SR 400 (I-4) Project Development and Environment (PD&E) Study
FM No.: 432100-1-22-01

Endangered Species Biological Assessment

Segment 4: State Road 400 (SR 400)/Interstate 4 (I-4) from East of SR 15-600/US 17-92 (Seminole/Volusia County Line) to ½ Mile East of SR 472

Volusia County (79110), Florida

July 2016

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1.0 Summary of Project

The Florida Department of Transportation (FDOT) is conducting an update/reevaluation of the Project Development and Environment (PD&E) studies for the extension of proposed express lanes for State Road 400 (SR 400)/Interstate 4 (I-4). The project limits in the original I-4 PD&E studies were:

- West of Memorial Boulevard (SR 546) to the Polk/Osceola County Line, (29.5 miles)
- CR 532 (Polk/Osceola County Line) to West of SR 528 Beachline Expressway (13.7 miles), and
- West of SR 528 Beachline Expressway to SR 472 (43 miles).

The corresponding environmental documents associated with these PD&E studies include: Environmental Assessment/Finding of No Significant Impact (EA/FONSI) for SR 400 (I-4) from West of Memorial Boulevard (SR 546) to the Polk/Osceola County Line [Financial Project Number (FPN) 201210 (December 1998)] and from CR 532 (Polk/Osceola County Line) to West of SR 528 (Beachline Expressway) [FPN 242526 and 242483 (December 1999)] and Final Environmental Impact Statement (FEIS) for I-4 from SR 528 (Beachline Expressway) to SR 472 [FPN 242486, 242592 and 242703 (August 2002, Record of Decision Pending)].

The project limits of the current SR 400 (I-4) PD&E reevaluation, herein referred to as I-4 Beyond the Ultimate (BtU) PD&E Reevaluation Study, include a total of approximately 43 miles of roadway sections east and west of the 21-mile, I-4 Ultimate project. The I-4 Ultimate project, which began construction in early 2015, is reconstruction to include new express lanes, of the section of I-4 which extends from west of SR 435 (Kirkman Road) to east of SR 434. For analysis purposes, the current I-4 BtU project, has been divided into the following five segments:

- Segment 1: SR 400 (I-4) from West of CR 532 (Polk/Osceola County Line) to West of SR 528 (Beachline Expressway) - Osceola County (92130) and Orange County (75280)
- Segment 2: SR 400 (I-4) from West of SR 528 (Beachline Expressway) to West of SR 435 (Kirkman Road) - Orange County (75280)
- Segment 3: SR 400 (I-4) from 1 Mile East of SR 434 to East of SR 15-600/US 17-92 (Seminole/Volusia County Line) - Seminole County (77160)
- Segment 4: SR 400 (I-4) from East of SR 15-600/US 17-92 (Seminole/Volusia County Line) to ½ Mile East of SR 472 - Volusia County (79110)
- Segment 5: SR 400 (I-4) from West of SR 25/US 27 to West of CR 532 (Polk/Osceola County Line) Polk County (16320)

Since no Record of Decision has been issued by the Federal Highway Administration (FHWA) for Segments 2, 3 and 4, the current PD&E BtU study for these three segments will update the original PD&E study. This Endangered Species Biological Report was prepared for Segment 4 of the SR 400 (I-4) BtU PD&E Reevaluation Study and contains detailed information that fulfills the purpose and need for SR 400/I-4, from East of SR 15-600/US 17-92 (Seminole/Volusia County Line) to ½ Mile East of SR 472, PD&E study.

The purpose of this report is to document changes in support of the PD&E update for the I-4 BtU Segment 4 portion of the FEIS for I-4 from SR 528 (Beachline Expressway) to SR 472 (FPN 242486-1, 242592-1 and 242703-1, August 2002, Record of Decision Pending). This update includes environmental analysis of the original design concept, which showed six general use lanes (GULs) and two high occupancy vehicle (HOV) lanes (6+2), to the current proposed design, which includes six GULs and four express lanes (EL) operating under a variable price toll plan (6+4). Other changes being reanalyzed include stormwater management, access plan and interchange configurations.

1.1 Description of Proposed Action

FDOT is proposing to reconstruct and widen I-4 as part of the I-4 BtU concept. This involves the build-out of I-4 to its ultimate condition through Central Florida, including segments in Polk, Osceola, Orange, Seminole and Volusia Counties. The concept design proposes the addition of two new express lanes in each direction, resulting in a total of ten dedicated lanes. The project limits for the segment analyzed in this report are within an approximate ten (10) mile segment of I-4 which extends from east of US 17/92 to east of SR 472, from Milepost 0.086 to 10.227 in Volusia County (herein referred to as I-4, Segment 4) and as shown in **Figure 1.1**. Although, the interstate is a designated east-west corridor, the alignment follows a southwest to northeast orientation through the limits of Segment 4. The study area in this section from east of US 17/92 to east of SR 472 includes the interchanges at Dirksen Drive/Debary Avenue, Saxon Boulevard and SR 472/Howland Boulevard. A new interchange with I-4 providing direct access only to the express lanes is proposed to be constructed about halfway between Saxon Boulevard and SR 472, with the Rhode Island Avenue extension.

The proposed improvements to I-4 include widening the existing six lane divided urban interstate to a ten lane divided highway. The existing typical section of the I-4 mainline consists of three 12-foot travel lanes in each direction. The outside and inside shoulders are 12 feet wide with 10 feet paved. The median width varies from 37 feet to 375 feet and the existing right of way (ROW) varies from 300 feet to 630 feet. The typical section in the proposed condition will have three 12-foot general use travel lanes with a 10-foot inside and 12-foot outside shoulder and two 12-foot express lanes with a 4-foot inside and 10-foot outside shoulder, in each direction. A barrier wall between adjacent 10-foot shoulders will separate the express lanes from the general use lanes. A 44' transit corridor will be provided in the median for the entire length of Segment 4 and, auxiliary lanes in both the eastbound and westbound directions will be provided in some areas. The I-4 existing and proposed typical sections are shown in Figure 1.2.

1.2 Purpose and Need

The proposed improvements to I-4 include widening the existing six lane divided urban interstate to a ten lane divided highway in order to improve traffic operations, enhance connectivity and improve mobility by providing travel choices to the motoring public. I-4 is an east-west limited access freeway which links the west and east coasts of Florida, from I-275 in Tampa to I-95 in Daytona Beach. I-4 spans across six counties in Central Florida, traversing many cities including Lakeland, Orlando, Altamonte Springs, Sanford and DeLand. I-4 is a critical component of Florida's Strategic Intermodal System (SIS) which links seaports, rail, airports and other intermodal facilities. This aspect of I-4's significance is evidenced through connectivity provided by major junctions with I-275 and I-75 in the Tampa Bay area, SR 429 (Daniel Webster Western Beltway), SR 417 (Southern Connector/Central Florida Greenway/Seminole Expressway), SR 528 (Martin Andersen Beachline Expressway), SR 91 (Florida's Turnpike), SR 408 (Spessard Lindsay Holland East-West Expressway) in Central Florida and I-95 on the east coast.

I-4 serves as the primary corridor in the movement of people and freight between major population, employment and activity centers in the Central Florida region. When the entire Interstate was fully opened in the early 1960's, it was designed to serve intrastate and interstate travel by providing a critical link between the east and west coasts of Central Florida. Although this role continues to be a crucial transportation function of I-4, the highway also serves large volumes of local and commuter traffic with shorter trip distances. Today, the highway serves as the primary link between hotel/resort complexes and tourist attractions such as Walt Disney World, Universal Studios, Sea World, the International Drive Resort Area and downtown Orlando. Since I-4 is the only north-south limited access facility that is centrally located between the predominant employment centers and the major suburbs to the north, it has become the primary commuting corridor in the Central Florida metropolitan area.

Growth in Central Florida over the past decades has made it difficult for the transportation system to accommodate travel demand. Additionally, traffic congestion and crash incidents have resulted in major delays on the Interstate as well as other arterials surrounding the corridor. Increased congestion levels are experienced outside of the typical morning and afternoon rush-hour periods, affecting mobility levels for more hours of the day and impacting other non-commuter/non-weekday travel. The congestion on I-4 is further evidenced by the less than desirable levels of service on the Interstate as well as the crossroads.

Projections of future population and employment in the region indicate that travel demand will continue to increase well into the future. The ability to accommodate the new travel patterns resulting from growth must be provided to sustain the region's economy. Without the improvements, extremely congested conditions are expected to occur for extended periods of time in both the morning and evening peak periods.

Due to these congested conditions, user travel times will continue to increase, the movement of goods through the urban area will be slower, and the deliveries of goods within the urban area will be forced to other times throughout the day. The need for improvements to I-4 is illustrated by the important transportation roles I-4 serves to the Central Florida region and the State of Florida. If no improvements are made to the Interstate, a loss in mobility for the area's residents, visitors, and commuters can be expected, resulting in a severe threat to the continued viability of the economy and the quality of life.

The PD&E update involves revising the original design concept showing 6 GULs + 2 HOV lanes, as recommended in the FEIS for I-4 from SR 528 to SR 472 (FPN No. 242486, 242592& 242703, August 2002, Record of Decision Pending), to the current proposed design of 6 GUL + 4 EL. The express lanes are tolled lanes and will extend the full length of the project. The access to/from the tolled lanes will be evaluated as part of this effort to determine if changes are needed from the previously approved concept for access to/from the HOV Lanes. The original I-4 PD&E Studies involved physical separation between the general use lanes and the HOV lanes on I-4, with demand management in the HOV lanes. The original demand management strategy was to control the use of the lanes by requiring a minimum number of occupants per vehicle to maintain an acceptable level of service (Level of Service D). This update also addresses revising the demand management tool to convert the HOV lanes to tolled express lanes. The express lanes will be separated from the general use travel lanes by two shoulders with a barrier wall in between the shoulders. A variable pricing tolling plan is proposed for the express lanes. The tolls will vary by time of day and day of week to maintain acceptable levels of service in the express lanes. The tolls will be collected electronically through existing E-Pass, SunPass and other systems currently in place in the Central Florida area. The conversion to Express Lanes will maintain the same right-of-way limits as documented previously and will not change the impacts to the social, natural or physical environment. An update to the Systems Access Modification Report (SAMR) prepared in January 2013 is being completed in conjunction with this effort.

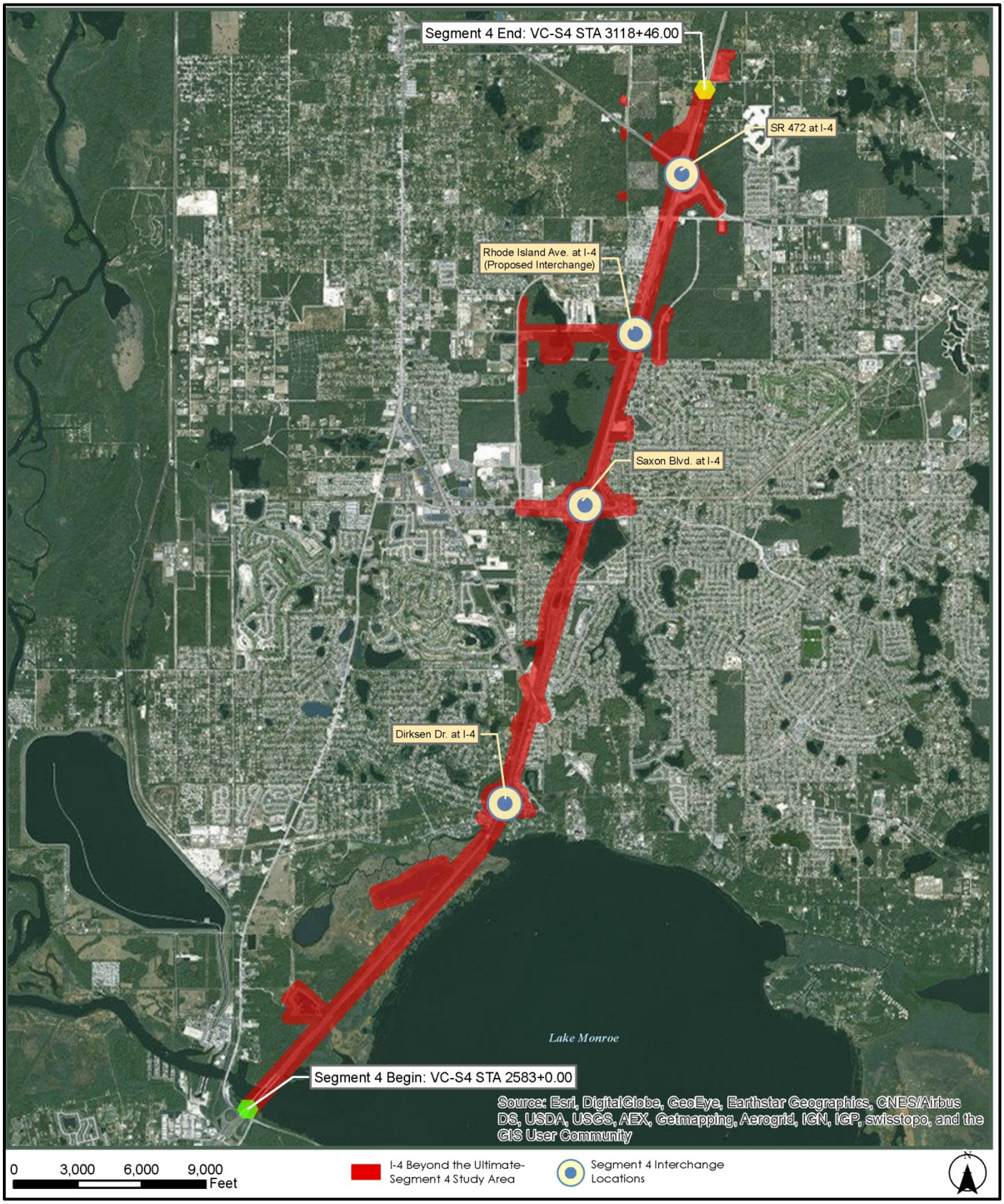


Figure 1.1 - Project Location Map

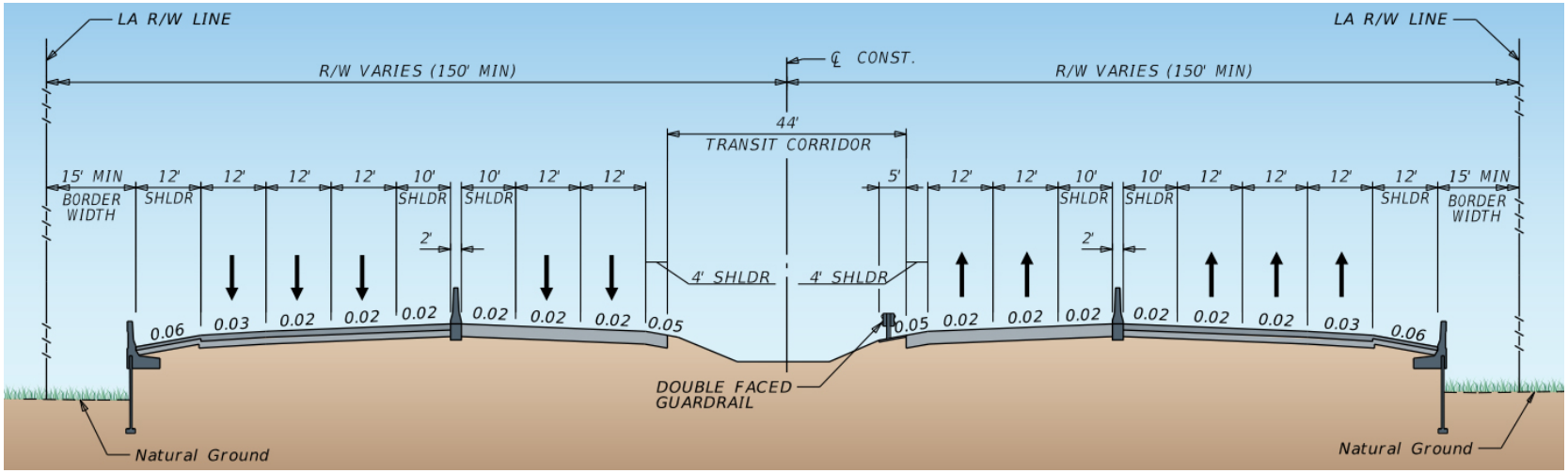
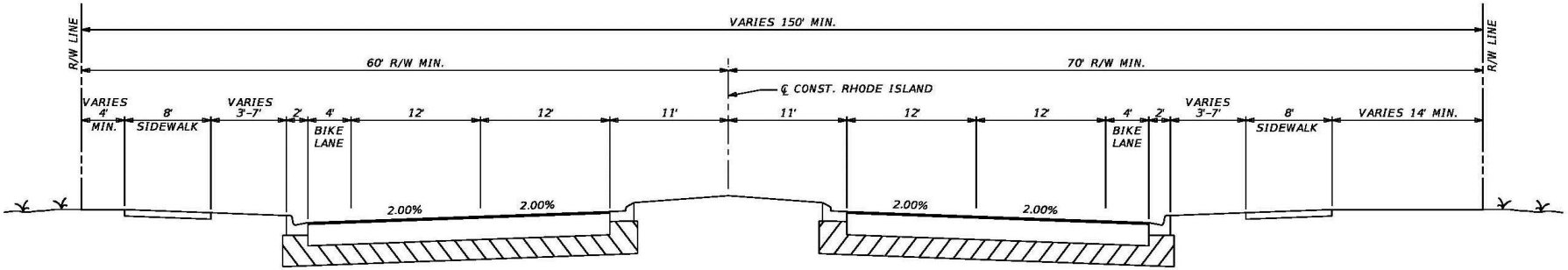


Figure 1.2 - I -4, Segment 4 Proposed Typical Section



TYPICAL SECTION
RHODE ISLAND AVENUE
DESIGN SPEED = 45 MPH

Figure 1.3 - Proposed Rhode Island Avenue Typical Section

2.0 Methodology

2.1 Literature Search

Prior to the initiation of fieldwork, a background records and literature search was conducted to identify federal and state protected plant and animal species of known or potential occurrence in Volusia County, FL (Volusia County). The key information source for this effort was a compilation of all the observation and distribution records published by the Florida Natural Areas Inventory (FNAI), the Florida Committee on Rare and Endangered Plants and Animals (FCREPA), the Florida Fish and Wildlife Conservation Commission (FFWCC), the U.S. Fish and Wildlife Service (USFWS), and information gathered from relevant scientific literature. A database for this report is included in the project files and was last updated in June 2014.

Appendix B provides a list of animal (see Table 1) and plant (see Table 2) species of known or potential occurrence within Volusia County, and a summary of the habitat type(s) typically utilized by each. Sixty-eight (68) species of animals and 64 species of plants have been identified as potentially occurring in Volusia County, though suitable habitat may not be available for all of them along the project corridor. Of these, 7 are federally listed animals, 4 are federally listed plants, 26 are state listed animals, and 55 are state listed plants.

2.2 Agency Coordination

Information regarding the I-4 Beyond the Ultimate PD&E project was provided on October 22, 2014 to Jane Monaghan representing the USFWS North Florida Ecological Services Office and to Jane Chabre representing the FFWCC Office of Conservation Planning Services (**Appendix D**).

2.3 Field Survey

The project area includes approximately 10 linear miles of right-of-way and forty-two (42) proposed stormwater areas. Ground-based biological surveys were conducted in May and September of 2013, March 2014, October 2014, and April 2015 to identify natural habitat types, anthropogenic land use types and to investigate wildlife (including listed species) occurrence along the project corridor. Habitat and land use types were categorized according to the Florida Land Use, Cover, and Forms Classification System (FLUCFCS) (FDOT, 1999). Results of the habitat and land use evaluation, including descriptions of types observed along the project corridor, are provided in Section 3.1.2 (see NRCS Soils maps in **Figure B, Appendix A** and Land Use and Habitat Coverage Maps in **Figure C, Appendix A**).

Wildlife surveys were conducted during daylight hours and followed species specific survey guidelines as outlined by FFWCC and USFWS. During the field visits, all observations of listed plant and wildlife species or indicators of their presence (i.e., remnants, tracks, burrows, calls, and scat) within the study corridor were noted by staff biologists. General wildlife observations were also documented during the field visits.

In order to ensure a thorough assessment of potential impacts to state and federal listed plant species, project team scientists conducted the field surveys within all suitable habitat in the proposed widening area and proposed stormwater pond sites. Prior to the commencement of the surveys, typical habitat and other relevant life history information were gathered for each of the listed plant species of potential occurrence along the project corridor. Photographic aerial interpretation and ground-truthing were used to delineate the different habitat types present along the corridor. Site surveys generally consisted of meandering transects that covered at least 25% of each site. In areas where listed plant species were discovered, the location was recorded using a sub-meter global positioning system (GPS) unit, for later

depiction on aerial photographic maps. Section 3.2 provides a summary of wildlife, including listed species, of known or potential occurrence.

2.3.1 Florida Scrub-Jay Survey

A Florida scrub-jay survey was conducted during the original I-4 PD&E Study (Final Environmental Impact Statement (FEIS) for I-4 from SR 528 Beachline Expressway to SR 472, May 2000 with field work from 1996 – 1998) within this alignment corridor. Stations were sampled for the presence of scrub-jays at the Saxon Boulevard interchange, along both sides of the highway between Saxon Boulevard and SR 472, and at the interchange at SR 472. Typically, a standard survey is conducted in accordance with the techniques outlined by the FFWCC (Florida Scrub-Jay Survey Guidelines, updated 08/24/2007). The survey consists of the playback of recorded scrub-jay vocalizations throughout all potential habitats. This includes the "classic" xeric oak scrub, along with scrubby pine flatwoods, sand pine scrub, and any other type of habitat containing scrub oaks. Since scrub-jays were observed at fifteen of the call stations during the investigation for the original PD&E report in May 2000, a formal scrub-jay survey was conducted in October of 2014. A total of 101 stations were established along the entire roadway corridor and pond sites. Additional design work after the completion of this survey necessitated a supplemental survey of four additional pond sites in April 2015. Observations recorded during the surveys are shown on the Species Location Maps (**Figure D** in **Appendix A**), and in the Florida Scrub-jay Survey Technical Memorandum (in **Appendix E**).

2.3.2 Gopher Tortoise Survey

A gopher tortoise survey was conducted in May and June of 2013, March 2014, October 2014, and April 2015 in accordance with the FFWCC technical publication titled Gopher Tortoise Permitting Guidelines, April 2008, revised April 2013 (and subsequently revised in February 2015). Habitats that were suspected of supporting tortoise populations because of the nature of the vegetation, hydrology and soils, were selected for the survey, as well as cleared areas within the right-of-way and along the right-of-way fence line with suitable soil conditions. The activity classification and GPS location of all burrows within the I-4 right-of-way and potential pond sites were collected for post-processing and mapping. Burrows found during the survey were classified as Potentially Occupied (PO) or Abandoned (AB). Those classified as PO were further described as either Active (POA) or Inactive (POI): Active burrows are in good repair, with the classic half-moon shaped entrance, and appear to be in use by a tortoise. They have obvious tortoise tracks or shell scraping signs on the burrow floor or the mound, often contain loose soil on the burrow floor, and may contain recently excavated soil. Inactive burrows are in good repair, but do not show recent tortoise use. They have the classic half-moon shaped entrance, but the soil on the burrow floor is usually hard packed, as is the burrow mound. There are no tortoise tracks or shell scraping signs, no recently excavated soil, and the burrow mound may have vegetation growing on it or be partially covered with fallen leaves. The POI classification of burrows has the potential to change due to seasonal dormancy, inactivity due to weather conditions, and the affinity of the gopher tortoise to utilize more than one burrow. Activity classification can and often does change from survey to survey. Both POI and AB burrows can serve as a refuge for burrow commensals, including gopher frogs, Florida mice, and indigo snakes, and should be considered in the same manner as active burrows. The location of each burrow was depicted on an aerial to indicate its location (see Species Location Maps**, Figure D, Appendix A**). Surveys methods were developed to cover 100% of the suitable habitat within the right-of-way and 50% of suitable habitat within each proposed pond site.

2.3.3 Listed Plant Survey

A survey for listed plant species was performed during May 2013, March 2014, October 2014, and April 2015 in an attempt to coincide with the flowering period of most Florida plants. The survey was conducted using pedestrian transects that covered 100% of the existing right-of-way and at least 25% of each pond site location. Any listed plants or obvious

indicators of the possible presence of listed plants were noted. In the event that listed plants were encountered during field surveys, their position was marked using a handheld GPS. Species observational data was collected in field books, describing the condition, density, and areal coverage. Any recorded data related to listed plant species was projected on the Species Location Maps (**Figure D in Appendix A**).

3.0 Results

3.1 Natural Habitat and Human Land Use Assessment

3.1.1 Soils

According to the Soil Survey of Volusia County, Florida (1980), the proposed project (I-4 with 500 ft. buffer and the Rhode Island Avenue extension) area consists of twenty one mapped soil types including Apopka fine sand, 0 to 5 percent slopes (1), Astatula fine sand, 0 to 8 percent slopes (4), Astatula fine sand, 8 to 17 percent slopes (5), Basinger fine sand, depressional (8), Bluff sandy clay loam (10), Cassia fine sand (13), Daytona sand, 0 to 5 percent slopes (17), EauGallie fine sand (20), Electra fine sand, 0 to 5 percent slopes (22), Immokalee sand (29), Myakka fine sand, depressional (33), Orsino fine sand, 0 to 5 percent slopes (37), Paola fine sand, 0 to 8 percent slopes (42), Paola fine sand, 8 to 17 percent slopes (43), Placid fine sand, depressional (48), Pomona fine sand, depressional (50), Quartzipsamments, gently sloping (54), Riviera fine sand (55), Smyrna fine sand (60), St. Johns fine sand (61), and Tavares fine sand, 0 to 5 percent slopes (63).

A brief description of each of the mapped soil types occurring within the project site is provided below (see NRCS Soils Map**, Figure B, Appendix A**).

Apopka fine sand, 0 to 5 percent slopes (1) – Apopka fine sand, 0 to 5 percent slopes is a well-drained, nearly level to gently sloping soil found on intermediate to high sand hills. Typically, the surface layer is very dark grayish brown fine sand about 6 inches thick. The subsurface layer is fine sand to a depth of 62 inches. In sequence downward, 16 inches is grayish brown mottles with very pale brown, 28 inches is light yellowish brown mottles brownish yellow, and 12 inches is white. The subsoil is brownish yellow sandy clay loam mottles with pale brown to more than 80 inches deep.

The water table is typically 72 inches beneath the surface or below. When protected from fire, like in the southern part of the Deland ridge, the natural vegetation consists of a forest of sand live oak, sand pine, laurel oak, and turkey oak. The understory includes pineland threeawn, common prickly pear cactus, gopher apple, and scattered saw palmetto.

Astatula fine sand, 0 to 8 percent slopes (4) – Astatula fine sand, 0 to 8 percent slopes is an excessively drained, nearly level to sloping soil found on sandhills. Typically, the surface layer is gray fine sand about 2 inches thick. The underlying layers are fine sand about 93 inches thick. In sequence downward, 8 inches is brown, 16 inches is pale brown, and 69 inches is very pale brown.

The water table is always below 80 inches and is usually below 120 inches. The natural vegetation consists of sand pine, turkey oak, sand live oak, laurel oak, and longleaf pine. The understory includes fetterbush, rosemary bush, scattered saw palmetto, pineland threeawn, prickly pear cactus, gopher apple, creeping bluestem, and chalky bluestem.

Astatula fine sand, 8 to 17 percent slopes (5) – Astatula fine sand, 8 to 17 percent slopes is an excessively drained, sloping to moderately steep soil found around sinks and depressions and on the side slopes of high sand ridges. Typically, the surface layer is gray fine sand about 3 inches thick. The underlying layers are fine sand to a depth of 80 inches or more. The upper 7 inches is brown, the next 36 inches is light yellowish brown, and the lower 34 inches is very pale brown.

The water table is always below 80 inches and is usually below 120 inches. The natural vegetation consists of sand pine, turkey oak, sand live oak, laurel oak, and longleaf pine. The understory includes fetterbush, rosemary bush, scattered saw palmetto, pineland threeawn, prickly pear cactus, gopher apple, creeping bluestem, and chalky bluestem.

Basinger fine sand, depressional (8) – Basinger fine sand, depressional is a poorly drained, nearly level soil found mainly in depressions and in a few poorly defined drainage ways in the flatwoods and sandhills. Typically, the surface layer is gray fine sand about 5 inches thick. The underlying layers are sand to a depth of more than 80 inches. The upper 15 inches is light gray generally streaked with gray or dark gray, the next 5 inches is dark brown with black fragments, and the lower layers are grayish brown, very pale brown or light gray.

The water table is at or above the surface for several months in most years. The rest of the time it is within 30 inches of the surface except during prolonged dry periods. The natural vegetation consists of St. John's wort, maidencane, other water tolerant grasses, some pineland threeawn, and scattered pond pine.

Bluff sandy clay loam (10) – Bluff sandy clay loam is a very poorly drained, nearly level and frequently flooded soil found on low terraces bordering the St. Johns River. Typically, the surface layer is sandy clay loam about 14 inches thick. The upper 8 inches is black, and the lower 6 inches is dark gray. The subsoil is gray sandy clay loam that extends to 68 inches. Mottles in shades of brown and yellow commonly occur in the subsoil. Below this to a depth of 99 inches is gray massive clay.

The water table is at the surface for long periods of time and is commonly flooded during the rainy season. The water table may drop several feet below the surface during extended dry periods. The natural vegetation consists of water tolerant plants including sedges, pickerelweed, cattail, and some sawgrass. In some places there are hammocks of cabbage palm, live oak, and cedar.

Cassia fine sand (13) – Cassia fine sand is a somewhat poorly drained, nearly level to gently sloping soil found in slightly elevated positions in the flatwoods or in lower positions on the sandhills. Typically, the surface layer is gray fine sand about 3 inches thick. The subsurface layer is white fine sand about 25 inches thick. The subsoil is 4 inches of black fine sand over 4 inches of brown fine sand mottles with dark reddish brown. The sand grains are coated with organic matter. The substratum is fine sand to a depth of 80 inches or more. The upper 11 inches is brown, the next 7 inches is pale brown, and the lower 27 inches is light gray.

The water table is between 15 and 40 inches below the surface for about 6 months a year, and recedes below 40 inches during dry seasons in most years. The natural vegetation consists of scattered slash pine, longleaf pine, and sand pine. The understory includes dense scrubby oaks, a few saw palmetto, and pineland threeawn.

Daytona sand, 0 to 5 percent slopes (17) – Daytona sand, 0 to 5 percent slopes is a moderately well drained, nearly level to gently sloping soil found on gently undulating sandhills or slightly elevated places in flatwoods. Typically, the surface layer is gray sand about 5 inches thick. The subsurface layer is white sand about 31 inches thick. The subsoil is mainly yellowish brown sand about 11 inches thick. Below the subsoil to a depth of 80 inches or more is light brownish gray sand with mottles in shades of brown.

The water table is commonly at a depth of 40 to 50 inches below the surface for between 1 and 4 months a year during the wet season. It can drop to 72 inches deep or lower during extended dry periods. The natural vegetation consists of scattered turkey oak, slash pine, and some longleaf pine. The understory is commonly brushy and includes rosemary, fetterbush, and saw palmetto.

EauGallie fine sand (20) – EauGallie fine sand is a poorly drained, nearly level soil found in broad flatwoods. Typically, the surface layer is 9 inches thick. The upper 4 inches is black fine sand, and the lower 5 inches is very dark gray fine sand. The subsurface layer is gray fine sand about 12 inches thick. The subsoil begins at a depth of about 21 inches. The upper 6 inches is black fine sand, the next 4 inches is dark brown fine sand. To a depth of 52 inches is brown fine sand, and to 61 inches is a layer of gray sandy loam. Below this to 65 inches is pale brown fine sand.

The water table fluctuates within 10 inches of the surface for periods of 1 to 4 months in most years and is within 40 inches for more than 6 months. The natural vegetation consists of longleaf pine, and slash pine. The understory includes saw palmetto, gallberry, and pineland threeawn.

Electra fine sand, 0 to 5 percent slopes (22) – Electra fine sand, 0 to 5 percent slopes is a somewhat poorly drained, nearly level soil that is found in slightly elevated areas in the flatwoods. Typically, the surface layer is dark gray fine sand that is 2 inches thick. The subsurface layer is fine sand that is light gray in the upper 6 inches and white in the lower 27 inches. The subsoil is between depths of 35 and 78 inches. In sequence downward, it is 6 inches of dark reddish brown fine sand, 11 inches of dark brown to brown fine sand, 5 inches of very pale brown fine sand, 13 inches of light brownish gray sandy clay loam, and 8 inches of light brownish gray sandy loam. Below the subsoil to 92 inches is gray loamy fine sand.

The water table is at a depth of between 20 and 40 inches for about 4 months during most years and recedes to below 40 inches during drier periods. The natural vegetation consists of open forest of slash pine, sand pine, and dense scrub oak. The understory includes saw palmetto, creeping bluestem, chalky bluestem, pineland threeawn, fetterbush, and gallberry.

Immokalee sand (29) – Immokalee sand is a poorly drained, nearly level soil found on broad areas in the flatwoods, low areas between sand ridges, or on slightly elevated areas between ponds and sloughs. Typically, the surface layer is about 10 inches thick. The upper 5 inches is black sand, and the lower 5 inches is dark gray sand. The subsurface layer is sand streaked with very dark gray in old root channels. The upper 6 inches is gray, and the lower 18 inches is light gray. The subsoil is loamy sand or sand that is coated with organic matter. The upper 5 inches is dark reddish brown loamy sand, and the lower 5 inches is black sand. The underlying material is grayish brown sand to a depth of 80 inches or more.

The water table is within 10 inches of the surface for between 1 and 2 months a year and 10 to 40 inches below the surface for more than 6 months in most years. Occasionally the water table will rise above the surface during prolonged heavy rains. The natural vegetation consists of an open forest of slash pine and longleaf pine. The understory includes saw palmetto, runner oak, and pineland threeawn.

Myakka fine sand, depressional (33) – Myakka fine sand, depressional is a poorly drained, nearly level soil found in depressions in the flatwoods. Typically, the surface layer is a very dark gray about 5 inches thick with a gray subsurface layer about 20 inches thick. The subsoil is black in the upper 3 inches, dark reddish brown in the next 7 inches, and dark brown in the lower part. The sand grains in the 10 inches of subsoil are coated with organic matter. Below the subsoil to a depth of about 80 inches is brown fine sand.

The water table is within 10 inches of the surface for 3 to 6 months a year and is commonly goes 2 to 6 inches above the surface during rainy periods. During prolonged dry periods, the water table may drop to between 2 and 3 feet below the surface. The natural vegetation consists of pineland threeawn, maidencane, scattered pine, myrtle, and scattered clumps of saw palmetto.

Orsino fine sand, 0 to 5 percent slopes (37) – Orsino fine sand, 0 to 5 percent slopes is a moderately well drained, nearly level to gently sloping sandy soil that is found on low flat ridges and low side slopes of higher sandhills. Typically, the surface layer is gray fine sand about 6 inches thick. The subsurface layer is light gray fine sand about 24 inches thick. Tongues of material from the subsurface layer extend into the subsoil. The subsoil is mainly brownish yellow and yellow fine sand about 38 inches thick. The underlying material is very pale brown fine sand mottles with yellowish brown and light gray to a depth of 80 inches or more.

The water table is 40 to 60 inches below the soil surface in wet seasons. It recedes to below 60 inches during dry periods. The natural vegetation consists of sand pine with an understory that includes scattered saw palmetto and rosemary.

Paola fine sand, 0 to 8 percent slopes (42) – Paola fine sand, 0 to 8 percent slopes is an excessively drained, nearly level to sloping sandy soil that is found on high, broad sandhills. Typically, the surface layer is a mixture of light gray fine sand and black organic matter about 6 inches thick. The subsurface layer is light gray and white fine sand about 20 inches thick. The subsoil is yellow fine sand about 38 inches thick. Tongues of subsurface material extend into the subsoil. They have a dark brown or yellowish brown exterior and a light gray interior. Below the subsoil is very pale brown fine sand to a depth of 80 inches or more.

The water table is seasonally at its highest at 72 inches below the surface and recedes to a greater depth during dry periods. The natural vegetation consists of a sand pine-scrub oak forest with an understory that includes scattered saw palmetto and rosemary.

Paola fine sand, 8 to 17 percent slopes (43) – Paola fine sand, 8 to 17 percent slopes is an excessively drained, strongly sloping to moderately steep sandy soil that can be found in small areas of side slopes and sand ridges, around sinks, and along streams that have high banks. Typically, the surface layer is gray fine sand about 5 inches thick. The upper 6 inches of the subsurface layer is gray fine sand, and the lower 19 inches is light gray fine sand. The subsoil is yellow fine sand about 35 inches thick. Tongues of subsurface material extend into the subsoil. They have a brownish yellow exterior and a light gray interior. Below the subsoil is very pale brown fine sand to a depth of 80 inches or more.

The water table is seasonally at its highest at 72 inches below the surface and recedes to a greater depth during dry periods. The natural vegetation consists of a sand pine-scrub oak forest with an understory of rosemary.

Placid fine sand, depressional (48) – Placid fine sand, depressional is a very poorly drained, nearly level soil that occurs in wet depressions. Typically, the surface layer is black fine sand about 11 inches thick over 4 inches of very dark gray fine sand that generally has a few gray streaks. The underlying material is fine sand that extends to 80 inches or more. The upper 28 inches is gray, the next 24 inches is grayish brown, and the lower part is light brownish gray.

The water table is within a depth of 12 inches of the surface for more than 6 months during most years. The soil is generally covered with standing water for as much as 6 months annually. The natural vegetation is generally wetland grasses, such as maidencane, but in some areas it is pond pine, bay, and cypress.

Pomona fine sand, depressional (50) – Pomona fine sand, depressional is a poorly drained, nearly level soil that is found in depressions. Typically, the surface layer is black fine sand about 7 inches thick. The subsurface layer is gray fine sand about 7 inches thick. The subsoil between depths of 14 and 25 inches is friable dark reddish brown fine sand and between depth of 25 and 33 inches is very dark grayish brown and dark brown fine sand. Below this is 16 inches of brown fine sand and then 4 inches of light gray fine sand. Between depths of 53 and 61 inches is gray fine sandy loam. Below this to 70 inches or more is light gray fine sandy loam with pockets of loamy fine sand and fine sand.

The water table fluctuates from about 6 inches above the soil surface to a depth of about 10 inches for 4 to 8 months during most years. The water table may drop to a depth of 40 inches during extended dry periods. The natural vegetation consists of scattered slash pine, loblolly bay, sweetgum, and pond pine. The understory includes gallberry, wax myrtle, St.-John's wort, fetterbush, and scattered saw palmetto.

Quartzipsamments, gently sloping (54) – Quartzipsamments, gently sloping is a moderately well drained, gently sloping sandy soil that has been reworked and shaped by earthmoving equipment. This soil can be found around former sloughs and shallow ponds that have been deepened to form lakes, or where low areas have been filled with sandy material. Typically, these soils are highly variable because they have been mixed during movement and have no defining horizonation or orderly sequence of layers.

The water table is usually below a depth of 40 inches in most places. The vegetation consists of various scattered weeds.

Riviera fine sand (55) – Riviera fine sand is a poorly drained, nearly level soil that is found on broad, low flats. Typically, the surface layer is fine sand about 16 inches thick. The upper 4 inches is very dark gray, and the lower 12 inches is dark gray. The subsurface layer is light brownish gray fine sand about 9 inches thick. The subsoil is about 18 inches of gray sandy clay loam that has many medium and coarse distinct yellowish brown mottles. The upper 13 inches has vertical tonguing or intrusions from the subsurface layer. The underlying material to a depth of about 64 inches is light brownish gray loamy sand.

The water table is within a depth of 10 inches of the surface for between 2 and 6 months and is within 40 inches for about 6 months during most years. The natural vegetation consists of mixed hardwoods, cabbage palm, water oak, laurel oak, southern magnolia, slash pine, and southern red cedar. The understory includes wax myrtle, gallberry, fetterbush, maidencane, smooth cordgrass, chalky bluestem, pineland threeawn, toothache grass, and broomsedge bluestem.

Smyrna fine sand (60) – Smyrna fine sand is a poorly drained, nearly level sandy soil found on broad areas in the flatwoods. Typically, the surface layer is black or very dark gray fine sand about 4 inches thick. The subsurface layer is fine sand about 13 inches thick that is gray in the upper 4 inches and light gray in the lower 9 inches. The subsoil is fine sand about 33 inches thick. The upper 2 inches is very dark gray, the next 5 inches is black, the next 3 inches is very dark grayish

brown, and the lower 23 inches is brown. Below the subsoil, between depths of 50 to 72 inches, is gray fine sand that has brownish mottles, and next is 8 inches of white fine sand that has yellowish mottles.

