perching on slash pine (*Pinus elliottii*) trees within and adjacent to the project area during 2017 field surveys for this species but no crested caracara nests were documented during those surveys. Because no caracara nests were documented, no impacts to the crested caracara are anticipated. A crested caracara biological assessment report has been prepared for this project and it is included in **Appendix D**.

Everglade snail kite (*Rostrhamus sociabilis plumbeus*): This is a federally listed endangered species. The project is located within the USFWS Everglade snail kite CA but is not located in USFWS designated Everglade snail kite critical habitat. The Everglade snail kite is a habitat specialist and appropriate nesting habitats include wetland areas containing coastal plain willow (*Salix caroliniana*), melaleuca (*Melaleuca quinquenervia*), pond cypress (*Taxodium ascendens*), bald cypress (*Taxodium distichum*), wax myrtle (*Morella cerifera*), sawgrass (*Cladium jamaicense*), cattail (*Typha* spp.), buttonbush (*Cephalanthus occidentalis*), and giant bulrush (*Scirpus validus*) that also have appropriate water depth underneath to serve as potential nesting substrate (0.2-1.3 meters deep).

Everglade snail kites were observed flying over the project area, but none were observed foraging or roosting in the project area. The vast majority of wetlands in the project area are contained within lands utilized for cattle grazing and these wetlands have been impacted via cattle trampling of vegetation and cattle waste documented within the wetlands. According to 2009-2013 GIS data, the nearest documented nest was sighted approximately 2.56 miles southwest of the project area adjacent to Lake Okeechobee. No potential prey of Everglade snail kites, including the invasive island apple snails (*Pomacea insularum*) and the native apple snail (*Pomacea paludosa*), were documented within the wetland and surface waters proposed to be impacted. Because no Everglade snail kites were observed foraging within project wetlands and surface waters, and no food source was documented in wetlands and surface waters, it is anticipated that this project may affected but not likely to adversely affect the Everglade snail kite.

Florida grasshopper sparrow (*Ammodramus savannarum floridanus*): The Florida grasshopper sparrow is a federally listed endangered species, and while the project falls within the USFWS CA for the Florida grasshopper sparrow no appropriate habitat for the species exists in the project area. The Florida grasshopper sparrow is a habitat specialist requiring dry prairie habitat that undergoes frequent fires. Vegetation within this preferred habitat includes bluestem grasses (*Andropogon* spp.), saw palmetto (*Serenoa repens*), St. John's wort (*Hypericum* spp.), wiregrass (*Aristida* spp.) and dwarf oaks (*Quercus minima*). Because no Florida grasshopper sparrows were observed during field surveys, and there is no suitable habitat for this species in the project area, it is anticipated that

this project will have no effect on the Florida grasshopper sparrow which is consistent with the PD&E Study findings.

Florida bonneted bat: This is a federally endangered species. The project is located in the November 2017 revised USFWS CA for the Florida bonneted bat. Echolocation data has documented Florida bonneted bats utilizing a variety of natural habitats including pine flatwoods, cypress domes, hardwood hammocks, and wetlands. The Florida bonneted bat has also been documented in urban and suburban neighborhoods. Potential roosting sites for this species include tree snags, tree cavities, bat houses, abandoned buildings, bridges, and overpasses.

As part of a USFWS Concurrence Request, pedestrian surveys were conducted on January 29, 2015 to document potential Florida bonneted bat roosts within the portion of the SR 710 project that overlaps with the USFWS Florida bonneted bat CA. All potential bat roost areas were inspected for bat occupancy (with the presence of guano, stains, odors, carcasses, or the roosting bats themselves [Gore and Studenroth 2005]) using flashlights and/or binoculars when suitable. No bats of any species were observed in tree snags from the ground vantage point and the snags were located just outside of the project footprint. In addition to natural habitat, potential Florida bonneted bat roosts were surveyed for in bridges and abandoned structures. Several bridges are located within the project corridor, however only two bridges are located both in the project corridor and within the CA. These consist of the SR 710 bridge over the L-63N Canal and the SR 710 bridge over Mosquito Creek. Bridge expansion joints or crevices that could potentially be utilized by bats as roost sites were surveyed. Joints and crevices utilized by bats are typically 0.5 to 1.25 inches wide (Keeley and Tuttle 1999). One potential bat roost was located in the project limits and within the project footprint located in the SR 70 bridge over the L-63N canal. It should be noted, that to date Florida bonneted bats have not been documented in bridge expansion joints. FDOT committed to reinitiate consultation with USFWS during design and USFWS issued an effect determination of may affected but not likely to adversely affect in the BO (**Appendix B**).

Per a teleconference with the USFWS biologist John Wrublik on January 4, 2018, the USFWS recommended that an infrared camera survey of all potential roosting areas (tree snags and tree cavities) be conducted for the SR 710 project since some trees cavities and snags have been documented within and adjacent to the project limits (**Figure 3**), but no Florida bonneted bats have been previously documented within or adjacent to the project limits. During subsequent coordination with FDOT D1 it was suggested that the USFWS be contacted again due to anticipated changes in the USFWS Florida bonneted bat survey guidelines. Revised USFWS Florida bonneted bat survey guidelines were issued in November 2017 and another revision is anticipated before the end of this year. Per email communication with USFWS biologist John Wrublik on July 10, 2018 the USFWS now requested that both acoustic and potential roost surveys be conducted for the SR 710 project. The design-phase formal tree cavity survey and acoustic survey have not been initiated; therefore, the results will be provided in a supplemental document to the biological assessment once the survey is completed.

Eastern indigo snake: The Eastern indigo snake is a federally listed threatened species that uses a wide variety of habitats and may be expected to occupy almost any tract that contains potentially suitable habitat. The project area contains potential habitat for the species. In addition, 26

potentially occupied gopher tortoise burrows have been documented in the project area. Per the 2013 USFWS Update Addendum to USFWS Concurrence Letter to U.S. Army Corps of Engineers Eastern Indigo Snake Programmatic Effect Determination Key, if a project will impact greater than 25 acres of xeric habitat or more than 25 active/inactive gopher tortoise burrows, then the project may affect the eastern indigo snake and consultation with the USFWS is required. Greater than 25 gopher tortoise burrows will be affected by the project, therefore, this project "may affect" the eastern indigo snake. Per a teleconference with the USFWS biologist John Wrublik on January 4, 2018, because there are no historic sightings of eastern indigo snakes in the project limits, and no eastern indigo snakes were observed during any of the listed species surveys conducted for this project, a biological assessment will not be required. The 2013 USFWS Standard Protection Measures for the Eastern Indigo Snake (**Appendix E**) will be implemented during construction to minimize potential impacts to this species during site clearing and construction. Therefore, the project may affect, but not likely to adversely affect the eastern indigo snake which is consistent with the PD&E Study findings.

State Listed Faunal Species

In the 2011 ESBA, the roseate spoonbill, little blue heron, tri-colored heron, reddish egret, and Florida burrowing owl were listed as species of special concern but as of January 2017 Florida's Official Endangered and Threatened Species List was updated and these species were re-classified as threatened. The limpkin, white ibis, and snowy egret were listed as species of special concern in the 2011 ESBA, but as of January 2017, they were removed from Florida's Endangered and Threatened Species List, although they are a part of FWC's Imperiled Species Management Plan. The anticipated impacts associated with the state listed faunal species documented below are consistent with the PD&E Study findings.

Florida burrowing owl (*Athene cunicularia floridana*): The Florida burrowing owl is a state threatened species. Burrowing owls utilize open areas with short groundcover for the excavation of burrows and also as foraging habitat. Open pasture habitat suitable for Florida burrowing owls is present in the project area, but no individuals or burrows were observed during field surveys. Therefore, no impacts to this owl are anticipated.

Florida sandhill crane (*Antigone canadensis pratensis*): The Florida sandhill crane is a state listed threatened species that forages in open pastures and nests in freshwater marshes and open water areas. Nesting season for this species is season December 1 to August 31. Foraging and nesting habitat is present in the project area but only foraging sandhill cranes have been observed in the project area. No sandhill crane nests have been documented up to and including the 2017 field surveys. The project team will resurvey appropriate sandhill crane nesting habitat within the project area if construction is initiated during or just prior to the Florida sandhill crane nesting. Should project construction be initiated during nesting season, and nests are found to be present, the nest protection guidelines for the sandhill crane will be implemented. Therefore, no impacts to this species are anticipated.

Southeastern American kestrel (*Falco sparverius paulus*): The southeastern American kestrel is a state listed threatened species. Optimal habitat consists of open fields and pastures for foraging with snags for perching and nesting. Suitable nesting habitat includes tree cavities excavated by woodpeckers and artificial nest boxes. The most reliable way to document presence of southeastern American kestrels is by documenting the time of the year that the sightings occur. If a kestrel is seen in Florida from May through July, it is almost certainly a southeastern American kestrel because the northern migrants, the American kestrel (*Falco sparverius*), are not present in Florida during this time. Kestrel sightings during field surveys occurred in January and March of 2017; therefore, it is not possible to determine if these were American or southeastern American kestrels. All kestrels observed during field surveys were either foraging or perching in the project area. Tree cavities were observed in the project area so potential nesting habitat exists for this species. The project team will resurvey appropriate kestrel habitat within the project area if construction is initiated between May and July to determine if southeastern American kestrels are documented within the project limits. Because the project area contains foraging habitat, tree cavities, and kestrels were observed in the project limits this project is not anticipated to adversely affect the southeastern American kestrel.

Gopher tortoise (*Gopherus polyphemus*): This is a state listed threatened species. The location of all gopher tortoise burrows observed during field surveys was documented with a global positioning system (GPS) capable of submeter accuracy. A total of 26 potentially occupied and one abandoned gopher tortoise burrow were documented in the project area. Because gopher tortoise burrows were documented and there is known tortoise habitat in the project boundary, a 100 percent survey will be conducted per the 2017 FWC Gopher Tortoise Permitting Guidelines, *Gopherus polyphemus*, April 2008 (Revised January 2017) within 90 days prior to construction. It is anticipated that a gopher tortoise permit will be obtained and all tortoises will be relocated out of the project area before proposed construction. Because gopher tortoises will be relocated out of the project area before construction begins, no impacts to the gopher tortoise are anticipated.

Florida pine snake (*Pituophis melanoleucus mugitus*): The Florida pine snake is a state listed threatened species. This species utilizes a variety of upland habitats but its most common natural habitat are sandhills and it spends 70-80 percent of its time underground. It can be found taking refuge in pocket gopher (*Geomys pinetis*) and gopher tortoise burrows. No Florida pine snakes were observed during field surveys, but potential habitat and refugia (gopher tortoise burrows) exist in the project area. However, pursuant to FWC's Gopher Tortoise Permitting Guidelines (2017), if during gopher tortoise relocation a Florida pine snake is incidentally captured, it will be released onsite or allowed to escape unharmed; therefore, no impacts to the Florida pine snake are anticipated.

Sherman's fox squirrel (*Sciurus niger shermani*): The Sherman's fox squirrel is a state listed species of special concern. Sherman's fox squirrels utilize open woods, pine and cypress stands, live oak forest, and longleaf pine savannah. This species typically has two breeding seasons per year, October to February and April to August, and uses several different nests in their home ranges. Most nests are leaf nests made of Spanish moss (*Tillandsia usneoides*), pine needles, twigs, and leaves; nests may occasionally be constructed within tree cavities. Sherman's fox squirrels are known to nest in six tree species: slash pine, sand post oak (*Quercus margarettae*), laurel oak

(*Quercus laurifolia*), live oak (*Quercus virginiana*), turkey oak *(Quercus laevis*), and longleaf pine (*Pinus palustris*). During field surveys, Sherman's fox squirrels were observed foraging and moving about in the project area, but none were observed utilizing a nest. The FWC recommends that preconstruction surveys be conducted for nests of this species. If an active nest is observed, it may be avoided by providing a 150 to 200-foot buffer that doesn't isolate it from adjacent habitat allowing direct connection to non-impacted habitats. If impacts to an active nest are unavoidable, a nest take permit would be required. Because Sherman's fox squirrels and their habitat were documented in the project area, and appropriate protection and/or permitting actions will be taken should a nest be located prior to or during construction, this project "may affect, but is not likely to adversely affect" the Sherman's fox squirrel.

Other potential listed faunal species in the project area include the state listed threatened little blue heron (*Egretta caerulea*) and tricolored heron (*Egretta tricolor*). The project contains habitat for wading birds and both of these species were observed during field surveys. No impacts to these species are anticipated because wetland loss will be mitigated pursuant to Part IV, Chapter 373, F.S. and the CWA section 404(b)(1).

Floral Species

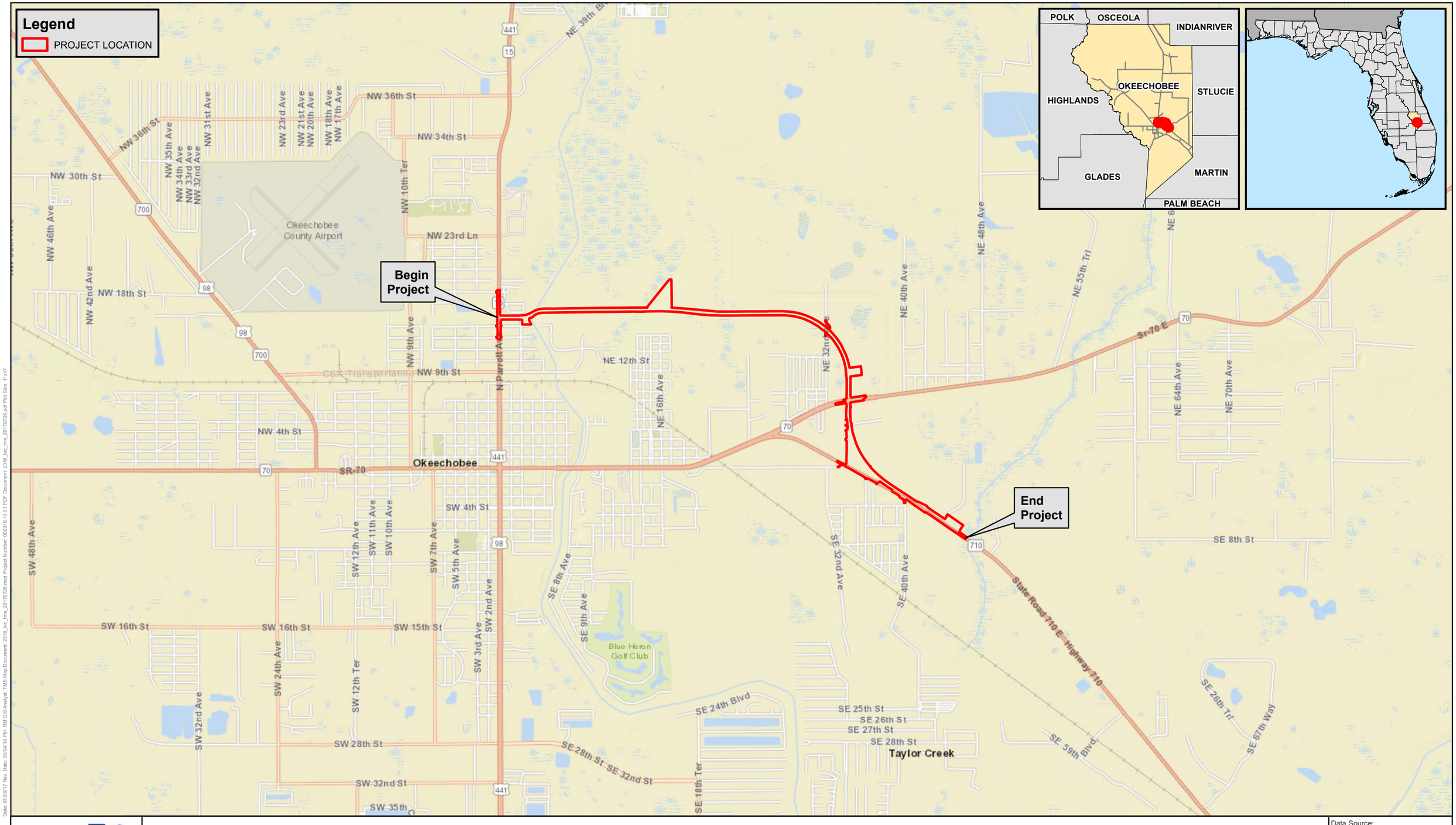
A total of 12 state listed threatened plants and three state listed endangered plants have the potential to occur in Okeechobee County (**Table 3**). No state listed plants were observed during field surveys. The majority of the project area is impacted due to land use conversion or land management activities. Due to the lack of sightings, and altered habitats in the project area due to land use or land management activities, no impacts are anticipated to state listed floral species.

SECTION 4
References

Florida Department of Transportation. 2011. Endangered Species Biological Assessment, SR 710 PD&E Study from US 441 to CR 714, Okeechobee and Martin Counties, Florida.

Gore, J.A., and K.R. Studenroth, Jr. 2005. Status and Management of Bats Roosting in Bridges in Florida. Final Report, Florida Department of Transportation Research Project #BD433. Tallahassee, Florida.

Figures



Date: 07/26/17 Rev. Date: 06/04/18 PM: RM GIS Analyst: TMS Map Document: 2316_loc_tms_20170726.mxd Project Number: 002316.10.01 PDF Document: 2316_loc_tms_20170726.pdf Plot Size: 11x17

All data within this map are supplied as is, without warranty. This product has not been prepared for legal, engineering, or survey purposes. Users of this information should review or consult the primary data sources to ascertain the usability of the information.

Figure 1 - Project Location Map

SR 710 from US 441 to L-63 Canal
FPID #: 419344-3-32-01
Okeechobee County, Florida

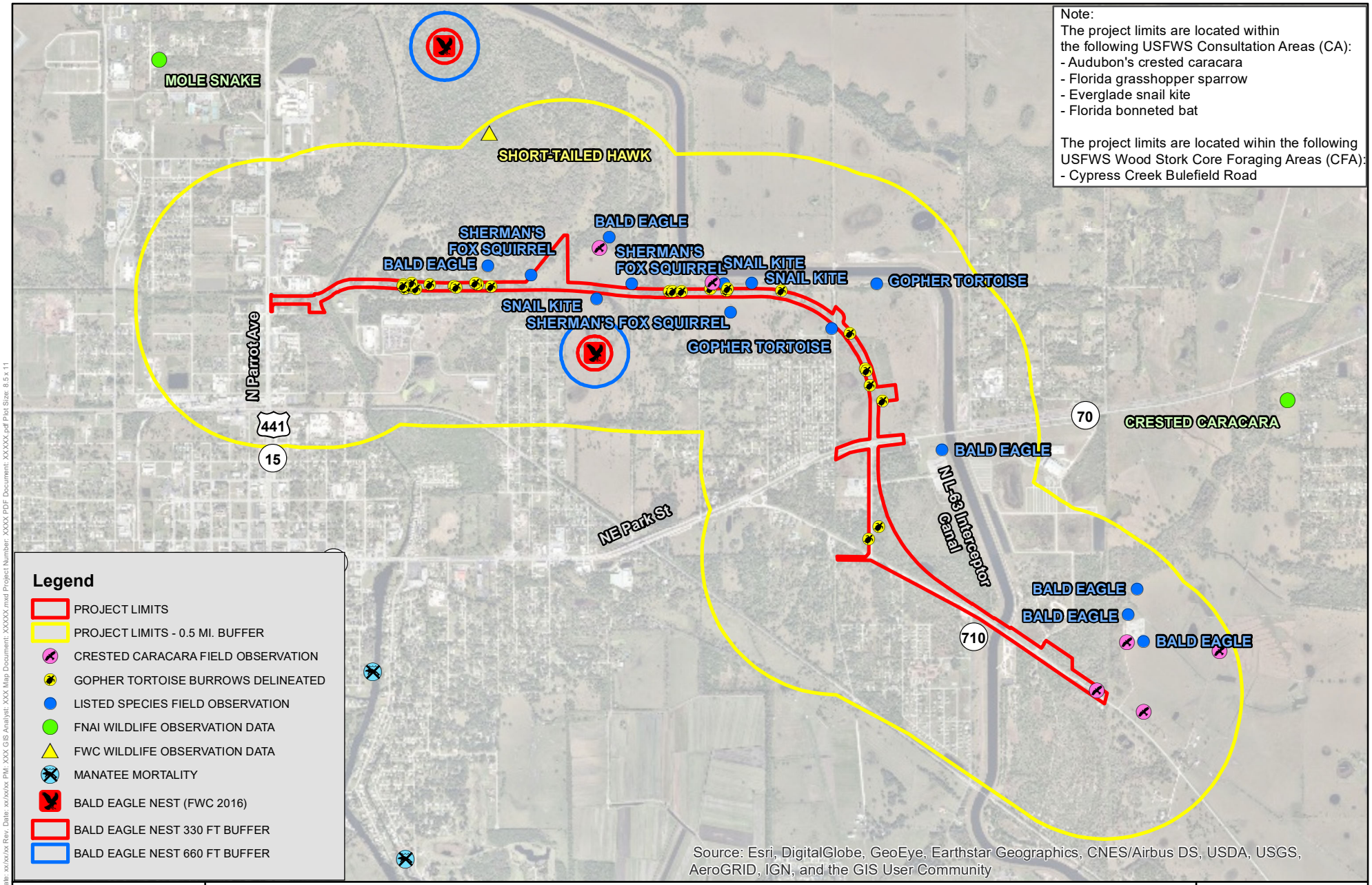
0 3,000 6,000 9,000 Feet

Data Source:
- Wantman Group

Imagery Source:
- ESRI Streets

Coordinate System:
NAD 1983 Florida
State Plane East

N



Date: xx/xx/xx Rev. Date: xx/xx/xx PM: XXX GIS Analyst: XXX Map Document: XXXXX.mxd Project Number: XXXX PDF Document: XXXXX.pdf Plot Size: 8.5 x 11

FDOT

All data within this map are supplied as is, without warranty. This product has not been prepared for legal, engineering, or survey purposes. Users of this information should review or consult the primary data sources to ascertain the usability of the information

Figure 2 - Listed Species Map

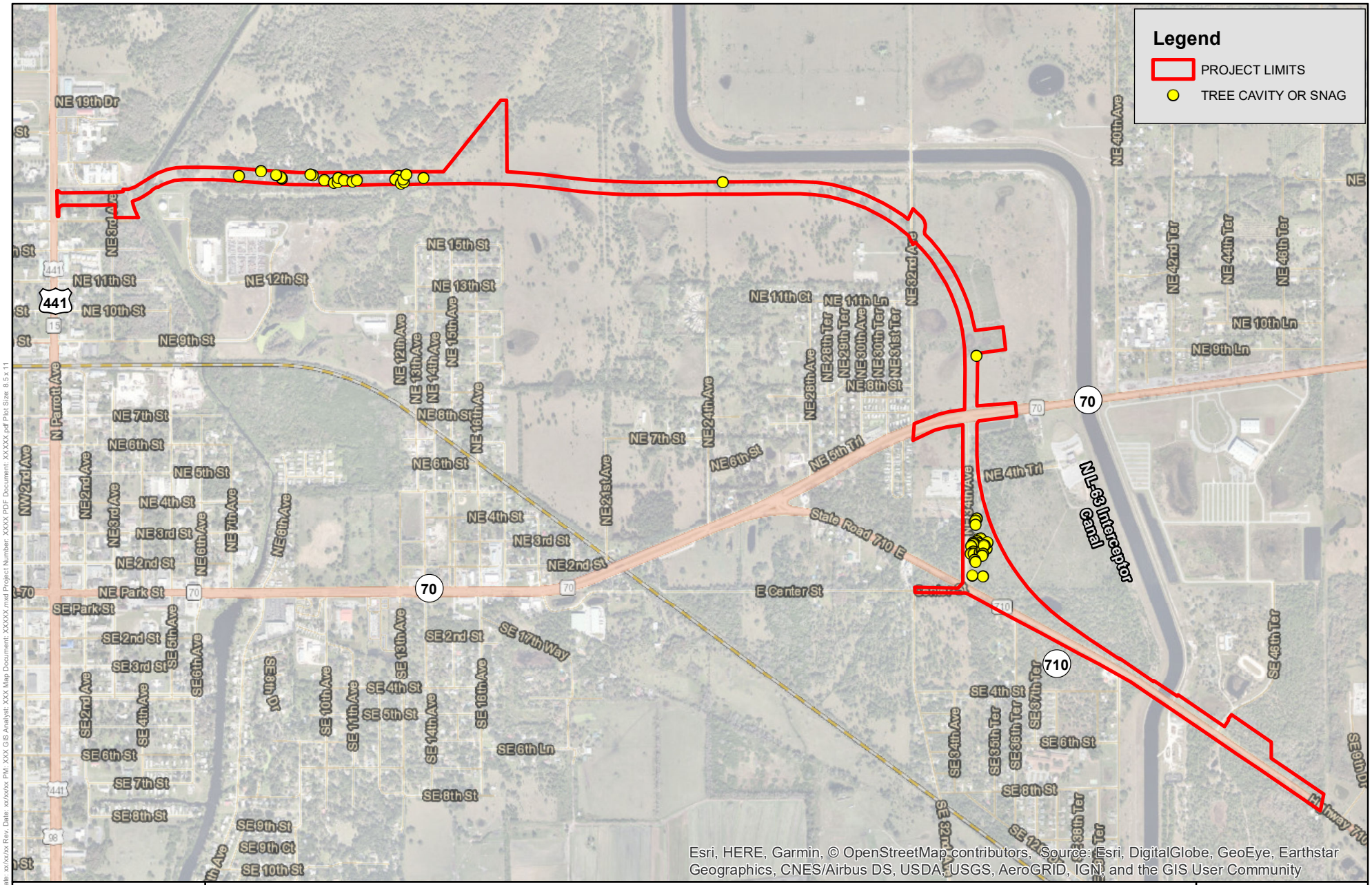
SR 710 from US 441 to L-63 Canal
FPID #: 419344-3-32-01
Okeechobee County, Florida

0 2,000 4,000 6,000 Feet

N

Data Source:
FNAI
FWC
USFWS
Wantman
ESA Scheda
Imagery Source:
ESRI

Coordinate System:
NAD 1983 Florida
State Plane West



Date: xx/xx/xx Rev. Date: xx/xx/xx PM: XXX GIS Analyst: XXX Map Document: XXXXX.mxd Project Number: XXXX PDF Document: XXXXX.pdf Plot Size: 8.5 x 11

FDOT

All data within this map are supplied as is, without warranty. This product has not been prepared for legal, engineering, or survey purposes. Users of this information should review or consult the primary data sources to ascertain the usability of the information.

Figure 3 - Location of Tree Cavities and Snags

SR 710 from US 441 to L-63 Canal
FPID #: 419344-3-32-01
Okeechobee County, Florida

0 1,000 2,000 3,000 Feet

N

Data Source:
Wantman
ESA Scheda
Imagery Source:
ESRI

Coordinate System:
NAD 1983 Florida
State Plane West

Tables

Table 1. Federally Listed Species Effect Determinations

Species	Federal Status	Biological Assement Effect Determination
Animals		
Audubon's Crested Caracara (*Polyborus plancus audubonii*)	Threatened	May Affect, But Not Likely to Adversely Affect
Eastern Indigo Snake (*Drymarchon corais couperi*)	Threatened	May Affect, But Not Likely to Adversely Affect
Everglade Snail Kite (*Rostrhamus sociabilis plumbeus*)	Endangered	May Affect, But Not Likely to Adversely Affect
Florida Grasshopper Sparrow (*Ammodramus savannarum floridanus*)	Endangered	No Effect
Wood Stork (*Mycteria americana*)	Threatened	May Affect, But Not Likely to Adversely Affect
Florida Bonneted Bat (*Eumops floridanus*)	Endangered	May Affect, But Not Likely to Adversely Affect

Table 2. Listed and Non-Listed Wildlife Species Observed

Scientific Name	Common Name	FWC Status*	USFWS Status**
BIRDS			
Accipiter cooperii	Cooper's hawk		
Agelaius phoeniceus	red-winged blackbird		
Ammodramus savannarum	grasshopper sparrow		
Anhinga anhinga	anhinga		
Antigone canadensis pratensis	sandhill crane	T	
Aramus guarauna	limpkin		
Ardea alba	great egret		
Ardea herodias	great blue heron		
Bubulcus ibis	cattle egret		
Buteo lineatus	red-shouldered hawk		
Cardinalis cardinalis	northern cardinal		
Cathartes aura	turkey vulture		
Charadrius vociferus	killdeer		
Coragyps astratus	black vulture		
Corvus brachyrhynchos	American crow		
Corvus ossicfragus	fish crow		
Cyanocitta cristata	blue jay		
Dryocopus pileatus	pileated woodpecker		
Egretta caerulea	little blue heron	T	
Egretta thula	snowy egret		
Egretta tricolor	tricolored heron	T	
Elanoides forficatus	swallow-tailed kite		
Eudocimus albus	white ibis		
Falco sparverius	American kestrel		
Gallinula galeata	common gallinule		
Haliaeetus leucocephalus	bald eagle		#
Lanius ludovicianus	loggerhead shrike		
Megaceryle alcyon	belted kingfisher		
Melanerpes carolinus	red-bellied woodpecker		
Meleagris gallopavo	wild turkey		
Mimus polyglottos	northern mockingbird		
Miniotilta varia	black-and-white warbler		
Mycteria americana	wood stork		
Pandion haliaetus	osprey		
Pelecanus occidentalis	brown pelican		
Phalacrocorax auritus	double-crested cormorant		
Podilymbus podiceps	pied-billed grebe		
Polioptila caerulea	blue-gray gnatcatcher		
Polyborus plancus audubonii	Audubon's crested caracara		T
Progne subis	purple martin		
Quiscalus major	boat-tailed grackle		
Quiscalus quiscula	common grackle		
Rostrhamus sociabilis plumbeus	Everglade snail kite		E
Sayornis phoebe	eastern phoebe		
Setophaga coronata	yellow-rumped warbler		
Setophaga discolor	prairie warbler		
Setophaga palmarum	palm warbler		
Sturnus vulgaris	European starling		
Tachycineta bicolor	tree swallow		
Tringa flavipes	lesser yellowlegs		

Table 2. Listed and Non-Listed Wildlife Species Observed

Scientific Name	Common Name	FWC Status*	USFWS Status**
Turdus migratorius	American robin		
Zenaida macroura	mourning dove		
REPTILES			
Alligator mississippiensis	American alligator		T (S/A)
Gopherus polyphemus	Gopher tortoise	T	
MAMMALS			
Canis latrans	coyote		
Odocoileus virginianus	white-tailed deer		
Sciurus niger shermani	Sherman's fox squirrel	SSC	
Sus scrofa	wild hog		

*Florida Fish and Wildlife Conservation Commission (FWC)
E = Endangered
T = Threatened
SSC = Species of Special Concern

**U.S. Fish and Wildlife Service (USFWS)
E = Endangered
T = Threatened
# Protected by Bald and Golden Eagle Protection Act
T(S/A) = Federally-designated Threatened species due to similarity of appearance

Table 3. Threatened and Endangered Plants Within Okeechobee County, Florida

Scientific Name	Common_Name	FDACS Status*	FWS Status**
Calopogon multiflorus	Manyflowered grasspink	T	
Conradina grandiflora	Largeflower false rosemary	T	
Lilium catesbaei	Catesby's lily	T	
Lythrum flagellare	Florida loosestrife	E	
Myrcianthes fragrans	Twinberry	T	
Opuntia stricta	Erect pricklypear	T	
Pinguicula lutea	Yellow butterwort	T	
Sacoila lanceolata	Leafless beaked ladiestresses	T	
Sarracenia minor	Hooded pitcherplant	T	
Spiranthes laciniata	Lacelip ladiestresses	T	
Tillandsia balbisiana	Northern needleleaf	T	
Tillandsia fasciculata Sw.	Cardinal airplant	E	
Tillandsia utriculata	Giant airplant	E	
Tillandsia variabilis	Leatherleaf airplant	T	
Zephyranthes simpsonii	Redmargin zephyrlily	T	

Note: No listed plants observed during field surveys.

*Florida Department of Agriculture and Consumer Sciences (FDACS)

E = Endangered

T = Threatened

**U.S. Fish and Wildlife Service (USFWS) Listed Plants

E = Endangered

T = Threatened

Appendix A

USFWS and FWC Coordination and Consultation

Florida Department of Transportation

CHARLIE CRIST
GOVERNOR

PO Box 1249
Bartow, Florida 33831-1249

STEPHANIE KOPELOUSOS
SECRETARY

December 1, 2010

Ms. MaryAnn Poole
Director of the Office of Policy and Stakeholder Coordination
Florida Fish and Wildlife Conservation Commission
2574 Seagate Drive, Suite 250
Tallahassee, FL 32399-1600

RE: Transmittal of Endangered Species Biological Assessment
SR 710 PD&E Study
From US 441 to CR 714
FPID No. 419344-2-22-01
Okeechobee and Martin Counties, Florida

Dear Ms. Poole:

Please find enclosed the Endangered Species Biological Assessment (ESBA) prepared for the above referenced project. The Florida Department of Transportation (FDOT) is currently conducting a Project Development and Environment (PD&E) Study to evaluate options for the proposed improvements to SR 710 from US 441 to CR 714. The PD&E Study will evaluate engineering and environmental data, which will aid in determining impacts, if any, associated with the proposed improvements. The proposed improvements are required to meet existing and projected traffic demands and safety needs. The total project length is approximately 12 miles and is located in the following sections:

Township 37 S, Range 35 E, Sections 9, 10, 11, 13, 14, 15, 16, and 24
Township 37 S, Range 36 E, Sections 19, 29, 30, 31, 32, and 33
Township 38 S, Range 36 E, Sections 3, 4, 10, 11, 12, 13, and 14

This ESBA was conducted in accordance with Section 7 of the Endangered Species Act of 1973 to assess potential effects on protected species and their habitats within the project study limits associated with the alternatives for the proposed improvements. As part of this process, qualified biologists performed a field review of wildlife resources within the project corridor. A total of ten federally protected species and fourteen state protected species (state only, no federal protection) were originally identified as potentially utilizing or inhabiting the study area. Study methodologies, along with the detailed results of field investigations, are included in the ESBA.

As a result of the data collection effort, field reviews, and agency coordination, project biologists have concluded the following for federally and/or state protected species:

May affect	1 species	wood stork
May affect, not likely to adversely affect	3 species	American alligator, eastern indigo snake, crested caracara
No affect	20 species	Florida grasshopper sparrow, snail kite, red-cockaded woodpecker, West Indian manatee, Florida panther, Okeechobee gourd, Florida burrowing owl, Florida sandhill crane, wading birds (6), southeastern American kestrel, gopher frog, Florida pine snake, gopher tortoise, Sherman's fox squirrel, Florida mouse

Because of the potential for effects to the wood stork, the FDOT is committed to re-initiating Section 7 consultation during the design phase and prior to permitting the project. At that time, the FDOT will evaluate the current information and provide appropriate mitigation, if necessary.

The FDOT, on behalf of Federal Highway Administration, respectfully requests your review comments or a letter of concurrence with the findings of the ESBA within 30 days. This review effort is also being coordinated with a representative of the USFWS. If you have any questions, please contact me at (863) 519-2625.

Sincerely,

Jeffrey W. James
Environmental Project Manager

Attachment: Endangered Species Biological Assessment

xc:	Nicole Broome	FDOT (without enclosure)
	Scott McCall	FDOT (without enclosure)
	Mark Schulz	FDOT (without enclosure)
	Elizabeth Serdynski	FDOT (without enclosure)
	Dave Dangel, PE	Inwood Consulting Engineers (without enclosure)
	Kristin Caruso	Scheda Ecological Associates (without enclosure)

United States Department of the Interior

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

January 7, 2011

JAN 13 2011

Jeffrey James
Florida Department of Transportation
801 North Broadway Avenue
Bartow, Florida 33831-1249

Service Federal Activity Code: 41420-2009-CPA-0625
Service Consultation Code: 41420-2009-I-0459
Date Received: December 6, 2010
Project: State Road 710 from U.S. Highway 441 to County Road 714
Counties: Okeechobee and Martin

Dear Mr. James:

The U.S. Fish and Wildlife Service (Service) has reviewed your letter and draft Endangered Species Biological Assessment (ESBA) dated December 1, 2010, and other information submitted by the Florida Department of Transportation (FDOT), on behalf of the Federal Highway Administration, for the project referenced above. This letter is submitted in accordance with section 7 of the Endangered Species Act of 1973, as amended (Act) (87 Stat. 884; 16 U.S.C. 1531 *et seq.*).

PROJECT DESCRIPTION

The FDOT is proposing to extend and widen State Road (SR) 710 from U.S. Highway 441 to County Road (CR) 714. The existing 10-mile stretch of two-lane roadway from CR 714 to SR 70 will be enlarged to four lanes. The intersection of SR 710 and CR 15 B will also be realigned. In addition, the FDOT proposes to extend SR 710 from its existing terminus at SR 70 approximately 2 miles to U.S. Highway 441. The new extension would consist of a four-lane roadway. The purpose of the project is to provide additional lane capacity to reduce traffic congestion, address safety and hurricane evacuation concerns, and enhance the movement of freight and goods. The project site is located in Okeechobee County and Martin County, Florida.

THREATENED AND ENDANGERED SPECIES

Eastern indigo snake

The Service notes the project occurs within the geographic range of the threatened Eastern indigo snake (*Drymarchon corais couperi*). During construction, the FDOT has agreed to implement the Service's *Standard Protection Measures for the Eastern Indigo Snake* (Service 2004a) to minimize adverse effects to this species. The FDOT has determined the project "may affect, but

is not likely to adversely affect" the eastern indigo snake. Based on the adherence to the indigo snake protection measures, the Service concurs with this determination.

For the species listed above, this letter fulfills the requirements of section 7 of the Act and further action is not required. If modifications are made to the project, if additional information involving potential effects to listed species becomes available, or if a new species is listed, reinitiation of consultation may be necessary.

Wood stork

The project site is located within the core foraging area (CFA) (within 18.6 miles) of an active breeding colony of the endangered wood stork (*Mycteria americana*). The Service believes the loss of wetlands within a CFA may reduce foraging opportunities for wood storks. To minimize potential adverse effects to the wood stork, the Service's *Draft Supplemental Habitat Management Guidelines for the Wood Stork in the South Florida Ecological Services Consultation Area* (Service 2004b) (Guidelines) recommends the applicant replace wetlands lost due to the action.

The compensation plan should include a temporal lag factor, if necessary, to ensure wetlands provided as compensation adequately replace the wetland functions lost due to the project. Moreover, wetlands offered as compensation should be of the same hydroperiod, and located within the CFA of the affected wood stork colony. The Service does not consider the preservation of wetlands, by itself, as adequate compensation for impacts to wood stork foraging habitat, because the habitat lost is not replaced. Accordingly, any wetland mitigation plan that includes the preservation of wetlands should include a restoration, enhancement, or creation component.

In some cases, the Service accepts wetlands compensation located outside the CFA of the affected wood stork nesting colony. Specifically, wetland credits purchased from a "Service Approved" mitigation bank located outside the CFA would be acceptable to the Service, provided the impacted wetlands occur within the permitted service area of the bank. For projects that impact 5 or more acres of wood stork foraging habitat, the Service requires a functional assessment be conducted using our "Wood Stork Foraging Analysis Methodology" (Methodology) on the foraging habitat to be impacted and the foraging habitat provided as mitigation. The Methodology can found in the Service's letter to the Corps dated May 18, 2010, (Service Federal Activity Code Number 41420-2007-FA-1494) available at the following web address: http://www.fws.gov/verobeach/images/pdfLibrary/20100518_letter_Service%20to%20Corps_FL%20Programmatic%20Stork%20revised1.pdf.

The FDOT has determined the project "may affect" the wood stork. The FDOT intends to reinitiate consultation with the Service for the wood stork (pursuant to section 7 of the Act, as described in 50 CFR § 402.14) during the design phase of the project prior to permitting. At that time the Service will work with the FDOT to minimize the projects impacts to the wood stork. The Service concurs with the FDOT's determination for the wood stork.

Audubon's crested caracara

The project is located within the geographic range of the threatened Audubon's crested caracara (*Caracara cheriway = Polyborus plancus audubonii*). The FDOT has determined the project "may affect" the Audubon's crested caracara. The FDOT intends to request reinitiation of consultation with the Service for the Audubon's crested caracara (pursuant to section 7 of the Act, as described in 50 CFR § 402.14) during the design phase of the project prior to permitting. At that time the FDOT intends to resurvey lands within and near the project corridor to determine the status of nesting caracaras, and the Service will work with the FDOT to minimize the projects impacts to the caracara. The Service concurs with the FDOT's determination for the Audubon's crested caracara.

FISH AND WILDLIFE RESOURCES

The Service finds the portion of project corridor that extends SR 710 from SR 70 to U.S. Highway 441 could have significant impacts to fish and wildlife and their habitat. Direct impacts from construction will include loss of habitat within the footprint of the roadway corridor and the footprint of any stormwater treatment ponds constructed for the project. The total acreage of lands to be impacted by the project was not provided. The indirect impacts resulting from the project include: fragmentation of existing habitat; mortality of wildlife due to collisions with vehicles; degradation of existing adjacent habitat due to road-related liter and runoff; and disturbance to wildlife due roadway noise. More importantly, the Service believes the new motor vehicle access provided to undeveloped lands in the area will significantly increase the likelihood existing fish and wildlife habitat adjacent to and near the project site will be converted to residential and commercial development. We believe such development is significantly less likely to occur without the new roadway access provided by the proposed extension.

Based on the project's adverse impacts to fish and wildlife and its habitat, the Service does not support the proposed extension of State Road 710 from State Road 70 to U.S. Highway 441. We recommend the proposed extension be eliminated from the project design. The Service believes a project design that includes the widening of SR 710 from CR 714 to SR 70 would still meet the project purpose and need, as stated in the draft ESBA.

Thank you for allowing us to provide these comments and for your cooperation in the effort to protect federally listed species. If you have any questions regarding this project, please contact John Wrublik at 772-562-3909, extension 282.

Sincerely yours,

Victoria A. Foster

for Paul Souza
Field Supervisor
South Florida Ecological Services Office

cc:
FWC, Tallahassee, Florida (Mary Ann Poole, Jane Chabre, Traci Wallace)
NOAA Fisheries, West Palm Beach, Florida (Brandon Howard)

LITERATURE CITED

U.S. Fish and Wildlife Service. 2004a. Standard protection measures for the eastern indigo snake. Fish and Wildlife Service, South Florida Ecological Services Office: Vero Beach, Florida.

U.S. Fish and Wildlife Service. 2004b. Draft Supplemental Habitat Management Guidelines for the Wood Stork in the South Florida Ecological Services Consultation Area. Fish and Wildlife Service, South Florida Ecological Services Office; Vero Beach, Florida.

United States Department of the Interior

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

August 7, 2013

Martin Horwitz
Florida Department of Transportation
801 North Broadway Avenue
Bartow, Florida 33831-1249

Service CPA Code: 2009-CPA-0625
Service Consultation Code: 2009-I-0459
Date Received: June 18, 2013
Project: State Road 710 from U.S. Highway 441 to County Road 714
Counties: Okeechobee and Martin

Dear Mr. Horwitz:

The U.S. Fish and Wildlife Service (Service) has reviewed your letter dated June 18, 2013, and other information submitted by the Florida Department of Transportation (FDOT), on behalf of the Federal Highway Administration (FHWA), for the project referenced above. This letter is submitted in accordance with section 7 of the Endangered Species Act of 1973, as amended (Act) (87 Stat. 884; 16 U.S.C. 1531 *et seq.*

PROJECT DESCRIPTION

The FDOT is proposing to extend and widen State Road (SR) 710 from U.S. Highway (US) 441 to County Road (CR) 714. The existing 10-mile stretch of two-lane roadway from CR 714 to just south of SR 70 will be enlarged to four lanes. The intersection of SR 710 and CR 15B will also be realigned. In addition, the FDOT proposes to extend SR 710 for about 3 miles from approximately 0.2 mile southeast of the intersection of Southeast 36th Terrace to north of SR 70, and then west to US 441. The proposed new extension consists of a four-lane paved roadway with a center median. The purpose of the project is to provide additional lane capacity to reduce traffic congestion, address safety and hurricane evacuation concerns, and enhance the movement of freight and goods. The project will fill 26.49 acres of wetlands. To compensate for impacts to wetlands, the FDOT has proposed to acquire credits from the Bluefield Ranch Mitigation Bank (BRMB). The project site is located in Sections 9-11, 13-16, and 24, of Township 37 South, Range 35 East; Sections 19 and 29-33, of Township 37 South, Range 36 East; and Sections 3, 4, and 10-14, of Township 38 South, Range 36 East, in Okeechobee County and Martin County, Florida.

THREATENED AND ENDANGERED SPECIES

Eastern indigo snake

The Service notes the project occurs within the geographic range of the threatened Eastern indigo snake (*Drymarchon corais couperi*). During construction, the FDOT has agreed to implement

the Service's *Standard Protection Measures for the Eastern Indigo Snake* (Service 2004a) to minimize adverse effects to this species. The FDOT has determined the project "may affect, but is not likely to adversely affect" the eastern indigo snake. Based on the adherence to the indigo snake protection measures, the Service provided concurrence with this determination in a letter to the FDOT dated January 7, 2011.

Wood stork

The project site is located within the core foraging area (CFA; 18.6 miles) of an active breeding colony of the endangered wood stork (*Mycteria americana*). The Service believes the loss of wetlands within a CFA may reduce foraging opportunities for wood storks. To minimize potential adverse effects to the wood stork, the Service's *Draft Supplemental Habitat Management Guidelines for the Wood Stork in the South Florida Ecological Services Consultation Area* (Service 2004b) (Guidelines) recommends the applicant replace wetlands lost due to the action. The compensation plan should include a temporal lag factor, if necessary, to ensure wetlands provided as compensation adequately replace the wetland functions lost due to the project. Moreover, wetlands offered as compensation should be of the same hydroperiod, and located within the CFA of the affected wood stork colony.

The Service does not consider the preservation of wetlands, by itself, as adequate compensation for impacts to wood stork foraging habitat, because the habitat lost is not replaced. Accordingly, any wetland mitigation plan that includes the preservation of wetlands should include a restoration, enhancement, or creation component. In some cases, the Service accepts wetlands compensation located outside the CFA of the affected wood stork nesting colony. Specifically, wetland credits purchased from a "Service Approved" mitigation bank located outside the CFA would be acceptable to the Service, provided the impacted wetlands occur within the permitted service area of the bank.

For projects that impact 5 or more acres of wood stork foraging habitat, the Service requires a functional assessment be conducted using our "Wood Stork Foraging Analysis Methodology" (Methodology) on the foraging habitat to be impacted and the foraging habitat provided as mitigation. The Methodology can found on our website at: http://www.fws.gov/verobeach/BirdsPDFs/20120712_WOST%20Forage%20Assessment%20Methodology_Appendix.pdf .

The FDOT has determined the project "may affect, but is not likely to adversely affect" the wood stork. The project will fill 26.49 acres of short-hydroperiod (inundated < 180 days per year) wetlands that may provide foraging habitat for the wood stork. Application of the Service's Methodology indicates the 26.49 acres of short-hydroperiod wetlands and swales provide 23.98 kilograms (kg) of wood stork forage biomass. To compensate for impacts to wood stork foraging habitat, the FDOT has proposed to acquire credits that provide at least 23.98 kg of wood stork biomass from short-hydroperiod wetlands at the BRMB. Based on the minor overall impacts to wood stork foraging habitat, the Service concurs with the FDOT's determination for the wood stork.

For the species listed above, this letter fulfills the requirements of section 7 of the Act and further action is not required. If modifications are made to the project, if additional information involving potential effects to listed species becomes available, or if a new species is listed, reinitiation of consultation may be necessary.

Audubon's crested caracara

The project is located within the geographic range of the threatened Audubon's crested caracara (*Caracara cheriway* = *Polyborus plancus audubonii*). The FDOT determined the project "may affect, but is not likely to adversely affect" the Audubon's crested caracara. The FDOT's consultant conducted surveys for caracara nests in or near the project corridor in January, February, March, and April of 2013. The survey methods were based on the Service's caracara nest survey guidance. An active caracara nest was observed approximately 1 mile northwest of Southeast 128th Avenue and 428 feet northeast of SR 710. Based on the information provided, the Service finds the project will result in adverse effects to the caracara, and we cannot concur with the FDOT's determination that the project is not likely to adversely affect the caracara. We recommend the FDOT contact the FHWA, the Federal action agency for the project, and ask them to request the Service initiate formal consultation for the project, pursuant to section 7 of the Act (as described in 50 CFR § 402.14). To minimize the adverse effects of the project to the caracara, we recommend the FDOT provide a proposal to offset the impacts to caracara and their habitat. Measures to benefit caracara can include preservation and management of caracara habitat, or contributions to the Wildlife Foundation of Florida's caracara fund, which supports monitoring of the caracara in Florida.

FISH AND WILDLIFE RESOURCES

The Service reiterates our comments made during the screening of the proposed project through FDOT's *Efficient Transportation Decision Making Process* in 2009, and our letter to the FDOT dated January 7, 2011. We find that the portion of project corridor that extends SR 710 from southeast of SR 70 to US 441 is likely to have significant impacts to fish and wildlife and their habitat. Direct impacts from construction will include loss of habitat within the footprint of the roadway corridor and the footprint of any stormwater treatment ponds constructed for the project. The indirect impacts resulting from the project include: fragmentation of existing habitat; mortality of wildlife due to collisions with vehicles; degradation of existing adjacent habitat due to road-related liter and runoff; and disturbance to wildlife due to roadway noise. More importantly, the Service believes that the new motor vehicle access provided to undeveloped lands in the area will significantly increase the likelihood that existing fish and wildlife habitat adjacent to, and near, the roadway extension will be converted to residential and commercial development. We believe that such development is significantly more likely to occur due to the new roadway access provided by the proposed extension.

Based on the project's adverse impacts to fish and wildlife and its habitat, the Service does not support the proposed extension of State Road 710 from southeast of SR 70 to U.S. Highway 441.

Accordingly, we request the FDOT and the FHWA eliminate the proposed roadway extension from the project. We believe a more economical and environmentally prudent approach to address the transportation needs in the area would be the widening of existing major roadways in the area (*e.g.*, SR 70, US 441) in concert with the segment of SR 710 from CR 714 to SR 70. The Service believes this type of project design would still meet the purpose and need of the project and result in far less impacts to fish and wildlife resources.

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

Sincerely yours,

for Larry Williams
Field Supervisor
South Florida Ecological Services Office

cc: electronic only
Corps, Palm Beach Gardens, Florida (Garett Lips)
FHWA, Tallahassee, Florida (Joseph Sullivan)
FWC, Tallahassee, Florida (FWC-CPS)
NOAA Fisheries, West Palm Beach, Florida (Brandon Howard)

LITERATURE CITED

U.S. Fish and Wildlife Service. 2004a. Draft standard protection measures for the eastern indigo snake. Fish and Wildlife Service, South Florida Ecological Services Office; Vero Beach, Florida.

U.S. Fish and Wildlife Service. 2004b. Draft Supplemental Habitat Management Guidelines for the Wood Stork in the South Florida Ecological Services Consultation Area. Fish and Wildlife Service, South Florida Ecological Services Office; Vero Beach, Florida.

United States Department of the Interior

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

May 27, 2014

Marlon Bizerra
Florida Department of Transportation
801 North Broadway Avenue
Bartow, Florida 33831-1249

Service CPA Code: 2009-CPA-0625
Service Consultation Code: 2009-I-0459
Date Received: May 7, 2014
Project: State Road 710 from U.S. Highway 441 to County Road 714
Counties: Okeechobee and Martin

Dear Mr. Bizerra:

The U.S. Fish and Wildlife Service (Service) has reviewed your letter dated May 7, 2014, and other information submitted by the Florida Department of Transportation (FDOT), on behalf of the Federal Highway Administration (FHWA), for the project referenced above. This letter is submitted in accordance with section 7 of the Endangered Species Act of 1973, as amended (Act) (87 Stat. 884; 16 U.S.C. 1531 *et seq.*

PROJECT DESCRIPTION

The FDOT is proposing to extend and widen State Road (SR) 710 from U.S. Highway (US) 441 to County Road (CR) 714. The existing 10-mile stretch of two-lane roadway from CR 714 to just south of SR 70 will be enlarged to four lanes. The intersection of SR 710 and CR 15B will also be realigned. In addition, the FDOT proposes to extend SR 710 for about 3 miles from approximately 0.2 mile southeast of the intersection of Southeast 36th Terrace to north of SR 70, and then west to US 441. The proposed new extension consists of a four-lane paved roadway with a center median. The purpose of the project is to provide additional lane capacity to reduce traffic congestion, address safety and hurricane evacuation concerns, and enhance the movement of freight and goods. The project will fill 26.49 acres of wetlands. To compensate for impacts to wetlands, the FDOT has proposed to acquire credits from the Bluefield Ranch Mitigation Bank (BRMB). The project site is located in Sections 9-11, 13-16, and 24, of Township 37 South, Range 35 East; Sections 19 and 29-33, of Township 37 South, Range 36 East; and Sections 3, 4, and 10-14, of Township 38 South, Range 36 East, in Okeechobee County and Martin County, Florida.

THREATENED AND ENDANGERED SPECIES

Eastern indigo snake

The Service notes the project occurs within the geographic range of the threatened eastern indigo snake (*Drymarchon couperi = Drymarchon corais couperi*). During construction, the FDOT has agreed to implement the Service's *Standard Protection Measures for the Eastern Indigo Snake* (Service 2004a) to minimize adverse effects to this species (the measures were recently updated [Service 2013] and the most current measures will be followed at the time of construction). The FDOT has determined the project "may affect, but is not likely to adversely affect" the eastern indigo snake. Based on the adherence to the indigo snake protection measures, the Service provided concurrence with this determination in a letter to the FDOT dated January 7, 2011.

Wood stork

The project site is located within the core foraging area (CFA) of an active breeding colony of the endangered wood stork (*Mycteria americana*). The CFA is defined as all lands within 18.6 miles of the colony. The Service believes the loss of wetlands within a CFA may reduce foraging opportunities for wood storks. To minimize potential adverse effects to the wood stork, the Service's *Draft Supplemental Habitat Management Guidelines for the Wood Stork in the South Florida Ecological Services Consultation Area* (Service 2004b) (Guidelines) recommends the applicant replace wetlands lost due to the action. The compensation plan should include a temporal lag factor, if necessary, to ensure wetlands provided as compensation adequately replace the wetland functions lost due to the project. Moreover, wetlands offered as compensation should be of the same hydroperiod, and located within the CFA of the affected wood stork colony.

The Service does not consider the preservation of wetlands, by itself, as adequate compensation for impacts to wood stork foraging habitat, because the habitat lost is not replaced. Accordingly, any wetland mitigation plan that includes the preservation of wetlands should include a restoration, enhancement, or creation component. In some cases, the Service accepts wetlands compensation located outside the CFA of the affected wood stork nesting colony. Specifically, wetland credits purchased from a "Service Approved" mitigation bank located outside the CFA would be acceptable to the Service, provided the impacted wetlands occur within the permitted service area of the bank.

For projects that impact 5 or more acres of wood stork foraging habitat, the Service requires a functional assessment be conducted using our "Wood Stork Foraging Analysis Methodology" (Methodology) on the foraging habitat to be impacted and the foraging habitat provided as mitigation. The Methodology can found on our website at: http://www.fws.gov/verobeach/ListedSpeciesBirds.html .

The FDOT has determined the project "may affect, but is not likely to adversely affect" the wood stork. The project will fill 26.49 acres of short-hydroperiod (inundated < 180 days per year) wetlands that may provide foraging habitat for the wood stork. Application of the Service's Methodology indicates the 26.49 acres of short-hydroperiod wetlands and swales provide about 23.98 kilograms (kg) of wood stork forage biomass. To compensate for impacts to wood stork foraging habitat, the FDOT has proposed to acquire credits that provide at least 23.98 kg of wood stork biomass from short-hydroperiod wetlands at the BRMB. Based on the minor overall impacts to wood stork foraging habitat, the Service concurred with the FDOT's determination for the wood stork in a letter to the FDOT dated August 7, 2013.

For the species listed above, this letter fulfills the requirements of section 7 of the Act and further action is not required. If modifications are made to the project, if additional information involving potential effects to listed species becomes available, or if a new species is listed, reinitiation of consultation may be necessary.

Audubon's crested caracara

The project is located within the geographic range of the threatened Audubon's crested caracara (*Caracara cheriway* = *Polyborus plancus audubonii*). The FDOT's consultant conducted surveys for caracara nests in or near the project corridor in January, February, March, and April of 2013. The survey methods were based on the Service's caracara nest survey guidance. An active caracara nest was observed approximately 1 mile northwest of Southeast 128th Avenue and 428 feet northeast of SR 710. The FDOT determined the project "may affect, and is likely to adversely affect" the Audubon's crested caracara. The Service understands the project will not go forward until some unknown time in the future, and the FDOT has committed to conducting new surveys to assess the status of nesting caracaras in and near the project site at that time. As such, the Service does not have enough information at this time to provide concurrence or non-concurrence with FDOT's determination. To comply with section 7 of the Act, the FDOT has committed to reinitiate consultation with the Service prior to advancing the project to construction, during the design and permitting phase of the project. At this time, the FDOT will provide additional information (including current survey data) that will allow the Service to complete our analysis of the project's effects to the caracara, and complete consultation on the project. The FDOT must document this commitment in their final environmental document, and in documents for any subsequent reevaluation of the project.

Florida bonneted bat

The project is located in the geographic range of the endangered Florida bonneted bat (*Eumops floridanus*). The FDOT has determined the project "may affect, but is not likely to adversely affect" the Florida bonneted bat. The Service does not have enough information at this time to provide concurrence or non-concurrence with FDOT's determination. To comply with section 7 of the Act, the FDOT has committed to reinitiate consultation with the Service prior to advancing the project to construction, during the design and permitting phase of the project. At this time,

the FDOT will provide additional information (including the results of current roosting surveys for the Florida bonneted bat in the project corridor) that will allow the Service to complete our analysis of the project's effects to the Florida bonneted bat, and complete consultation on the project. The FDOT must document this commitment in their final environmental document, and in documents for any subsequent reevaluation of the project.

FISH AND WILDLIFE RESOURCES

With respect to the proposed extension of SR 710 to U.S 441, the Service reiterates our comments from past letters, emails, and the screening of the proposed project through FDOT's *Efficient Transportation Decision Making Process* in 2009. We find the proposed extension of SR 710 from southeast of SR 70 to US 441 is likely to have significant impacts to fish and wildlife and their habitat. Direct impacts from construction will include loss of habitat within the footprint of the roadway corridor and the footprint of any stormwater treatment ponds constructed for the project. The indirect impacts resulting from the project include: fragmentation of existing habitat; mortality of wildlife due to collisions with vehicles; degradation of existing adjacent habitat due to road-related liter and runoff; and disturbance to wildlife due to roadway noise. More importantly, the Service believes the new motor vehicle access provided to undeveloped lands in the area will significantly increase the likelihood existing fish and wildlife habitat adjacent to, and near, the roadway extension will be converted to residential and commercial development. We believe such development is significantly more likely to occur due to the new roadway access provided by the proposed extension.

In the FDOT's current letter dated May 7, 2014, the FDOT states existing roads such as NE 32nd Avenue and NE 24th Street, and future roads proposed by developers in the area, will provide basically the same access and incentive for development as the proposed SR 710 extension. However, we find unlikely that two existing, partially unpaved, dead-end roads will provide the same type of access and growth inducement, if any, for new development as a new four-lane paved highway that provides a direct connection among three major highways (*i.e.*, SR 710, SR 70, and US 441) would provide. Moreover, it is unlikely that a developer would propose a new road of the magnitude of the proposed SR 710 extension's preferred alternative 1-2C. The FDOT states in the current letter the need for this project is not tied to economic development. But the FDOT's August 26, 2013, letter to the Service specifically indicates it is the intent of Okeechobee County that lands adjacent to the SR 710 extension corridor be developed in the future for residential, mixed-use, and industrial uses, and therefore, "the extension of SR 710 is needed to provide access to this area." Consequently, it appears to the Service the need for the SR 710 extension is strongly tied to economic development and there appear to be contrary statements between the 2013 and 2014 letters. This new development, in the Service's view, would be much less likely to occur but for the extension project. It also appears encouraging development is the primary reason alternative 1-2C was selected as the preferred alternative for the SR 710 extension, as this alternative appears to provide the greatest amount of new access to currently undeveloped lands of the three proposed extension alternatives.

The Service's mission is to conserve all fish and wildlife and their habitat for the use and enjoyment of the American people. As such, the Service is not solely concerned with impacts to threatened and endangered species, but also with greater fish and wildlife overall. Therefore, based on the project's significant direct and indirect adverse impacts to fish and wildlife and its habitat, the Service does not support the proposed extension of State Road 710 from southeast of SR 70 to U.S. Highway 441. Furthermore, we do not believe the FDOT has demonstrated conclusively the SR 710 extension is needed at this time. Accordingly, we continue to request the FHWA eliminate the proposed SR 710 roadway extension from the project as currently designed. We believe a more environmentally prudent approach to address the transportation needs in the area would be to widen the existing four-lane SR 70 to six lanes (center lane widening) from SR 710 to US 441. As an alternative, we also believe maintaining SR 70 from SR 710 to US 441 as a four-lane roadway would still provide a project that meets most of area's transportation needs, minimizes effects to fish and wildlife, and eliminates obtrusive road noise and road light impacts to homeowners living near the proposed SR 710 extension corridor.

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

Sincerely yours,

Victoria A. Foster

for Craig Aubrey
Field Supervisor
South Florida Ecological Services Office

cc: electronic only
Corps, Palm Beach Gardens, Florida (Garett Lips)
FHWA, Tallahassee, Florida (Linda Anderson)
FWC, Tallahassee, Florida (FWC-CPS)
NOAA Fisheries, West Palm Beach, Florida (Brandon Howard)

LITERATURE CITED

U.S. Fish and Wildlife Service. 2004a. Draft standard protection measures for the eastern indigo snake. Fish and Wildlife Service, South Florida Ecological Services Office; Vero Beach, Florida.

U.S. Fish and Wildlife Service. 2004b. Draft Supplemental Habitat Management Guidelines for the Wood Stork in the South Florida Ecological Services Consultation Area. Fish and Wildlife Service, South Florida Ecological Services Office; Vero Beach, Florida.

U.S. Fish and Wildlife Service. 2013. Standard protection measures for the eastern indigo snake. Fish and Wildlife Service, South Florida Ecological Services Office; Vero Beach, Florida.

Florida Department of Transportation

RICK SCOTT
GOVERNOR

801 North Broadway
Bartow, FL 33830

JIM BOXOLD
SECRETARY

February 5, 2015

Mr. John Wrublik
United States Fish and Wildlife Service
South Florida Ecological Services Office
1339 20th Street
Vero Beach, FL 32960

RE: Concurrence Request for the Florida Bonneted Bat
SR 710 from US 441 to CR 714
FPID No. 419344-2-22-01
Okeechobee and Martin Counties, Florida

Dear Mr. Wrublik,

In a letter to the U.S. Fish and Wildlife Service (USFWS) dated May 7, 2014, the FDOT requested consultation for the endangered Florida bonneted bat (*Eumops floridanus*), committed to reinitiate consultation for the species during the permitting phase of the project, and determined that the project "may affect and is not likely to adversely affect" the Florida bonneted bat. In an email dated January 21, 2015, the Service indicated that they will require project surveys to be conducted within the project footprint and within suitable habitat in order to determine if the SR 710 project will or will not adversely affect the species, and complete the consultation process for the SR 710 project.

Scheda Ecological Associates, Inc. (Scheda) biologists conducted a field survey to locate potential roosts of the Florida bonneted bat (*Eumops floridanus*) within the project limits of SR 710 from US 441 to CR 714 (Figure 1). Specifically, surveys were conducted within the USFWS Florida bonneted bat Consultation Area (CA) located within the SR 710 project limits. Approximately 5.2 miles of the 12.7-mile project is located within the Florida bonneted bat CA. The following text includes information on the Florida bonneted bat, description of the survey methodology and survey results.

FLORIDA BONNETED BAT

The Florida bonneted bat has been documented historically in, and continues to have the potential to inhabit, a variety of habitat types including mangroves, earth midden hammocks, pine rockland, wet prairie, tropical hardwoods, hardwood hammock, pine flatwoods, lakes, cypress hammock, scrubby flatwoods, and wetland scrub habitat, as well as man-made and altered areas such as residential and urban areas canals, and developed park land (Federal Register, October 2013). Although the species has been documented in this variety of habitat types, very little is known about the specific habitat requirements of the Florida bonneted bat (Federal Register, October 2013).

Examples of documented roost sites include a cavity in a long leaf pine (*Pinus palustris*) tree (Belwood 1992), a cavity in a Florida royal palm (*Roystonea regia*) (Belwood 1992), bat houses located on public and private land (Federal Register, October 2013), limestone outcroppings (Marks and Marks 2008), and under Spanish tiles of residential properties (Belwood 1992). The number of Florida bonneted bats in a roost varies from a single individual to small colonies (Belwood 1992). Up until very recently, the only known Florida bonneted bat roosts were in bat boxes. However, one was confirmed in September 2014 on Avon Park Air Force Range property in a pine tree.

METHODOLOGY

To date, a formal survey protocol has not been adopted by the Service for the Florida bonneted bat. However, project biologist have had personal communications with Service biologists in the past regarding general survey concepts for the species; these were followed for this current survey.

Prior to the field assessment, available mapping resources were consulted to document land use / land cover in the project area and included:

- 2008 South Florida Water Management District (SFWMD) Florida Land Use, Cover and Forms Classification System (FLUCFCS) data; and
- 2010 Microsoft true-color aerial photography.

Biologists conducted pedestrian surveys on January 29, 2015 to document potential Florida bonneted bat roosts within the portion of the SR 710 project that overlaps with the USFWS Florida bonneted bat CA. All potential bat roost areas were inspected for bat occupancy (with the presence of guano, stains, odors, carcasses, or the roosting bats themselves [Gore and Studenroth 2005]) using flashlights and/or binoculars when suitable.

The project consists predominantly of open range land and pasture; very little natural habitat and vegetation remains within the project limits. However, any tree, snag, and other large vegetation that was deemed as potential bat roost habitat was examined for cavities.

Within the natural habitat, we identified several woodpecker cavities in two tree snags. However, no bats of any species were observed in these snags from our ground vantage point and the snags were located just outside of the project footprint. In addition to natural habitat, we surveyed for potential Florida bonneted bat roosts in any identified bridges and abandoned structures. Several bridges are located within the project corridor, however only two bridges are located both in the project corridor and within the CA. These consist of the SR 710 bridge over the L-63N Canal and the SR 710 bridge over Mosquito Creek. We surveyed each bridge for expansion joints or crevices that could potentially be utilized by bats as roost sites. Joints and crevices utilized by bats are typically 0.5 to 1.25 inches wide (Keeley and Tuttle 1999).

RESULTS

One potential bat roost was located in the project limits and within the project footprint (Figure 1 and Figure 2). Roost #1 consists of crevices, with staining, located in the SR 70 bridge over the L-63N canal. The crevices are approximately three quarters of an inch in width. It is not possible to determine if the

staining is from bats currently occupying the bridge, or historically occupying the bridge. Past bridge inspection reports from 2010 did not note bat presence in the bridge. The height of the bridge over the canal water level is approximately 8.5 feet which is likely sufficient for deterring predation. Furthermore, In January 2014, the L-63N canal bridge was surveyed for Florida bonneted bat in association with the SR 70 from N.E. 31st Ave. to N.E. 80th Ave. design project after listing of the species, Service Consultation Code-F-00905, and resulted in no noted bat presence in the bridge. Lastly, we surveyed the bridge over Mosquito Creek, but the bridge is a continuous concrete bridge lacking expansion joints or crevices. Finally, no bat houses were located within the project footprint.

CONCLUSIONS

There are no previous documented occurrences of Florida bonneted bats roosting in bridges; therefore the probability of Florida bonneted bats roosting in the L-63N canal bridge is very low. Therefore, we do not believe that there is adequate roosting habitat for the Florida bonneted bat within the project area.

Based on the above information indicating that (1) the project consists mostly of open range land and pasture with little vegetation, (2) our survey did not confirm bat species of any kind, and identified only one, marginal area with low probability of providing Florida bonneted bat roost habitat, and (3) no bat boxes will be impacted, we have determined that the proposed project "**may affect, but is not likely to adversely affect**" the Florida bonneted bat.

The FDOT, on behalf of the Federal Highway Administration, respectfully requests your review comments or a letter of concurrence within 30 days. If you have any questions, please contact me via email at martin.horwitz@dot.state.fl.us or by phone at (863) 519-2805.

Sincerely,

Martin Horwitz
Environmental Project Manager

Attachments: Figure 1: Project Study Area for Potential Bonneted Bat Roost Sites Map
Figure 2: Land Use Within Project Corridor and Florida Bonneted Bat Consultation Area Map
FDOT consultation request letter (May 7, 2014)
Service email dated January 21, 2015

cc:

Gwen G. Pipkin	FDOT
David Dangel, P.E.	Inwood
Kristin Caruso	Scheda

REFERENCES

Belwood, J.J. 1992. Florida mastiff bat *Eumops glaucinus floridanus*. Pages 216-223 in S.R. Humphrey (ed.), Rare and endangered biota of Florida. Vol. I. Mammals. University Press of Florida. Gainesville, Florida.

Federal Register. 2013. Endangered and threatened wildlife and plants; endangered species status for the Florida bonneted bat. Volume 78, Number 191.

Gore, J.A. and Studenroth, K.R. 2005. Status and Management of Bats Roosting in Bridges in Florida. Report submitted to the Florida Department of Transportation by the Florida Fish and Wildlife Conservation Commission.

Keeley, B. W. and M. D. Tuttle. 1999. Bats in American bridges. Bat Conservation International, Inc. Austin, Texas.

Marks, G. E. and C. S. Marks. 2008. Status of the Florida bonneted bat (*Eumops floridanus*).

Project Location
Florida Bonneted Bat Focal Area (Not Present)
Florida Bonneted Bat Consultation Area
Potential Florida Bonneted Bat Roost Site

PASCO
HILLSBOROUGH
PINELLAS
POLK
OSCEOLA
BREVARD
INDIANRIVER
MANATEE
HARDEE
OKEECHOBEE
STLUCIE
HIGHLANDS
SARASOTA
DESOTO
MARTIN
CHARLOTTE
GLADES
PALMBEACH
LEE
HENDRY
BROWARD
COLLIER
MONROE
DADE

Begin Project
End Project
HIGHLANDS
OKEECHOBEE
STLUCIE
GLADES
MARTIN

SR-70
SR-70 W
SR-70 E
SR-710
SR-710 W
NE 7th St
NE 6th St
NE 6th Ct
NE 5th Tri
NE 4th Tri
NE 21st Ave
NE 28th Ave
NE 30th Ave
NE 31st Ave
NE 31st Way
NE 31st Ter
NE 34th Ave
NE 9th Ln
NE 41st Way
E Center St
Center St
Mosquito Creek
SE 4th St
SE 33rd Ave
SE 38th Ter
SE 40th Ter
SE 40th Ave
SE 10th St
SE 6th Dr
SE 8th St

Figure 1 - Project Study Area for Potential Florida Bonneted Bat Roost Sites Map

FPID #: 419344-2-22-01
SR 710 PD&E from US 441 to CR 714
Okeechobee and Martin Counties, Florida

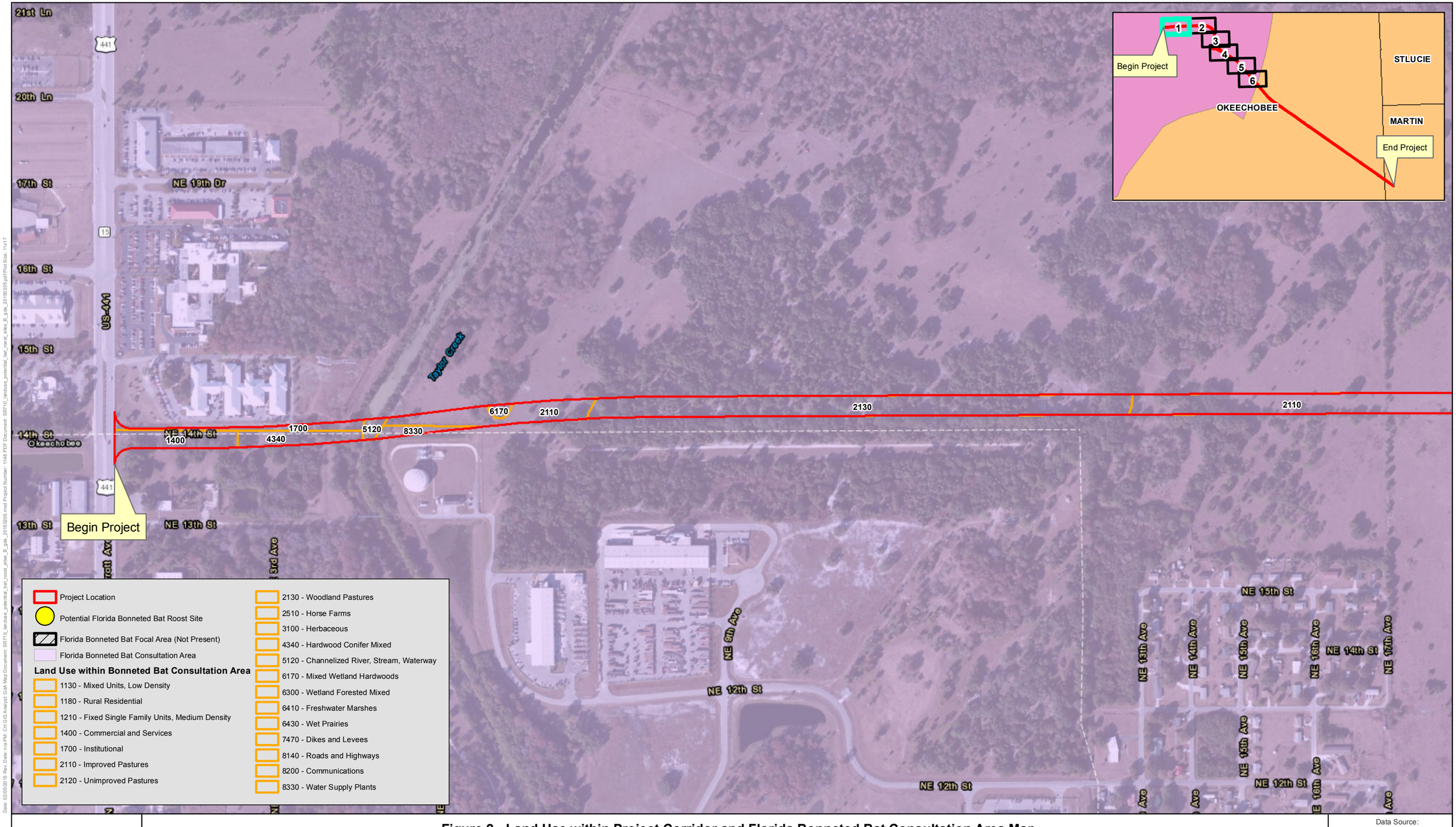
0 1,000 2,000 3,000 Feet

Data Source:
-Scheda Scientists
-Inwood Engineers
-FWC
Imagery Source:
-2010 Microsoft

Coordinate System:
NAD 1983 Florida
State Plane East

N

Date: 02/03/2015 Rev. Date: n/a PM: CH GIS Analyst: GdA Map Document: SR710_potential_bat_roost_sites_B_gda_20150203.mxd Project Number: 1148 PDF Document: SR710_potential_bat_roost_sites_B_gda_20150203.pdf Plot Size: 11x17



Date: 02/05/2015 Rev. Date: n/a PM: CH GIS Analyst: GdA Map Document: SR710_landuse_potential_bat_roost_sites_B_gda_20150205.mxd Project Number: 1148 PDF Document: SR710_landuse_potential_bat_roost_sites_B_gda_20150205.pdf Plot Size: 11x17

Figure 2 - Land Use within Project Corridor and Florida Bonneted Bat Consultation Area Map

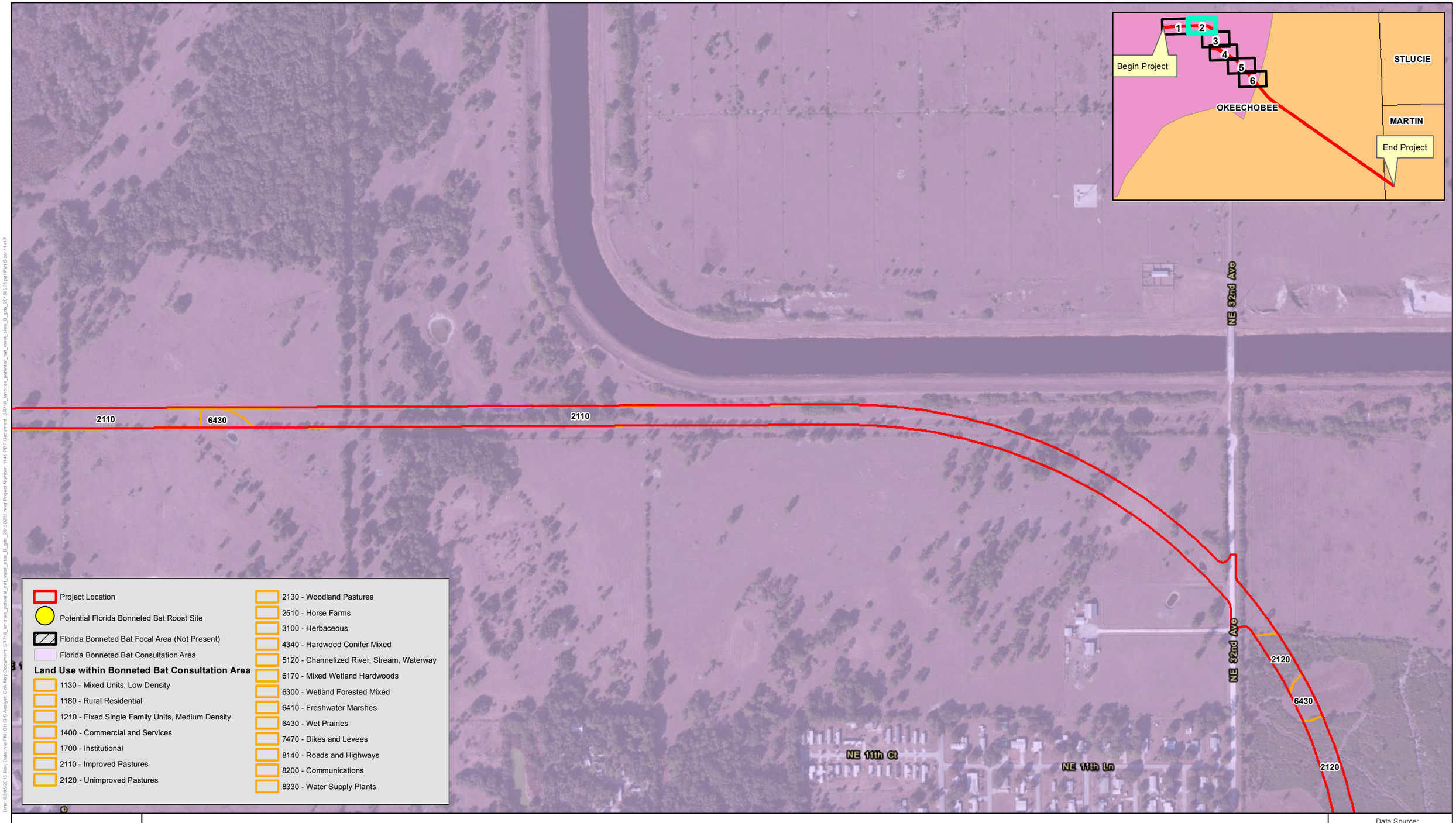
FPID #: 419344-2-22-01
SR 710 PD&E from US 441 to CR 714
Okeechobee and Martin Counties, Florida

0 400 800 1,200 Feet

N

Data Source:
-Scheda Scientists
-Inwood Engineers
-FWC
-SFWMD
Imagery Source:
-2010 Microsoft

Coordinate System:
NAD 1983 Florida State Plane East



Date: 02/05/2015 Rev. Date: n/a PM: CH GIS Analyst: GIA Map Document: SR710_landuse_potential_bat_roost_sites_B_gda_20150205.mxd Project Number: 1148 PDF Document: SR710_landuse_potential_bat_roost_sites_B_gda_20150205.pdf Plot Size: 11x17

Figure 2 - Land Use within Project Corridor and Florida Bonneted Bat Consultation Area Map

FPID #: 419344-2-22-01
SR 710 PD&E from US 441 to CR 714
Okeechobee and Martin Counties, Florida

0 400 800 1,200 Feet

N

Data Source:
-Scheda Scientists
-Inwood Engineers
-FWC
-SFWMD
Imagery Source:
-2010 Microsoft

Coordinate System:
NAD 1983 Florida State Plane East

Date: 02/05/2015 Rev. Date: n/a PM: CH GIS Analyst: GdA Map Document: SR710_landuse_potential_bat_roost_sites_B_gda_20150205.mxd Project Number: 1148 PDF Document: SR710_landuse_potential_bat_roost_sites_B_gda_20150205.pdf Plot Size: 11x17

Figure 2 - Land Use within Project Corridor and Florida Bonneted Bat Consultation Area Map

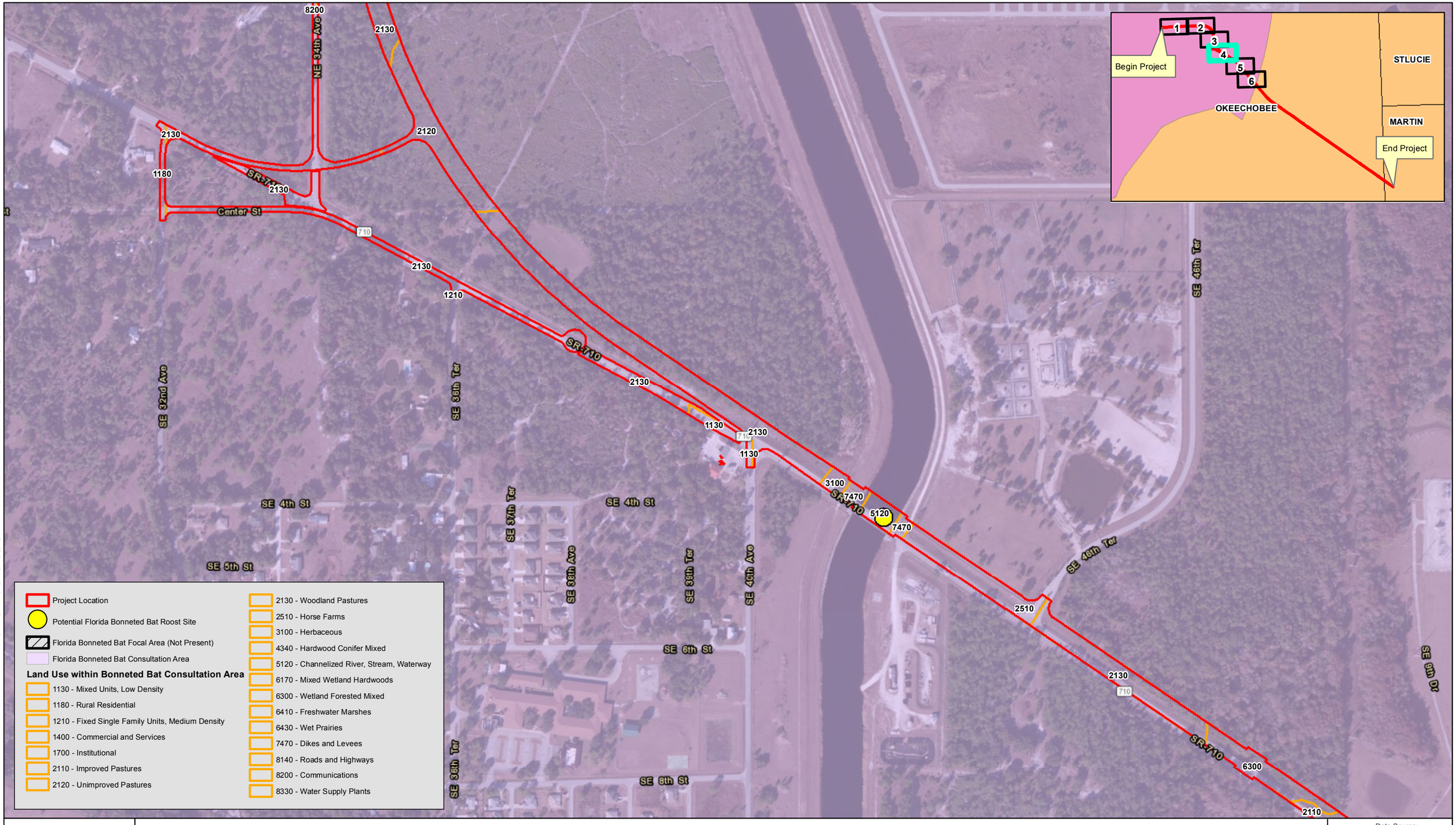
FPID #: 419344-2-22-01
SR 710 PD&E from US 441 to CR 714
Okeechobee and Martin Counties, Florida

0 400 800 1,200 Feet

N

Data Source:
-Scheda Scientists
-Inwood Engineers
-FWC
-SFWMD
Imagery Source:
-2010 Microsoft

Coordinate System:
NAD 1983 Florida State Plane East



Date: 02/05/2015 Rev: Date: n/a PM: CH GIS Analyst: GdA Map Document: SR710_landuse_potential_bat_roost_sites_B_gda_20150205.mxd Project Number: 1148 PDF Document: SR710_landuse_potential_bat_roost_sites_B_gda_20150205.pdf Plot Size: 11x17

Figure 2 - Land Use within Project Corridor and Florida Bonneted Bat Consultation Area Map

FPID #: 419344-2-22-01
SR 710 PD&E from US 441 to CR 714
Okeechobee and Martin Counties, Florida

0 400 800 1,200 Feet

N

Data Source:
-Scheda Scientists
-Inwood Engineers
-FWC
-SFWMD
Imagery Source:
-2010 Microsoft

Coordinate System:
NAD 1983 Florida State Plane East

Date: 02/05/2015 Rev. Date: n/a PM: CH GIS Analyst GdA Map Document: SR710_landuse_potential_bat_roost_sites_B_gda_20150205.mxd Project Number: 1148 PDF Document: SR710_landuse_potential_bat_roost_sites_B_gda_20150205.pdf Plot Size: 11x17

Figure 2 - Land Use within Project Corridor and Florida Bonneted Bat Consultation Area Map

FPID #: 419344-2-22-01
SR 710 PD&E from US 441 to CR 714
Okeechobee and Martin Counties, Florida

0 400 800 1,200 Feet

N

Data Source:
-Scheda Scientists
-Inwood Engineers
-FWC
-SFWMD
Imagery Source:
-2010 Microsoft

Coordinate System:
NAD 1983 Florida State Plane East

Date: 02/05/2015 Rev. Date: n/a PM: CH GIS Analyst: GdA Map Document: SR710_landuse_potential_bat_roost_sites_B_gdb_20150205.mxd Project Number: 1148 PDF Document: SR710_landuse_potential_bat_roost_sites_B_gdb_20150205.pdf Plot Size: 11x17

Figure 2 - Land Use within Project Corridor and Florida Bonneted Bat Consultation Area Map

FPID #: 419344-2-22-01
SR 710 PD&E from US 441 to CR 714
Okeechobee and Martin Counties, Florida

0 400 800 1,200 Feet

N

Data Source:
-Scheda Scientists
-Inwood Engineers
-FWC
-SFWMD
Imagery Source:
-2010 Microsoft

Coordinate System:
NAD 1983 Florida State Plane East

From: Wrublik, John [mailto:john_wrublik@fws.gov]
Sent: Wednesday, January 21, 2015 3:46 PM
To: Horwitz, Martin
Cc: Constance Cassler; Ashleigh Blackford; Pipkin, Gwen G
Subject: Re: FW: Request Wrublik, John <john_wrublik@fws.gov>to Initiate Formal Consultation for the Caracara for SR 710 from US 441 to CR 714

Martin,

I have the draft BO back from Ashleigh Blackford and I am currently addressing her comments before we finalize the document. Asleigh has indicated there is one more issue that will need to be resolved before we can complete the biological opinion and the consultation for the project. In a letter to the Service dated May 7, 2014, the FDOT requested consultation for the endangered Florida bonneted bat (*Eumops floridanus*) (FBB), and determined that the project "may affect and is not likely to adversely affect" the FBB. The FDOT indicated that they plan to reinitiate consultation on the FBB during the permitting phase of the project. This is not acceptable to the Service. Because the signed BO completes consultation on the SR 710 project, the Service will need the FDOT to provide the additional information on the FBB to the Service that the Service needs to determine if the SR 710 project will or will not adversely affect this species. As such, I will need the results of a survey conducted within suitable habitat for the FBB in the project footprint before I can complete our consultation and provide the FDOT with our signed biological opinion. I suggest that you have your consultants conduct a survey of suitable habitat within the project footprint as soon as possible, and provide the results of the survey to me. If you have any questions, please contact me or Ashleigh Blackford.

John

John M. Wrublik
U.S. Fish and Wildlife Service
1339 20th Street
Vero Beach, Florida 32960
(772) 469-4282

Florida Department of Transportation

RICK SCOTT
GOVERNOR

801 North Broadway
Bartow, FL 33830

ANANTH PRASAD, P.E.
SECRETARY

May 7, 2014

Mr. Larry Williams
Field Supervisor
United States Fish and Wildlife Service
South Florida Ecological Services Office
1339 20th Street
Vero Beach, FL 32960

Attention: Mr. John Wrublik

Reference: Financial Project No.: 419344-2-22-01
State Road 710 Project Development and Environment (PD&E) Study
From US 441 to CR 714 (SW Martin Highway) Okeechobee and Martin Counties, Florida

Dear Mr. Williams:

This letter is in follow-up to our August 26, 2013 letter (Attachment 1) in response to previous comments made by the US Fish & Wildlife Service (USFWS) and is in response to follow-up emails from John Wrublik dated September 6, 2013 and September 9, 2013. At this time, ongoing USFWS concerns and indication that the USFWS does not support the extension of State Road 710 (SR 710) from SR 70 to US 441 and completion of Section 7 consultation for Audubon's crested caracara remain unresolved. In addition, the project is within the recently listed Florida bonneted bat consultation area. The following is provided to address the remaining outstanding concerns.

The SR 710 Project Development & Environment (PD&E) Study includes the planned extension of SR 710 from its current terminus at SR 70 to US 441 on a new alignment. USFWS has indicated that it does not support the preferred alignment Alternative 1-2C and recommended that existing roads (SR 70 and US 441) be widened instead and requested an analysis be conducted to determine the economic feasibility of widening SR 70 from SR 710 to US 441. The comparative analysis is provided in Attachment 2 (pgs. 9-11). USFWS also stated that if the extension is constructed, that it prefers Alternative 1-2A rather than the preferred Alternative 1-2C.

Proposed Extension of SR 710 from SR 70 to US Highway 441

The consideration of the extension of SR 710 on a new alignment was included in the SR 710 PD&E Study at the request of Okeechobee County. The proposed extension of SR 710 included a detailed analysis to develop viable corridors and the alternative alignments for the extension. The Florida Department of

Transportation (FDOT) coordinated this analysis with both Okeechobee County and the City of Okeechobee in order to receive local government input during the process. Presentations were made to the Okeechobee Board of County Commissioners and the Okeechobee City Council to provide the results of the SR 710 extension analysis. Both the County and the City provided letters in support of the proposed extension of SR 710 to FDOT.

The proposed extension of SR 710 is included in *Okeechobee County's Long Range Transportation Needs Assessment Study* (Needs Plan for 2035), *Okeechobee County's Long Range Transportation Plan* (Cost Feasible Plan for 2020 and 2035), and *Okeechobee County's Comprehensive Plan* (amended May 7, 2009).

As part of the development of the purpose and need statement for the SR 710 extension, a traffic analysis was conducted to document the need for the extension of SR 710 to US 441. This traffic analysis compared how the local roadways, primarily SR 70 and US 441, would operate with and without the extension of SR 710 from SR 70 to US 441 (Attachment 2, pgs. 3-4). The purpose of the SR 710 extension, contained within the approved Environmental Assessment (EA), is to meet the needs of Okeechobee County by improving regional connectivity, enhancing evacuation capabilities, accommodating future population and growth, and local government goals and objectives.

A question has been raised by USFWS regarding the diversion of traffic away from the businesses on SR 70 if the extension is built. As previously provided, the minimum typical section width is 160 feet (Attachment 1, pg. 4 and Figure 6, pg. 5). The widening of SR 70 for any of the widening alternatives would have a significant impact on the existing businesses since many of them would be eliminated (Attachment 2, pgs 5-8, Attachment 3). In addition, the existing Year 2012 daily traffic volumes on the portion of SR 70 between US 441 and SR 710 range between 21,000 vehicles per day (vpd) and 26,000 vpd. Under the build scenario for the SR 710 extension, the projected Annual Average Daily Traffic (AADT) volumes for the year 2030 on SR 70 range between 29,400 vpd and 29,900 vpd. This indicates that the future traffic volumes on SR 70 are still projected to increase even with the construction of the SR 710 extension.

In addition, the businesses along SR 70 east of US 441 are primarily destination type businesses such as banks, auto parts, law office, and municipal facilities that cater to the local population rather than through traffic. In summary, it is unlikely that the SR 710 extension would have an adverse impact on businesses along SR 70 since the future traffic volumes on SR 70 are projected to experience moderate increases.

SR 710, SR 70 and US 441 are each designated on the state evacuation route network. During the hurricanes of 2004, vehicles heading inland from the east coast caused tremendous traffic congestion issues in downtown Okeechobee, specifically at the SR 70/US 441 intersection. The construction of the extension of SR 710 would help distribute traffic by providing alternate routes for vehicles wishing to continue west on SR 70 and vehicles heading north on US 441.

Comparison of Alternative 1-2A and 1-2C

USFWS stated in their September 6, 2013 e-mail that if an extension of SR 710 is selected, that the Service prefers Alternative 1-2A over 1-2C because it appears to the Service that Alternative 1-2C has the greatest potential for inducing development and urban sprawl (Attachment 2, pg. 12). Conversely, the Service contends that "…Alternative 1-2A would seem to result in the least potential for inducing development and urban sprawl, and will result in the least impacts to undeveloped lands and fish and wildlife

habitat". The Service stated that, "Consequently, in the event a roadway extension of SR 710 is approved for the project, we request that Alternative 1-2A be utilized." We disagree with the identification of Alternative 1-2A as the preferred alternative for the reasons as discussed below.

Both alignments were initially identified through land suitability mapping because they traverse through undeveloped land, avoiding, as much as possible, impacts to existing neighborhoods, residences, churches, wetlands and other natural resources. The land that both alternatives traverse through is, however, developable and is identified for future residential development in the Okeechobee Future Land Use Map (Attachment 1, Figure 3). As such, both alternatives would provide access to existing undeveloped land for future development. Existing roads such as NE 32nd Avenue and NE 24th Avenue could also provide access to much of the same undeveloped land as the proposed extension of SR 710. In addition, Alternative 1-2A and Alternative 1-2C run along the same alignment east of US 441 for approximately 1 mile and would provide the same access for future development in this concurrent area.

Although economic development is recognized by the Federal Highway Administration (FHWA) as a need to support various projects by FHWA, the need for this project is not tied to economic development. The County's future land use plan and urban core area were defined prior to the PD&E Study and development of SR 710 extension alternatives. Regardless of whether or not Alternative 1-2A or 1-2C are constructed, existing development already exists in the area north of SR 70 and east of US 441. In addition, future development could continue to occur in the area through access along NE 24th Avenue and NE 32nd Avenue and/or developer provided roadways whether or not Alternative 1-2A or 1-2C is constructed. Both alternative alignments traverse through undeveloped land within the urban core area and would present equal opportunities for future development (Attachment 1, Figure 4).

It is also important to note that the biological assessment for the study area did not identify endangered or threatened species within the urban core area. Therefore, there is no indication that either of the alignments will have a significant impact on endangered or threatened species or their habitat.

As stated in our August 26th, 2013 letter (Attachment 1, pg. 6) to the Service, Alternative 1-2A was not selected as the preferred alternative because the alignment traverses between two minority neighborhoods (Pine Ridge Park and Southern Pines), triggering environmental justice concerns, and was considered more impactful to the neighborhoods by dividing them than Alternative 1-2C. Executive Order 12898 addresses environmental justice issues through a requirement to pay special attention to addressing disproportionately high and adverse impacts on minority and low income populations. Alternative 1-2A had a higher number of residential relocations and noise site impacts than Alternative 1-2C and public comments were received against Alternative 1-2A from the impacted residences. Although Alternative 1-2A meets all roadway design standards, the proximity of the SR 70/SR 710 extension intersection to the existing SR 70 bridge over the CSX Railroad could create a safety issue. Vehicles traveling eastbound on SR 70 from downtown Okeechobee will not be able to see the future traffic signal at the SR 70/SR 710 extension intersection until they are at the top of the railroad overpass and could then have to come to a stop in a short distance at the traffic signal on a down grade. For these reasons, it is our recommendation that Alternative 1-2C remain as the preferred alternative. The identification of the Preferred Alternative is based on the engineering and environmental (social, cultural, natural, and physical) analysis, agency coordination, and public comments. In making this decision, we must consider overall impacts.

Summary SR 710 Extension and Alternative 1-2A versus Alternative 1-2C

The information provided herein (See Attachments 1, 2 and 3) supports the original decision to provide a new extension of SR 710 with Alternative 1-2C as the preferred alternative. In Summary we provide the following:

- The traffic analysis indicated that if the extension of SR 710 is not provided from SR 70 to US 441, the existing four-lane segment of SR 70 between SR 710 and US 441 will operate at a level of service (LOS) F in 2030 and would need to be widened to six-lanes to provide an acceptable LOS C. LOS C is the minimum acceptable level of service on this type of Strategic Intermodal System (SIS) roadway per Rule Chapter 14-94 F.A.C. (Attachment 1, pg. 4; Attachment 2, pgs. 3-4).
- The extension of SR 710 eliminates the need for widening SR 70 to six lanes since SR 70 from US 441 to SR 710 would operate at LOS C in 2030 with the extension.
- Construction of the proposed extension of SR 710 would result in far fewer residential and business impacts than widening SR 70 and is significantly less costly compared to the alternative to widen SR 70 (Attachment 2, pgs. 9, 11).
- The proposed extension of SR 710 will not induce new development that could not already occur via access through the existing road network. The proposed extension of SR 710 will provide additional access to this area which has been identified by Okeechobee County and the City of Okeechobee for future development on their respective future land use maps. These maps referenced above were previously provided to USFWS and FHWA in a letter from the Department dated August 26, 2013 (Attachment 1, Figures 3-5).
- Another consideration that supports the extension of SR 710 versus widening SR 70 is that SR 710 carries a high percentage of trucks. Currently, trucks coming from Florida's east coast travel on SR 710, turn west onto SR 70 and then continue west on SR 70 or turn north onto US 441 to get to destinations in other parts of the state. The proposed extension of SR 710 from SR 70 to US 441 would give the trucks heading north on US 441 an alternative to driving into the downtown core area and through the heavily congested intersection of SR 70 and US 441. The diversion of truck traffic will also extend the life of the existing SR 70 and US 441 roadway infrastructure in the downtown area.
- As stated in our August 26, 2013 letter to the Service, Alternative 1-2A was not selected as the preferred alternative because the alignment traverses between two minority neighborhoods (Pine Ridge Park and Southern Pines), triggering environmental justice concerns, and was considered more impactful to the neighborhoods by dividing them. Alternative 1-2C is preferred over Alternative 1-2A because it will not split the two low income/minority neighborhoods that exist in the project area that could result in environmental justice concerns.
- Alternative 1-2C results in one residential relocation and will have a better intersection with SR 70 along with no sight distance/safety concerns when compared to Alternative 1-2A.
- FDOT proposes to include the multi-use path in the preferred improvements because it was requested by Okeechobee County, will provide for alternative modes of travel, will provide access to the Nubbin Slough Stormwater Treatment Area public use facility and it will provide system continuity with the multi-use path that is included in the adjacent section of SR 710 from CR 714 to CR 609 in Martin County. The USFWS letter on the SR 710 PD&E Study from County Road 714 to County Road 609 dated July 20, 2010 did not include any concerns or opposition to the proposed multi-use path along that section of SR 710.

- The Endangered Species Biological Assessment (ESBA) and supporting wildlife surveys conducted for the SR 710 PD&E Study did not identify any federally threatened or endangered species that would be adversely affected by the construction of the extension of SR 710.

Audubon's Crested Caracara

FDOT proposed a determination for the caracara of "may affect, but is not likely to adversely affect" in a letter to USFWS dated August 26, 2013. USFWS responded on September 9, 2013 stating they could only concur with a determination of "may affect, likely to adversely affect" the caracara and that USFWS "is not opposed to having the FHWA request initiation of formal consultation for the project during final design and permitting phase of the project". FDOT is in agreement with the determination of "may affect, likely to adversely affect" the caracara and commits to reinitiate consultation with USFWS for the caracara pursuant to Section 7 of the Endangered Species Act during the design and permitting phase and prior to advancing the project to construction. At that time, FDOT will resurvey to determine the presence and status of nesting caracaras and provide additional information necessary for determination of effects. For impacts identified, in consultation with the USFWS and FHWA, FDOT will provide agreed upon mitigation. A similar determination was made by FDOT District 4 for the SR 710 PD&E Study from CR 714 to CR 609 and the USFWS concurred with this determination (Service Consultation Code: 41420-2010-1-0286). FHWA granted location and design concept acceptance on that project under the reasonable assurance guidance.

Florida Bonneted Bat

The Florida bonneted bat (*Eumops floridanus*) was recently listed as a federally endangered species (Federal Register, October 2013) and the project area is located within the consultation area for it. Therefore, we are reinitiating consultation as required for the Florida bonneted bat. The Florida bonneted bat has been documented historically in, and continues to have the potential to inhabit, a variety of habitat types including mangroves, earth midden hammocks, pine rockland, wet prairie, tropical hardwoods, hardwood hammock, pine flatwoods, lakes, cypress hammock, scrubby flatwoods, and wetland scrub habitat, as well as man-made and altered areas such as residential and urban areas canals, and developed park land (Federal Register, October 2013). Although the species has been documented in this variety of habitat types, very little is known about the specific habitat requirements of the Florida bonneted bat (Federal Register, October 2013). Currently, the only known Florida bonneted bat roosts are in bat boxes.

There are no previous documented occurrences of Florida bonneted bats roosting in bridges or in the surrounding area; therefore the probability of Florida bonneted bat roosting in the project area is low. FDOT determined that the project "may affect, but is not likely to adversely affect" the Florida bonneted bat.

To comply with Section 7 of the Endangered Species Act, FDOT commits to reinitiate consultation with USFWS prior to advancing the project to construction. At that time, FDOT will provide the additional information allowing USFWS to complete their analysis of the project's effects on the Florida bonneted bat and complete consultation on the project.