The water table is within 10 inches of the surface for between 1 and 4 months and between 10 and 40 inches for more than 6 months during most years. During rainy seasons, the water table may rise to the surface for brief periods of time. The natural vegetation consists of an open forest of slash pine with an understory that includes saw palmetto, running oak, and pineland threeawn.

St. Johns fine sand (61) – St. Johns fine sand is a poorly drained, nearly level sandy soil that occurs in low places in flatwoods, generally adjacent to swamps. Typically, the surface layer is 7 inches of black fine sand above 3 inches of very of very dark gray fine sand. The subsurface layer is about 16 inches thick and is composed of 3 inches of gray fine sand over 13 inches of light gray fine sand. The subsoil is fine sand coated with colloidal organic matter composed of 9 inches of black on top, 8 inches of dark reddish brown in the middle, and 11 inches of dark brown on the bottom. Below the subsoil is brown fine sand to a depth of 60 inches or more.

The water table is within 10 inches of the surface for 2 to 6 months and between 10 and 40 inches for more than 6 months. In rainy seasons, the water table rises to the surface for brief periods of time. The natural vegetation consists of pond pine, longleaf pine, slash pine, and loblolly bay with an understory that includes saw palmetto and gallberry.

Tavares fine sand, 0 to 5 percent slopes (63) – Tavares fine sand, 0 to 5 percent slopes is a moderately well drained, nearly level to gently sloping sandy soil that is found on higher positions on the low sand ridges and in intermediate positions on the higher sand ridges. Typically, the surface layer is dark gray fine sand about 8 inches thick. The underlying material is fine sand to a depth of 80 inches or more. The upper 16 inches is pale brown fine sand that has yellowish and brownish splotches throughout. The next 24 inches is very pale brown mottles with yellow. Below this to 80 inches is white fine sand mottled with brown and yellow.

The water table is between 40 and 60 inches of the surface during wet seasons and recedes to a greater depth during prolonged dry periods. The natural vegetation consists of a forest of longleaf pine and turkey oak with a understory that includes pineland threeawn and scattered saw palmetto.

3.1.2 Land Use Types

Land Use types found within the project corridor are described below (see Land Use and Habitat Coverage Map**, Figure C, Appendix A**).

Residential (1000-1300) – This range of land use codes consists of areas containing low, medium, and high density residential housing. These areas are found primarily in the central portion of the project corridor on both sides of the right-of way from Dirksen Drive and Debary Avenue to Saxon Boulevard. This land use was also observed north of Saxon Boulevard on the east side of the right-of-way, and south of Graves Avenue on the west side of the right-of-way. The majority of dwellings along the project corridor consist of single family homes. The most densely populated areas are the Orange City RV Resort and an area of homes along Deltona Boulevard. This land use has a low likelihood for wildlife occurrence.

Commercial and Services (1400) – This land use was observed primarily around the interchanges with Dirksen Drive/Debary Avenue, and Saxon Boulevard and along Deltona Boulevard and Enterprise Road. It includes numerous types of businesses in malls, strip malls and as stand-alone establishments along the corridor. This land use has a low likelihood for wildlife occurrence.

Retail Sales and Services (1410) – This land use was observed in several portions of the project corridor, primarily along Deltona Boulevard and Enterprise Road. It consists of shopping centers, and other service/retail oriented businesses along the adjacent roadways. This land use has a low likelihood for wildlife occurrence.

Professional Services (1430) – Medical offices, dental offices, veterinary offices, and other professional offices are located along the corridor, primarily along Deltona Boulevard and Enterprise Road. This land use has a low likelihood for wildlife occurrence.

Tourist Services (1450) – Two hotels were identified along the project corridor, one at the interchange with Dirksen Drive/Debary Avenue, and one at the interchange with Saxon Boulevard. This land use has a low likelihood for wildlife occurrence.

Cemeteries (1480) – Two cemeteries were identified along the project corridor, one along Enterprise Road to the east of I-4, and one along Saxon Boulevard to the west of I-4. This land use has a low likelihood for wildlife occurrence.

Other Light Industrial (1550) – Two small light industrial facilities were identified along the project corridor. One was along Enterprise Road to the east of I-4, and the other was along Graves Avenue to the east of I-4. This land use has a low likelihood for wildlife occurrence.

Institutional (1700) – This land use consists of schools and institutions such as Deltona Middle School, several places of worship along Deltona Boulevard, and a fire station along Diamond Street. This land use has a low likelihood for wildlife occurrence.

Golf Courses (1820) – This land use was only observed to the west of I-4 at the Orange City RV Resort. This land use has a moderate likelihood for wildlife occurrence.

Parks and Zoos (1850) – This land use consists of recreational facilities that are either parks or zoos. Lake Monroe Park to the west of I-4 along the St. Johns River was the only representative of this land use identified. This land use has a moderate likelihood for wildlife occurrence.

Community Recreational Facilities (1860) – This land use is represented by Bill Keller Park, which is a recreational sport facility located off of Colomba Road, west of the right-of-way. This land use has a low likelihood for wildlife occurrence.

Open Land (1900) – This land use consists of undeveloped land within urban areas and inactive land with street patterns but without structures. Several small areas of this land use were observed along the central portion of the project corridor. This land use has a low likelihood for wildlife occurrence.

Improved Pasture (2110) – This category of land use consists of land which has been cleared, tilled, reseeded with specific grass types and periodically improved with brush control and fertilizer application. A large swath of land on the western side of I-4 just north of the SR 472 interchange has been converted to improved pasture. This land use has a moderate likelihood for wildlife occurrence.

Herbaceous- Dry Prairie (3100) – This land use consists of open, dry treeless areas containing grasses, forbs, sedges, rushes and other herbaceous vegetation. This habitat was observed in one small patch of land on the western side of I-4 just north of the Enterprise Road overpass. This land use may also be used to describe some areas surrounding reservoirs in this project corridor. This land use has a high likelihood for wildlife occurrence.

Shrub and Brushland (3200) – This land use consists of primarily shrubs and brush species. A few small patches of this land use were observed along the project corridor and portions of the Rhode Island Avenue extension. This land use has a high likelihood for wildlife occurrence.

Mixed Upland Non-forested (3300) – This land use is described as not being dominated by any species and may be comprised of multiple species. It was observed in a small area to the north and south of Graves Avenue, on the west side of I-4. This land use has a high likelihood for wildlife occurrence.

Pine Flatwoods (4110) – This land use consists of natural pine flatwoods. It was observed along a thin strip of land along Florida Avenue, west of the right-of-way and several other small patches along the project corridor. This land use has a high likelihood for wildlife occurrence.

Longleaf Pine - Xeric Oak (4120) – This land use is described as being dominated by longleaf pine and has a mid-story canopy of blue-jack oak, turkey oak, post oak, and other dry site tolerant oaks and hardwoods. It was observed in a small area to the southwest of the Graves Avenue overpass. This land use has a high likelihood for wildlife occurrence.

Sand Pine (4130) – This land use consists of upland forest communities dominated by sand pine. It was observed along the majority of the project corridor on both sides of the right-of-way north of Saxon Boulevard, within the proposed right-of-way for the Rhode Island Avenue extension east of I-4, and in other small isolated patches south of Saxon Boulevard. This land use has a high likelihood for wildlife occurrence.

Xeric Oak (4210) – This land use upland oak communities which occupy similar habitat as the Longleaf Pine – Xeric Oak community except that the pines, if present, are not the dominant species. The vegetation typically consists of a mid-story canopy of blue-jack oak, turkey oak, post oak, and other dry site tolerant oaks and hardwoods. It was observed along portions of the proposed Rhode Island Avenue extension, including Pond Site A. There is a high likelihood for wildlife in this land use.

Hardwood-Conifer Mixed (4340) – Vegetation within this land use consists of oaks, pine, and other species with no clear canopy dominance between hardwoods and conifers. This land use was observed along a large portion of the northern portion of the corridor, especially around the SR 472 interchange and areas on the west side of I-4 to the north of Saxon Boulevard. Other smaller areas of this land use were observed in isolated patches between Dirksen Drive/Debary Avenue and Saxon Boulevard. This land use has a high likelihood for wildlife occurrence.

Coniferous Plantations (4410) – This land use consists almost exclusively of pine forests artificially generated by planting seedling stock or seeds. Two small isolated patches of this land use were identified to the west of the right-of-way. This land use has a moderate likelihood for wildlife occurrence.

Streams and Waterways (5100) – This land use designates rivers, creeks, canals, and other linear water bodies. The St. Johns River resumes its course at the mouth of Lake Monroe, approximately where I-4 crosses from Seminole County to Volusia County over a bridge. I-4 also crosses Padgett Creek, which is a small tributary to Lake Monroe. This land use has a high likelihood for wildlife occurrence.

Lakes (5200) – This land use designates inland water bodies which are not classified as reservoirs. Lake Monroe is a large lake located to the east of I-4 at the southern portion of the corridor. Several other named lakes, including Lake Gleason, Lake Emerald, and Trout Lake are located near the right-of-way. Several other smaller lakes are located along the project corridor, including one that is directly adjacent to the west of the right-of-way, south of Saxon Boulevard and one that is to the south of the proposed Rhode Island Avenue extension. This land use has a high likelihood for wildlife occurrence.

Reservoirs (5300) – This land use designates all retention ponds and other artificial impoundments used for irrigation and flood control. Numerous reservoirs were observed along the project corridor, primarily in urban areas. One reservoir is located within the median, south of Saxon Boulevard. This land use has a high likelihood for wildlife occurrence.

Bay Swamps (6110) – This land use is composed of dominant trees such as loblolly bay, sweetbay magnolia, swamp bay, with slash pine and loblolly pine as an associated component at times. Large gallberry, fetterbush, wax myrtle and titi are included in the understory vegetation. One isolated patch was observed to the west of the project corridor north of the St. Johns River. This land use has a high likelihood for wildlife occurrence.

Mixed Wetland Hardwoods (6170) – This land use is reserved for those wetland hardwood communities which are composed of a large variety of hardwood species tolerant of hydric conditions yet exhibit an ill-defined mixture of species. This habitat type was primarily observed along the southern portion of the project corridor between the St. Johns River and the Dirksen Drive/Debary Avenue interchange. This land use has a high likelihood for wildlife occurrence.

Cypress (6210) – Dominant vegetation consists of cypress and was observed in low areas bordering Lake Monroe and the St. Johns River. This land use has a high likelihood for wildlife occurrence.

Wetland Forested Mixed (6300) – This land use is defined as mixed wetlands forest communities in which neither hardwoods or conifers achieve a 66 percent dominance of the crown canopy composition. This habitat type was observed to the west of I-4 near the St. Johns River and in several patches within and adjacent to the Dirksen Drive/Debary Avenue interchange. This land use has a high likelihood for wildlife occurrence.

Wetland Scrub (6310) – This land use is defined as being associated with topographic depressions and poorly drained soil with a mix of wetland species without a dominant species. This habitat type was observed in a narrow strip of land on both sides of I-4 between the St. Johns River and the Dirksen Drive/Debary Avenue interchange and in several other isolated patches. This land use has a high likelihood for wildlife occurrence.

Freshwater Marsh (6410) – This land use is defined as vegetated non-forested wetlands which are usually found in low-lying areas or depressions in the landscape, they can be found adjacent to the roadway in several places between the St. Johns River and Saxon Boulevard. Smaller isolated patches of this habitat type also occur in several areas near lakes throughout the project corridor. This land use has a high likelihood for wildlife occurrence.

Emergent Aquatic Vegetation (6440) – This land use is defined as being wetland areas where floating vegetation and vegetation which is found either partially or completely above the surface. Multiple patches of this habitat type were observed along the project corridor, usually near or adjacent to waterways. This land use has a high likelihood for wildlife occurrence.

Disturbed Lands (7400) – This land use is defined as those areas which have been changed due primarily to human activities other than mining. An area of exposed sand which is used for driving off-road vehicles was observed east of I-4 just south of the Graves Avenue overpass. This land use may also be used to describe some earthen berms surrounding reservoirs in this project corridor. This land use has a low likelihood for wildlife occurrence.

Rural Land in Transition without Positive Indicators of Intended Activity (7410) – This land use was observed in one area to the east of I-4, just south of Graves Avenue. This land use has a moderate likelihood for wildlife occurrence.

Railroads (8120) – This land use designates all railroad facilities and lines. A railroad bridge crosses the St. Johns River to the west of I-4, and the railroad line extends to the north, away from the right-of-way. This land use has a low likelihood for wildlife occurrence.

Roads and Highways (8140) – This land use designates all major and minor roads throughout the project corridor. This land use has a low likelihood for wildlife occurrence, though the right-of-way does support habitat for gopher tortoise burrows in some locations.

Communications (8200) – This land use designates all communications structures. A radio tower and an associated building were observed east of I-4 along Lake Monroe. This land use has a low likelihood for wildlife occurrence.

Electrical Power Facilities (8310) – This land use designates power plants, including the FPL Sanford Plant along the St. Johns River and the Duke Energy Florida Turner Plant #B off of Debary Avenue. This land use has a low likelihood for wildlife occurrence.

Electrical Power Transmission Lines (8320) – There are electrical power transmission lines that cross the St. Johns River just west of I-4. There are also lines that cross I-4 at the Dirksen Drive/Debary Avenue and Saxon Boulevard interchanges. This land use has a low likelihood for wildlife occurrence.

Water Supply Plants (8330) – There is a water supply plant east of I-4 to the north of Firwood Drive, off of Normandy Boulevard. This land use has a low likelihood for wildlife occurrence.

Surface Water Collection Basins (8370) – This land use consists of areas used to collect excess stormwater runoff. They are found near roadways and within interchanges. This land use has a low likelihood for wildlife occurrence.

3.1.3 Existing and Proposed Right-of-Way

The existing unpaved right-of-way within the project corridor consists primarily of areas of maintained grass. The right-of-way is lined with intermittent patches of landscaped vegetation, as well as other smaller areas of natural vegetation. The center median south of Saxon Boulevard has been converted into storm water and drainage treatment, with a series of ponds that have been heavily planted with native vegetation.

The project is developing alternatives for the proposed expansion, all of which will be assumed to impact the existing right-of-way in its entirety. In order to achieve the goals of the project (expansion to 6 general use lanes plus 4 express lanes), the designers must utilize as much of the existing right-of-way as possible, though the potential for the need to acquire minimal amounts of additional right-of-way for the improvements remains. New right-of-way for pond sites will be required as the existing right-of-way does not contain sufficient areas to provide the necessary treatment and retention, along with the capacity expansions. The project right-of-way is depicted on the Land Use and Habitat Coverage Maps (see **Figure C**, in **Appendix A**).

3.1.4 Proposed Stormwater Management Areas

Forty three (43) potential stormwater management facilities were evaluated for this segment; twelve (12) are existing facilities which were previously permitted and are being modified or enlarged to meet the requirements of the project, while four (4) are existing and will be utilized with no modifications. Twenty four (24) new pond sites, two (2) new treatment swales and one (1) stormwater vault are proposed. The proposed pond sites are depicted on the Land Use and Habitat Coverage Maps (see **Figure C**, in **Appendix A**) and photographs of each pond site are included in **Appendix C**.

The existing pond sites that will not require modifications are pond sites 400, D, 413, and 414. (removed 418, added to existing/modified)

Pond Site 400 – Pond Site 400 is located west of I-4 to the north of the St. Johns River. This is a recommended pond site. The current pond site has very little open water and is dominated by cattail with some primrose and climbing hemp vine along the edges. The sloped rim of the pond primarily consists of mowed Bahia grass and other herbaceous species. There is a high likelihood for wildlife occurrence on this existing pond site.

Pond Site D – Pond Site D is located to the east of I-4, along the western edge of Normandy Boulevard and is proposed as part of the Rhode Island Avenue extension. The current site consists entirely of mowed Bahia grass and weedy herbaceous species. The edge of the pond site is comprised primarily of sand pine with some scrub live oak, palmetto, and turkey oak. There is a high likelihood for wildlife occurrence on this existing pond site.

Pond Site 413 – Pond Site 413 is located south of the intersection of Graves Avenue and SR 472. This pond site is primarily Bahia grass with other herbaceous species and has large open patches of bare sand. The majority of the perimeter of the pond site is vegetated with scrub live oak, sand pine, palmetto, and gopher apple. A family of three scrub jays was observed utilizing and defending the majority of this pond site. There is a high likelihood for wildlife occurrence on this existing pond site.

Pond Site 414 – Pond Site 414 is located to the northeast of the Cassadaga Road overpass. This pond site is primarily mowed Bahia grass with some patches of cogon grass and other herbaceous species. There is a moderate likelihood for wildlife occurrence on this existing pond site.

The existing pond sites that will require modifications for project include ponds 402A, 405A, 405B, 406A, 407A, 408, 408 (ALT), 409A1, 409A2, 410, 411, and 418.

Pond Site 402A – Pond Site 402A is located to the west of I-4, within the interchange with Dirksen Drive. This is a recommended pond site. The current pond site is surrounded by patches of cattail, primrose, and torpedo grass with some planted cypress and sweetgum along the edges. Dense patches of hydrilla dominate the open water portion of the pond site. The rim of the pond primarily consists of mowed Bahia grass and other herbaceous species. There is a high likelihood for wildlife occurrence on this proposed pond site.

Pond Site 405A – Pond Site 405A is located within the southwest quadrant of the Saxon Boulevard interchange. This is a recommended pond site. The pond site has shallow standing water with vegetation consisting primarily of cattail, willow, and white water lily along with a patch of pickerel weed and arrowhead at the southwest part of the site. There is a high likelihood for wildlife occurrence on this proposed pond site.

Pond Site 405B – Pond Site 405B is located within the southwest quadrant of the Saxon Boulevard interchange. This is a recommended pond site. The pond site has shallow standing water with vegetation consisting primarily of cattail, willow, and white water lily. There is a high likelihood for wildlife occurrence on this proposed pond site.

Pond Site 406A – Pond Site 406A is located within the northwest quadrant of the Saxon Boulevard interchange. This is a recommended pond site. The central part of the pond site consists of mowed torpedo grass and other herbaceous species. The western part of the pond site consists of a patch of wax myrtle, salt bush, and slash pine with some planted cypress. The eastern and northern portions of the pond site are dominated by sand pine. Sandhill cranes were observed foraging at this pond site. There is a high likelihood for wildlife occurrence on this proposed pond site.

Pond Site 407A – Pond Site 407A is located within the northeast quadrant of the Saxon Boulevard interchange. The pond site consists primarily of torpedo grass with rattlebox and other herbaceous species along the sloped banks. There is a high likelihood for wildlife occurrence on this proposed pond site.

Pond Site 408 – Pond Site 408 is located on the north side of Saxon Boulevard, to the east of I-4. This is a recommended pond site. This current pond site is primarily un-vegetated and semi-wet, with the sloped rim consisting primarily of mowed Bahia grass. There is a moderate likelihood for wildlife occurrence on this proposed pond site.

Pond Site 408 (Alternative) - Pond Site 408 is located on the north side of Saxon Boulevard, to the east of I-4. This current pond site is primarily un-vegetated and semi-wet, with the sloped rim consisting primarily of mowed Bahia grass. Three quarters of the pond will be constructed over an existed commercial shopping plaza that consists of several businesses. There is a moderate likelihood for wildlife occurrence within the overlapping portion of pond site 408 and a low likelihood of wildlife within the remaining portion of the proposed pond site.

Pond Site 409A1– Pond Site 409A1 is located on the east side of I-4, north of Saxon Boulevard. This pond is recommended. The pond site is mostly mowed Bahia grass and other herbaceous species. A stand consisting of sand pine and scrub live oak is located along the southern, eastern, and northern end of the fence within the designated right-of-way. Two families of scrub jays were encountered at this location and were observed utilizing the existing pond and portions of the proposed modifications to the pond. There is a high likelihood for wildlife to utilize the habitat on this proposed pond site.

Pond Site 409A2 – Pond Site 409A2 is located on the east side of I-4, north of Saxon Boulevard. This alternative pond site is mostly mowed Bahia grass and other herbaceous species. A stand consisting of sand pine and scrub live oak is located along the southern, eastern, and northern end of the fence within the designated right-of-way. Two families of scrub jays were encountered at this location and were observed utilizing the existing pond and portions of the proposed modifications to the pond. There is a high likelihood for wildlife to utilize the habitat on this proposed pond site.

Pond Site 410 – Pond Site 410 is located to the east of I-4, within SR 472 interchange. This pond site is primarily mowed Bahia grass. There is a moderate likelihood for wildlife occurrence on this proposed pond site.

Pond Site 411 – Pond Site 411 is located to the east of I-4, within SR 472 interchange. This pond site is primarily mowed Bahia grass with sand pine and saw palmetto along the western edge. No obvious signs of contamination were observed in the field for this site. There is a moderate likelihood for wildlife occurrence on this proposed pond site.

Pond Site 418 – Pond Site 418 is located to the west of Dr. Martin Luther King Jr. Beltway, between SR 472 and Cassadaga Road. This pond site is primarily comprised of sand pine with some scrub live oak, laurel oak, and palmetto. There is a high likelihood for wildlife occurrence on this existing pond site.

Newly proposed ponds include ponds 401, 402B, 402C, 402D, 402E, 402F, FPC 403, 403, 406B, FPC 407, 407B, 407C, Stormwater Vault 408, 408 B, 408-D1, 409B1, A, 412, 415, 416, 417, B, B1, and C.

Pond Site 401 – Pond site 401 is a proposed new pond site located west of I-4, south of the Dirksen Drive/Debary Avenue interchange. This is an existing FDOT borrow pit that has been proposed as an alternative to the treatment swales (Treatment Swales 401-A and 401-B). The existing borrow pit is primarily open water lined with cabbage palm and cattails. There is a high likelihood for wildlife occurrence on this proposed pond site.

Pond Site 402B – Pond Site 402B is a proposed new pond site located to the east of I-4, within the interchange with Debary Avenue. This is a recommended pond site. The current site is densely forested with slash pine, water oak, and cabbage palm, with elderberry, wax myrtle and various herbaceous species along the edges. An osprey nest was observed on top of power line structure between Pond Sites 402B and 402C. There is a high likelihood for wildlife occurrence on this proposed pond site.

Pond Site 402C – Pond Site 402C is a proposed new pond site located to the east of I-4, within the interchange with Debary Avenue. This is a recommended pond site. The current site is densely forested with slash pine, water oak, and cabbage palm, with elderberry, wax myrtle and various herbaceous species along the edges. An osprey nest was observed on top of power line structure between Pond Sites 402B and 402C. There is a high likelihood for wildlife occurrence on this proposed pond site.

Pond Site 402D – Pond Site 402D is a proposed new pond site located to the west of I-4, within the interchange with Dirksen Drive. This is a recommended pond site. The current site is densely forested with slash pine, and water oak. There is a moderate likelihood for wildlife occurrence on this proposed pond site.

Pond Site 402E – Pond Site 402E is a proposed new pond site located to the east of I-4, within the interchange with Debary Avenue. This is a recommended pond site. The current site is densely forested with slash pine, and water oak. There is a moderate likelihood for wildlife occurrence on this proposed pond site.

Pond Site 402F – Pond Site 402F is a proposed new pond site located to the east of I-4, northwest of the ramp from westbound I-4 to Dirksen Drive This is a recommended pond site. The current site is primarily standing water overgrown with willow, primrose, and elderberry. The northwest edge of the proposed pond site is composed of slash pine, sweet bay, Dahoon holly, camphor tree and Chinese tallow. There is a high likelihood for wildlife occurrence on this proposed pond site.

Pond Site FPC 403 – Pond Site FPC 403 is a proposed new floodplain compensation pond located to the west of I-4, between the northern edge of an existing lake and the southern terminus of Goddard Drive. This is a recommended pond site. The current site is primarily a mix of dense vegetation primarily comprised of laurel oak, scrub live oak, slash pine, cabbage palm and saw palmetto. There is a high likelihood for wildlife occurrence on this proposed pond site.

Pond Site 403 – Pond Site 403 is a proposed new pond site located within the I-4 median between the Enterprise Road overpass and the Saxon Boulevard interchange. This is a recommended pond site. The current site consists of four vegetated basins surrounded by mowed berms with an area of open water near the center of the proposed pond. The central portion of the site consists of an existing pond which is primarily open water with several large patches of white water lily and is surrounded by a mix of cattails, willow, and various weedy herbaceous species. The vegetated basins to the north and south of the central pond consist primarily of planted cypress and red maple with large patches of cogon

grass with some salt bush, willow, wax myrtle, and cattails. There is a moderate likelihood for wildlife occurrence on this proposed pond site.

Pond Site 406B – Pond Site 406B is a proposed new pond site located within the northwest quadrant of the Saxon Boulevard interchange. The current site is densely forested with sand pine, with some scrub live oak and palmetto in the understory. A pair of scrub jays was observed utilizing and defending the north and western portions of this pond site. There is a high likelihood for wildlife occurrence on this proposed pond site.

Pond Site FPC 407 – Pond Site FPC 407 is a proposed new floodplain compensation pond located within the southeast quadrant of the Saxon Boulevard interchange. This is a recommended floodplain compensation pond. The pond site consists primarily of cabbage palm, slash pine, and laurel oak with rattlebox, Cogon grass, and other herbaceous species along the edge of the existing right-of-way fence. The northern portion of this proposed pond site consists of the existing maintained right-of-way and ramp. There is a moderate likelihood for wildlife occurrence on this proposed pond site.

Pond Site 407B – Pond Site 407B is a proposed pond site located within the northeast quadrant of the Saxon Boulevard interchange. The current site is primarily mowed Bahia grass with a patch of un-mowed primrose and willow at the west end of the pond site. There is a moderate likelihood for wildlife occurrence on this proposed pond site.

Pond Site 407C – Pond Site 407C is a proposed pond site located within the northeast quadrant of the Saxon Boulevard interchange. The current site is densely forested with sand pine with some scrub live oak and palmetto. There is a moderate likelihood for wildlife occurrence on this proposed pond site.

Stormwater Vault 408 – The Stormwater Vault pond is located along the north side of Saxon Boulevard, to the east of I-4, northwest of the intersection of Saxon Boulevard and Finland Drive, which is the recommended alternative. The current site is entirely single-family residential houses with mowed lawns and ornamental landscaping. There is a low likelihood for wildlife occurrence on this proposed pond site.

Pond Site 408B – Pond Site 408B is an alternative pond site located along the south side of Saxon Boulevard, to the east of I-4, between Finland Drive and Diane Terrace. The current site is entirely single-family residential houses. There is a low likelihood for wildlife occurrence on this proposed pond site.

Pond Site 408D1 – Pond Site 408-D1 is an alternative pond site located along the south side of Saxon Boulevard, to the east of I-4, between Diane Terrace and Normandy Boulevard. The current site is entirely single-family residential houses. There is a low likelihood for wildlife occurrence on this proposed pond site.

Pond Site 409B1 – Pond Site 409B1 is a proposed new pond site located to the west of I-4, between Saxon Boulevard and the Graves Avenue overpass, which is the recommended alternative. The current site is primarily slash pine and live oak with some palmetto and cabbage palm. There is a high likelihood for wildlife occurrence on this proposed pond site.

Pond Site A – Pond Site A is a proposed new pond site located to the west of I-4, to the south of the proposed Rhode Island Avenue extension. The current site is primarily scrub live oak and palmetto with some rusty lyonia, slash pine, and cabbage palm. There is a high likelihood for wildlife occurrence on this proposed pond site.

Pond Site B – Pond Site B is an alternative pond site located to the west of I-4, along the southern edge of the proposed Rhode Island Avenue extension. This pond site is recommended. The current site is primarily scrub live oak, sand pine, and

palmetto with some turkey oak, fetterbush, and aster. There is a high likelihood for wildlife occurrence on this proposed pond site.

Pond Site B1 – Pond Site B1 is located to the west of I-4, along the southern edge of the proposed Rhode Island Avenue extension and is the recommended alternative for this pond site. The current site is primarily scrub live oak, sand pine, and palmetto with some turkey oak, fetterbush, and aster. There is a high likelihood for wildlife occurrence on this proposed pond site.

Pond Site C – Pond Site C is located to the east of I-4, along the southern edge of the proposed Rhode Island Avenue extension. The current site is dominated by sand pine with some scrub live oak, palmetto, turkey oak, fetterbush, and rusty lyonia. There is a high likelihood for wildlife occurrence on this proposed pond site.

Pond Site 412 – Pond Site 412 is a proposed new pond site located to the northeast of the SR 472 interchange. This pond site is primarily live oak with some cabbage palm and palmetto. Some burrows, potentially abandoned gopher tortoise burrows were observed in close proximity to this pond site. There is a high likelihood for wildlife occurrence on this proposed pond site.

Pond Site 415 – Pond Site 415 is a proposed new pond site located to the north of SR 472, between Kentucky Avenue/Dr. Martin Luther King Jr. Beltway and I-4. This pond site is heavily wooded and composed primarily of laurel oak and palmetto with some longleaf and slash pines along the edges. There is a high likelihood for wildlife occurrence on this proposed pond site.

Pond Site 416 – Pond Site 416 is located to the west of Kentucky Avenue, between Graves Avenue and SR 472. This pond site is primarily comprised of sand pine with some scrub live oak, laurel oak, and palmetto. There is a high likelihood for wildlife occurrence on this proposed pond site.

Pond Site 417 – Pond Site 417 is a proposed new pond site located to the southwest of the Kentucky Avenue/Dr. Martin Luther King Jr. Beltway and SR 472. This pond site is primarily comprised of mixed pines, laurel oak, and palmetto. There is a high likelihood for wildlife occurrence on this proposed pond site.

Two new treatment swale alternatives are proposed adjacent to the roadway along the causeway across Lake Monroe and the Debary Bayou.

Treatment Swale 401A – Treatment Swale 401A is a proposed new treatment swale alternative located parallel to I-4 on the western side of the right-of-way between the St. Johns River Bridge and the Padgett Creek Bridge. The existing right-of-way is paved up to the boundary fence at this location, but the other side of the fence is heavily vegetated with a mix of vegetation which includes cabbage palm, marshmallow, willow, wax myrtle, elm, ash, Chinese tallow, salt bush, and elderberry. There is a high likelihood for wildlife occurrence within the proposed swales.

Treatment Swale 401B – Treatment Swale 401B is a proposed new treatment swale located parallel to I-4 on the eastern side of the right-of-way between the St. Johns River Bridge and the Padgett Creek Bridge. This is a recommended treatment swale. The existing right-of-way is paved up to the boundary fence at this location, but the other side of the fence is heavily vegetated with a mix of vegetation which includes cabbage palm, marshmallow, willow, wax myrtle, elm, ash, Chinese tallow, salt bush, and elderberry. There is a high likelihood for wildlife occurrence within the proposed swales.

3.2 Wildlife, Including Listed Species

During the field investigation, individuals or evidence of at least forty (40) different mammal, bird, and reptile species were identified along the project corridor (see Species Location Maps, **Figure D, Appendix A**). Of those species, the following species appear on protected species lists developed by the USFWS, the FFWCC, FNAI or FCREPA:

Aphelocoma coerulescens coerulescens – Florida scrub-jay
Ardea alba – great egret
Egretta caerulea – little blue heron
Egretta thula – snowy egret
Elanoiodes forficatus – American swallow-tailed kite
Eudocimus albus – white ibis
Gopherus polyphemus – gopher tortoise
Grus canadensis pratensis – Florida sandhill crane
Haliaeetus leucocephalus leucocephalus – southern bald eagle
Mycteria americana – wood stork
Pandion haliaetus – osprey

Additional wildlife species observed during the field investigations included:

Agelaius phoeniceus – red-winged blackbird
Anhinga anhinga - anhinga
Anolis carolinensis – green anole
Anolis sagrei – Cuban brown anole
Ardea herodias – great blue heron
Bubulcus ibis – cattle egret
Buteo lineatus – red-shouldered hawk
Butorides virescens – green heron
Cathartes aura – turkey vulture
Cnemidophorus sexlineatus – six-lined racerunner
Coluber constrictor – black racer
Columba livia – rock dove
Corvus brachyrhynchos – American crow
Coragyps atratus – black vulture
Dasypus novemcinctus – armadillo
Didelphis virginiana – opossum
Dumetella carolinensis – catbird
Fulica americana – American coot
Gallinula galeata – common gallinule
Geomys pinetis – pocket gopher
Lontra canadensis – river otter
Meleagris gallopavo – wild turkey
Phalacrocorax auritus – cormorant
Procyon lotor – raccoon
Pseudemys concinna floridana – Florida cooter
Quiscalus quiscula – grackle
Sciurus carolinensis – gray squirrel
Strix varia – barred owl
Sus scrofa – feral pig

Numerous other wildlife and plant species, many of which are protected, have the potential to occur in Volusia County (See Tables 1 & 2 **in Appendix B**). Although evidence of the occurrence of those species was not observed during field inspections of the existing right-of-way or proposed pond sites, suitable habitat exists in those areas. A discussion of species that might be impacted by the proposed project is provided below in Section 4.0.

4.0 Impact Analysis

4.1 Potentially Impacted Listed Species and Other Sensitive Species

During field investigations, wildlife and plant surveys were conducted in potential impact areas such as proposed pond site areas and the existing right-of-way that contain habitat for one or more listed species. Listed below are those species with the potential to occur within the study limits and potentially be impacted by the project.

4.1.1 Federally Listed Species

Informal Consultation for federally listed species was completed with USFWS and documented in the letter dated February 28, 2016 in which the USFWS concurred with the proposed effects determinations described below. All federally listed species within the segment with the exception of the Florida scrub-jay were granted either "No Effect" or "May Affect, But not Likely to Adversely Affect". Formal Consultation to address a "May Affect" determination for the Florida scrub-jay was completed and is documented in the Biological Opinion dated July 5, 2016. The documents are included in the Agency Coordination contained in Appendix D.

Reptiles

Eastern Indigo Snake (Drymarchon corais couperi) – The eastern indigo snake, listed by both the FFWCC and the USFWS as Threatened, is a habitat generalist, using a variety of habitats from mangrove swamps to xeric uplands. These snakes are cold-sensitive and require gopher tortoise burrows, other animal holes, or stumps for protection during winter months. These snakes require large tracts of natural, undisturbed habitat, and prefer to forage in and around wetlands for their preferred prey – other snakes. Numerous burrows were located within the project area and the potential for indigo snakes is moderate, though no indigo snakes were observed during field studies and the closest documented sighting is located approximately 4 miles to the northwest (2008 sighting near Blue Springs State Park). If an eastern indigo snake is observed during construction, the contractor will be required to cease any operation that might cause harm to the snake. If the eastern indigo snake does not move away from the construction area, both the FFWCC and USFWS will be contacted for further guidance. An effects determination was made by utilizing the USFWS Programmatic Key for the Eastern Indigo Snake (January 2010, updated August 2013). In accordance with the key, the project will implement the Standard Protection Measures for the Eastern Indigo Snake (USFWS, 2013), but may impact more than 25 acres of xeric habitat (scrub, sandhill, or scrubby flatwoods) and likely has more than 25 active and inactive gopher tortoise burrows. Therefore, the project would receive a **may affect** determination under the key. The FDOT will make the commitment to have permits conditioned such that all active and inactive gopher tortoise burrows will be evacuated prior to site manipulation in the vicinity of the burrow, and would then qualify for a **may affect, not likely to adversely affect** determination.

Avian

Snail kite (*Rostrhamus sociabilis plumbeus*) – The snail kite is listed as Endangered by both the USFWS and the FFWCC. This non-migratory, medium-sized raptor utilizes large open freshwater marsh habitats and lakes with shallow water.

Nests are usually located in a low tree or shrub at the water's edge. The main staple of their diet is the apple snail, lending to their name. The project does occur within the USFWS consultation area for the snail kite though no observations have been documented within or near the project corridor. Adequate nesting and foraging habitat are located adjacent to the project area, but none of it occurs within the proposed right-of-way or pond site areas. Therefore, this project will have **no effect on** the snail kite.

Florida Scrub-Jay (*Aphelocoma coerulescens*) – The Florida scrub-jay, listed as Threatened by both the FFWCC and USFWS, is an endemic species found in Florida scrub habitats. This gregarious jay is a habitat specialist and typically lives in scrub and scrubby flatwoods habitats. Suitable habitat includes xeric oak scrub, along with scrubby pine flatwoods, sand pine scrub, and any other type of habitat containing scrub oaks. During the initial PD&E field work in 1996-1998, numerous stations were sampled for the presence of scrub-jays at the interchanges at Saxon Boulevard and SR 472, and along both sides of I-4 between the interchanges. Cursory surveys for scrub-jays were conducted in September of 2013 to evaluate the presence of this species. During these surveys, at least four scrub-jays were observed responding to a call-back recording north of Saxon Boulevard adjacent to I-4 eastbound, and two more responded when the call was played in the northeastern quadrant of the interchange at SR 472. Two scrub-jays were observed at Pond Site 409A1/A2 as well. A full five-day scrub-jay survey was conducted in October of 2014 to ascertain the population size and potential home range of scrub-jays within the project corridor. Additional design work after the completion of the survey necessitated a supplemental survey of four additional pond sites in April 2015.

Based on the results of the 2014 formal survey, scrub-jays were observed at 11 of the 101 stations (see Species Location Map, **Figure D, Appendix A**). Scrub-jays were also observed at 4 more stations (out of the additional 18 stations surveyed) during the 2015 supplemental survey. These scrub-jays comprise five (5) separate families of which four (4) intersect with the existing or proposed FDOT right-of-way for the project. The remaining scrub-jays observed are either outside the right-of-way or were single incidental observations. The potential impacts for the recommended alternative as proposed would be: Family 1 at the westbound off-ramp from I-4 to Saxon Blvd would have 0.90 acres of occupied territory impacted, Family 2 along eastbound I-4 at Pond Site 409 A1/A2 would have 1.22 acres of occupied territory impacted, and Family 3 along I-4 eastbound at Pond Site 409 A1/A2 would have 2.56 acres of occupied territory impacted. Based upon the results of this survey, the project is anticipated to impact a total of 4.68 acres of occupied Florida scrub-jay territory within the existing and/or proposed FDOT Right-of-Way and proposed recommended pond sites. Detailed analysis is provided in the Florida Scrub-jay Survey Technical Memorandum prepared for FDOT (see **Appendix E**). The proposed widening and stormwater ponds will have a direct impact on scrub-jays or scrub-jay habitat, and therefore, this project **may affect** the Florida scrub-jay. Mitigation to offset impacts to scrub-jay habitat will be provided via a contribution to The Nature Conservancy fund for West Volusia County Meta-population at a 2:1 to ratio in accordance to the USFWS Florida Scrub-Jay Umbrella Habitat Conservation Plan. The Biological Opinion issued by USFWS on July 5, 2016 provides the authorization for the impact to 4.68 acres of occupied Florida scrub-jay territory provided the mitigation contribution of $143,460 to The Nature Conservancy Managed Funds for Public Lands to offset the impacts.

Red-Cockaded Woodpecker (*Picoides borealis*) – This species is listed as Endangered by the USFWS and Threatened by the FFWCC. The colonial red-cockaded woodpecker (RCW) is a habitat specialist, requiring stands of over-mature pine that have contracted the red-heart disease. RCW's require diseased trees for cavity building, which they use for nest and roost cavities. Preferred pine stands need to have a fairly open canopy, with a sparse subcanopy to allow easy flight. RCWs must also have ample foraging habitat consisting of younger pines surrounding the cavity trees. No suitable nesting habitat was observed in the impact area within the project limits. The project occurs within the designated USFWS consultation area,

though is not documented as having any nesting birds recorded within the project vicinity. The previous PD&E Study (May 2000) indicated that no suitable habitat or any documented RCW sightings within the proposed right-of-way or pond sites had occurred. Additionally, no suitable habitat for nesting or foraging was identified within the vicinity of the project during field surveys. Therefore, this project will have **no effect** on the red-cockaded woodpecker.

Wood Stork (*Mycteria americana*) – This species, now listed as Threatened by the USFWS , is the only true species of stork nesting in the United States. This reclassification does not change any conservation or protection measures for the wood stork under the Endangered Species Act (ESA), rather it recognizes the recovery and the positive impact that conservation efforts have had on breeding populations of storks. Feeding areas for wood storks include marshes, pools, or ditches in which fish congregate. This species typically nests in mixed woodlands comprised of such overstory species as cypress, gum, and southern willow; pond apple and mangrove swamps may also be utilized for nesting.