In conclusion, we trust that the information provided with this letter addresses the concerns identified and supports the selection of the preferred alternative, Alternative 1-2C, for the proposed extension of SR 710. Again, the identification of the Preferred Alternative is based on the engineering and environmental (social, cultural, natural, and physical) analysis, agency coordination, and public comments. In making this

decision, we must consider overall impacts. Also, the information further clarifies FDOT's commitment to avoid, minimize, and mitigate for potential impacts to Audubon's crested caracara and the Florida bonneted bat. The following commitment will be documented in the final Environmental Document for the project and in document(s) for any subsequent reevaluation(s) of the project:

> "*Based on coordination with the USFWS to comply with Section 7 of the Endangered Species Act, FDOT commits to reinitiate consultation and provide additional information necessary to allow USFWS to complete consultation on Audubon's crested caracara and the Florida bonneted bat prior to advancing the project to construction.*"

We trust that our response satisfies the regulatory concerns of the USFWS. We respectfully request your concurrence with the proposed reasonable assurance for Audubon's crested caracara and the Florida bonneted bat. If the USFWS has additional comments regarding specific impacts to species, we would be glad to address those comments.

Sincerely,

Marlon J. Bizerra, P.E.
District Environmental Manager

cc: Linda Anderson, FHWA
Craig Aubrey, USFWS
Victoria Foster, USFWS
Gwen Pipkin, FDOT
Martin Horwitz, FDOT
David Dangel, Inwood Consulting Engineers
Kristin Caruso, Scheda Ecological Associates
Kimberly Warren, Atkins

Attachments: Attachment 1 – 2013-8-26 FDOT letter to USFWS
Attachment 2 – SR 710 PD&E Study PowerPoint
Attachment 3 – SR 70 Alignments

Appendix B

USFWS Biological Opinion (September 9, 2015)

U.S. Department of Transportation
Federal Highway Administration

Florida Division

August 27, 2014

545 John Knox Road, Suite 200
Tallahassee, Florida 32303
Phone: (850) 553-2200
Fax: (850) 942-9691 / 942-8308
www.fhwa.dot.gov/fldiv

In Reply Refer To:
HDA-FL

John Wrublik
United States Fish and Wildlife Service
South Florida Ecological Services Office
1339 20th Street
Vero Beach, FL 33702

Re: SR 710 from US 441 to CR 714, Okeechobee and Martin Counties, Florida,
FPN#: 419344-2-22-01

Dear Mr. Wrublik:

The Federal Highway Administration (FHWA), on behalf of the Florida Department of Transportation (FDOT), requests that the United States Fish and Wildlife Service (USFWS) initiate formal Section 7 consultation on Audubon's crested caracara (*Caracara cheriway*) for Florida Project # 419344-2-22-01, SR 710 from US 441 to CR 714, Okeechobee and Martin Counties, FL. FDOT has determined that this project *may affect, is likely to adversely affect* the caracara.

A species-specific survey for the caracara was conducted January through April 2013 and was submitted to USFWS on June 18, 2013, by FDOT, Service Consultation Code 2009-1-0459. This document contains the information on the nest location, habitats surrounding the nest and the nest's proximity to the project alignment, as requested by Mr. Wrublik.

In informal consultation, FDOT and USFWS have agreed to the following:

> Mitigation for impacts to the caracara nest will consist of a $100,000 donation to the Caracara Fund of the Wildlife Foundation of Florida (WFF). The Biological Opinion will include the conditions that 1) construction of the project will not commence until the Service receives a letter or email from the WFF stating that the FDOT has provided $100,000.00 to the WWF's Caracara Fund and 2) the Service has informed the FDOT and FHWA that it has received the notification from the WWF discussed in condition 1. These conditions will also be added to the project's Environmental Assessment as a commitment.

It is FHWA's and FDOT's understanding, from conversations with Mr. Wrublik, that Formal Consultation with the production of a Biological Opinion can be concluded within the 135-day time frame. This is critical due to the project's tight production schedule.

Please contact Linda Anderson, Environmental Specialist, FHWA, p: 850-553-2226, e: linda.anderson@dot.gov, if additional information is required.

Sincerely,

FOR: James Christian, P.E.
Division Administrator

Cc: Gwen Pitkin, FDOT District 1
Martin Horwitz, FDOT District 1
BSB Murthy, FHWA

United States Department of the Interior

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

September 9, 2015

James Christian
Federal Highway Administration
545 John Knox Road
Tallahassee, Florida 32303

Service CPA Code:	04EF2000-2009-CPA-0625
Service Consultation Code:	04EF2000-2009-F-0459
Date Received:	August 27, 2014
Consultation Initiation Date:	February 5, 2015
Applicant:	Federal Highway Administration, Florida Department of Transportation
Project:	State Road 710 from U.S. Highway 441 to County Road 714
Counties:	Okeechobee and Martin

Dear Mr. Christian:

This document transmits the U.S. Fish and Wildlife Service's (Service) Biological Opinion based on our review of the Federal Highway Administration's (FHWA) authorization of the Florida Department of Transportation's (FDOT) widening and extension of State Road (SR) 710 from County Road (CR) 714 to U.S. Highway (US) 441identified as the SR 710 project in Okeechobee County and Martin County, Florida. The Biological Opinion documents the effects of the project on the threatened Audubon's crested caracara (*Caracara cheriway = Polyborus plancus audubonii*; caracara), the endangered Florida bonneted bat (*Eumops floridanus*; FBB), the threatened wood stork (*Mycteria americana*), and the threatened eastern indigo snake (*Drymarchon corais = Drymarchon couperi corais*) in accordance with section 7 of the Endangered Species Act of 1973, as amended (Act) (87 Stat. 884; 16 U.S.C. 1531 *et seq.*). Your request for formal consultation was received on August 27, 2014.

This Biological Opinion is based on information provided by the FDOT (a designated Federal representative of the FHWA) and the FDOT's consultant; and meetings, telephone conversations, emails, and other sources of information. A complete record of this consultation is on file at the Service's South Florida Ecological Services Office, Vero Beach, Florida.

Consultation History

In a letter to the Service dated December 1, 2010, the FDOT transmitted their biological assessment and determined that the SR 710 project may affect the wood stork, and may affect, but is not likely to adversely affect the eastern indigo snake and caracara.

In a letter to the FDOT dated January 7, 2011 (Service 2011), the Service concurred with the FDOT's determination that the SR 710 project may affect, but is not likely to adversely affect the eastern indigo snake, and responded that the project may affect and is likely to adversely affect the wood stork and the caracara. The Service noted the FDOT intended to reinitiate section 7 consultation with the Service for the wood stork and the caracara prior to permitting. The Service further noted the portion of project corridor that extends SR 710 from SR 70 to US 441 could have significant direct and indirect impacts to fish and wildlife and their habitats, and the new motor vehicle access provided to undeveloped lands in the area would significantly increase the likelihood existing fish and wildlife habitat adjacent to and near the project site would be converted to residential and commercial development. The Service recommended the proposed extension be eliminated from the project design.

In a letter to the Service dated June 18, 2013, the FDOT transmitted the results of: 1) a survey of active caracara nests within lands in and near the project footprint, and 2) an assessment of wood stork foraging habitat in the project footprint based on the Service's Wood Stork Foraging Habitat Assessment Methodology (Service 2012). One active caracara nest, approximately 428 feet (ft) (130.5 m) north of SR 710 and 1 mile northwest of Southeast 128th Avenue, was observed during the caracara nest survey. In addition, the FDOT's consultant determined the project would impact 26.49 acres (ac) [10.72 hectares (ha)] of wetlands that provide 23.98 kilograms (kg) of wood stork forage biomass. The FDOT proposed to acquire credits that provide at least 23.98 kg of wood stork biomass from short-hydroperiod wetlands at the Bluefield Ranch Mitigation Bank. The FDOT also changed their determinations for the wood stork and caracara from "may affect, likely to adversely affect" to "may affect, not likely to adversely affect."

In a letter to the FDOT dated August 7, 2013 (Service 2013a), the Service concurred with the FDOT's determination that the SR 710 project may affect, but is not likely to adversely affect the wood stork based on the overall minor impacts to potential wood stork foraging habitat. The Service also noted the project would likely result in adverse effects to the caracara, and we could not concur with the FDOT's determination that the project is not likely to adversely affect the caracara. The Service recommended the FDOT contact the FHWA and ask them to request the Service initiate formal consultation for the project, pursuant to section 7 of the Act. The Service also recommended the FDOT provide a proposal to minimize the impacts of the project to caracara and their habitat. Measures to benefit caracara could include preservation and management of caracara habitat, or contributions to the Wildlife Foundation of Florida's (WFF) caracara fund to support monitoring and conservation of the caracara in Florida. Finally, the Service reiterated our previous comment regarding significant impacts to fish and wildlife from the project and continued to recommend that the proposed extension be eliminated from the project design.

In a letter to the Service dated August 26, 2013, the FDOT provided more information on the active caracara nest located near the project footprint. The FDOT also continued to request the Service concur with their determination that the project may affect, but is not likely to adversely affect the caracara. The FDOT also provided reasons the proposed extension of SR 710 from just south of SR 70 to US 441 is needed.

In an email to the FHWA dated September 6, 2013, the Service restated our concern regarding the construction of the extension of SR 710 from SR 70 to US 441. Further, the Service requested, in the event the extension of SR 710 from SR 70 to US 441 is approved, that alternative 1-2A, identified in the FDOT's biological assessment and letter dated December 1, 2010, be used because it would have the least impacts to fish and wildlife.

In an email to the FDOT dated September 9, 2013, the Service reiterated our finding that the project will result in adverse effects to the caracara, and stated we could not concur with the FDOT's determination that the project may affect, but is not likely to adversely affect the caracara. The Service also restated our concern regarding the construction of the extension of SR 710 from SR 70 to US 441.

In a letter to the Service dated May 7, 2014, the FDOT requested consultation for the FBB. The FDOT determined the project may affect and is not likely to adversely affect the FBB and indicated they plan to reinitiate consultation to include the FBB during the permitting phase of the project, if appropriate. The FDOT also provided additional reasons the proposed extension of SR 710 from SR 70 to US 441 is needed.

In a letter to the FDOT dated May 27, 2014, the Service stated that we did not have enough information at this time to provide concurrence or non-concurrence with their determination for the FBB. The Service noted the FDOT has committed to reinitiate consultation with the Service on the FBB during the design and permitting phase of the project. The Service also restated our concern regarding the construction of the extension of SR 710 from SR 70 to US 441.

In a letter to the Service dated August 27, 2014, the FHWA requested the Service initiate formal consultation on the SR 710 project for adverse effects to the caracara.

In a letter to the Service dated February 5, 2015, the FDOT provided results of FBB roosting surveys conducted on January 9, 2015, for the portion of project footprint that is located in the Service's consultation area for the FBB. These surveys were submitted to support their May 7, 2014, determination. Roosting FBBs were not observed during the survey.

As of February 5, 2015, the Service received all the information necessary for initiation of formal consultation on the caracara for this project as required in the regulations governing interagency consultations (50 CFR § 402.14). The Service is providing this Biological Opinion in conclusion of formal consultation.

BIOLOGICAL OPINION

DESCRIPTION OF PROPOSED ACTION

The FHWA has been asked to authorize and fund the FDOT's proposal to extend and widen SR 710 from US 441to CR 714. The existing 10-mile (16.1 kilometer [km]) stretch of two-lane roadway from CR 714 to just south of SR 70 would be enlarged to four paved lanes (each 12 feet [3.7 m] wide) with 5-foot (1.5 m) wide paved shoulders, a grass center median, and stormwater swales. The intersection of SR 710 with CR 714 would be realigned by extending the existing two-lane CR 714 roadway westward about 0.4 mi (0.6 km) to intersect with SR 710 at the intersection of CR 15B. In addition, the FDOT proposes to extend SR 710 for about 3 miles just south of its existing terminus with SR 70. The paved extension would contain four paved lanes (each 12 feet [3.7 m] wide) with 5-foot (1.5 m) wide paved shoulders, a grass center median, and stormwater swales, and would begin approximately 0.2 mile southeast of the existing SR 710 intersection with SR 70 and proceed north to near Southeast 36th Terrace. The extension would then proceed west to connect with US 441. The purpose of the project is to provide additional lane capacity to reduce traffic congestion associated with expected future development, address safety and hurricane evacuation concerns, and enhance the movement of freight and goods. The FDOT conducted a traffic analysis indicating that without the proposed improvements, SR 710 would operate below the accepted level of service. The proposed project would fill 26.49 ac of wetlands. To compensate for impacts to wetlands, the FDOT has proposed to acquire credits from the Bluefield Ranch Mitigation Bank. The project site is located in Sections 9-11, 13-16, and 24, of Township 37 South, Range 35 East; Sections 19 and 29-33, of Township 37 South, Range 36 East; and Sections 3, 4, and 10-14, of Township 38 South, Range 36 East, in Okeechobee County and Martin County, Florida (Figure 1).

Surveys conducted by the FDOT's consultant in 2013 documented one active caracara nest within a cabbage palm tree (*Sabal palmetto*) located near the project footprint. This nest was observed approximately 1 mile northwest of Southeast 128th Avenue and 428 feet (ft [130.5 meters(m)]) northeast of SR 710 (Figure 2). The project footprint is located in the primary zone of this nest (*i.e.*, all lands within 985 ft [300 m] of the nest). Protection of the primary zone is very important particularly during the caracara nesting season, and must be maintained in order to provide conditions conducive for successful reproduction. Construction of the project would impact 8.75 ac (3.54 ha) of currently undeveloped improved pasture within the 69.67 ac (28.32 ha) nest primary zone. The project footprint is also located within the secondary zone of this nest (defined as all lands within 985 ft (300m) to 4,920 ft (1,500 m) of the nest). The secondary zone provides important foraging territory adjacent to the nest location. When assessing incidental take of the caracara resulting from habitat loss, the Service focuses primarily on the amount of habitat lost in the primary zone due to its potential adverse impacts on reproduction.

To minimize adverse impacts of the project to the caracara, the FDOT has proposed to schedule the construction of the SR 710 project to avoid the caracara nesting season to the greatest extent practicable. However, due to the time needed to construct the project, construction activities may occur during the caracara nesting season. Breeding caracaras may (Nicholson 1928) or may not reuse the nest site that was used during the previous nesting season, or nest in close proximity to the

previous nest (Layne 1996). The FDOT has proposed to monitor the nest site documented in 2013 (Figure 2) when construction activities occur within 985 ft (300.2 m) of this nest site. The purpose of the monitoring is to determine if caracaras have initiated nesting at the site. If the nest is determined to be active, no construction activities will occur within 400 ft (121.9 m) of the active nest, as identified above. In addition, the FDOT has proposed to provide $100,000.00 to the WFF caracara fund to either: 1) acquire and/or protect caracara habitat or 2) support monitoring of the caracara in Florida. The WFF monitoring effort will provide information on how development-related disturbances and changes in habitat availability affect caracara nesting and reproduction. Before commencement of construction, the FDOT will provide the Service a receipt from the WFF documenting the $100,000.00 contribution.

Action area

The action area is defined as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action. The project will result in the widening and extension of an existing highway (*i.e.*, SR 710 from southeast of SR 70 to US 441). The proposed extension will provide new access to undeveloped lands. Therefore, the presence of a new paved roadway extension may result in a variety of indirect and cumulative effects within lands adjacent to the roadway extension. The new access to undeveloped lands provided by the proposed roadway extension is likely to stimulate new development (*e.g.*, commercial and residential subdivisions, additional road infrastructure) and increase the local human population in lands adjacent to the roadway extension. Such development is likely to increase the loss of caracara habitat in lands adjacent to the project extension. However, the extent of the project's effects to surrounding lands is difficult to discern. The remainder of the project corridor (*i.e.*, SR 710 from southeast of SR 70 to CR 714) will enlarge an existing roadway, but not provide new access to undeveloped lands. Therefore, we anticipated that additional development is not likely to be induced in this portion of the project corridor as a result of the proposed action. Consequently, the Service defines the action area as: 1) all lands within the construction footprint, 2) all lands within 5 miles (8.05 km) of the segment of the project footprint of SR 710 from SR 70 to US 441 (the Service anticipates this area is sufficiently large to capture the indirect and cumulative effects resulting from the proposed new paved road), and 3) all lands within 1,000 ft of both sides of the construction footprint of SR 710 from SR 70 to CR 714 (the Service has based this buffer on the size of the primary zone [985 ft] defined in the Service's draft species conservation guidelines for the caracara [Service 2004a]). The Service has determined that the action area is sufficiently large to incorporate all lands where nesting activities of the caracara could potentially be disturbed due to short-term construction activities associated with the road widening, induced development, and the ongoing motor vehicle traffic using the highway upon completion of the proposed project.

Species not likely to be adversely affected by the proposed action

FDOT determined the SR 710 project may affect but is not likely to adversely affect three additional federally-listed species (see section entitled "Consultation History"): the endangered FBB, the threatened eastern indigo snake, and the threatened wood stork. With respect to the FBB, the FDOT's consultant conducted a survey for roosting FBBs within the portion of the project

footprint that is located within the Service's consultation area for the FBB. Neither roosting FBBs nor their guano was observed during the survey. To address potential project effects to the eastern indigo snake, the FDOT agreed to implement the Service's *Standard Protection Measures for the Eastern Indigo Snake* (Service 2013b) during construction. As previously discussed in Consultation History, the project will result in impacts to a minor acreage of wetlands (26.49 ac [10.72 ha]) that may provide foraging habitat for the wood stork (Service 2013a). Based on the information provided, the Service concurs with the FDOT's determination that the project may affect, but is not likely to adversely affect the FBB, eastern indigo snake, and wood stork. Critical habitat has not been designated for these species and will not be affected.

STATUS OF THE SPECIES/CRITICAL HABITAT

The following discussion is based on the caracara account provided in the Multi-Species Recovery Plan (Service 1999), augmented with more recent updates.

Species/critical habitat description

The Florida population of the caracara was listed as threatened under the Act on July 6, 1987. Critical habitat has not been designated for the caracara.

The caracara is a large raptor with a head crest, naked face, heavy bill, elongated neck, and unusually long legs. The total length of the caracara ranges from about 19.7 inches (in) [50.04 centimeters (cm)] to 25.2 in (64.01 cm) with a maximum wingspan of 47.2 in (119.9 cm). A caracara's feet and its flight behavior are also noteworthy identification traits. The feet contain talons that are flatter than those of other raptor species, and this adaptation aids in foraging because it allows the caracara to walk or run on the ground more easily (Morrison and Humphrey 2001). Caracaras are strong fliers and may reach speeds of 40 miles per hour. In flight, caracaras are commonly observed soaring in a circular pattern at high altitudes (Howell 1932).

Life history

Caracaras are diurnal, non-migratory, and territorial. Adult caracaras may be found in their territory year-round. Territories average approximately 3,000 ac (approximately 1,200 ha), corresponding to a radius of 1.2 to 1.5 miles (2.0 to 2.5 km) surrounding the nest site (Morrison and Humphrey 2001). Foraging typically occurs throughout the territory during both nesting and non-nesting seasons.

The caracara prefers habitats that contain largely short-stature vegetation with a low density of trees that can be used for nesting. Historically, caracaras inhabited native dry or wet prairies containing scattered cabbage palms, their preferred nesting tree. Scattered saw palmetto (*Serenoa repens*), low-growing oaks (*Quercus minima, Q. pumila*), and cypress (*Taxodium distichum*) also occur within these native communities. Over the last century, many of the native prairie vegetation communities in central and south Florida have been converted for cattle ranching, and have been replaced by improved and unimproved pasture dominated by non-native, sod-forming grasses. Caracaras are now known to occur primarily within pasture because the vegetation structure of this

habitat type is similar to that of native prairies. In addition, the scattered cabbage palms that are often present within improved pastures provide nesting sites for caracaras. Morrison and Humphrey (2001) hypothesize that habitats with short-stature vegetation may be preferred by the caracara, due to its tendency to walk on the ground while foraging. The height and relatively simple structure of the vegetation may directly facilitate foraging by caracaras because it easier to walk through and provides less cover for predators. Consequently, caracaras likely benefit from management actions, such as regular mowing, burning, and high-density grazing in agricultural lands and prescribed burning in native habitat types that maintain vegetation in a low stature and structurally simple condition (Morrison and Humphrey 2001).

Morrison and Humphrey (2001) characterized caracara distribution, reproductive activity, and land use patterns within a 5,180,000-ac (2,096,000 ha) area in south-central Florida. Comparisons of caracara territories to randomly selected areas of available habitat within the study area indicated that caracara territories contained higher proportions of improved pasture and lower proportions of forest, woodland, oak scrub, and marsh. Territory size was inversely related to the amount of improved pasture within the territory. In addition, breeding-area occupancy rate, breeding rate, and nesting success were consistently higher on private ranch lands during the study.

Additional investigations into habitat suitability for caracara (Morrison et al. 2006) indicate maintaining heterogeneity, including specific land cover types as well as small (less than 2.47 ac [0.99 ha]) freshwater wetlands, is important in maintaining suitable habitat for the caracara in Florida. The proportion of six vegetation and land cover types (*i.e.*, cabbage palm-live oak hammock, grassland, improved pasture, unimproved pasture, hardwood hammocks and forest, and cypress/pine/cabbage palm) and two types of aquatic habitats (*i.e.*, lentic and lotic) were determined to be the most important criteria for predicting habitat suitability for caracara. Most known nest locations (72.9 percent) in the study were present on improved pasture although that habitat type only comprised 12.5 percent of the entire study area. Caracara appear to be using pastures, ditches, and impounded wetlands that have replaced the historic land cover as shown by the high occurrence of improved and unimproved pastures and wetlands in caracara home ranges (Morrison et al. 2006).

Caracaras are highly opportunistic in their feeding habits and will capture live prey and eat carrion. The diverse diet consists of insects and other invertebrates, fish, snakes, turtles, birds, and mammals (Layne 1978, Bent 1961; Layne et al. 1977; Morrison 2001). Recent information from Morrison (2005) indicates wetland-dependent prey species and mammals (primarily in the form of carrion) comprise about 64 percent and 31 of the total diet, respectively. Caracaras search for prey while flying, from perches, and when walking or running along the ground (Service 1999). Sections of roads are regularly patrolled for animals killed by collisions with motor vehicles (Palmer 1988), and caracaras are known to occasionally chase the larger black vulture (*Cathartes aura*) and turkey vulture (*Coragyps atratus*) away from a carcass (Howell 1932). Scavenging at land-fills has also been observed (Morrison 2001). Tractors plowing fields or mowing pastures and road right-of-ways are often closely followed in order to feed on prey that may be flushed or exposed. Agricultural drainage ditches, cattle ponds, roadside ditches, the margins of wetlands and other shallow water features, and recently burned lands also provide good foraging areas for the caracara (Morrison 2001).

As indicated above, adult caracaras are generally territorial and usually occur within their established territory. Oberholser (1974) attributes territoriality to the caracara's habit of feeding on carrion. Nonetheless, Morrison (2005) has observed that sub-adult caracaras are nomadic. Caracaras are capable of moving long distances, and an individual may traverse a large portion of the species' range in Florida from the time it leaves it natal territory to the time it establishes a territory as a sub-adult. Adults will also occasionally leave their territory and travel great distances, usually outside of the breeding season. The caracara's vagility and nomadic behavior during its sub-adult years may be reason that caracaras are occasionally recorded far outside their breeding range. Caracaras have been observed in the Florida Keys and into the panhandle of Florida (Bay County) as well as in other states, although some of these individuals may have escaped from captivity (Layne 1996). Currently, there is no evidence to suggest breeding and genetic exchange occurs between the Florida population and other populations of the northern caracara.

Observations and radio-telemetry monitoring have documented aggregations of caracaras within several "gathering areas" in south-central Florida. Large groups of caracaras (up to 50) have been observed along the Kissimmee River north of SR 98; south of Old Eagle Island Road in northern Okeechobee County; south of SR 70 and west of Fort Pierce in St. Lucie County; and south of SR 70 on the Buck Island Ranch in Highlands County. These gathering areas are regularly, but not continually, used by sub-adult and non-breeding caracaras and generally consist of large expanses of improved pasture. Morrison (2001) suggests gathering areas may be important to caracaras before first breeding during the first 3 years after leaving their natal territory. However, the habitat values of these areas to caracaras have not yet been evaluated.

Breeding information on the caracara has been reported in the literature (Morrison1997, 1999). Breeding pairs of caracaras are monogamous, highly territorial, and exhibit fidelity to both their mate and the site (Morrison 1999). First breeding occurs at 3 years of age (Nemeth and Morrison 2002). The initiation of breeding is marked by several behavioral changes, including the pair perching together near the nesting site, preening and allopreening, and sharing food. Caracaras are one of the first of Florida's raptors to begin nesting. Although breeding activity can occur from September through June, the primary breeding season is considered to be November through April. Nest initiation and egg-laying peak from December through February. Caracaras construct new nests each nesting season, often in the same tree as the previous year. Both males and females participate in nest building. Nests are well concealed and most often found in the tops of cabbage palms (Morrison and Humphrey 2001), although nests have been found in live oaks (*Q. virginiana*), cypress (first record, Morrison et al. 1997), Australian pine (*Casuarina* spp.), saw palmetto, and black gum (*Nyssa sylvatica*). Caracaras usually construct their nests 4 to 18 m above the ground, and the nest structure primarily consists of stems from herbaceous and woody shrubs, vines, grasses or other plant materials woven together and trampled to form a depression (Bent 1938; Sprunt 1954; Humphrey and Morrison 1997; Smith and Scholer 2013). Caracaras vigorously defend their nesting territory during the breeding season (Morrison 2001). The clutch size is usually two eggs, although at times three eggs are laid. Incubation lasts for about 31 to 33 days (Morrison 1999) and is shared by both sexes. Ordinarily, only one brood is raised per season, but about 10 percent of the breeding pairs may raise a second brood. The young fledge at about 7 to 8 weeks of age, and post-fledgling dependency lasts approximately 8 weeks.

Distribution and population status

The caracara is a resident, non-migratory species that occurs in Florida as well as the southwestern United States and Central America. Florida's population of caracara is found in the prairie area of the south-central region of the State, from Polk County and Osceola County southward to Collier and Broward Counties. The caracara is most abundant in a five-county area that includes Glades, DeSoto, Highlands, Okeechobee, and Osceola Counties (Service 1999).

Monitoring the caracara population and determining territory occupancy and nesting effort and success is very difficult because most caracara breeding territories occur on private lands in Florida that are not accessible to researchers (Humphrey and Morrison 1997). Consequently, estimates of the caracara population have been based on counts of caracaras along roadsides (Heinzman 1970; Layne 1995). These roadside counts also have the potential to be strongly affected by the presence of non-territorial juvenile and sub-adult birds during the period when they are nomadic. Because the occurrence and density of caracaras is not evenly distributed within the region they occupy (due to congregations and nomadic individuals), roadside surveys are probably unreliable for estimating the overall population.

Morrison and Humphrey (2001) noted the caracara is perceived to be in long-term decline, although adequate data are not available on historic patterns of abundance, or habitat used to accurately assess the status of the species. Past surveys of the caracara population in Florida have been conducted. Heinzman's (1970) 4-year road survey from 1967 to 1970 suggested fewer than 100 individual caracaras at 58 localities remained in Florida. Stevenson (1976) concurred with this estimate in 1974. Layne (1995) monitored caracara distribution and population status in Florida from 1972 to 1989. Layne (1995) estimated the adult portion of the population was stable with a minimum of about 300 birds in 150 territories. The immature portion of the population was estimated to be about 100 to 200 individuals, increasing the total statewide population estimate to 400 to 500 birds. However these population estimates may be biased because they were based on roadside counts of birds, and roadsides were surveyed more intensively than areas away from roads. Given the problems associated with conducting a reliable range-wide survey of the population, obtaining an accurate estimate of the caracara's current population size remains difficult.

Evidence suggests habitat is limited for caracara and the species is at or near carrying capacity within the existing habitat. Monitoring of breeding areas since the 1990's has found territories tend to remain occupied and that breeding is attempted every year. The fact territories are not seen regularly coming and going is consistent with the assertion that all possible breeding sites are occupied (Morrison et al. 2007). Furthermore, Dwyer et al. 2010, tracked individual nonbreeding caracaras in adult plumage for over 3 years and found the birds never established breeding territories, indicative the birds were unable to find suitable breeding sites. In fact, nonbreeding adults (floaters) made up approximately 40 percent of the nonbreeding population (Dwyer et al. 2010).

Threats

The caracara's perceived decline, as described in historic literature, is attributed primarily to habitat loss (Layne 1996). Large areas of native prairie and pasture lands in south-central Florida have been converted to citrus operations, tree farms, other forms of agriculture, and real estate

development and habitat loss has accelerated in the past few decades (Morrison and Humphrey 2001). The perceived population decline and the geographic isolation of the Florida population resulted in the listing of the caracara as threatened in 1987. However, historical conversion of forested habitats to pasture has not been adequately documented as partially offsetting losses of caracara habitat, so a full accounting of historic habitat changes is lacking. The current threat of habitat loss persists as changes in land use and development of caracara habitat continue.

As discussed above, the caracara prefers open habitats with low-stature vegetation for foraging Morrison and Humphrey, 2001). Accordingly, cattle ranching and the creation of extensive pastures appear to be compatible with caracara survival. The number of caracara territories occurring in improved or unimproved pasture can be expected to increase if sufficiently large overgrown pastures are reclaimed and/or new pastures or restored native prairies are created from lands subject to other agricultural land uses. The conversion of pasture to citrus (Cox et al. 1994), sugarcane, and residential/commercial development is cause for concern. Recognizing the habitat value of cattle ranches and enlisting landowner cooperation in the conservation and management of these lands are essential elements in recovery of the caracara.

The Florida population of caracaras is isolated and habitat-specific. Therefore, it may be susceptible to environmental catastrophes and potentially reduced reproductive rates because of demographic accidents such as skewed sex ratios or disproportionate age-related mortality. Low numbers may also reduce the genetic viability in the population through loss of heterozygosity, thereby increasing vulnerability to environmental stresses. The location of many of the occupied territories on private land, and the inaccessibility of these territories to surveyors, makes it difficult to census the caracara and detect changes in its population size and distribution. This difficulty increases the possibility of not detecting a population decline that could result in extinction.

Road mortalities may also be a significant cause of caracara decline. Florida's burgeoning human population has increased the number of motor vehicles and the need for roads. The increase in traffic as well as the caracara's predisposition for feeding on road-killed animals has probably increased the number of caracaras killed or injured as a result of vehicle strikes. Morrison (2003) identifies highway mortalities as a major cause of juvenile mortalities with young birds especially vulnerable within the first 6 months after fledging.

Other potential threats to caracaras include the lack of habitat management in some areas that can result in degradation or loss of caracara habitat. In particular, encroachment of woody shrubs and trees into open dry prairies, pastures and similar habitats will result in reduction in habitat suitability. In addition, the large-scale removal of cabbage palms from pastures to sell for commercial and residential landscaping may also reduce the availability of potential nesting sites. Finally, we also acknowledge climate change as an emerging threat to the species.

Analysis of the species/critical habitat likely to be affected

In a letter to the Service dated August 27, 2014, the FHWA determined the SR 710 project may affect and is likely to adversely affect the threatened caracara. Critical habitat has not been designated for the caracara and therefore, will not be affected. The caracara is likely to be adversely affected through the loss of habitat and other indirect effects of the project, including road mortality, which will be discussed in further detail below.

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."

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 (See 51 Federal Register 19,926, 19,933 [June 3, 1986 - preamble to FWS consultation regulations]).

Status of the species within the action area

As previously stated the Service defines the action area as: 1) all lands within the construction footprint, 2) all lands within 5 miles (8.05 km) of the segment of the project footprint of SR 710 from SR 70 to US 441, and 3) all lands within 1,000 ft of both sides of the construction footprint of SR 710 from SR 70 to CR 714.

The exact number of caracaras inhabiting the action area, and the size of their territories, are not known because repeated surveys conducted over at least an entire year would be needed to ascertain this information. Most lands that are not currently developed provide foraging and nesting habitat for the species. Nest surveys performed in accordance with the Service's draft *Survey Protocol for Finding Caracara Nests* (Service 2004b) were conducted by the FDOT's consultant during January, February, March, and April of 2013, and results of these surveys provide information on the relative abundance of caracaras in the action area. An active caracara nest was observed in a cabbage palm tree approximately 1 mile northwest of Southeast 128th Avenue and 428 ft (130.5 m) northeast of SR 710. during the 2013 nest surveys (Figure 2). Two adult caracaras were observed visiting the nest tree. The number of chicks produced by the nest was not determined. But one caracara likely fledged from the nest because a juvenile caracara was subsequently observed associating with the two caracaras that regularly tended the nest. Current nesting information during the construction of the project is also important because the SR 710 project could result in take of nesting birds (see section entitled "Effects of the Action").

Factors affecting the species environment within the action area

Much of the action area is currently managed for agricultural purposes (*e.g.*, pasture for cattle ranching, citrus, sod farms *etc.*). Some agricultural activities may result in adverse impacts to caracaras through the loss or degradation of caracara foraging habitat, loss of nesting trees (*i.e.*, cabbage palms), and harassment and disturbance. Conversely, other agricultural practices may be beneficial to caracaras. For example, the creation or maintenance of cattle pastures can provide open areas and scattered clumps of cabbage palms preferred by caracaras for foraging and nesting.

Commercial and residential development threatens the caracara in the action area and throughout its geographic range. Much of the action area still remains rural. However, human population growth and related development around the town of Okeechobee has resulted in the loss of caracara habitat and development is likely to continue in the future. In addition to habitat loss, development may result in fragmentation of caracara habitat and potential disturbance of caracaras from human activities.

Roads and highways facilitate the movement of people and goods by cars and trucks, and may adversely affect the caracara. The construction of new roads and the widening of existing roads can result in the direct loss of wildlife habitat (Forman et al. 2003). Caracaras can also be injured or killed due to collisions with motorized vehicles when attempting to feed on carrion on or adjacent to existing highways. The action area includes several heavily travelled paved roads in addition to SR 710 including SR 70, U.S. Highway 441, and U.S. Highway 98. The number of injuries and mortalities to caracaras resulting from collisions with motor vehicles that occurs annually in the action area is unknown but may be a significant source of mortality.

Our analyses under the Act include consideration of observed or likely environmental effects 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 which 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 at regional and local levels vary from global average conditions, rather than using global scale projections, we use "downscaled" projections when they are available and have been developed through appropriate scientific procedures, because such projections provide higher resolution information that is more relevant to spatial scales used for analyses of a given species and the conditions influencing it. (See Melillo *et al.* 2014, Appendix 3, pp. 760-763 for a discussion of climate modeling, including downscaling). 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.

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 caracara. For example, an increase or decrease in precipitation could affect water levels in wetlands and canals. This, in turn, could affect prey densities and ultimately affect productivity and survivorship of the caracara. Increased precipitation would likely increase the availability of prey species, whereas increased periods of drought could reduce wetland prey habitat and the amount of prey available to caracara. It is also possible the intensity or frequency of thunderstorms or hurricanes may increase. Winds associated with these events could adversely affect the caracara by increasing the number of nests

blown out of trees, reducing the number of trees available for nesting, and injuring or killing caracaras through direct impact with flying debris. It is difficult to precisely estimate the overall impacts of climate change on the caracara. However, 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).

EFFECTS OF THE ACTION

Factors to be considered

Caracaras are known to nest and forage in and around the SR 710 project corridor. The proposed action will take place when this species is likely to be present in the area. The date construction will commence is unknown. However, construction is expected to be completed in about 2-3 years following commencement. The project will result in a permanent loss of caracara habitat in the project footprint and is likely to result in additional permanent loss of habitat in the action area due to new development as a result of the new extension roadway providing access to currently unavailable lands (as discussed below). Disturbance to caracaras resulting from noise due to construction activities will be temporary. However, noise from motor vehicles using the new roadway extension following construction will be permanent and the frequency of disturbance will be constant as motor vehicles are likely to use the roadway 24 hours a day (similar to what already occurs within the portion of the roadway proposed for widening only [*i.e.*, SR 710 just south of SR 70 to CR 714]). The likelihood of mortality from collision with vehicles using the roadway will also increase as a result of the extension of SR710 and potentially its widening.

Analyses for effects of the action

Beneficial effects: Beneficial effects are those effects of the proposed action that are wholly positive, without any adverse effects to the listed species or its critical habitat. The proposed action will not result in beneficial effects to the caracara.

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 probability of direct incidental take of the caracara is dependent upon the number of caracaras in the area, their dispersal abilities, and the amount, distribution, and quality of available habitat. The direct effects this project will have on the caracara within the action area are discussed below.

The project will result in the direct loss of habitat suitable for caracara foraging and nesting. Construction activities associated with the SR 710 project will convert approximately 251.6 ac (101.8 ha) of habitat (estimate based on information provided by the FDOT) that provides potential foraging and nesting opportunities to the caracara to paved roadway and sodded right-of-way and surface water treatment areas. These impacts include the loss of foraging habitat within the portion of the project footprint located in the primary zone of the active caracara nest (*i.e.*, all lands within 985 ft of the nest) found during the 2013 nest surveys (Figure 2). Construction of the project will impact 8.75 ac (3.5 ha) of currently undeveloped and suitable foraging habitat for the caracara (*i.e.*, improved pasture) within the 69.67 ac (28.32 ha) nest primary zone. Therefore, the project is expected to result in a small reduction of the geographic range of the species.

Caracaras may respond to the loss of habitat within the project corridor by remaining in their existing territory, shifting their territory to existing uplands and wetlands, or they may leave the project area and abandon a territory. As previously mentioned, although the secondary zone provides important foraging territory adjacent to the nest location, the Service focuses our analysis on the amount of habitat lost in the primary zone rather than the secondary zone when evaluating effects of the action.

The project also has the potential effect caracara nesting through directly killing adult and juvenile caracaras, destroying caracara nests or disturbing nesting attempts during construction. It is unlikely the direct mortality of adult caracaras will result from construction activities related to the project. We note caracaras are highly vagile and intelligent, and likely to avoid construction activities that potentially could result in direct mortality. The active nest sited found by FDOT's consultant in 2013 (Figure 2) will not be directly affected by construction activities. However, construction of the SR 710 project could result in the loss of other potential nest sites (*i.e.,* cabbage palm or oak trees) in the action area that have not been identified. If an active caracara nest is discovered, the FDOT or their designated agents will establish and mark a 400-ft (121.9 m) perimeter around the nest tree. This marked area will be avoided during construction activities for the duration of the caracara nesting season, until fledging has occurred, or the nest has failed. The construction activities (*e.g.*, noise, land clearing, human activity, etc.) associated with the SR 710 project may disturb caracaras. Nesting caracaras may react to construction activities by abandoning an existing nest (potentially resulting in the mortality of nestlings or egg hatching failure), avoiding establishing a nest near the project corridor and establishing a new nest site further away, or avoiding nesting altogether. To minimize the potential for disturbance to nesting caracaras, the FDOT has proposed to schedule the construction of the SR 710 project to avoid the caracara nesting season to the greatest extent practicable. However, due to the time needed to construct the project, construction activities may occur during the caracara nesting season. The FDOT has proposed to monitor the nest site located in 2013 when construction activities occur within 985 ft (300.2 m) of this nest site. The purpose of the monitoring is to determine if caracaras have initiated nesting at the site. If the nest is determined to be active, no construction activities will occur within 400 ft (121.9 m) of the active nest. If additional nests are located, this area will be marked. Based on the avoidance and minimization measures in place, construction is not anticipated to adversely affect any identified caracara nest. However, surveys have not been conducted throughout the action area; therefore, the possibility exists that construction could disturb nesting activities at an undetected nest.

Indirect effects: Indirect effects are caused by or result from the proposed action, are later in time, and are reasonably certain to occur. Indirect effects may occur outside the area directly affected by the action.

The SR 710 project will include a new roadway extension from southeast of SR 70 to US 441. The new road access provided by the portion of the project will allow for an increase in human population growth and associated commercial and residential development in undeveloped lands surrounding the 3-mile (4.8 km) extension. This area contains roughly 19,200 ac (7,770 ha) of land, of which more than half is not developed. The Service asserts that but for the new transportation infrastructure that this growth and development may not occur or at the least

would be much less likely to occur. Human population growth and development induced by the project could adversely affect the caracara by increasing the potential for further loss and modification of existing caracara habitat in lands adjacent to the roadway extension. Such development would result in further reduction in the geographic range of the caracara, and further fragmentation of habitat within the geographic range of these species. The amount of development likely to occur is difficult to ascertain, but based on the forecasted increase in Florida's human population could be significant and include several hundred acres of habitat.

Motor vehicles using the roadway pose a threat to caracaras foraging in the SR 710 action area. Caracaras may be injured or killed due to collisions with motor vehicles. The threat of vehicle collisions is exacerbated to some extent due to the caracara's habit of feeding on the carrion of road-killed animals. Motor vehicles currently use the existing SR 710 roadway, and will continue to use the roadway following completion of the project. The addition of lanes within the existing SR 710 roadway will not increase motor vehicle traffic, and therefore, is not expected to increase the potential for injuries and deaths of caracaras. However, the construction of the roadway extension will introduce new motor vehicle traffic within undeveloped lands that currently are not exposed to traffic. Consequently, the SR 710 project will increase the potential for motor vehicle collisions with caracaras in this area. The Service has anecdotal reports of two caracaras killed due to collisions with motor vehicles within the existing section of SR 710 located in the project footprint (Schubert 2015). As such, we acknowledge at least some caracara deaths due to motor vehicles will occur due to the project, especially for young and inexperienced individuals. However, due to the intelligence and agility of the caracara, we envision that the number of caracara deaths due to motor vehicle collisions associated with the project is likely to be small.

Motor vehicles could also result in disturbance to caracaras in the action area. Lights and noise from motor vehicles using the new highway lanes may cause caracaras to avoid the roadway or adversely affect caracara nesting as described above. However, based on observations of caracaras in other portions of their range in Florida, the Service finds that caracara will likely acclimate to motor vehicle disturbance.

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.

Summary on the effects of habitat loss direct and indirect

Based on the loss of habitat and the disturbance resulting from the project, the SR 710 project has the potential to reduce the population size and overall range of the caracara in Florida. Specifically, the project is anticipated to reduce the total habitat available to caracaras in the project footprint by roughly 198.9 ac (80.5 ha), and an undetermined amount of habitat within 5 mi (8 km) of the footprint of the roadway extension due to development induced by the new roadway access provided. Habitat loss will reduce foraging and nesting opportunities for caracaras. With respect to the active caracara nest documented near the project footprint, the Service cannot predict if the caracara pair currently nesting there will be able to successfully reproduce in the same general area

during or following construction, or whether the loss of foraging habitat or disturbance from motor vehicles will require the pair to adjust their territory. Because we suspect that the caracara habitat may be at its carrying capacity (*i.e.,* the habitat is saturated), if the nesting pair adjusts their territory it is reasonably certain that it would impact neighboring caracara territories. This could result in: 1) a reduction in the territory size of either or both pairs which could reduce breeding success, or 2) result in increased territory disputes between individuals, possibly lowering their individual fitness or nesting success, or 3) the resident pair could abandon their territory altogether. The Service does not know whether or not the reproductive potential of the nesting pair would be reduced or lost and whether the pair's movement could have subsequent indirect effects on neighboring territories. Therefore; based on our knowledge of caracara biology, and assuming a worst case scenario (to err on side of the species), the Service finds the SR 710 project will result in loss of one breeding territory. Consequently the project will result in a small local reduction in the existing caracara population, and a small reduction in its current total range. The Service is developing a range-wide monitoring study of caracaras that is partially funded by entities causing disturbance to caracaras. The monitoring study will use telemetry to assess the effects of disturbance and loss of habitat on the caracara nesting and reproduction. As a conservation measure the FDOT will provide $100,000.00 towards this effort.

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.

Anticipated future County actions in the action area that will adversely affect the caracara's habitat include the issuance of County building permits. Permits to construct single-family homes and commercial buildings within the action area are required by Okeechobee County and Martin County. The effects of these building permits have been considered under the Effects of the Action under indirect effects. The Service has not identified any additional cumulative effects beyond those already discussed in the Environmental Baseline.

CONCLUSION

After reviewing the current status of the caracara, 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 project as proposed is not likely to jeopardize the continued existence of the caracara. No critical habitat has been designated for this species; therefore, none will be affected.

Construction of the project will result in the loss of 251.6 ac (101.8 ha) of foraging and nesting habitat for the caracara within the project footprint. This includes 8.75 ac (3.5 ha) of habitat within the primary zone of the 2013 active caracara nest located approximately. This loss of habitat represents approximately 13 percent of the primary zone for this nest. The project will also result in an undetermined amount of habitat loss (potentially several hundred acres) in the action area due to future development induced by the new access to undeveloped lands provided by the roadway extension. In addition, the project will result in potential disturbance to caracaras

attempting to nest due to project related construction activities, and could result in the incidental mortality of eggs or nestlings at undetected nests in proximity to the construction. Finally, caracaras (adults and juveniles) could die from vehicle collision when birds feed on carrion on or adjacent to the roadway once construction is completed and the road is used by motor vehicles. Although these factors are anticipated to result in an overall reduction of the caracara's range (from loss of habitat) and decrease in population (decreased breeding success, abandonment of territory, and/or direct mortality), these effects are anticipated to be small in relation to the overall range and population numbers (estimated to be at least 150 territories) of the caracara. Therefore, these adverse effects are not expected to appreciably reduce the overall survival and recovery of the caracara.

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 this incidental take statement.

The measures 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)].

AMOUNT OR EXTENT OF TAKE ANTICIPATED

The total amount of incidental take from the SR 710 project is difficult to quantify because some of the factors on which the level of take is dependent is unknown. For example, the number of caracaras that are likely to be killed due to collision with vehicles is dependent on the number of caracaras that continue to persist in the area, the amount of carrion available to the birds, and the amount of road traffic. Based on our knowledge of caracara biology and best available information in the region the Service estimates the amount of take from the SR 710 project to be:

1. The loss of one breeding territory. The Service bases this loss of one territory on the single nest documented in 2013 (Figure 2) and the loss of 251.6 ac of foraging and nesting habitat from the road construction. Although it is possible the caracaras may still breed successfully by either choosing a new nest location further away from the construction activities, or by adapting to the disturbance and proceeding with their usual foraging or nesting activities, we chose to take the conservative approach for the species and consequently, we anticipate the reduction in foraging habitat will result in the need for the pair to shift their territory to compensate for the loss of foraging habitat. Because caracara habitat is believed to be saturated with its carrying capacity of breeding pairs, we anticipate this pair will be unable to successfully continue to breed and occupy a reduced territory and without an ability to shift to adjacent lands (because they are occupied) the territory will be lost.

2. In addition to direct habitat loss, the SR 710 project will result in the indirect effect of the additional loss of habitat within 5 miles of the SR 710 roadway extension due to induced developed resulting from the new access provided. However, the amount of this development is difficult to quantify because it is unknown when the development might occur, to what extent it might occur and, what the status of the caracara in the area will be at that time. Therefore, we will not quantify any take associated with this indirect effect.

3. Construction disturbance resulting in the loss of one nest containing up to three nestlings. As previously indicated the possibility exists an unidentified nest may occur in the action area and be subject to disturbance during construction. Although this pair may still breed successfully by either choosing a new nest location further away from the construction activities, or by adapting to the disturbance and proceeding with their usual foraging or nesting activities, the possibility exists that the nesting attempt may fail. In the event a caracara nest is not detected during construction and subsequent avoidance and minimization measures are not in place to avoid nest disturbance, the Service exempts the incidental take of one nest and its young from disruption of breeding activity. The quantity of three nestlings was calculated based on a typical clutch size for the caracara of two to three eggs.

4. One caracara killed by a motor vehicle every 2 years. In lieu of other information, the Service bases the number of caracara killed by motor vehicles on the fact the caracara is intelligent, agile, and likely, in most cases to avoid being struck by motor vehicles. Moreover, although the total number of caracaras in the action area is not known, the caracara is known to occur in low densities across its range, except for in gathering areas which have not been documented in the project area. To our knowledge, no studies have quantified the rate of injuries and deaths of caracara due to motor vehicle collisions on high-speed, paved highways in the caracara's range. In addition, accurate estimates on the number of road-killed caracara are difficult to obtain because caracaras occur in low densities throughout their range, and vultures and other scavengers may move or eliminate caracara carcasses before they can be observed. Also, the number of birds foraging on the road is dependent on the number of carcasses found on the road. Therefore, for the purposes of this Biological Opinion, incidental take of the caracara resulting from motor vehicle collisions, disturbance and habitat loss, will be exceeded if SR 710 is widened or extended more than currently proposed.

The Service will not refer the incidental take of caracara for prosecution under the Migratory Bird Treaty Act of 1918, as amended (16 U.S.C §§ 703-712), if such take is in compliance with terms and conditions (including amount and/or number) specified herein.

EFFECT OF THE TAKE

In the accompanying Biological Opinion the Service determined this level of anticipated take is not likely to result in jeopardy to the caracara. If, during the course of this action, this level of take is exceeded, such take would represent new information requiring review of the reasonable and prudent measures provided. The Federal agency must immediately provide modification of the reasonable and prudent measures.

REASONABLE AND PRUDENT MEASURES

When providing an incidental take statement, the Service is required to give reasonable and prudent measures it considers necessary or appropriate to minimize the take, along with terms and conditions that must be complied with to implement the reasonable and prudent measures. Furthermore, the Service must also specify procedures to be used to handle or dispose of any individuals taken. The Service finds the following additional reasonable and prudent measures are necessary and appropriate to reduce take and to minimize the direct and indirect effects of the proposed project on the caracara:

- Minimize the adverse effects of the action to the caracara through appropriate pre-construction monitoring of caracara nesting.

TERMS AND CONDITIONS

To implement the above reasonable and prudent measures, the Service has outlined the following terms and conditions. In accordance with the Interagency Cooperation Regulation (50 CFR 402), these terms and conditions must be complied with to implement the reasonable and prudent measures:

- If land clearing associated with the project is proposed within suitable caracara nesting habitat from December 1 through April 30, the applicant or their designated agents will survey suitable nesting habitat sites (*e.g.*, cabbage palm and oak trees etc.) within the project corridor daily for signs of caracara nesting beginning at least 5 days prior to the commencement of land clearing and continuing until such a time where all native vegetation in the project footprint is cleared. Should caracaras initiate nesting within the project corridor, the applicant or their designated agents will establish and mark a 400-foot perimeter around the nest tree and contact the Service for further instructions. This marked area will be avoided during construction activities for the duration of the caracara nesting season, until fledging has occurred, or the nest has failed.

REPORTING REQUIREMENTS - DISPOSITION OF DEAD OR INJURED SPECIMENS

Survey results of suitable nesting habitat and monitoring reports should be submitted to the Service on an annual basis during construction, following the caracara nesting season. The report should include whether any nests were detected and whether the proximity of the nest to construction required FDOT to establish buffers. The result of the nesting attempt should also be included.

Upon locating a dead caracara specimen, initial immediate notification must be made to the nearest Service Law Enforcement Office (Mr. Vance M. Eaddy, Service; 9549 Koger Blvd., Suite 111; St. Petersburg, Florida, 33702; 727-570-5398). Secondary notification should be made to the FWC; South Region (3900 Drane Field Road; Lakeland, Florida, 33811-1299; 1-800-282-8002). Care must be taken in handling any dead specimens of proposed or listed species found in the project area to preserve the specimen or its remains in the best possible state. In conjunction with the preservation of any dead specimens, the finder has the responsibility to ensure evidence intrinsic to determining the cause of death of the specimen is not unnecessarily disturbed. The finding of dead specimens does not imply enforcement proceedings pursuant to the Act. The reporting of dead specimens is required to enable the Service to determine if take is reached or exceeded and to ensure the terms and conditions are appropriate and effective.