According to the USFWS data, the project is located within the 15-mile Core Foraging Area (CFA) of one wood stork colony (Hontoon Island Colony) (see Species Location Map, **Figure D, Appendix A**). Foraging areas within the study area include drainage features, small water bodies, stormwater ponds, and the wetlands and shoreline associated with Lake Monroe and the St. John's River. Utilizing the *Corps of Engineers and U. S. Fish and Wildlife Service Effect Determination Key for the Wood Stork in Central and North Peninsular Florida* (2008), the project is not within 2,500 feet of an active colony site, will likely impact Suitable Foraging Habitat (SFH) of greater than 0.5 acres, and is located within the CFA of one wood stork colony (*Hontoon Island*). The estimated direct impacts to wetlands include approximately **58.88** acres of jurisdictional wetland systems and **44.66 acres** of other surface waters.

Additionally, FDOT commits to provide SFH compensation within the Service Area of a Service-approved wetland mitigation bank(s) within the CFA, and the Project is not contrary to the Service's *Habitat Management Guidelines for the Wood Stork in the Southeast Region* and in accordance with the Clean Water Act section 404(b)(1) guidelines. There are six currently permitted mitigation banks that include the project corridor within the bank service area that have credits available to offset impacts to SFH. FDOT will coordinate with the permitting agencies during the permitting phase of the project on compensatory mitigation and minimization of impacts to suitable foraging habitat. These actions should result in no net loss of foraging habitat; therefore, the project **may affect, but is not likely to adversely affect** the wood stork.

Southern Bald Eagle (*Haliaeetus leucocephalus*) – The southern bald eagle was delisted from both the US Endangered Species Act and FFWCC imperiled list, though it is still protected under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. The USFWS issued the National Bald Eagle Management Guidelines in May 2007 while Florida adopted a Bald Eagle Management Plan (BEMP) in April 2008, written closely to follow the federal guidelines. The BEMP provides guidelines and recommendations to help people avoid violating state and federal eagle laws. The BEMP also outlines strategies to maintain the Florida population of bald eagles at or above current levels. The BEMP goal is to, "maintain a stable or increasing population of eagles in Florida in perpetuity." Bald eagles almost always nest in the tops of living or dead tall trees along or very near lakes and rivers; these water bodies provide fish, typically their preferred food. Bald eagles generally avoid areas with extensive human activity, so management guidelines must be considered before any construction can be initiated within 660 feet of an active southern bald eagle nest. A juvenile bald eagle was observed flying over I-4 at the northern end of the St. John's River Bridge. Four bald eagles nests are recorded to be in the general vicinity (within 1 mile) of the project corridor (SE061, VO014, VO073, and VO012). However, none of these nests are located within 660 feet of the proposed right-of-way or any of the proposed pond sites. For that reason, the project will have **no effect** on the southern bald eagle.

Osprey (*Pandion haliaetus*) – The osprey, also known as the fish hawk, are expert anglers that typically share the same habitat as bald eagles but are smaller in size. Ospreys build large stick nests located in the tops of large living or dead trees and on manmade structures such as utility poles, channel markers and nest platforms. They are listed as a Species of Special Concern by FFWCC only in Monroe County, but are also still protected under the Migratory Bird Treaty Act. Permits are required throughout the state to remove a nest for these raptors, however, a replacement structure must be erected to mitigate the removal of the nest. Some nests have been observed along the banks of Lake Monroe and the St. Johns River. Should any nests found along the corridor be subject to impacts, a nest removal permit will be applied for from FFWCC. Therefore, this project **may affect, but not likely adversely affect** the osprey.

Mammals

Florida Manatee (*Trichechus manatus latirostris*) - This species is listed as Endangered by both the USFWS and the FFWCC and has designated critical habitat along the St. Johns River and within the western and northern shores of Lake Monroe. Florida manatees are found in freshwater, brackish, and marine environments. Typical coastal and inland habitats include coastal tidal rivers and streams, mangrove swamps, salt marshes, freshwater springs, and vegetated bottoms. As herbivores, manatees feed on the wide range of aquatic vegetation that these habitats provide. Shallow seagrass beds, with ready access to deep channels, are generally preferred feeding areas in coastal and riverine habitats (Smith 1993). Manatees use springs and freshwater runoff sites for drinking water; secluded canals, creeks, embayments, and lagoons for resting, cavorting, mating, calving and nurturing their young; and open waterways and channels as travel corridors. Manatees occupy different habitats during various times of the year, with a focus on warm water sites during winter. Manatees have also adapted to changing ecosystems in Florida. Industrial warm water discharges and deep-dredged areas are used as wintering sites, stormwater/freshwater discharges provide manatees with drinking water, and the imported exotic plant, *Hydrilla* spp. has become an important food source at some wintering sites. The impacts proposed along the roadway at Lake Monroe will not directly impact the lake but rather the wetlands adjacent which are largely inaccessible to the manatee, and therefore, according to the Corps of Engineers, Jacksonville District, and the State of Florida Effect Determination Key for the Manatee in Florida (April 2013) this project **may affect, but is not likely to adversely affect** the Florida manatee.

FEDERALLY LISTED PLANT SPECIES

A review of agency databases and a field review of the project corridor indicate that there have been few reported occurrences of federally listed plant species within the proposed project area. USFWS currently shows that two (2) federally listed species have been demonstrated to have the potential to occur within Volusia County, the Okeechobee gourd (*Cucurbita okeechobeensis*) and Rugel's pawpaw (*Deeringothamnus rugelii*) (see Table 2, Appendix B). Information from the previous PD&E Study (May 2000) indicated that one listed plant was observed in this segment. Vegetation surveys conducted in 1997 by project scientists identified pigeon wings (*Clitoria fragrans*) in some scrubby areas outside of the right-of-way at the Saxon Boulevard interchange and SR 472 interchange. This plant is not listed as occurring within Volusia County according to current information provided on the USFWS website. A follow up protected plant field survey covering the area of proposed right-of-way widening and pond sites was conducted in May 2013 by project botanists and other biologists. No federally listed plant species were identified within the proposed widening impact area or pond sites during the field investigations; though a potential siting of the Okeechobee gourd was made in the floodplain between I-4 and the Wayside Park boat ramp (west of I-4 at the US 17/92 interchange which is outside the project footprint). Confirmation was not definitively made as the observation was not made during flowering season. Habitat for both pigeon wings and Rugel's pawpaw does exist along the project corridor though considerable changes to the land uses where

previous sightings were made have occurred since 1997. No direct or indirect impacts to federally listed plant species are likely to occur and this project **may affect, but is not likely to adversely affect** federally listed plant species.

4.1.2 State Listed Species

Mammals

Florida Mouse (*Podomys floridanus*) – This mouse, listed as a Species of Special Concern by the FFWCC, is one of the two mammal species that are endemic to Florida. It typically lives within gopher tortoise burrows in fire-maintained, xeric uplands. Sub-optimal habitat exists in the xeric uplands that contain gopher tortoise burrows, such as mesic flatwoods (4110), sand pine scrub (4130), and sand pine plantations (4410). Numerous gopher tortoise burrows were located within the project area, but no Florida mice were observed during field surveys. If gopher tortoise burrows are proposed to be impacted, then the relocation of gopher tortoises and their burrow commensals will be conducted prior to construction. Because of this, the project **is not likely to adversely affect** the Florida mouse.

Sherman's Fox Squirrel (*Sciurus niger shermani*) – The Sherman's fox squirrel, listed by the FFWCC as a Species of Special Concern, is the largest of the three fox squirrel subspecies that occur in Florida. They have large ranges that can span over 80 acres. Optimum habitat for this subspecies is predominantly longleaf pine-turkey oak sandhills, although they are also reported to occur in mesic forested areas, as well. Some potential habitat is present within the project area, although Sherman's fox squirrels were not observed during the site investigations for this project. The amount of potential habitat for this species impacted by the project will be minimal. Therefore, the proposed project **is not likely to adversely affect** the Sherman's fox squirrel.

Florida Black Bear (*Ursus americanus floridanus*) – The Florida black bear is a very wide-ranging species formerly listed as Threatened by the FFWCC. Preferred habitat of the black bear includes dense forest, both upland and wetland, but the bear is often encountered in other areas during its seasonal movements. The bear was removed from the list in August 2012 after the approval of the Florida Black Bear Management Plan. The plan was implemented to set a strategy in place to address challenges in bear management, to manage for a sustainable bear population state-wide, and reduce human-bear conflicts. Going forward, FFWCC will continue to engage with landowners and regulating agencies to guide future land use to be compatible with the objectives of the Bear Management Plan. The plan divides the state into seven Bear Management Units (BMU's) which support the seven sub-populations of bear across the state. The project occurs within the Central BMU, which includes Alachua, Bradford, Brevard, Clay, Flagler, Lake, Marion, Orange, Putnam, Seminole, St. Johns, Sumter, and Volusia counties and contains the Ocala/St. Johns subpopulation, named after the Ocala National Forest and St. Johns River watershed. The Central BMU is the only BMU with a subpopulation estimated at 1,000 bears (the highest in the state), which is one of the criteria that determine a species risk for extinction. Black bears are common in Volusia County, especially to the north of the project corridor where bear kills on the I-4 have been recorded. As no further fragmentation of bear habitat is proposed, the project **is not likely to adversely affect** the Florida black bear.

Reptiles

Florida Pine Snake (*Pituophis melanoleucus mugitus*) – This snake, listed as a Species of Special Concern by the FFWCC, is another tortoise burrow commensal organism, utilizing both tortoise burrows and the tunnels of pocket gophers (*Geomys pinetis*) for feeding and shelter. Preferred habitat of the pine snake is xeric uplands, and to a lesser extent, flatwoods and other mesic uplands. Some habitat is available within the project, especially where gopher tortoise burrows and pocket gopher mounds were observed (see **Figure D, Appendix A**). Both the pocket gophers and the pine snakes live nearly their

whole lives underground and are very hard to observe directly. Earth work in suitable habitat may impact subterranean pine snakes. With the relocation of commensal organisms from gopher tortoise burrows if impacted, the project **is not likely to adversely affect** the Florida pine snake.

Gopher Tortoise (*Gopherus polyphemus*) – The occurrence of this species, listed as Threatened by the FFWCC and as a Candidate species by USFWS, is a key factor in the determination of habitat suitability for certain other listed species because of the large number of other animals that use tortoise burrows for one or more of their life requisites. While it is common to find gopher tortoise burrows in most types of upland communities, the preferred habitats include xeric uplands and disturbed, ruderal areas.

Approximately 23 burrows were observed along the corridor within the right-of-way and proposed potential ponds sites during a preliminary survey. It is likely that impacts to these areas cannot be avoided; therefore relocation of the tortoises and their commensals will be necessary. A conservation permit should be applied for from the FFWCC, and the relocation of any burrows to be impacted should be carried out within 30 days of construction (see **Figure D, Appendix A**). As FDOT will make the commitment to relocate all potentially impacted gopher tortoise burrows, the project **is not likely to adversely affect** the gopher tortoise.

Short-tailed snake (*Stilosoma extenuatum*) – The short-tailed snake, listed as Threatened by the FFWCC, belongs to a monotypic genus that is endemic to Florida. Rarely seen due to its earth-burrowing tendencies, it is restricted to xeric uplands, primarily longleaf pine-turkey oak sandhills and sand pine scrub, for its habitat requirements. Herpetologist Paul Moler (FFWCC-retired) reports short-tailed snakes occur in a wider range of ecosystems than indicated in the scant literature on the species, and may be found where prey (small snakes) and loose soils occur in North-Central Florida. Suitable habitat (sand pine scrub) is not present on this project, nor was any of these snakes observed during any field surveys. As some areas of xeric habitat exist, the project **is not likely to adversely affect** the short-tailed snake.

Amphibians

Gopher Frog (*Rana capito*) – The gopher frog, listed by the FFWCC as a Species of Special Concern, is a gopher tortoise burrow commensal organism, using tortoise burrows for shelter. Prime gopher frog habitat includes xeric uplands, especially longleaf pine-turkey oak associations with nearby (i.e. within one mile) seasonally flooded marshes or ponds. Field biological surveys have shown that gopher tortoise burrows were located throughout the project corridor, though no gopher frogs were observed. If gopher tortoise burrows are impacted, then this species could be impacted as well, though the excavation of any potentially occupied burrows and the relocation of any gopher tortoises and their burrow commensals should offset any impacts to this species. Therefore, the project **is not likely to adversely affect** the gopher frog.

Avian

Florida Sandhill Crane (*Grus canadensis pratensis*) – This non-migratory subspecies, listed as Threatened by the FFWCC, can often be seen foraging in improved pastures, open fields and along the roadside. Sandhill cranes nest in freshwater marshes and feed in adjacent fields and pastures. Adequate nesting habitat is found within the freshwater marshes located adjacent to the project corridor, and foraging habitat was found within the project limits. Sandhill cranes were observed flying over the project area several times during multiple surveying events, and were observed foraging at Pond Site 406A. No evidence of nests was observed within the project area. The proposed project **is not likely to adversely affect** the sandhill crane.

Southeastern American Kestrel *(Falco sparverius paulus)* – This resident subspecies of the kestrel, listed as Threatened by the FFWCC, can be distinguished from its cousin, *F. s. sparverius*, a winter migrant, by its smaller size. The Southeastern kestrel requires three components for optimal habitat: large, open fields for foraging, snags for nesting, and snags, fence lines or telephone poles as perching sites from which to hunt. No kestrels were observed along the project corridor, nor within any pond sites or along the portion of the project to be widened. No areas within the project corridor meet this definition for optimal habitat. Therefore, this project **is not likely to adversely affect** this species.

Least tern (*Sterna antillarum*) – Historically, least terns nested on sandy beaches and lakeshores, but presently, they nest almost exclusively on man-made substrates such as spoil islands and gravel rooftops. This small tern, listed as Threatened by the FFWCC, is still fairly common in localized areas. However, none have been reported in the project study area. Prime nesting areas are minimal, so this species has only a low possibility of occurring along the project corridor, therefore the proposed project will have **no effect** on the least tern.

Wading Birds – Wading bird rookeries were not observed and are not known to occur within or adjacent to the study area. Potential foraging habitat for limpkin (*Aramus guarana)*, little blue heron (*Egretta caerulea),* roseate spoonbill (*Ajaia ajaja),* white ibis (*Eudocimus albus*), tri-colored heron (*Egretta tricolor*), and snowy egret (*Egretta thula*), all classified as Species of Special Concern (SSC) by the FFWCC, occurs within the limits of the study area. Little blue heron, snowy egret, and white ibis were observed during field surveys. No wetlands providing critical foraging or nesting habitat for these avian species will be impacted by the proposed project and indirect impacts to wading birds are not anticipated. Therefore, the proposed project **is not likely to adversely affect** the wading bird population in the region.

STATE LISTED PLANT SPECIES

A review of available information revealed that 55 state listed plant species have the potential to occur within the habitats located within the project area in Volusia County (see Table 2, Appendix B). One state listed plant species was observed during the field assessment of project area or during the previous PD&E Study (May 2000). Vegetation surveys conducted in 1997 identified Garberia (*Garberia heterophylla*) within scrubby areas north of Saxon Boulevard. This plant is locally common in this area and was identified during listed plant surveys conducted in May 2013 and is identified on the Species Location Maps (**Figure D** in **Appendix A**). Therefore, the proposed project **is not likely to adversely affect** state listed plant species.

4.1.3 Other Sensitive Species

MIGRATORY BIRDS

The Migratory Bird Conservation Commission was established on February 18, 1929 by the passage of the Migratory Bird Conservation Act. It was created and authorized to consider and approve any areas of land and/or water recommended by the Secretary of the Interior for purchase or rental by the U.S. Fish and Wildlife Service under the Act. In 1989, the Commission acquired the additional responsibility to approve project funding under the North American Wetland Conservation Act. This Act provides for Federal funding to encourage partnerships to protect, enhance, restore, and manage wetland and other habitats for migratory birds and other fish and wildlife to carry out the North American Waterfowl Management Plan. Waterfowl are the most prominent and economically important group of migratory birds of the North American Continent. National Migratory Bird Areas in Florida include Arthur R. Marshall, Caloosahatchee, Cedar Key, Chassahowitzka, Egmont Key, Great White Heron, Hobe Sound, J.N. Ding Darling, Lake Woodruff, Matlacha Pass, Merritt Island, Okeefenokee, Pine Island, Pinellas, St. Marks, and St. Vincent. None of these National Migratory Bird Areas

are located within a one-mile radius of the project corridor. If the project results in direct impacts to wetland habitat or surface water features (i.e. roadside ditches) that could be utilized by migratory birds there may be implications regarding these species. Impacts to wetlands will be mitigated for at approved mitigation sites within the affected watershed and will offset any potential impacts to migratory birds from this project.

5.0 Conclusions, Recommendations, and Commitments

The proposed project will avoid and minimize impacts to wildlife and their habitat to the greatest practicable extent. Unavoidable impacts will be mitigated through a combination of actions designed to enhance local and regional ecological and hydrologic connectivity where possible. Those actions constitute the current recommendations developed and refined by staff and consulting environmental scientists representing various federal and state agencies and nongovernmental organizations, using the most current record and project specific scientific information available. The FDOT routinely reevaluates PD&E Study results and commitments prior to and during the project design phase, and again prior to right-of-way acquisition and construction. Therefore, the wildlife and habitat recommendations proposed herein will be subject to reevaluation in the future. Appropriate modifications to the recommended actions may be made in the event that the latest science, design constraints or other relevant changes in circumstance so dictate.

Project Commitments

The following specific wildlife and habitat commitments will be incorporated into all appropriate project PD&E documents and will be carried over into the design phases.

1. As required by FDOT Standard Specifications, the construction of equipment staging areas for storage of oils, greases, fuel, road bed material, and equipment maintenance will be sited in previously disturbed areas not adjacent to any streams, wetlands, or surface water bodies. The staging areas will be surveyed for listed species prior to their use. Also as required by FDOT Standard Specifications, if protected species are identified unexpectedly within the construction area during construction, coordination will be initiated with the appropriate resource agencies to avoid or mitigate impacts.

2. Eastern indigo snake habitat has been identified within the project limits. The project will utilize the US Fish and Wildlife Service Standard Protection Measures for the Eastern Indigo Snake, at the US Fish and Wildlife Service Link:http://www.fws.gov/northflorida/IndigoSnakes/20130812_Eastern_indigo_snake_Standard_Protection_Measures.htm.

3. During permitting, all potential gopher tortoise habitat that could be impacted by the project will be systematically surveyed according to the current guidelines published by the Florida Fish and Wildlife Conservation Commission. If gopher tortoise burrows are found, all practicable design measures will be employed to avoid impacts to the burrows. For burrows which cannot be avoided, a permit will be obtained from FWC for relocation of gopher tortoises and commensals, and relocation will be performed at a time as close as practicable to the start of construction activities at the site of the burrows.

4. During permitting, FDOT will coordinate with the permitting agencies to quantify and provide compensation for any unavoidable impacts to wood stork suitable foraging habitat (SFH). Mitigation for these impacts will be provided within the service area of a USFWS-approved wetland mitigation bank that provides an amount of habitat

and foraging function equivalent to that of the impacted SFH in accordance with the *Corps of Engineers and U.S. Fish and Wildlife Service Effect Determination Key for the Wood Stork in Central and North Peninsular Florida*.

5. The project identified occupied 4.68 acres of Florida scrub-jay habitat which is proposed to be impacted. FDOT commits to provide compensatory mitigation to offset the potential impacts to occupied territory in the form of contribution to The Nature Conservancy fund for the West Volusia County Metapopulation at a ratio of 2:1 in accordance with the USFWS Florida Scrub-Jay Umbrella Habitat Conservation Plan, as described in the Biological Opinion issued by USFWS on July 5, 2016 for this project.

6. FDOT commits to include a construction commitment to prevent clearing and grubbing within the areas of occupied scrub-jay habitat during nesting season (March 1 – June 30) to avoid any potential harm to individual birds should they be present. These areas will be identified on the project exhibits in the ESBA and EIS Update and will be identified on the design plans.

7. Unauthorized take of Florida-scrub-jays associated with the proposed activities should be immediately reported by notifying the Jacksonville Ecological Services Field Office at (904) 731-3336. If a dead Florida scrub-jay is found in the project area, the specimen should be thoroughly soaked in water and frozen for later analysis of cause of death.

The utilization of these commitments and mitigation measures for unavoidable impacts are recommended to minimize the overall impacts to wildlife from this project.

6.0 References

Florida Department of Transportation, Florida Land Use, Cover, and Forms Classification System (FLUCFCS), Level III, third edition, 1999

Florida Fish and Wildlife Conservation Commission, Bald Eagle Management Plan, April 2008

Florida Fish and Wildlife Conservation Commission, Florida Black Bear Management Plan, June 2012

Florida Fish and Wildlife Conservation Commission, Gopher Tortoise Permitting Guidelines, April 2013

Florida Fish and Wildlife Conservation Commission Website
http://ocean.floridamarine.org/TRGIS/Description_Layers_Terrestrial.htm#speciesLoc

Hipes, D., D.R. Jackson, K. NeSmith, D. Printiss, and K. Brandt. 2000. *Field Guide to the Rare Animals of Florida*. Florida Natural areas Inventory, Tallahassee, FL.

US Department of Agriculture Soil Conservation Service, Soil Survey of Volusia County, Florida, 1980

US Department of Transportation Federal Highway Administration and Florida Department of Transportation District 5 in cooperation with the US Coast Guard and US Army Corps of Engineers, Draft Environmental Impact Statement I-4 PD&E Study Section 2 from SR 528 to SR 472, August 2000

US Fish and Wildlife Service, Wood Stork Key for Central and North Peninsular Florida, September 2008

US Fish and Wildlife Service, Eastern Indigo Snake Programmatic Effect Determination Key, August 2013

URS Greiner Woodward Clyde, Endangered Species Biological Assessment for the PD&E Study for Interstate 4, Section 2, from SR 528 to SR 472, May 2000

APPENDIX A
PROJECT MAPS AND FIGURES

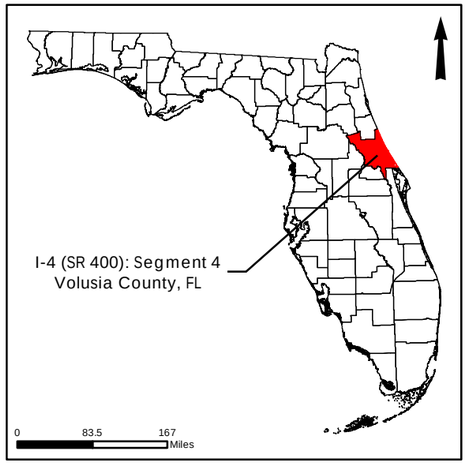
I-4 (SR 400) PROJECT DEVELOPMENT AND ENVIRONMENT (PD&E) STUDY
BEYOND THE ULTIMATE

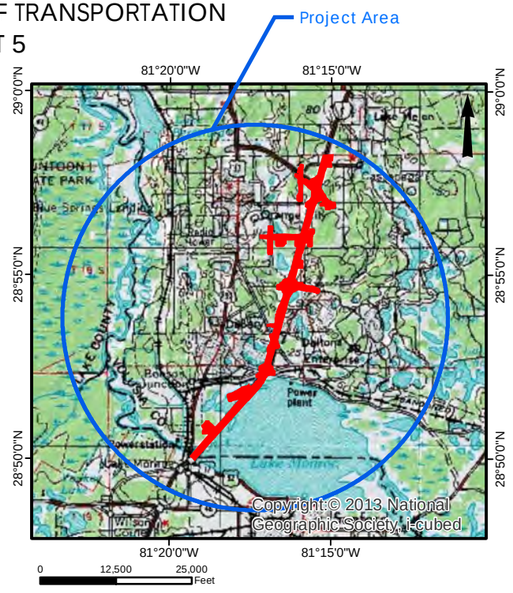
SEGMENT 4

FDOT FM NO. 432100-1-22-01

ENDANGERED SPECIES BIOLOGICAL ASSESSMENT

VOLUSIA COUNTY
FLORIDA DEPARTMENT OF TRANSPORTATION
DISTRICT 5





MAP SHEET INDEX

FIGURE NO.	SHEET NO.	TITLE
Figure A	Single Sheet	USGS Topographical Map
Figure B	Sheets 1-9	NRCS Soils Map
Figure C	Sheets 1-9	Land Use and Habitat Coverage Map
Figure D	Sheets 1-9	Species Location Map

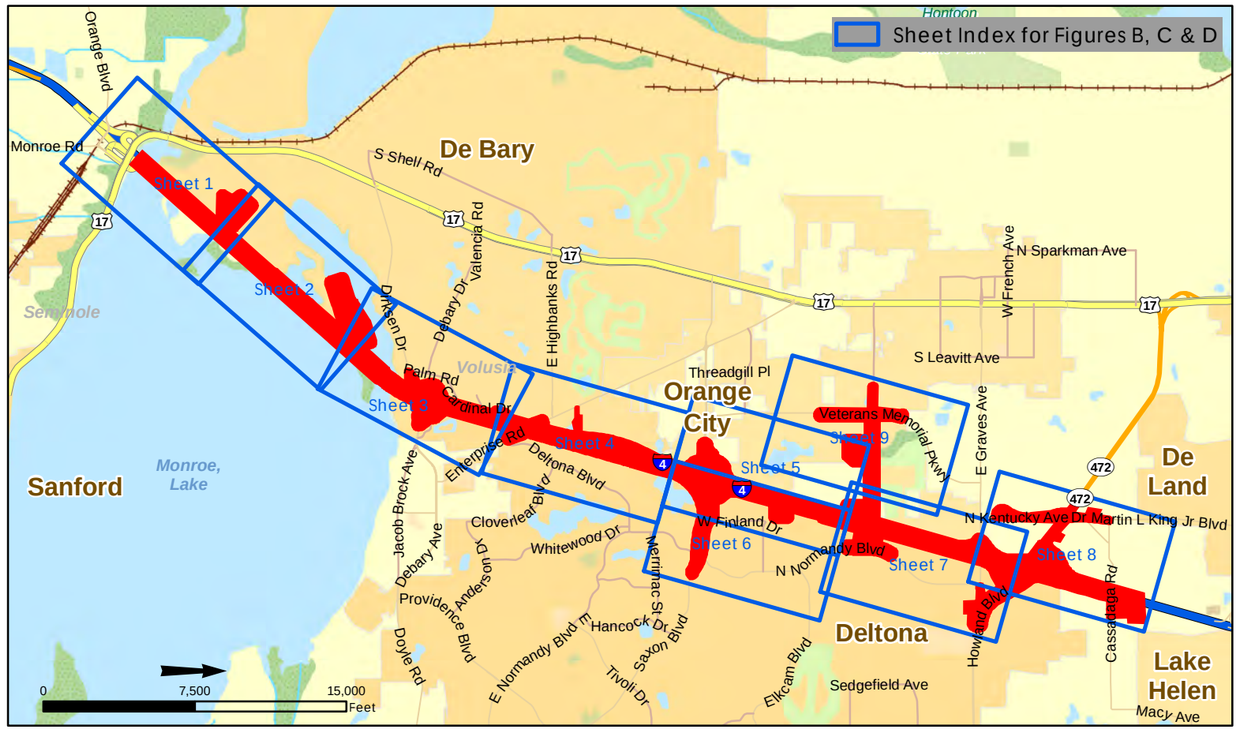
PROJECT DETAILS

ENDANGERED SPECIES BIOLOGICAL ASSESSMENT REPORT:
Segment 4 - Report Maps

Florida Department of Transportation- D5
SR 400 Project Development & Environment Study
Segment 4: SR 400 E. of SR 15/600 US 17/92 to 1/2 mile E of SR 472

79110 Volusia County
STA 2583+0.00(Begin) - MP 0.086
STA 3118+46.00 (End) - MP 10.227

Notes:
Abbreviations:
(R) = Recommended; (ALT) = Alternative; SV = Stormwater Vault
LD = Low Density; MD= Medium Density; HD = High Density
STA = Station; VC = Volusia County



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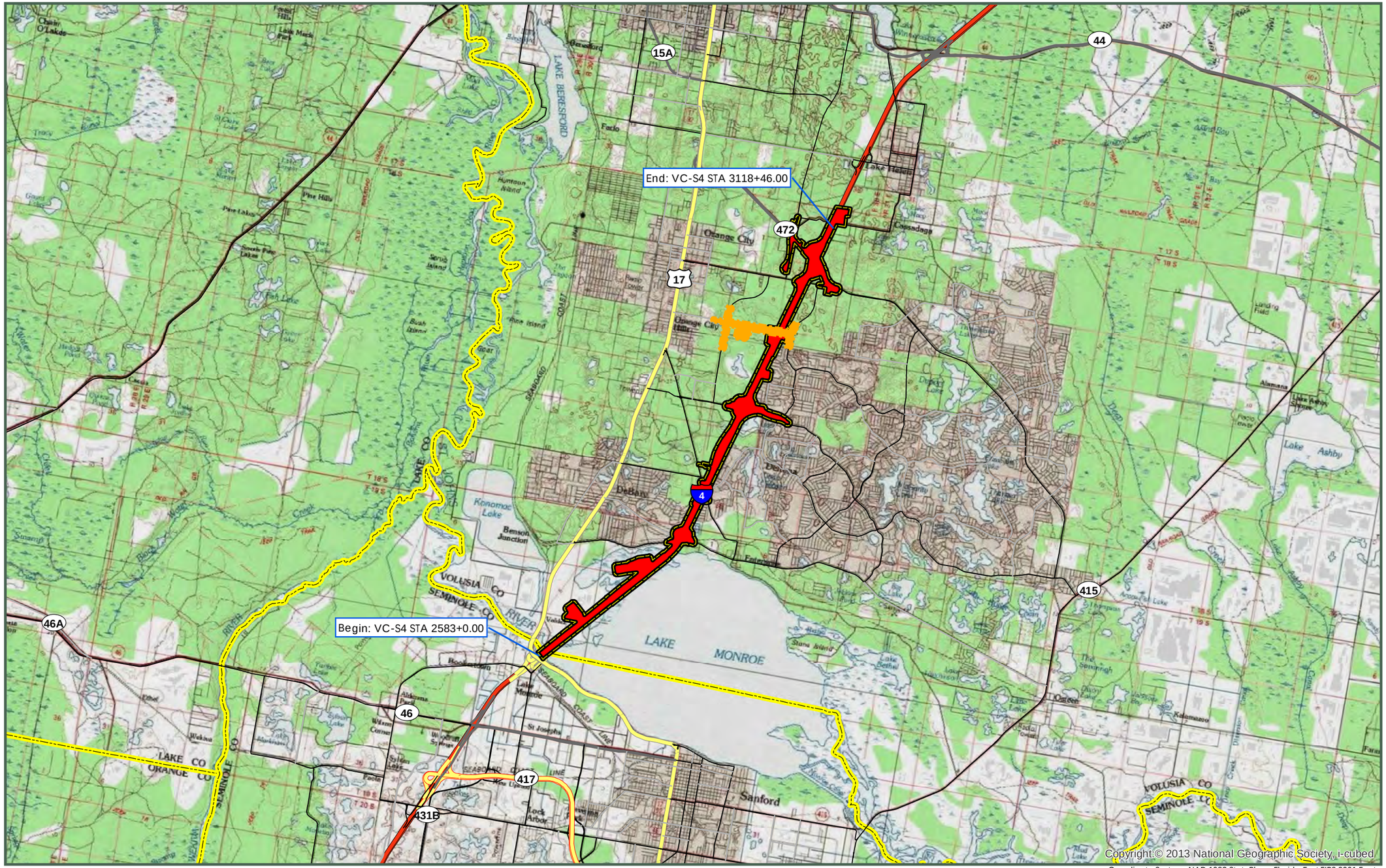


Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

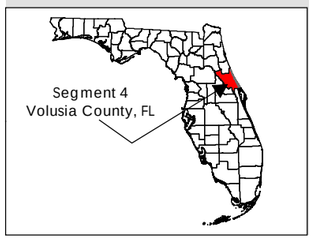
0 10,000 20,000 Feet

Figure A - USGS Topographical Map

Map Key

Segment 4 PD&E Limits

- I-4 Beyond the Ultimate-Segment 4 Study Area
- Rhode Island Ave (Extension)
- County Boundaries



Title:
ENDANGERED SPECIES BIOLOGICAL ASSESSMENT REPORT: Segment 4 - USGS Topographical Map

Client/Project:
Florida Department of Transportation- D5
SR 400 Project Development & Environment Study
Segment 4: SR 400 E. of SR 15/600 US 17/92 to 1/2 mile E of SR 472

Project Location:
79110 Volusia County
STA 2583+0.00(Begin) - MP 0.086
STA 3118+46.00 (End) - MP 10.227

Prepared by: mLeonard 12/15/2015
Technical Review by: mDrauer 12/15/2015
Independent Review by: jMoore 12/15/2015

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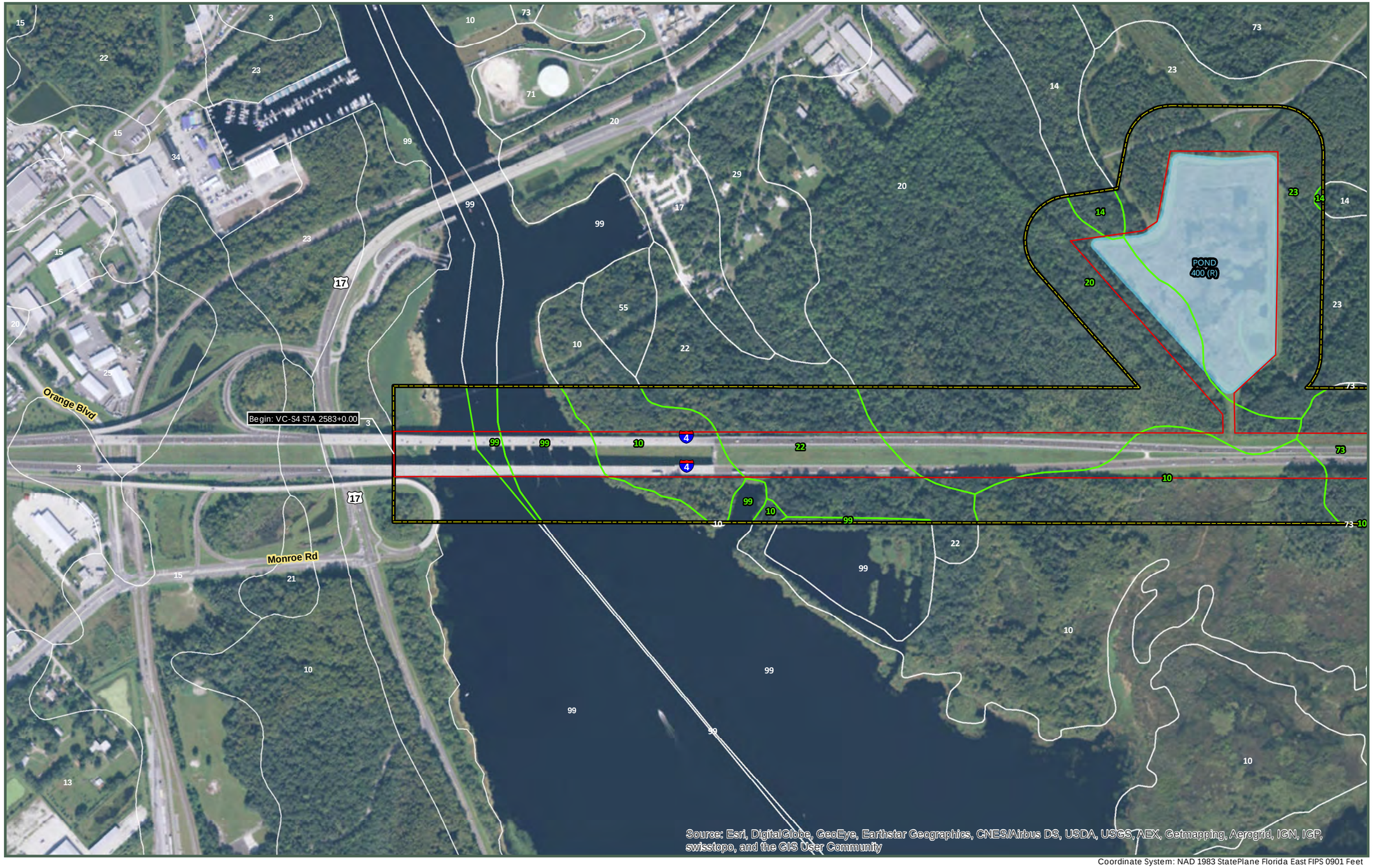

Map Key

Segment 4 PD&E Limits

- I-4 Beyond the Ultimate- Segment 4 Study Area
- Rhode Island Ave (Extension)
- I-4 Beyond the Ultimate- Segment 4 R/W (12/10/15)
- Proposed Ponds (12/10/15)
- Proposed Swales (12/10/15)

NRCS Soils (Segment 4)

- 10:BLUFF
- 13:CASSIA
- 14:CHOBEE
- 17:DAYTONA
- 1:APOPKA
- 20:EAUGALLIE
- 22:ELECTRA
- 23:FARMTON
- 24:FLUVAQUENTS
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- 99:WATER

Pond Notes:
(R)= Recommended; (ALT)= Alternative;
SV= Stormwater Vault

Title:
ENDANGERED SPECIES BIOLOGICAL ASSESSMENT REPORT: Segment 4 - NRCS Soils Map

Client/Project:
Florida Department of Transportation- D5
SR 400 Project Development & Environment Study
Segment 4: SR 400 E. of SR 15/600 US 17/92 to 1/2 mile E of SR 472

Project Location:
79110 Volusia County
STA 2583+0.00(Begin) - MP 0.086
STA 3118+46.00 (End) - MP 10.227

Prepared by: mLeonard 12/16/2015
Technical Review by: mDrauer 12/16/2015
Independent Review by: jMoore 12/16/2015

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

0 650 1,300 Feet

Figure B- Sheet 1 of 9: NCRS Soils Map

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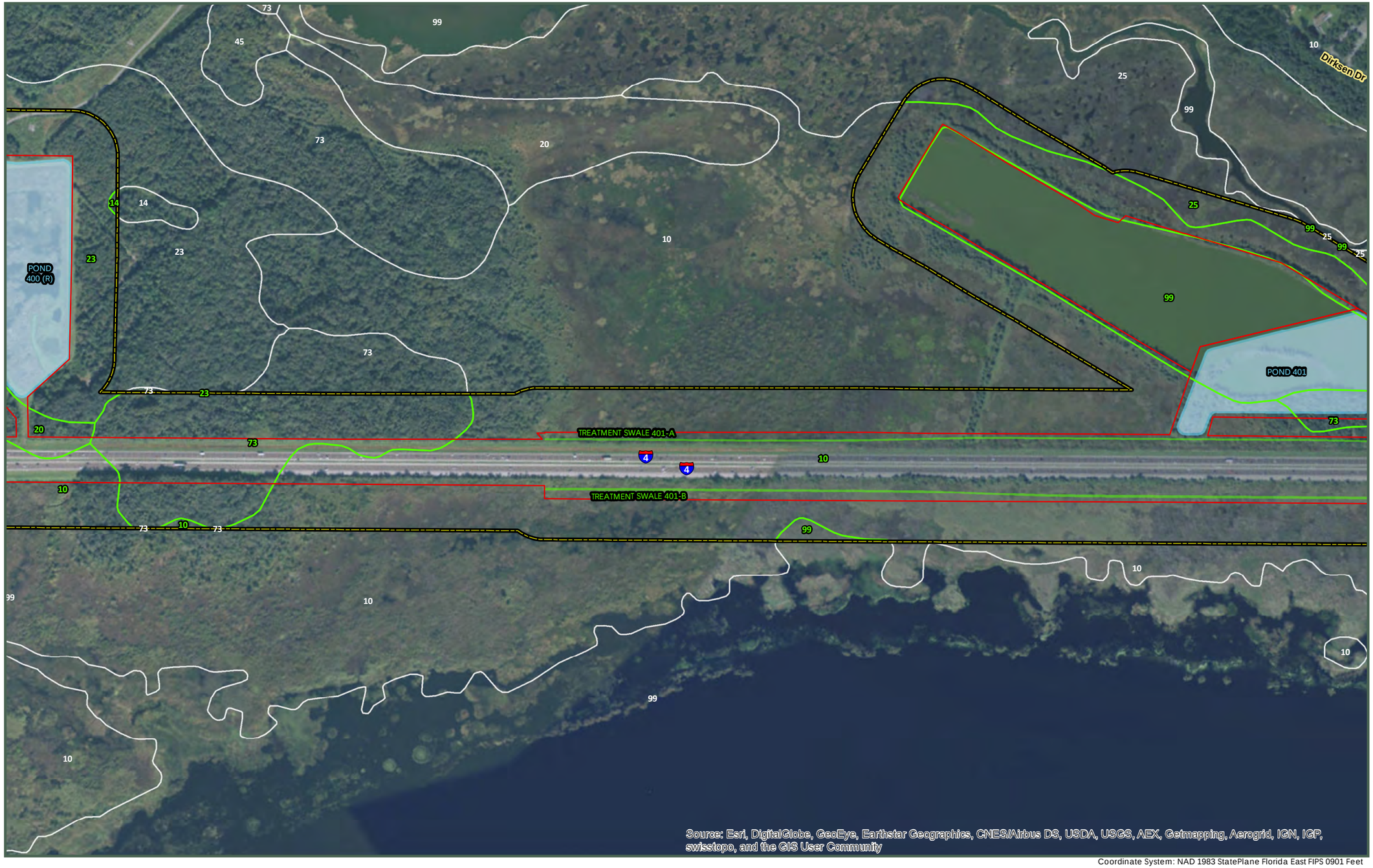