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

This concludes formal consultation on the SR 710 project. As provided in 50 CFR Section 402.16, reinitiation of formal consultation is required when discretionary Federal agency involvement or control over the action has been retained and if: (1) the amount or extent of incidental take is exceeded; (2) the agency action is subsequently modified in a manner that causes an effect to a 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. 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,

Roxanna Hinzman
Field Supervisor
South Florida Ecological Services Office

cc: electronic only
Corps, Jacksonville, Florida (Randy Turner)
EPA, West Palm Beach, Florida (Richard Harvey)
FDOT, Bartow, Florida (Gwen Pipkin)
FHWA, Tallahassee, Florida (Luis Lopez)
FWC, Tallahassee, Florida (FWC-CPS)
NOAA Fisheries, West Palm Beach, Florida (Brandon Howard)

LITERATURE CITED

Audubon, J.J. 1834. Ornithological biography. Volume I. Adam and Charles Black; Edinburgh, Scotland.

Bent, A.C. 1938. Life histories of North American birds of prey, part 2. U.S. National Museum Bulletin 170, Government Printing Office; Washington, D.C.

Bent, A.C. 1961. Life histories of North American birds of prey, Volume I. Dover Publishers; New York, New York.

Cox, J.R., R. Kautz, M. MacLaughlin, and T. Gilbert. 1994. Closing the gaps in Florida's wildlife habitat conservation system. Florida Game and Fresh Water Fish Commission; Tallahassee, Florida.

Dwyer, J. F. 2010. Ecology of non-breeding and breeding Crested Caracaras (*Caracara cheriway*) in Florida. Ph.D. dissertation, Virginia Tech, Blacksburg, Virginia.

Forman, R. T. T., D. Sperling, J. A. Bissonette, A. P. Clevenger, C. D. Cutshall, V. H. Dale, L. Fahrig, R. France, C. R. Goldman, K. Heanue, J. A. Jones, F. J. Swanson, T. Turrentine, and T. C. Winter. 2003. Road Ecology: Science and Solutions. Island Press, Washington, D.C.

Heinzman, G. 1970. The caracara survey: A 4-year report. Florida Naturalist 43(4):149.

Howell, A.H. 1932. Florida bird life. Florida Department of Game and Fresh Water Fish; Tallahassee, Florida.

Humphrey, S.R. and J.L. Morrison. 1997. Habitat associations, reproduction, and foraging ecology of Audubon's crested caracara in south-central Florida. Final Report. Florida Game and Fresh Water Fish Commission Nongame Program Project Number NG91-007, August 8, 1997.

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

IPCC 2013: Annex III: Glossary [Planton, S. (ed.)]. Pp. 1147-1465 In: *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental 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. https://www.ipcc.ch/pdf/assessment-report/ar5/wg1/WG1AR5_AnnexIII_FINAL.pdf

Layne, J.N. 1978. Threatened, Audubon's crested caracara. Pages 34-36 *in* H.W. Kale II, ed., Rare and endangered biota of Florida. Volume II: Birds. University Press of Florida; Gainesville, Florida.

Layne, J.N. 1995. Audubon's crested caracara in Florida. Pages 82-83 *in* E.T. LaRoe, G.S. Farris, C.E. Puckett, P.D. Doran, and M.J. Mac, eds. Our living resources: A report to the nation on the distribution, abundance, and health of United States plants, animals, and ecosystems. U.S. Department of the Interior, National Biological Service; Washington, D.C.

Layne, J.N. 1996. Crested caracara. Pages 197-210 *in*: J.A. Rodgers, Jr., H.W. Kale II, and H.T. Smith (eds.). Rare and Endangered Biota of Florida. Volume V. Birds. University Press of Florida; Gainesville, Florida.

Layne, J.N., F.E. Lohrer, and C.E. Winegarner. 1977. Bird and mammal predators on the cattle egret in Florida. Florida Field Naturalist (5): 1.1-4.

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

Morrison, J.L. 1997. Reproductive ecology and habitat associations of Florida's crested caracara (*Caracara plancus audubonii*). Ph.D. dissertation. University of Florida; Gainesville, Florida

Morrison, J.L. 1999. Breeding biology and productivity of Florida's Crested Caracaras. Condor 101(3):505-517.

Morrison, J.L. 2001. Recommended management practices and survey protocols for Audubon's crested caracaras (*Caracara cheriway audubonii*) in Florida. Technical Report Number 18. Florida Fish and Wildlife Conservation Commission; Tallahassee, Florida.

Morrison, J.L. 2003. Semi-annual monitoring report of Audubon's crested caracara within the Kissimmee River Restoration Project area – January through June 2003. Prepared for the South Florida Water Management District. Johnson Engineering; Fort Myers, Florida 33901.

Morrison, J.L. 2005. Personal communication. Associate professor of biology. Caracara workshop in Vero Beach, Florida on October 31, 2005. Trinity College; Hartford, Connecticut.

Morrison, J.L. and S.R. Humphrey. 2001. Conservation value of private lands for crested caracara in Florida. Conservation Biology 15(3): 675-684.

Morrison, J.L., M.A. McMillian, S.M. McGehee, and L.D. Todd. 1997. First record of crested caracara nesting in cypress. Florida Field Naturalist 25(2):51-53.

Morrison, J.L., K.V. Root, and J. Barnes. 2006. Habitat suitability and demographic population viability models for Florida's crested caracaras. Final Report to the Florida Fish and Wildlife Conservation Commission; Tallahassee, Florida.

Morrison, J.L., J.F. Dwyer, J.D. Fraser. 2007. Personal communication. Biologist. Letter to the U.S. Fish and Wildlife Service dated November 8, 2007. Evidence for habitat limitation for crested caracaras in Florida. Dept. Biology, Trinity College, Hartford, CT 06106. Dept. Biology, Trinity College, Hartford, Connecticut 06106.

Nemeth, N.M. and J.L. Morrison. 2002. Natal dispersal of the crested caracara in Florida. Journal of Raptor Research 36(3):203-206.

Nicholson, D. J. 1928. The Audubon Caracara of Florida. Oologist 45:2-8.

Oberholser, H.C. 1974. The bird life of Texas (Volume I). University of Texas Press; Austin, Texas.

Palmer, R.S. 1988. Crested caracara. Pp. 235-249 *in*: R.S. Palmer (ed.). Handbook of North American birds, Volume 5. Yale University Press; New Haven, Connecticut.

Schubert, S. 2015. Personal communication. Biologist. Conversation with John Wrublick. Note to file. U.S. Fish and Wildlife Service. South Florida Ecological Services Office, Vero Beach, Florida.

Smith, J.A. and M.N. Scholer. 2013. Nest components of crested carcacaras (Caracara cheriway) breeding in Florida. Florida Field Naturalist 41(2): 42-48.

Sprunt, A., Jr. 1954. Florida Bird Life. Coward-McCann, Incorporated and National Audubon Society; New York, New York.

Stevenson, H.M. 1976. Vertebrates in Florida. University Presses of Florida. Gainesville, Florida.

U.S Fish and Wildlife Service (Service). 1999. South Florida Multi-Species Recovery Plan. Southeast Region; Atlanta, Georgia.

U.S. Fish and Wildlife Service (Service). 2004a. Species Conservation Guidelines for Audubon's Crested Caracara-Draft April 20, 2004. South Florida Ecological Services Office, Vero Beach, Florida.

U.S. Fish and Wildlife Service (Service). 2004b. Survey Protocol for finding Caracara Nests – Draft April 20, 2004. Service, South Florida Ecological Services Office, Vero Beach, Florida. http://www.fws.gov/verobeach/images/pdflibrary/Caracara_Survey_Protocol.pdf

U.S. Fish and Wildlife Service (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. 48 pages.

U.S. Fish and Wildlife Service (Service). 2011. State Road 710 from U.S. Highway 441 to County Road 714 (Service Consultation Code 2009-I-0459) January 7, 2011. Fish and Wildlife Service, South Florida Ecological Services Office; Vero Beach, Florida.

U.S. Fish and Wildlife Service (Service). 2012. Wood Stork Foraging Habitat Assessment Methodology. http://www.fws.gov/verobeach/ListedSpeciesBirds.html

U.S. Fish and Wildlife Service (Service). 2013a. State Road 710 from U.S. Highway 441 to County Road 714 (Service Consultation Code 2009-I-0459) August 7, 2013. Fish and Wildlife Service, South Florida Ecological Services Office; Vero Beach, Florida.

U.S. Fish and Wildlife Service (Service). 2013b. Standard protection measures for the eastern indigo snake. Fish and Wildlife Service, South Florida Ecological Services Office; Vero Beach, Florida.

Figure 1. Location map of the SR 710 project site in Martin County and Okeechobee County, Florida (Segments 1 and 2 indicate sections of roadway to be added, Segment 3 and 4 indicate sections of roadway to be widened).

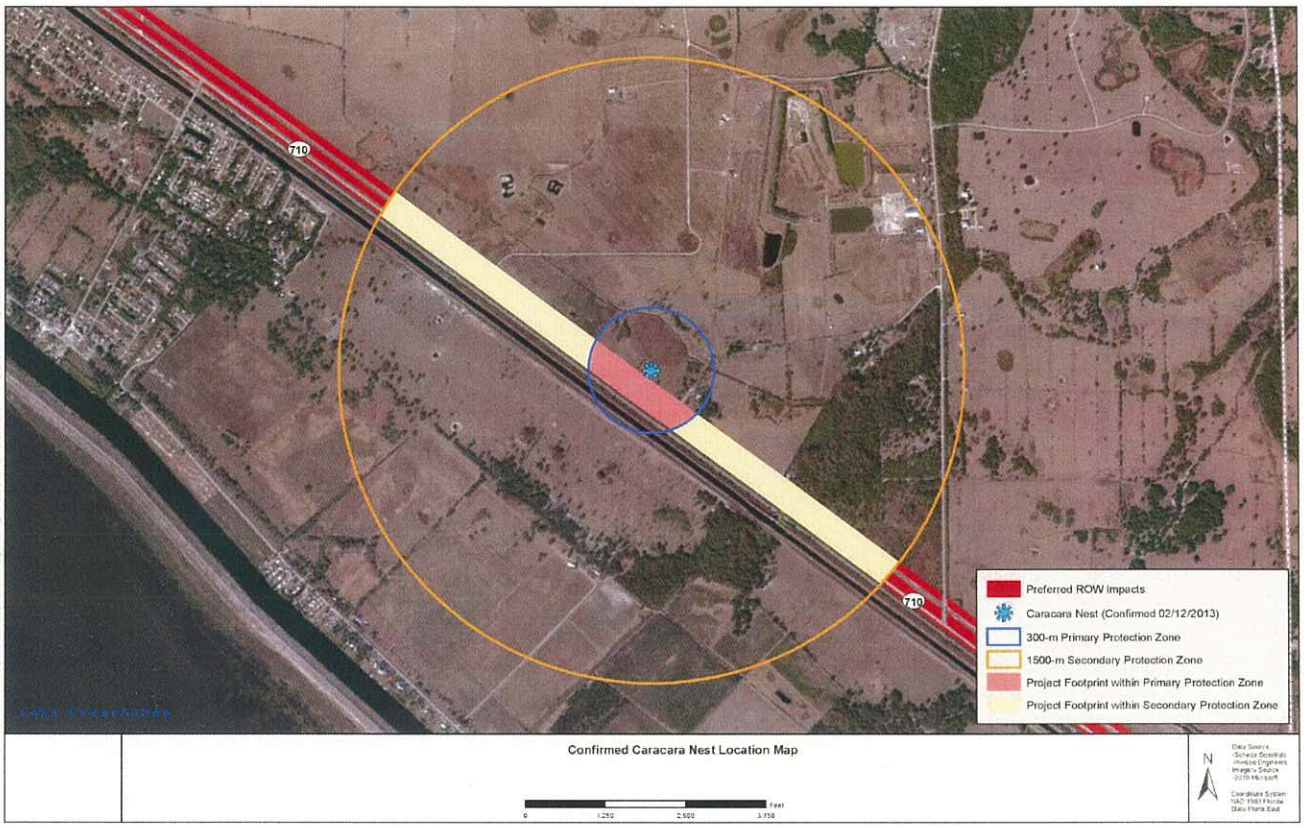


Figure 2. Location map of active nest of caracara documented during surveys conducted by the FDOT's consultant in 2013.

Appendix C

Wood Stork Biological Assessment Report

SR 710 FROM US 441 TO L-63 CANAL
OKEECHOBEE COUNTY, FLORIDA
FPID NO. 419344-3-32-01

Wood Stork Biological Assessment

Prepared for
FDOT District One

August 2018

Prepared by
ESA Scheda Corporation

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 (MOU) dated December 14, 2016 and executed by the Federal Highway Administration and FDOT.

TABLE OF CONTENTS

Biological Assessment

List of Figures

List of Tables

Appendices

SECTION 1
Introduction

The Endangered Species Biological Assessment (ESBA) listed the wood stork (*Mycteria americana*) as endangered by the U.S Fish and Wildlife Service (USFWS). Effective July 30, 2014, the USFWS reclassified the U.S. breeding population of wood storks from endangered to threatened under the Endangered Species Act of 1973, as amended. This project is located within the Core Foraging Area (CFA) of one wood stork colony: Cypress Creek Bluefield Road (ID #616047); therefore, a Wood Stork Foraging Habitat Assessment was conducted as wetland impacts are expected to exceed five acres.

Species and Habitat Description

The wood stork is a large, long-legged wading bird, with a head to tail length of 85 to 115 cm (33 to 45 inches) and a wingspan of 150 to 165 cm (59 to 65 inches) (Coulter et al. 1999). Typical foraging sites throughout the wood stork's range include freshwater marshes and stock ponds, shallow, seasonally flooded roadside or agricultural ditches, narrow tidal creeks or shallow tidal pools, managed impoundments, and depressions in cypress heads and swamp sloughs. Shallow wetland depressions that concentrate fish, either through local reproduction or through the consequences of drying, may be used as a feeding habitat.

In south Florida, Ogden et al. (1976) found that certain fish species were taken preferentially. Mosquito fish (*Gambusia affinis*) were under-represented in the diet in proportion to abundance, whereas, flagfish (*Jordanella floridae*), sailfin mollies (*Poecilia latipinna*), marsh killifish (*Fundulus confluentus*), yellow bullheads (*Ameiurus natalis*), and sunfish (*Centrarchidae* spp.) were over-represented. Wood storks also occasionally consume crustaceans, amphibians, reptiles, mammals, birds, and arthropods.

Wood storks generally forage in wetlands within 50 kilometers (km) (31 miles) of the colony site (Bryan and Coulter 1987), but forage most frequently within 20 km (12 miles) of the colony (Coulter and Bryan 1993). Maintaining this wide range of feeding site options ensures sufficient wetlands of all sizes and varying hydroperiods are available, during shifts in seasonal and annual rainfall and surface water patterns, to support wood storks.

Status

The wood stork was federally listed as endangered on February 28, 1984 (49 FR 7332-7335), but was down-listed as threatened on July 30, 2015 (Federal Register 2014). The wood stork is found from northern Argentina, eastern Peru and western Ecuador north to Central America, Mexico, Cuba, Hispaniola, and the southeastern United States (American Ornithologists' Union 1998). Only

the population segment that breeds in the southeastern United States is listed as endangered. In the United States, wood storks were historically known to nest in all coastal states from Texas to South Carolina (Wayne 1910; Bent 1926; Howell 1932; Oberholser 1938; Dusi and Dusi 1968; Cone and Hall 1970; Oberholser and Kincaid 1974). Dahl (1990) estimates these states lost about 38 million acres, or 45.6%, of their historic wetlands between the 1780s and the 1980s. However, it is important to note that wetlands and wetland losses are not evenly distributed in the landscape. Hefner et al. (1994) estimated 55% of the 2.3 million acres of the wetlands lost in the southeastern United States between the mid-1970s and mid-1980s were located in the Gulf-Atlantic Coastal Flats. These wetlands were strongly preferred by wood storks as nesting habitat. No critical habitat has been designated for the wood stork.

Existing Environmental Characteristics

The survey boundary is located within the Core Foraging Area (CFA) of one active wood stork nesting colony, Cypress Creek Bluefield Road (ID #616047) which was last documented as active in 2016. This colony is located approximately 10.6 miles northeast of the project site. The USFWS considers the area within 18.6 miles of a nesting colony as the CFA for wood storks in south Florida. The Action Area of this biological assessment includes the project limits and the CFA of one wood stork colony (**Figure 1**).

The land use / land cover within the project limits was field reviewed. It is comprised of Residential Low Density (FLUCFCS 1130), Residential Medium Density (FLUCFCS 1210), Commercial and Services (FLUCFCS 1400), Industrial (FLUCFCS 1550), and Institutional Development (FLUCFCS 1700); Improved Pasture (FLUCFCS 2110), Unimproved Pasture (FLUCFCS 2120), Woodland Pasture (FLUCFCS 2130), Horse Farm (FLUCFCS 2510), Herbaceous Dry Prairie (FLUCFCS 3100), Hardwood-Conifer Mixed Forest (FLUCFCS 4340), Channelized Waterways (FLUCFCS 5120), Mixed Wetland Hardwood Forest (FLUCFCS 6170), Wetland Forested Mixed (FLUCFCS 6300), Freshwater Marshes (FLUCFCS 6410), Dikes and Levees (FLUCFCS 7470), Roads and Highways (FLUCFCS 8140), Communications (FLUCFCS 8200), and Sewage Treatment Facilities (FLUCFCS 8330).

SECTION 2
Methodology

Impacts to wetlands and surface waters within the project area are subject to state and federal wetland mitigation compensation requirements and, where applicable, wood stork suitable foraging habitat (SFH) mitigation. Wetlands and surface waters considered non-jurisdictional waters are still subject to federal review from the perspective of wood stork SFH impact and mitigation.

The USFWS Wood Stork Foraging Habitat Assessment Methodology (**Appendix A**) was used by FDOT, District 1 to assess wood stork SFH affected by the project. Our analysis of the proposed wetland and surface water impacts has addressed both short and long hydroperiod wetland impacts. Specifically, the USFWS considers short hydroperiod wetlands as those inundated with water less than 180 days per year (i.e., Class 1, Class 2, and Class 3 hydroperiod wetlands), and long hydroperiod wetlands as those inundated greater than 180 days per year (i.e., Class 4, Class 5, Class 6, and Class 7).

SECTION 3
Results

The wood stork is known to forage within suitable wetland habitats located throughout the project site. As reflected in **Table 1,** approximately 149,174 acres of wetlands and surface waters containing potentially SFH for wood storks occur within the project action area (**Figure 2**). This calculation was based on FLUCFCS mapping completed by SFWMD in 2014 and it excludes land use codes deemed to not provide SFH such as bays and estuaries (FLUCFCS 5400) due to depth of water greater than 15 inches and therefore unsuitable as wood stork foraging habitat.

The project will result in the loss of approximately 5.28 acres of permanent wetland impacts, and 1.13 acres of surface water impacts, totaling 6.41 acres (**Appendix B**). Of the 6.41 acres, 5.28 acres are considered wood stork SFH. Surface Waters 01 and 02, totaling 1.12 acres, are not considered wood stork SFH. Surface Waters 01 and 02 are canal systems that have steep side slopes and water levels greater than 15 inches which is outside the hydrological range to be suitable foraging habitat for wood storks. The surface water labeled OSW, at the eastern end of the project, does not appear to hold water except for very short periods after rain events.

As mentioned previously, the USFWS Wood Stork Foraging Habitat Assessment Methodology (**Appendix A**) was used to calculate wood stork foraging biomass loss for the 5.28 acres of wetland impacts associated with the extension of SR 710. It was determined that the permanent impacts will result in 11.77 kg of wood stork foraging biomass loss, of that 2.09 kg are considered short hydroperiod wetlands and 9.68 kg are considered long hydroperiod wetlands (**Table 2**). The updated design of the SR 710 project during the design phase, plus the field delineations of wetlands and surface water boundaries as opposed to aerial delineations during the PD&E analysis, results in an increase of long hydroperiod wetlands impacted, a decrease in short hydroperiod wetland impacted, and a decrease in the estimated kilograms of wood stork prey biomass lost as compared to the impacts determined during the PD&E phase.

Compensation

Mitigation for unavoidable wetland impacts will be provided through purchase of credits from a private, fully permitted (both state and federal) wetland mitigation bank to satisfy all mitigation requirements of Part IV, Chapter 373 F.S., and U.S.C. 1344. At this time, Bluefield Ranch Mitigation Bank is the only bank with available credits that overlaps the project area and provides kilograms (kg) of wood stork prey biomass per credit. Specifically, each wetland credit also provides 2.23 kg of short hydroperiod prey biomass and/or 8.15 kg of long hydroperiod prey biomass compensation.

There are 2.21 units of functional loss for USACE jurisdictional wetland impacts. The cumulative wood stork prey biomass gained through the purchase of 2.21 wetland mitigation credits will result in a total gain of approximately 12.45 kg of wood stork prey biomass. Outlined below is the breakdown of wetland mitigation credits and biomass gain, which will more than compensate for the 9.65 kg of anticipated prey biomass loss (**Table 2**).

- Bluefield Ranch Mitigation Bank
    - 1.27 mitigation credits to be purchased (long hydroperiod) X 8.15 kg prey biomass / credit = 10.35 kg of wood stork prey biomass (2.35 kg more than required)
    - 0.94 mitigation credits to be purchased (short hydroperiod) X 2.23 kg prey biomass / credit = 2.10 kg of wood stork prey biomass (0.45 kg more than required)

Surface waters impacts totaling 1.13 acres are composed of two canal systems (Surface Waters 01 and 02) and one roadside ditch (Surface Water OSW). The roadside ditch will periodically hold water during rain events, but primarily remains dry; therefore, it does not provide wood stork SFH. Surface Waters 01 and 02 have steep side slopes and contain standing water greater than 15 inches deep; therefore, these systems do not provide appropriate wood stork foraging habitat.

Additionally, the proposed project will result in the creation of 3.08 acres of stormwater management facilities to treat water from impervious areas (**Appendix C**). These stormwater management areas include dry retention ponds, wet ponds, and swales. The dry retention ponds and swales will have ditch bottoms set at an elevation at least one foot above seasonal high ground water. The wet ponds will contain littoral areas along the pond edges set at an elevation of six inches above and two inches below seasonal high ground water. These stormwater management systems will provide additional foraging habitat for the wood stork that compensate for any functions provided by the impacted surface waters.

Effect Determination

Mitigation for the loss of wood stork foraging habitat will be provided by credit purchase from a state and federal approved wetland mitigation bank (Bluefield Ranch Mitigation Bank). A portion of mitigation bank's service area falls within the CFA of the wood stork colony affected by the project. It is anticipated that credits purchased for wetland mitigation will compensate for the loss of wood stork prey due to the proposed project. Therefore, it is anticipated that the proposed project **"may affect, but not likely to adversely affect"** the wood stork.

SECTION 4
References

American Ornithologists' Union. 1998. Check-list of North American birds. 7th ed. Am. Ornithol. Union, Washington, D.C.

Bent, A.C. 1926. Life histories of North American Marsh Birds. U.S. Natural Museum Bulletin 135. 392 pp

Bryan, A.L., Jr., and M.C. Coulter. 1987. Foraging Characteristics of Wood Storks in East-Central Georgia, U.S.A. Colonial Waterbirds 10(2):157-161.

Cone, W.C. and J.V. Hall. 1970. Wood ibis found nesting in Okeefenokee Refuge. Oriole 35:14

Coulter, M.C. and A.L. Bryan, Jr. 1993. Foraging Ecology of Wood storks (Mycteria americana) in East Central Georgia: Characteristics of foraging sites. Colonial Waterbirds 16:59 70.

Coulter, M.C., J.A. Rodgers, J.C. Ogden, and F.C. Depkin. 1999. Wood stork (Mycteria americana). In: The Birds of North America, No. 409 9A. Poole and F. Gill, eds.). The Birds of North America, Inc., Philadelphia, PA.

Dahl, T.E. 1990. Wetlands losses in the United States 1780s to 1980s. U.S. Department of the Interior, Fish and Wildlife Service; Washington, D.C.

Dusi, J. L., and R. T. Dusi. 1968. Evidence for the Breeding of the Wood Stork in Alabama. Alabama. Birds 16: 14-16.

Federal Register. 2014. Endangered and Threatened Wildlife and Plants; Reclassification of the U.S. Breeding Population of the Wood Stork From Endangered to Threatened; Final Rule. Volume 79, Number 125. Page 37077.

Hefner, J.M., B.O. Wilen, T.E. Dahl, and W.E. Frayer. 1994. Southeast wetlands: Status and trends, Mid-1970s to Mid-1980s. U.S. Department of the Interior, Fish and Wildlife Service, Atlanta, Georgia.

Howell, A. H. 1932. Florida birdlife. Coward McCann, New York.

Oberholser, H. C. 1938. The bird life of Louisiana. Louisiana Dept. Conserv. Bull. 28.

Oberholser, H.C. and E.B. Kincaid, Jr. 1974. The bird life of Texas. University of Texas Press; Austin, Texas.

Ogden, J.C., J.A. Kushlan, and J.T. Tilmant. 1976. Prey Selectivity by the Wood Stork. Condor 78(3):324-330.

Wayne, A. T. 1910. Birds of South Carolina. Contribution to the Charleston Museum No. 1, Charleston, South Carolina.

Figures

Legend

- PROJECT LOCATION
- WOOD STORK NESTING COLONIES
- WOOD STORK CORE FORAGING AREAS (ACTION AREA)

Cypress Creek Bluefield Road

Okeechobee
Taylor Creek
Lake Okeechobee
Brighton Reservation
Indiantown
Port St Lucie
St Lucie
Fort Pierce
Lakewood Park
Indian River Estates
Jensen Beach
North River Shores
Stuart
Palm City
Port Salerno
Jupiter Island
Hobe Sound

Figure 1 - Wood Stork Action Area and Nesting Colonies Map

SR 710 from US 441 to L-63 Canal
FPID #: 419344-3-32-01
Okeechobee County, Florida

0 22,000 44,000 66,000 Feet

All data within this map are supplied as is, without warranty. This product has not been prepared for legal, engineering, or survey purposes. Users of this information should review or consult the primary data sources to ascertain the usability of the information.

Data Source:
- Wantman Group
- USFWS

Imagery Source:
- ESRI Streets

Coordinate System:
NAD 1983 Florida State Plane East

N

Date: 07/27/17 Rev Date: 08/05/18 PM: RM GIS Analyst: TMS Map Document: 2316_wood_stork_colony_tms_20170727.mxd Project Number: 002316.20 C PDF Document: 2316_wood_stork_colony_tms_20170727.pdf Plot Size: 11x17

Legend

- PROJECT LOCATION
- WOOD STORK NESTING COLONIES
- SURFACE WATERS
- WETLANDS

Cypress Creek Bluefield Road

Okeechobee
Taylor Creek
Brighton Reservation
Lakewood Park
St Lucie
Fort Pierce
Indian River Estates
Port St Lucie
Jensen Beach
North River Shores
Stuart
Palm City
Port Salerno
Jupiter Island
Hobe Sound
Indiantown
Jonathan Dickinson State Park

Figure 2 - Wetland Habitats Within the Wood Stork Action Area Map

SR 710 from US 441 to L-63 Canal
FPID #: 419344-3-32-01
Okeechobee County, Florida

0 22,000 44,000 66,000 Feet

All data within this map are supplied as is, without warranty. This product has not been prepared for legal, engineering, or survey purposes. Users of this information should review or consult the primary data sources to ascertain the usability of the information.

Data Source:
- Wantman Group
- USFWS

Imagery Source:
- ESRI Streets

Coordinate System:
NAD 1983 Florida State Plane East

N

Tables

Table 1. Wetland Habitats Within the Project Action Area

Land Cover Code	Land Use Description	Area (Acres)
5110	NATURAL RIVER, STREAM, WATERWAY	694
5120	CHANNELIZED WATERWAYS, CANALS	4,177
5200	LAKES	58,861
5300	RESERVOIRS	12,091
5600	SLOUGH WATERS	7
6110	BAY SWAMPS	1,414
6111	BAY HEAD	2
6120	MANGROVE SWAMP	404
6170	MIXED WETLAND HARDWOODS	11,556
6172	MIXED SHRUBS	10,106
6180	CABBAGE PALM WETLAND	1,755
6191	WET MELALEUCA	29
6200	WETLAND CONIFEROUS FORESTS	8
6210	CYPRESS	2,612
6215	CYPRESS - DOMES / HEADS	360
6216	CYPRESS - MIXED HARDWOODS	3,320
6240	CYPRESS - PINE - CABBAGE PALM	88
6250	WET PINELANDS HYDRIC PINE	551
6300	WETLAND FORESTED MIXED	2,270
6410	FRESHWATER MARSHES / GRAMINOID PRAIRIE / MARSH	33,916
6411	FRESHWATER MARSHES - SAW GRASS	24
6420	SALTWATER MARSHES / HALOPHYTIC HERBACEOUS PRAIRIE	10
6440	EMERGENT AQUATIC VEGETATION	4,917
	Total	**149,174**

Table 2. Wood Stork Prey Biomass Loss Per Wetland Impact Area

Wetland ID	Type	Hydroperiod Classification	Impact Area (acres)	Percent Exotics	Biomass loss (kg)
WTL-01	Herbaceous	Class 3 (120-180 days)	0.27	25-50	0.30
WTL-03	Herbaceous	Class 3 (120-180 days)	0.05	25-50	0.06
WTL-05A	Forested	Class 2 (60-120 days)	0.11	75-90	0.00
WTL-05B	Herbaceous	Class 2 (60-120 days)	0.01	25-50	0.01
WTL-05C	Forested	Class 4 (180-240 days)	0.69	0-25	2.12
WTL-08	Forested	Class 2 (60-120 days)	0.47	0-25	0.38
WTL-12	Herbaceous	Class 4 (180-240 days)	0.71	0-25	2.19
WTL-13	Herbaceous	Class 4 (180-240 days)	1.02	0-25	3.14
WTL-15	Herbaceous	Class 4 (180-240 days)	0.18	0-25	0.55
WTL-17	Forested	Class 3 (120-180 days)	0.52	0-25	0.90
Short Hydroperiod Biomass Loss					**1.65**
Long Hydroperiod Biomass Loss					**8.00**
Total Wood Stork Prey Biomass Loss					**9.65**

Note: Values are subject to rounding effects

Table 3. Wood Stork Prey Biomass Gain

Wetland ID	Type	Hydroperiod Classification	Mitigation Credits	Percent Exotics	Biomass (kg) / Credit	Biomass Gain (kg)
WTL-01	Herbaceous	Class 3 (120-180 days)	0.11	25-50	2.23	0.24
WTL-03	Herbaceous	Class 3 (120-180 days)	0.01	25-50	2.23	0.03
WTL-05A	Forested	Class 2 (60-120 days)	0.03	75-90	2.23	0.07
WTL-05B	Herbaceous	Class 2 (60-120 days)	0.01	25-50	2.23	0.02
WTL-05C	Forested	Class 4 (180-240 days)	0.30	0-25	8.15	2.45
WTL-08	Forested	Class 2 (60-120 days)	0.37	0-25	2.23	0.83
WTL-12	Herbaceous	Class 4 (180-240 days)	0.46	0-25	8.15	3.75
WTL-13	Herbaceous	Class 4 (180-240 days)	0.42	0-25	8.15	3.42
WTL-15	Herbaceous	Class 4 (180-240 days)	0.09	0-25	8.15	0.73
WTL-17	Forested	Class 3 (120-180 days)	0.41	0-25	2.23	0.91
Short Hydroperiod Biomass Gain						**2.10**
Long Hydroperiod Biomass Gain						**10.35**
Total Wood Stork Prey Biomass Gain						**12.45**

Note: Values are subject to rounding effects

Appendix A

USFWS Wood Stork Foraging Habitat Assessment Methodology)

Wood Stork Foraging Habitat Assessment Methodology **July 12, 2012**

The decline of the wood stork in the United States is primarily due to the loss of wetland habitats and the concomitant reduction in prey availability. To determine the effect of development actions on the wood stork in south Florida, the Service has chosen to assess the action's effect on wood stork foraging habitat. As such, the Service has developed a functional assessment known as the "Wood Stork Foraging Habitat Assessment Methodology" (Methodology), as described below. The Methodology can be used to estimate the biomass of wood stork forage provided per unit quantity of wetland habitat. The assessment can be applied to both wetlands being lost by a development project and the wetlands proposed as mitigation.

The Service has identified four parameters that can be used in the estimation of wood stork prey biomass:

1. Vegetation Density
2. Wetland Hydroperiod
3. Prey Size Suitability
4. Competition with other wading bird species for forage

Parameter 1 - Density of vegetation

As discussed previously, a wetland's suitability for wood stork foraging is partially dependent on its vegetation density. Coulter and Bryan (1993) found that wood storks prefer to forage in ponds and marshes with little or no canopy. Wood storks have been observed foraging in forested wetlands (*e.g.*, swamps, mesic woodlands etc.), but prefer open areas within these habitat types (Coulter and Bryan 1993; P.C. Frederick, University of Florida, personal communication 2006; J.A. Rodgers, FWC, personal communication 2006). Coulter and Bryan (1993) suggested that wetlands with open canopies may be more readily detected by wood storks and are easier to land at than at closed-canopy sites. Wetlands with sparse canopies also allow wood storks to take flight more quickly to avoid predators.

The presence of invasive exotic plants may also affect wood stork foraging. Melaleuca (*Melaleuca quinqueneriva*) is an exotic tree species that has become established in south Florida's wetlands. Melalueca produces dense stands that may limit a site's accessibility to foraging by wading birds including the wood stork. O'Hare and Dalrymple (1997) investigated the effects of melalueca infestation on wetland-dependent birds in south Florida wetlands. A moderate level of melalueca infestation was found to have little effect on the production of some prey species use by the wood stork (*i.e.*, amphibians and reptiles) as long as the wetland's critical abiotic factors (*e.g.*, hydrology) were not significantly impaired (O'Hare and Dalrymple 1997). However, fish abundance was found to decrease in closed canopy melalueca forests. Wood storks will forage in melaleuca-dominated wetlands when the distribution of trees is sparse or non-continuous (*i.e.*, areas of broken stands due to blow-downs). However, wood storks generally will not forage in melaleuca where the stem density is high and the canopy closed (P.C. Frederick, University of Florida, personal communication 2006). The limiting factor to wood stork foraging within melalueca-dominated wetlands appears to be the restriction of access to the area resulting from the presence of the vegetation.

Parameter 1 - Foraging suitability value (Vegetation Density)

To determine how the presence of invasive exotic vegetation may affect wood stork foraging, we developed foraging suitability indices for wetlands (as described below) using data from O'Hare and Dalrymple (1997). O'Hare and Dalrymple (1997) identified five vegetation classes based on coverage of melalueca (Table WSM1):

Table WSM1. Classes of Melalueca Coverage (from O'Hare and Dalrymple 1997).

75-100 percent mature dense melaleuca coverage (DMM)
75-100 percent sapling dense melaleuca coverage (DMS or SDM)
50-75 percent melaleuca coverage (P75)
0-50 percent melaleuca coverage (P50)
0-10 percent melaleuca coverage (Marsh [MAR])

The number of wetland-dependent bird species and individuals observed per cover type by O'Hare and Dalrymple (1997) are listed in columns 2 and 3 in Table WSM2.

Table WSM2. Foraging suitability indices for wetland-dependent birds species.

Cover type	No. of species (S)	No. of individuals (I)	S*I	Foraging suitability
DMM	1	2	2	0.001
DMS	4	10	40	0.025
P75	10	59	590	0.372
P50	11	92	1,012	0.639
MAR	12	132	1,584	1.000

The foraging suitability index for wetlands dependent birds is calculated for each cover type from O'Hare and Dalrymple (1997) (Table WSM2) by multiplying the number of species observed (S) by the number of individuals observed (I). The product (S*I) is then divided by the product of the number of species for MAR and the number of individuals for MAR (12 x 132 = 1,584) observed by O'Hare and Dalrymple (1997). Based on the calculations listed above, we developed foraging suitability indices for wetlands used by wood storks based on the coverage of exotic plants (Table WSM3). The Service chose 0.03 (the foraging suitability index for the DMS cover type, rounded up from 0.025) to define foraging suitability for exotic plant coverage ranging from 76 percent to 100 percent.

Table WSM3. Wood Stork Foraging Suitability Indices.

Exotic Plants (percent coverage)	Foraging Suitability Index
0 to 25	1.00
26 to 50	0.64 (rounded up from 0.639)
51 to 75	0.37 (rounded down from 0.372)
76 to 100	0.03 (rounded up from 0.025)

Parameter 2 – Wetland Hydroperiod

Hydroperiod: The hydroperiod of a wetland can affect the density of wood stork prey species. For example, studies of Everglades fish populations using a variety of quantitative sampling techniques (pull traps, throw traps, block nets) have shown that the density of small forage fish increases with hydroperiod. Marshes inundated for less than 120 days per year average ± 4 fish/meter $(m)^2$, and marshes inundated for more than 340 days per year average ± 25 fish/m^2 (Loftus and Eklund 1994; Trexler et al. 2002).

Kushlan (1990) described short hydroperiod wetlands as wetlands inundated from 0 to 180 days per year, intermediate hydroperiod wetlands as wetlands inundated from 180 to 270 days per year, and long hydroperiod wetlands as wetlands inundated from 270 to 360 days per year. However, Trexler et al. (2002) defined short hydroperiod wetlands as wetlands with less than 300 days per year inundation. For the purposes of our Methodology, the Service defines wetlands inundated from 0 to 180 days per year as "short hydroperiod" wetlands and wetlands inundated from 180 to 360 days per year as "long hydroperiod" wetlands. In addition, we have adopted the seven wetland hydroperiod classes for wetlands in south Florida used by the SFWMD in their evaluation of various restoration projects throughout the Everglades Protection Area (Table WSM4).

Table WSM4. SFWMD's hydroperiod classes for Everglades Protection Area.

Hydroperiod Class	Number of days inundated
1	0-60
2	60-120
3	120-180
4	180-240
5	240-300
6	300-330
7	330-365

The Service estimated the fish biomass available to the wood stork for each of the SFWMD's hydroperiod classes listed in Table WSM4 as follows. First, we took estimates of fish density (number of fish/ m^2) for the various hydroperiod classes presented in Trexler et al. (2002) (Table WSM5). Trexler et al. (2002) derived these density estimates from throw trap sampling of wetland sites in the Everglades, and the estimates were presented as the square root of the number of fish/m^2 for each of six hydroperiod classes. It is important to note that Trexler et al. (2002) used six hydroperiod classes to characterize the length of inundation during the year compared to the seven hydroperiod classed employed by the SFWMD and used by the Service in our Methodology (Table WSM4). The fish density estimates presented Trexler et al. 2002, increase with hydroperiod class, and this trend has been noted by other investigators (Turner et al. 1999, Turner and Trexler 1997, Carlson and Duever 1979).

Table WSM5. Fish densities per hydroperiod from Trexler et al. (2002).

Hydroperiod class	Days inundated	Fish Density(fish/m^2)*
Class 1	0-120	2.0
Class 2	120-180	3.0
Class 3	180-240	4.0
Class 4	240-300	4.5
Class 5	300-330	4.8
Class 6	330-365	5.0

*As presented, these densities are square root transformed, as described in Trexler et al 2002.

For our assessment, we transformed the fish density data provided by Trexler et al. 2002 to obtain fish density values for each of seven hydroperiods defined by the SFWMD. We obtained a fish density value of 2 fish/m^2 for the SFWMD's Class 1 hydroperiod (0 to 60 days inundated; Table WSM6) by extrapolating Trexler et al.'s Class 1 hydroperiod fish density value of 2.0 fish/m^2 for 0 to 120 days inundated to 1.0 fish/$m.^2$ and doubling this value. To calculate fish density values for the remaining SFWMD hydroperiods (Classes 2 through 7), the fish density values for hydroperiod classes 1 through 6 presented by Trexler et al. 2002 (Table WSM5) were squared. Fish density values for each of the seven SFWMD hydroperiod classes are as presented in Table WSM6.

Table WSM6. Extrapolated values of fish density per each SFWMD hydroperiod.

Hydroperiod class	Days inundated	Fish density
Class 1	0-60	2 fish/m^2
Class 2	60-120	4 fish/m^2
Class 3	120-180	9 fish/m^2
Class 4	180-240	16 fish/m^2
Class 5	240-300	20 fish/m^2
Class 6	300-330	23 fish/m^2
Class 7	330-365	25 fish/m^2

The Service is aware the throw-trap method used by Trexler et al. (2002) generally only captures fish 8 centimeters (cm) (3.15 inches [in]) or less in total length. However, the Service believes the data provide a good approximation of the fish sizes preferred by wood storks. We note Ogden et al (1976) found wood storks generally consume fish ranging in total length from 1.5 cm (0.59 in) to 9 cm (3.54 in), and Kushlan et. al. (1975) reported wood storks feed primarily on fish from 6 cm (2.36 in) to 8 cm (3.15 in) total length. The Service is aware wood storks will occasionally forage on fish larger than 8cm total length, and we acknowledge this size class of fish is not completely captured by our methodology. However, we note only a small proportion of the wood stork's diet consists of fish greater than 8 cm total length. As such, we do not believe our assessment of wood stork foraging biomass is significantly flawed.

The transformed estimates of fish density listed in Table WSM6 are now used to estimate fish biomass for each of the seven hydroperiods. For our assessment, we considered class 7 hydroperiod wetlands with a density of 25 fish/m^2 to have a mean annual biomass of

6.5 grams /m^2 (wet mass). This estimate of mean annual biomass was based on studies conducted by Turner et al. (1999), Trexler et al. (2002), and Carlson and Duever (1979) in Everglades National Park and WCA 3A. In these studies, the mean biomass (standing stock) of fish from Class 5 and 6 hydroperiod wetlands ranged from 5.5 to 6.5 grams/m^2 (wet mass). These data were originally calculated as g/m^2 dry mass and converted to g/m^2 wet mass following the procedures referenced in Kushlan et al (1986) and also referenced in Turner et al (1999). The fish density data provided in Turner et al. (1999) included both data from samples representing fish 8 cm or smaller and fish larger than 8 cm (3.15 in) and included summaries of data presented in Turner and Trexler (1997), Carlson and Duever (1979), and Loftus and Eklund (1994). These data sets also applied a 0.6 g/m^2 (dry mass) correction estimate for fish greater than 8 cm (3.15 in) based on Turner et al's (1999) block-net rotenone samples.

We estimated the biomass for the SFWMD hydroperiod classes 1 through 6 based on the fish density of 25 fish/m^2 and the biomass of 6.5 grams/m^2 wet mass derived for the Class 7 hydroperiod described above. First, we calculated a mean biomass per fish value of 0.26 grams/m^2 wet mass by dividing 6.5 grams/m^2 wet mass by 25 fish/m^2. We then multiplied the mean biomass per fish value of 0.26 grams/m^2 wet mass by the fish density values for hydroperiod classes 1 through 6. For example, the biomass of fish provided by the Class 3 hydroperiod is 2.3 grams/m^2 (9*0.26 = 2.3). The calculated values of fish biomass are presented in Table WSM7.

Table WSM7. Estimated mean annual fish biomass for SFWMD's hydroperiods.

Hydroperiod class	Days inundated	Mean annual fish biomass
Class 1	0-60	0.5 gram/m^2
Class 2	60-120	1.0 gram/m^2
Class 3	120-180	2.3 grams/m^2
Class 4	180-240	4.2 grams/m^2
Class 5	240-300	5.2 grams/m^2
Class 6	300-330	6.0 grams/m^2
Class 7	330-365	6.5 grams/m^2

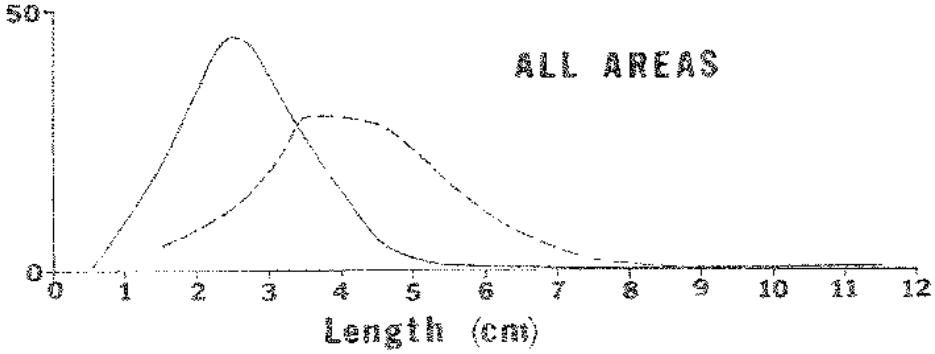
Parameter 3 – Prey Size Suitability

Wood storks are highly selective in their feeding habits. Ogden et al. (1976) reported that five species of fish comprised over 85 percent of the number and 84 percent of the biomass of over 3,000 prey items collected from adult and nestling wood storks (Table WSM8). These species were also observed to be consumed by wood storks in greater proportion than smaller and more abundant fish species [*e.g.*, mosquito fish (*Gambusia affinis*), least killifish (*Heterandria formosa*), and bluefin killifish (*Lucania goodei*)]. This may be the result of the small body size of these species not eliciting a bill-snapping reflex by wood storks (Coulter et al. 1999).

Table WSM8. Primary fish species consumed by wood storks from Ogden et al. (1976).

Common name	Scientific name	Percent individuals	Percent biomass
Sunfishes	*Centrarchidae* spp.	14	44
Yellow bullhead	*Italurus natalis*	2	12
Marsh killifish	*Fundulus confluentus*	18	11
Flagfish	*Jordenella floridae*	32	7
Sailfin molly	*Poecilia latipinna*	20	11

The following figure from Ogden et al. (1976) compares the frequency (expressed as percent, 0 to 50) of the fish size available to wood storks (solid line) and the frequency of fish size consumed by wood storks (dashed line).



The area under the dashed line represents the size of fish most likely consumed by wood storks (1.5 to 9.0 cm in total length). The Service has adopted this range of fish sizes as those most likely to be consumed by the wood stork and we will use this size range in our assessment of wood stork forage (see discussion below). As discussed above, the throw-trap method used by Trexler et al. (2002) generally only captures fish 8 cm or less in total length, and wood storks occasionally comsume fish larger than 8cm in total length. However, the Service believes the data from Trexler et al. (2002) provide a good approximation of the fish sizes preferred by wood storks.

The next element of our wood stork Methodology is the wood stork suitable prey base (biomass per hydroperiod). The wood stork suitability prey base is comprised of two components: (1) the amount of biomass per hydroperiod class within the range of fish sizes likely to be consumed by wood storks and (2) the likelihood that this prey base is actually consumed by the wood stork.

To estimate the fraction of the available fish biomass within the size range of fish likely to be consumed by wood storks (1.5 to 9.0 cm), the Service used the following approach. We noted that Kushlan et al. (1986) listed the mean biomass of the warmouth (*Lepomis gulosus*) as 36.76 g (rounded to 36.8 g in Appendix WSM-A [see page 12]). In Trexler et al. (2002), the warmouth accounts for about 0.048 percent (18/37,715=0.000477) of the total number of fish collected during the study (Appendix WSM-A). We then multiplied the mean biomass of 36.76 g of the warmouth reported by Kushlan et al. (1986) by the percent occurrence value of 0.048 percent provided by Trexler et al. 2002 to calculate an adjusted mean biomass of 1.75 g (36.76 g * 0.048 = 1.75 g). The mean biomass of the warmouth (1.75 g) accounts for 6.57 percent (1.75/26.715 = 0.0657) of the estimated average biomass (26.715 g) of Trexler et al.'s (2002)

samples. Using the Service's estimate of mean annual biomass for class 7 hydroperiod wetlands of 6.5 g/m^2, the warmouth biomass for class 7 hydroperiod wetlands would be 0.427 g/m^2 (6.5 g/m^2 x 0.0657 = 0.427 g/m^2).

However, the Service noted the size frequency distribution (assumed normal) of warmouth from Kushlan et al. (1986) indicate that 48 percent of warmouth sampled were greater than 9 cm total length and 0.6 percent were less than 1.5 cm total length. As such, 48.6 percent of warmouth were outside of the size range (1.5 cm to 9 cm total length) of fish most likely consumed by the wood stork. The mean annual biomass for warmouth for class 7 hydroperiod wetlands in the size range likely consumed by the wood stork is calculated as 0.208 g/m^2 [0.427*(0.48+0.006)]=0.2075 g/m^2 (rounded to 0.208). Using this approach for all fish species collected by Trexler et al. 2002 (Appendix WSM-A) for class 7 hydroperiod wetlands, the Service estimates that only 3.685 g/m^2 of the 6.5 g/m^2 mean annual fish biomass consists of fish within the size range likely consumed by wood storks (about 57 percent [3.685/6.5*100=56.7] of the total mean annual fish biomass available).

The Service also used data in Ogden et al 1976 (Appendix WSM-A) to estimate the available mean annual fish biomass for fish within the size range likely consumed by wood storks for class 7 hydroperiod wetlands. We calculated that 2.97 g/m^2 of the 6.5 g/m^2 mean annual fish biomass for a class 7 hydroperiod wetland (about 45.7 percent) consists of fish within the size range likely to be consumed by wood storks.

Finally, we adjusted the values of estimated mean annual fish biomass for each of the SFWMD's hydroperiods (Table WSM7) to reflect the size of fish most likely consumed by woods storks. This was accomplished by adding the biomass value of 3.685 g/m^2 (derived from data in Kushlan et al. 1986 and Trexler et al. 2002; Appendix WSM-A) to the biomass value of 2.97 g/m^2 (derived from data in Ogden et al 1976 2002; Appendix WSM-A) and dividing the sum of 6.665 g/m^2 by to obtain a mean value of 3.33 g/m^2 for class 7 hydroperiod wetlands. The Service notes that the mean biomass value of 3.33 g/m^2 s for class 7 hydroperiod wetlands comprises 51 percent of the mean annual biomass estimate of 6.5 g/m^2 for class 7 hydroperiod wetlands listed in Table WSM7 (3.33 g/m^2/6.5 g/m^2 = 0.51 or 51 percent). Therefore, we multiplied each value of mean annual fish biomass listed in Table WSM7 to calculate values of mean annual fish biomass per hydroperiod adjusted for the size range of fish (1 to 9 cm total length) most likely to be consumed by wood storks (*i.e.*, the wood stork suitable prey base) (Table WSM9).

Table WSM9. Estimates of suitable fish biomass per hydroperiod.

Hydroperiod class	Days inundated	Fish biomass
Class 1	0-60	0.26 gram/m^2
Class 2	60-120	0.52 gram/m^2
Class 3	120-180	1.196 grams/m^2
Class 4	180-240	2.184 grams/m^2
Class 5	240-300	2.704 grams/m^2
Class 6	300-330	3.12 grams/m^2
Class 7	330-365	3.38 grams/m^2

Crayfish Biomass

Although the diet of the wood stork is made up primarily of fish, wood storks are known to forage on crayfish (*Procambarus* spp.) (J. Lauritsen, Audubon Corkscrew Swamp Sanctuary, personal communication 2007, 2009; Depkin et al. 1992; Bryan and Gariboldi 1998; Kahl 1964). Depkin et al. (1992) report that crayfish make up 1 percent of the biomass and 1.9 percent of the prey items observed for wood storks from east-central Georgia and also noted the presence of crayfish in the diets of wood storks (fish represented 92 percent of all individual prey items and 93 percent of the total biomass). Lauritsen (Audubon Corkscrew Swamp Sanctuary, personal communication 2007, 2009) suggests crayfish may be an important source of food for wood storks. The importance of crayfish in the wood stork's diet in unclear. Nonetheless, the Service has decided to assess crayfish biomass as part of our estimate of biomass production per hydroperiod.

The presence of melalueca in wetlands does not seem to affect the use of these habitats by crayfish. O'Hare and Dalrymple (1997) found that crayfish are randomly distributed among cover types and melaleuca coverage did not largely affect dispersion patterns. Lauritsen (Corkscrew Swamp Sanctuary 2007, 2009) noted crayfish occur in wetlands with dense melaleuca and migrate to more open areas as water levels fall during the dry season. Hendrix and Loftus (2000) noted that *P. alleni* typically burrow during the dry season, a behavior which provides persistence during droughts, and *P. fallax* was typically found in long hydroperiod wetlands.