Map Key

Segment 4 PD&E Limits

- I-4 Beyond the Ultimate- Segment 4 Study Area
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ENDANGERED SPECIES BIOLOGICAL ASSESSMENT REPORT: Segment 4 - NRCS Soils Map

Client/Project:
Florida Department of Transportation- D5
SR 400 Project Development & Environment Study
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79110 Volusia County
STA 2583+0.00(Begin) - MP 0.086
STA 3118+46.00 (End) - MP 10.227

Prepared by: mLeonard 12/16/2015
Technical Review by: mDrauer 12/16/2015
Independent Review by: jMoore 12/16/2015

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

0 650 1,300 Feet

Figure B- Sheet 2 of 9: NCRS Soils Map

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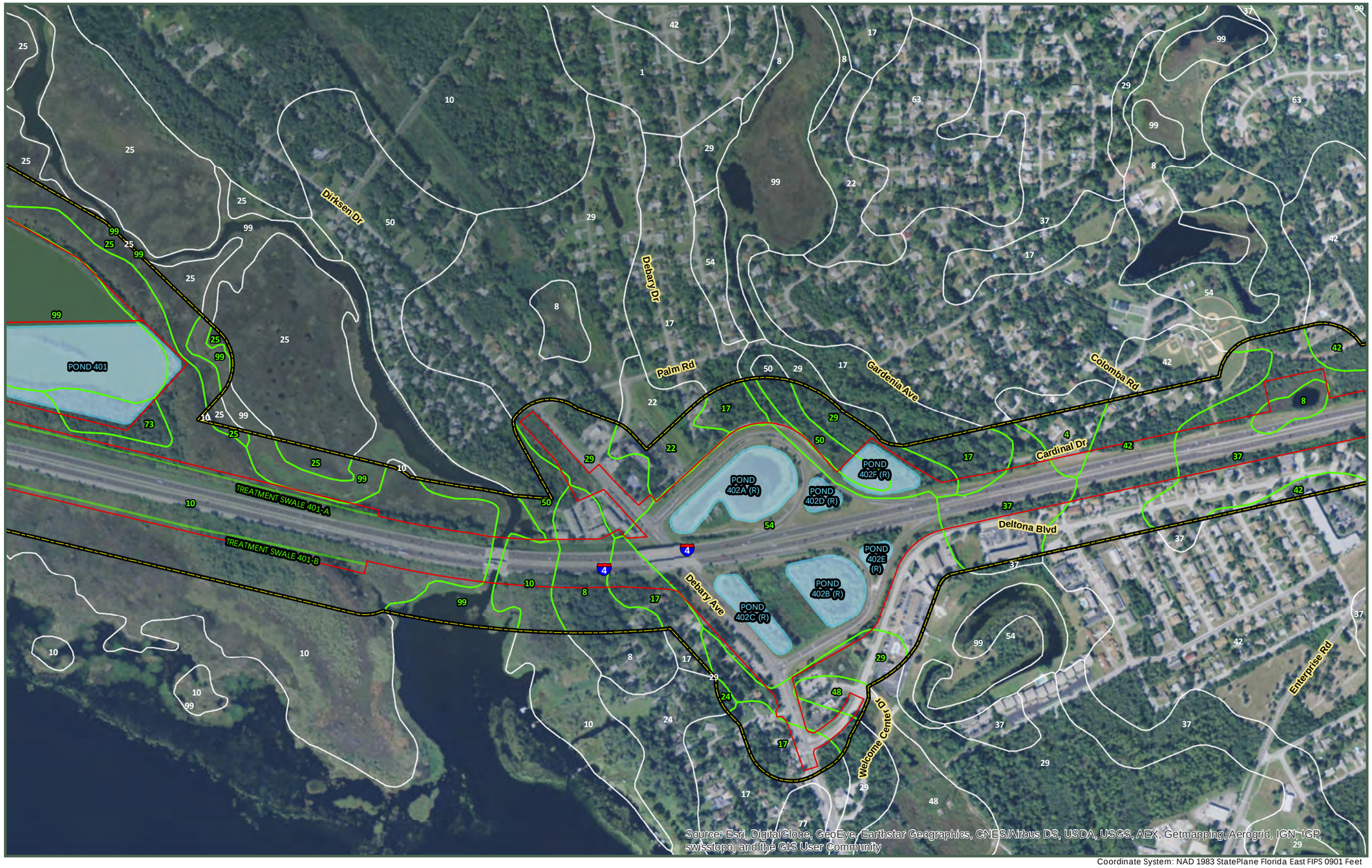

Map Key

Segment 4 PD&E Limits

- I-4 Beyond the Ultimate-Segment 4 Study Area
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Title:
ENDANGERED SPECIES BIOLOGICAL ASSESSMENT REPORT: Segment 4 - NRCS Soils Map

Client/Project:
Florida Department of Transportation- D5
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Independent Review by: jMoore 12/16/2015

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

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Figure B- Sheet 3 of 9: NCRS Soils Map

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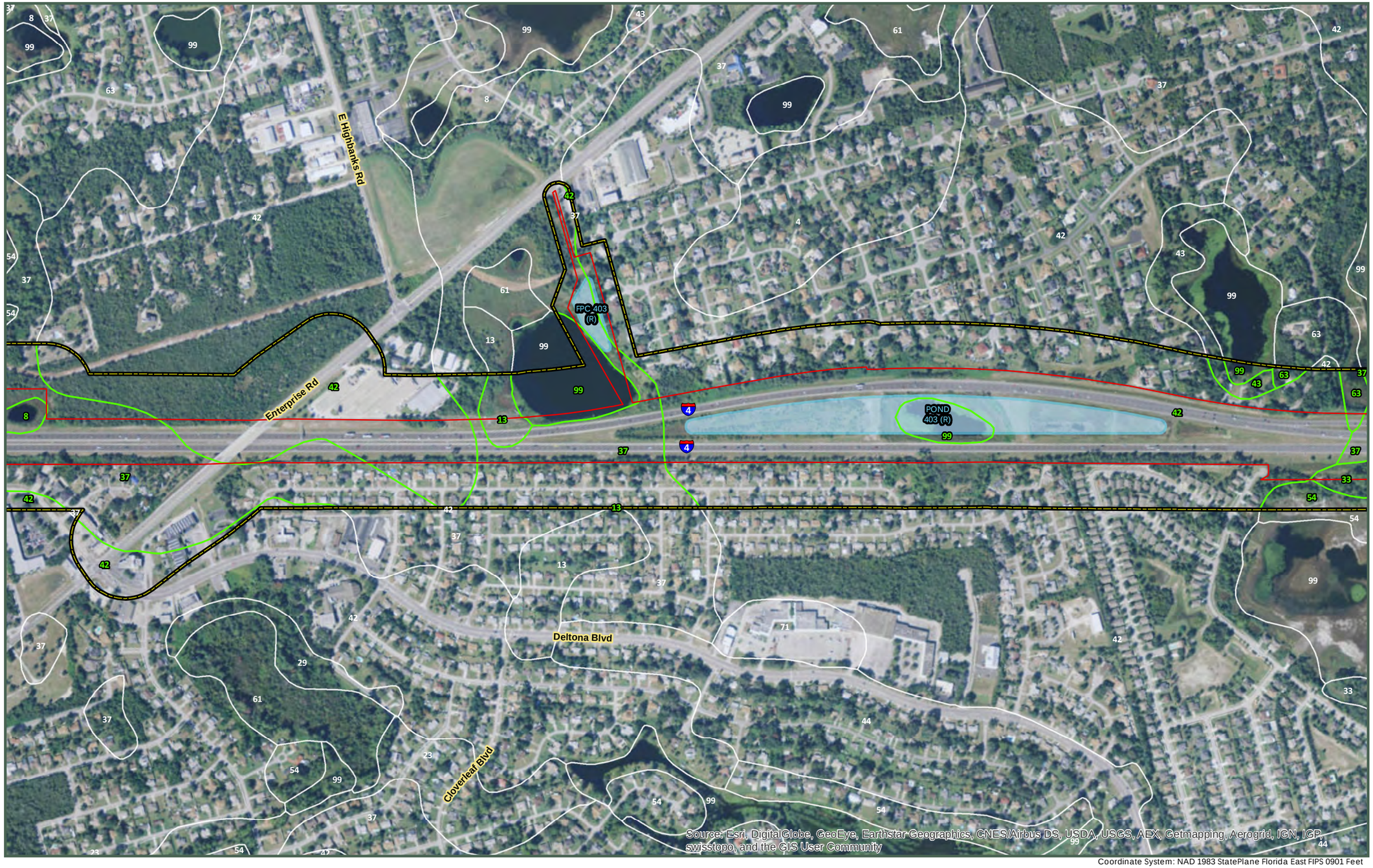

Map Key

Segment 4 PD&E Limits

- I-4 Beyond the Ultimate-Segment 4 Study Area
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- I-4 Beyond the Ultimate-Segment 4 R/W (12/10/15)
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ENDANGERED SPECIES BIOLOGICAL ASSESSMENT REPORT: Segment 4 - NRCS Soils Map

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Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

0 650 1,300 Feet

Figure B- Sheet 4 of 9: NCRS Soils Map

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Map Key

Segment 4 PD&E Limits

- I-4 Beyond the Ultimate- Segment 4 Study Area
- Rhode Island Ave (Extension)
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Title:
ENDANGERED SPECIES BIOLOGICAL ASSESSMENT REPORT: Segment 4 - NRCS Soils Map

Client/Project:
Florida Department of Transportation- D5
SR 400 Project Development & Environment Study
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Project Location:
79110 Volusia County
STA 2583+0.00(Begin) - MP 0.086
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Prepared by: mLeonard 12/16/2015
Technical Review by: mDrauer 12/16/2015
Independent Review by: jMoore 12/16/2015

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

0 650 1,300 Feet

Figure B- Sheet 5 of 9: NCRS Soils Map

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Map Key

Segment 4 PD&E Limits

- I-4 Beyond the Ultimate- Segment 4 Study Area
- Rhode Island Ave (Extension)
- I-4 Beyond the Ultimate- Segment 4 R/W (12/10/15)
- Proposed Ponds (12/10/15)
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ENDANGERED SPECIES BIOLOGICAL ASSESSMENT REPORT: Segment 4 - NRCS Soils Map

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Independent Review by: jMoore 12/16/2015

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

0 650 1,300 Feet

Figure B- Sheet 6 of 9: NCRS Soils Map

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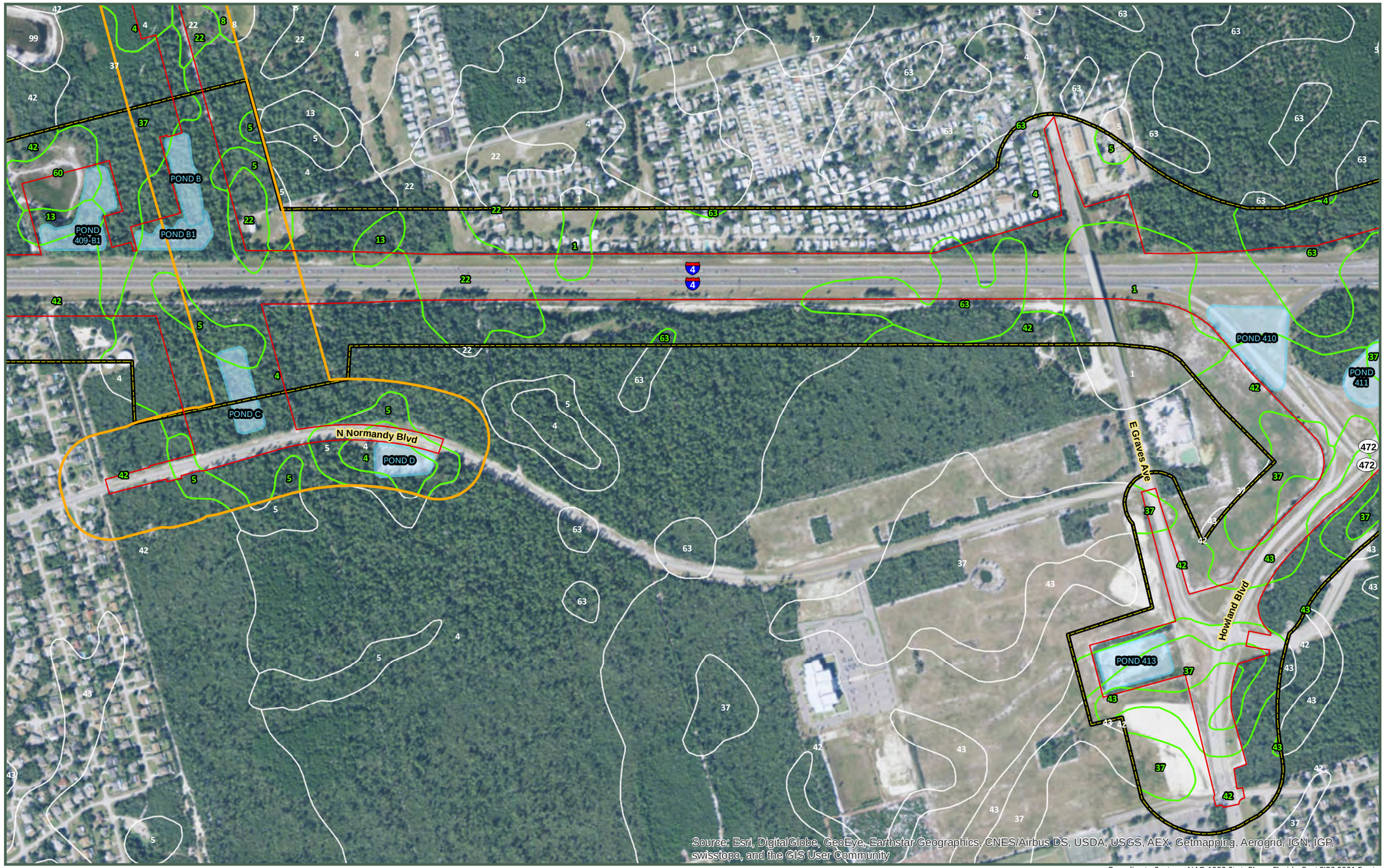

Map Key

Segment 4 PD&E Limits

- I-4 Beyond the Ultimate- Segment 4 Study Area
- Rhode Island Ave (Extension)
- I-4 Beyond the Ultimate- Segment 4 R/W (12/10/15)
- Proposed Ponds (12/10/15)
- Proposed Swales (12/10/15)

NRCS Soils (Segment 4)

- 10:BLUFF
- 13:CASSIA
- 14:CHOBEE
- 17:DAYTONA
- 1:APOPKA
- 20:EAUGALLIE
- 22:ELECTRA
- 23:FARMTON
- 24:FLUVAQUENTS
- 25:GATOR
- 29:IMMOKALEE
- 2:APOPKA
- 32:MYAKKA
- 33:MYAKKA
- 37:ORSINO
- 42:PAOLA
- 43:PAOLA
- 48:PLACID
- 4:ASTATULA
- 50:POMONA
- 54:QUARTZIPSAMMENTS
- 57:SATELLITE
- 5:ASTATULA
- 60:SMYRNA
- 61:ST. JOHNS
- 63:TAVARES
- 73:WABASSO
- 8:BASINGER
- 99:WATER

Pond Notes:
(R)= Recommended; (ALT)= Alternative;
SV= Stormwater Vault

Title:
ENDANGERED SPECIES BIOLOGICAL ASSESSMENT REPORT: Segment 4 - NRCS Soils Map

Client/Project:
Florida Department of Transportation- D5
SR 400 Project Development & Environment Study
Segment 4: SR 400 E. of SR 15/600 US 17/92 to 1/2 mile E of SR 472

Project Location:
79110 Volusia County
STA 2583+0.00(Begin) - MP 0.086
STA 3118+46.00 (End) - MP 10.227

Prepared by: mLeonard 12/16/2015
Technical Review by: mDrauer 12/16/2015
Independent Review by: jMoore 12/16/2015

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

0 650 1,300 Feet

Figure B- Sheet 7 of 9: NCRS Soils Map

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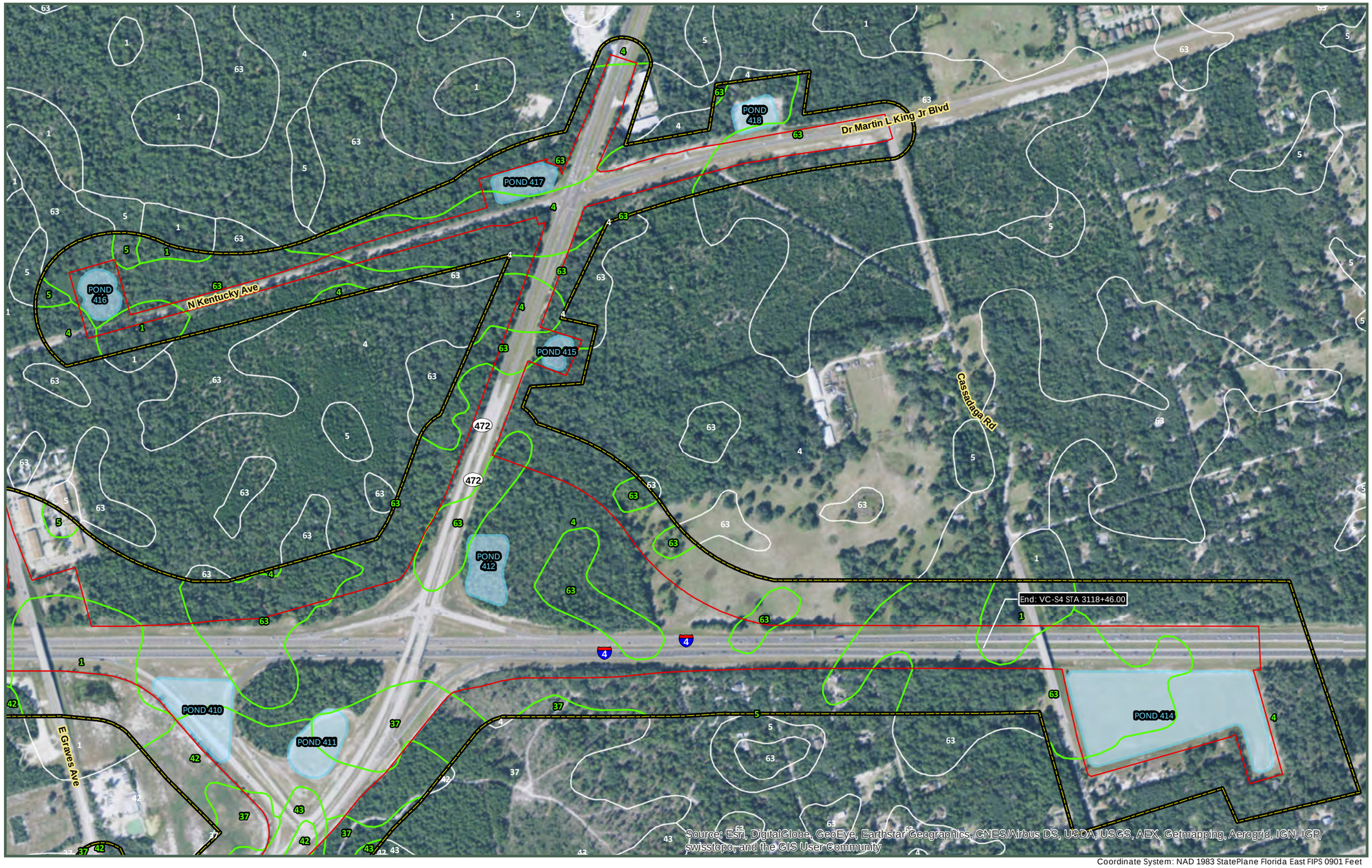

Map Key

Segment 4 PD&E Limits

- I-4 Beyond the Ultimate- Segment 4 Study Area
- Rhode Island Ave (Extension)
- I-4 Beyond the Ultimate- Segment 4 R/W (12/10/15)
- Proposed Ponds (12/10/15)
- Proposed Swales (12/10/15)

NRCS Soils (Segment 4)

- 10:BLUFF
- 13:CASSIA
- 14:CHOBEE
- 17:DAYTONA
- 1:APOPKA
- 20:EAUGALLIE
- 22:ELECTRA
- 23:FARMTON
- 24:FLUVAQUENTS
- 25:GATOR
- 29:IMMOKALEE
- 2:APOPKA
- 32:MYAKKA
- 33:MYAKKA
- 37:ORSINO
- 42:PAOLA
- 43:PAOLA
- 48:PLACID
- 4:ASTATULA
- 50:POMONA
- 54:QUARTZIPSAMMENTS
- 57:SATELLITE
- 5:ASTATULA
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- 61:ST. JOHNS
- 63:TAVARES
- 73:WABASSO
- 8:BASINGER
- 99:WATER

Pond Notes:
(R)= Recommended; (ALT)= Alternative;
SV= Stormwater Vault

Title:
ENDANGERED SPECIES BIOLOGICAL ASSESSMENT REPORT: Segment 4 - NRCS Soils Map

Client/Project:
Florida Department of Transportation- D5
SR 400 Project Development & Environment Study
Segment 4: SR 400 E. of SR 15/600 US 17/92 to 1/2 mile E of SR 472

Project Location:
79110 Volusia County
STA 2583+0.00(Begin) - MP 0.086
STA 3118+46.00 (End) - MP 10.227

Prepared by: mLeonard 12/16/2015
Technical Review by: mDrauer 12/16/2015
Independent Review by: jMoore 12/16/2015

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

0 650 1,300 Feet

Figure B- Sheet 8 of 9: NCRS Soils Map

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Map Key

Segment 4 PD&E Limits

- I-4 Beyond the Ultimate- Segment 4 Study Area
- Rhode Island Ave (Extension)
- I-4 Beyond the Ultimate- Segment 4 R/W (12/10/15)
- Proposed Ponds (12/10/15)
- Proposed Swales (12/10/15)

NRCS Soils (Segment 4)

- 10:BLUFF
- 13:CASSIA
- 14:CHOBEE
- 17:DAYTONA
- 1:APOPKA
- 20:EAUGALLIE
- 22:ELECTRA
- 23:FARMTON
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- 63:TAVARES
- 73:WABASSO
- 8:BASINGER
- 99:WATER

Pond Notes:
(R)= Recommended; (ALT)= Alternative;
SV= Stormwater Vault

Title:
ENDANGERED SPECIES BIOLOGICAL ASSESSMENT REPORT: Segment 4 - NRCS Soils Map

Client/Project:
Florida Department of Transportation- D5
SR 400 Project Development & Environment Study
Segment 4: SR 400 E. of SR 15/600 US 17/92 to 1/2 mile E of SR 472

Project Location:
79110 Volusia County
STA 2583+0.00(Begin) - MP 0.086
STA 3118+46.00 (End) - MP 10.227

Prepared by: mLeonard 12/16/2015
Technical Review by: mDrauer 12/16/2015
Independent Review by: jMoore 12/16/2015

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

0 650 1,300 Feet

Figure B- Sheet 9 of 9: NCRS Soils Map

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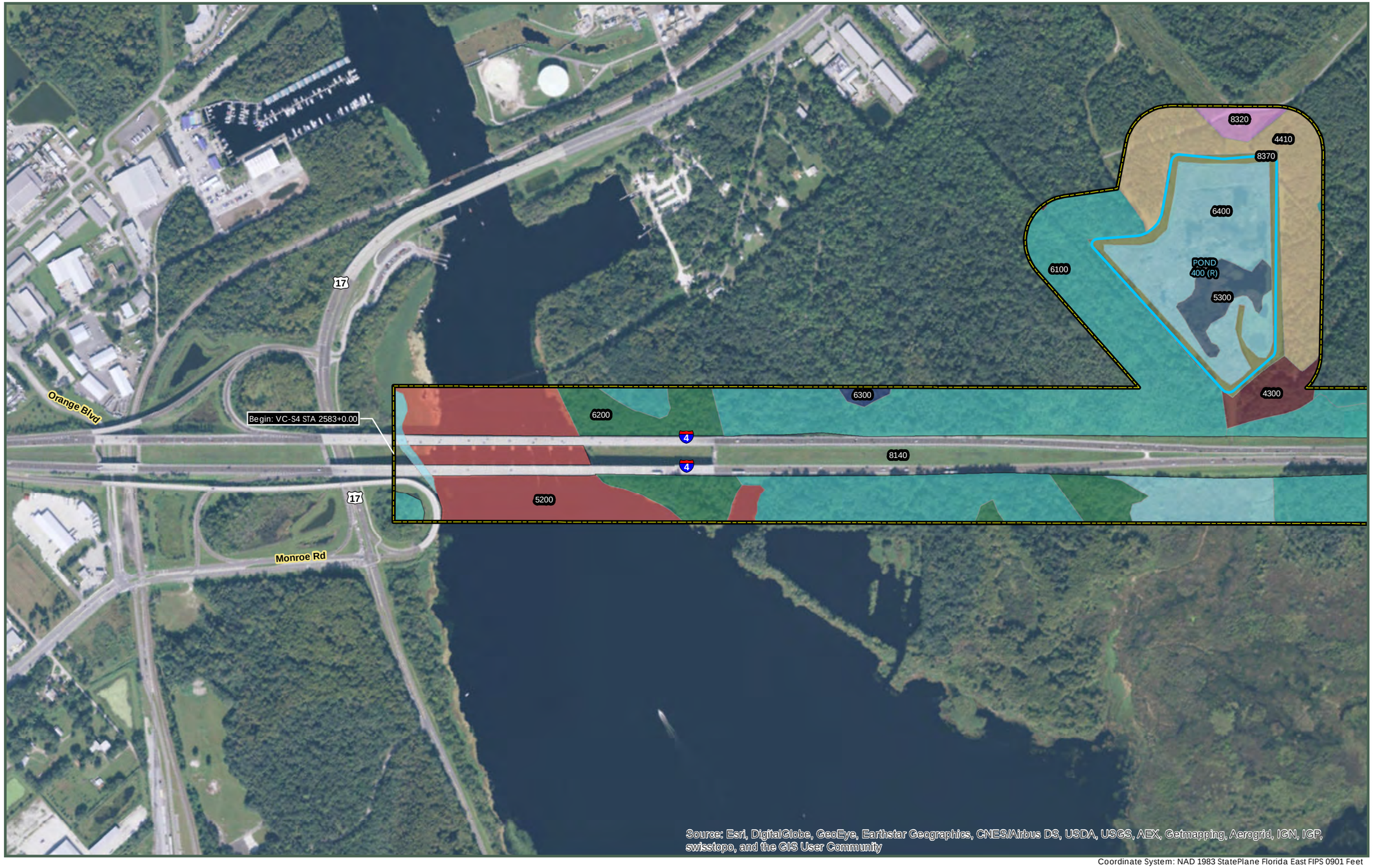


Map Key

Segment 4 PD&E Limits
- I-4 Beyond the Ultimate- Segment 4 Study Area
- Rhode Island Ave (Extension)
- Proposed Ponds (12/10/15)
- Proposed Swales (12/10/15)

LAND USE & HABITAT COVER
- 1100: Residential, LD
- 1200: Residential, MD
- 1300: Residential,HD
- 1400: Commercial and Services
- 1480: Cemeteries
- 1550: Other Light Industrial
- 1700: Institutional
- 1800: Recreational
- 1900: Open Land
- 2100: Pasture and Crop Land
- 3100: Herbaceous
- 3200: Shrub and Brushland
- 3300: Mixed Rangeland
- 4100: Upland Coniferous Forests
- 4200: Upland Hardwood Forests
- 4300: Upland Hardwoods Forests
- 4410: Pine plantation
- 5100: Streams and waterways
- 5200: Lakes
- 5300: Reservoirs
- 6100: Wetland Hardwood Forests
- 6200: Wetland Coniferous Forests
- 6300: Wetland Forested Mixed
- 6400: Vegetated Non-Forested Wetlands
- 7400: Disturbed Lands
- 8140: Roads and Highways
- 8320: Power Transmission Lines
- 8330: Water Supply Plants
- 8350: Solid Waste Disposal
- 8370: Surface water collection basins

Title:
ENDANGERED SPECIES BIOLOGICAL ASSESSMENT REPORT: Segment 4 - Land Use and Habitat Coverage Map

Client/Project:
Florida Department of Transportation- D5
SR 400 Project Development & Environment Study
Segment 4: SR 400 E. of SR 15/600 US 17/92 to 1/2 mile E of SR 472

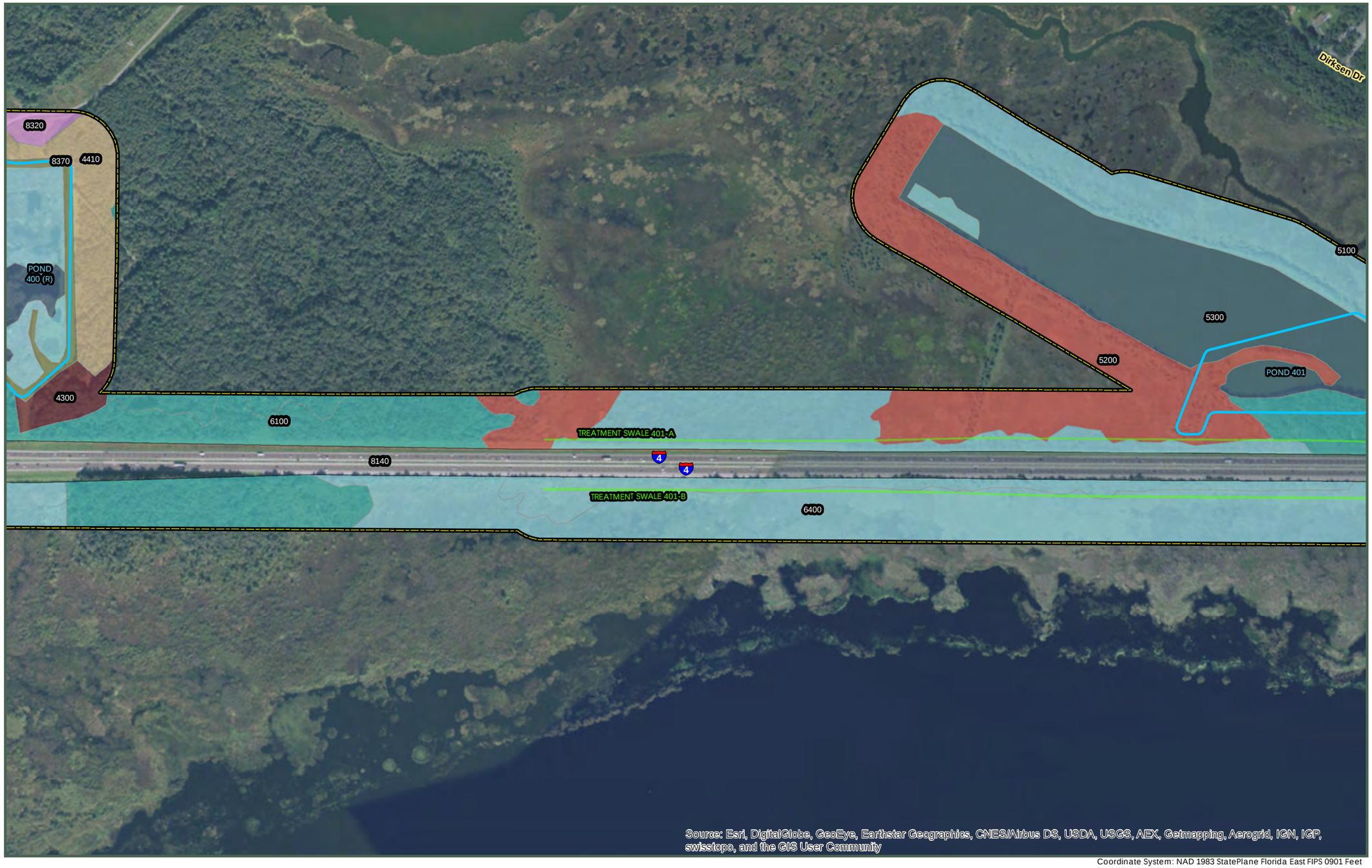
Project Location:
79110 Volusia County
STA 2583+0.00(Begin) - MP 0.086
STA 3118+46.00 (End) - MP 10.227

Prepared by: mLeonard 12/16/2015
Technical Review by: mDrauer 12/16/2015
Independent Review by: jMoore 12/16/2015

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

0 650 1,300 Feet

Figure C- Sheet 1 of 9: Land Use and Habitat Coverage Map



Map Key

Segment 4 PD&E Limits
- I-4 Beyond the Ultimate- Segment 4 Study Area
- Rhode Island Ave (Extension)
- Proposed Ponds (12/10/15)
- Proposed Swales (12/10/15)

LAND USE & HABITAT COVER
- 1100: Residential, LD
- 1200: Residential, MD
- 1300: Residential,HD
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- 7400: Disturbed Lands
- 8140: Roads and Highways
- 8320: Power Transmission Lines
- 8330: Water Supply Plants
- 8350: Solid Waste Disposal
- 8370: Surface water collection basins

Title:
ENDANGERED SPECIES BIOLOGICAL ASSESSMENT REPORT: Segment 4 - Land Use and Habitat Coverage Map

Client/Project:
Florida Department of Transportation- D5
SR 400 Project Development & Environment Study
Segment 4: SR 400 E. of SR 15/600 US 17/92 to 1/2 mile E of SR 472

Project Location:
79110 Volusia County
STA 2583+0.00(Begin) - MP 0.086
STA 3118+46.00 (End) - MP 10.227

Prepared by: mLeonard 12/16/2015
Technical Review by: mDrauer 12/16/2015
Independent Review by: jMoore 12/16/2015

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

0 650 1,300 Feet

Figure C- Sheet 2 of 9: Land Use and Habitat Coverage Map

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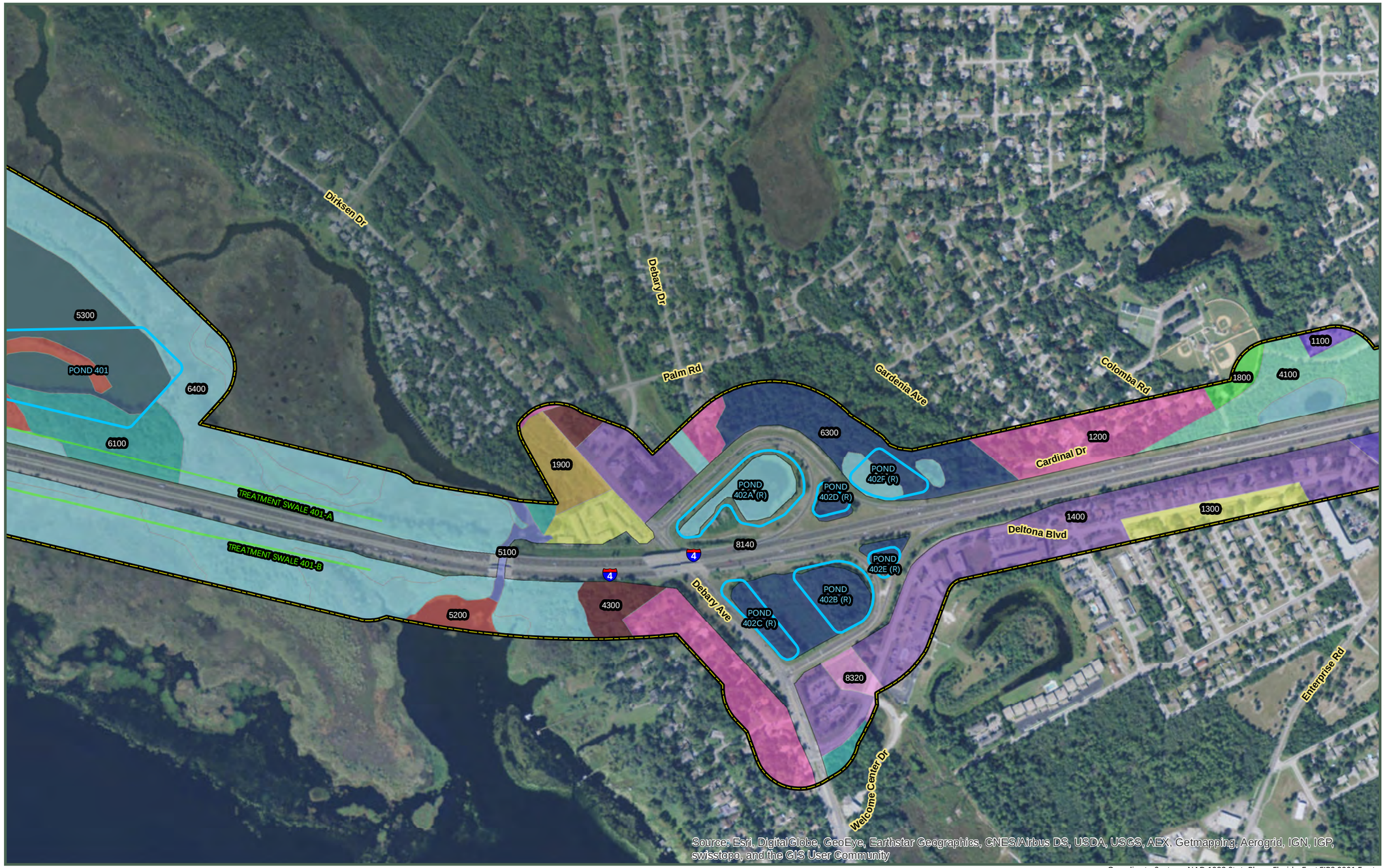

Map Key

Segment 4 PD&E Limits
- I-4 Beyond the Ultimate-Segment 4 Study Area
- Rhode Island Ave (Extension)
- Proposed Ponds (12/10/15)
- Proposed Swales (12/10/15)

LAND USE & HABITAT COVER
- 1100: Residential, LD
- 1200: Residential, MD
- 1300: Residential,HD
- 1400: Commercial and Services
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- 8140: Roads and Highways
- 8320: Power Transmission Lines
- 8330: Water Supply Plants
- 8350: Solid Waste Disposal
- 8370: Surface water collection basins

Title:
ENDANGERED SPECIES BIOLOGICAL ASSESSMENT REPORT: Segment 4 - Land Use and Habitat Coverage Map

Client/Project:
Florida Department of Transportation- D5
SR 400 Project Development & Environment Study
Segment 4: SR 400 E. of SR 15/600 US 17/92 to 1/2 mile E of SR 472

Project Location:
79110 Volusia County
STA 2583+0.00(Begin) - MP 0.086
STA 3118+46.00 (End) - MP 10.227

Prepared by: mLeonard 12/16/2015
Technical Review by: mDrauer 12/16/2015
Independent Review by: jMoore 12/16/2015

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

0 650 1,300 Feet

Figure C- Sheet 3 of 9: Land Use and Habitat Coverage Map

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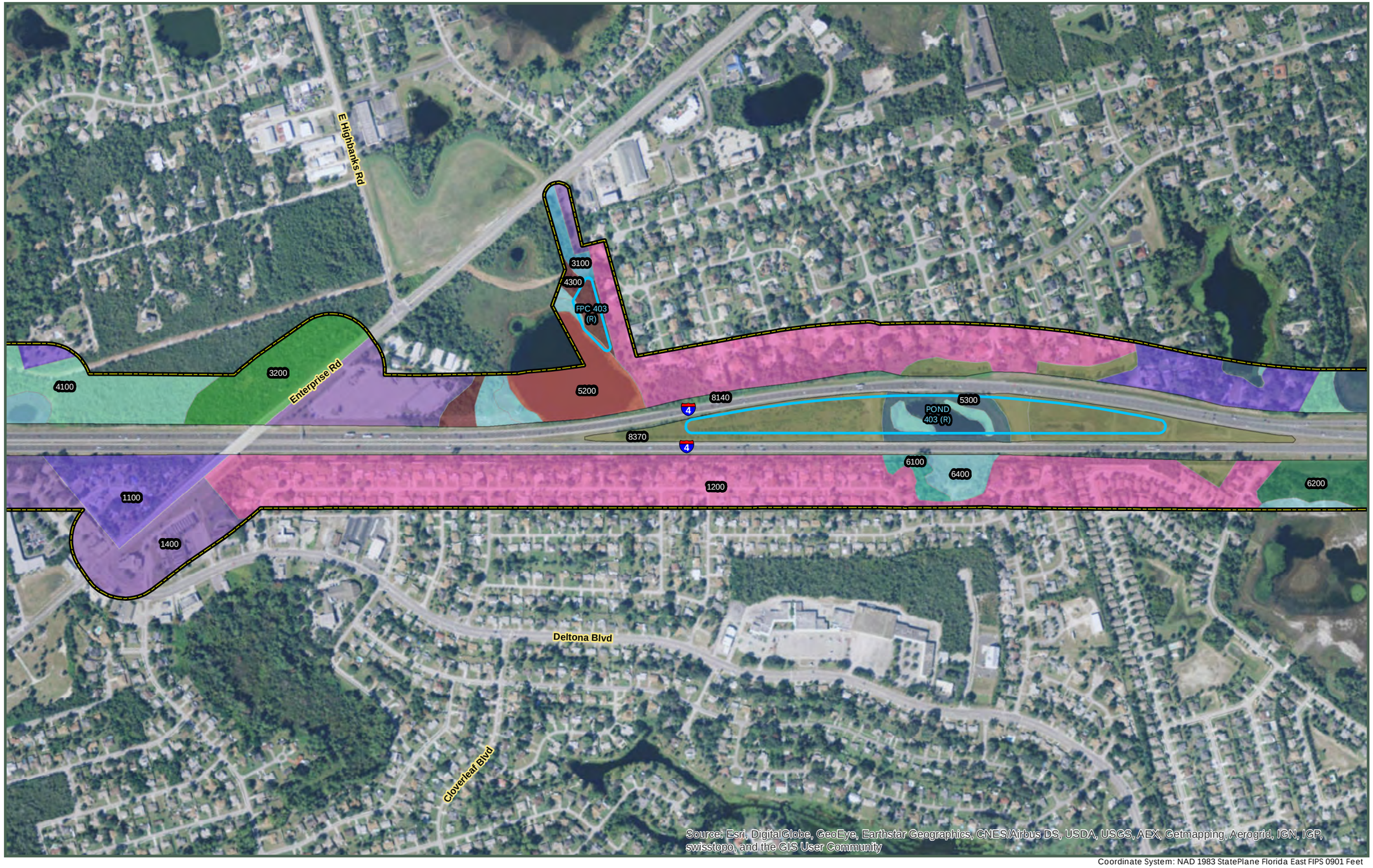

Map Key

Segment 4 PD&E Limits
- I-4 Beyond the Ultimate- Segment 4 Study Area
- Rhode Island Ave (Extension)
- Proposed Ponds (12/10/15)
- Proposed Swales (12/10/15)

LAND USE & HABITAT COVER
- 1100: Residential, LD
- 1200: Residential, MD
- 1300: Residential,HD
- 1400: Commercial and Services
- 1480: Cemeteries
- 1550: Other Light Industrial
- 1700: Institutional
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- 7400: Disturbed Lands
- 8140: Roads and Highways
- 8320: Power Transmission Lines
- 8330: Water Supply Plants
- 8350: Solid Waste Disposal
- 8370: Surface water collection basins

Title:
ENDANGERED SPECIES BIOLOGICAL ASSESSMENT REPORT: Segment 4 - Land Use and Habitat Coverage Map

Client/Project:
Florida Department of Transportation- D5
SR 400 Project Development & Environment Study
Segment 4: SR 400 E. of SR 15/600 US 17/92 to 1/2 mile E of SR 472

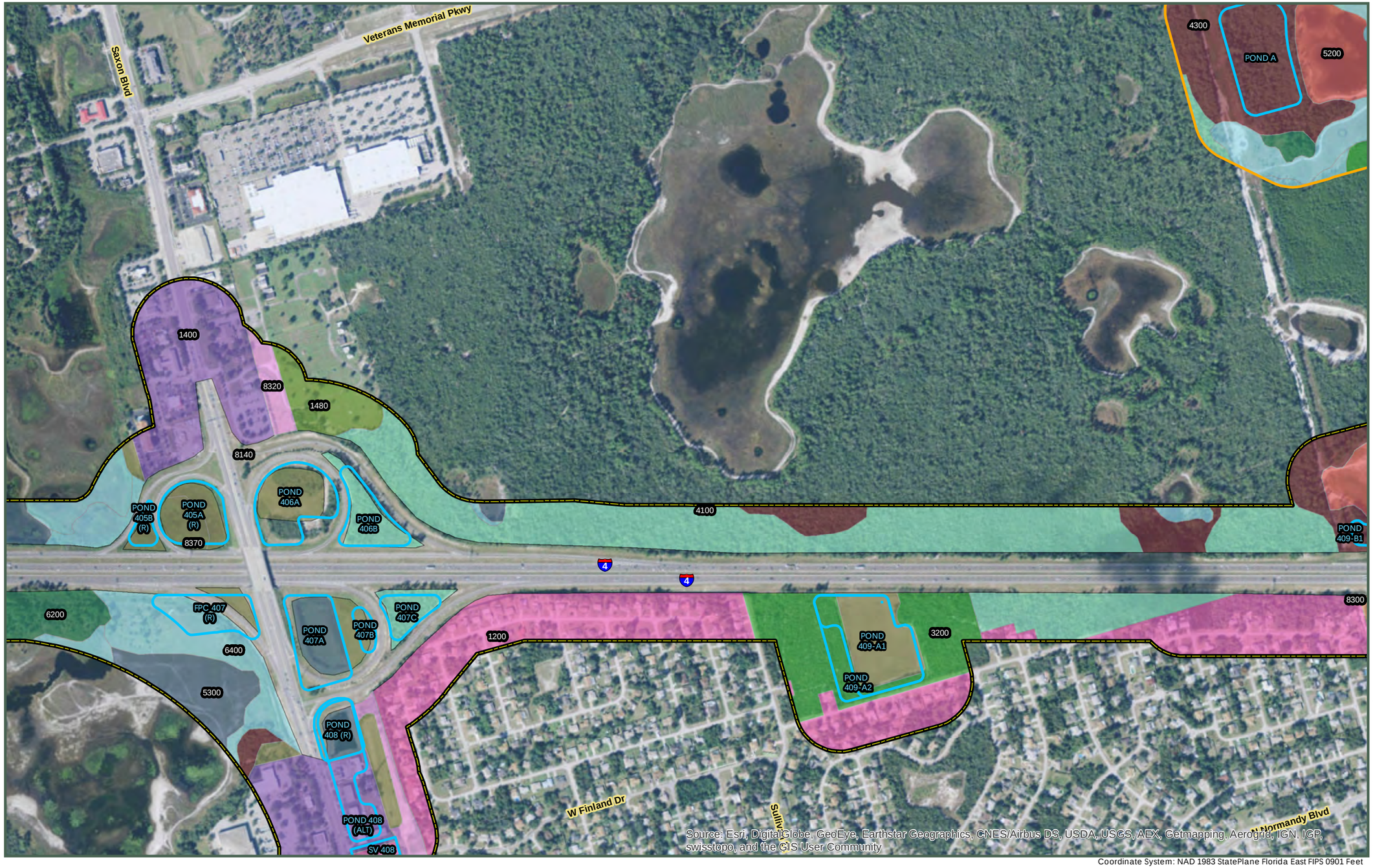
Project Location:
79110 Volusia County
STA 2583+0.00(Begin) - MP 0.086
STA 3118+46.00 (End) - MP 10.227

Prepared by: mLeonard 12/16/2015
Technical Review by: mDrauer 12/16/2015
Independent Review by: jMoore 12/16/2015

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

0 650 1,300 Feet

Figure C- Sheet 4 of 9: Land Use and Habitat Coverage Map



Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

0 650 1,300 Feet

Map Key

Segment 4 PD&E Limits
- I-4 Beyond the Ultimate-Segment 4 Study Area
- Rhode Island Ave (Extension)
- Proposed Ponds (12/10/15)
- Proposed Swales (12/10/15)

LAND USE & HABITAT COVER
- 1100: Residential, LD
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- 8320: Power Transmission Lines
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- 8350: Solid Waste Disposal
- 8370: Surface water collection basins

Title:
ENDANGERED SPECIES BIOLOGICAL ASSESSMENT REPORT: Segment 4 - Land Use and Habitat Coverage Map

Client/Project:
Florida Department of Transportation- D5
SR 400 Project Development & Environment Study
Segment 4: SR 400 E. of SR 15/600 US 17/92 to 1/2 mile E of SR 472

Project Location:
79110 Volusia County
STA 2583+0.00(Begin) - MP 0.086
STA 3118+46.00 (End) - MP 10.227

Prepared by: mLeonard 12/16/2015
Technical Review by: mDrauer 12/16/2015
Independent Review by: jMoore 12/16/2015

Figure C- Sheet 5 of 9: Land Use and Habitat Coverage Map

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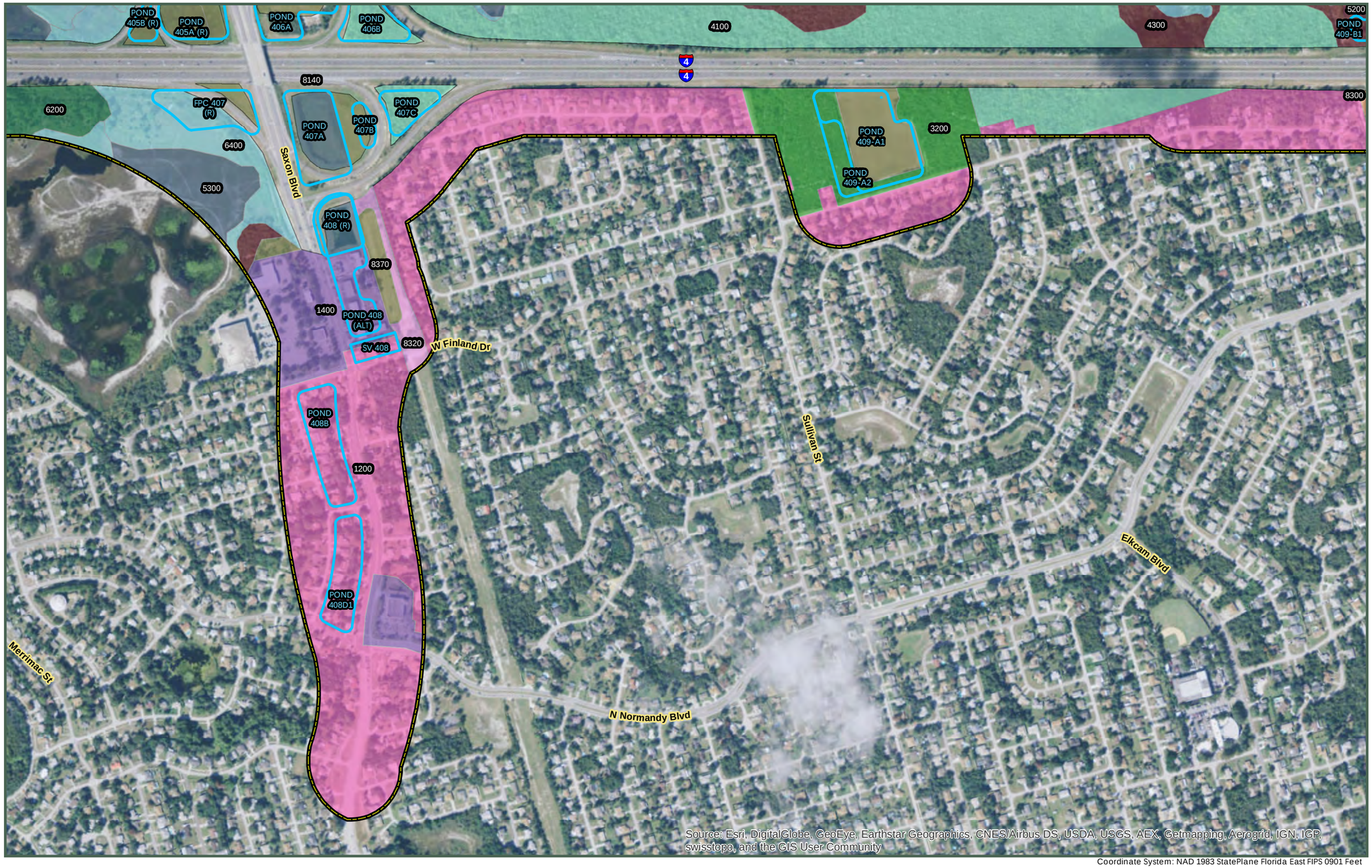

Map Key

Segment 4 PD&E Limits
- I-4 Beyond the Ultimate-Segment 4 Study Area
- Rhode Island Ave (Extension)
- Proposed Ponds (12/10/15)
- Proposed Swales (12/10/15)

LAND USE & HABITAT COVER
- 1100: Residential, LD
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- 1300: Residential,HD
- 1400: Commercial and Services
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- 8140: Roads and Highways
- 8320: Power Transmission Lines
- 8330: Water Supply Plants
- 8350: Solid Waste Disposal
- 8370: Surface water collection basins

Title:
ENDANGERED SPECIES BIOLOGICAL ASSESSMENT REPORT: Segment 4 - Land Use and Habitat Coverage Map

Client/Project:
Florida Department of Transportation- D5
SR 400 Project Development & Environment Study
Segment 4: SR 400 E. of SR 15/600 US 17/92 to 1/2 mile E of SR 472

Project Location:
79110 Volusia County
STA 2583+0.00(Begin) - MP 0.086
STA 3118+46.00 (End) - MP 10.227

Prepared by: mLeonard 12/16/2015
Technical Review by: mDrauer 12/16/2015
Independent Review by: jMoore 12/16/2015

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

0 650 1,300 Feet

Figure C- Sheet 6 of 9: Land Use and Habitat Coverage Map

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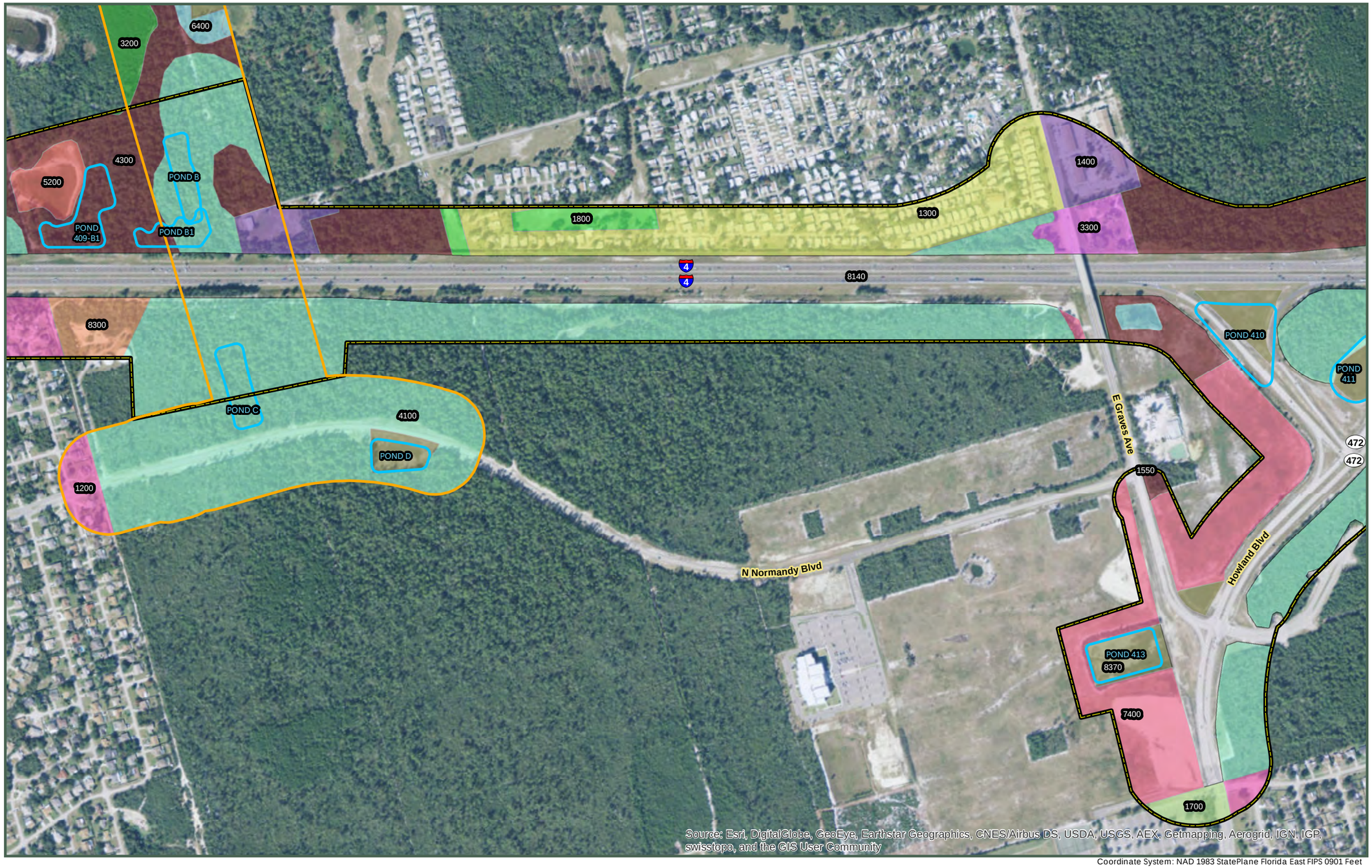

Map Key

Segment 4 PD&E Limits
- I-4 Beyond the Ultimate-Segment 4 Study Area
- Rhode Island Ave (Extension)
- Proposed Ponds (12/10/15)
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LAND USE & HABITAT COVER
- 1100: Residential, LD
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- 8140: Roads and Highways
- 8320: Power Transmission Lines
- 8330: Water Supply Plants
- 8350: Solid Waste Disposal
- 8370: Surface water collection basins

Title:
ENDANGERED SPECIES BIOLOGICAL ASSESSMENT REPORT: Segment 4 - Land Use and Habitat Coverage Map

Client/Project:
Florida Department of Transportation- D5
SR 400 Project Development & Environment Study
Segment 4: SR 400 E. of SR 15/600 US 17/92 to 1/2 mile E of SR 472

Project Location:
79110 Volusia County
STA 2583+0.00(Begin) - MP 0.086
STA 3118+46.00 (End) - MP 10.227

Prepared by: mLeonard 12/16/2015
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Independent Review by: jMoore 12/16/2015

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

0 650 1,300 Feet

Figure C- Sheet 7 of 9: Land Use and Habitat Coverage Map

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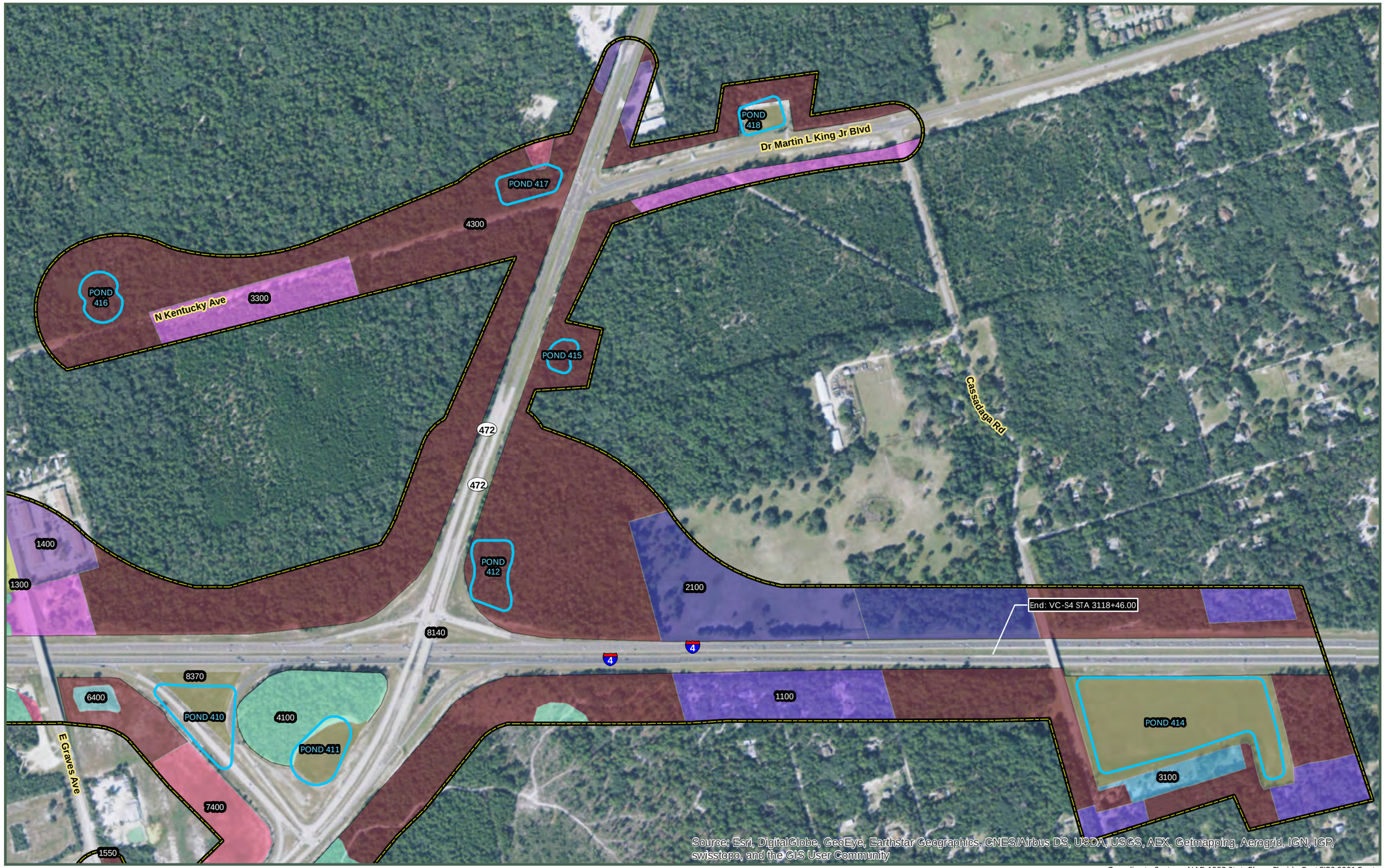

Map Key

Segment 4 PD&E Limits
- I-4 Beyond the Ultimate-Segment 4 Study Area
- Rhode Island Ave (Extension)
- Proposed Ponds (12/10/15)
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LAND USE & HABITAT COVER
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- 7400: Disturbed Lands
- 8140: Roads and Highways
- 8320: Power Transmission Lines
- 8330: Water Supply Plants
- 8350: Solid Waste Disposal
- 8370: Surface water collection basins

Title:
ENDANGERED SPECIES BIOLOGICAL ASSESSMENT REPORT: Segment 4 - Land Use and Habitat Coverage Map

Client/Project:
Florida Department of Transportation- D5
SR 400 Project Development & Environment Study
Segment 4: SR 400 E. of SR 15/600 US 17/92 to 1/2 mile E of SR 472

Project Location:
79110 Volusia County
STA 2583+0.00(Begin) - MP 0.086
STA 3118+46.00 (End) - MP 10.227

Prepared by: mLeonard 12/16/2015
Technical Review by: mDrauer 12/16/2015
Independent Review by: jMoore 12/16/2015

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

0 650 1,300 Feet

Figure C- Sheet 8 of 9: Land Use and Habitat Coverage Map

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Map Key

Segment 4 PD&E Limits
- I-4 Beyond the Ultimate- Segment 4 Study Area
- Rhode Island Ave (Extension)
- Proposed Ponds (12/10/15)
- Proposed Swales (12/10/15)

LAND USE & HABITAT COVER
- 1100: Residential, LD
- 1200: Residential, MD
- 1300: Residential,HD
- 1400: Commercial and Services
- 1480: Cemeteries
- 1550: Other Light Industrial
- 1700: Institutional
- 1800: Recreational
- 1900: Open Land
- 2100: Pasture and Crop Land
- 3100: Herbaceous
- 3200: Shrub and Brushland
- 3300: Mixed Rangeland
- 4100: Upland Coniferous Forests
- 4200: Upland Hardwood Forests
- 4300: Upland Hardwoods Forests
- 4410: Pine plantation
- 5100: Streams and waterways
- 5200: Lakes
- 5300: Reservoirs
- 6100: Wetland Hardwood Forests
- 6200: Wetland Coniferous Forests
- 6300: Wetland Forested Mixed
- 6400: Vegetated Non-Forested Wetlands
- 7400: Disturbed Lands
- 8140: Roads and Highways
- 8320: Power Transmission Lines
- 8330: Water Supply Plants
- 8350: Solid Waste Disposal
- 8370: Surface water collection basins

Title:
ENDANGERED SPECIES BIOLOGICAL ASSESSMENT REPORT: Segment 4 - Land Use and Habitat Coverage Map

Client/Project:
Florida Department of Transportation- D5
SR 400 Project Development & Environment Study
Segment 4: SR 400 E. of SR 15/600 US 17/92 to 1/2 mile E of SR 472

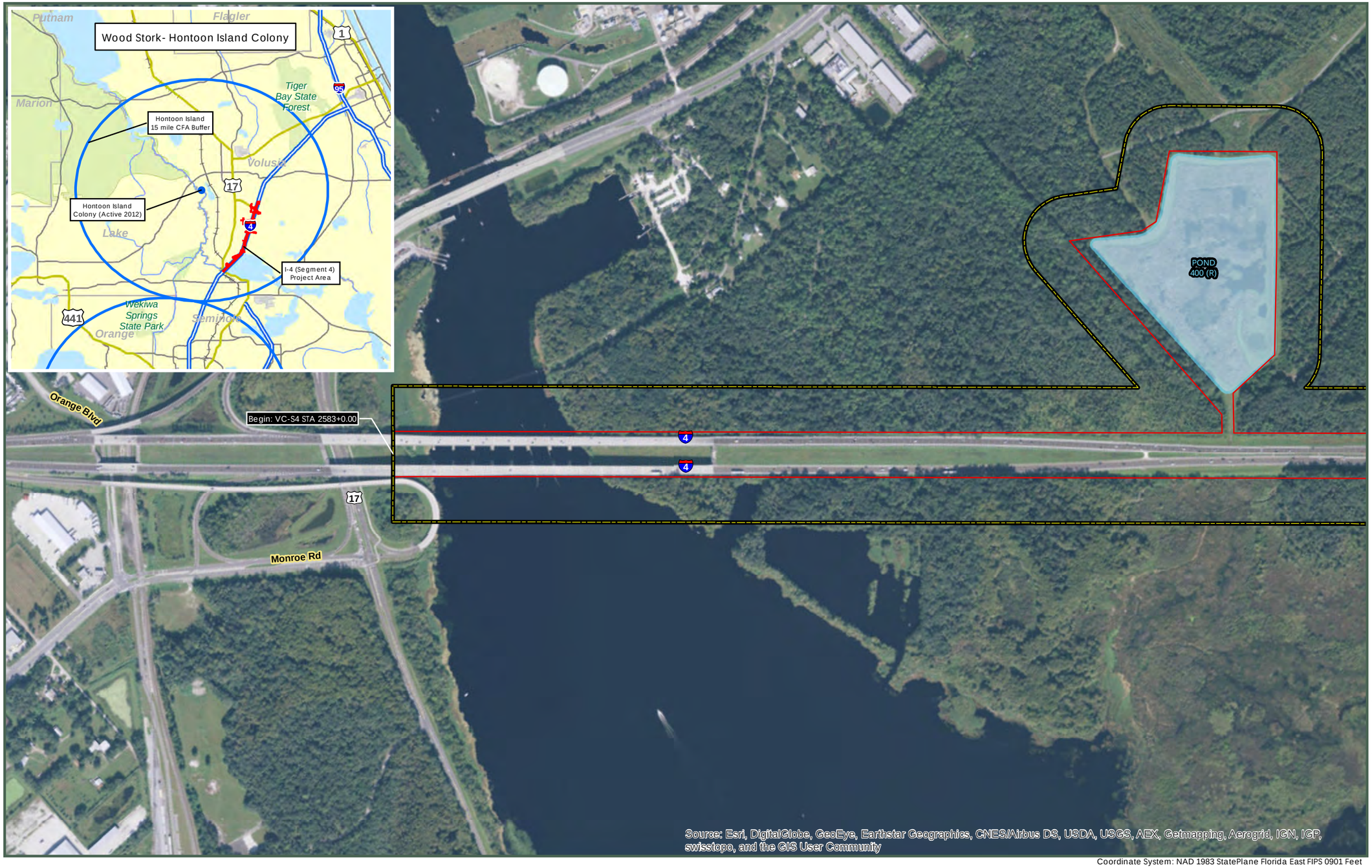
Project Location:
79110 Volusia County
STA 2583+0.00(Begin) - MP 0.086
STA 3118+46.00 (End) - MP 10.227

Prepared by: mLeonard 12/16/2015
Technical Review by: mDrauer 12/16/2015
Independent Review by: jMoore 12/16/2015

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

0 650 1,300 Feet

Figure C- Sheet 9 of 9: Land Use and Habitat Map



Map Key

Segment 4 PD&E Limits

- I-4 Beyond the Ultimate- Segment 4 Study Area
- Rhode Island Ave (Extension)
- I-4 Beyond the Ultimate- Segment 4 R/W (12/10/15)
- Proposed Ponds (12/10/15)
- Proposed Swales (12/10/15)

Flora

- Garberia

Fauna

- Gopher Tortoise
- Scrub Jay

Segment 4 Species Notes:
Wood Stork Colonies - Hontoon Island (15 mile CFA Buffer). Segment 4 is fully within CFA

Title:
ENDANGERED SPECIES BIOLOGICAL ASSESSMENT REPORT: Segment 4 - Species Location Map

Client/Project:
Florida Department of Transportation- D5
SR 400 Project Development & Environment Study
Segment 4: SR 400 E. of SR 15/600 US 17/92 to 1/2 mile E of SR 472

Project Location:
79110 Volusia County
STA 2583+0.00(Begin) - MP 0.086
STA 3118+46.00 (End) - MP 10.227

Prepared by: mLeonard 2014/12/04
Technical Review by: mDrauer 2014/12/04
Independent Review by: jMoore 2014/12/04

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

0 650 1,300 Feet

Figure D - Sheet 1 of 9 : Species Location Map

1 " = 650 '

SR 400 (I-4) Project Development and Environment (PD&E) Study | FM No. 432100-1-22-01

2024230168

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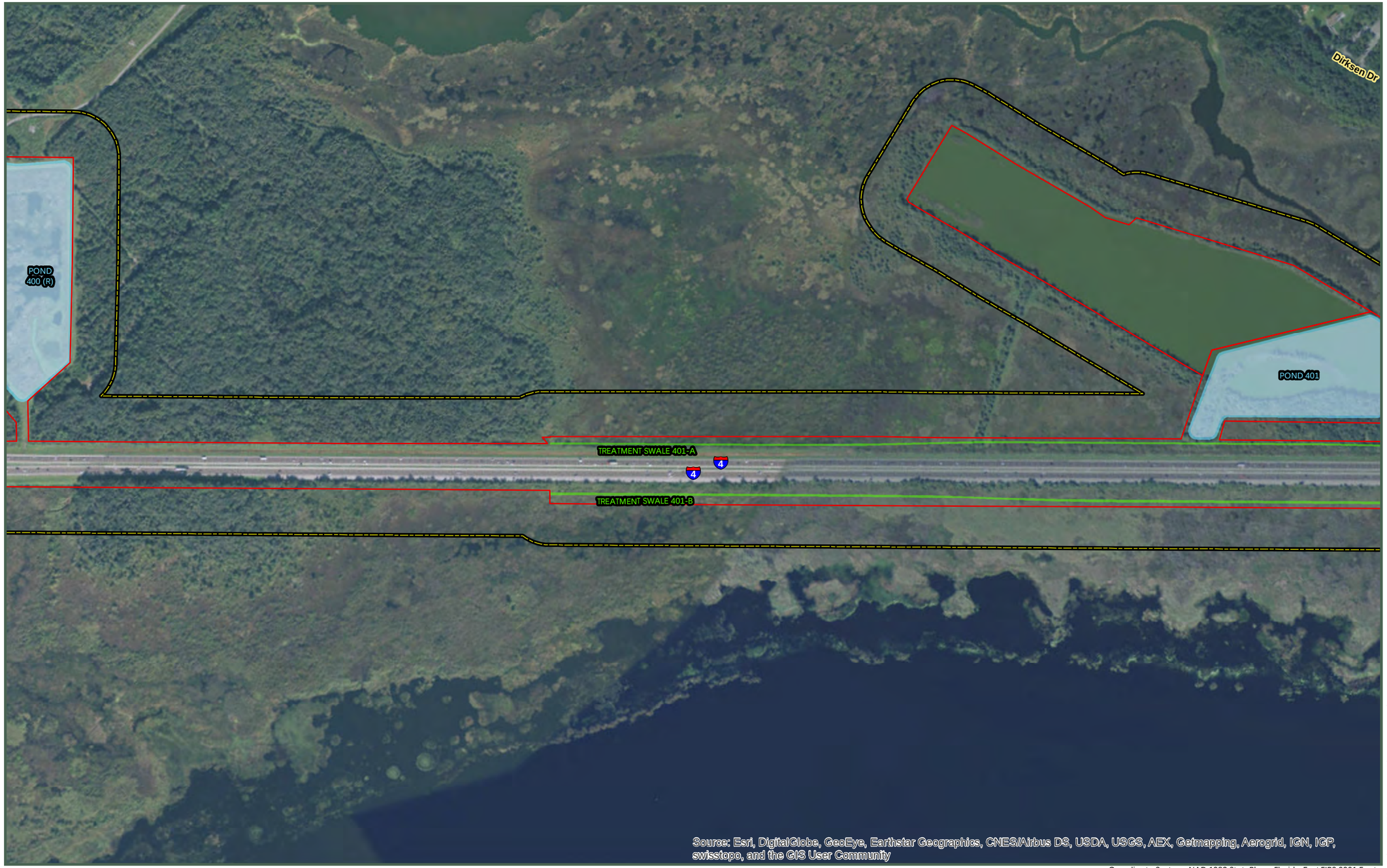
ENDANGERED SPECIES BIOLOGICAL ASSESSMENT REPORT: Segment 4 - Species Location Map

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



Map Key

Segment 4 PD&E Limits

- I-4 Beyond the Ultimate- Segment 4 Study Area
- Rhode Island Ave (Extension)
- I-4 Beyond the Ultimate- Segment 4 R/W (12/10/15)
- Proposed Ponds (12/10/15)
- Proposed Swales (12/10/15)

Flora

- Garberia

Fauna

- Gopher Tortoise
- Scrub Jay

Segment 4 Species Notes:
Wood Stork Colonies - Hontoon Island (15 mile CFA Buffer). Segment 4 is fully within CFA

Title:
ENDANGERED SPECIES BIOLOGICAL ASSESSMENT REPORT: Segment 4 - Species Location Map

Client/Project:
Florida Department of Transportation- D5
SR 400 Project Development & Environment Study
Segment 4: SR 400 E. of SR 15/600 US 17/92 to 1/2 mile E of SR 472

Project Location:
79110 Volusia County
STA 2583+0.00(Begin) - MP 0.086
STA 3118+46.00 (End) - MP 10.227

Prepared by: mLeonard 2014/12/04
Technical Review by: mDrauer 2014/12/04
Independent Review by: jMoore 2014/12/04

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

0 650 1,300 Feet

Figure D - Sheet 2 of 9 : Species Location Map

1 " = 650 '

SR 400 (I-4) Project Development and Environment (PD&E) Study | FM No. 432100-1-22-01

2024230168

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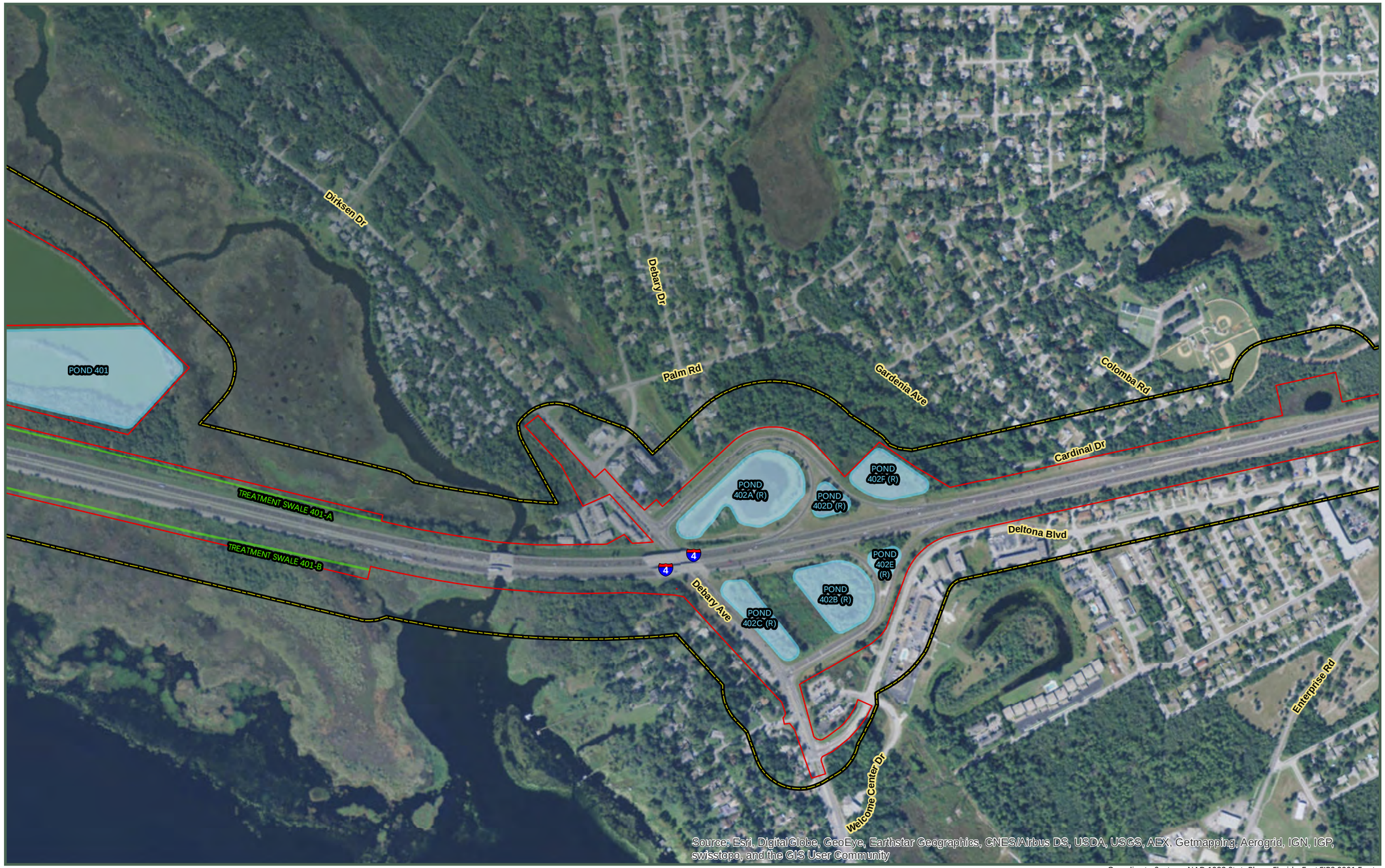

Map Key

Segment 4 PD&E Limits

- I-4 Beyond the Ultimate- Segment 4 Study Area
- Rhode Island Ave (Extension)
- I-4 Beyond the Ultimate- Segment 4 R/W (12/10/15)
- Proposed Ponds (12/10/15)
- Proposed Swales (12/10/15)

Flora

- Garberia

Fauna

- Gopher Tortoise
- Scrub Jay

Segment 4 Species Notes:
Wood Stork Colonies - Hontoon Island (15 mile CFA Buffer). Segment 4 is fully within CFA

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

0 650 1,300 Feet

Title:
ENDANGERED SPECIES BIOLOGICAL ASSESSMENT REPORT: Segment 4 - Species Location Map