Acosta and Perry (2002) assessed the biomass of the *P. alleni* from seasonal wetlands of various hydroperiods within the Florida Everglades. However, Acosta and Perry (2002) defined wetland hydroperiods in terms of months of inundation. Therefore, the Service converted the hydroperiod class used in Acosta and Perry (2002) from months of inundation to days of inundation for use in our Methodology. Acosta and Perry (2002) only provided crayfish density and biomass estimates for wetlands of hydroperiod class 2, 4, and 5, and the converted values are 0.10 gram/m^2, 0.15 gram/m^2, and 0.23 gram/m^2, respectively (Table WSM10). Acosta and Perry (2002) noted that long hydroperiod wetlands typically had densities of crayfish two times greater than medium hydroperiod wetlands and five times greater than short hydroperiod wetlands. Therefore, we estimated the crayfish biomass for hydroperiod Class 3 wetlands by adding the crayfish biomass estimate for hydroperiod class 2 wetlands (0.10 gram/m^2) to the crayfish biomass estimate for hydroperiod class 4 wetlands (0.15 gram/m^2) and divided the sum (0.25 gram/m^2) by 2 to obtain a value of 0.125 gram/m^2 (rounded to 0.13 gram/m^2 in Table WSM10). The Service estimated the mean annual crayfish biomass for Class 1 hydroperiod wetlands based on Acosta and Perry's (2002) comment that long hydroperiod wetlands typically had densities five times greater than short hydroperiod wetlands. Therefore, the Service used Acosta and Perry's (2002) average long hydroperiod value for crayfish biomass of 0.229 grams/m^2 and divided this value by 5 to calculate a value of 0.05 gram/m^2 for Class 1 hydroperiod wetlands (0.229/5=0.045). We estimated the crayfish biomass value for the Class 7 hydroperiod wetlands based on the maximum density recorded in Acosta and Perry's (2002) study (0.248 gram/m^2, rounded to 0.25 gram/m^2 in Table WSM10). Finally, we estimated the crayfish biomass for class 6 hydroperiod wetlands by adding the crayfish biomass estimate for hydroperiod class 5 wetlands (0.23 gram/m^2) to the crayfish biomass estimate for hydroperiod

class 7 (0.25 gram/m^2) and divided the (0.48 gram/m^2) by 2 to obtain a value of 0.24 gram/m^2 (Table WSM10).

To estimate the total forage biomass available to the wood stork for each wetland hydroperiod class (Table WSM9), we added the value of mean annual crayfish biomass derived from Acosta and Perry 2002 to the value of mean annual biomass estimated for fish (Table WSM10).

Table WSM10. Estimates of suitable fish biomass and crayfish biomass per hydroperiod.

Hydroperiod class	Fish biomass	Crayfish biomass	Total biomass	Percent change
Class 1	0.26 gram/m^2	0.05 gram/m^2	0.31 gram/m^2	19.2
Class 2	0.52 gram/m^2	0.10 gram/m^2	0.62 gram/m^2	19.2
Class 3	1.19 grams/m^2	0.13 gram/m^2	1.32 grams/m^2	10.5
Class 4	2.18 grams/m^2	0.15 gram/m^2	2.34 grams/m^2	7.0
Class 5	2.70 grams/m^2	0.23 gram/m^2	2.93 grams/m^2	8.4
Class 6	3.12 grams/m^2	0.24 gram/m^2	3.36 grams/m^2	7.7
Class 7	3.38 grams/m^2	0.25 gram/m^2	3.63 grams/m^2	7.4

Parameter 4 – Competition with other wading bird species for forage

The computer simulations of wood stork colony population size by Fleming et al. (1994) assumed that only 10 percent of the wood stork forage prey base is available to be consumed by wood storks. This reduction in prey availability was attributed to water level of the foraging habitat, and in part to the effects of competition with other wading bird species. Fleming et al. (1994) did not specify the magnitude of each effect, but the Service believes it is likely competition with other wading bird species limits the availability of prey to wood storks. As such, the Service has included competition with other wading bird species for forage as a parameter in our assessment of wood stork forage biomass.

The Service has chosen to assess the effects of competition of other wading bird species on wood stork biomass availability as follows. We have adopted the assumption made by Fleming et al. (1994) that only 10 percent of the potential forage at a wetland site is available to wood storks for foraging. This figure represents a 90 percent reduction of total forage biomass actually available to wood storks at a wetland site. The Service considers competition for forage with other wading bird species, as well as the 3 factors described above (vegetation density, wetland hydroperiod, and prey size) as all contributing equally to the reduction in forage availability. Consequently, we find that each factor comprises 0.225 or 22.5 percent of the total 90 percent reduction in forage availability (4 x 22.5 = 90 percent). As discussed above, our assessment has already accounted for the effects of vegetation density, wetland hydroperiod, and prey size. To adjust the estimates of total biomass per hydroperiod presented in Table WSM10 for the effects of competition with other wading bird species, we have established a competition adjustment factor of 0.325. This factor was calculated by subtracting 0.675 (the sum of reduction in forage availability due to vegetation density, wetland hydroperiod, and prey size [0.225 + 0.225 + 0.225 = 0.675) from 1 (this number represents 100 percent of the total forage

biomass present at a wetland site) (1 – 0.675 = 0.325). Table WSM11 presents estimates of total forage biomass adjusted for competition.

Table WSM 11. Estimates of total biomass of fish and crayfish per hydroperiod adjusted for the effect of competition with other wading birds.

Hydroperiod class	Total Fish and Crayfish Biomass	Competition Factor	Adjusted Total biomass (Total Fish and Crayfish Biomass x Competition Factor)
Class 1	0.31 gram/m^2	0.325	0.1008 gram/m^2
Class 2	0.62 gram/m^2	0.325	0.2015 gram/m^2
Class 3	1.32 grams/m^2	0.325	0.4290 grams/m^2
Class 4	2.34 grams/m^2	0.325	0.7605 grams/m^2
Class 5	2.93 grams/m^2	0.325	0.9523 grams/m^2
Class 6	3.36 grams/m^2	0.325	1.0920 grams/m^2
Class 7	3.63 grams/m^2	0.325	1.1798 grams/m^2

Summary of the factors affecting vulnerability of wetland habitats to wood stork foraging in the action area

Through the above discussions, we have identified that there are essentially four parameters in assessing wood stork foraging habitat.

1. The density of vegetation within habitats suitable for wood stork foraging;

2. The hydroperiod of the wetland, including two subcomponents: (a) the fish density per hydroperiod (number of fish), and (b) the fish biomass per hydroperiod (g/m^2);

3. The size of prey size; and

4. Competition with other wading bird species

All four of these parameters can be used to calculate an estimate of the forage biomass available to wood storks in a wetland. As such, the Methodology can be applied to both wetlands being lost by a development project and the wetlands proposed as mitigation to assess the effect of an action on wood stork foraging. The following example illustrates the use of the Methodology:

> A development project results in the loss of 50 acres of wetland (25 acres of Class 3 hydroperiod and 25 acres of Class 4 hydroperiod), each containing 10 percent cover of melaleuca. The forage biomass of a each wetland is calculated by multiplying the number of acres of wetlands impacted by 4,047 m^2 (to convert acres to m^2) by the amount of actual biomass consumed by the wood stork (Table WSM11) and the exotic foraging suitability index (Table WSM3). The Service's Methodology considers the portion of the wetland covered by exotic vegetation (*i.e.*, the 10 percent melalueca in this

example) as 100 percent suitable to wood storks. To adjust for habitat availability and the wood stork competition factor, the value of forage biomass derived in Table WSM11 is multiplied by 1.0 (*i.e.,* habitat is 100 percent suitable for wood storks). The product is divided by 1,000 grams to convert the forage biomass value calculated in grams to kilograms.

The 25 acres of class 3 hydroperiod wetlands provide 43.4 kg of biomass forage [(25 acres x 4,047 m^2 /acre x 0.4290 g/m^2 (Table WSM11) x 1.0 (Table WSM3))/1,000 grams =43.4 kg)], and the 25 acres of class 4 hydroperiod wetlands provide 76.94 kg of biomass forage [(25 acres x 4,047 m^2 /acre x 0.7605 g/m^2 (Table WSM11) x 1.0 (Table WSM3) x 1.0)/1,000 grams =76.94 kg)]. The total forage biomass (fish and crayfish) lost due to the action is 120.34 kg (43.4 kg from class 3 hydroperiod wetlands + 76.94 kg from class 4 hydroperiod wetlands), and this value represents the loss of 0.61 nest based on Kahl's (1964) estimate that 201 kg of forage was needed for a successful wood stork nest.

LITERATURE CITED

Acosta, C.A. and S.A. Perry. 2002. Spatially explicit population r esponses of crayfish *Procambaruas alleni* to potential shifts in vegetation distribution in the marl marshes of Everglades National Park, USA. Hydrobiologia 427: 221-230.

Bryan, A.L., Jr. and J.C. Gariboldi. 1998. Food of Nestling Wood Storks in Coastal Georgia Colonial Waterbirds 21(2):152-158.

Carlson, J.E. and M.J. Duever. 1979. Seasonal fish population fluctuation in south Florida swamps. Proceedings of Annual Conference of Southeastern Association of Fish and Wildlife Agencies 31: 603-611.

Coulter, M.C. and A.L. Bryan, Jr. 1993. Foraging ecology of wood storks (*Mycteria americana*) in east central Georgia: Characteristics of foraging sites. Colonial Waterbirds 16:59 70.

Coulter, M.C., J.A. Rodgers, J.C. Ogden, and F.C. Depkin. 1999. Wood stork (*Mycteria americana*). In: The Birds of North America, No. 409 9A. Poole and F. Gill, eds.). The Birds of North America, Incorporated; Philadelphia, Pennsylvania.

Depkin, F.C., M.C. Coulter, and A.L. Bryan, Jr. 1992. Food of nestling Wood Storks in east-central Georgia. Colonial Waterbirds 15:219-225.

Flemming, D.M., W.F. Wolff, and D.L. DeAngelis. 1994. Importance of landscape heterogeneity to wood storks. Florida Everglades Management 18: 743-757.

Hendrix, A.N. and W.F. Loftus. 2000. Distribution and relative abundance of the crayfishes *Procambarus alleni* (Faxon) and *P. fallax* (Hagen) in southern Florida. Wetlands 20: 194-199.

Kahl, M.P., Jr. 1964. Food ecology of the wood stork (*Mycteria americana*) in Florida. Ecological Monographs 34:97 117.

Kushlan, J.A., J.C. Ogden, and A.L. Higer. 1975. Relation of water level and fish availability to wood stork reproduction in the southern Everglades, Florida. U.S. Geological Survey open file report 75 434. U.S. Government Printing Office; Washington, D.C.

Kushlan, J.A., S.A. Voorhees, W.F. Loftus, and P.C. Frohring. 1986. Length, mass and caloric relationships of Everglades animals. Florida Scientist 49(2):65-79.

Kushlan, J.A. 1990. Wetlands and wildlife, the Everglades perspective in Freshwater Wetlands and Wildlife, R.R. Sharitz and J.W. Gibbons (Eds.), CONF-8603 101, DOE Symp. Ser. No. 61, Office of Scientific and Technical Information, U.S. Department of Energy; Oak Ridge Tennessee.

Loftus, W.F. and A. Eklund. 1994. Long-term dynamics of an Everglades small-fish assemblage Pp. 461-484 in Everglades: The ecosystem and its restoration, Davis, S.M. and Ogden, J.C. (Eds.) St. Lucie Press; Delray, Florida.

O'Hare, N.K. and G.H. Dalrymple, 1997. Wildlife in Southern Everglades Invaded by Melaleuca (*Melaleuca quinquenervia*). 41 Bulletin of the Florida Museum of Natural History 1-68. University of Florida; Gainesville, Florida.

Ogden, J.C., J.A. Kushlan, and J.T. Tilmant. 1976. Prey selectivity by the wood stork. Condor 78(3):324 330.

Trexler, J.C., W.F. Loftus, F. Jordan, J.H. Chick, K.L. Kandl, T.C. McElroy, and O.L. Bass. 2002. Ecological scale and its implications for freshwater fishes in the Florida Everglades. Pages 153-181. In J.W. Porter and K.G. Porter (editors). The Everglades, Florida Bay, and Coral Reefs of the Florida Keys: An Ecosystem Sourcebook . CRC Press, Boca Raton, Florida.

Turner, A., and J. C. Trexler. 1997. Sampling invertebrates from the Florida Everglades: a comparison of alternative methods. Journal of the North American Benthological Society 16:694-709

Turner, A.W., J.C. Trexler, C.F. Jordan, S.J. Slack, P. Geddes, J.H. Chick, and W.F. Loftus. 1999. Targeting ecosystem features for conservation: standing crops in the Everglades. Conservation Biology 13(4):898-911.

Appendix WSM-A.

Data from Kushlan et al. (1986), Ogden et al. 1986, and Trexler et al. (2002) used by the Service to estimate the fraction of the available fish biomass within the size range of fish that may be consumed by wood storks**.**

		Kushlan et al. (1986)				Ogden et al. (1976)		Everglades - Trexler et al. (2002)				
Species	Common name	Mean Mass (g)	Proportion of fish < 15mm	Proportion of fish > 90mm	Proportion within 15-90 mm wood stork preference	% items consumed by stork	% biomass consumed by stork	Total collected	% of total collected	Mean mass based on % collected	Mass within 6 g/m2	Mass within stork prey size
Osteichtheyes												
Amia calva	Bowfin	1307.3	0.000	0.997	0.002	0.1	0.1		0.000	0.000	0.000	0.000
Lepisosterus platyrhincus	gar	182.5	0.012	0.948	0.039	0.2	2.8	1	0.003	0.484	0.109	0.004
Elops saurus	lady fish	346.7	0.000	1.000	0.000				0.000	0.000	0.000	0.000
Notemigonus crysoleucas	golden shiner	2.5	0.086	0.028	0.885	0.1	0.2		0.000	0.000	0.000	0.000
Notropis petersoni	coastal shiner	0.3	0.029	0.000	0.971			60	0.159	0.046	0.010	0.010
Notropis maculatus	taillight shiner					0.2	0.1	1	0.003	0.000	0.000	0.000
Erimuzon sucetta	Lake cubsucker	20.5	0.300	0.211	0.489				0.000	0.000	0.000	0.000
Ictalurus natalis	yellow bullhead catfish	29.0	0.063	0.438	0.499	1.7	11.8	29	0.077	2.228	0.500	0.250
Ameiurus nebulosus	brown bullhead catfish								0.000	0.000	0.000	0.000
Noturus gyrinus	tadpole madtom	1.4	0.052	0.000	0.948	0.2	0.1	8	0.021	0.029	0.007	0.006
Clarias batrachus	walking catfish	40.5	0.016	0.796	0.188			4	0.011	0.429	0.096	0.018
Bagre marinus	gafftopsail catfish	464.4	0.000	0.997	0.003				0.000	0.000	0.000	0.000
Opsanus beta	gulf toadfish	14.9	0.001	0.339	0.660				0.000	0.000	0.000	0.000
Strongylura notata	redfin needlefish	3.9	0.034	0.669	0.297				0.000	0.000	0.000	0.000
Adinia xenica	diamond killfish	0.7	0.002	0.000	0.998				0.000	0.000	0.000	0.000
Cyprinidon variegatus	sheepshead minnow	0.3	0.278	0.000	0.722	4.1	2.7	41	0.109	0.035	0.008	0.006
Floridichthylys carpio	goldspotted killfish	1.1	0.033	0.000	0.967				0.000	0.000	0.000	0.000
Fundulus chrysotus	golden topminnow	0.4	0.273	0.000	0.727	1.3	0.8	1844	4.889	1.750	0.393	0.286
Fundulus confluentus	marsh killifish	0.5	0.188	0.000	0.812	18.0	10.7	87	0.231	0.120	0.027	0.022
Fundulus grandis	gulf killfish	9.9	0.001	0.118	0.881				0.000	0.000	0.000	0.000
Fundulus seminolis	seminole killifish	5.8	0.000	0.110	0.890	0.7	3.1	1	0.003	0.016	0.003	0.003
Jordanella floridae	flagfish	0.3	0.260	0.000	0.740	32.0	7.0	1783	4.728	1.480	0.332	0.246
Lucania goodei	bluefin killifish	0.1	0.280	0.000	0.720	0.1	0.1	8391	22.248	2.759	0.620	0.446
Lucania parva	rainwater killifish	0.2	0.150	0.000	0.850	0.3	0.1	1	0.003	0.001	0.000	0.000
Gambusia affinus	mosquitofish	0.1	0.464	0.000	0.536	6.3	0.5	9825	26.051	2.214	0.497	0.266
Heterandria formosa	least killifish	0.0	0.917	0.000	0.083	0.5	0.1	12713	33.708	1.315	0.295	0.025
Poecilia latipinna	sailfin molly	0.2	0.292	0.000	0.708	19.8	10.6	1699	4.505	1.081	0.243	0.172
Labidesthes sicculus	brook silverside	0.5	0.002	0.000	0.998	0.1	0.1	5	0.013	0.007	0.002	0.002
Menidia beryllina	tidewater silverside	0.8	0.000	0.000	1.000	0.1	0.1		0.000	0.000	0.000	0.000
Elassoma evergladei	everglades pygmy sunfish	0.2	0.250	0.000	0.750			487	1.291	0.200	0.045	0.034
Enneacanthus gloriosus	bluespotted sunfish	0.5	0.155	0.000	0.845	0.8	0.9	238	0.631	0.321	0.072	0.061
Lepomis gulosus	warmouth	36.8	0.006	0.484	0.510	4.8	27.2	18	0.048	1.754	0.394	0.201
Lepomis macrochirus	bluegill	21.2	0.047	0.283	0.670	0.3	0.7	6	0.016	0.337	0.076	0.051
Lepomis marginatus	dollar sunfish	2.1	0.046	0.000	0.954			14	0.037	0.077	0.017	0.016
Lepomis microlophus	redear sunfish	30.8	0.052	0.362	0.586	2.3	5.4	55	0.146	4.490	1.008	0.591
Lepomis punctatus	spotted sunfish	7.0	0.182	0.030	0.787	2.8	8.7	197	0.522	3.661	0.822	0.647
Lepomis	unidentified sunfish	12.6	0.137	0.134	0.729	2.5	1.0	16	0.042	0.534	0.120	0.087
Sunfish	unidentified sunfish	9.8	0.175	0.070	0.754	2.5	1.0		0.000	0.000	0.000	0.000
Micropterus salmoides	largemouth bass	104.0	0.007	0.855	0.138	0.3	4.4	4	0.011	1.103	0.248	0.034
Etheostoma fusiforme	swamp darter	0.4	0.002	0.000	0.998			2	0.005	0.002	0.001	0.001
Astronotus ocellatus	oscar								0.000	0.000	0.000	0.000
Hemichromis bimaculatus	jewelfish	4.2	0.092	0.000	0.908				0.000	0.000	0.000	0.000
Spilotum nicaraguense	Nicaraguan cichlid								0.000	0.000	0.000	0.000
Eucinostomus gula	jenny mojarra	2.9	0.000	0.000	1.000				0.000	0.000	0.000	0.000
Haemulon plumieri	white grunt	6.2	0.000	0.011	0.988				0.000	0.000	0.000	0.000
Lagodon rhomboides	pinfish	7.1	0.001	0.039	0.960				0.000	0.000	0.000	0.000
Bairdiella chrysoura	silver perch	7.1	0.000	0.047	0.953				0.000	0.000	0.000	0.000
Cichlasoma bimaculatum	black acara	13.0	0.000	0.005	0.995			7	0.019	0.242	0.054	0.054
Cichlasoma urophthalmus	mayan cichlid							21	0.056	0.000	0.000	0.000
Mugil curema	white mullet					0.1	0.8		0.000	0.000	0.000	0.000
Rivulus marmoratus	rivulus					0.1	0.1		0.000	0.000	0.000	0.000
Esox niger	chain pickerel					0.1	0.1	5	0.013	0.000	0.000	0.000
Erimyzon sucetta	lake chubsucker							145	0.384	0.000	0.000	0.000
Belonesox belizanus	pike killifish							3	0.008	0.000	0.000	0.000
Tilapia mariae	spotted tilapia							4	0.011	0.000	0.000	0.000
Total								**37715**	**100.000**	**26.715**	**6.000**	**3.539**

*Shaded estimate of average mass from length-weight relationship given for species on www.fishbase.org with average length assumed to be 5 cm (FLMNH). The proportion of fish length less than 1.5 cm was set to be the average of all sunfish.

Appendix B
Dredge and Fill Plan Sheets

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

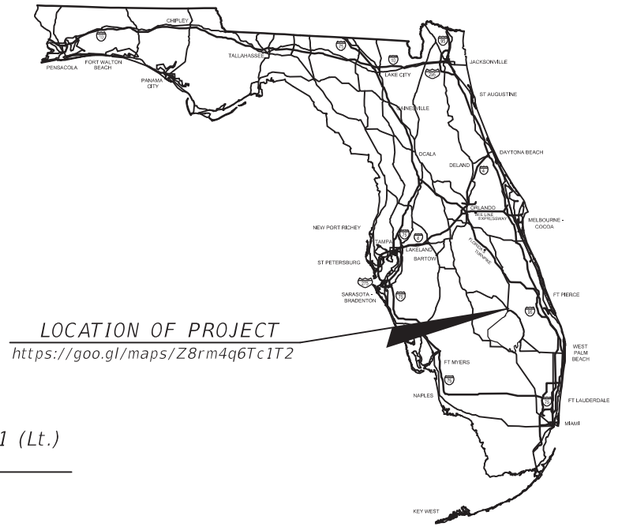
CONTRACT PLANS

FINANCIAL PROJECT ID 419344-3-52-01

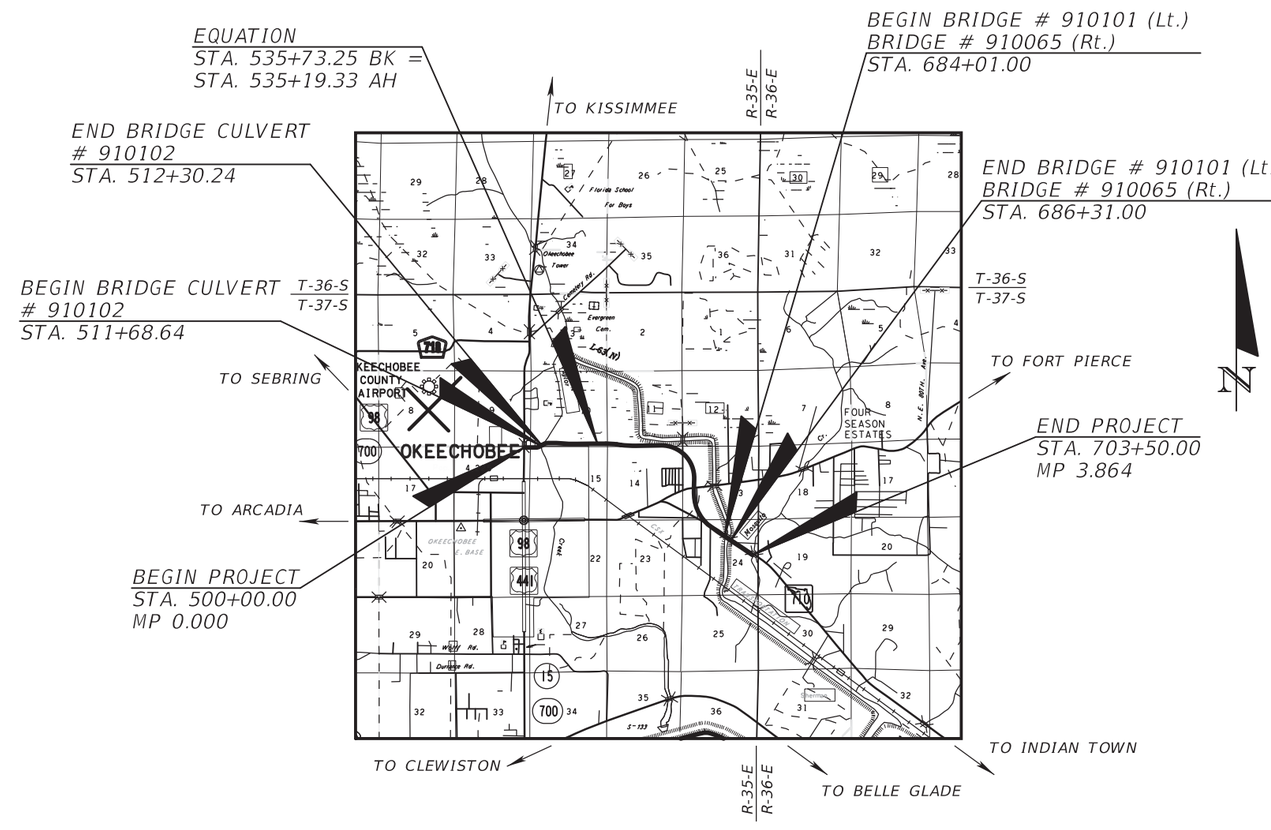
OKEECHOBEE COUNTY (91060)

STATE ROAD NO. 710

INDEX OF PLANS



LOCATION OF PROJECT
https://goo.gl/maps/Z8rm4q6Tc1T2



GREG GRIFFITH
WANTMAN GROUP, INC.
2035 VISTA PARKWAY
WEST PALM BEACH, FL 33411
(561) 687-2220 PHONE
(561) 687-1110 FAX

FDOT PROJECT MANAGER:
JIMMY P. VILCE, E.I.

CONSTRUCTION CONTRACT NO.	FISCAL YEAR	SHEET NO.
	21	1

GENERAL NOTES:

1. BENCHMARK ELEVATIONS SHOWN IN THE PLANS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88).

2. EXISTING DRAINAGE STRUCTURES WITHIN CONSTRUCTION LIMITS SHALL REMAIN UNLESS OTHERWISE NOTED.

3. ANY PUBLIC LAND CORNER WITHIN THE LIMITS OF CONSTRUCTION IS TO BE PROTECTED. IF A CORNER MONUMENT IS IN DANGER OF BEING DESTROYED AND HAS NOT BEEN PROPERLY REFERENCED, THE ENGINEER SHOULD NOTIFY BOB BRANDENBURG, THE DISTRICT LOCATION SURVEYOR, WITHOUT DELAY, BY TELEPHONE AT (863) 519-2290.

4. EXISTING DRIVEWAY CONNECTIONS WITHIN THE LIMITS OF THIS PROJECT ARE TO BE REPLACED AT THE SAME LOCATION AND WIDTH, UNLESS OTHERWISE SHOWN IN THE PLANS OR REFERENCED IN THE DEPARTMENT'S APPROVED PROPERTY APPRAISAL.

5. EXISTING SUPERELEVATION RATES TO BE MAINTAINED UNLESS OTHERWISE SHOWN IN THE PLANS OR AS DIRECTED BY THE PROJECT ENGINEER.

6. ALL PAVED INTERSECTIONS TO BE RESURFACED TO THE FARTHEST RADIUS RETURN UNLESS OTHERWISE SHOWN IN THE PLANS OR OTHERWISE DIRECTED BY THE ENGINEER.

UTILITIES:

1. ALL EXISTING UTILITIES ARE TO REMAIN IN PLACE UNLESS OTHERWISE NOTED.

2. CONTRACTOR'S ATTENTION IS DIRECTED TO THE EXISTENCE OF OVERHEAD UTILITIES WHICH MAY INTERFERE WITH NORMAL CONSTRUCTION PRACTICES AT THIS LOCATION.

3. THE LOCATION(S) OF THE UTILITIES SHOWN IN THE PLANS (INCLUDING THOSE DESIGNATED VV VH AND VVH) ARE BASED ON LIMITED INVESTIGATION TECHNIQUES AND SHOULD BE CONSIDERED APPROXIMATE ONLY. THE VERIFIED LOCATION/ELEVATIONS APPLY ONLY AT THE POINTS SHOWN. INTERPOLATIONS BETWEEN THESE POINTS HAVE NOT BEEN VERIFIED.

4. THE CONTRACTOR SHALL NOTIFY UTILITY OWNERS OF ANY EXCAVATION OR DEMOLITION ACTIVITY THROUGH SUNSHINE ONE-CALL OF FLORIDA, INC. (1-800-432-4770) AND SHALL ALSO NOTIFY THOSE UTILITY OWNERS/AGENCIES LISTED WITHIN OR IMPACTED BY THESE PLANS, NOT LESS THAN TWO (2) FULL BUSINESS DAYS IN ADVANCE OF THE BEGINNING OF CONSTRUCTION ON THE JOB SITE.

5.

UTILITY/AGENCY OWNERS:	CONTACT:	TELEPHONE NUMBERS:
CENTURYLINK	KENNETH LUTZ	(863) 452-3185
COMCAST	TIMOTHY KORNDOERFER	(772) 692-9010
FLORIDA POWER & LIGHT DISTRIBUTION	BILL HESTER	(772) 337-7063
FLORIDA POWER & LIGHT TRANSMISSION	GEORGE BECK	(561) 694-3459
FLORIDA PUBLIC UTILITY	DAN SCRIBBEN	(386) 668-9319
OKEECHOBEE UTILITY AUTHORITY	JOHN HAYFORD	(863) 763-9460 EXT. 218
FLORIDA GAS TRANSMISSION (FGT)	JOSEPH SANCHEZ	(407) 838-7171
VERIZON BUSINESS/ MCI	INVESTIGATIONS	(972) 729-6322

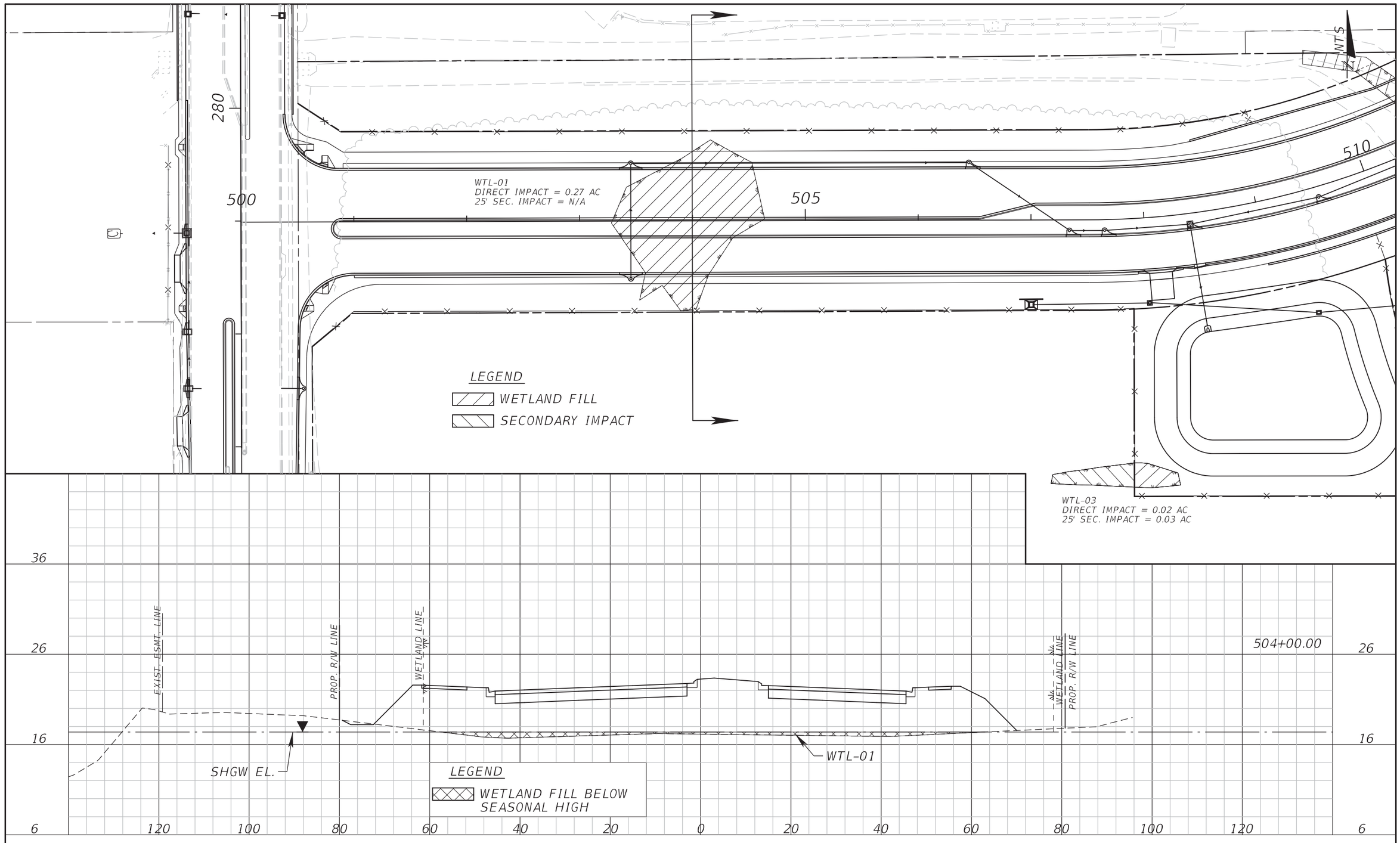
REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 710	OKEECHOBEE	419344-3-52-01

GENERAL NOTES

SHEET NO. 2



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

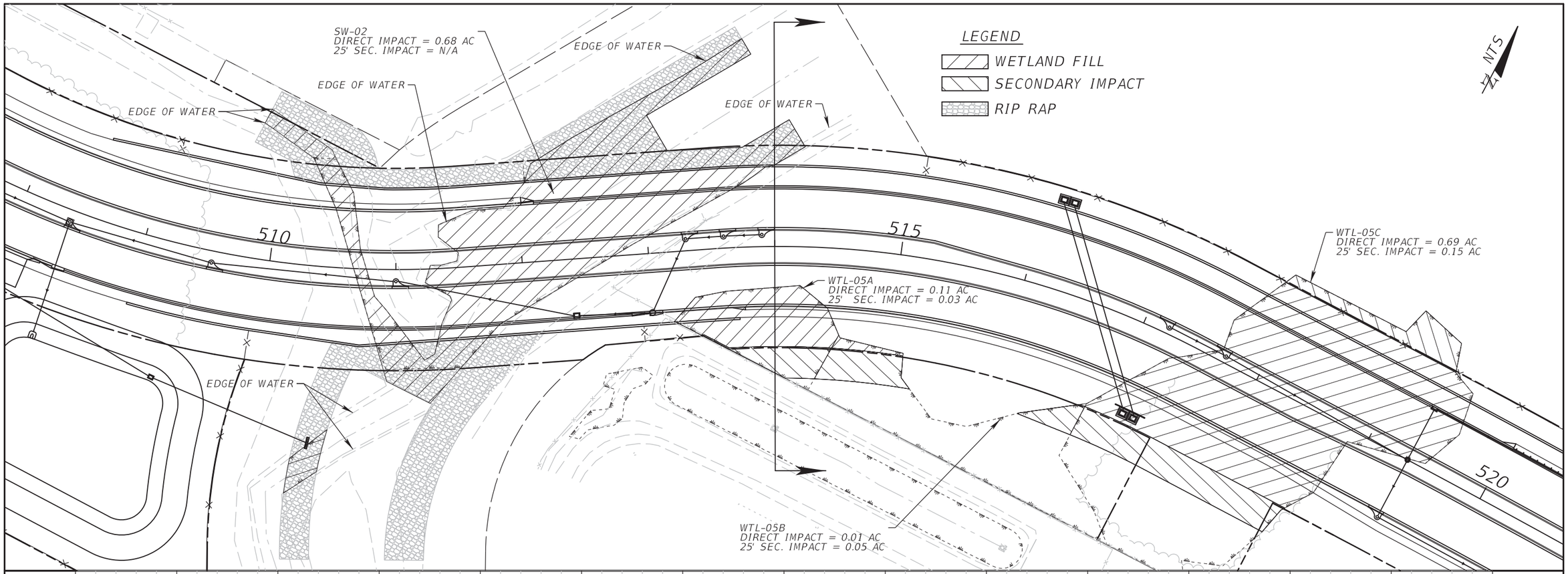
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

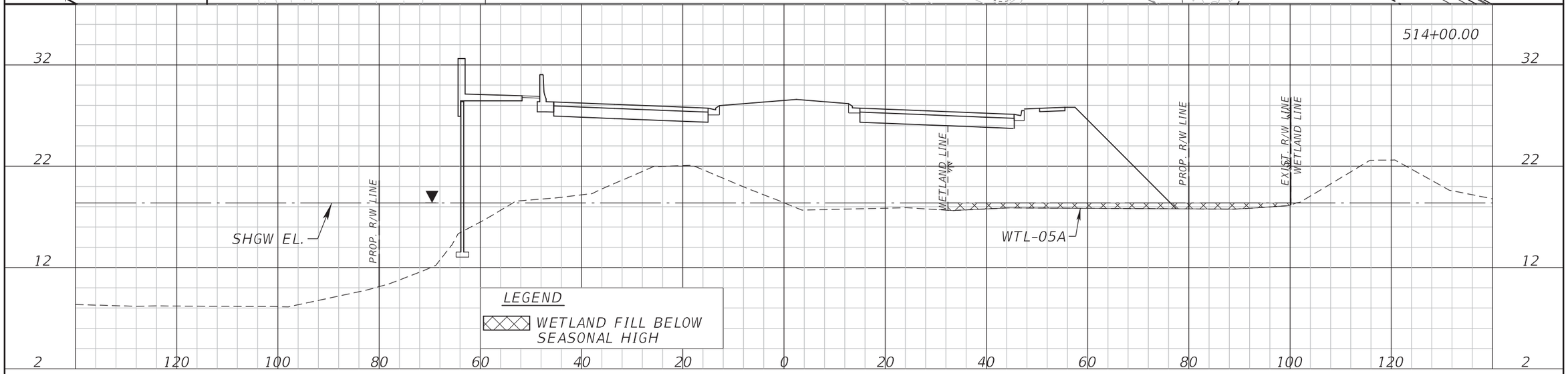
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 710	OKEECHOBEE	419344-3-52-01

DREDGE AND FILL SKETCHES

SHEET NO. 3

USER: George 6/22/2018 11:08:48 AM c:\pwworking\wgi\george\d0586041\PLANEM10.DGN





REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

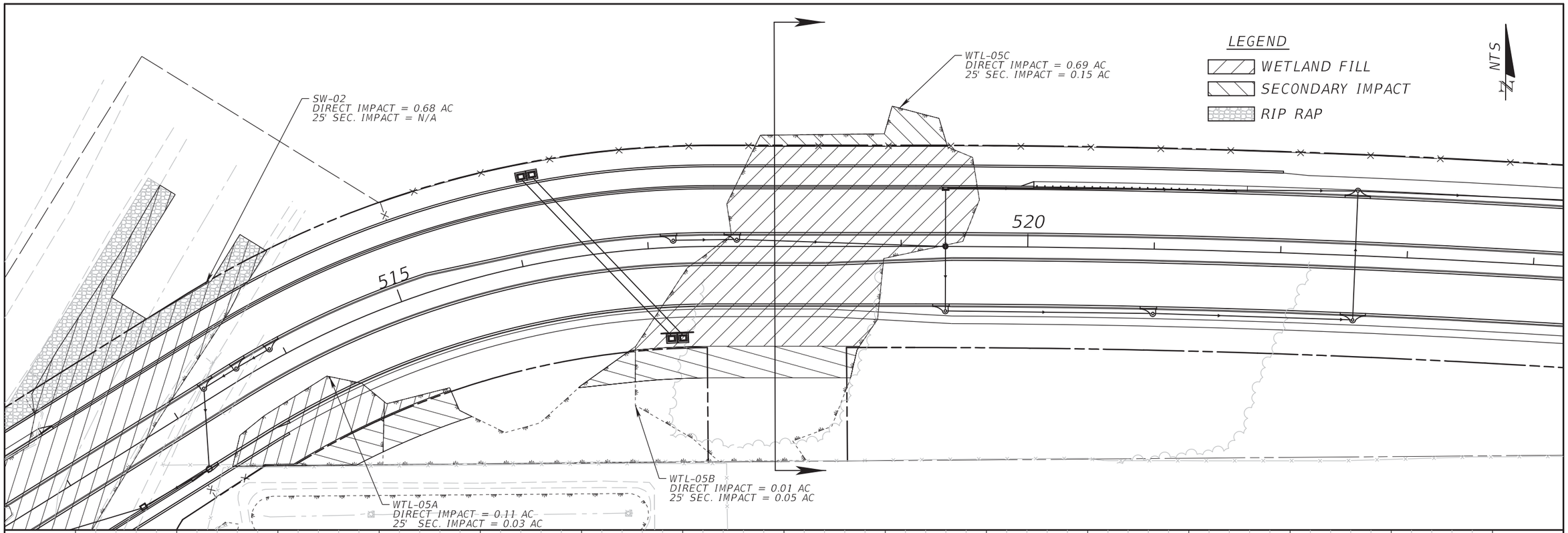
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

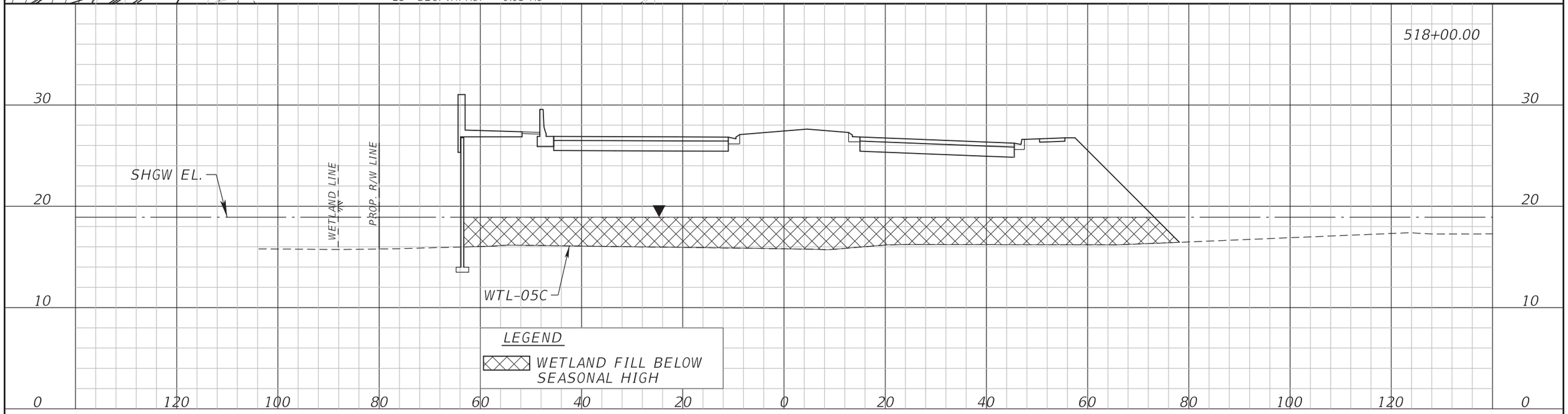
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 710	OKEECHOBEE	419344-3-52-01

DREDGE AND FILL SKETCHES

SHEET NO. 4

USER: George 6/22/2018 11:08:50 AM c:\pwworking\wgi\george\d0586041\PLANEM11.DGN





REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

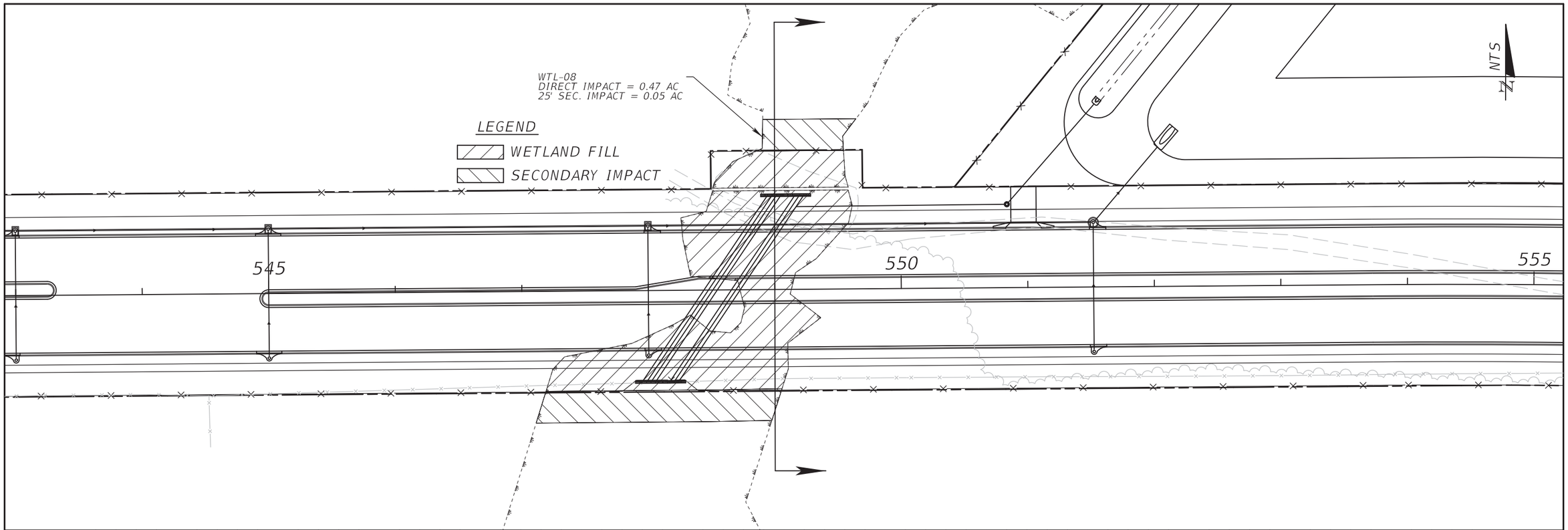
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

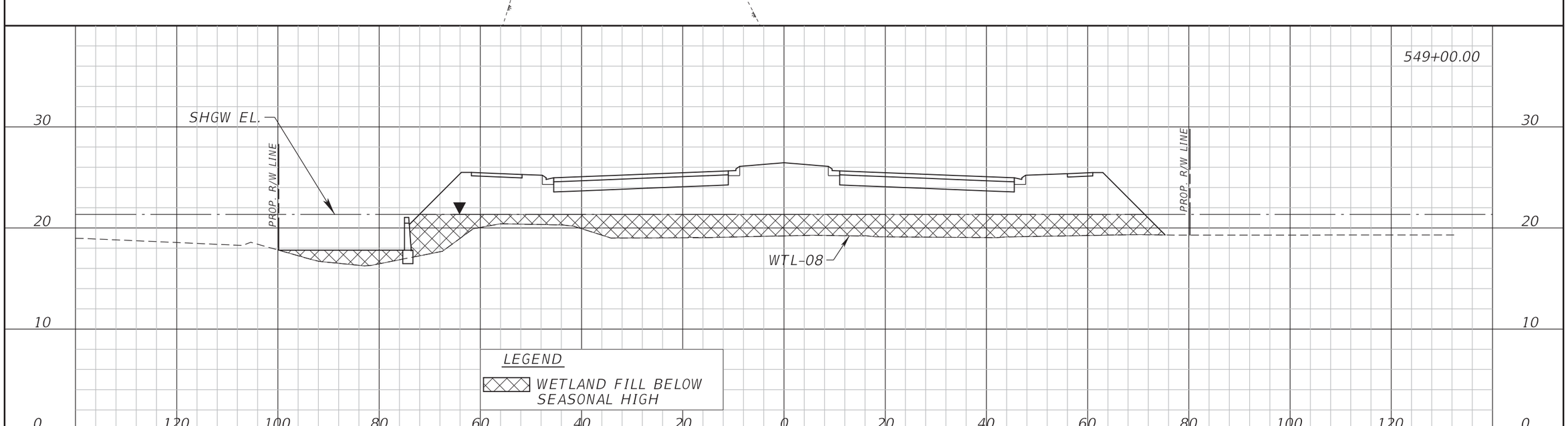
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 710	OKEECHOBEE	419344-3-52-01

DREDGE AND FILL SKETCHES

SHEET NO. 5

USER: George 6/22/2018 11:08:54 AM c:\pwworking\wgi\george\d0586041\PLANEM12.DGN





REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

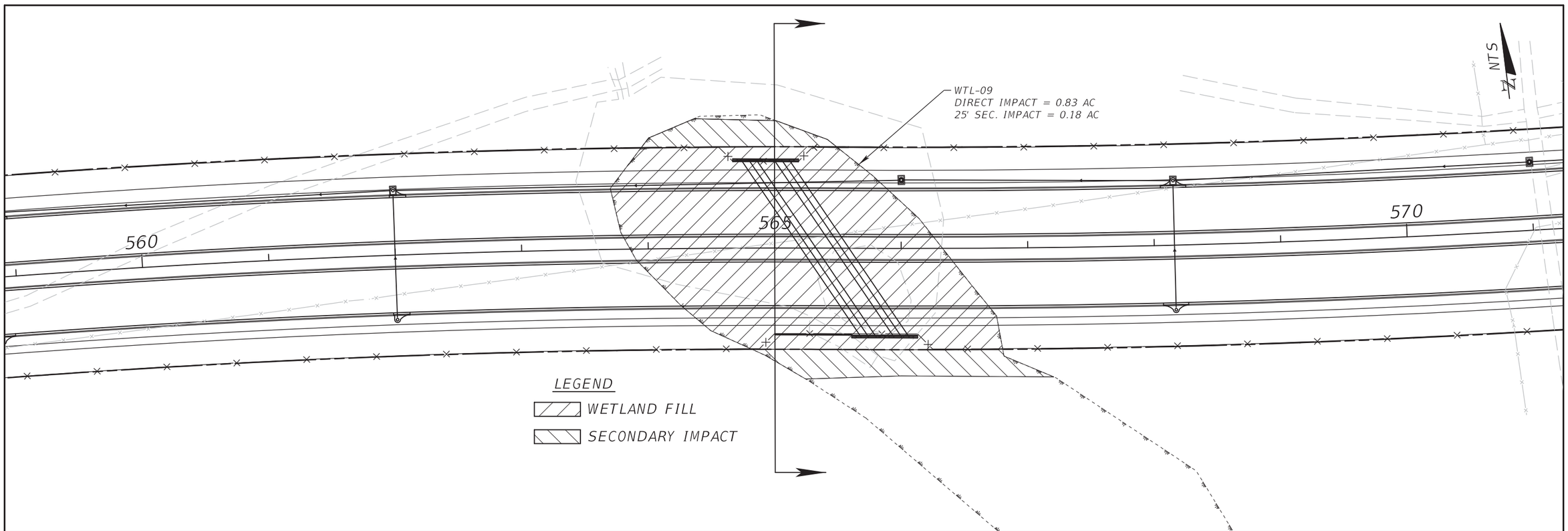
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

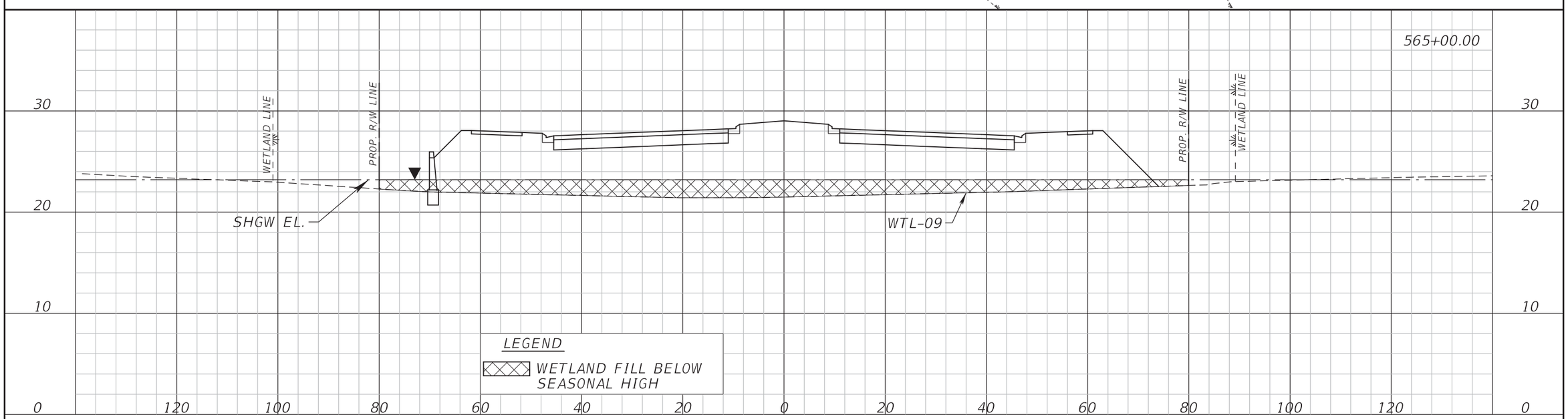
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 710	OKEECHOBEE	419344-3-52-01

DREDGE AND FILL SKETCHES

SHEET NO. 6

USER: George 6/22/2018 11:08:58 AM c:\pwworking\wgi\george\d0586041\PLANEM13.DGN





REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

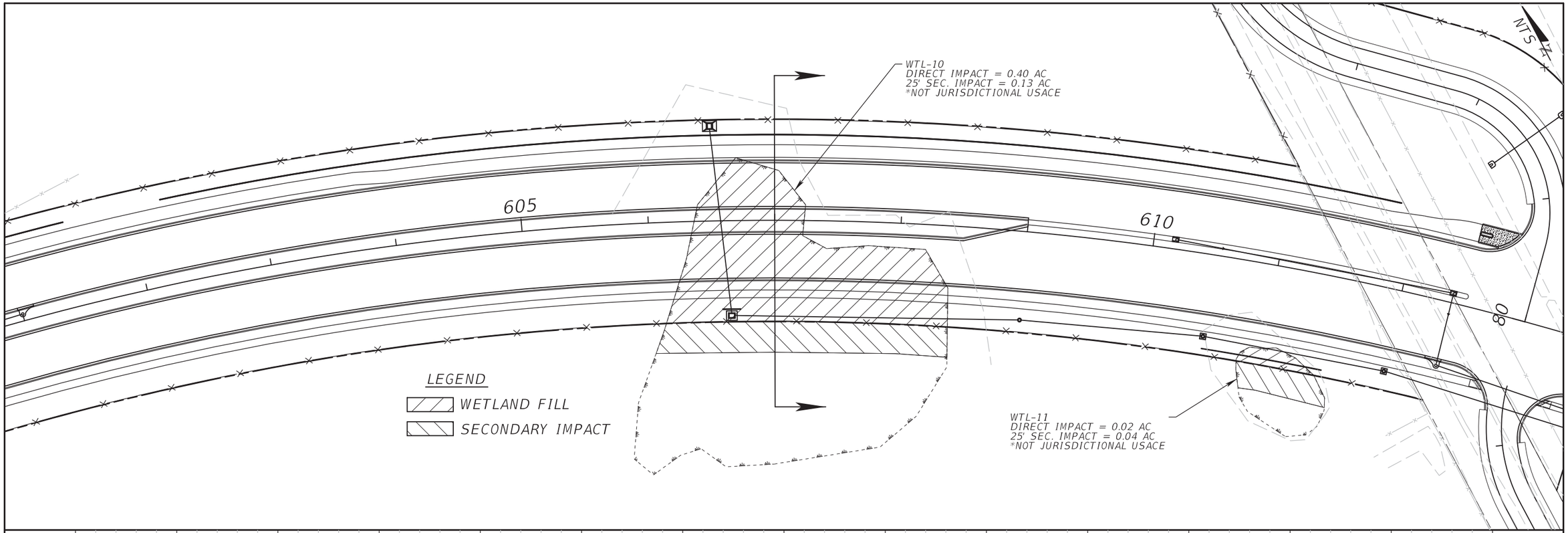
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

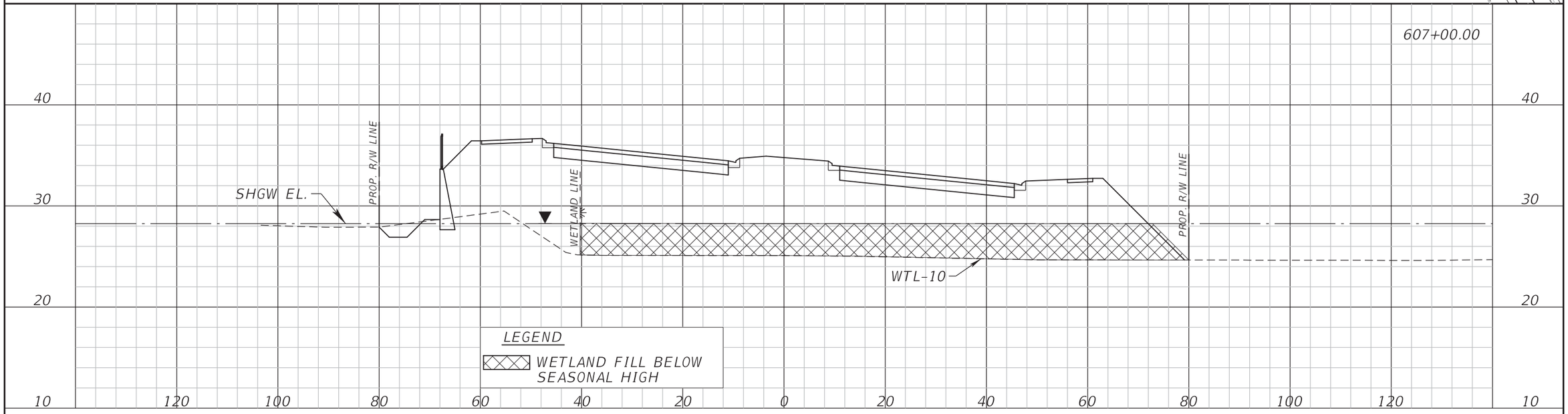
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 710	OKEECHOBEE	419344-3-52-01

DREDGE AND FILL SKETCHES

SHEET NO. 7

USER: George 6/22/2018 11:09:01 AM c:\pwworking\wgi\george\d0586041\PLANEM14.DGN





REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

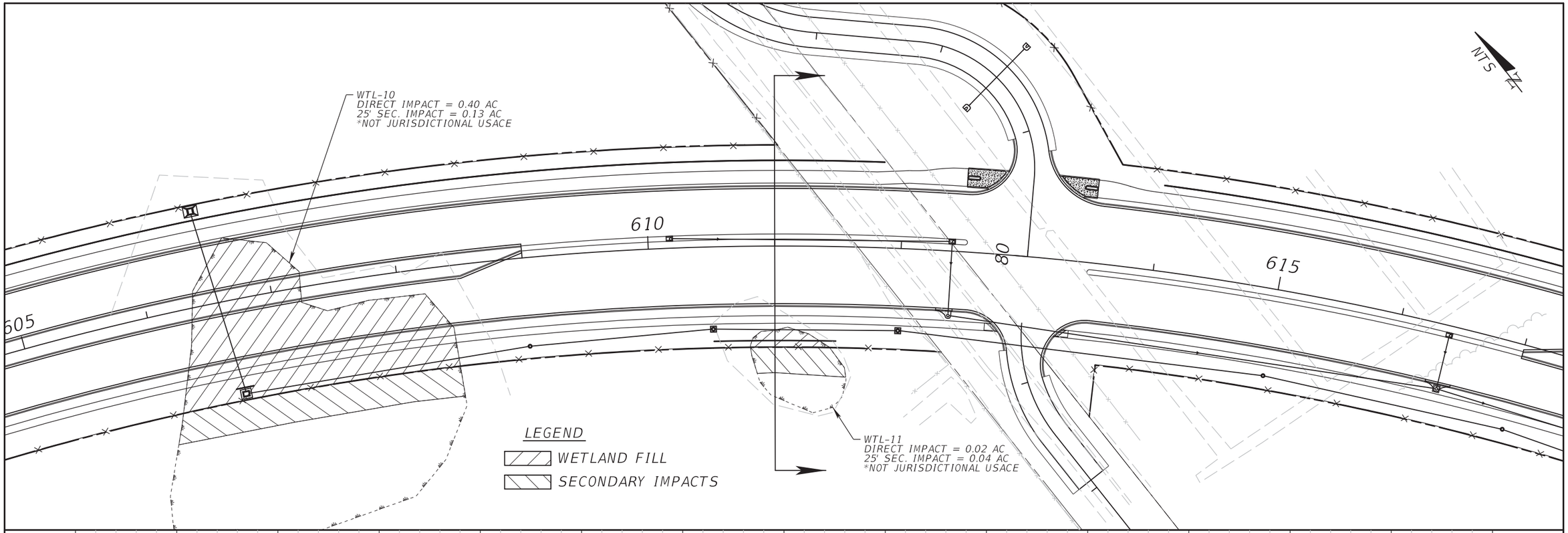
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

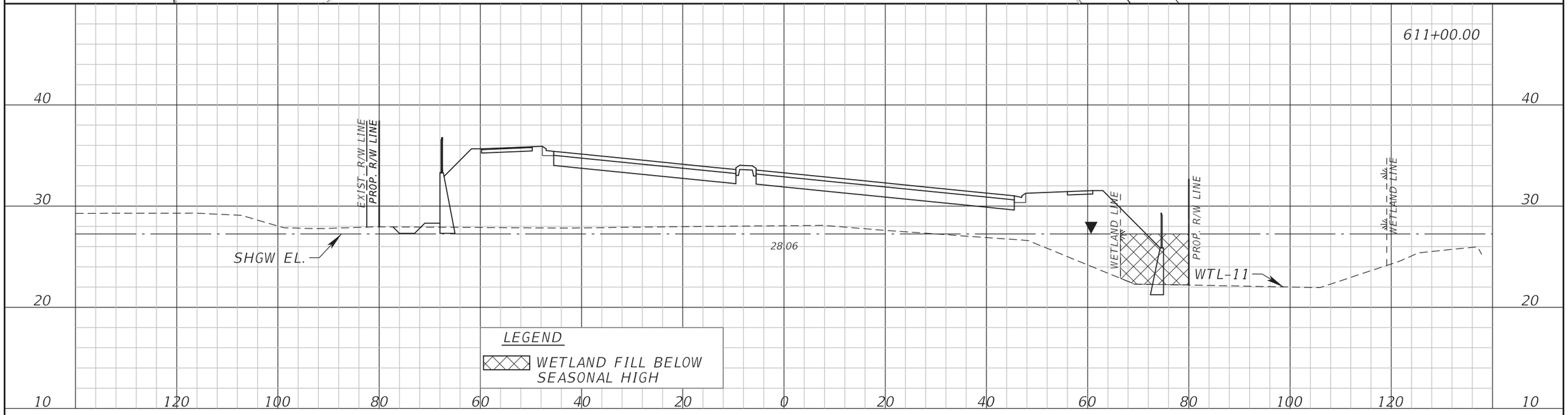
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 710	OKEECHOBEE	419344-3-52-01

DREDGE AND FILL SKETCHES

SHEET NO. 8

USER: George 6/22/2018 11:09:05 AM c:\pwworking\wgi\george\d0586041\PLANEM16.DGN





REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

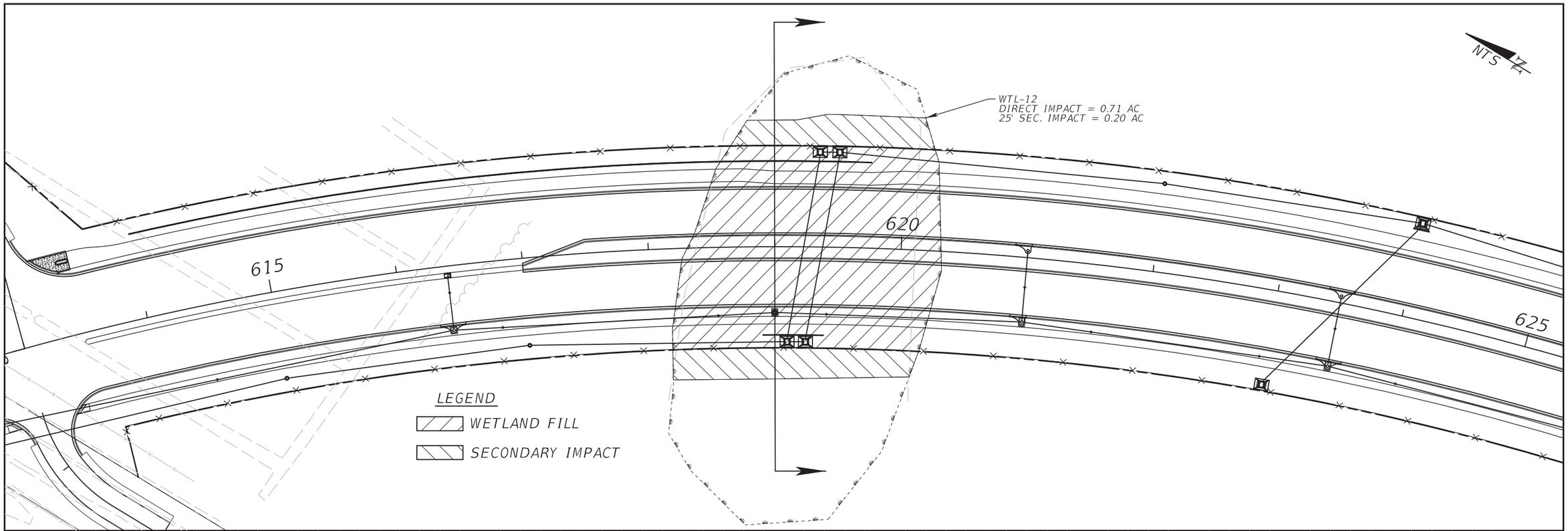
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

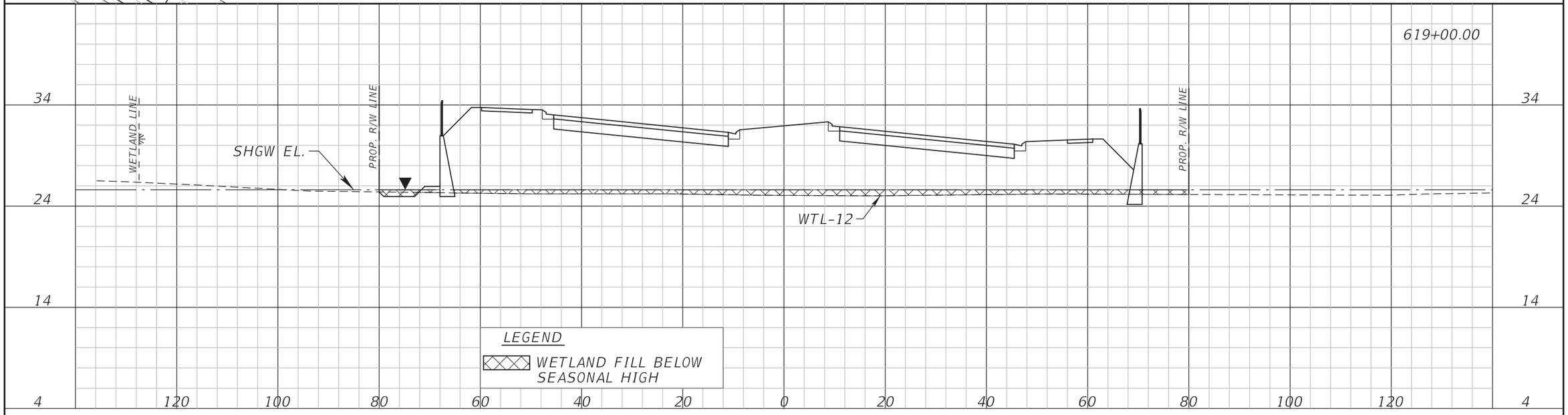
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 710	OKEECHOBEE	419344-3-52-01

DREDGE AND FILL SKETCHES

SHEET NO. 9

USER: George 6/22/2018 11:09:09 AM c:\pwworking\wgi\george\d0586041\PLANEM15.DGN





REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

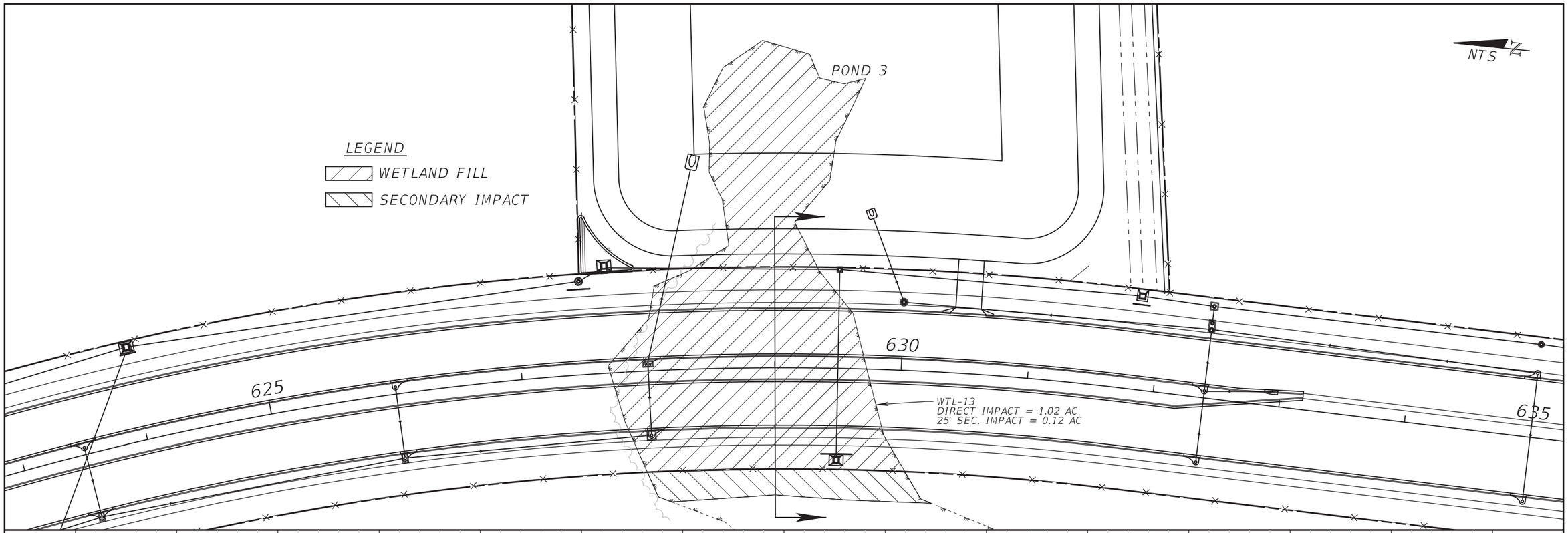
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

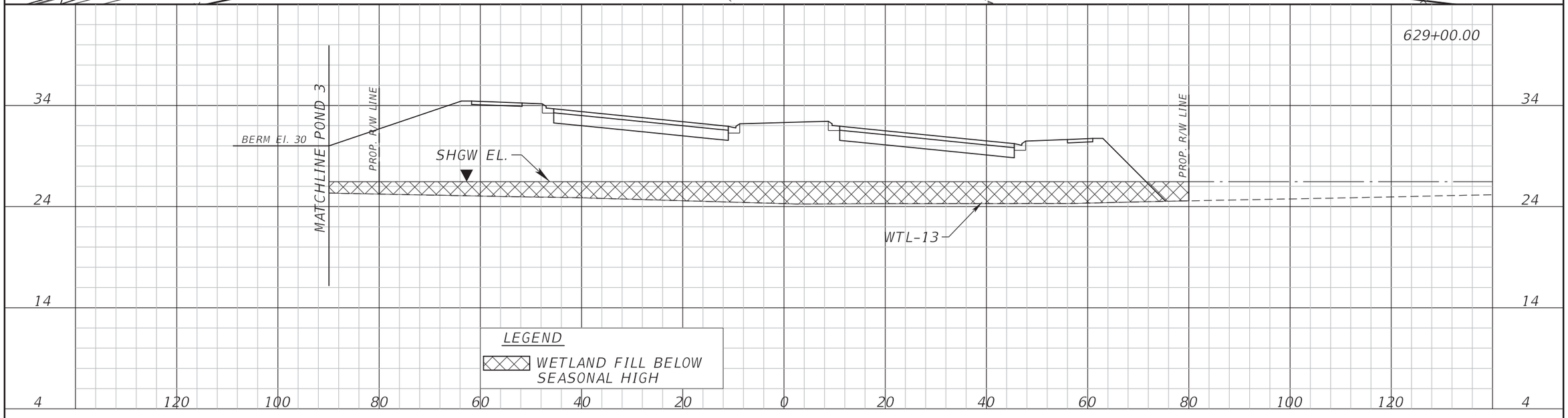
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 710	OKEECHOBEE	419344-3-52-01

DREDGE AND FILL SKETCHES

SHEET NO. 10

USER: George 6/22/2018 11:09:13 AM c:\pwworking\wgi\george\d0586041\PLANEM17.DGN





REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

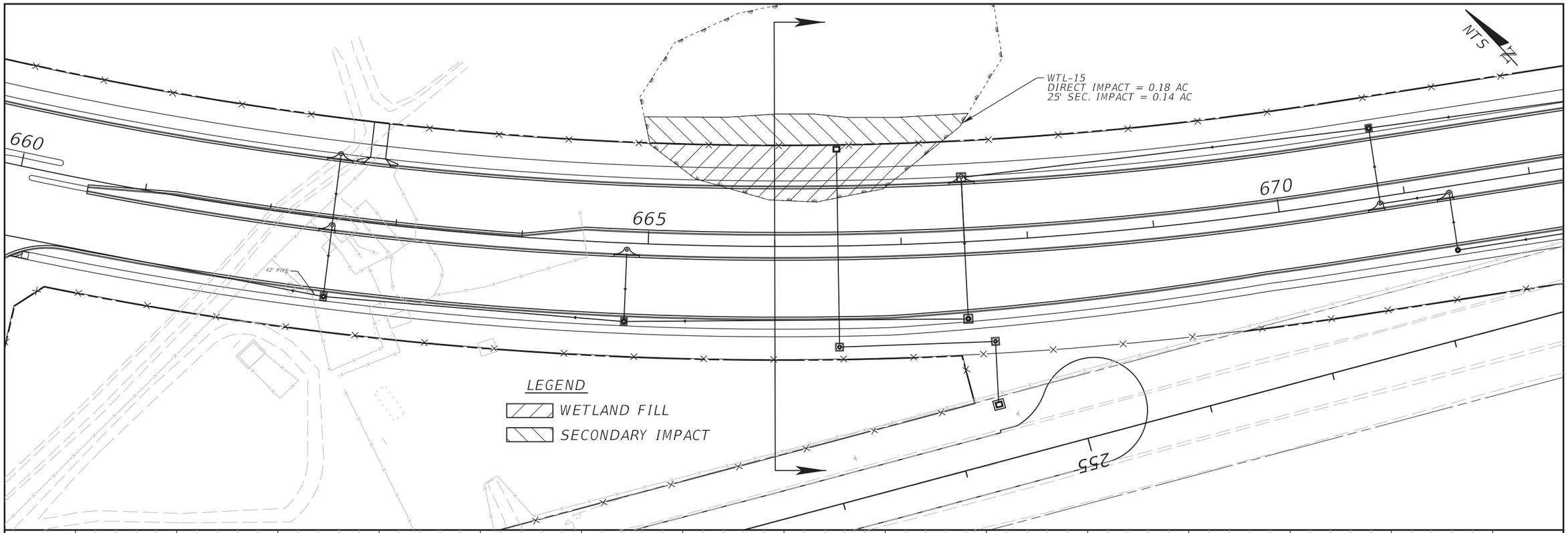
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

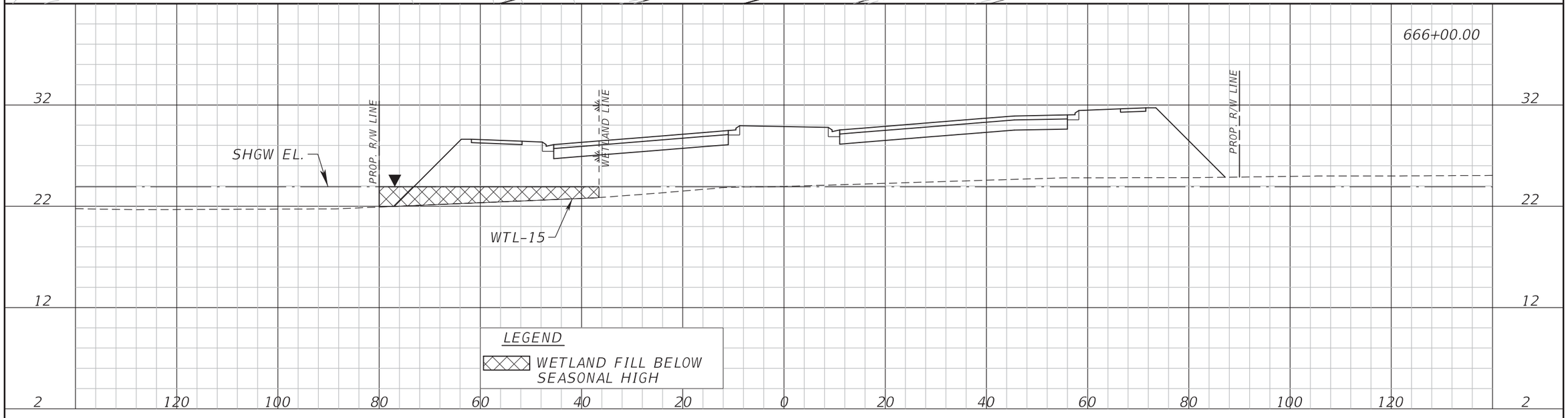
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 710	OKEECHOBEE	419344-3-52-01

DREDGE AND FILL SKETCHES

SHEET NO. 11

USER: George 6/22/2018 11:09:17 AM c:\pwworking\wgi\george\d0586041\PLANEM18.DGN





REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

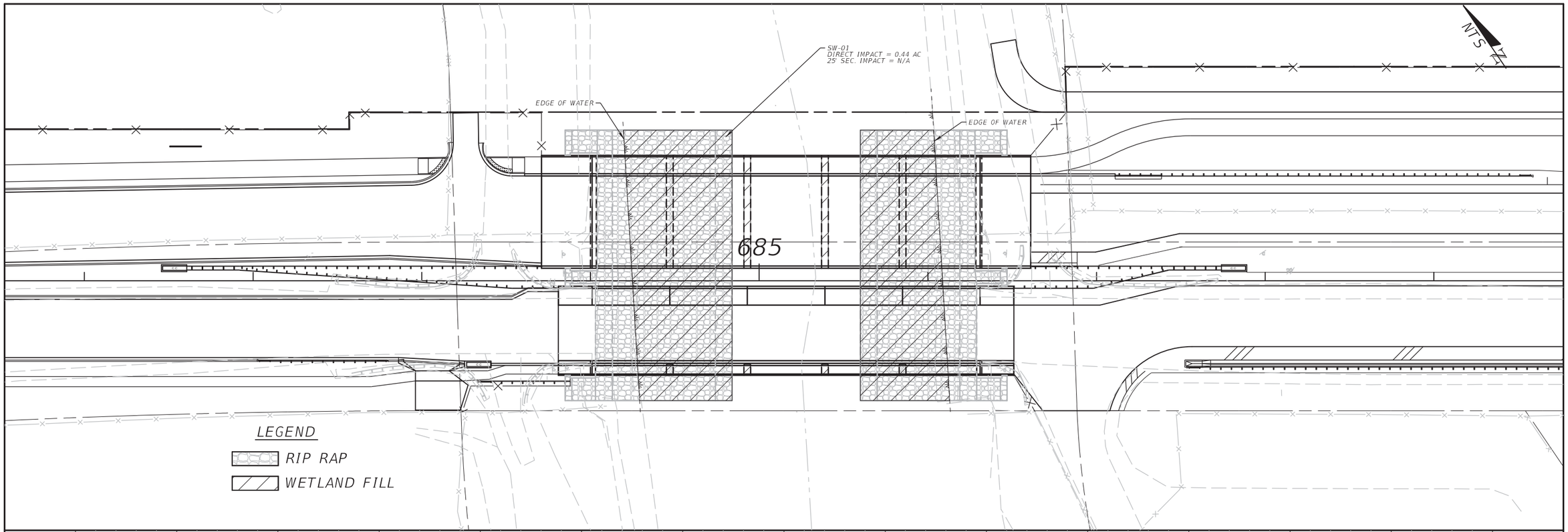
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

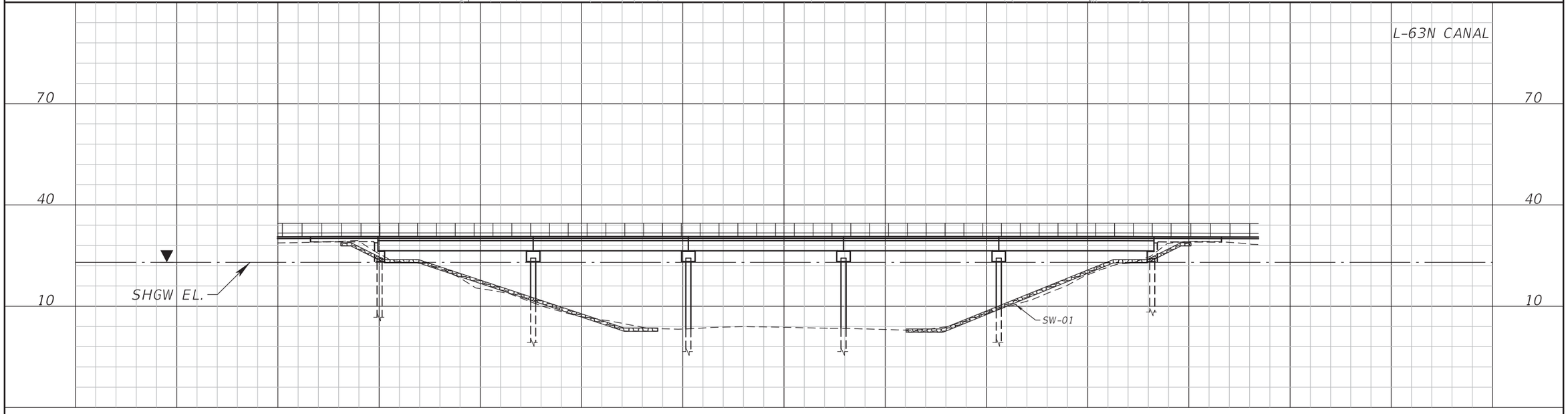
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 710	OKEECHOBEE	419344-3-52-01

DREDGE AND FILL SKETCHES

SHEET NO. 12

USER: George 6/22/2018 11:09:21 AM c:\pwworking\wgi\george\d0586041\PLANEM19.DGN





REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

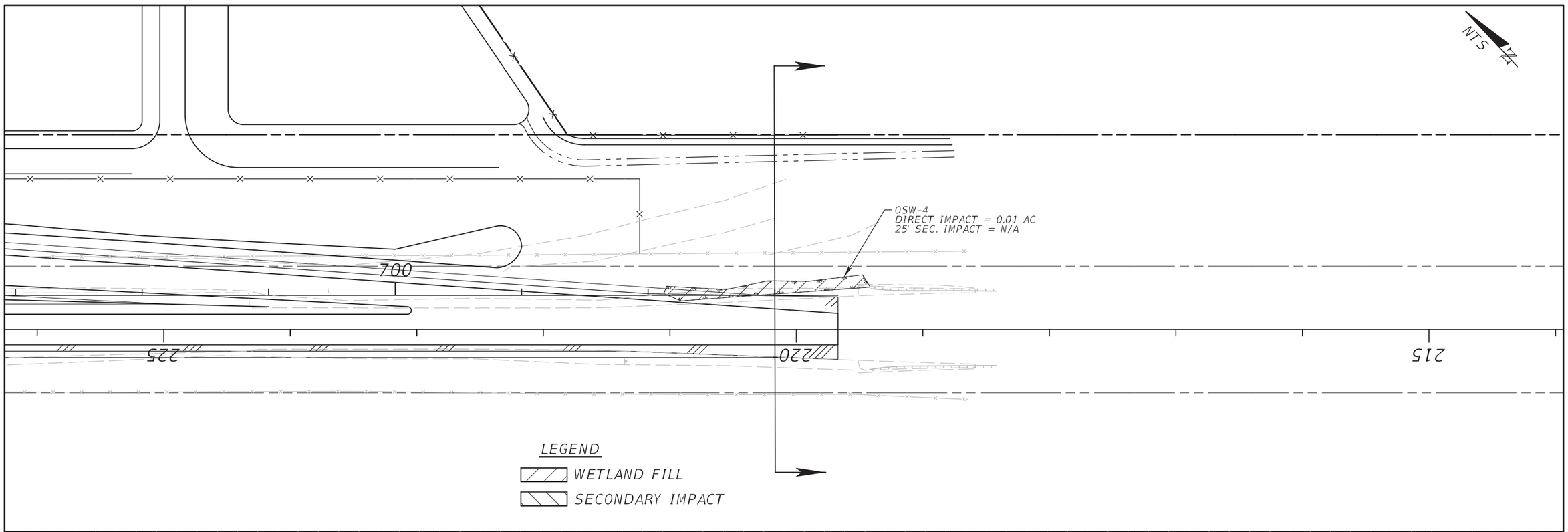
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

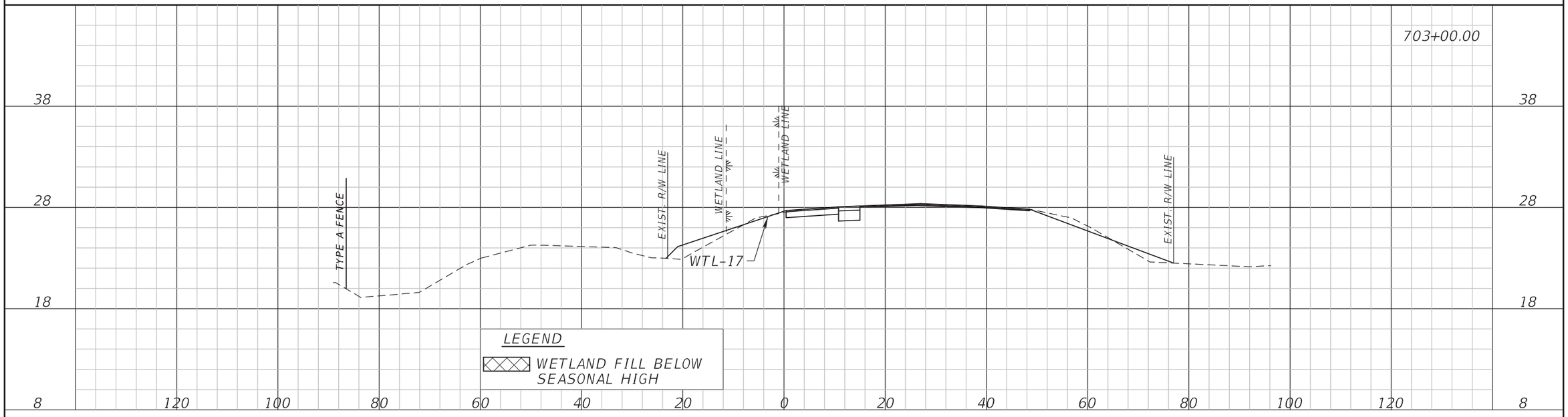
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 710	OKEECHOBEE	419344-3-52-01

DREDGE AND FILL SKETCHES

SHEET NO. 13

USER: George 6/22/2018 11:09:25 AM c:\pwworking\wgi\george\d0586041\PLANEM20.DGN





REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 710	OKEECHOBEE	419344-3-52-01

DREDGE AND FILL SKETCHES

SHEET NO. 14

USER: George 6/22/2018 11:09:29 AM c:\pwworking\wgi\george\d0586041\PLANEM21.DGN

NTS

WTL-17
DIRECT IMPACT = 0.52 AC
25' SEC. IMPACT = 0.25 AC

LEGEND

WETLAND FILL

SECONDARY IMPACT

695

700

230

225

220

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 710	OKEECHOBEE	419344-3-52-01

DREDGE AND FILL SKETCHES

SHEET NO.

15

USER: George 6/22/2018 11:09:33 AM c:\pwworking\wgi\george\d0586041\PLANEM22.DGN

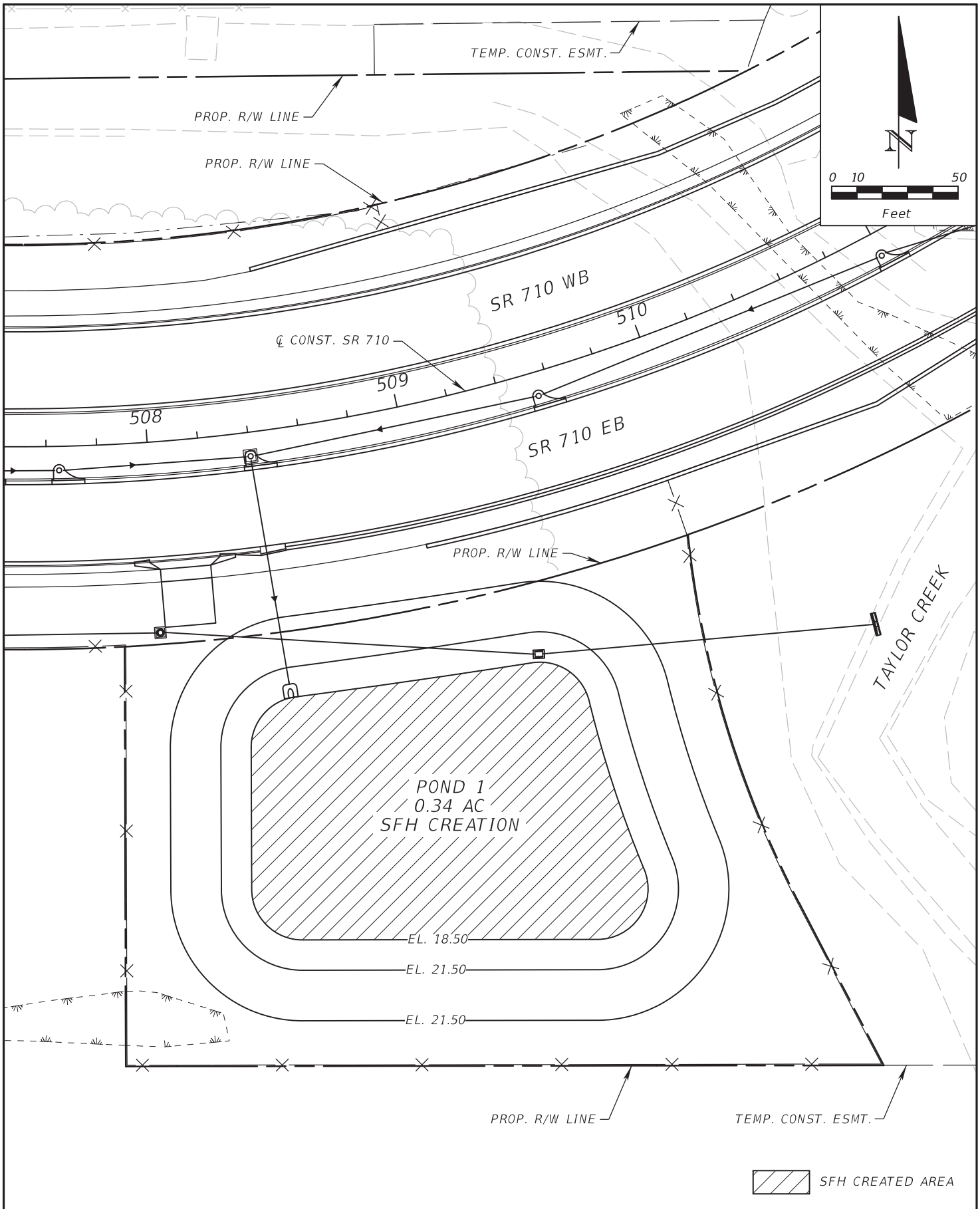
Appendix C

Suitable Forging Habitat Creation Plan Sheets

SR 710 from US 441 to L-63N
Impacts and Offset Summaries
June 22, 2018

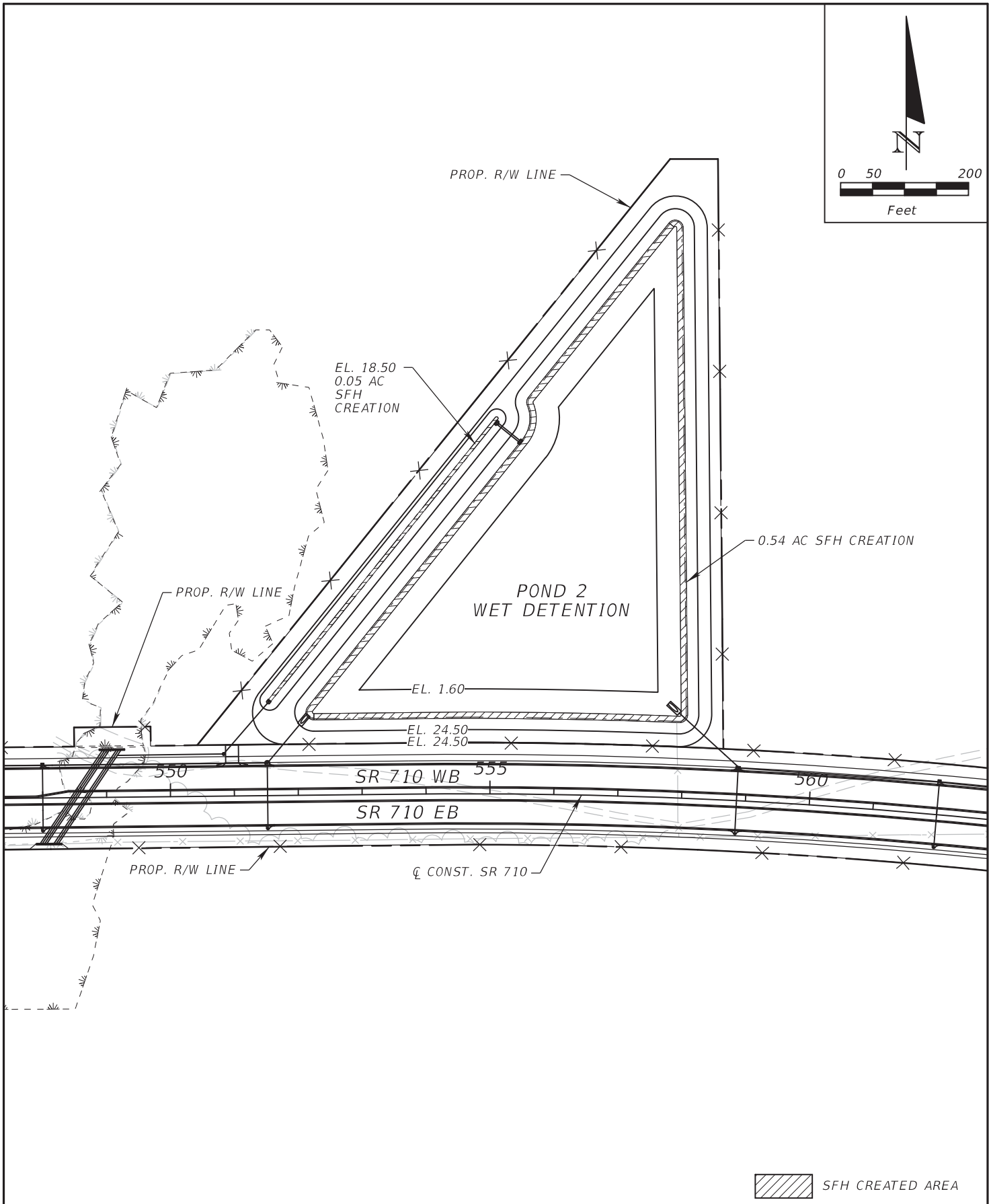
Name	Surface Water/Wetland Area (ac)	Impacted Area (ac)	Wood Stork Suitable Foraging Area Impact (ac)	Total Offset/Created Area (ac)
WTL-01	0.27	0.27	0.27	
WTL-03	0.05	0.05	0.02	
WTL-05A	0.14	0.11	0.11	
WTL-05B	0.26	0.01	0.01	
WTL-05C	0.98	0.69	0.69	
WTL-08	5.67	0.47	0.47	
WTL-09**	2.21	0.83	0.83	
WTL-10**	0.94	0.40	0.40	
WTL-11**	0.08	0.02	0.02	
WTL-12	1.38	0.71	0.71	
WTL-13	3.25	1.02	1.02	
WTL-15	0.83	0.18	0.18	
WTL-17	1.84	0.52	0.52	
OSW	0.03	0.01		
SW-02	0.68	0.68		
SW-01	0.77	0.44		
Pond 01				0.34
Pond 02				0.54
Pond 02 Swale				0.05
Pond 03				0.25
Pond 04				0.27
Pond 04 Swale				0.04
Pond 05				0.89
Floodplain Compensation				0.70
Total	**19.38 (17.90 W/1.48 SW)**	**6.41 (5.28 W/1.13 SW)**	**5.28 W**	**3.08***

*The equivalent of 4.80 acres of wetlands SFH will be offset through the purchase of 2.21 credits at an approved mitigation bank to make up 3.33 acre difference from impacted and created SFH areas. This will leave a surplus of 1.47 acres of SFH.
**Non-jurisdictional to the USACE



STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SFH CREATION MAPS (1)
ROAD NO.	COUNTY	FINANCIAL PROJECT ID	
SR 710	OKEECHOBEE	419344-3-52-01	

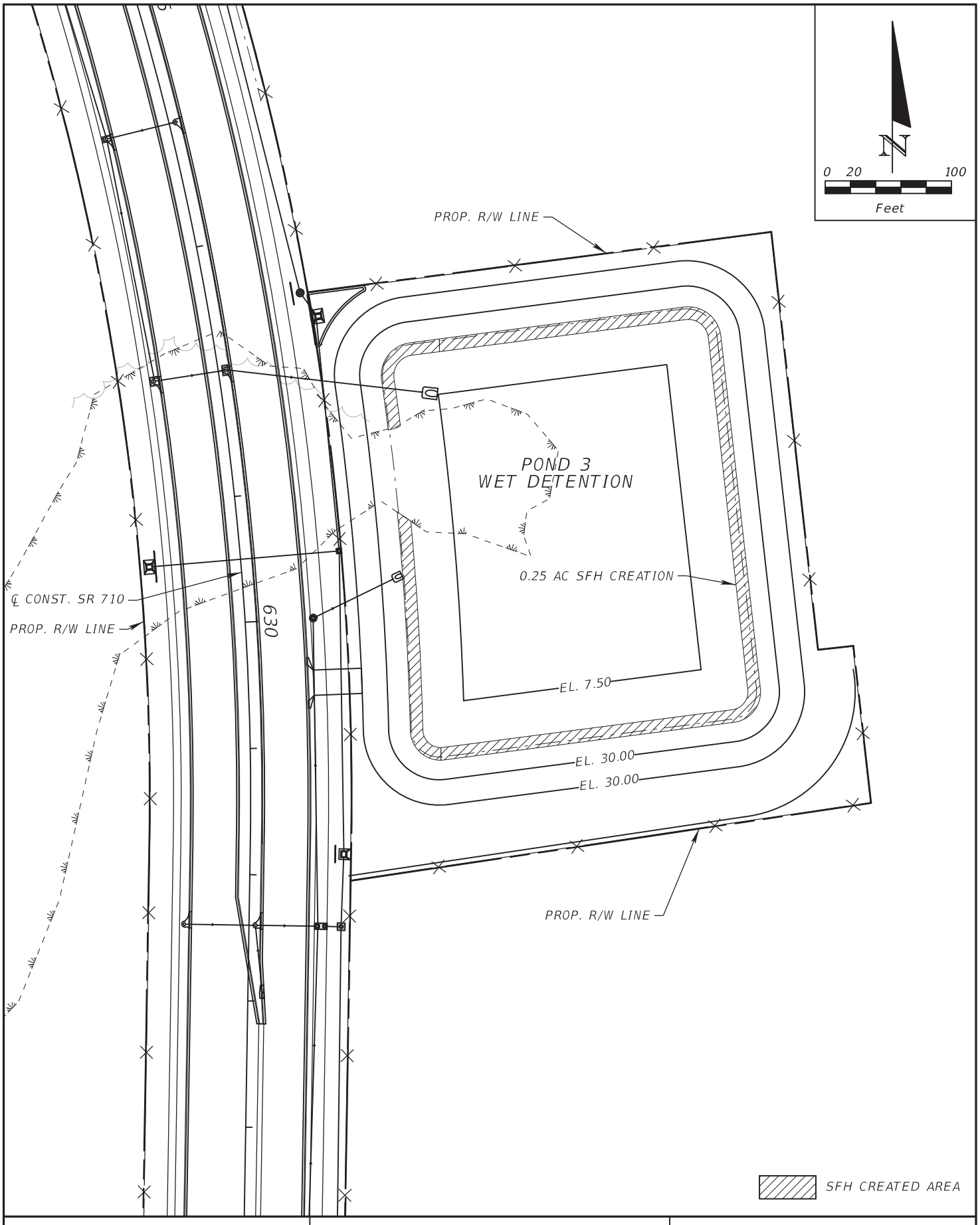
USER: George 5/10/2018 9:02:49 AM c:\pwworking\wgi\george\d0586041\PLANEM01.DGN



STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 710	OKEECHOBEE	419344-3-52-01

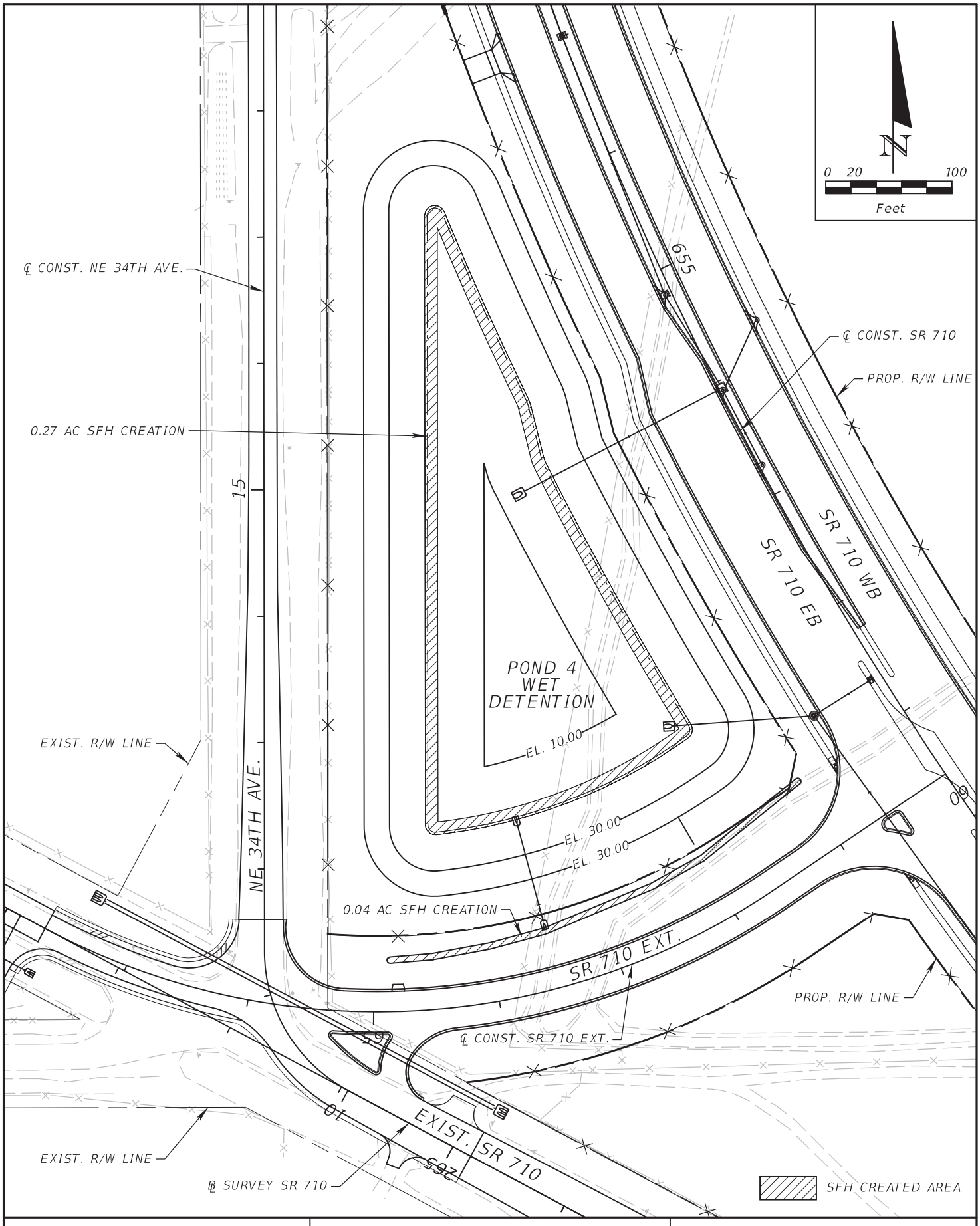
SFH CREATION MAPS (2)

USER: George 6/21/2018 4:39:57 PM c:\pwworking\wgi\george\d0586041\PLANEM02.DGN



STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SFH CREATION MAPS (3)
ROAD NO.	COUNTY	FINANCIAL PROJECT ID	
SR 710	OKEECHOBEE	419344-3-52-01	

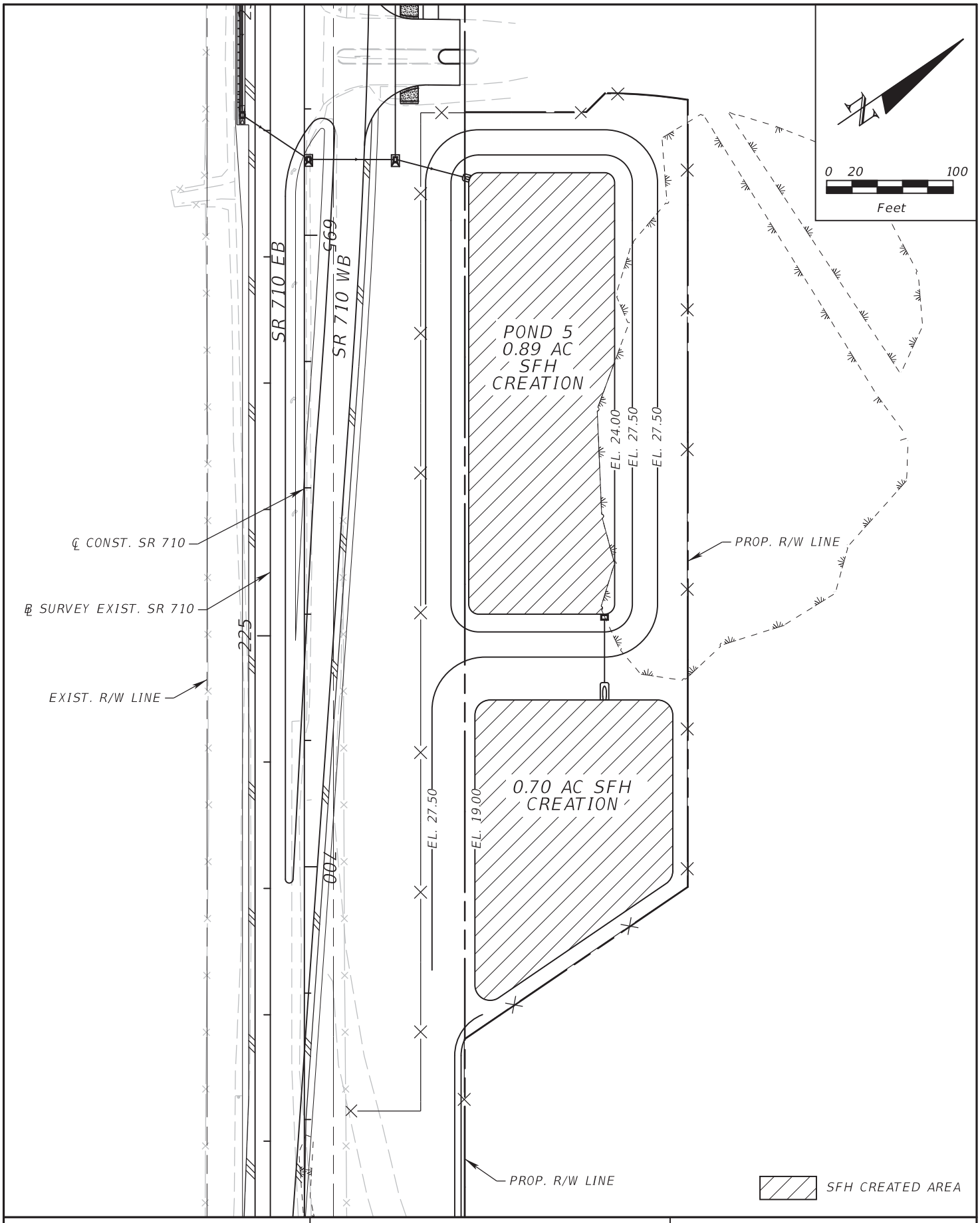
USER: George 6/21/2018 4:40:00 PM c:\pwworking\wgi\george\d0586041\PLANEM03.DGN



STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 710	OKEECHOBEE	419344-3-52-01

SFH CREATION MAPS (4)

USER: George 5/10/2018 9:05:57 AM c:\pwworking\wgi\george\d0586041\PLANEM04.DGN



STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 710	OKEECHOBEE	419344-3-52-01

SFH CREATION MAPS (5)

USER: George 6/21/2018 4:40:03 PM c:\pwworking\wgi\george\d0586041\PLANEM05.DGN

Appendix D

Audubon's Crested Caracara Biological Assessment Report

SR 710 FROM US 441 TO L-63 CANAL
OKEECHOBEE COUNTY, FLORIDA
FPID NO. 419344-3-32-01

Audubon's Crested Caracara Biological Assessment

Prepared for
FDOT District One

August 2018

Prepared by
ESA Scheda Corporation

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 (MOU) dated December 14, 2016 and executed by the Federal Highway Administration and FDOT.