Client/Project:
Florida Department of Transportation- D5
SR 400 Project Development & Environment Study
Segment 4: SR 400 E. of SR 15/600 US 17/92 to 1/2 mile E of SR 472

Project Location:
79110 Volusia County
STA 2583+0.00(Begin) - MP 0.086
STA 3118+46.00 (End) - MP 10.227

Prepared by: mLeonard 2014/12/04
Technical Review by: mDrauer 2014/12/04
Independent Review by: jMoore 2014/12/04

Figure D - Sheet 3 of 9 : Species Location Map

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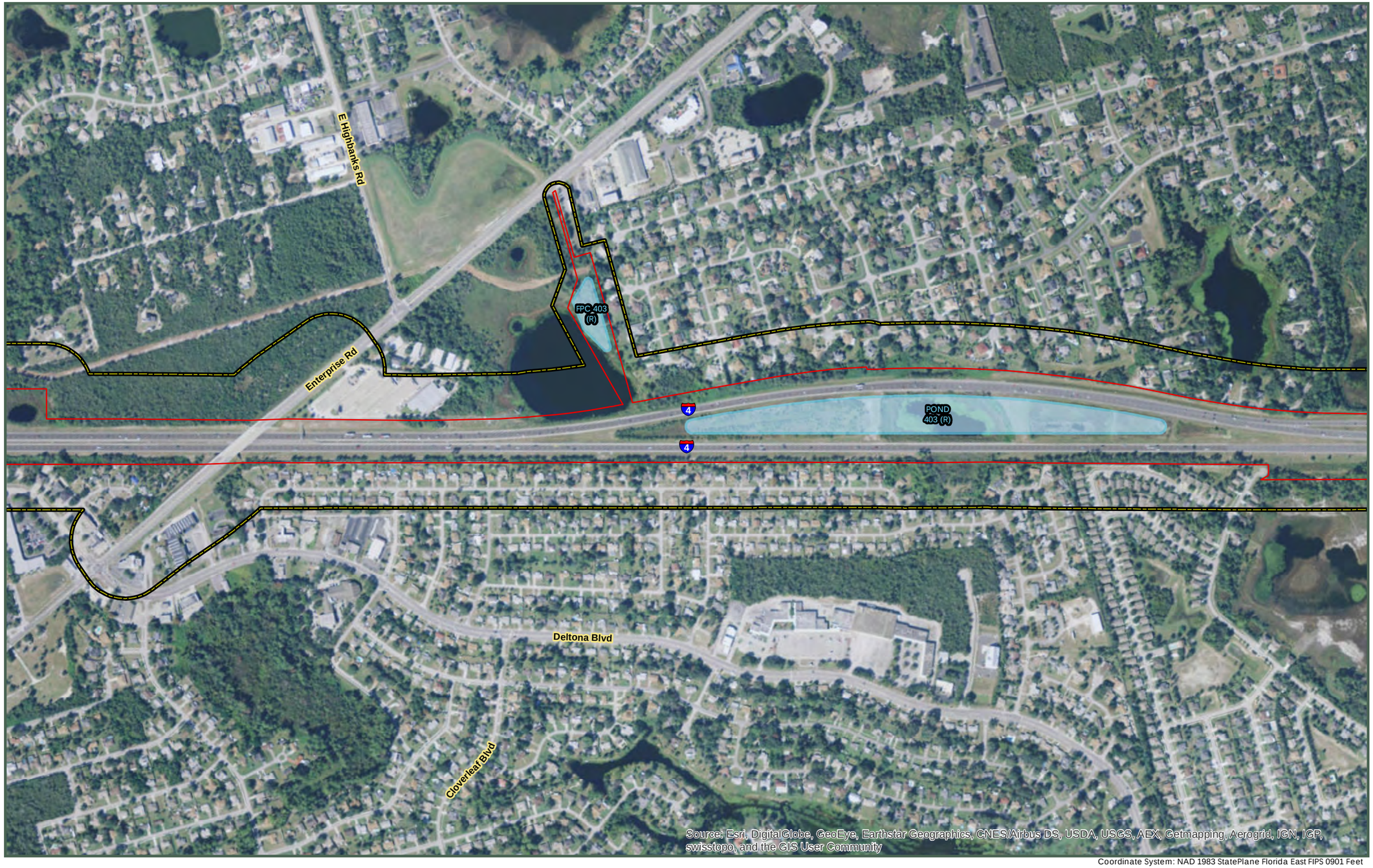

Map Key

Segment 4 PD&E Limits

- I-4 Beyond the Ultimate- Segment 4 Study Area
- Rhode Island Ave (Extension)
- I-4 Beyond the Ultimate- Segment 4 R/W (12/10/15)
- Proposed Ponds (12/10/15)
- Proposed Swales (12/10/15)

Flora

- Garberia

Fauna

- Gopher Tortoise
- Scrub Jay

Segment 4 Species Notes:
Wood Stork Colonies - Hontoon Island (15 mile CFA Buffer). Segment 4 is fully within CFA

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

0 650 1,300 Feet

Title:
ENDANGERED SPECIES BIOLOGICAL ASSESSMENT REPORT: Segment 4 - Species Location Map

Client/Project:
Florida Department of Transportation- D5
SR 400 Project Development & Environment Study
Segment 4: SR 400 E. of SR 15/600 US 17/92 to 1/2 mile E of SR 472

Project Location:
79110 Volusia County
STA 2583+0.00(Begin) - MP 0.086
STA 3118+46.00 (End) - MP 10.227

Prepared by: mLeonard 2014/12/04
Technical Review by: mDrauer 2014/12/04
Independent Review by: jMoore 2014/12/04

Figure D - Sheet 4 of 9 : Species Location Map

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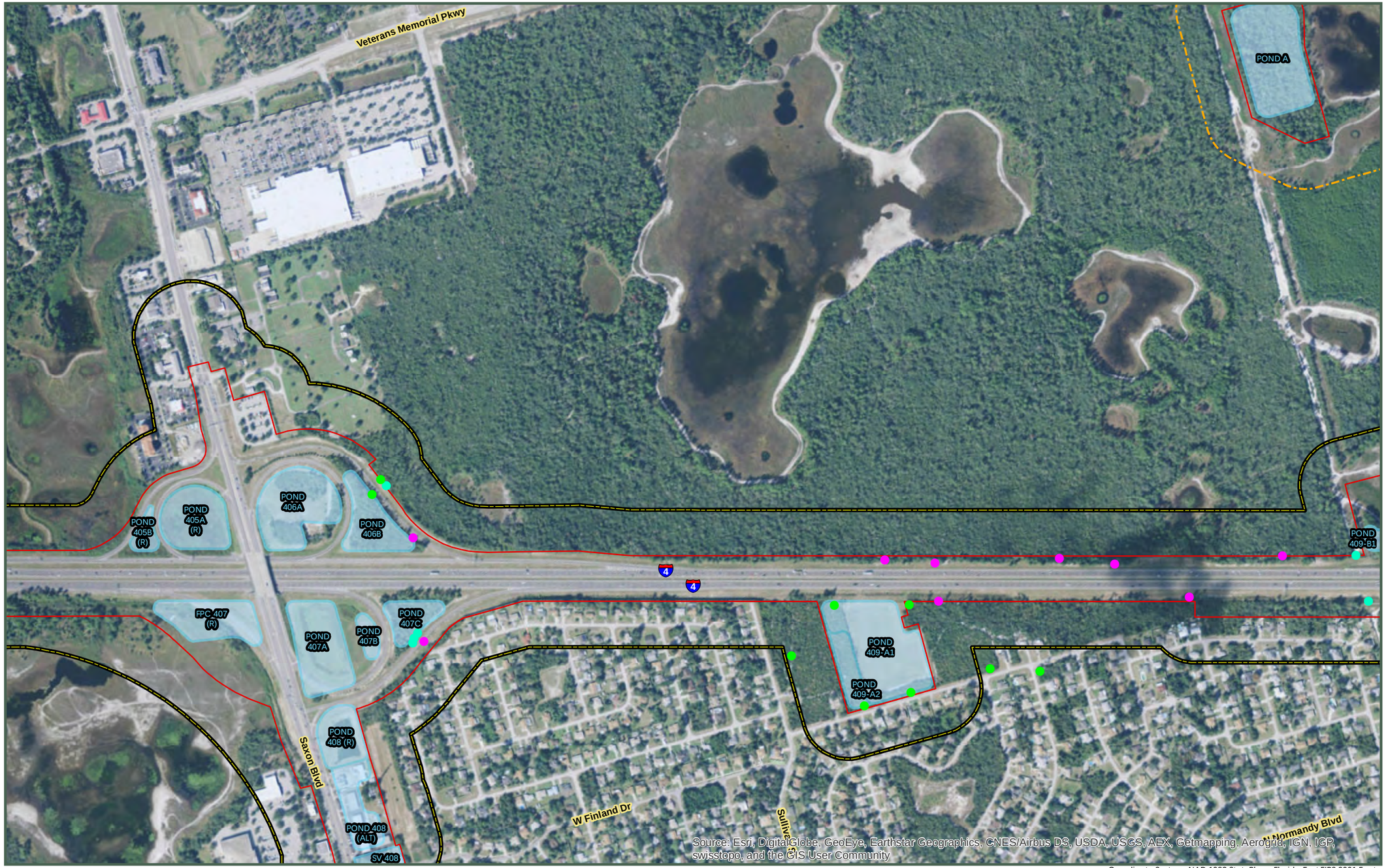

Map Key

Segment 4 PD&E Limits

- I-4 Beyond the Ultimate- Segment 4 Study Area
- Rhode Island Ave (Extension)
- I-4 Beyond the Ultimate- Segment 4 R/W (12/10/15)
- Proposed Ponds (12/10/15)
- Proposed Swales (12/10/15)

Flora

- Garberia

Fauna

- Gopher Tortoise
- Scrub Jay

Segment 4 Species Notes:
Wood Stork Colonies - Hontoon Island (15 mile CFA Buffer). Segment 4 is fully within CFA

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

0 650 1,300 Feet

Title:
ENDANGERED SPECIES BIOLOGICAL ASSESSMENT REPORT: Segment 4 - Species Location Map

Client/Project:
Florida Department of Transportation- D5
SR 400 Project Development & Environment Study
Segment 4: SR 400 E. of SR 15/600 US 17/92 to 1/2 mile E of SR 472

Project Location:
79110 Volusia County
STA 2583+0.00(Begin) - MP 0.086
STA 3118+46.00 (End) - MP 10.227

Prepared by: mLeonard 2014/12/04
Technical Review by: mDrauer 2014/12/04
Independent Review by: jMoore 2014/12/04

Figure D - Sheet 5 of 9 : Species Location Map

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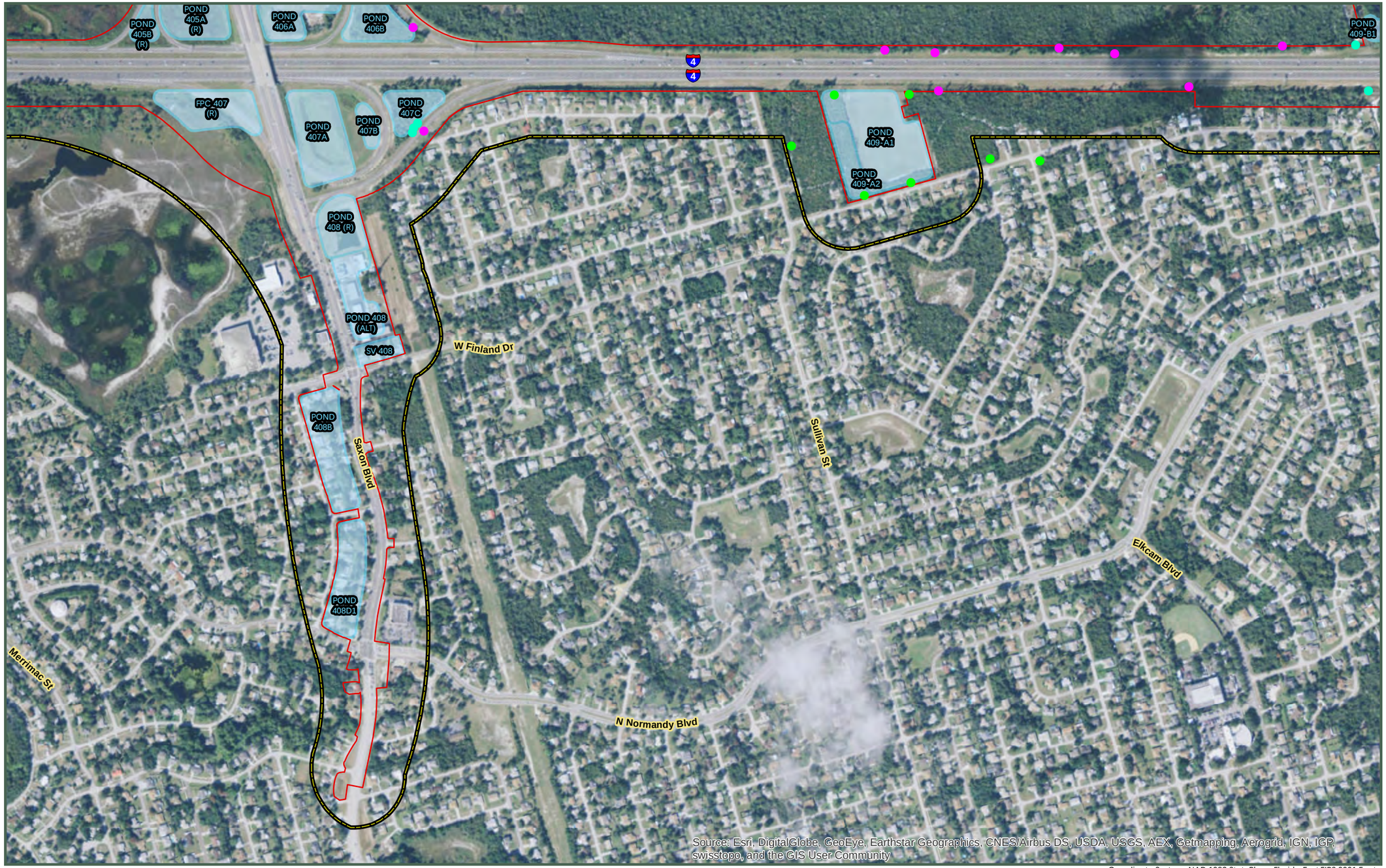

Map Key

Segment 4 PD&E Limits

- I-4 Beyond the Ultimate- Segment 4 Study Area
- Rhode Island Ave (Extension)
- I-4 Beyond the Ultimate- Segment 4 R/W (12/10/15)
- Proposed Ponds (12/10/15)
- Proposed Swales (12/10/15)

Flora

- Garberia

Fauna

- Gopher Tortoise
- Scrub Jay

Segment 4 Species Notes:
Wood Stork Colonies - Hontoon Island (15 mile CFA Buffer). Segment 4 is fully within CFA

Title:
ENDANGERED SPECIES BIOLOGICAL ASSESSMENT REPORT: Segment 4 - Species Location Map

Client/Project:
Florida Department of Transportation- D5
SR 400 Project Development & Environment Study
Segment 4: SR 400 E. of SR 15/600 US 17/92 to 1/2 mile E of SR 472

Project Location:
79110 Volusia County
STA 2583+0.00(Begin) - MP 0.086
STA 3118+46.00 (End) - MP 10.227

Prepared by: mLeonard 2014/12/04
Technical Review by: mDrauer 2014/12/04
Independent Review by: jMoore 2014/12/04

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

0 650 1,300 Feet

Figure D - Sheet 6 of 9 : Species Location Map

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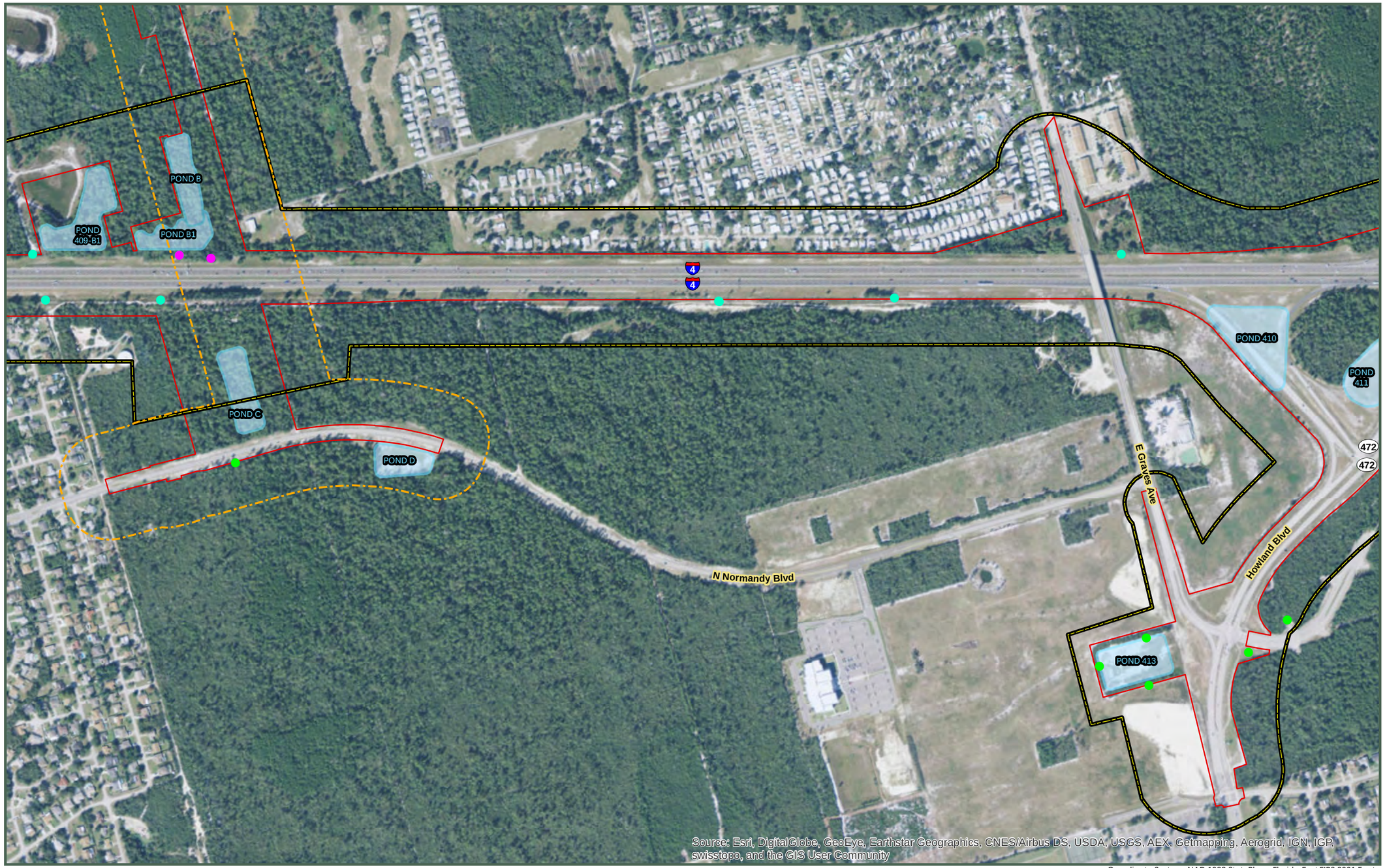

Map Key

Segment 4 PD&E Limits

- I-4 Beyond the Ultimate- Segment 4 Study Area
- Rhode Island Ave (Extension)
- I-4 Beyond the Ultimate- Segment 4 R/W (12/10/15)
- Proposed Ponds (12/10/15)
- Proposed Swales (12/10/15)

Flora

- Garberia

Fauna

- Gopher Tortoise
- Scrub Jay

Segment 4 Species Notes:
Wood Stork Colonies - Hontoon Island (15 mile CFA Buffer). Segment 4 is fully within CFA

Title:
ENDANGERED SPECIES BIOLOGICAL ASSESSMENT REPORT: Segment 4 - Species Location Map

Client/Project:
Florida Department of Transportation- D5
SR 400 Project Development & Environment Study
Segment 4: SR 400 E. of SR 15/600 US 17/92 to 1/2 mile E of SR 472

Project Location:
79110 Volusia County
STA 2583+0.00(Begin) - MP 0.086
STA 3118+46.00 (End) - MP 10.227

Prepared by: mLeonard 2014/12/04
Technical Review by: mDrauer 2014/12/04
Independent Review by: jMoore 2014/12/04

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

0 650 1,300 Feet

Figure D - Sheet 7 of 9 : Species Location Map

1 " = 650 '

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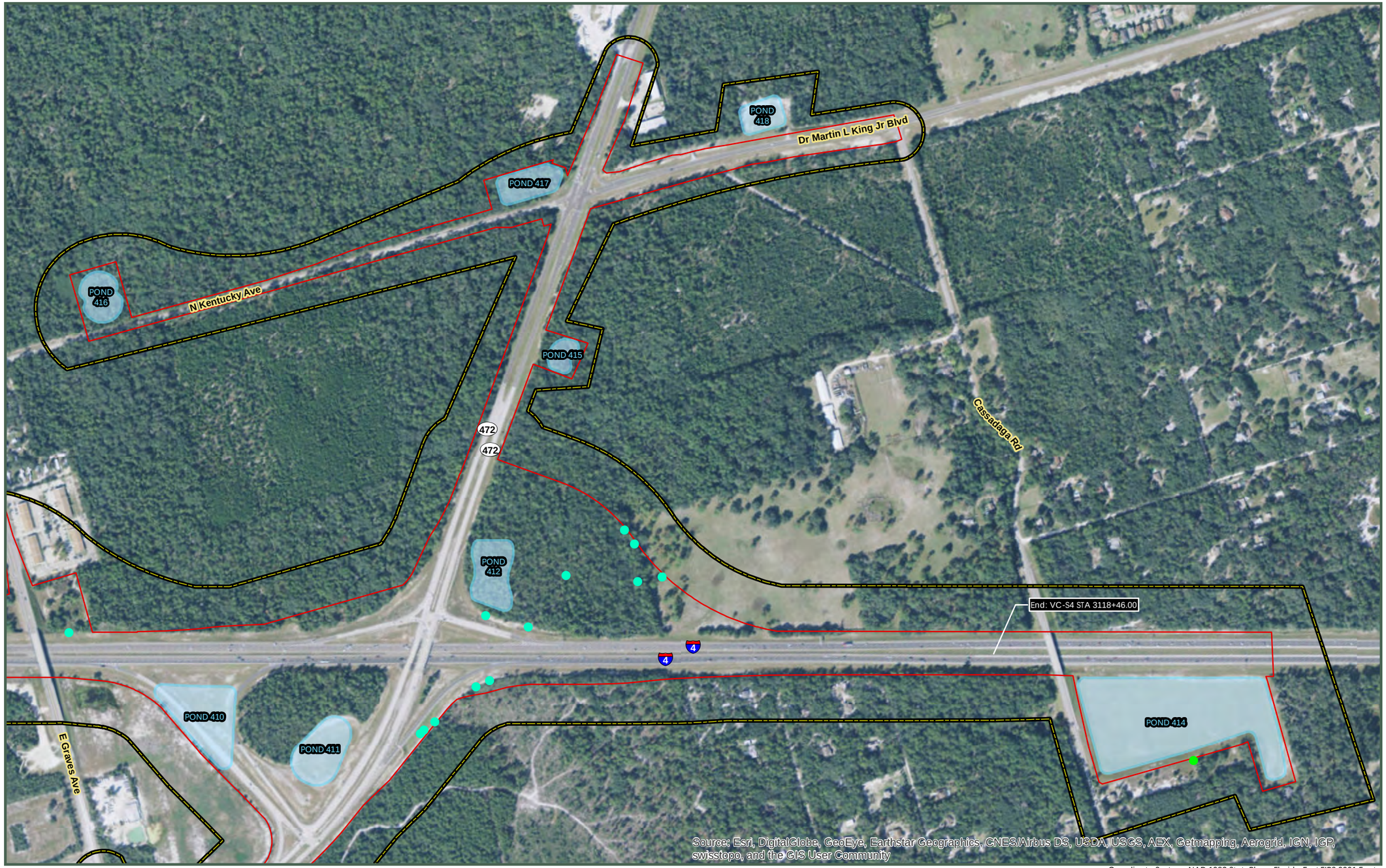

Map Key

Segment 4 PD&E Limits

- I-4 Beyond the Ultimate- Segment 4 Study Area
- Rhode Island Ave (Extension)
- I-4 Beyond the Ultimate- Segment 4 R/W (12/10/15)
- Proposed Ponds (12/10/15)
- Proposed Swales (12/10/15)

Flora

- Garberia

Fauna

- Gopher Tortoise
- Scrub Jay

Segment 4 Species Notes:
Wood Stork Colonies - Hontoon Island (15 mile CFA Buffer). Segment 4 is fully within CFA

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

0 650 1,300 Feet

Title:
ENDANGERED SPECIES BIOLOGICAL ASSESSMENT REPORT: Segment 4 - Species Location Map

Client/Project:
Florida Department of Transportation- D5
SR 400 Project Development & Environment Study
Segment 4: SR 400 E. of SR 15/600 US 17/92 to 1/2 mile E of SR 472

Project Location:
79110 Volusia County
STA 2583+0.00(Begin) - MP 0.086
STA 3118+46.00 (End) - MP 10.227

Prepared by: mLeonard 2014/12/04
Technical Review by: mDrauer 2014/12/04
Independent Review by: jMoore 2014/12/04

Figure D - Sheet 8 of 9 : Species Location Map

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Map Key

Segment 4 PD&E Limits

- I-4 Beyond the Ultimate- Segment 4 Study Area
- Rhode Island Ave (Extension)
- I-4 Beyond the Ultimate- Segment 4 R/W (12/10/15)
- Proposed Ponds (12/10/15)
- Proposed Swales (12/10/15)

Flora

- Garberia

Fauna

- Gopher Tortoise
- Scrub Jay

Segment 4 Species Notes:
Wood Stork Colonies - Hontoon Island (15 mile CFA Buffer). Segment 4 is fully within CFA

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

0 650 1,300 Feet

Title:
ENDANGERED SPECIES BIOLOGICAL ASSESSMENT REPORT: Segment 4 - Species Location Map

Client/Project:
Florida Department of Transportation- D5
SR 400 Project Development & Environment Study
Segment 4: SR 400 E. of SR 15/600 US 17/92 to 1/2 mile E of SR 472

Project Location:
79110 Volusia County
STA 2583+0.00(Begin) - MP 0.086
STA 3118+46.00 (End) - MP 10.227

Prepared by: mLeonard 2014/12/04
Technical Review by: mDrauer 2014/12/04
Independent Review by: jMoore 2014/12/04

Figure D - Sheet 9 of 9 : Species Location Map

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APPENDIX B
LISTED SPECIES TABLES

Table 1: Protected wildlife species with the potential to occur in Volusia County, Florida.

Species Name	Common Name	FFWCC	USFWS	FNAI	FCREPA	Likelihood of Occurrence	Habitat
Acipenser brevirostrum	Shortnose Sturgeon	E	E	S1	E	low	Large rivers and brackish habitat along coast
Agonostomus monticola	Mountain mullet			S3	R	low	Marine and estuarine habitats, alluvial & ruderal streams
Alligator mississippiensis	American alligator	T (S/A)	T(S/A)	S4		high	Various aquatic habitats
Aphelocoma coerulescens	Florida scrub-jay	T	T	S3	T	observed	Scrub and scrubby flatwoods
Aramus guarana	Limpkin	SSC		S3	SSC	moderate	Swamps, forested floodplains, mangrove swamps & marshes
Ardea alba	Great egret			S4	SSC	observed	Marshes, swamps, lakes, ponds, ditches and estuaries
Balaenoptera physalus	Finback whale	E	E		E	low	Oceanic
Buteo brachyurus	Short-tailed hawk			S1	R	moderate	Open country and forested areas; avoids dense forest
Caretta caretta	Atlantic loggerhead turtle	T	T	S3	T	low	Shallow, coastal waters
Charadrius melodus	Piping plover	T	T	S2	E	low	Breeds on beach dunes
Charadrius wilsonia	Wilson's plover			S2	SSC	low	Dry, sandy soil or pavement, near salt or brackish water
Chelonia mydas mydas	Atlantic green turtle	E	E	S2	E	low	Shallow, coastal waters
Corynorhinus rafinesquii	Southeastern big-eared bat			S2		low	Floodplains, pine flatwoods, mixed oak/pine areas
Crotalus adamanteus	Eastern diamond back rattlesnake			S3		moderate	Sandhills, pine flatwoods, dry prairie, hammocks, & coastal
Dermochelys coriacea	Leatherback turtle	E	E	S2	R	low	Oceanic; nests on sandy beaches and frontal dunes
Drymarchon corais couperi	Eastern indigo snake	T	T	S3	SSC	moderate	Wide variety of habitats
Egretta caerulea	Little blue heron	SSC		S4	SSC	observed	Marshes, ponds, lakes, meadows, streams & mangroves
Egretta rufescens	Reddish egret	SSC		S2	R	low	Marine and estuarine tidal swamps
Egretta thula	Snowy egret	SSC		S3	SSC	observed	Marshes, lakes, ponds and shallow, coastal habitats
Egretta tricolor	Tricolored heron	SSC		S4	SSC	moderate	Marshes, ponds and rivers
Elanoides forficatus	American swallow-tailed kite			S2	T	observed	Lowland forests
Elanus leucurus	White-tailed kite			S1		low	Savanna, riparian woodlands, marshes and prairies
Eretmochelys imbricata imbricata	Atlantic hawksbill turtle	E	E	S1	E	low	Offshore, hard bottomed habitats
Eubalaena glacialis	Right whale	E	E		E	low	Oceanic
Eudocimus albus	White ibis	SSC		S4	SSC	observed	Marshes, mangroves, lakes and estuaries
Falco columbarius	merlin			S2		moderate	variety of open habitats
Falco peregrinus tundrius	Arctic peregrine falcon			S2	E	moderate	Wide variety of open habitats
Falco sparverius paulus	Southeastern American kestrel	T		S3	T	moderate	Open, or partly open habitats with scattered trees
Gopherus polyphemus	Gopher tortoise	T	C	S3	T	observed	Sandhills, scrub, hammocks, dry prairies, flatwoods, & ruderal
Grus americana	Whooping crane		E/P	SNR		low	marshes, open habitats
Grus canadensis pratensis	Florida sandhill crane	T		S2S3	T	observed	Shallow wetlands, freshwater marshes and wet prairies
Haematopus palliatus	American oystercatcher	SSC		S2	T	low	Sandy and rocky coasts and islands

Haliaeetus leucocephalus leucocephalus	Southern bald eagle			S3	T	observed	Coasts, rivers and large lakes in open areas
Ixobrychus exilis	Least bittern			S4		moderate	marshes, swamps, wet prairies
Laterallus jamaicensis	Black rail			S2		low	marshes, salt marshes
Lepidochelys kempi	Atlantic (Kemp's) ridley turtle	E	E	S1	E	low	Coastal, benthic habitats
Megaptera novaeangliae	Humpback whale	E	E		E	low	Oceanic
Mustela frenata olivacea	Southeastern weasel			S3?	R	low	Scrub, sandhills, flatwoods, swamps and hammocks
Mustela frenata peninsulae	Florida weasel			S3?	R	low	Scrub, sandhills, flatwoods, swamps and hammocks
Mycteria americana	Wood stork	T	T	S2	E	observed	Marshes, swamps, streams and mangroves
Neofiber alleni	Round-tailed muskrat			S3	SSC	low	Shallow freshwater and salt marshes
Nerodia clarkii taeniata	Atlantic salt marsh snake	T	T	S1	E	low	Marine and estuarine tidal marshes
Notophthalmus perstriatus	Striped newt		C	S2S3	R	low	Sinkhole ponds in sandhills, marsh & bay ponds in flatwoods
Nyctanassa violacea	Yellow-crowned night-heron			S3?	SSC	moderate	Marshes, swamps, lakes, lagoons, mudflats, & mangroves
Nycticorax nycticorax	Black-crowned night-heron			S3?	SSC	moderate	Marshes, swamps, ponds, lagoons, mangroves & wet prairies
Pandion haliatetus	osprey			S3	SSC	observed	Nests on poles and trees along water bodies
Pelecanus occidentalis carolinensis	Eastern brown pelican	SSC		S3	T	low	Open, coastal habitats on islands
Peromyscus polionotus decoloratus	Pallid beach mouse			SX	RE	low	Coastal dunes and scrub
Peromyscus polionotus niveiventris	Southeastern beach mouse	T	T	S1	T	low	Coastal dunes and coastal scrub
Peucaea aestivalis	Bachman's sparrow			S3		low	Open pine woods, dry prairies and old fields
Physeter macrocephalus	Sperm whale	E	E		E	low	Oceanic
Picoides borealis	Red-cockaded woodpecker	T	E	S2	E	low	Open, mature pine woodlands
Picoides villosus	Hairy woodpecker			S3?	SSC	low	Deciduous and coniferous woods
Pituophis melanoleucus mugitus	Florida pine snake	SSC		S3	SU	moderate	Sandhills, scrubby flatwoods, hammocks & ruderal habitats
Platalea ajaja	Roseate spoonbill	SSC		S2	R	moderate	Marshes, swamps, ponds, rivers and lagoons
Plegadis falcinellus	Glossy ibis			S2	SSC	moderate	Marshes and swamps
Podomys floridanus	Florida mouse	SSC		S3	T	low	Scrub, flatwoods and longleaf pine-turkey oak sandhills
Pteronotropis welaka	Bluenose Shiner	SSC		S4	SSC	low	Riverine; quiet, weedy pools and holes
Rana (=Lithobates) capito	Gopher frog	SSC		S3	T	moderate	Xeric uplands and pine flatwoods
Rynchops niger	Black skimmer	SSC		S3	SSC	low	Coastal beaches and salt marshes
Sciurus niger shermani	Sherman's fox squirrel	SSC		S3	T	low	Longleaf pine-turkey oak sandhills, mesic flatwoods, & baygalls
Setphaga discolor paludicola	Florida prairie warbler			S3	SU	low	maritime hammocks, marine and estuarine tidal swamps
Sternula antillarum	Least tern	T		S3	T	low	Open, flat beaches, river and lake margins
Thalasseus maxima	Royal tern			S3	SSC	low	Open sand beaches and sparsely vegetated sandbars
Thalasseus sandvicensis	Sandwich tern			S2	SSC	low	Coastal beaches, flats and islands
Trichechus manatus latirostris	Florida manatee	E	E	S2	E *CH	moderate	Spring-runs, alluvial streams, and coastal estuaries
Ursus americanus floridanus	Florida black bear			S2	T	moderate	Variety of forested landscapes

Vireo altiloquus	Black-whiskered vireo	S3	R	low	Mangrove swamps

Notes:
FFWCC = Florida Fish and Wildlife Conservation Commission
E= Endangered; T= Threatened; SSC= Species of Special Concern
USFWS = US Fish and Wildlife Service
E= Endangered; T= Threatened; (S/A)= Similarity of Appearance; (E/P)= Experimental Population; C = Candidate for Listing; *CH = Critical Habitat
FNAI = Florida Natural Areas Inventory
S1= Critically Imperiled Due to Extreme Rarity; S2= Imperiled Due to Rarity; S3= Very Rare and Local;
S4= Apparently Secure; SH= Historical Occurrence; ?= Tentative Ranking
FCREPA = Florida Committee on Rare and Endangered Plants and Animals
Likelihood of Occurrence
Low= Low likelihood; Mod= Moderate likelihood; High= High likelihood; Obs= Observed by Stantec;
Obs*= Observed by Others

Source: Stantec Endangered Species Database, 2014.

Table 2: Protected plant species with the potential to occur in Volusia County, Florida.

Species Name	Common Name	FDA	USFWS	FNAI	Likelihood of Occurrence	Habitat
Acrostichum aureum	Golden leather fern	T		S3	moderate	Brackish and freshwater marshes
Asplenium erosum	Auricled spleenwort	E		S2	low	Hammocks
Asplenium denttum	American toothed spleenwort	E		S1S2	low	Hammocks and swamps
Calopogon multiflorus	Many-flowered grass pink	E		S2S3	low	Pine flatwoods, esp. recently burned
Centrosema arenicola	Sand butterfly pea	E		S2	moderate	Sandhills and scrubby flatwoods
Chamaesyce cumulicola	Sand dune spurge	E		S2	moderate	Coastal dunes and scrub
Conradina grandiflora	Large-flowered rosemary	E		S3	low	Pinelands
Cucurbita okeechobeensis	Okeechobee gourd	E	E	S1	moderate	Hammocks
Deeringothamnus rugelii	Rugel's pawpaw	E	E	S1	low	Wet pine flatwoods
Encyclia tampensis	Butterfly orchid	CE			low	Mangrove, cypress and hardwood swamps; hammocks
Epidendrum conopseum	Greenfly orchid	CE			low	Moist hammocks, cypress and hardwood swamps; epiphytic
Garberia heterophylla	Garberia	T			observed	Sand pine and oak scrub
Harrisiaeriophora	Indian River prickly apple	E	E	S1	low	Coastal Hammocks, scrubby flatwoods
Harrisella filiformis	Orchid	T			low	Cypress and hardwood swamps, old citrus groves; epiphytic
Hartwrightia floridana	Florida hartwrightia	T		S2	low	Acid, seepage areas
Helianthus carnosus	Lakeside sunflower	E		S1S2	low	Wet flatwoods
Ilex opaca var. arenicola	Scrub holly			S3	low	Sand pine scrub
Illicium parviflorum	Yellow star anise	E		S2	low	Wet woods and swamps
Lantana depressa	Verbena	E		S1	low	Rocky pinelands
Lechea cernua	Nodding pinweed	T		S3	low	Scrub
Lechea divaricata	Spreading pinweed; pine pinweed	E		S2	low	Pinelands
Lilium catesbaei	Catesby's lily	T		S3	low	Moist pine flatwoods and savannahs
Lobelia cardinalis	Cardinal flower	T			low	Streams, riverbanks and spring runs
Lycopodiella cernua	Nodding clubmoss	CE			low	Wet pinelands
Minuartia godfreyi	Leafy sandwort			S1	low	Wet woods and seepage areas
Myrcianthes fragrans	Simpson's ironwood; Simpson's stopper	T		S3	low	Coastal hammocks
Myriophyllum laxum	Piedmont water milfoil			S2S3	low	Ponds, lakes, streams, sloughs and ditches
Nemastylis floridana	Fall-flowering ixia; celestial lily	E		S2	low	Swamps, marshes and wet pine flatwoods
Nolina atopocarpa	Florida beargrass	T		S3	low	Dry pinelands and shell middens
Ophioglossum palmatum	Hand adder's tongue fern	E		S2	low	Hammocks; epiphytic on Sabal palmetto
Osmunda cinnamomea	Cinnamon fern	CE			observed	Wet woods and swamps
Osmunda regalis	Royal fern	CE			observed	Wet woods and swamps

Pavonia spinifex	Yellow hibiscus			S2S3	low	Disturbed sites
Pecluma (=Polypodium) plumula	Polypody fern	E		S2	low	Hammocks; epiphytic
Pecluma (=Polypodium) ptilodon	Swamp plume polypody	E		S2	low	Hammocks
Peltandra sagittifolia	Spoon-flower			S3	low	Swampy woods and marshes
Peperomia humilis	Terrestrial peperomia; pepper	E		S2	low	Limestone grottos
Persea humilis	Scrub bay; Silkbay			S3	low	Sand pine scrub
Physotegia leptophylla	Slender-leaved false dragonhead			S3S5	low	Riverbanks and swamps
Pinguicula caerulea	Blue butterwort	T			low	Wet, acid pinelands
Platanthera blephariglottis	Large white fringed orchid	T			low	Marshes, and wet, open, grassy areas
Platanthera cristata	Golden fringed orchid	T			low	Marshes and wet, pine flatwoods
Platanthera flava	Southern tubercled orchid;gypsy-spikes	T			low	Cypress and hardwood swamps
Platanthera nivea	Snowy orchid; bog torch	T			low	Wet pine flatwoods
Pogonia ophioglossoides	Rose pogonia	T			low	Marshes and wet, pine flatwoods
Pteroglossaspis ecristata	Wild coco; giant orchid	T		S2	low	Sand pine scrub and sandhills
Rhapidophyllum hystrix	Needle palm	CE			low	Wet to mesic woods and hammocks
Rhododendron canescens	Pink azalea	CE			low	Streambanks and swamp margins
Rhynchosia cinerea	Brown-haired snoutbean			S3	low	Dry pinelands
Sarracenia minor	Hooded pitcherplant	T			low	Wet, open, acid pinelands and bogs
Scaevola plumieri	Inkberry	T			low	Coastal strands
Schwalbaea americana	American chaffseed	E	E	S1	low	Dry, oak woods and pinelands
Spiranthes brevilabris var. floridana	Florida ladies' tresses	E			low	Pine flatwoods
Spiranthes laciniata	Lace-lip ladies' tresses	T			low	Marshes and cypress swamps
Spiranthes longilabris	Long-lip ladies' tresses	T			low	Marshes and wet pine flatwoods
Spiranthes tuberosa	Little ladies' tresses; little pearl twist	T			low	Pine flatwoods
Tephrosia angustissima	Curtiss' hoary pea	E		S1	low	Coastal strands
Tillandsia utriculata	Giant wild pine	E			low	Hammocks and cypress swamps; epiphytic
Verbena maritima	Coastal vervain	E			low	Coastal dunes and pinelands
Verbena tampensis	Tampa vervain	E			low	Moist pinelands
Verbesina heterophylla	Variable-leaf crownbeard			S2	low	Seasonally wet flatwoods
Zamia pumila	Florida coontie	CE			low	Hammocks, pinelands and Indian middens
Zephyranthes atamasca	Rain lily	T			low	Wet pine flatwoods and meadows
Zephyranthes simpsonii	Simpson's zephyr lily	T		S2S3	low	Wet pine flatwoods and meadows

Notes:
FDA = Florida Department of Agriculture
E= Endangered; T= Threatened; CE= Commercially Exploited

USFWS = US Fish and Wildlife Service

E= Endangered; T= Threatened

FNAI = Florida Natural Areas Inventory

S1= Critically Imperiled Due to Extreme Rarity; S2= Imperiled Due to Rarity; S3= Very Rare and Local; S4= Apparently Secure; SH= Historical Occurrence; ?= Tentative Ranking

Likelihood of Occurrence

Low= Low likelihood; Mod= Moderate likelihood; High= High likelihood; Obs= Observed by Stantec; Obs*= Observed by Others

Source: Stantec Endangered Species Database, 2014.