TABLE OF CONTENTS

Biological Assessment

List of Figures

List of Tables

Appendices

SECTION 1
Introduction

The U.S Fish and Wildlife Service (USFWS) Audubon's crested caracara Consultation Area (CA) overlaps the project limits; therefore, there is the potential for this species habitat to be impacted. Additionally, based on the available habitat and coordination with the USFWS, a species-specific caracara survey was warranted for the project. This section summarizes the methods and results of a 2017 species-specific Audubon's crested caracara survey conducted for the proposed design services of SR 710 from US 441 to L-63 Canal. This survey was conducted in compliance with the 2016 USFWS Crested Caracara Draft Survey Protocol – Additional Guidance (2016-2017 Breeding Season).

Species and Habitat Description

The Audubon's crested caracara is a large, boldly patterned raptor with a crest, naked face, heavy bill, elongated neck, and long legs. It has a body length of about 50-60 centimeters (cm) (20-24 inches) and a wingspan of about 124 cm (50 inches). The adult is blackish-brown on the crown, upper abdomen, rump, wings, and thighs. The lower part of the head, throat, upper breast, lower abdomen, and undertail coverts are white or cream. The lower breast has blackish barring with a buff background color. The back is also heavily barred with black and white. The tail is white with 11 to 14 narrow dark crossbars and a broad terminal band; there are conspicuous white patches in the outer part of the wing in flight. The bill is bluish-gray which contrasts with the bright yellow facial skin, which turns reddish-orange when flushed with blood. The legs and feet are deep yellow. Juveniles have a similar color pattern but are brownish and buff with the breast and upper back streaked instead of barred. In addition, facial skin of juveniles is pinkish in color and the legs are gray.

Caracaras inhabit open xeric to mesic habitats. Its preferred habitat is native dry or wet prairie with associated marshes, cabbage palm (*Sabal palmetto*), and cabbage palm-live oak (*Quercus virginiana*) hammocks. Native prairie habitats have been greatly reduced in Florida through construction of housing developments and conversion to improved pasture, consequently caracaras frequently utilize unimproved and improved pastures.

Adult caracaras maintain and defend large territories, usually with their mates. Breeding activity can occur between September and June with the primary season being November through April. Suitable nest trees are an important component of caracara habitat. Cabbage palms are most frequently utilized followed by live oaks, cypress (*Taxodium* spp.), and occasionally Australian pine (*Casuarina* spp.) and black gum (*Nyssa sylvatica*). Caracaras usually construct their nests 12-50 feet above the ground and consist primarily of woven vines trampled to form a depression (Humphrey and Morrison 1997). Caracara pairs sometimes have two or three alternate nest trees

that may be used in different years or for a second nesting effort within the first year. All nest trees are typically situated in the same general vicinity, usually within 0.3 miles of each other.

Caracaras forage extensively on the ground with a foraging range average of 3,000 acres and a radius of approximately one mile. Caracaras are opportunistic feeders with a diet consisting of carrion as well as a wide variety of live invertebrate and vertebrate prey. This species also closely follows agricultural equipment to capitalize on prey that may be exposed during agricultural activities. Agricultural drainage ditches, cattle ponds, roadside ditches, and other shallow water features also provide good feeding areas for caracaras (Morrison 2001). Within native habitats, caracaras regularly scavenge in recently burned areas and forage along the margins of wetlands within dry prairie communities.

Status

The Audubon's crested caracara is a federally designated threatened species by the USFWS and protected by the Endangered Species Act (ESA), as amended (16 U.S.C. 1531 et seq.) and the Migratory Bird Treaty Act. No Critical Habitat has been designated for this species.

The decline of the caracara in Florida is primarily due to habitat loss. In particular, the optimal habitat for caracaras, dry prairie, has been largely destroyed or modified for agriculture and residential development. Additionally, previous regulatory mechanisms did not adequately prevent the destruction or modification of the caracara's habitat, located mainly on private land. Both of these factors led to the federal listing of the species.

In order to reduce the potential for nest abandonment and loss of eggs and small chicks from human disturbance, the USFWS recommends that a primary and secondary protection zone be placed around nest trees (2004 Species Conservation Guidelines South Florida). The primary zone encompasses a 360-degree area extending 985 feet (300 meters) outward from the nest tree. Morrison (2001) found that the adult caracaras are most sensitive to human disturbance during incubation or early nesting stages if the source of disturbance is within 985 feet from the nest tree. Year-round restrictions in the primary zone typically include activities such as alteration to pasture, wetlands, nest trees, and other vegetation, as well as construction of buildings, roads, power lines or canals, changes in land management activities, and chemical applications that are harmful to wildlife. Nesting season limitations within the primary zone include normal agricultural activities (only until nestlings fledge), human entry, and low flyovers by aircraft.

A 360-degree secondary zone is recommended as a foraging protection zone and extends 4,920 feet (1,500 meters) outward from the nest tree. Conservation measures for this zone include maintaining pasture, grassland, and wetlands (including ditches and canals) that are necessary for caracara foraging habitat. Conversion of pasture and wetland habitats in this zone to row crops, sugarcane, citrus groves, pine plantations or hardwood forest may adversely affect caracaras. The use of chemicals toxic to wildlife including pesticides, fertilizers, or herbicides should be limited as they may impact the food supply available for caracaras. Normal ranching and agricultural operations (including sod farming), hiking, bird watching, fishing, camping, picnicking, hunting, and recreational off-road vehicle use are allowed within the secondary zone.

Existing Environmental Characteristics

Natural/biological features and land use within the survey boundary were initially reviewed using the 2014 Florida Land Use, Cover and Forms Classification System (FLUCFCS) Geographic Information System (GIS) data layer available from the South Florida Water Management District (SFWMD) and which was subsequently field verified. A 1,500-meter secondary zone buffer of the survey boundary, which comprises the project action area for this species, was created and Improved Pastures (FLUCFCS 2110 ~ 33%) is the predominant land cover, followed by Woodland Pastures (FLUCFCS 2130 ~ 10%). The remaining land use categories with significant coverage in this survey area include: Medium Density Residential (FLUCFCS 1210 ~ 7%), Mixed Wetland Hardwoods (FLUCFCS 6170 ~ 6%), Open Land (FLUCFCS 1900 ~ 5%), and Commercial Services (FLUCFCS 1400 ~ 5%). **Figure 1** depicts the land uses within the 1,500-meter buffer. Land use within the project limit is heavily impacted due to agricultural activities such as growing row crops, cattle grazing, and citrus farming.

SECTION 2
Methodology

Preliminary Data Collection

A comprehensive literature and GIS database search was conducted for the project action area (1,500-meter buffer of the project boundary) to determine if the Audubon's crested caracara was previously documented within the project limits and if suitable habitat was available. The literature and database search included standard references such as the Rare and Endangered Biota of Florida Series, Florida Geographic Data Library (FGDL) GIS databases, as well as the Florida Fish and Wildlife Conservation Commission (FWC) and USFWS lists of protected species and their GIS databases.

Based on this preliminary protected species effort, caracara findings include the following:

- The project falls within the USFWS Audubon's crested caracara CA;
- No critical habitat has been designated for the caracara;
- Suitable foraging and nesting habitat was identified within the project boundary (proposed ROW) and outside the project boundary;
- Caracaras were documented flying, feeding, and perching in the vicinity of the project area in the PD&E Study during the 2013 nesting season;
- In 2005 and 2009-2011 caracara nest trees were documented within the South Florida Water Management District (SFWMD)-managed Lake Okeechobee Water Retention Phosphorus Removal project site, approximately 3.12 miles east of the SR 710 project boundary (2011 USFWS Biological Opinion Nubbin Slough STA Intake Design Refinement); and
- The nearest caracara nest tree was documented for the SR 70 widening from NE 31st Avenue to east of NE 80th Avenue project. The nest tree was documented in 2010 and was approximately 2.91 miles northeast of the SR 710 project (2013 USFWS Biological Opinion State Road 70 From Northeast 31st Avenue to East of Northeast 80th Avenue); therefore, will not be affected.

Field Survey Methodology

Project biologists examined current aerial photographic imagery and field-verified 2014 SFWMD FLUCFCS data to identify appropriate areas to survey for caracara nests. The 1,500-meter survey boundary buffer was used to identify any potential nests that would have a primary 985-foot (300-meter) and/or secondary 4,920-foot (1,500-meter) protection zone that overlaps with the proposed project.

Six survey stations were established which allowed for a field of view that included potential caracara nesting trees. Determination of survey stations was based upon potential available nesting habitat, area of visibility, and suitable foraging habitat. Field surveys were conducted bi-weekly; each included field surveys in the morning as per the 2016 USFWS Crested Caracara Draft Survey Protocol – Additional Guidance (2016-2017 Breeding Season) (December 2016) (**Appendix A**). Each survey event was conducted over a two or more-day period in the same week. Field surveys were conducted from January 5 through April 27, 2017. Surveys began at sunrise and continued until late morning. For each survey event, a team of one or two field biologists monitored a pre-determined survey station. Typically, each person worked individually and routinely assessed the project area to the greatest extent possible and monitored areas that had suitable nesting and/or foraging habitat in the vicinity. Survey efforts were focused in open pastures which provide the best foraging habitat for the species in the survey boundary. Survey stations and observation blocks are presented in **Figure 2**.

Caracara datasheets modeled after USFWS samples were used to record observations (**Appendix B**). The datasheets document information on the number of individuals, age class, and activity was recorded during observation periods as well as other wildlife observations.

SECTION 3
Results

Potential foraging habitat for the species was identified throughout the project landscape. Pastureland, dry prairies and open lands, lightly wooded areas, and roadways (which provide roadkill) offer foraging opportunities for the species and are all present within the project area. Potential nesting habitat for the species was also identified within the project area; specifically, pastureland and dry prairies with scattered cabbage palms. Within the immediate roadway footprint, only minimal potential nesting habitat was observed which consists of scattered cabbage palms and oaks in the region of the new alignment.

All locations of observed individual caracaras were recorded and the results are presented in **Figure 3.** USFWS Caracara Survey Forms are provided in **Appendix B** and a summary of the survey data is documented in **Table 1**. Photos documenting the representative field of view at each survey station are in **Appendix C**. Crested caracara observer experience is documented in **Table 2**. The faunal species observed during the Audubon's crested caracara surveys are documented in **Table 3**.

The first observation of a caracara was on January 6, 2017, when one adult caracara was observed at Station 6, flying north to south from over the power substation to over a house to the east. Individual caracaras were also observed several times throughout the field surveys on January 16, 19, 30 2017; March 15, 2017; April 14, 26, and 27, 2017. Only one sighting (April 26, 2017) documented a pair of Audubon's crested caracara together and during this sighting the pair were observed flying along the canal north of the project area and out of sight of the observer. No nesting behavior was observed and no nests of the Audubon crested caracara were documented during the field surveys.

Effect Determination

One potential crested caracara nest was documented in the PD&E phase of the SR 710 project during the 2008 and 2009 crested caracara nesting seasons. This potential nest is 3.4 miles southeast of the current SR 710 project limits. During the 2017 crested caracara nesting season field surveys, caracaras were observed in the current SR 710 project limits. Based upon caracara flight patterns and behaviors during the 2017 surveys it is unlikely that the project limits contain any active caracara nests, nor is the project likely located within the 300-meter primary zone buffer or 1,500-meter secondary zone buffer of any active caracara nests. No Audubon caracara nests were documented during the 2017 crested caracara survey of the design phase of the SR 710 project. Therefore, it is anticipated that the proposed project **"may affect, but is not likely to adversely affect"** the Audubon's crested caracara.

SECTION 4
References

.

Humphrey, S.R., and J. L. Morrison. 1997. Habitat Associations, Reproduction, and Foraging Ecology of Audubon's Crested Caracaras in South-Central Florida. Final Report. Florida Game and Freshwater Fish Commission (Florida Fish and Wildlife Conservation Commission) Nongame Program Project No. NG91-007 (August 8, 1997).

Morrison, J. L. 2001. Recommended Management Practices and Survey Protocols for Audubon's Crested Caracara (*Polyborus plancus audubonii*) in Florida. Technical Report No. 18. Florida Fish and Wildlife Conservation Commission, Tallahassee, FL.

USFWS. 2004. Species Conservation Guidelines, South Florida: Audubon's Crested Caracara.

USFWS. 2016. USFWS Crested Caracara Draft Survey Protocol-Additional Guidance (2016-2017 Breeding Season).

Figures

Legend

- PROJECT LOCATION
- PROJECT LOCATION - 1500 M BUFFER (6885.39 ac.)
- SFWMD FLUCFCS

Begin Project

End Project

LUCODE

1110 - RESIDENTIAL, LOW DENSITY - FIXED SINGLE FAMILY (76.18 ac.)
1120 - RESIDENTIAL, LOW DENSITY - MOBILE HOME (14.66 ac.)
1130 - RESIDENTIAL, LOW DENSITY - MIXED, FIXED AND MOBILE (6.62 ac.)
1180 - RESIDENTIAL, LOW DENSITY - RURAL RESIDENTIAL (209.77 ac.)
1210 - RESIDENTIAL, MEDIUM DENSITY - FIXED SINGLE FAMILY (483.47 ac.)
1220 - RESIDENTIAL, MEDIUM DENSITY - MOBILE HOME (71.82 ac.)
1230 - RESIDENTIAL, MEDIUM DENSITY - MIXED, FIXED AND MOBILE (38.11 ac.)
1290 - RESIDENTIAL, MEDIUM DENSITY - UNDER CONSTUCTION (42.15 ac.)
1320 - RESIDENTIAL, HIGH DENSITY - MOBILE HOME (11.68 ac.)
1330 - RESIDENTIAL, HIGH DENSITY - MULTIPLE DWELLING, LOW RISE (11.19 ac.)
1400 - COMMERCIAL AND SERVICES (320.91 ac.)
1423 - WHOLESALE SALES AND SERVICES - JUNKYARD (4.58 ac.)
1550 - INDUSTRIAL - OTHER LIGHT INDUSTRY (102.47 ac.)
1700 - INSTITUTIONAL (108.53 ac.)
1710 - EDUCATIONAL FACILITIES (207.42 ac.)
1850 - PARKS AND ZOOS (42.53 ac.)
1900 - OPEN LAND (331.21 ac.)
1920 - INACTIVE LAND WITH STREET PATTERN (7.38 ac.)
2110 - IMPROVED PASTURES (2264.27 ac.)
2120 - UNIMPROVED PASTURES (192.86 ac.)
2130 - WOODLAND PASTURES (702.65 ac.)
2150 - FIELD CROPS (75.26 ac.)
2210 - CITRUS GROVES (48.94 ac.)
2410 - TREE NURSERIES (18.19 ac.)
2430 - ORNAMENTALS (9.44 ac.)
2510 - HORSE FARMS (57.23 ac.)
3100 - HERBACEOUS (DRY PRAIRIE) (26.09 ac.)
3200 - UPLAND SHRUB AND BRUSHLAND (63.18 ac.)
3300 - MIXED RANGELAND (20.52 ac.)
4110 - PINE FLATWOODS (29.05 ac.)
4200 - UPLAND HARDWOOD FOREST (111.12 ac.)
4271 - OAK - CABBAGE PALM FOREST (12.21 ac.)
4340 - HARDWOOD - CONIFER MIXED (87.83 ac.)
5120 - CHANNELIZED WATERWAYS, CANALS (138.30 ac.)
5300 - RESERVOIRS (31.03 ac.)
6110 - BAY SWAMPS (2.25 ac.)
6170 - MIXED WETLAND HARDWOODS (434.07 ac.)
6172 - MIXED SHRUBS (80.33 ac.)
6210 - CYPRESS (70.61 ac.)
6300 - WETLAND FORESTED MIXED (55.05 ac.)
6410 - FRESHWATER MARSHES / GRAMINOID PRAIRIE - MARSH (81.24 ac.)
7400 - DISTURBED LANDS (3.37 ac.)
7470 - DIKES AND LEVEES (118.79 ac.)
8110 - AIRPORTS (1.18 ac.)
8140 - ROADS AND HIGHWAYS (21.11 ac.)
8200 - COMMUNICATIONS (20.54 ac.)
8310 - ELECTRICAL POWER FACILITIES (5.90 ac.)
8330 - SEWAGE TREATMENT (12.12 ac.)

Figure 1 - Land Use WIthin 1,500 Meter Buffer Map

SR 710 from US 441 to L-63 Canal
FPID #: 419344-3-32-01
Okeechobee County, Florida

0 2,200 4,400 6,600 Feet

Data Source:
- Wantman Group
- SFWMD

Imagery Source:
- ESRI Aerial Imagery

Coordinate System:
NAD 1983 Florida
State Plane East

N

Date: 07/26/17 Rev. Date: 06/04/18 PM: RM GIS Analyst: TMS Map Document: 23 16 .luc .tms .20170726.mxd Project Number: 0523316.20.C PDF Document: 23 16 .luc .tms .20170726.pdf Plot Size: 11x17

Begin Project

End Project

1 2 3 4 5 6

Okeechobee County Airport

Legend

- PROJECT LOCATION
- PROJECT LOCATION - 1500 M BUFFER
- CARACARA OBSERVATION BLOCKS
- SURVEY STATIONS

Figure 2 - Crested Caracara Survey Stations and Observation Blocks Map

SR 710 from US 441 to L-63 Canal
FPID #: 419344-3-32-01
Okeechobee County, Florida

0 2,200 4,400 6,600 Feet

Data Source:
- Wantman Group
- ESA Scheda

Imagery Source:
- ESRI Aerial Imagery

Coordinate System:
NAD 1983 Florida State Plane East

N

Date: 07/27/17 Rev. Date: 06/04/18 PM: RM GIS Analyst: TMS Map Document: 2316_caracara_tms_20170727.mxd Project Number: 002316.20 C:PDF Document: 2316_caracara_tms_20170727.pdf Plot Size: 11x17

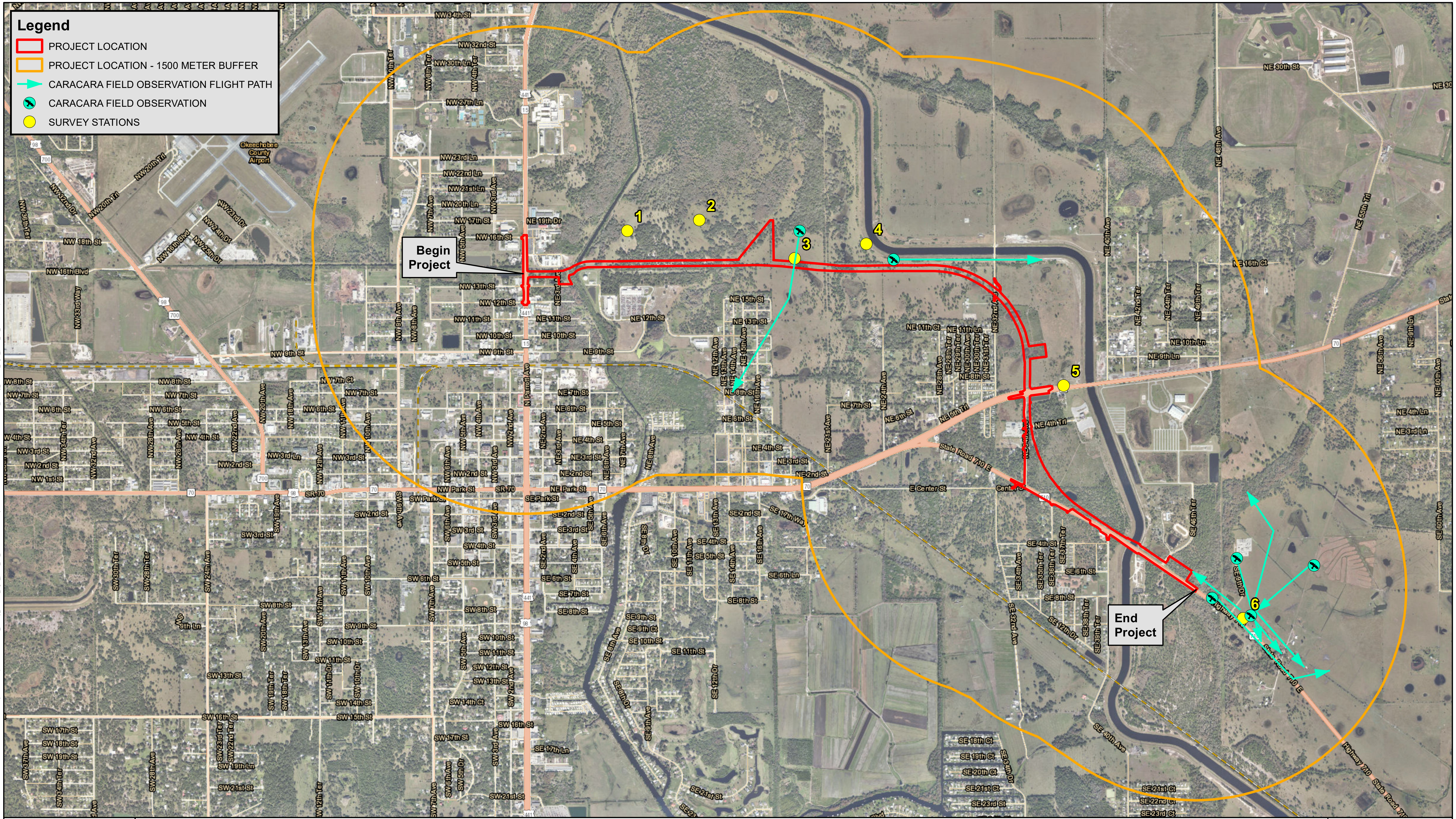


Figure 3 - Crested Caracara Survey Stations and Flight Path Map

SR 710 from US 441 to L-63 Canal
FPID #: 419344-3-32-01
Okeechobee County, Florida

0 2,200 4,400 6,600 Feet

N

FDOT

Data Source:
- Wantman Group
- ESA Scheda
Imagery Source:
- ESRI Aerial Imagery

Coordinate System:
NAD 1983 Florida
State Plane East

Tables

Table 1. Summary of Caracara Survey Data

Date of Site Visit	Number of Caracaras Observed	Activity Observed
Jan. 05, 2017	0	No caracara observed
Jan. 06, 2017	1	One adult caracara observed at Station 6, flying north to south from area over power substation to over house to the east of observer Station 6 at 09:28AM.
Jan. 16, 2017	2	Individual caracaras observed at Station 6. First observation was at 07:11AM, when an adult caracara was observed on the ground in cattle pasture with two black vultures. At 07:15AM, this individual flew southeast over pasture towards houses and barn, out of sight. At 8:27AM, an adult caracara was observed flying north from the pasture, near the location of the earlier sighting. The individual flew west into the tree line and north past power lines out of sight. The caracara was observed to have an unknown object in its beak.
Jan. 17, 2017	0	No caracara observed
Jan. 19, 2017	1	At 09:18AM, one adult caracara observed at Station 3, flying south in a zigzag flight pattern around pond. Flew out of observer's sight over residential area to southwest.
Jan. 30, 2017	1	At 06:58AM at Station 6, an adult caracara flew from north to south and landed in the pasture. It was observed eating at a carcass and foraging. It flew southeast and out of sight at 07:04AM.
Feb. 01, 2017	0	No caracara observed
Feb. 02, 2017	0	No caracara observed
Feb. 15, 2017	0	No caracara observed
Feb. 16, 2017	0	No caracara observed
Feb. 17, 2017	0	No caracara observed
Feb. 27, 2017	0	No caracara observed
Feb. 28, 2017	0	No caracara observed
Mar. 01, 2017	0	No caracara observed
Mar. 02, 2017	0	No caracara observed
Mar. 03, 2017	0	No caracara observed
Mar. 13, 2017	0	No caracara observed
Mar. 14, 2017	0	No caracara observed
Mar. 15, 2017	1	At 07:45AM at Station 6, one adult caracara was observed flying north over the trees, then south along SR 710 until it flew out of sight of SR 710 in the proximity of the barn.

Table 1. Summary of Caracara Survey Data

Date of Site Visit	Number of Caracaras Observed	Activity Observed
Mar. 16, 2017	0	No caracara observed
Mar. 27, 2017	0	No caracara observed
Mar. 28, 2017	0	No caracara observed
Mar. 30, 2017	0	No caracara observed
Mar. 31, 2017	0	No caracara observed
Apr. 10, 2017	0	No caracara observed
Apr. 11, 2017	0	No caracara observed
Apr. 12, 2017	0	No caracara observed
Apr. 13, 2017	0	No caracara observed
Apr. 14, 2017	1	At Station 6 at 09:00AM, one adult caracara flew from behind observation point to the south over the pasture to the east of SR 710 toward buildings then out of sight behind trees.
Apr. 25, 2017	0	No caracara observed
Apr.26, 2017	2	At Station 4 at 07:20AM, two adult caracara are observed flying east along the canal. They continue eastward until out of sight.
Apr. 27, 2017	1	At Station 6 at 08:30AM, one adult caracara is observed flying northwest along the road.

Table 2. Crested Caracara Observer Experience

Name	Primary or Secondary Observor	Total Hours of Experience	Number of Caracara Nests Previously Found
Robert Mrykalo	Primary	280	3
Claus Hansen	Primary	100	1
Garren Mezza	Primary	41	0
Nicholas Gadbois	Primary	65	1

Table 3. Listed and Non-Listed Wildlife Species Observed

Scientific Name	Common Name	FWC Status*	USFWS Status**
BIRDS			
Accipiter cooperii	Cooper's hawk		
Agelaius phoeniceus	red-winged blackbird		
Ammodramus savannarum	grasshopper sparrow		
Anhinga anhinga	anhinga		
Antigone canadensis pratensis	sandhill crane	T	
Aramus guarauna	limpkin		
Ardea alba	great egret		
Ardea herodias	great blue heron		
Bubulcus ibis	cattle egret		
Buteo lineatus	red-shouldered hawk		
Cardinalis cardinalis	northern cardinal		
Cathartes aura	turkey vulture		
Charadrius vociferus	killdeer		
Coragyps astratus	black vulture		
Corvus brachyrhynchos	American crow		
Corvus ossicfragus	fish crow		
Cyanocitta cristata	blue jay		
Dryocopus pileatus	pileated woodpecker		
Egretta caerulea	little blue heron	T	
Egretta thula	snowy egret		
Egretta tricolor	tricolored heron	T	
Elanoides forficatus	swallow-tailed kite		
Eudocimus albus	white ibis		
Falco sparverius	American kestrel		
Gallinula galeata	common gallinule		
Haliaeetus leucocephalus	bald eagle		#
Lanius ludovicianus	loggerhead shrike		
Megaceryle alcyon	belted kingfisher		
Melanerpes carolinus	red-bellied woodpecker		
Meleagris gallopavo	wild turkey		
Mimus polyglottos	northern mockingbird		
Miniotilta varia	black-and-white warbler		
Mycteria americana	wood stork		
Pandion haliaetus	osprey		
Pelecanus occidentalis	brown pelican		
Phalacrocorax auritus	double-crested cormorant		
Podilymbus podiceps	pied-billed grebe		
Polioptila caerulea	blue-gray gnatcatcher		
Polyborus plancus audubonii	Audubon's crested caracara		T
Progne subis	purple martin		
Quiscalus major	boat-tailed grackle		
Quiscalus quiscula	common grackle		
Rostrhamus sociabilis plumbeus	Everglade snail kite		E
Sayornis phoebe	eastern phoebe		
Setophaga coronata	yellow-rumped warbler		
Setophaga discolor	prairie warbler		
Setophaga palmarum	palm warbler		
Sturnus vulgaris	European starling		
Tachycineta bicolor	tree swallow		
Tringa flavipes	lesser yellowlegs		

Table 3. Listed and Non-Listed Wildlife Species Observed

Scientific Name	Common Name	FWC Status*	USFWS Status**
Turdus migratorius	American robin		
Zenaida macroura	mourning dove		
REPTILES			
Alligator mississippiensis	American alligator		T (S/A)
Gopherus polyphemus	Gopher tortoise	T	
MAMMALS			
Canis latrans	coyote		
Odocoileus virginianus	white-tailed deer		
Sciurus niger shermani	Sherman's fox squirrel	SSC	
Sus scrofa	wild hog		

*Florida Fish and Wildlife Conservation Commission (FWC)
E = Endangered
T = Threatened
SSC = Species of Special Concern

**U.S. Fish and Wildlife Service (USFWS)
E = Endangered
T = Threatened
# Protected by Bald and Golden Eagle Protection Act
T(S/A) = Federally-designated Threatened species due to similarity of appearance

Appendix A

2016 USFWS Crested Caracara Draft Survey Protocol- Additional Guidance (2016-2017)

USFWS Crested Caracara Draft Survey Protocol – Additional Guidance (2016-2017 Breeding Season)

The northern crested caracara (*Caracara cheriway*) is a resident, diurnal, and non-migratory raptor that occurs primarily in Florida, Texas, Arizona, Cuba, Mexico, Central America, and the northern portions of South America (Morrison and Dwyer 2012). Only the Florida population, which is isolated from the remainder of the species, is listed as threatened under the Endangered Species Act.

In order to avoid the potential for unauthorized take, future project sites within the caracara consultation area (Figure 1) containing habitats (same or similar) as described below should undergo a formal caracara survey to determine site utilization by caracaras. The intent of caracara surveys is three-fold: (1) to determine the location(s) of active caracara nest(s) that could be adversely affected by the proposed project; (2) to determine the presence and use of the project area by breeding and non-breeding caracaras, including the approximate boundaries of breeding territories, if possible; and (3) to determine the fate and productivity of any caracara nest found.

We recommend coordinating with the U.S. Fish and Wildlife Service (Service) prior to conducting surveys, including submittal of a proposed survey plan and list of observers which follows the guidance below. Following the guidance will ensure that the surveys are timed during the period of greatest detection to document caracaras within or adjacent to the proposed project. The Service has caracara observation and nest location data as well as designated caracara congregation areas that may be of use for planning surveys. For project consultations under the Endangered Species Act, surveys must follow this protocol and must be no older than the previous caracara nesting season (January – April) in order to be considered valid. In the event that construction or vegetation clearing activity will occur more than one year after permitting is completed, contact the Service to discuss the need for follow-up surveys.

Foraging and Nesting Habitat

The Florida caracara population commonly occurs on dry or wet prairies with scattered cabbage palms (*Sabal palmetto*). It may also be found in lightly wooded areas. Scattered saw palmetto (*Serenoa repens*), scrub oaks (*Quercus geminata, Q. minima, Q. pumila*), and cypress (*Taxodium* spp.) may also be present. Widespread changes in land use may have caused a change in habitat use in this species. Morrison and Humphrey (2001) found a strong association of caracara home ranges with improved pasture. The presence of seasonal wetlands, which may serve as foraging habitat, is an important factor in the attractiveness of these pastures to caracaras (Service 1999). Therefore, today we recognize caracara foraging habitat (and nesting territories) as those areas with short herbaceous vegetation. This includes native wet and dry prairies, but also improved, unimproved, and woodland pastures, sod farms, row crops, levees, and rangeland. Juvenile caracaras may also use citrus and tree farms.

The primary nesting substrate is cabbage palm, although there have been rare reports of nesting in slash pine (pers. obs.), cypress, oak, red cedar (Morrison 2007), Australian pine

(*Casuarina* sp.), saw palmetto, and black gum (*Nyssa sylvatica*), and even more atypical locations such as an electrical substation, radio tower, and billboard (Dwyer and DallaRosa 2015).

Survey Design and Planning

The protective area for a caracara nest is a radius of about 1,500 meters (m) (4,920 feet) from the nest. Therefore, the survey area should include the project area and a 1,500-m buffer zone around the perimeter of the project area (including access roads) to account for off-site nest trees in territories that might overlap onto the project area. A recent aerial photograph depicting the project boundary and buffer zone should be used to identify all areas of suitable habitat and to preliminarily map observation blocks. An observation block is defined as an area easily observable from one vantage point. Enough observation blocks must be identified to cover all suitable habitats within the project boundary and 1,500-m buffer. Surveyors should try to obtain legal access to non-project property within the survey area where suitable habitat exists; these efforts should be documented (e.g., copy of letter, email, etc.). If permission cannot be obtained, contact the Service for additional guidance prior to initiating surveys.

Prior to the first survey, a site visit should be conducted to confirm suitable habitat and the location of observation blocks. Based on this site assessment (*e.g.*, presence of visual obstructions), observation blocks may need to be revised. During the site visit, also identify observer survey stations (at least one per observation block). Survey stations should be located to allow full, unobstructed view of the observation block – strategic points are those where caracaras are more likely to be seen going to and from potential nesting or foraging sites. Based on the site assessment, update the aerial photo to show suitable habitat, and labeled observation blocks and their respective survey stations. The location of survey stations may be adjusted if needed based on initial survey results in order to obtain a different/better view of caracara activity. Any adjustments to the survey design should be documented via revised maps.

Observer Qualifications

Information from a recent study (Dwyer *et al.* 2012) suggested that the probability that a visit or series of visits (*i.e.*, a survey) would lead to the discovery of an existing caracara nest increases with an experienced observer. Due to their cryptic nest site locations and unorthodox method of foraging (walking on the ground), successful nest site surveys require a specific skillset acquired by conducting numerous surveys under the supervision of an experienced caracara surveyor. In addition, caracaras can be hard to find and identify at long distances, especially under low-light conditions. Caracaras may also be wary of humans and will change their behavior in the presence of people, which can make locating nests extremely difficult for less experienced observers. Due to these factors, surveys must be conducted by a qualified biologist having at least two years of experience conducting bird surveys and at least 40 hours of caracara survey experience (i.e., equivalent to one survey season) under the supervision of an experienced caracara surveyor. If an observer does not meet these minimum qualifications,

the observer should be accompanied by a qualified observer who will serve as the primary observer. Even in cases of qualified observers, and where staff resources allow it, having two observers at the same station can increase the probability of finding a nest.

Conducting Foraging and Nesting Surveys

The highest probability of success in finding caracara nests is during the period of January through March. This period covers the time when adult caracaras are foraging to feed nestlings and therefore, become more visible to observers. As such, surveys must start no later than January 10 and continue through April 30 to provide adequate data to conclude whether or not the site contains an active caracara nest and/or foraging habitat. If the survey starts after January 10, and no nest are found, the survey may not be considered valid by the Service. Surveys considered invalid should be repeated the following nesting season using the latest Service protocol to ensure that early nesting birds were not missed. Surveys should not be conducted in November or December without additional coordination with the Service to avoid disturbing nesting caracaras during nest initiation or incubation, when they are more prone to disturbance.

A complete survey of the project area consists of one survey session every two weeks of each observation block within the project area and the 1,500-m buffer from early January (i.e., Jan 1 - 10) through April 30 (unless a nest is found within the observation block prior to April 30; in that event, begin Productivity Surveys as described below). A survey session is defined as a single survey within an identified observation block initiated at least 15 minutes prior to sunrise and lasting 3 hours (Dwyer et al. 2012). The entire 3-hour survey session must be spent viewing the one observation block – observers cannot rotate between stations, cruise roads, or leave the observation block unless following a flying caracara. If the survey area is large or includes obstructed views, and multiple observation blocks are required, then multiple observers (preferred) or additional survey sessions will be needed to complete the survey of the entire project area. Afternoon or evening surveys are optional, but cannot be substituted for early morning surveys (in the event of not finding a nest). More frequent morning surveys (i.e., more than one during any two-week period) of an observation block are also optional, and can increase the probability of finding a nest, but cannot replace the subsequent “once per two-week surveys” through April 30 (in the event of not finding a nest).

Surveys should be conducted from inside a vehicle (best option is a truck or similar vehicle to maximize height and minimize view obstructions) or an appropriate wildlife blind using high-power binoculars. This minimizes caracara disturbance and behavior alteration, and increases the probability of finding nest locations. Depending on the distance being surveyed, or the proximity of the caracara/nest being observed, it may also be acceptable for the observer to be adjacent to the vehicle if that affords better viewing. A spotting scope is essential when documenting behavior of caracaras and confirming nest tree locations that are far away. If this cannot be accomplished (e.g., due to visibility or vehicle access restrictions), the Service should be contacted to provide site-specific guidance.

Weather conditions must be adequate to clearly view the whole area. Surveys should not be conducted when it is rainy or foggy (Dwyer *et al*. 2012). Wind speed should be less than 12 miles per hour (19 kilometers per hour; Beaufort Number 3). Weather conditions and other important information must be recorded on field data sheets as itemized below (see Reporting).

During the survey, from a stationary position, search for caracara activity, including birds perched in trees or on sentinel posts, flying along roads or levees, or carrying nesting material or food. Watch for other birds, such as American crows (*Corvus brachyrhynchos*), red-tailed hawks (*Buteo jamaicensis*), red-shouldered hawks (*Buteo lineatus*), bald eagles (*Haliaeetus leucocephalus*), and turkey vultures (*Cathertes aura*), that might elicit an aggressive response from caracaras. Nesting caracaras will often chase potential predators away from the nest, thus revealing their presence. Also, vultures can indicate the presence of carrion that may attract caracaras. If the observer is near or on a road, pay attention to road-killed animals that may serve as forage for caracaras. If in a pasture, look for cow or calf carcasses on which caracaras may forage.

If a caracara is sighted, document its activity (*i.e.*, foraging, roosting, preening, territorial behavior, etc.) and location on an aerial map. If a caracara is in flight, document on the aerial map the direction the bird came from, the direction it is flying in, and if it is carrying nesting material or food. Make all reasonable efforts to track the bird to a potential nest location. If a potential nest tree is detected, then the observer can reposition to improve observation of the bird's behavior. All observer locations during a survey should be marked on the aerial. All caracara observations must be recorded on the field data sheets, including time of observation, number of birds, plumage (adult/juvenile), activity/behavior (*e.g.*, perching, foraging, feeding, preening, courtship or territorial display, etc.), and nest stage (building, incubating, nestlings, fledglings), if applicable. Corresponding caracara locations and flight paths must be marked and labeled on the aerial map. Also mark any potential or confirmed nest tree locations on the aerial photo, with GPS coordinates of the observation site and an estimate of the direction and distance of the nest from the observation point (a rangefinder may help to measure distance). Do not try to approach the nest as this may cause the caracara to abandon their nesting attempt. It may be possible to use a compass bearing from two different locations to triangulate the location of a nest tree that may be too far away and not near recognizable landmarks.

Survey sessions of each observation block must be repeated at two week intervals. Once a nest tree location is confirmed, report the location to the Service and transition to Productivity Surveys. In addition to location of nest trees, the survey data described above can be used to understand the use of the survey area (*e.g.*, as foraging or roosting habitat) by both breeding and non-breeding caracaras. Non-breeding caracaras can include both juveniles and adults. Detailed survey data are also useful in approximating boundaries of breeding territories, which is typically important to identifying the number of territories that may be impacted by a proposed project and the anticipated effect that proposed activities may have on a breeding

caracara pair. This is especially true for projects which are large in size or include habitat conversion. For more details on caracaras, see Service (1999) and Morrison and Dwyer (2012).

Conducting Productivity Surveys

Once a nest tree is confirmed or highly suspected, begin productivity surveys. These surveys involve the same repeated, two-week visits, but the surveyor need only observe the nest for the amount of time necessary to determine nest status (*i.e.,* incubating, nestlings, fledglings, or failed) and may survey the nest tree at any time during the day (assuming the weather conditions are appropriate). This will likely require much less effort per day than nest surveys. Many times, a spotting scope can be more useful than binoculars in observing activity in the nest that will indicate the nest status. As nesting progresses, the nestlings will become more active and easier to observe. Record the bird activity and number of nestlings. Record the fledging date and number of fledglings. From the fledging date, and previous observations, estimate the egg-laying date. If the nest appears to fail, continue surveying the nest tree area until April 30 as re-nesting may occur. If nests are deemed active on April 30, continue surveying those nest trees until they are either successful or have failed.

Reporting

An example field data sheet is provided at the end of this document, but observers may use their own data sheet format as long as the required information is collected. Requirements for final reports are as follows:

1. Map of field-verified habitat types within the project area and 1,500-m buffer;
2. Copies of marked aerial photo(s) showing all suitable habitat, with labeled observation blocks and their respective survey stations (including any alternate station locations used);
3. For each survey station, copies of any photos taken that document the field of view, nest tree or caracaras;
4. Documentation of efforts to contact adjacent landowners, and copies of access agreements, if applicable;
5. A summary table with the following information for each observer: name, hours of experience conducting caracara surveys (as of January 1), approximate number of caracara nests previously found, and whether the observer served as a primary or secondary observer;
6. Copies of all individual field data sheets which include the following information for each survey:
    - observation block/survey station identification,
    - survey date,
    - observer name(s),
    - observer location (*e.g.*, in a vehicle, blind, on foot),
    - start and end times,

- start and end weather conditions (temperature, wind speed and direction, cloud cover, visibility, and precipitation),
- caracara location/activity details including (for each observation):
  - time of observation,
  - number of birds,
  - plumage,
  - activity/behavior, and
  - nesting stage, if applicable, and
- an aerial map showing all observed caracara locations and flight paths (labeled to correspond with activity details) and any potential/confirmed nest tree locations; and

7. Location data (*e.g.*, latitude/longitude) for all caracara observations and potential/confirmed nest trees in Excel, projected shapefile (the preferred projection is Florida Albers NAD83 in meters), or .kml/.kmz format and attributed to include the information in (6) above.

Additional survey or reporting requirements may exist if the caracara surveys are required by a Service Biological Opinion (BO)(in this event, refer to the Terms and Conditions of the BO). For questions or additional guidance regarding the above survey protocol, please contact the Service's caracara lead biologist, Steve Schubert, at 772-469-4249 or 772-562-3909.

Literature Cited

Dwyer, J.F., and J.P. Dalla Rosa. 2015. Use of anthropogenic nest substrates by crested caracaras. Southeastern Naturalist 12(1):N10-N15.

Dwyer, J. F., J. L. Morrison, and J. D. Fraser. 2012. Factors influencing detection of nesting crested caracaras. The Journal of Wildlife Management 76(4):857–862.

Morrison, J. L. 2001. Recommended management practices and survey protocols for Audubon's crested caracaras (*Polyborus plancus audubonii*) in Florida. Technical Report No. 18. Florida Fish and Wildlife Conservation Commission. Tallahassee, Florida.

Morrison, J. L. 2007. Characteristics of nest sites used by crested caracaras in South-Central Florida. Florida Field Naturalist 35(1):1-8.

Morrison, J. L. and J. F. Dwyer. 2012. Crested Caracara (*Caracara cheriway*), The Birds of North America (P. G. Rodewald, Ed.). Ithaca: Cornell Lab of Ornithology. Retrieved from the Birds of North America: https://birdsna.org/Species-Account/bna/species/crecar1

U.S. Fish and Wildlife Service (Service). 1999. South Florida multi-species recovery plan. Atlanta, Georgia. http://www.fws.gov/verobeach/MSRPPDFs/AudubonsCrestedCaracara.pdf

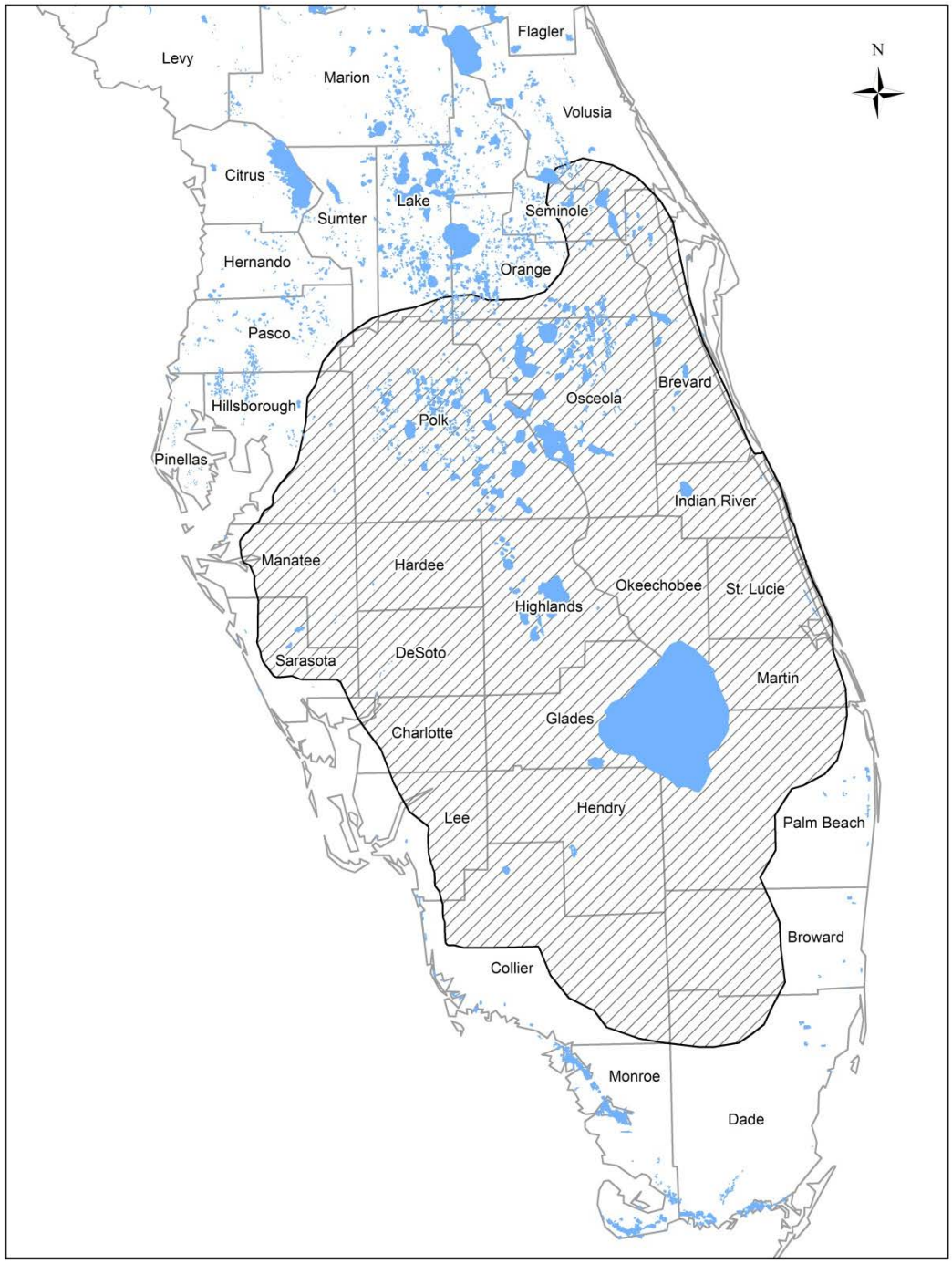


Figure 1. USFWS consultation area for crested caracara.

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: _____
Location/Observation Block/Lat-Long:_____

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start:					
Finish:					

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc

Appendix B

Audubon's Crested Caracara Field Data Sheets

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: FPN 419344-3-21-01 SR 710 Station 1

Location/Observation Block/Lat-Long: Okeechobee, FL /27°15'37.76"N, 80°49'21.45"W

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
1/5/17	7:05AM	10:05AM	Bob Mrykalo - Qualified (Primary)

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 7:05AM	54°	0 mph	10%	cumulus	N/A
Finish: 10:05AM	68°	calm	25%	cirrus	NA

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
Open weeded pasture surrounded by live oaks. Scattered cabbage palms & cattle grazing

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
			No caracara observed

white-tailed deer
Red bellied woodpecker
Red Shouldered hawk
osceola turkey
blue jay
turkey vulture

killdeer
Palm warbler
blue gray gnatcatcher
osprey
American crow

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: FPN 419344-3-21-01 SR 710 Station 2

Location/Observation Block/Lat-Long: Okeechobee, FL /27°15'38.47"N, 80°49'2.41"W

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
1/5/17	7:00am	10:00am	Nicholas Gadbois - Qualified (Primary)

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 7:00am	54°F	3mph SW	15%	Cumulus	N/A
Finish: 10:00am	68°F	3mph SW	20%	Cirrus	N/A

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
open pasture with cabbage palm, area surrounded by oak, pine hammock, cows in area, construction noise can be heard.

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
			No caracara observed

pileated woodpecker
Red shouldered hawk
Double crested Cormorant
loggerhead shrike
Fish Crow
Cattle egret
Red bellied woodpecker

mocking birds
Deer
osprey

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: FPN 419344-3-21-01 SR 710 Station 3

Location/Observation Block/Lat-Long: Okeechobee, FL /27°15'30.16"N, 80°48'37.87"W

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
1/5/17	7:00am	10:09 Am	Claus Hansen - Qualified (Primary)

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 7:00am	56°F	Calm	15%	Cumulus	N/A
Finish: 10:09am	68°F	Calm	25%	Cirrus	

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
open cow pasture with cows moving through. Surrounded by oaks, pines, scattered cabbage palms and pines in pasture. Cow pond to south with gator. Construction noise in distance.

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
			No Caracara observed

Ibis
little blue heron
Cattle egret
killdeer
Sandhill crane
mocking bird
American Crow
Tri-colored heron
red-bellied woodpecker
Pileated woodpecker
Snowy egret

anhinga
white egret
Palm warbler
black vulture
great blue heron

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: FPN 419344-3-21-01 SR 710 Station 4

Location/Observation Block/Lat-Long: Okeechobee, FL /27°15'34.62"N, 80°48'19.10"W

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
1/6/17	7:00am	10:00am	Nicholas Gadbois - Qualified (Primary)

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 7:00am	52°F	Calm	100%	Cirrus	light ground Fog
Finish: 10:00am	67°F	2mph SW	0%	—	none

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
observation location on top of berm south of canal. N.E. of berm is open pasture with scattered cabbage palm. S.W. of berm is open pasture with pine/oak hammock surrounding, scattered cabbage palm.

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
			No caracaras observed.

Great blue heron
American crow
red shouldered hawk
Killdeer
Sandhill crane
little blue heron
Mocking bird
Cormorant
Belted kingfisher
Cattle egret

Cooper's hawk
Martin
Black vulture

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: FPN 419344-3-21-01 SR 710 Station 5

Location/Observation Block/Lat-Long: Okeechobee, FL /27°15'0.32"N, 80°47'27.29"W

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
1/6/17	7:02 Am	10:05 Am	Claus Hansen - Qualified (Primary)

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 7:02 Am	53°F	Calm	0	—	light ground Fog
Finish: 10:05 Am	68°F	3-6 mph SW	0	—	none

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
observation location alongside Highway SR70. Construction in area along roadside. Cow pasture to N with scattered cabbage palm, grazing cows. Canal and highway to east. Pasture with scattered cabbage palm to S, 95 and developed commercial/ agriculture to south, Highway to west.

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
			No Caracara observed

American Crow
Palm warblers
Sandhill crane
Belted kingfisher
Gull
Mourning dove
Double crested colmorant
Osprey
black vulture

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: FPN 419344-3-21-01 SR 710 Station 6

Location/Observation Block/Lat-Long: Okeechobee, FL /27°14'7.50"N, 80°46'40.02"W

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
1/6/17	6:48Am	9:50Am	Brad Young - Qualified (Primary)

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 6:48Am	56°F	Calm	—	—	Light Fog
Finish: 9:50Am	63°F	Calm	0	—	—

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
Parked in private drive entrance, facing N.E.. Oak trees to west of open cow pasture, scattered cabbage palms in pasture. Power lines in pasture, extends across field to N. from obs. loc #6. Pond to N ~150'. Cypress trees @ ~200' to N.

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
6	A	9:28Am	Fly over observation location N→S from area over power substation to over house to east of observer location 6.

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

1st Bald eagle (perched on double power pole) - 42° from station #6 - 7:11 Am.

cattle egret
Fish crow
Blue heron
Sandhill crane
Coyote
little blue heron
unI.d. ducks

Black Vulture on carrion in field @ 64°
- No Caracara among small flock of B. Vultures

2nd Eagle flying S.W. to power substation

9:45 - 1st eagle moved to perch on double power pole @ 60°

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: FPN 419344-3-21-01 SR 710 Station 5

Location/Observation Block/Lat-Long: Okeechobee, FL /27°15'0.32"N, 80°47'27.29"W

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
1/16/17	7:00am	10:00 am	Nicholas Gadbois - Qualified (Primary)

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 7:00am	60°F	Calm	30%	stratus	none
Finish: 10:00am	72°F	5mph E	80%	alto stratus	none

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
observation STA 5 alongside SR70, west of canal. Construction alongside road and adjacent canal. Pasture with palm and pine trees. SR70 highway east and west of observation STA 5.

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
			NO Caracara observed

killdeer
Little blue heron
Fish crow
Gull
great blue heron
Sandhill crane
great egret
loggerhead shrike
Black Vulture
mocking bird
Eastern phoebe

Sterling
Coopers hawk
red shouldered hawk
woodstork
Bald eagle – flew south along Canal

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: FPN 419344-3-21-01 SR 710 Station 6

Location/Observation Block/Lat-Long: Okeechobee, FL /27°14'7.50"N, 80°46'40.02"W

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
1/16/17	6:57 Am	10:00 am	Claus Hansen - Qualified (Primary) Garren Mezza - Secondary

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 6:57 Am	59°F	2mph E	20%	Cirrus/Stratus	none
Finish: 10:00 Am	74°F	5mph NE	75%	alto stratus	

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
Along SR710, active cow pasture on either side of SR710, cow pasture open with grazing cows, scattered cabbage palms, some pines and oaks scattered on N side of SR710.

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
STA 6	A	7:11am	Caracara on ground in N. cow pasture w/ 2 black vultures. 7:15am - Caracara flew S.E. over pasture towards houses/barn, out of sight behind trees and houses.
STA 6	A	8:27Am	Caracara flying N from pasture, close proximity to earlier location. Then flew west into treeline and N. past powerlines out of sight. Caracara had something in beak.

Fish Crow
Black Vulture
Cattle egret
Sandhill cranes
Killdeer
tree swallow
mourning dove
woodstork
Anhinga

Bald eagle-observed in two locations near power station, on two seperate power poles.
Red bellied woodpecker
Kestrel
Redshouldered hawk

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: FPN 419344-3-21-01 SR 710 Station 1

Location/Observation Block/Lat-Long: Okeechobee, FL /27°15'37.76"N, 80°49'21.45"W

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
11/17/17	7:00am	10:00am	Nick Gadbois - Qualified (Primary)

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 7:00am	63°F	3mph E	95%	Altostratus	none
Finish: 10:00am	75°F	5mph SE	5%	Cumulus	none

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
Open pasture surrounded by live oaks. Scattered cabbage palms, Construction noise in background.

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
			No Caracara observed

white ibis
cattle egrets
Sand hill Cranes
Belted kingfisher
American crow
Turkey
Osprey
Gull
Redshouldered hawk

Deer
Pileated woodpecker
Cormorant
Northern mocking bird
Palm warbler
Black Vultures

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: FPN 419344-3-21-01 SR 710 Station 2

Location/Observation Block/Lat-Long: Okeechobee, FL /27°15'38.47"N, 80°49'2.41"W

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
1/17/17	7:05am	10:05am	Claus Hansen - Qualified (Primary) Garren Mezza - (Secondary)

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 7:05am	61°F	3mph ENE	95%	Cumulus & Cirrus	None
Finish: 10:05am	76°F	7mph SE	15%	Cirrus	None

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
Open pasture with Cabbage palm, area surrounded by oak, pine hammock. Cows in area. Construction noise can be heard.

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
			No Caracara observed

Ibis
black vulture
pileated woodpecker
Sandhill crane
Cattle egret
American crow
red bellied woodpecker
Deer
wild pig

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: FPN 419344-3-21-01 SR 710 Station 3

Location/Observation Block/Lat-Long: Okeechobee, FL /27°15'30.16"N, 80°48'37.87"W

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
1/19/17	7:00am	10:00am	Nick Gadbois - Qualified (Primary)

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 7:00am	58°F	0mph	5%	Stratus	light Fog
Finish: 10:00am	71°F	2mph S	5%	Stratus	none

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
Cow pasture surrounded by oaks, pine hammock. Cows in pasture. Cow pound to South.

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
STA 3	A	9:18am	Flying South direction, with a zigzag flight path around pond. Flew out of sight over residential area to southwest.

osprey
great blue heron
Cattle egret
Black vulture
Sandhill crane
Fish Crow
Red Shouldered hawk
Killdeer
woodstork
wild pig
white ibis
Deer

Turkey
American Crow
martins
lesser yellow leg
Gulls
Snowy egret
Belted Kingfisher
Great egret
Turkey Vulture

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: FPN 419344-3-21-01 SR 710 Station 4

Location/Observation Block/Lat-Long: Okeechobee, FL /27°15'34.62"N, 80°48'19.10"W

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
1/19/17	7:00am	10:02am	Claus Hansen-Qualified(Primary) Garren Mezza-Secondary

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 7:00am	55°F	Calm	5%	Cirrus/Stratus	Light Fog
Finish: 10:02am	71°F	Calm	5%	Cirrus/Stratus	none

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
Observation location on top of berm South of Canal. N.E. of berm is open pasture w/ scattered cabbage palm. S.W. of berm is open pasture w/ pine, oak hammock surrounding, scattered Cabbage Palm. * Construction activity in close proximity to STA 4.

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
			No Caracara observed

Black Vulture
Red shouldered hawk
tricolored heron
Cattle egret
killdeer
American crow
pileated woodpecker
wood stork
palm warbler

Osprey
redshouldered hawk

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: FPN 419344-3-21-01 SR 710 Station 6

Location/Observation Block/Lat-Long: Okeechobee, FL /27°14'7.50"N, 80°46'40.02"W

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
1/30/17	6:55Am	9:55Am	Nick Gadbois-Primary Gallen Mezza- Secondary

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 6:55Am	43F	0mph	40%	altostratus	light grand fog
Finish: 9:55Am	57F	6mph NW	10%	altocumulus	NA

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
Open cow pasture to N with scattered cabbage palms. Power lines in pasture. Pond to N in pasture.

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
Station 6	Adult	6:58Am	Flew from N to S and landed in pasture. Eating carcas and braging. Flew Southwest and out of sight at 7:04Am

Killdeer
Cattle egret
Yellow rump warblers
Cormorant
Kestrel
Mourning doves
Great egret
N. mockingbird
Starling
Tricolor heron
Sandhill crane
Fish crow
Bald eagle
Turkey vulture
Black vulture

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: FPN 419344-3-21-01 SR 710 Station 1

Location/Observation Block/Lat-Long: Okeechobee, FL /27°15'37.76"N, 80°49'21.45"W

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
2/1/17	7:00am	10:05am	Claus Hansen- Primary

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 7:00am	46F	0mph	<5%	Cirrus	N/A
Finish: 10:05am	68F	1mph NW	<5%	Cirrus	N/A

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
Open pasture surrounded by live oaks. Scattered Cabbage palms. Construction noise in area.

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
			No Caracara observed

Fishcrow
Black Vulture
yellow ~~butty~~ rump warblers
white ibis
Snowy egret
red bellied woodpecker
Killdeer
Anhinga

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: FPN 419344-3-21-01 SR 710 Station 3

Location/Observation Block/Lat-Long: Okeechobee, FL /27°15'30.16"N, 80°48'37.87"W

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
2/1/17	6:55Am	10:05Am	Nick Gadbois - Primary

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 655Am	43°F	0mph	<5%	altostratus	NA
Finish: 10:00Am	64°F	2mph NE	clear	clear	Na

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
Open pasture, cows present. Surrounded by oak and pine hammocks. Scattered Cabbage palms and pines in pasture. Cow pond to south. Construction noise in distance.

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
			NO Caracara observed

Cows
G. Blue heron
Killdeer
woodstork
Sandhill crane
cattle egret
Starling

martins
Deer
fishcrow
Prairie Warbler
red bellied woodpecker
Cooper's hawk
Robins

Black Vulture
Snowy egret

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: FPN 419344-3-21-01 SR 710 Station 5

Location/Observation Block/Lat-Long: Okeechobee, FL /27°15'0.32"N, 80°47'27.29"W

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
2/1/17	6:50Am	10:00Am	Brandon Gray - Primary

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 650Am	42F	0 mph	5%	cirrus	NA
Finish: ~~650Am~~ 1000Ams	67F	0 mph	5%	cirrus	NA

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
observation location alongside highway SR 70. Construction in area alongside highway. Cow pasture to N. with scattered cabbage palms, cows present. Canal and highway to east. Pasture w/ scattered cabbage palms to S., abandoned commercial/agriculture to south.

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
			No Caracara observed

boat tailed grackle
Common grackle
belted kingfisher
Cattle egret
Osprey
Fish crows

Black Vulture

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: FPN 419344-3-21-01 SR 710 Station 2

Location/Observation Block/Lat-Long: Okeechobee, FL /27°15'38.47"N, 80°49'2.41"W

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
2/2/17	6:55Am	10:00am	Nick Gadbois - Primary

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 655Am	50°F	0mph	<5%	Strat s	light ground fog
Finish: 10:00Am	71°F	3mph E	Clear		NA

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
open pasture with cabbage palms, area surrounded by oak, pine hammock,

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
			No Caracara observed

Grackle
Starlings
Turkey Vulture
Red shouldered hawk
Deer
Cormorant

Fish crow
Robin
N. Mocking bird
Sparrow
N. Cardinal
red bellied woodpecker

Black & white Warbler
Prairie Warbler

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: FPN 419344-3-21-01 SR 710 Station 4

Location/Observation Block/Lat-Long: Okeechobee, FL /27°15'34.62"N, 80°48'19.10"W

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
2/2/17	6:55Am	10:00Am	Claus Hansen-Primary Garren Mezza- Secondary

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 6:55Am	50F	Calm	5%	alto stratus	Light ground fog
Finish: 10:00Am	73F	3mph NE	<5%	alto stratus	NA

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
Observation location on top of berm, South of Canal. N.E. of berm is open pasture with scattered cabbage palms. S.W. of berm is open pasture with ~~Scattered~~ Pine/oak hammock surrounding, scattered cabbage palms.
* excavation/construction of berm W of Canal in close proximity to observation location.

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
			No Caracara observed

Sandhill Cranes
great egret
Cattle egret
Killdeer
W. ibis
Woodstork

N. Cardinal
tree swallows
red shouldered hawk
Mourning dove
Yellow rump warblers

Snail kite

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: FPN 419344-3-21-01 SR 710 Station 1

Location/Observation Block/Lat-Long: Okeechobee, FL /27°15'37.76"N, 80°49'21.45"W

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
2/15/17	6:55AM	10:00AM	Claus Hansen - Primary

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 6:55Am	64°F	1mph SSW	90%	stratus/cumulus	light ground fog
Finish: 10:00Am	72°F	4mph SSW	40%	stratus/cumulus	NA

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
open pasture surrounded by live oaks. Scattered Cabbage palms, cattle in area, construction sounds in vicinity.

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
			No Caracara observed

Killdeer
Sandhill crane
pileated woodpecker
black vulture
yellow rump warbler
great blue heron
woodstork
redshouldered hawk

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: FPN 419344-3-21-01 SR 710 Station 6

Location/Observation Block/Lat-Long: Okeechobee, FL /27°14'7.50"N, 80°46'40.02"W

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
2/15/17	6:45Am	10:00Am	Brad Young – Primary

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 6:45Am	72F	10mph E	100%	Stratus	NA
Finish: 10:00Am	85F	10mph E	20%	Cumulus	NA

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
Parked alongside SR710. Oak trees to west of open pasture, scattered Cabbage palms in pasture. Powerlines in pasture extends across field to N. from OBS. loc. #6 Pond to N. Cows grazing.

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
			NO Caracara observed

Great blue heron
Cattle egret
Black Vulture
Turkey Vulture
Bald eagle
red shouldered hawk
Pileated woodpecker

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: FPN 419344-3-21-01 SR 710 Station 3

Location/Observation Block/Lat-Long: Okeechobee, FL /27°15'30.16"N, 80°48'37.87"W

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
2/16/17	6:55Am	10:00 Am	Claus Hansen-Primary Garren Mezza-Secondary

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 6:55Am	63°F	5mph NW	95%	cumulus	overcast
Finish: 10:00Am	67°F	11mph WNW	35%	cumulus	NA

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
Open cow pasture. Cows moving through and grazing. Surrounded by oaks, pines, scattered cabbage palms and slash pine in pasture. Cow pond to south. Construction noise can be heard.

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
			NO Caracara observed

Killdeer
Cattle egret
pileated woodpecker
Sandhill crane
wild turkey
American crow
woodstork
tricolored heron
lesser yellow legs
bald eagle(adult)
Black Vulture

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: FPN 419344-3-21-01 SR 710 Station 5

Location/Observation Block/Lat-Long: Okeechobee, FL /27°15'0.32"N, 80°47'27.29"W

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
2/16/17	6:45am	10:00 am	Brad Young – Primary

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 6:45Am	65F	15mph NE	100%	stratus	NA
Finish: 10:00Am	63F	15mph NE	30%	Cumulus	NA

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
observation alongside highway SR70. Construction in area alongside road and bridge. Cow pasture to N with scattered cabbage palm to S, abandoned Commercial / agriculture to south. Active construction during survey. Feed supply delivery to cattle in pasture

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
			No Caracara observed

American Crow
Cattle egret
Great blue heron
Sandhill crane
loggerhead shrike
Osprey
Black Vulture
Boat tailed grackle
white ibis

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: FPN 419344-3-21-01 SR 710 Station 2

Location/Observation Block/Lat-Long: Okeechobee, FL /27°15'38.47"N, 80°49'2.41"W

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
2/17/17	6:45am	10:00am	Claus Hansen - Primary

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 6:45Am	46F	2mph NW	<5%	stratus	NA
Finish: 10:00Am	65F	2mph NW	<5%	stratus	NA

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
open pasture with Cabbage Palm. Area surrounded by oak, pine hammock. Cows in area. Construction noise in vicinity.

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
			No Caracara observed

pileated woodpecker
yellow rumpwarbler
palm warbler
wildpig
red shouldered hawk
wild turkey
cattle egret
osprey
bald eagle (juvenile)

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: FPN 419344-3-21-01 SR 710 Station 4

Location/Observation Block/Lat-Long: Okeechobee, FL /27°15'34.62"N, 80°48'19.10"W

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
2/17/17	6:50Am	10:00Am	Nick Gadbois- Primary

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 6:50Am	44F	0mph	5%	stratus	light ground fog
Finish: 10:00Am	63F	5mph N	5%	stratus	N/A

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
observation location on top of berm, south of canal. N.E. of berm is open pasture with scattered cabbage palm. S.W. of berm is open pasture with pine/oak hammock surrounding, scattered cabbage palm. Cows in N.E. pasture. Construction/excavation of berm.

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
			No Caracara observed

woodstork
Great blue heron
Killdeer
Sandhill crane
red shouldered hawk
starling
Mocking bird

Tri-colored heron
white ibis
8
American Crow
tree swallows
Cormorant
Alligator
Little blue heron

cows
Grebe
black vultures
morning dove

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: FPN 419344-3-21-01 SR 710 Station 6
Location/Observation Block/Lat-Long: Okeechobee, FL /27°14'7.50"N, 80°46'40.02"W

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
2/27/17	6:30am	10:00AM	Claus Hansen-Primary Garren Mezza-Secondary

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 6:30am	65F	Calm	10%	Stratus	Nil
Finish: 10:00am	78	15mph ESE	50%	cumulus	Nil

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
Parked alongside SR 710, next to cow pasture, cows present. Oak trees to W of open pasture, scattered cabbage palms. Powerlines in pasture, extends across pasture to N. from obs. loc #6. Pond to N ~150'

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
			No Caracara observed.

Mocking bird
Sandhill crane
Cardinal
Starling
Fish Crows
Black Vulture
Mourning dove
Cattle egret
Palm warbler
little blue heron
pileated woodpecker
bluejay
Sandhill crane
Killdeer
Baldeagle

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: FPN 419344-3-21-01 SR 710 Station 5
Location/Observation Block/Lat-Long: Okeechobee, FL /27°15'0.32"N, 80°47'27.29"W

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
2/28/17	6:45am	10:00Am	Claus Hansen-Primary Garren Mezza-Secondary

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 6:45am	65F	Calm	0%	N/A	N/A
Finish: 1000	76°F	5mphSSE	95%	overcast	N/A

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
~~Amerie~~ Active construction on bridge and SR70. observation location alongside SR70. Cow pasture to N with scattered cabbage palms. Canal & highway to east. Pasture w/ scattered cabbage palms to S. Abandoned commercial/agriculture to south, highway to west.

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
			No Caracara observed

American crow
Cardinal
Mocking bird
Black Vulture
yellow rump warbler
boat tailed grackle
osprey
cattle egret
Starling
Cormorant

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: FPN 419344-3-21-01 SR 710 Station 1

Location/Observation Block/Lat-Long: Okeechobee, FL /27°15'37.76"N, 80°49'21.45"W

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
3/1/17	6:30Am	10:00Am	Claus Hansen - Primary Garren Mezza - Secondary

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 630Am	66F	3mph ESE	0%	Clear	light ground fog
Finish: 1000Am	78F	7mph ESE	5%	cumulus	NA

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
Open pasture surrounded by live oaks. Scattered Cabbage palms.

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
			No CaraCara observed

Woodstork
Cormorants
redshouldered hawk
mourning dove
yellow rump warbler
black vulture
white ibis
great egret

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: FPN 419344-3-21-01 SR 710 Station 2
Location/Observation Block/Lat-Long: Okeechobee, FL /27°15'38.47"N, 80°49'2.41"W

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
3/2/17	6:30Am	10:00Am	Claus Hansen – Primary Galen Mezza- Secondary

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 630Am	69F	calm	5%	stratus	Light ground fog
Finish: 10:00	80F	3mph SW	20%	stratus/cumulus	NA

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
			NO Caracara observed

Turkey
red shoulder hawk
Cattle egret
Palm warbler
Cardinal

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: FPN 419344-3-21-01 SR 710 Station 3

Location/Observation Block/Lat-Long: Okeechobee, FL /27°15'30.16"N, 80°48'37.87"W

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
3/3/17	6:35Am	10:00Am	Nick Gadbois- Primary Garran Mezza- Secondary

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 6:35Am	62F	7mph N	50%	altocumulus	NA
Finish: 10:00Am	67F	12mph N	100%	overcast	NA

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
open cow pasture. Cows and horses present. pig moving through. Surrounded by oak and pine. Cabbage palms scattered in pasture. Cow pond to South. Construction noise in distance.

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
			No Caracara observed

Sandhill crane
cattle egret
osprey
cow
pig
killdeer
horse
redshouldered hawk

great blue heron
belted kingfisher
Fishcrow
swallow tail kite
*Snailkite
black vulture
kestrel
grasshopper sparrow

starlings

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: FPN 419344-3-21-01 SR 710 Station 4

Location/Observation Block/Lat-Long: Okeechobee, FL /27°15'34.62"N, 80°48'19.10"W

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
3/3/17	630 Am	10:00 Am	Claus Hansen- Primary

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 630Am	62F	6mph NW	60%	Cumulus/Stratus	NA
Finish: 1000Am	68F	6mph N	100%	overcast	NA

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
observation location on top of berm South of Canal. N.E. of berm is open pasture with scattered cabbage palm. S.W. of berm is open pasture with pine/oak hammock surrounding, scattered cabbage Palm.

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
			No Caracara observed

redshouldered hawk
Cattle egret
Yellow rump warbler
Sandhill crane
tri colored heron
Cardinal
bluejay
great blue heron
redbellied woodpecker
black Vulture

USFWS Crested Caracara Draft Survey Protocol – Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: FPN 419344-3-21-01 SR 710 Station 5

Location/Observation Block/Lat-Long: Okeechobee, FL /27°15'0.32"N, 80°47'27.29"W

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
3/13/17	7:15*	10:15	Claus Hansen - Primary

*Daylights Savings time on 3/12/17

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 7:15Am	60F	2mph N	95%	Stratus	1:SM Ground Fog
Finish: 10:30	64F	1mph N	100%	stratus/cumulus	NA

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
Active Construction on bridge and SR 70. Cows grazing in Con pasture to N.

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
			No Caracara observed

Anhinga
grackle
Little blue Heron
Kingfisher
American Crow
Mourning dove
Cattle egret
Sandhill crane
Fishcrow

Great Blue Heron
Osprey
Mocking bird
loggerhead Shrike
Pileated woodpecker

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: FPN 419344-3-21-01 SR 710 Station 1
Location/Observation Block/Lat-Long: Okeechobee, FL /27°15'37.76"N, 80°49'21.45"W

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
3/14/17	7:15	10:15	Garren Mezza, Primary

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 7:15	64°	19 mph WNW	25%	Stratocumulus Cirrus	—
Finish: 10:15	67°	12 WNW	50%	Cumulus Stratocumulus	—

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
Open pasture surrounded by Live Oaks. Scattered Cabbage palms

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
			No Caracara observed

American crow, ibis, red shouldered hawk, vulture
Swallow tail kite, Great egret, Kestrel

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: FPN 419344-3-21-01 SR 710 Station 2
Location/Observation Block/Lat-Long: Okeechobee, FL /27°15'38.47"N, 80°49'2.41"W

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
3/14/17	7:15 am	10:15 am	Nick Gadbois - Primary

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 7:15	67°F	13 mph W	70%	Cumulus	NA
Finish: 10:15	67°F	12 mph NW	50%	Stratocumulus	NA

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
Open pasture with cabbage palms. Area surrounded by oak, pine hammock. Cows in area. Construction noise in vicinity.

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
			No Caracara observed.

Sandhill crane, black vulture, cows, horses, cattle egret, Red shoulder hawk, starling, & American crow, swallowtail kite, red-bellied woodpecker.

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: FPN 419344-3-21-01 SR 710 Station 3

Location/Observation Block/Lat-Long: Okeechobee, FL /27°15'30.16"N, 80°48'37.87"W

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
3/16/17	7:25am	10:25am	Nick Gadbois, Primary

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 7:25am	41° F	6 mph N	2 %	Stratus	NA
Finish: 10:25am	51° F	10 mph N	clear	—	NA

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
Open cow pasture, cows and horses present, Surrounded by oak and pine trees, Cabbage palms scattered in pasture Cow pond to south, Construction noise in background.

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
			No Caracara observed

Sandhill cranes, American crow, cows, starlings, red-shoulder hawk, black vulture, swallow-tail kite, horses, cattle egret, Great blue heron

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: FPN 419344-3-21-01 SR 710 Station 6
Location/Observation Block/Lat-Long: Okeechobee, FL /27°14'7.50"N, 80°46'40.02"W

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
3/15/17	7:15AM	11:30 AM	Claus Hansen – Primary

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 7:15AM	48°F	calm	<5%	cirrus	NA
Finish: 11:30	57°F	7mph WNW	<5%	cirrus	NA

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
Parked alongside SR710. Oak trees to west of open pasture, scattered cabbage palms in pasture. Power lines in pasture extends across field to N. from observation Location #6. Pond to N ~150'

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
Stat 6	A	7:45	flew from N over trees. flew S along SR 710 until out of site behind trees on E side of SR710 in proximity of house/barn

American Crow
grackle
yellow rump warbler
black vulture
bald eagle
*Caracara
mocking bird

USFWS Crested Caracara Draft Survey Protocol – Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: FPN 419344-3-21-01 SR 710 Station 4

Location/Observation Block/Lat-Long: Okeechobee, FL /27°15'34.62"N, 80°48'19.10"W

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
3/16/17	7:15 am	10:15 am	Garren Mezza Primary

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 7:15 am	41°	6mph NNW	5%	Cirrus	—
Finish: 10:15 am	51°F	10 mph NW	clear	—	—

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
Observation location on top of berm, south of canal. NE of berm is open pasture with scattered cabbage palm. SW of berm is open pasture with pine/oak hammock surrounding, scattered cabbage palm. Cows in NE pasture. Construction/Excavation on berm

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
			No Caracara observed

Sandhill crane, great blue heron, Great Egret vulture, cormorant, American crow, tree swallows, Osprey, killdeer, cattle egret, swallowtail kite

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: FPN 419344-3-21-01 SR 710 Station 5

Location/Observation Block/Lat-Long: Okeechobee, FL /27°15'0.32"N, 80°47'27.29"W

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
3/27/17	7:15 am	10:15 am	Garren Mezza, Primary

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 7:15 am	57°	Calm	1%	Cumulus	foggy
Finish: 10:15 am	76°	N 6mph	35%	Cumulus	—

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
Active construction on bridge and SR 70. Cows grazing in cow pasture

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
			No Caracara observed.

American Crow, boat-tail grackle, black vulture, sandhill crane, starling, tree swallow, cattle egret, cormorant, Great egret, osprey

USFWS Crested Caracara Draft Survey Protocol – Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: FPN 419344-3-21-01 SR 710 Station 1

Location/Observation Block/Lat-Long: Okeechobee, FL /27°15'37.76"N, 80°49'21.45"W

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
3/28/17	7:10	10:10	Claus Hanson- Primary

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 7:10	58°F	Calm	0%	Clear	Light grey RS
Finish: 11:10	78°F	Calm	10%	Cumulus, Strats	No

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
Open pasture surrounded by live oaks. Scattered cabbage palms. No Caracara observed

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
			No Caracara observed

American crow
Cardinal
redwinged blackbird
red shouldered hawk
wild turkey
Cows
Cattle egret
blue jay
Osprey

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: FPN 419344-3-21-01 SR 710 Station 4

Location/Observation Block/Lat-Long: Okeechobee, FL /27°15'34.62"N, 80°48'19.10"W

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
3/28/17	7:05	11:05	Garren Mezza, Primary

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 7:05	57°	Calm	—	—	foggy
Finish: 11:05	80°	WNW 3mph	25%	Cumulus	NA

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
Observation location on top of berm, south of canal. NE of berm is open pasture with scattered cabbage palm. SW of berm is open pasture with pine/oak hammock surrounding, scattered cabbage palm. Cows in NE pasture

Construction/Excavation on berm

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
			No Caracara observed.

Great egret, Great blue heron, sandhill crane, Little blue heron ibis, alligator, anhinga, tree swallow, american crow osprey, black vulture, cormorant, red shoulder hawk

USFWS Crested Caracara Draft Survey Protocol – Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: FPN 419344-3-21-01 SR 710 Station 2

Location/Observation Block/Lat-Long: Okeechobee, FL /27°15'38.47"N, 80°49'2.41"W

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
3/30/17	7:15Am	10:15	Claus Hansen - Primary

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 7:15Am	62F	calm	<5%	cirrus	light ground Fog
Finish: 10:30	79 F	4mph NW	25%	Cumulus	N/A

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
Construction noise in area.

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
			NO Caracara observed

Turkey
Cardinal
red shouldered hawk
Swallow tailed kite
black vulture

USFWS Crested Caracara Draft Survey Protocol – Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: FPN 419344-3-21-01 SR 710 Station 3

Location/Observation Block/Lat-Long: Okeechobee, FL /27°15'30.16"N, 80°48'37.87"W

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
3/30/17	7:30	10:30	Garren Mezza, Primary

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 7:30	69°	N 1 mph	< 5%	Cirrus	Light ground fog
Finish: 10:30	79°	S 10 mph	25%	Cumulus	—

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
Open cow pasture, cows and horses present. Surrounded by oak and pine trees. Cabbage palms scattered in pasture. Cow pond to south. Construction noise in background

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
			No Caracara observed

Cattle egret, mockingbird, boat-tail grackle, red-bellied woodpecker, sandhill crane, kestrel, black vulture red shoulder hawk, anhinga, osprey, swallowtail kite

USFWS Crested Caracara Draft Survey Protocol – Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: FPN 419344-3-21-01 SR 710 Station 6

Location/Observation Block/Lat-Long: Okeechobee, FL /27°14'7.50"N, 80°46'40.02"W

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
3/31/17	7:15	10:15	Garren Mezza, Primary

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 7:15	68°	SSE 2 mph	35%	Cirrostratus	very light fog
Finish: 10:15	76°	S 13 mph	>95%	Cumulus, stratus	Overcast

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
Parked alongside SR 710. Oak trees to west of open pasture, scattered cabbage palms in pasture. Powerlines in pasture extends across field to N from observation Location #6. Pond to N ~150'

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
			No caracaras observed.

Sandhill crane, american crow, mockingbird, boat-tail grackle cattle egret, Great blue heron, Killdeer, black vulture Red-bellied woodpecker, ibis, Great Egret, wood stork mourning dove,

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: FPN 419344-3-21-01 SR 710 Station 2
Location/Observation Block/Lat-Long: Okeechobee, FL /27°15'38.47"N, 80°49'2.41"W

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
4/10/17	6:45		Claus Hansen - Primary

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 6:45	63F	Calm	90%	Cumulus/sirrus	NA
Finish: 10:30	77°F	9mph NE	20%	Cumulus	NA

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
open pasture with cabbage palms, area is surrounded by oak, pine hammock. cows in area. Construction noise can be heard.

Observations
(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
			No Caracara observed

Cattle egret
Fish crow
Pileated woodpecker
Cardinal
Black Vulture

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: FPN 419344-3-21-01 SR 710 Station 1
Location/Observation Block/Lat-Long: Okeechobee, FL /27°15'37.76"N, 80°49'21.45"W

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
4/11/17	6:45	10:45	Garren Mezza, Primary

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 6:45	59°	Calm	50%	Cumulus/cirrus	NA
Finish: 10:45	77°	8 mph E	75%	Cumulus	NA

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
Pasture area. Construction noises in distance. open pasture surrounded by live oaks, scattered cabbage palms. Cattle moving through.

Observations
(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
			No Caracara observed

Anhinga, Limpkin, Red shoulder hawk, Osprey, Starling, tree swallow, 8 American crow, red-bellied woodpecker, black vulture, cattle egret, swallowtail kite, wild turkey

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: FPN 419344-3-21-01 SR 710 Station 3

Location/Observation Block/Lat-Long: Okeechobee, FL /27°15'30.16"N, 80°48'37.87"W

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
4/11/17	6:45		Claus Hansen Primary

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 6:45	59F	Calm	50%	cumulus/cirrus	NA
Finish: 10:45	77F	8mph E	75%	cumulus	NA

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
cows in pasture, construction noise in distance. Surrounded by oaks and pines with scattered cabbage palms and pines in pasture. Cow pond to south(dry).

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
			No Caracara observed

cattle egret
tree swallows
American Crow
Cardinal
red bellied woodpecker
red shouldered hawk
turkey
bluejay

swallow tail kite
pileated woodpecker
gnatcatcher
mocking bird
black vulture

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: FPN 419344-3-21-01 SR 710 Station 4

Location/Observation Block/Lat-Long: Okeechobee, FL /27°15'34.62"N, 80°48'19.10"W

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
4/12/17	6:50	10:30	Claus Hansen - Primary

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 6:50	60F	Calm	25%	Cirrus	NA
Finish: 10:30	78F	10mph N	75%	~~Cumulus~~ overcast	NA

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
observation location on top of berm, south of canal. N.E. of berm is open pasture with scattered cabbage palm, S.W. of berm is open pasture with pine/oak hammock surrounding, scattered cabbage palm.

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
			No Caracara observed

Mocking bird
Cardinal
red shouldered hawk
ibis
little blue heron
Sandhill crane
black vulture
yellow rump warbler

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: FPN 419344-3-21-01 SR 710 Station 5

Location/Observation Block/Lat-Long: Okeechobee, FL /27°15'0.32"N, 80°47'27.29"W

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
4/13/17	6:50	10:40	Garren Mezza, Primary

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 6:50	63°	NE 4 mph	<5%	Cumulus	Light fog
Finish: 10:40	78°	ENE 9 mph	80%	Cumulus	—

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
observation location alongside SR 70. Construction in area alongside road and on bridge. Cow pasture to N with scattered cabbage palm. Canal and highway to E. Pasture with scattered cabbage palm to S. Abandoned commercial/agriculture to S. Highway to W.

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
			No Caracara observed

Great egret, sandhill crane, Great blue heron, boat-tailed grackle mourning dove, osprey, & American crow, tree swallow Killdeer, Mockingbird, cormorant, Red shoulder hawk Anhinga, black vulture

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: FPN 419344-3-21-01 SR 710 Station 6

Location/Observation Block/Lat-Long: Okeechobee, FL /27°14'7.50"N, 80°46'40.02"W

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
4/14/17	6:40		Claus Hansen - Primary

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 6:40	57F	1mph NE	40%	Cirrus	NA
Finish: 10:15	72F	4mph NE	90 %	cirrus/cumulus	NA

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
parked along SR710, facing N. then S.. Oak trees to W of open cow pasture, scattered cabbage palms in pasture Power lines in pasture, extends across field to N. Pond(dry) to N ~150'

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
Sta 6	A	9:00	Flew from behind observation point, is south direction, over pasture to the east of SR710. Flew towards buildings then out of sight behind trees.

Mocking bird
American crow
Cattle egret
Boat tailed grackle
Starlings
Tree Swallow
Bald eagle
Snowy egret
Osprey
red bellied woodpecker
great blue heron

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: FPN 419344-3-21-01 SR 710 Station 1
Location/Observation Block/Lat-Long: Okeechobee, FL /27°15'37.76"N, 80°49'21.45"W

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
4/25/17	6:30	10:00am	Garren Mezza, Primary

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 6:30	56°	Calm	0	clear	very light fog
Finish: 10:00	70°	10 mph W	<5%	cirrus	—

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
Pasture area. Construction noises in distance, open pasture surrounded by live oaks, scattered cabbage palms. Cattle moving through.

Observations
(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
			No caracara observed

Red bellied woodpecker, boat tail grackle, sandhill crane, cardinal, mourning dove, 8 American crow, gallinule, osprey Limpkin, swallowtail kite, cattle egret, pileated woodpecker black vulture

3

USFWS Crested Caracara Draft Survey Protocol – Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: FPN 419344-3-21-01 SR 710 ~~Station 4~~ Station 2

Location/Observation Block/Lat-Long: Okeechobee, FL /27°15'34.62"N, 80°48'19.10"W

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
4/25/16	630	10:00	Claus Hansen - Primary

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 630	60	calm	0	clear	NA
Finish: 1000	70	10mph W	<5	cirus	NA

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
Open pasture with cabbage palms, area is surrounded by oak, pine hammock, cows in area. Construction noise can be heard.

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
			NO Caracara observed

Cardinal
Cattle egret
Mocking bird
red shouldered hawk
red bellied woodpecker

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: FPN 419344-3-21-01 SR 710 Station 3
Location/Observation Block/Lat-Long: Okeechobee, FL /27°15'30.16"N, 80°48'37.87"W

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
4/26/17	6:45	10:00	Claus Hansen- Primary

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 6:45	55	Calm	5%	cirrus	NA
Finish: 10:00	75	2mph E	5-10	cirrus	NA

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
Cows in pasture, construction noises in distance. Surrounded by oaks and pines with scattered cabbage palms and pines in pasture. Cow pond to south (dry).

Observations
(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
			No Caracara observed

Cattle egret
Cardinal
red bellied wood pecker
mocking bird
tree swallows
Sandhill crane
red shoulder hawk
black vulture
American crow

Swallow tail kite
mourning dove

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: FPN 419344-3-21-01 SR 710 Station # 4

Location/Observation Block/Lat-Long: Okeechobee, FL /27°15'38.47"N, 80°49'2.41"W

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
4/26/17	6:30	10:00	Garren Mezza, Primary

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 6:30	54°	Calm	5%	Stratus/cirrus	Light fog
Finish: 10:00	75°	2 mph E	10%	cirrus	—

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
Observation Location on top of berm, south of canal. N.E. of berm is open pasture with scattered cabbage palm, S.W. of berm is open pasture with pine/oak hammock surrounding, scattered cabbage palm.

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
4	A	7:20 am	2 caracaras flying east along canal into the sunrise

Great blue heron, Great egret, sandhill crane, Little blue heron, red-bellied woodpecker, American crow, Tree swallow, Pileated woodpecker, cardinal, swallowtail Kite, cattle egret, red shoulder hawk, black vulture

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: FPN 419344-3-21-01 SR 710 Station 5

Location/Observation Block/Lat-Long: Okeechobee, FL /27°15'0.32"N, 80°47'27.29"W

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
4/27/17	6:30	10:00	Claus Hansen, Primary

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 630	68	Calm	0	—	ground fog
Finish: 1000	82	3mph ESE	40%	Cirrus	NA

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
Observation Location alongside SR 70. Construction in area alongside road and on bridge. Cow pasture to N. with scattered cabbage palm, Canal and highway to E. Pasture with scattered cabbage palm to S. Abandoned commercial/agriculture to S. Highway to W.

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
			No Caracara observed

Cardinal
mocking bird
Cattle egret
American crow
Boat tailed grackle
great blue heron
Brown pelican

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: FPN 419344-3-21-01 SR 710 Station 6

Location/Observation Block/Lat-Long: Okeechobee, FL /27°14'7.50"N, 80°46'40.02"W

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
4/27/17	6:30	10:00	Garren Mezza, Primary

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 6:30	68	Calm	—	—	Heavy fog
Finish: 10:00	82	3 mph ESE	30%	Cumulus/Cirrus	—

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
Parked alongside SR 710 facing N, then S. Oak trees to W of open cow pasture, scattered cabbage palms in pasture. Power lines in pasture, extends across field to N. Pond (dry) to N ~ 150'.

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
6	A	8:30 AM	1 Caracara flying NW along road

Cattle egret, mourning dove, boat-tail grackle, tree swallows, Red-bellied woodpecker & 8 sandhill crane, Killdeer Swallowtail Kite,

Appendix C

Representative Field of View at Survey Stations

Station 1 – View North

Station 1 – View South

SR 710 From US 441 to L-63 Canal
Okeechobee County, Florida
FPID No. 419344-3-32-01

Appendix C

Representative Photographs of Survey Station Views

Sheet 1

Station 1 – View East

Station 1 – View West

Station 2 – View North

Station 2 – View South

Station 2 – View East

Station 2 – View West

Station 3 – View North

Station 3 – View South

Station 3 – View East

Station 3 – View West

Station 4 – View North

Station 4 – View South

Station 4 – View East

Station 4 – View West

Station 5 – View North

Station 5 – View South

Station 5 – View East

Station 5 – View West

Station 6 – View North

Station 6 – View South

Station 6 – View East

Station 6 – View West

Appendix E

Standard Protection Measures for the Eastern Indigo Snake

STANDARD PROTECTION MEASURES FOR THE EASTERN INDIGO SNAKE
U.S. Fish and Wildlife Service
August 12, 2013

The eastern indigo snake protection/education plan (Plan) below has been developed by the U.S. Fish and Wildlife Service (USFWS) in Florida for use by applicants and their construction personnel. At least **30 days prior** to any clearing/land alteration activities, the applicant shall notify the appropriate USFWS Field Office via e-mail that the Plan will be implemented as described below (North Florida Field Office: jaxregs@fws.gov; South Florida Field Office: verobeach@fws.gov; Panama City Field Office: panamacity@fws.gov). As long as the signatory of the e-mail certifies compliance with the below Plan (including use of the attached poster and brochure), no further written confirmation or "approval" from the USFWS is needed and the applicant may move forward with the project.

If the applicant decides to use an eastern indigo snake protection/education plan other than the approved Plan below, written confirmation or "approval" from the USFWS that the plan is adequate must be obtained. At least 30 days prior to any clearing/land alteration activities, the applicant shall submit their unique plan for review and approval. The USFWS will respond via e-mail, typically within 30 days of receiving the plan, either concurring that the plan is adequate or requesting additional information. A concurrence e-mail from the appropriate USFWS Field Office will fulfill approval requirements.

The Plan materials should consist of: 1) a combination of posters and pamphlets (see **Poster Information** section below); and 2) verbal educational instructions to construction personnel by supervisory or management personnel before any clearing/land alteration activities are initiated (see **Pre-Construction Activities** and **During Construction Activities** sections below).

POSTER INFORMATION

Posters with the following information shall be placed at strategic locations on the construction site and along any proposed access roads (a final poster for Plan compliance, to be printed on 11" x 17" or larger paper and laminated, is attached):

DESCRIPTION: The eastern indigo snake is one of the largest non-venomous snakes in North America, with individuals often reaching up to 8 feet in length. They derive their name from the glossy, blue-black color of their scales above and uniformly slate blue below. Frequently, they have orange to coral reddish coloration in the throat area, yet some specimens have been reported to only have cream coloration on the throat. These snakes are not typically aggressive and will attempt to crawl away when disturbed. Though indigo snakes rarely bite, they should NOT be handled.

SIMILAR SNAKES: The black racer is the only other solid black snake resembling the eastern indigo snake. However, black racers have a white or cream chin, thinner bodies, and WILL BITE if handled.

LIFE HISTORY: The eastern indigo snake occurs in a wide variety of terrestrial habitat types throughout Florida. Although they have a preference for uplands, they also utilize some wetlands

and agricultural areas. Eastern indigo snakes will often seek shelter inside gopher tortoise burrows and other below- and above-ground refugia, such as other animal burrows, stumps, roots, and debris piles. Females may lay from 4 - 12 white eggs as early as April through June, with young hatching in late July through October.

PROTECTION UNDER FEDERAL AND STATE LAW: The eastern indigo snake is classified as a Threatened species by both the USFWS and the Florida Fish and Wildlife Conservation Commission. "Taking" of eastern indigo snakes is prohibited by the Endangered Species Act without a permit. "Take" is defined by the USFWS as an attempt to kill, harm, harass, pursue, hunt, shoot, wound, trap, capture, collect, or engage in any such conduct. Penalties include a maximum fine of $25,000 for civil violations and up to $50,000 and/or imprisonment for criminal offenses, if convicted.

Only individuals currently authorized through an issued Incidental Take Statement in association with a USFWS Biological Opinion, or by a Section 10(a)(1)(A) permit issued by the USFWS, to handle an eastern indigo snake are allowed to do so.

IF YOU SEE A <u>LIVE</u> EASTERN INDIGO SNAKE ON THE SITE:

- Cease clearing activities and allow the live eastern indigo snake sufficient time to move away from the site without interference;
- Personnel must NOT attempt to touch or handle snake due to protected status.
- Take photographs of the snake, if possible, for identification and documentation purposes.
- Immediately notify supervisor or the applicant's designated agent, **and** the appropriate USFWS office, with the location information and condition of the snake.
- If the snake is located in a vicinity where continuation of the clearing or construction activities will cause harm to the snake, the activities must halt until such time that a representative of the USFWS returns the call (within one day) with further guidance as to when activities may resume.

IF YOU SEE A <u>DEAD</u> EASTERN INDIGO SNAKE ON THE SITE:

- Cease clearing activities and immediately notify supervisor or the applicant's designated agent, **and** the appropriate USFWS office, with the location information and condition of the snake.
- Take photographs of the snake, if possible, for identification and documentation purposes.
- Thoroughly soak the dead snake in water and then freeze the specimen. The appropriate wildlife agency will retrieve the dead snake.

Telephone numbers of USFWS Florida Field Offices to be contacted if a live or dead eastern indigo snake is encountered:

North Florida Field Office – (904) 731-3336
Panama City Field Office – (850) 769-0552
South Florida Field Office – (772) 562-3909

PRE-CONSTRUCTION ACTIVITIES

1. The applicant or designated agent will post educational posters in the construction office and throughout the construction site, including any access roads. The posters must be clearly visible to all construction staff. A sample poster is attached.

2. Prior to the onset of construction activities, the applicant/designated agent will conduct a meeting with all construction staff (annually for multi-year projects) to discuss identification of the snake, its protected status, what to do if a snake is observed within the project area, and applicable penalties that may be imposed if state and/or federal regulations are violated. An educational brochure including color photographs of the snake will be given to each staff member in attendance and additional copies will be provided to the construction superintendent to make available in the onsite construction office (a final brochure for Plan compliance, to be printed double-sided on 8.5" x 11" paper and then properly folded, is attached). Photos of eastern indigo snakes may be accessed on USFWS and/or FWC websites.

3. Construction staff will be informed that in the event that an eastern indigo snake (live or dead) is observed on the project site during construction activities, all such activities are to cease until the established procedures are implemented according to the Plan, which includes notification of the appropriate USFWS Field Office. The contact information for the USFWS is provided on the referenced posters and brochures.

DURING CONSTRUCTION ACTIVITIES

1. During initial site clearing activities, an onsite observer may be utilized to determine whether habitat conditions suggest a reasonable probability of an eastern indigo snake sighting (example: discovery of snake sheds, tracks, lots of refugia and cavities present in the area of clearing activities, and presence of gopher tortoises and burrows).

2. If an eastern indigo snake is discovered during gopher tortoise relocation activities (i.e. burrow excavation), the USFWS shall be contacted within one business day to obtain further guidance which may result in further project consultation.

3. Periodically during construction activities, the applicant's designated agent should visit the project area to observe the condition of the posters and Plan materials, and replace them as needed. Construction personnel should be reminded of the instructions (above) as to what is expected if any eastern indigo snakes are seen.

POST CONSTRUCTION ACTIVITIES

Whether or not eastern indigo snakes are observed during construction activities, a monitoring report should be submitted to the appropriate USFWS Field Office within 60 days of project completion. The report can be sent electronically to the appropriate USFWS e-mail address listed on page one of this Plan.