APPENDIX C
PHOTOS

I-4 PD&E Segment 4 Pond Site Photographs

Pond Site 400

Pond Site 401

Treatment Swale 401-A Westbound

Treatment Swales 401-A Eastbound and 401-B

Pond Site 402A

Pond Site 402B

Pond Site 402C

Pond Site 402D

Pond Site 402E

Pond Site 402F

Pond Site FPC 403

Pond Site 403: southern existing pond

Pond Site 403: middle existing pond

Pond Site 403: northern existing pond

Pond Site 405A

Pond Site 405B

Pond Site 406A

Pond Site 406B

Pond Site 407A

Pond Site 407B

Pond Site 407C

Pond Site 408

Stormwater Vault

Pond Site 409-A1

Pond Site 409-A2

Pond Site 409-B1

Pond Site A

Pond Site B

Pond Site B1

Pond Site C

Pond Site D

Pond Site 410

Pond Site 411

Pond Site 412

Pond Site 413

Pond Site 414

Pond Site 415

Pond Site 416

Pond Site 417

Pond Site 418

APPENDIX D
AGENCY COORDINATION

United States Department of the Interior

U. S. FISH AND WILDLIFE SERVICE

7915 BAYMEADOWS WAY, SUITE 200
JACKSONVILLE, FLORIDA 32256-7517

IN REPLY REFER TO:

FWS LOG NO. 04EF1000-2016-F-0360

July 5, 2016

Cathy Kendall, AICP
Senior Environmental Specialist
Federal Highway Administration
3500 Financial Plaza, Suite 400
Tallahassee, FL 32312

RE: SR 400 (I-4) Beyond Ultimate Project – SR 400 (I-4) from East of SR 15/600 (US 17/92) (Seminole/Volusia County Line) to ½ Mile East of SR 472
Volusia County
Financial Management No. 432100-1-22-01

Dear Ms. Kendall:

This document transmits the U.S. Fish and Wildlife Service's (Service) biological opinion based on the review of the proposed widening of I-4 Beyond Ultimate (BtU) Segment 4 that starts East of SR 15/600 to ½ mile east of SR 472 in Volusia County, Florida and its effects on the Florida Scrub-Jay (Aphelocoma coerulescens) in accordance with section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

The enclosed Biological Opinion is based on the biological assessment submitted to the Service by the Florida Department of Transportation (FDOT) and the Federal Highway Administration (FHWA) and other sources of information. A complete administrative record of this consultation is on file in the Jacksonville Ecological Services Field Office.

Consultation History

22 October 2014, FDOT provided the Service with information on the results from previous re-survey of the proposed project.

17 December 2015, FDOT, FHWA, the applicant's consultant (Stantec) and the Service met to discuss needs for consultation for I-4 extension of proposed express lanes. The decision was made to send the Service a request for informal consultation and another request for informal consultation.

20 January 2016, FDOT requested informal consultation for I-4 BtU segments 2, 3, and 4. Informal consultation for these segments was concluded on 2 March 2016.

19 February 2016, Cathy Kendall (FHWA) requested formal consultation for I-4 BtU, Segment 4.

11 May 2016, FDOT, FHWA, and the Service met to discuss I-4 BtU consultations.

15 June 2016, the Service provided the applicant a draft biological opinion.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

The proposed action involves the reconstruction and widening of I-4 to its ultimate condition. The proposed project will add two new express lanes in each direction, resulting in a total of 10 dedicated lanes within a ten mile segment which extends from east of US 17/92 to east of SR 472 in Volusia County. The proposed project includes the interchanges at Dirksen Drive/Debary Avenue, Saxon Boulevard, and SR 472/Howland Boulevard. A new interchange with I-4 is proposed between Saxon Boulevard and SR 472. Stormwater treatment is proposed with the construction of thirty nine (39) pond sites along the 10 mile corridor.

The new extension proposed to Rhode Island Avenue is 1 ¼ miles from the existing east end of Rhode Island Avenue. This section consists of a four-lane urban roadway divided by a 22-foot landscape median with two 12-foot travel lanes and a 4-foot bike lane in each direction.

The proposed action will impact 1.89 hectares [ha] (4.68 acres [ac]) of occupied Florida Scrub-Jay habitat. An integral part of the proposed action to benefit or promote the recovery of the listed species under review, the following conservation measure serves to minimize or compensate for the projects adverse effects. The applicant has agreed to contribute money to the Florida Scrub-Jay Conservation Program Fund as a conservation measure. This fund supports a wide variety of Florida Scrub-Jay conservation efforts locally and range-wide. The contribution towards The Nature Conservancy (TNC) Managed Funds for Public Lands may involve acquisition of lands, management of acquired TNC lands, and/or management of other occupied lands in public ownership. The contribution for the 1.89 ha (4.68 ac) of impacts to the occupied Florida Scrub-Jay habitat will be in the amount of $143,460. This is determined by the following formula: $15,327 per acre multiplied at 2:1 ratio. FDOT and FHWA shall provide the funds to meet the proposed 2:1 ratio for compensation no later than 30 days prior to ground disturbance.

In addition, the applicant will include a construction commitment to prevent clearing and grubbing within the areas of occupied scrub-jay habitat during nesting season (March 1 – June 30) to avoid any potential harm to individual birds should they be present. These areas will be identified on the project exhibits in the ESBA and EIS Update and will be identified on the design plans.

The Service has described the action area to include all of the proposed right-of-way and adjacent xeric oak communities (scrub) for reasons that will be explained and discussed in the "EFFECTS OF THE ACTION" section of this consultation.

STATUS OF THE SPECIES/CRITICAL HABITAT

This section summarizes Florida Scrub-Jay biology and ecology as well as information regarding the status and trends of the Florida Scrub-Jay throughout its entire range. We use this information to assess whether a federal action is likely to jeopardize the continued existence of the above mentioned species. The "ENVIRONMENTAL BASELINE" section summarizes information on status and trends of the Florida Scrub-Jay specifically within the action area. These summaries provide the foundation for our assessment of the effects of the proposed action, as presented in the "EFFECTS OF THE ACTION" section.

Species/critical habitat description

Florida Scrub-Jays are about 25 to 30 centimeters [cm] (10 to 12 inches [in]) long and weigh about 77 grams [g] (3 ounces [oz]). They are similar in size and shape to Blue Jays (*Cyanocitta cristata*) but differ significantly in coloration (Woolfenden and Fitzpatrick 1996a). Unlike the Blue Jay, the Florida Scrub-Jay lacks a crest. It also lacks the conspicuous white-tipped wing and tail feathers, black barring, and bridle of the Blue Jay. The Florida Scrub-Jay's head, nape, wings, and tail are pale blue, and its body is pale gray on its back and belly. Its throat and upper breast are lightly striped and bordered by a pale blue-gray "bib" (Woolfenden and Fitzpatrick 1996a). Florida Scrub-Jay sexes are not distinguishable by plumage (Woolfenden and Fitzpatrick 1984), and males, on the average, are only slightly larger than females (Woolfenden 1978). The sexes may be identified by a distinct "hiccup" call vocalized only by females (Woolfenden and Fitzpatrick 1984, 1986). Florida Scrub-Jays that are less than about five months of age are easily distinguishable from adults; their plumage is smokey grey on the head and back, and they lack the blue crown and nape of adults. Molting occurs between early June and late November and peaks between mid-July and late September (Bancroft and Woolfenden 1982). During late summer and early fall, when the first basic molt is nearly done, fledgling Florida Scrub-Jays may be indistinguishable from adults in the field (Woolfenden and Fitzpatrick 1984). The wide variety of vocalizations of Florida Scrub-Jays is described in detail by Woolfenden and Fitzpatrick (1996b).

Habitat Characteristics

Florida Scrub-Jays are restricted to scrub and scrubby flatwoods occurring on relict dunes and sand ridges throughout Florida, primarily concentrated along the Atlantic Coast, Gulf Coast, and on the central ridges of the peninsula (Laessle 1958, Davis 1967, Myers 1990, Woolfenden and Fitzpatrick 1996b). At the landscape scale, Florida Scrub-Jays require suitable quantity and configuration of habitat to persist long-term. Given the size of Florida Scrub-Jay territories and the short dispersal distances exhibited by the species, it is critical to maintain large, contiguous blocks of Florida Scrub-Jay habitat to support local

populations that are relatively resistant to local extinction (Fitzpatrick *et al.* 1991). The probability of persistence increases with increasing connectivity to other Florida Scrub-Jay populations (Coulon *et al.* 2010, 2012).

Within each territory, Florida Scrub-Jays require low, shrubby oaks, few tall trees, and bare patches of sand or sparse herbaceous vegetation (Breininger *et al.* 1998). Optimal habitat conditions include patches of oak shrubs 1.2-1.7 meters [m] (4-5.5 feet [ft]) tall, 10-50 percent bare sand, and less than one canopy tree per acre (Breininger 2004), though Florida Scrub-Jays can tolerate one to two pine trees per acre. The arrangement of shrub heights in a Florida Scrub-Jay territory is an important indicator of habitat quality (Breininger and Carter 2003, Breininger *et al.* 2013). Florida Scrub-Jays need scrub oaks of sufficient height to provide nest sites, acorns, and cover from predators; however, mortality exceeds recruitment when the average shrub height exceeds 1.7 m (5.5 ft), and Florida Scrub-Jays disappear from long-unburned, overgrown scrub (Woolfenden and Fitzpatrick 1996, Breininger and Carter 2003, Breininger *et al.* 2006).

No critical habitat has been designated for this species; therefore, none will be affected.

Life History

Diet

Florida Scrub-Jays forage mostly on or near the ground, often along the edges of natural or man-made openings. They visually search for food by hopping or running along the ground beneath the scrub, or by jumping from shrub to shrub. Insects, particularly orthopterans and lepidopteran larvae, comprise the majority of the animal diet throughout most of the year (Woolfenden and Fitzpatrick 1984). Acorns are by far the most important plant food (Fitzpatrick *et al.* 1991). From August to November each year Florida Scrub-Jays harvest and cache thousands of scrub oak acorns throughout their territory. Each Florida Scrub-Jay may cache 6,500 to 8,000 acorns per year (DeGange *et al.* 1989). Acorns are mainly cached by hammering into the sand, but are also stuffed into pine needle tufts, Spanish or ball moss, and palmetto fronds (Woolfenden and Fitzpatrick 1996b). Acorns are typically buried 1 to 2 cm (0.4 to 0.8 in) beneath the surface of bare sand in openings in the scrub during fall, and retrieved and consumed in winter and early spring. Other small nuts, fruits, and seeds also are eaten.

Vertebrate prey items comprise the minority of the diet, but may include a wide array of species weighing up to 25 g (0.9 oz) (Toland 1996). Notable vertebrate prey species documented for Florida Scrub-Jays on both the Lake Wales Ridge and the Atlantic Coastal Ridge include: green treefrog (*Hyla cinerea*), squirrel treefrog (*H. squirella*), green anole (*Anolis carolinensis*), brown anole (*A. sagrei*), Florida scrub lizard (*Sceloporus woodi*), six-lined racerunner (*Cnemidophorus sexlineatus*), black racer (*Coluber constrictor*), peninsula crowned snake (*Tantilla relicta relicta*), rough greensnake (*Opheodrys aestivus*), house mouse (*Mus musculus*), cotton mouse (*Peromyscus gossypinus*), oldfield mouse (*P. polionotus*), and Florida mouse (*Podomys floridanus*) (Woolfenden and Fitzpatrick 1984).

In suburban areas, Florida Scrub-Jays will accept supplemental foods offered by humans, such as peanuts, corn, and sunflower seeds. The bulk of this food is purposely provided for the birds by feeders; however, hand offering by humans also occurs.

Social Structure

Florida Scrub-Jays have a social structure that involves cooperative breeding, a trait that the western North American populations of other scrub-jay species do not exhibit (Woolfenden and Fitzpatrick 1984). Florida Scrub-Jays live in groups ranging from two (a single mated pair) up to large, extended families of eight adults and one to four juveniles. Fledgling Florida Scrub-Jays remain with the breeding pair in their natal territory as "helpers," forming a closely-knit, cooperative family group. Pre-breeding numbers are generally reduced to either a pair with no helpers or families of three or four individuals (a pair plus one or two helpers).

Florida Scrub-Jays have a well-developed intrafamilial dominance hierarchy, with breeder males most dominant, followed by helper males, breeder females, and finally female helpers (Woolfenden and Fitzpatrick 1977). Helpers participate in sentinel duties (McGowan and Woolfenden 1989), territorial defense, predator-mobbing, and the feeding of both nestlings (Stallcup and Woolfenden 1978) and fledglings (McGowan and Woolfenden 1990). The well-developed sentinel system involves having one individual occupying an exposed perch watching for predators or territory intruders. When a predator is observed, the sentinel Florida Scrub-Jay gives a distinctive warning call, and all group members seek cover in dense shrub vegetation (Fitzpatrick *et al.* 1991).

Territoriality

Florida Scrub-Jay pairs occupy year-round, multi-purpose territories (Woolfenden and Fitzpatrick 1984, Fitzpatrick *et al.* 1991). Territory size averages 9 to 10 ha (22 to 25 ac), with a minimum size of about 5 ha (12 ac). The availability of territories is a limiting factor for Florida Scrub-Jay populations. Because of this limitation, non-breeding adult males may remain at the natal territory as helpers for up to five years, waiting for either a mate or territory to become available (Fitzpatrick *et al.* 1991). New territories are established several ways: by replacing a lost breeder on a territory (Woolfenden and Fitzpatrick 1984); through "territorial budding," where a helper male becomes a breeder in a segment of its natal territory (Woolfenden and Fitzpatrick 1978); by inheriting a natal territory following the death of a breeder; by establishing a new territory between existing territories (Woolfenden and Fitzpatrick 1984); or through "adoption" of an unrelated helper by a neighboring family followed by resident mate replacement (Toland 1996). Territories also can be obtained by creating suitable habitat in areas that were previously unsuitable through effective habitat management efforts (Thaxton and Hingtgen 1994).

Reproduction and Demography

To become a breeder, a Florida Scrub-Jay must acquire a territory and a mate. Evidence presented by Woolfenden and Fitzpatrick (1984) suggests that Florida Scrub-Jays are

permanently monogamous. The pair retains ownership and sole breeding-privileges in their particular territory year after year. Courtship to form the pair is lengthy and ritualized, and involves posturing and vocalizations made by the male to the female (Woolfenden and Fitzpatrick 1996b). Copulation between the pair is generally out of sight of other Florida Scrub-Jays (Woolfenden and Fitzpatrick 1984). These authors also reported never observing copulation between unpaired Florida Scrub-Jays, nor courtship behavior between a female other than her mate. Age at first breeding in the Florida Scrub-Jay varies from 1 to 7 years, although most individuals become breeders between 2 and 4 years of age (Fitzpatrick and Woolfenden 1988). Persistent breeding populations of Florida Scrub-Jays exist only where there are scrub oaks in sufficient quantity to provide an ample winter acorn supply, cover from predators, and nest sites during the spring (Woolfenden and Fitzpatrick 1996).

Florida Scrub-Jay nests are typically placed in shrubby oaks, at a height of 1 to 2 m (3 to 6 ft). *Quercus inopina* and *Q. geminata* are the preferred shrubs on the Lake Wales Ridge (Woolfenden and Fitzpatrick 1984), and *Q. myrtifolia* is favored on the Atlantic Coastal Ridge (Toland 1991) and southern Gulf Coast (Thaxton 1998). In suburban areas, Florida Scrub-Jays nest in the same evergreen oak species as well as in introduced or exotic trees; however, they construct their nests in a significantly higher position in these oaks than when in natural scrub habitat (Bowman *et al.* 1996). Florida Scrub-Jay nests are an open cup, about 18 to 20 cm (7 to 8 in) outside diameter, and 8 to 9 cm (3 to 3.5 in) inside diameter. The outer basket is bulky and constructed of coarse twigs from oaks and other vegetation, and the inside is lined with tightly wound palmetto or cabbage palm fibers. There is no foreign material as may be present in a **B**lue Jay nest (Woolfenden and Fitzpatrick 1996b).

Nesting is synchronous, normally occurring from 1 March through 30 June (Woolfenden and Fitzpatrick 1990; Fitzpatrick *et al.* 1994). On the Atlantic Coastal Ridge and southern Gulf Coast, nesting may be protracted through the end of July (Toland 1996, Thaxton 1998). In suburban habitats, nesting is consistently initiated earlier (March) than in natural scrub habitat (Fleischer 1996). Food supplementation studies have shown the importance of resources in the timing of reproduction and supplemented Florida Scrub-Jays breed earlier (Bowman and Woolfenden 2001; Schoech and Bowman 2001; Schoech *et al.* 2004, 2008). Other variables attributed to advanced egg laying in suburban areas include artificial lighting and temperature. Nesting failures are almost always caused by predation, most frequently by ground-based predators including eastern coachwhip (*Masticophis flagellum*), eastern indigo snake (*Drymarchon couperi*), rat snake (*Elaphe obsoleta*), corn snake (*E. guttata*), raccoon *(Procyon lotor*), and domestic cat (*Felis catus*) (Fitzpatrick *et al.* 1991; Schaub *et al.* 1992).

Clutch size ranges from one to five eggs, but is typically three or four eggs. Clutch size is generally larger (up to six eggs) in suburban habitats, and the birds attempt to rear more broods (Fleischer 1996). Double brooding by as much as 20 percent has been documented on the Atlantic Coastal Ridge and in suburban habitat within the southern Gulf Coast, compared to about 2 percent on the Lake Wales Ridge (Toland 1996, Thaxton 1998). Florida Scrub-Jay eggs measure 27.08 millimeters [mm] (1 in) x 20.18 mm (0.8 in) (length x breadth) (Woolfenden and Fitzpatrick 1996b), and coloration varies from a pea green to

pale glaucous green, blotched and spotted with irregularly shaped markings of cinnamon rufous and vinaceous cinnamon, these being heaviest about the larger end (Bendire 1895, Bent 1946). Eggs are incubated for 17 to 18 days, and fledging occurs 16 to 21 days after hatching (Woolfenden 1974, 1978; Fitzpatrick *et al.* 1994). Only the breeding female incubates and broods eggs and nestlings (Woolfenden and Fitzpatrick 1984). Average production of young is two fledglings per pair, per year (Woolfenden and Fitzpatrick 1990; Fitzpatrick *et al.* 1994), and the presence of helpers improves fledging success (Mumme 1992). Annual productivity must average at least two young fledged per pair for a population of Florida Scrub-Jays to maintain long-term stability (Fitzpatrick *et al.* 1991).

Fledglings depend upon adults for food for about ten weeks, during which time they are fed by both breeders and helpers (Woolfenden 1975; McGowan and Woolfenden 1990). Survival of Florida Scrub-Jay fledglings to yearling age class averages 33 percent in optimal scrub; while annual survival of breeding adults averages 78 percent (Woolfenden and Fitzpatrick 1996b). Florida Scrub-Jays that become breeders average 4.2 breeding seasons with 10-20 percent of the breeding-population age equal or greater than 10 years. The longest observed lifespan of a Florida Scrub-Jay is 15.5 years at Archbold Biological Station in Highlands County (Woolfenden and Fitzpatrick 1996b).

Dispersal

Florida Scrub-Jays are non-migratory, extremely sedentary, and permanently territorial. Juveniles remain in their natal territory for up to five years before dispersing to become breeders (Woolfenden and Fitzpatrick 1984). The length of time Florida Scrub-Jays remain helpers in their natal territories is influenced by many factors including sex, age, breeding opportunities, and mate availability (Breininger *et al.* 2010). Once they pair and become breeders, they remain on their breeding territory until death. Dispersal distances are skewed sharply toward short-distance dispersals, with most individuals dispersing within two territories from their natal territory (Breininger *et al.* 2006, Coulon *et al.* 2010). In suitable habitat, fewer than 5 percent of Florida Scrub-Jays disperse more than 8 km (5 mi) (Fitzpatrick *et al.* 1994). Dispersal distances differ between sexes, with females dispersing significantly farther than males (Breininger *et al.* 2006, Coulon *et al.* 2010). Florida Scrub-Jay dispersal behavior is affected by the intervening landscape matrix. Protected scrub habitats will most effectively sustain Florida Scrub-Jay subpopulations if they are located within a matrix of surrounding habitats that can be utilized and traversed by Florida Scrub-Jays. Additionally, the distance between patches of potential habitat has a strong influence on Florida Scrub-Jay dispersal. Recent research has shown that gene flow decreases dramatically as the gap between scrub patches increases (Coulon *et al.* 2012). The authors concluded that gap widths beyond 2 to 3 km (1.2 to 1.9 mi) resulted in a reduction in gene flow. This is consistent with behavioral observations and analyses of dispersal data, which indicated that dispersal events and patch occupancy decreased beyond a gap size of 3.5 km (2.2 mi) (Stith *et al.* 1996).

Status and Distribution

The Florida Scrub-Jay was federally listed as threatened in 1987 primarily because of habitat fragmentation, degradation, and destruction (52 FR 20719). Florida Scrub-Jays once occupied 39 of the 40 counties south of, and including Levy, Gilchrist, Alachua, Clay, and Duval counties. Historically, many of these counties would have contained hundreds or even thousands of breeding pairs (Fitzpatrick *et al.* 1994). Only the southernmost county, Monroe, lacked Florida Scrub-Jays (Woolfenden and Fitzpatrick 1996a).

A decline in Florida Scrub-Jay population numbers was first noted in the literature by Byrd (1928), though Cox (1987) posited that Florida Scrub-Jay numbers probably had been declining since well before that time. Others continued to report population declines throughout the 20th century due to habitat loss from development and agriculture and habitat degradation from the exclusion of fire (Grimes 1940, 1943; Sprunt 1946; Early 1952; Longstreet 1954; Brigham 1973; Austin 1976; Woolfenden 1978; Cox 1987; Fitzpatrick *et al.* 1994; Toland 1999). By 1984, Florida Scrub-Jays had become extirpated from Broward, Dade, Duval, Gilchrest, Pinellas, and St. Johns counties, and Cox (1987) estimated that 15,600-22,800 Florida Scrub-Jays remained.

An extensive, state-wide survey of Florida Scrub-Jays in 1992-1993 estimated 3,961 Florida Scrub-Jay family groups with 10,972 individuals (Fitzpatrick *et al.* 1994). The survey most likely overestimated the abundance of Florida Scrub-Jays at Merritt Island National Wildlife Refuge and Cape Canaveral Air Force Station (Boughton and Bowman 2011) but underestimated the abundance of Florida Scrub-Jays in Ocala National Forest (ONF), some areas in southwest Florida, and some areas in southern Brevard and northern Indian River counties (Miller and Stith 2002; Breininger *et al.* 2003; K. Miller, unpublished data). By the early 1990s, Florida Scrub-Jays had become extirpated from two more counties (Alachua and Clay), though at least one Florida Scrub-Jay group was later discovered in Clay County (Bowman and Boughton 2011). Ten or fewer Florida Scrub-Jay pairs remained in an additional seven counties (Flagler, Hardee, Hendry, Hernando, Levy, Orange, and Putnam) (Fitzpatrick *et al.* 1994). Population numbers in 27 of the original 39 counties had 30 or fewer breeding pairs (Fitzpatrick *et al.* 1994). Fitzpatrick *et al.* (1994) estimated that Florida Scrub-Jays had declined between 25 and 50 percent in the northern third of the species' range since the surveys by Cox (1987). Woolfenden and Fitzpatrick (1996b) estimated that Florida Scrub-Jay populations had declined by 90 percent or more since European settlement.

Based primarily on the 1992-93 statewide Florida Scrub-Jay survey, Stith (1999a) used a spatially-explicit individual-based population model to evaluate the vulnerability of remaining Florida Scrub-Jay populations. Stith identified 21 demographically-isolated metapopulations of Florida Scrub-Jays throughout the species' range. Assuming fully restored habitat with high occupancy rates, results of simulations indicated that 16 of the 21 metapopulations had a moderate or high risk of quasi-extinction (the probability of a Florida Scrub-Jay metapopulation falling below 10 pairs in 60 years), though the risk of quasi-extinction could be improved for 13 of the metapopulations through habitat acquisition (Stith 1999).

Florida Scrub-Jay populations have continued to decrease since the 1992-93 statewide

survey and Stith's metapopulation model. For example, Toland (1999) estimated a decline of over 50 percent in areas in Brevard County that were re-surveyed in 1998-99. Part of this decline may be attributed to a possible rare epidemic in 1997-1998 (Breininger *et al.* 2003, cited in Toland 1999). Reductions have not been confined solely to unprotected lands. Florida Scrub-Jay populations have declined by 25 percent on managed conservation lands, excluding ONF, from 1992-93 to 2009-2010 due to inadequate habitat management (Boughton and Bowman 2011). Although population estimates were not available for ONF, the amount of suitable Florida Scrub-Jay habitat decreased by 22 percent from 1999-2012 (U.S. Forest Service, unpublished data). On average, Florida Scrub-Jay populations on managed conservation lands are estimated to be well below the potential carrying capacity.

The decline of Florida Scrub-Jay populations has been even more severe on unprotected lands, especially in suburban areas, where Florida Scrub-Jays have reduced demographic success compared to wildlands (Bowman 1998, Breininger 1999). For example, a suburban population in Highlands County (Lake Placid Estates) decreased from over 100 groups in the early 1990s to 7 groups by 2013 (R. Bowman, unpublished data). Similarly, Florida Scrub-Jays in the city of Palm Bay declined from 54 groups in 1993 to 16 groups by 2009 (Toland 1999, Larson 2012). Beginning in 2010, the Service and other interested parties began translocating family groups from the city of Palm Bay to managed conservation lands. As of 2014, there were four groups remaining (Larson 2013).

Florida Scrub-Jays are now extirpated from 8 of the 39 counties previously occupied (Alachua, Broward, Dade, Duval, Flagler, Gilchrist, Pinellas, and St. Johns), and only 9 counties had more than 30 Florida Scrub-Jay groups on managed conservation lands as of 2012 (Boughton and Bowman 2011, Faulhaber 2013). Coulon and colleagues (2008) identified 10 major genetic groups (units) of Florida Scrub-Jays, each encompassing one or more of Stith's (1999) metapopulations. Only 4 of the 10 genetic units had 100 or more Florida Scrub-Jay groups on managed conservation lands in 2010 (Boughton and Bowman 2011).

Boughton and Bowman (2011) estimated 2,400-2,600 Florida Scrub-Jay groups remaining, excluding ONF. Based on recent data from ONF (Miller 2012), a reasonable estimate of remaining Florida Scrub-Jay populations is 3,500-3,850 groups. Assuming a 50-70 percent decline on private lands since the 1992-93 survey, Faulhaber and Miller (in lit. 10/08/2012) estimated 3,100-3,750 Florida Scrub-Jay groups (7,758-9,383 individuals).

Climate Change

Climate change is evident from observations of increases in average global air and ocean temperatures, widespread melting of snow and ice, and rising sea level, according to the Intergovernmental Panel on Climate Change Report (IPCC 2007). The IPCC Report describes changes in natural ecosystems with potential wide-spread effects on many organisms, including marine mammals and migratory birds. The potential for rapid climate change poses a significant challenge for fish and wildlife conservation. Species' abundance and distribution are dynamic, relative to a variety of factors, including climate. As climate changes, the abundance and distribution of fish and wildlife will also change. Highly

specialized or endemic species are likely to be most susceptible to the stresses of changing climate. Based on these findings and other similar studies, the Department of the Interior requires agencies under its direction to consider potential climate change effects as part of their long-range planning activities (Service 2007).

Temperatures are predicted to rise from 2° Celsius (C) to 5° C (3.6° Fahrenheit [F] - 9.0 ° F) for North America by the end of this century (IPCC 2007a, b). Other processes to be affected by this projected warming include rainfall (amount, seasonal timing and distribution), storms (frequency and intensity), and sea level rise.

Climatic changes in Florida could amplify current land management challenges involving habitat fragmentation, urbanization, invasive species, disease, parasites, and water management. Global warming will be a particular challenge for endangered, threatened, and other "at risk" species. It is difficult to estimate, with any degree of precision, which species will be affected by climate change or exactly how they will be affected. The Service will use Strategic Habitat Conservation planning, an adaptive science-driven process that begins with explicit trust resource population objectives, as the framework for adjusting our management strategies in response to climate change (Service 2006). As the level of information increases concerning the effects of global climate change on the Florida Scrub-Jay the Service will have a better basis to address the nature and magnitude of this potential threat and will more effectively evaluate these effects to the range-wide status of the Florida Scrub-Jay.

Analysis of the Species/Critical Habitat Likely to be Affected

The Florida Scrub-Jay's status since its listing in 1987 has not improved. The status and trends that we discussed above, clearly shows what two items are essential for recovery of this species: (1) additional acquisition of scrub lands for conservation in key areas; and (2) restoration and management of protected scrub conservation lands. Without these two important and necessary actions, it is unlikely that recovery can be achieved.

ENVIRONMENTAL BASELINE

This section is an analysis of the effects of past and ongoing human and natural factors leading to the current status of the species, its habitat, and ecosystem, within the action area. The environmental baseline is a "snapshot" of a species health at a specific point in time. It does not include the effects of the action under review in the consultation.

Status of the Species in the Action Area

Florida Scrub-Jays have been declining in and Volusia County for many decades. Volusia County continues to experience development and human population growth. Since the Florida Scrub-Jay was listed in 1987, the resident population has increased by approximately thirty four percent. Volusia County had 123 Florida Scrub-Jay groups, a significant number of them on federal property, less than ten years after listing based on a range-wide survey conducted in 1992/1993 (Fitzpatrick *et al.* 1994). Recent data shows that

there are approximately less than 10 areas with more than 10 family groups are currently found in Volusia County.

Florida Scrub-Jays have historically been known to occur east and west of the currently occupied sites within the proposed project area. A core area for scrub-jays is located west of the city of Deltona around Blue Springs State Park and Lake Beresford conservation lands. These conservation lands represent roughly 39% of the total potential habitat in this area. An additional core area with high potential but currently no land in public ownership has many challenges as it occurs in an urban matrix with major highway infrastructure vital to central Florida. These are large areas of scrub habitat embedded in and around the city of Deltona, also adjacent to Interstate 4 and SR 472. The undeveloped lands in this immediate area are within the economic development zone of the city bordering major infrastructure. Scrub-jays were identified in 2004 in the proposed project area for Rhode Island Avenue and near the SR 472 interchange. A small support area, that currently supports the largest Florida Scrub-Jay population, is at Lyonia Preserve east of the I-4 corridor. Florida Scrub-Jays exist in crowded conditions well above the estimated carrying capacity and the population has been declining since 2005 in spite of ongoing habitat management (FWS draft conservation strategy, 2016).

The environmental consultant staff (Stantec) observed Florida Scrub-Jays on eleven (11) of the one-hundred and one (101) stations surveyed in 2014. In 2015 scrub-jays were observed in four additional stations. In total, four (4) separate scrub-jay families intersect with the proposed project or the proposed existing right-of-way for the proposed project and three (3) families would be impacted by the proposed project as currently designed. Family 1 is located at the westbound off-ramp from I-4 to Saxon Blvd where 0.90 acres of occupied habitat would be impacted. Family 2 is at Pond Site 409 along eastbound I-4 where 1.22 acres of occupied territory will be impacted. Family 3 is also along eastbound I-4 at Pond Site 409 and will have 2.56 acres of occupied territory impacted. It is anticipated that the proposed project will impact 1.89 ha (4.68 ac) of occupied Florida Scrub-Jay habitat. Families four and five will not be impacted by the proposed project.

Climate Change

Based on the present level of available information concerning the effects of global climate change on the status of the Florida Scrub-Jay, the Service acknowledges the potential for changes to occur in the action area, but presently has no basis to evaluate if or how these changes are affecting the Florida Scrub-Jay. Nor does our present knowledge allow the Service to project what the future effects from global climate change may be or the magnitude of these potential effects.

EFFECTS OF THE ACTION

This section includes an analysis of the direct and indirect effects of the proposed action on the species and/or critical habitat and its interrelated and interdependent activities.

The proposed expansion of the 25.90 km (10 mile) segment of interstate highway (I-4) extending from east of US 17/92 to east of SR 472 in Volusia County will add two express lanes an additional interchange to this segment and improve on others to accommodate express lanes. The proposed project is a transportation project that aims to facilitate travel demands and future population growth in this area, and alleviate congestion.

The Service has defined the action area for the proposed action to include all xeric oak habitat (scrub) within the proposed right-of-way and all scrub habitat immediately adjacent to the right-of-way from east of US 17/92 to east of SR 472 along the I-4 corridor.

Factors to be Considered

Direct Effects - The construction of the proposed roadway expansion, interchanges, and associated ponds will result in the direct "take" – through harm and/or harassment – of three Florida Scrub-Jay territories currently consisting of three families (7 adults) resulting from the destruction of 1.89 ha (4.68 ac) of occupied habitat on the proposed project site. The current occupied territories occur in the sand pine habitat east of the Saxon interchange and were seen in the clover-leaf at the Saxon Boulevard interchange. The second and third territories occur at Pond Site 409 A1/A2 east of Saxon Boulevard. The new ponds will impact scrub in the area and will preclude proper management necessary (prescribed fire) to maintain suitable conditions for Florida Scrub-Jay utilization.

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 of the area directly affected by the action, and may include other Federal actions that have not undergone section 7 consultations, but will result from the action under consideration. The indirect effects may occur from the loss of scrub habitat on the project site that may interrupt dispersal corridors between areas occupied by Florida Scrub-Jays and inhibiting management of adjacent scrub habitat.

The anticipated proposed I-4 BtU- segment 4 project will result in additional habitat destruction and degradation that reduces the amount of area Florida Scrub-Jays can occupy, but also increases fragmentation of habitat. As more scrub-jay habitat is altered, the remaining habitat is reduced into smaller and smaller areas, separated from other patches by larger distances. Dispersal distances of Florida Scrub-Jays in fragmented habitat are greater than in optimal unfragmented habitat (Thaxton and Hingtgen 1996, Breininger 1999). Increased dispersal distances results in higher mortality rates and leave isolated territories more vulnerable to extirpation. This fragmentation also increases the probability of genetic isolation, which is likely to increase extinction probability (Fitzpatrick *et al.* 1991, Woolfenden and Fitzpatrick 1991, Snodgrass *et al.* 1993, Stith *et al.* 1996, Thaxton and Hingtgen 1996).

Another significant threat to Florida Scrub-Jay persistence is fire suppression and/or lack of fire management in scrub habitat (Woolfenden and Fitzpatrick 1984, 1991; Schaub *et al.* 1992; Stith *et al.* 1996; Breininger *et al.* 1999). Fire suppression, restricting the necessary management activities of the surrounding habitat, coupled with the proposed infrastructure

improvements and ensuing development may create unsuitable habitat conditions resulting in Florida Scrub-Jay abandonment of the area.

CUMULATIVE EFFECTS

Cumulative effects include effects of future State, local, or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

All development projects that may affect occupied Florida Scrub-Jay habitat in the action area require federal review pursuant to either section 7 or section 10 of the Act. However, we have no jurisdiction over activities that unintentionally resulted in the loss of unoccupied, but potentially suitable, habitat. Without continual management, occupied habitat will continue to become overgrown to the point that it no longer supports Florida Scrub-Jays, and potentially suitable unoccupied habitat will be converted to other uses, precluding future management and occupation by Florida Scrub-Jays. The extent to which this has historically occurred throughout the range of the Florida Scrub-Jay has been discussed previously. Habitat loss often results in habitat fragmentation which can have a greater impact then the amount destroyed by limiting or precluding the ability to effectively manage the remaining habitat. The extent to which it is likely to occur in the future is unknown.

CONCLUSION

This proposed project will result in the permanent loss of approximately 1.89 ha (4.68 ac) of habitat currently occupied by seven (7) Florida Scrub-Jays or approximately three Florida Scrub-Jay territories. From the information presented above, the following facts are apparent: 1) Florida Scrub-Jays are dependent on continuous human management of scrub habitat; 2) Florida Scrub-Jay recovery depends on additional purchase of scrub lands in key areas and effective restoration and management of protected lands; 3) succession of unmanaged scrub habitat is as important a factor in the decline of Florida Scrub-Jay populations as is loss of habitat to competing land uses.

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

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered or 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, carrying out 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 that 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 so that they become binding conditions of any grant or permit issued to future applicant, as appropriate, for the exemption in section 7(o)(2) to apply. FHWA and FDOT have a continuing duty to regulate the activity covered by this Incidental Take Statement. If FHWA and FDOT (1) fails to assume and implement the terms and conditions or (2) fails to require clients to adhere to the terms and conditions of the incidental take statement through enforceable terms, the protection coverage of section 7(o)(2) may lapse. To monitor the impact of incidental take FHWA and/or 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 Service has reviewed the biological information for the Florida Scrub-Jay, information presented by FHWA and FDOT, and other available information relevant to this action. Based on our review, incidental take is anticipated not to exceed approximately 1.89 ha (4.68 ac) of occupied Florida scrub-jay habitat or approximately three Florida scrub-jay territories currently consisting of seven Florida scrub-jays. All scrub-jay habitat – within the proposed Pond Site 409 A1/A2 and the westbound off-ramp from I-4 to Saxon Boulevard at the Saxon interchange – is included.

EFFECT OF THE TAKE

In the accompanying biological opinion, the Service determined that this level of anticipated take is not likely to result in jeopardy to the species or destruction or adverse modification of critical habitat.

REASONABLE AND PRUDENT MEASURES

When providing an incidental take statement, the Service is required to give non-discretionary 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.

As a conservation measure included for the proposed action, the applicant has agreed to contribute money to the Florida Scrub-Jay Conservation Program Fund. This fund supports a wide variety of Florida Scrub-Jay conservation efforts locally and range-wide. The contribution towards TNC Managed Funds for Public Lands may involve acquisition of lands, management of acquired TNC lands, and/or management of other occupied lands in public ownership. The contribution for the 1.89 ha (4.68 ac) of impacts to the occupied Florida Scrub-Jay habitat will be in the amount of $143,460. This is determined by the following formula: $15,327 per acre at a 2:1 ratio.

In addition, FDOT will prevent clearing and grubbing within the areas of occupied scrub-jay habitat during nesting season (March 1 – June 30) to avoid any potential harm to individual birds should they be present. The areas will be identified on the project exhibits in the ESBA and EIS Update and will be identified on the design plans.

Furthermore, the Service must also specify procedures to be used to handle or dispose of any individuals taken. The Service considers the following reasonable and prudent measures are necessary and appropriate:

1. Disposition of dead or injured specimens (salvage).

TERMS AND CONDITIONS

In order to be exempt from the prohibitions of section 9 of the Act, FHWA and FDOT must comply with the following terms and conditions, which implement the reasonable and prudent measures for incidental take described above. These terms and conditions are non-discretionary:

1. Unauthorized take of Florida Scrub-Jays associated with the proposed activities should be immediately reported by notifying the Jacksonville Ecological Services Field Office at 904-731-3336. If a dead Florida Scrub-Jay is found in the project area, the specimen should be thoroughly soaked in water and frozen for later analysis of cause of death.

The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed action. The Service estimates that approximately 1.89 ha (4.68 ac) of occupied Florida Scrub-Jay habitat or approximately three Florida Scrub-Jay territories will be incidentally taken or altered as a result of these actions.

If, during the course of these actions, this level of incidental take is exceeded, such incidental take represents new information requiring reinitiation of consultation and review of the reasonable and prudent measures provided. The Federal agency must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modifications of the reasonable and prudent measures.

CONSERVATION RECOMMENDATIONS

Section 7(a) (1) of the Act directs Federal agencies to use their authority 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 carry out recovery plans, or to develop information.

The Service is not suggesting any additional conservation recommendations at this time.

REINITIATION OF SECTION 7 CONSULTATION

This concludes formal consultation on the action outlined in the request. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) 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; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; 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.

The Service appreciates the cooperation of FHWA, FDOT and the applicant's environmental consultant Stantec during this consultation. If you have any questions regarding this biological opinion, please contact Lourdes Mena at (904) 731-3119.

Sincerely,

for Jay B. Herington
Field Supervisor

LITERATURE CITED

Austin, D.F. 1976. Florida scrub. Florida Naturalist. 49(4):2-5.

Bancroft, G.T. and G.E. Woolfenden. 1982. The molt of scrub jays and blue jays in Florida. Ornithological Monographs Number 29. American Ornithologists' Union; Washington, D.C. 51 pages.

Bendire, C.E. 1895. Life histories of North American birds. U.S. National Museum Special Bulletin No. 3. U.S. Government Printing Office, Washington D.C. 518 pages.

Bent, A.C. 1946. Life histories of North American jays, crows, and titmice. U.S. National Museum Bulletin 191. U.S, Government Printing Office, Washington D.C.

Bowman, R. 1998. Population dynamics, demography, and contributions to metapopulation dynamics by suburban populations of the Florida scrub-jay, *Aphelocoma coerulescens*. Final report on Project No. NG94-032 to Florida Fish and Wildlife Conservation Commission, Tallahassee, FL. 138 pages.

Bowman, R., G.E. Woolfenden, A.L. Fleischer, Jr., and L.M. Walton. 1996. Nest site selection by Florida scrub-jays in natural and modified habitats. Abstract, Archbold Biological Station 1996 Symposium. 12 September 1996. Lake Placid, Florida. 1 page.

Bowman, R. and G.E. Woolfenden. 2001. Nest success and the timing of nest failure of Florida scrub-jays in suburban and wildland habitats. Pages 383-402 *in*: Marzluff, J.M., R. Bowman, and R. Donnelly (eds.). Avian Ecology and Conservation in an Urbanizing World. Kluwer Academic Publishers, Norwell, MA.

Breininger, D.R. 1999. Florida scrub-jay demography and dispersal in a fragmented landscape. The Auk 116(2):520-527.

Breininger, D.R. 2004. An adaptive approach to managing Florida scrub-jay habitat. NASA Technical Memorandum NASA/TM-2004-211532.

Breininger, D. R. and G. M. Carter. 2003. Territory quality transitions and source-sink dynamics in a Florida Scrub-Jay population. Ecological Applications 13:516-529.

Breininger, D.R., M.J. Provancha, and R.B. Smith. 1991. Mapping Florida scrub jay habitat for purposes of land-use management. Photogrammetric Engineering & Remote Sensing 57(11):1467-1474.

Breininger, D.R., V.L. Larson, D.M. Oddy, R.B. Smith, and M.J. Barkaszi. 1996. Florida scrub-jay demography in different landscapes. The Auk 113(3):617-625.

Breininger, D.R., V.L. Larson, B.W. Duncan, and R.B. Smith. 1998. Linking habitat suitability to demographic success in Florida scrub-jays. Wildlife Society Bulletin 26(1):118-128.

Breininger, D.R., M.A. Burgman, and B.M. Stith. 1999. Influence of habitat quality, catastrophes, and population size on extinction risk of the Florida scrub-jay. Wildlife Society Bulletin 27(3):810-822.

Breininger, D.R., B. Toland, D. Oddy, M. Legare, J. Elseroad, and G. Carter. 2003. Biological criteria for the recovery of Florida scrub-jay populations on public lands in Brevard County and Indian River County. Final Report to Endangered Species Office, U.S. Fish and Wildlife Service, Jacksonville, Florida. 104 pages.

Breininger, D.R., B. Toland, D. Oddy, M. Legare, J. Elseroad, and G. Carter. 2003. Biological criteria for the recovery of Florida scrub-jay populations on public lands in Brevard County and Indian River County. Final Report to Endangered Species Office, U.S. Fish and Wildlife Service, Jacksonville, Florida. 104 pages.

Breininger, D.R., B. Toland, D.M Oddy, and M.L. Legare. 2006. Landcover characterizations and Florida Scrub-jay (*Aphelocoma coerulescens*) population dynamics. Biological Conservation 128:169-181.

Breininger, D.R., J.D. Nichols, G.M. Carter, and D.M Oddy. 2009. Habitat-specific breeder survival of Florida scrub-jays: inferences using multistate models. Ecology 90:3180-3189.

Breininger, D.R., E.D. Stolen, D.M. Oddy and G.C. Carter. 2010. A model selection approach to predicting whether Florida scrub-jays delay breeding. Condor 112:378-389.

Breininger, D.R., E.D. Stolen, G.C. Carter, D.M. Oddy and S.A Legare. 2013. Quantifying how territory quality and sociobiology affect recruitment to inform fire management. Animal

Conservation. In press.

Brigham, D. 1973. Scrub jay. Florida Naturalist 46:22.

Byrd, H. 1928. Notes from correspondents: Florida jay. Florida Naturalist 1(4):87.

Coulon, A., Fitzpatrick, J.W., Bowman, R., Stith, B.M., Makarewich, C.A., Stenzler, L.M. and Lovette, I.J. 2008. Congruent population structure inferred from dispersal behaviour and intensive genetic surveys of the threatened Florida scrub-jay (*Aphelocoma coerulescens*). Molecular Ecology 17, 1685-1701.

Coulon, A., Fitzpatrick, J.W., Bowman, R., and Lovette, I.J. 2010. Effects of habitat fragmentation on effective dispersal of Florida scrub-jays. Conservation Biology 24(4), 1080-1088.

Coulon, A., Fitzpatrick, J.W., Bowman, R., and Lovette, I.J. 2012. Mind the gap: genetic distance increases with habitat gap in of Florida scrub jays. Biology Letters 0, 1-4.

Cox, J.A. 1987. Status and distribution of the Florida scrub jay. Florida Ornithological Society Special Publication Number 3. Gainesville, Florida. 110 pages.

Davis, J.H., Jr. 1943. The natural features of southern Florida: especially the vegetation, and the Everglades. Florida Department of Conservation, Florida Geological Survey Geological Bulletin No. 25. 311 pages.

Davis, J.H., Jr. 1967. General map of natural vegetation of Florida. Agricultural Experiment Station, Institute of Food and Agricultural Sciences, University of Florida, Gainesville. 1 page.

DeGange, A.R., J.W. Fitzpatrick, J.N. Layne, and G.E. Woolfenden. 1989. Acorn harvesting by Florida scrub jays. Ecology 70(2):348-356.

Early, R.N. 1952. The Florida jay. Florida Naturalist 25:57-58.

Faulhaber, C.A. 2013. Personal communication. Biologist. Florida Fish and Wildlife Conservation Commission, Ocala, Florida.

Fitzpatrick, J.W. and G.E. Woolfenden. 1988. Components of lifetime reproductive success in the

Florida scrub jay. Pages 305-320 *in*: Clutton-Brock, T.H. (ed.). Reproductive success. University of Chicago Press; Chicago, Illinois.

Fitzpatrick, J.W., G.E. Woolfenden, and M.T. Kopeny. 1991. Ecology and development-related habitat requirements of the Florida scrub jay (*Aphelocoma coerulescens coerulescens*). Florida Game and Fresh Water Fish Commission Nongame Wildlife Program Technical Report Number 8. Tallahassee, Florida. 49 pages.

Fitzpatrick, J.W., B. Pranty, and B. Stith. 1994. Florida scrub jay statewide map, 1992-1993. Archbold Biological Station. Lake Placid, Florida. 14 pages + appendices.

Fleischer, A.L., Jr. 1996. Pre-breeding time budgets of female Florida scrub-jays in natural and suburban habitats. Abstract, Archbold Biological Station 1996 Symposium. 12 September 1996. Lake Placid, Florida. 1 page.

Grimes, S.A. 1940. Scrub jay reminiscences. Bird-Lore 42:431-436.

Grimes, S.A. 1943. Notes from northeast Florida. Florida Naturalist 16: 15-19.

Intergovernmental Panel on Climate Change. 2007a. Climate Change 2007. The Physical Science Basis - Summary for Policymakers. Contributions of Working Group I. Contribution to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change.

Intergovernmental Panel on Climate Change. 2007b. Climate Change 2007. Climate Change Impacts, Adaption and Vulnerability. Working Group II. Contribution to the Intergovernmental Panel on Climate Change. Fourth Assessment.

Laessle, A.M. 1958. The origin and successional relationship of sandhill vegetation and sand-pine scrub. Ecological Monographs 28(4):361-387.

Larson, V.L. 2012, 2013. Personal communication. Ecologist. Ecospatial Analysts. Merritt Island, Florida.

Longstreet, R.J. 1954. Ornithology of the mosquitoes – part 5. Florida Naturalist 27: 79-88.

McGowan, K.J. and G.E. Woolfenden. 1989. A sentinel system in the Florida scrub jay. Animal

Behaviour 37(6):1000-1006.

McGowan, K.J. and G.E. Woolfenden. 1990. Contributions to fledgling feeding in the Florida scrub jay. Journal of Animal Ecology 59(2):691-707.

Miller, K.E. 2012. Personal communication. Biologist. Florida Fish and Wildlife Conservation Commission; Gainesville, Florida.

Miller, K.E. and B.M. Stith. 2002. Florida scrub-jay distribution and habitat in Charlotte County. Final Report. Contract No. 2001000116: Scrub-Jay Survey. December 2002. 204 pages.

Mumme, R.L. 1992. Do helpers increase reproductive success? An experimental analysis in the Florida scrub jay. Behavioral Ecology and Sociobiology 31:319-328.

Myers, R.L. 1990. Scrub and high pine. Pages 150-193 *in*: Myers, R.L. and J.J. Ewel (eds.). Ecosystems of Florida. University of Central Florida Press; Orlando, Florida.

Schaub, R., R.L. Mumme, and G.E. Woolfenden. 1992. Predation on the eggs and nestlings of Florida scrub jays. The Auk 109(3):585-593.

Schoech, S. J., and R. Bowman. 2001. Variation in the timing of breeding between suburban and wildland Florida Scrub-Jays: Do physiologic measures reflect different environments?. In Avian Ecology and Conservation in an Urbanizing World (pp. 289-306). Springer US.

Schoech, S. J., R. Bowman and S. J. Reynolds. 2004. Food supplementation and possible mechanisms underlying early breeding in the Florida Scrub-Jay (Aphelocoma coerulescens). Hormones and Behavior, 46(5), 565-573.

Schoech, S.J., E.S. Bridge, R.K. Boughton, S.J. Reynolds, J.W. Atwell, and R. Bowman 2008. Food supplementation; a tool to increase reproductive output? A case study in the threatened Florida scrub-jay. Biological Conservation 141,162-173.

Snodgrass, J.W., T. Townsend and P. Brabitz. 1993. The status of scrub and scrub jays in Brevard County, Florida. Florida Field Naturalist 21(3): 69-74.

Sprunt, A. 1946. Aphelocoma coerulescens coerulescens (Bosc), Florida jay. Pages 77-88 *in*: Bent, A.C. (ed.). Life histories of North American jays, crows and titmice. U.S. National Museum Bulletin number 191. U.S. Government Printing Office; Washington, D.C.

Stallcup, J.A. and G.E. Woolfenden. 1978. Family status and contributions to breeding by Florida scrub jays. Animal Behaviour 26(4):1144-1156.

Stith, B.M. 1999a. Metapopulation viability analysis of the Florida scrub-jay (*Aphelocoma coerulescens*): a statewide assessment. Final report to the U.S. Fish and Wildlife Service, Jacksonville, Florida, Contract No. 1448-40181-98-M324. August 1999. 201 pages.

Stith, B.M. 1999b. Metapopulation dynamics and landscape ecology of the Florida scrub-jay, *Aphelocoma coerulescens*. Ph.D. Dissertation, University of Florida, Gainesville. 383 pages.

Stith, B.M., J.W. Fitzpatrick, G.E. Woolfenden, and B. Pranty. 1996. Classification and conservation of metapopulations: a case study of the Florida scrub jay. Pages 187-215 *in*: McCullough, D.R. (ed.). Metapopulations and wildlife conservation. Island Press; Washington, D.C.

Thaxton, J.E. and T.M. Hingtgen. 1994. Response of Florida scrub jays to management of previously abandoned habitat. District 4 Annual Report, Florida Park Service; Tallahassee, Florida.

Thaxton, J.E. and T.M. Hingtgen. 1996. Effects of suburbanization and habitat fragmentation on Florida scrub-jay dispersal. Florida Field Naturalist 24(2):25-37.

Thaxton, J.E. 1998. Personal communication. Biologist. Upland, Inc., Osprey, Florida.

Toland, B.R. 1991. Nest site characteristics of a Florida scrub jay population in Indian River County. Abstract. Florida scrub jay workshop. 23-24 May 1991. Ormond Beach, Florida. 1 page.

Toland, B.R. 1996. Personal communication. Biologist. Service.

Toland, B.R. 1999. Current status and conservation recommendations for the Florida scrub-jay in

Brevard County. Report to the Brevard County Board of County Commissioners. Brevard County Natural Resources Management Office, Viera, Florida. 40 pages.

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

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

U.S. Fish and Wildlife Service. 2016. Draft Conservation Strategy for the Florida Scrub-Jay (*Aphelocoma coerulescens*). Under Review

Woolfenden, G.E. 1974. Nesting and survival in a population of Florida scrub jays. The Living Bird 12:25-49.

Woolfenden, G.E. 1975. Florida scrub-jay helpers at the nest. The Auk 92(1):1-15.

Woolfenden, G.E. 1978. Growth and survival of young Florida scrub jays. Wilson Bulletin 90(1):1-18.

Woolfenden, G.E. and J.W. Fitzpatrick. 1978. The inheritance of territory in group-breeding birds. BioScience 28(2):104-108.

Woolfenden, G.E. and J.W. Fitzpatrick. 1984. The Florida scrub jay: demography of a cooperative-breeding bird. Princeton University Press; Princeton, New Jersey. 406 pages.

Woolfenden, G.E. and J.W. Fitzpatrick. 1986. Sexual asymmetries in the life history of the Florida scrub jay. Pages 87-107 *in*: Rubenstein, D.I. and R.W. Wrangham (eds.). Ecological aspects of social evolution: birds and mammals. Princeton University Press, Princeton, New Jersey.

Woolfenden, G.E. and J.W. Fitzpatrick. 1990. Florida scrub jays: a synopsis after 18 years of study. Pages 241-266 *in*: Stacey, P.B. and W.B. Koenig (eds.). Cooperative breeding in birds: long term studies of ecology and behavior. Cambridge University Press, Cambridge.

Woolfenden, G.E. and J.W. Fitzpatrick. 1991. Florida scrub jay ecology and conservation. Pages 542-565 *in*: Perrins, C.M., J.-D. Lebreton, and G.J.M. Hirons (eds.). Bird population studies: relevance to conservation and management. Oxford University Press; Oxford, United Kingdom.

Woolfenden, G.E. and J.W. Fitzpatrick. 1996a. Florida scrub-jay, *Aphelocoma coerulescens,* Family Corvidae, Order Passeriformes. Pages 267-280 *in*: Rodgers, J.A., 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.

Woolfenden, G.E. and J.W. Fitzpatrick. 1996b. Florida scrub-jay, (*Aphelocoma coerulescens*). Pages 1-27 *in*: Poole, A. and F. Gill (eds.). The birds of North America, No. 228. The Academy of Natural Sciences, Philadelphia, and The American Ornithologists' Union; Washington, D.C.

Owen, Catherine

From: Cathy.Kendall@dot.gov
Sent: Tuesday, February 16, 2016 5:13 PM
To: lourdes_mena@fws.gov
Cc: Owen, Catherine
Subject: FW: I-4 BtU Segments 2,3,4 Formal Consultation letter to FHWA
Attachments: I-4 BtU segments234 Sec7 Formal consult letter FHWA 2_1_16.pdf; I-4 BtU Segment 234 _formal FHWA final letter 2_1_16.doc

Attached is the FDOT District 5 recommendation regarding the Biological Assessment for the I-4 Beyond The Ultimate (I-4BTU) project. The Biological Assessment was discussed and provided to you at our face-to-face meeting on December 17, 2015. In consideration of the FDOT recommendation and our previous discussion, the Federal Highway Administration (FHWA) has determined that the project "may affect, and is likely to adversely affect" the Florida scrub-jay. We are therefore requesting Section 7 formal consultation regarding project impacts to this species. Potential impacts to other listed species from the project were addressed through informal consultation..

Please let me know if there is anything else needed for the formal consultation.

Cathy Kendall, AICP
Senior Environmental Specialist
FHWA - FL, PR and VI
3500 Financial Plaza, Suite 400
Tallahassee, FL 32312
(850) 553-2225
cathy.kendall@dot.gov

From: Owen, Catherine [mailto:Catherine.Owen@dot.state.fl.us]
Sent: Monday, February 01, 2016 2:21 PM
To: Kendall, Cathy (FHWA)
Cc: Stys-Palasz, Beata; Walsh, William; Lyon, Casey; Drauer, Mike
Subject: I-4 BtU Segments 2,3,4 Formal Consultation letter to FHWA

Good afternoon Cathy:

Attached is FDOT District Five's request for Section 7 formal consultation letter to FHWA, based on our December 17, 2015 coordination meeting.

The original signed, hard copy is in the mail to you; you should already have a CD of the full ESBA documentation (recall you gave Lourdes the hard copy ESBAs at our coordination meeting).

Please do not hesitate to contact us if there are any questions or if any further information is needed.

Thank you again. Regards, cathy

p.s. Also attached is the letter in Word, for your use in FHWA's transmittal letter to USFWS.

Catherine B. Owen, M.S.
Environmental Specialist IV
District Cultural Resources Coordinator

FDOT District Five
719 S. Woodland Blvd.
DeLand FL 32720
phone (386) 943-5383

FDOT

Florida Department of Transportation

RICK SCOTT
GOVERNOR

719 S. Woodland Blvd.
DeLand, FL 32720

JIM BOXOLD
SECRETARY

February 1, 2016

Mr. James Christian, Division Administrator
Federal Highway Administration
Florida Division Office
3500 Financial Plaza, Suite 400
Tallahassee, Florida 32312

Attention: Ms. Cathy Kendall, Senior Environmental Specialist

RE: **Request for Section 7 Formal Consultation**
SR 400 (I-4) Beyond the Ultimate Project Development and Environment Study - **Segments 2, 3, and 4** (Orange, Seminole and Volusia Counties)
Financial Management No. 432100-1-22-01

Dear Mr. Christian,

The FDOT is conducting an update of the Project Development and Environment (PD&E) Studies for the extension of proposed express lanes for SR 400 (I-4). The project limits in the original I-4 PD&E Studies, along with the corresponding environmental documents associated with these PD&E Studies, were:

- West of Memorial Boulevard (SR 546) to the Polk/Osceola County Line, (29.5 miles) – *Environmental Assessment/Finding of No Significant Impact (EA/FONSI) [FPN 201210, (1998)]*
- CR 532 (Polk/Osceola County Line) to West of SR 528 (Beachline Expressway) (13.7 miles) – *EA/FONSI [FPN 242526 and 242483, (1999)]*
- West of SR 528 (Beachline Expressway) to SR 472 (43 miles) - *Final Environmental Impact Statement (FEIS) [FPN 242486, 242592 and 242703, (2002)].*

The I-4 Ultimate project consists of reconstruction to include new express lanes for the 21-mile section of I-4 that extends from west of SR 435 (Kirkman Road) to east of SR 434. It was approved under FPNs 242486, 242592 and 242703 (FEIS 09/03/2002, ROD 12/08/2005), and is currently under construction.

The current I-4 Beyond the Ultimate (BtU) PD&E Study update includes a total of approximately 41 miles of roadway sections, located both east and west of the 21-mile, I-4 Ultimate project. It has been divided into the following five segments (**see attached figure**):

- Segment 1: SR 400 (I-4) from West of CR 532 (Polk/Osceola County Line) to West of SR 528 (Beachline Expressway) - Osceola County and Orange County

- **Segment 2: SR 400 (I-4) from West of SR 528 (Beachline Expressway) to West of SR 435 (Kirkman Road) - Orange County**
- **Segment 3: SR 400 (I-4) from 1 Mile East of SR 434 to East of SR 15/600 (US 17/92) (Seminole/Volusia County Line) - Seminole County**
- **Segment 4: SR 400 (I-4) from East of SR 15/600 (US 17/92) (Seminole/Volusia County Line) to ½ Mile East of SR 472 - Volusia County**
- Segment 5: SR 400 (I-4) from West of SR 25/US 27 to West of CR 532 (Polk/Osceola County Line) - Polk County

As part of the PD&E Study update, Endangered Species Biological Assessments (ESBA) were prepared for each of the individual BtU segments. Because Segments 2, 3, and 4 are all part of the I-4 FEIS from West of SR 528 (Beachline Expressway) to SR 472, the results of these ESBA reports are being combined for FHWA's purposes of assessing the potential impacts from the FEIS project as a whole. (Note that ESBAs for Segments 1 and 5 will be submitted under separate cover.) Based upon the results of the individual species effects determinations, both informal and formal consultation with the U.S. Fish and Wildlife Service (USFWS) for potential impacts will be required.

On December 17, 2015 a coordination meeting occurred with the USFWS, Federal Highway Administration (FHWA), FDOT District Five and project consultants to review the I-4 BtU project segments, and discuss the potential for project effects on the listed species that may occur within the Segment 2, 3 and 4 study areas. The ESBAs for Segments 2, 3 and 4 along with an initial request for informal consultation letter were provided to USFWS. As a result of this meeting, it was agreed that the letter would be revised based on input provided by USFWS (Lourdes Mena) and FHWA (Cathy Kendall), and then resubmitted by FDOT to USFWS for informal consultation. All of the species that have the potential to be affected by one or more of the BtU Segments 2, 3, and 4, but were proposed to have either a **No Effect** or **May Affect, Not Likely to Adversely Affect** determination during the coordination meeting, were addressed in the separate request for informal consultation FDOT submitted to USFWS on January 20, 2016.

As requested by FHWA, it was determined that a separate submittal for formal consultation from FHWA to USFWS should occur for the Florida scrub-jay (Segment 4). The Florida scrub-jay survey results and potential project impacts are documented in the Florida Scrub-jay Survey Technical Memorandum (an appendix to the Segment 4 ESBA). The following is the proposed Section 7 effects determination for the Florida scrub-jay, based upon the results of the surveys, and as discussed during the December 17, 2015 coordination meeting:

Florida Scrub-Jay (*Aphelocoma coerulescens coerulescens*) – The Florida scrub-jay, listed as Threatened by both the FFWCC and USFWS, is an endemic species found in Florida scrub habitats. This gregarious jay is a habitat specialist and typically lives in scrub and scrubby flatwoods habitats.

During the original PD&E Study, surveys were conducted for scrub-jays in Segment 2 in two areas near Sand Lake Road and I-4. Since then, both of these areas have been developed and no longer contain any scrub or scrub-like habitat. Regardless, cursory surveys for scrub-jays were

conducted in April and May of 2013 and April and May of 2014 to evaluate the presence of this species. No scrub-jays were observed within any proposed right-of-way or pond site areas of Segment 2.

Several stations were sampled for the presence of scrub-jays within Segment 3 during the original PD&E Study at the Lake Mary Boulevard interchange: four stations along the I-4 westbound right-of-way south of Lake Mary Boulevard, and two stations along the off-ramp from I-4 eastbound to Lake Mary Boulevard. Field investigations conducted during the present study indicated that these areas no longer contained any suitable habitat. The areas along I-4 westbound have been developed into multi-family residential units with no natural vegetation remaining, and the area along the eastbound off-ramp has been developed (into a Gander Mountain store), with planted pines as a buffer from the road. Regardless, cursory surveys for scrub-jays were conducted in September 2013 to evaluate the presence of this species. No scrub-jays were observed within any proposed right-of-way or pond site areas of Segment 3.

Within Segment 4, numerous stations were sampled for the presence of scrub-jays at the Saxon Boulevard and SR 472 interchanges, and along both sides of I-4 between the interchanges. Cursory surveys for scrub-jays were conducted in September 2013 to evaluate the presence of this species. During these surveys, at least four scrub-jays were observed responding to a call-back recording north of Saxon Boulevard adjacent to I-4 eastbound, and two more responded when the call was played in the northeastern quadrant of the interchange at SR 472. Two scrub-jays were observed at Pond Site 409 A1/A2 as well. A full five-day scrub-jay survey was conducted in October 2014, to ascertain the population size and potential territory size of the scrub-jays within this segment; a supplemental survey of four additional pond sites was conducted in April 2015.

Based on the results of these formal surveys (Segment 4), scrub-jays were observed at 15 of the 119 stations. These scrub-jays comprise five separate families, of which four intersect with the existing or proposed FDOT right-of-way, including pond sites. Impacts to occupied habitat would occur at three of the locations: Family 1 at the westbound I-4 off-ramp to Saxon Boulevard would impact 0.90 acres of occupied territory; Family 2 along eastbound I-4 at Pond Site 409 A1/A2 would impact 1.22 acres of occupied territory; and Family 3 along I-4 eastbound at Pond Site 409 A1/A2 would impact 2.56 acres of occupied territory. The remaining scrub-jays either occur at a pond site that is not going to have any physical changes (Family 5), occur outside the right-of-way (Family 4), or were single incidental observations. Detailed analysis is provided in the Florida Scrub-jay Survey Technical Memorandum prepared for FDOT (Appendix E, Segment 4 ESBA). The proposed widening and stormwater ponds may have a direct impact on scrub-jays or scrub-jay habitat (**4.68 acres** of occupied habitat). Therefore, based on these survey results (Segment 4), this project **May Affect** the Florida scrub-jay.

To offset the proposed impacts, FDOT proposes to mitigate by contributing to The Nature Conservancy fund for the West Volusia County Metapopulation at a ratio of 2:1 in accordance with the USFWS *Florida Scrub-Jay Umbrella Habitat Conservation Plan,* therefore proposing to contribute the equivalent of **9.36 acres** to the fund.

As discussed during the December 17, 2015 coordination meeting, the following commitments are to be made in the ESBA and PD&E Study's EIS Update concerning the Florida scrub-jay:

1. The project identified occupied Florida scrub-jay habitat which is proposed to be impacted. FDOT commits to provide compensatory mitigation to offset the potential impacts to occupied territory in the form of contribution to The Nature Conservancy scrub-jay plan for the West Volusia Metapopulation at a 2:1 ratio of mitigation to impacted habitat.

2. FDOT commits to include a construction commitment to prevent clearing and grubbing within the areas of occupied scrub-jay habitat during nesting season (March 1 – June 30) to avoid any potential harm to individual birds should they be present. These areas will be identified on the project exhibits in the ESBA and EIS Update and will be identified on the design plans.

3. FDOT commits to resurvey the corridor for Florida scrub-jays prior to the onset of construction during the approved USFWS survey window. Should the survey results demonstrate that there are no longer any occupied scrub-jay habitats, FDOT will re-initiate consultation with USFWS for the project.

We ask that USFWS provide concurrence with the determination for this species based upon the results documented in the Segment 4 ESBA and the discussion from the coordination meeting with USFWS on December 17, 2015. We appreciate the coordination effort and input already provided and look forward to continued consultation on this project. If you have any questions, feel free to contact either Catherine Owen at (386) 943-5383, catherine.owen@dot.state.fl.us or me at (386) 943-5411, william.walsh@dot.state.fl.us at your convenience. Thank you for your assistance with this project.

Sincerely,

William G. Walsh
Environmental Manager
FDOT, District Five

wgw/cbo

Cc: Casey Lyon, FDOT
Beata Stys-Palasz, FDOT
Mike Drauer, Stantec

United States Department of the Interior
U. S. FISH AND WILDLIFE SERVICE
7915 BAYMEADOWS WAY, SUITE 200
JACKSONVILLE, FLORIDA 32256-7517

IN REPLY REFER TO:

FWS Log No. 04EF1000-2016-I-0204

February 28, 2016

William G. Walsh
Environmental Manager
Florida Department of Transportation, District 5
719 S. Woodland Blvd.
Deland, FL 32720

RE: SR 400 (I-4) Beyond the Ultimate Project Development and Environment Study -
Segments 2, 3, and 4
Orange, Seminole and Volusia Counties, Florida
Financial Management No. 432100-1-22-01

Dear Mr. Walsh:

The U.S. Fish and Wildlife Service (Service) has completed its review of the update for the Project Development and Environment (PD&E) Studies for the extension of proposed express lanes for SR 400 (I-4). The current I-4 Beyond the Ultimate (BtU) PD&E Study update includes a total of 41 miles of roadway sections, both east and west of the 21 -mile, I-4 Ultimate project that extends from west of SR 435 to east of SR 434. Segment 2 extends from West of SR 528 (Beachline Expressway) to West of SR 435 (Kirkman Road) in Orange County. Segment 3 extends from 1 Mile East of SR 434 to East of SR 15/600 (US 17 /92) in Seminole County. Segment 4 extends from East of SR 15/600 (US 17/92) in the Seminole/Volusia County Line to ½ Mile East of SR 472 in Volusia County. Endangered Species Biological Assessments (ESBA) was prepared for each of the individual BtU segments and based on the results of the determinations both informal consultation and formal consultation will be needed. The Service provides the following comments, in accordance with section 7 of the Endangered Species Act of 1973 (Act), as amended (16 U.S.C. 1531 *et seq.*), for the informal portion of the consultation. A separate request for formal consultation for the Florida scrub-jay has been received for segment 4 and will be addressed separately.

Sand Skink (*Neoseps reynoldsi*)

FDOT conducted cover board surveys between April 10 and May 6, 2014 in segment 2 to determine the presence of sand skinks. A report was submitted to the Service where the area and results were described. There weren't any skinks or tracks observed during the surveys. The Service has reviewed the information provided, as well as available observations and species

presence data and **concurs with a 'may affect, but not likely to adversely affect' determination for this species.**

Eastern indigo snake (*Drymarchon couperi*)

Gopher tortoise burrows were found in all three segments of the proposed project area. Eastern indigo snakes were not observed but habitat for the species exists along the corridor. FDOT is committed to implementing the Standard Protection Measures for the Eastern Indigo Snake and will have all permits conditioned so that all burrows are excavated prior to site manipulation. Segment 2 and segment 3 will impact less than 25 acres of xeric habitat and doesn't have more than 25 active or inactive gopher tortoise burrows. Segment 4 will potentially impact more than 25 acres of xeric habitat and may contain more than 25 active or inactive gopher tortoise burrows, however there weren't any eastern indigo snakes observed during any of the field reviews. The closest documented sighting is approximately four miles to the northwest. FDOT will excavate all burrows prior to construction. The Service has reviewed the available information and **concurs with a 'may affect, but not likely to adversely affect' determination for this species.** The Service requests that in the event that an eastern indigo snake is observed in the project area that work is halted immediately and the Service is contacted.

Wood Stork (*Mycteria americana*)

Segment 2 is located within the Core Foraging Areas (CFA) of two wood stork colonies (Lawne Lake, Gatorland); Segment 3 is located within the CFA of two wood stork colonies (Lawne Lake, Hontoon Island); and Segment 4 is located within the Hontoon Island CFA. The project is not within 2,500 feet of an active colony site, will likely impact Suitable Foraging Habitat (SFH) of greater than 0.5 acres, and is located within the CFA of three wood stork colonies (Lawne Lake, Gatorland, and Hontoon Island). FOOT commits to provide SFH compensation within the Service Area of a Service-approved wetland mitigation bank(s) within the CFA and will coordinate with the permitting agencies during the permitting phase of the project on compensatory mitigation and minimization of impacts to suitable foraging habitat. Details of the mitigation bank commitment will be included in the ESBA and EIS Update. The Service has reviewed the available information and FDOT's commitments for minimizing and mitigating impacts to the wood stork and **concurs with a 'may affect, but not likely to adversely affect' determination for this species**.

Florida Manatee (*Trichechus manatus latirostris*)

The Florida manatee has Critical habitat designated along the St. Johns River and within the western and northern shores of Lake Monroe (Segment 4). Impacts proposed along the roadway at Lake Monroe (Segment 4) are not expected to impact the lake directly but rather the adjacent wetlands which are largely inaccessible to the Florida manatee. After following the *Effect Determination Key for the Manatee in Florida* (April 2013), FDOT determined that this project may affect, but is not likely to adversely affect the Florida manatee. However, FDOT commits to placing grates on any culvert added to I-4 in this area and to following the *Standard Manatee Conditions for In-Water Work*. The Service has reviewed the available information and **concurs with a 'may affect, but not likely to adversely affect' determination for this species.**

Federally listed plant species

Federally listed plants were not observed in any of the three segments, Segments 2, 3 and 4, during any of the field reviews. In addition, habitat for the Rugel's pawpaw (*Deeringothamnus rugelii*) and the pigeon wings (*Clitoria fragrans*) was not identified in Segment 3. The scrub lupine (*Lupinus aridorum*) was observed in May of 2000 west of Turkey Lake Road but follow up surveys did not identify the plant in the proposed right-of-way impact zone. FDOT concludes that the proposed project will not have any direct or indirect impacts to federally listed plant species and has determined that the proposed project may affect, but will likely to adversely affect any of the federally listed plant species described in the ESBA. The Service has reviewed the available information and **concurs with a 'may affect, but not likely to adversely affect' determination for these species.**

Thank you for considering the effects of your proposed project on fish and wildlife, and the ecosystems upon which they depend. Although this does not represent a biological opinion as described in Section 7 of the Act, it does fulfill the requirements of the Act. Should changes to the proposed project occur or new information regarding fish and wildlife resources become available, further consultation with the Service should be initiated to assess any or further potential impacts. If you have any questions, please contact Lourdes Mena at (904)731-3119.

Sincerely,

Jay B. Herrington
Field Supervisor

cc: Cathy Kendall, FHWA
Casey Lyon, FDOT District 5

FDOT

Florida Department of Transportation

RICK SCOTT
GOVERNOR

719 S. Woodland Blvd.
DeLand, FL 32720

JIM BOXOLD
SECRETARY

January 20, 2016

Dr. Heath Rauschenberger, Deputy Field Supervisor
U.S. Fish and Wildlife Service
North Florida Ecological Services Office
7915 Baymeadows Way, Suite 200
Jacksonville, FL 32256-7517

Attention: Ms. Lourdes Mena, Fish and Wildlife Biologist

RE: **Request for Section 7 Informal Consultation**
SR 400 (I-4) Beyond the Ultimate Project Development and Environment Study - **Segments 2, 3, and 4** (Orange, Seminole and Volusia Counties)
Financial Management No. 432100-1-22-01

Dear Dr. Rauschenberger,

The FDOT is conducting an update of the Project Development and Environment (PD&E) Studies for the extension of proposed express lanes for SR 400 (I-4). The project limits in the original I-4 PD&E Studies, along with the corresponding environmental documents associated with these PD&E Studies, were:

- West of Memorial Boulevard (SR 546) to the Polk/Osceola County Line, (29.5 miles) – *Environmental Assessment/Finding of No Significant Impact (EA/FONSI) [FPN 201210, (1998)]*
- CR 532 (Polk/Osceola County Line) to West of SR 528 (Beachline Expressway) (13.7 miles) – *EA/FONSI [FPN 242526 and 242483, (1999)]*
- West of SR 528 (Beachline Expressway) to SR 472 (43 miles) - *Final Environmental Impact Statement (FEIS) [FPN 242486, 242592 and 242703, (2002)].*

The I-4 Ultimate project consists of reconstruction to include new express lanes for the 21-mile section of I-4 that extends from west of SR 435 (Kirkman Road) to east of SR 434. It was approved under FPNs 242486, 242592 and 242703 (FEIS 09/03/2002, ROD 12/08/2005), and is currently under construction.

The current I-4 Beyond the Ultimate (BtU) PD&E Study update includes a total of approximately 41 miles of roadway sections, located both east and west of the 21-mile, I-4 Ultimate project. It has been divided into the following five segments (**see attached figure**):

- Segment 1: SR 400 (I-4) from West of CR 532 (Polk/Osceola County Line) to West of SR 528 (Beachline Expressway) - Osceola County and Orange County
- **Segment 2: SR 400 (I-4) from West of SR 528 (Beachline Expressway) to West of SR 435 (Kirkman Road) - Orange County**
- **Segment 3: SR 400 (I-4) from 1 Mile East of SR 434 to East of SR 15/600 (US 17/92) (Seminole/Volusia County Line) - Seminole County**
- **Segment 4: SR 400 (I-4) from East of SR 15/600 (US 17/92) (Seminole/Volusia County Line) to ½ Mile East of SR 472 - Volusia County**
- Segment 5: SR 400 (I-4) from West of SR 25/US 27 to West of CR 532 (Polk/Osceola County Line) - Polk County

As part of the PD&E Study update, Endangered Species Biological Assessments (ESBA) were prepared for each of the individual BtU segments. Because Segments 2, 3, and 4 are all part of the I-4 FEIS from West of SR 528 (Beachline Expressway) to SR 472, the results of these ESBA reports are being combined for FHWA's purposes of assessing the potential impacts from the FEIS project as a whole. (Note that ESBAs for Segments 1 and 5 will be submitted under separate cover.) Based upon the results of the individual species effects determinations described below, both informal and formal consultation with the U.S. Fish and Wildlife Service (USFWS) for potential impacts will be required.

On December 17, 2015 a coordination meeting occurred with the USFWS, Federal Highway Administration (FHWA), FDOT District Five and project consultants to review the I-4 BtU segments and discuss the potential for project effects to the species described below. The ESBAs for ***Segments 2, 3 and 4*** *along with an initial request for informal consultation letter were provided to USFWS. As a result of this meeting, it was agreed that this letter would be revised based on input provided by USFWS (Lourdes Mena) and FHWA (Cathy Kendall) and resubmitted by FDOT to USFWS for informal consultation. It was also determined that a subsequent submittal for formal consultation from FHWA to USFWS would occur for the Florida scrub-jay (Segment 4).*

The following is a description of the species that have the potential to be affected by one or more of the BtU **Segments 2, 3, and 4,** *as well as the proposed Section 7 effects determinations discussed during the coordination meeting:*

Reptiles

Sand Skink *(Neoseps reynoldsi)* – The sand skink is listed as Threatened by both the USFWS and Florida Fish and Wildlife Conservation Commission (FFWCC). The three most important factors in determining the presence of skinks are location, elevation, and suitable soils. Sand skinks occur on sandy ridges of interior Central Florida, including Orange County, typically at

elevations of 82 feet above sea level and higher. They occur in excessively drained, well-drained, and moderately well-drained sandy soils, with suitable soil types. These soil types typically support scrub, sandhill, or xeric hammock natural communities, though these may be degraded by impacts to overgrown scrub, pine plantation, citrus grove, old field, or pasture. Skinks have been documented to occur in all these degraded conditions where soil types are suitable, regardless of vegetative cover. This makes habitat condition of secondary importance in determining if skinks are present. If a site has suitable soils at the appropriate elevation within the counties where skinks are known to occur, there is a likelihood of presence, and potential effects to skinks should be considered.

Because Segment 2 occurs within the USFWS Consultation Area for sand skink, both a pedestrian survey and full cover board survey were conducted between April 10 and May 6, 2014. No skinks or signs of skinks were observed within any of the survey areas. A memorandum documenting the survey results was submitted to the USFWS to determine if project impacts to the sand skink would occur. The USFWS advised (email from Jane Monaghan dated October 22, 2014) that due to the fact that no direct or indirect observations of sand skinks were made during the survey, a finding of **may affect, not likely to adversely affect** for the sand skink would be appropriate.

December 17, 2015 coordination meeting: FDOT confirmed with USFWS that no additional sand skink survey would be required for Segment 2, thus no commitment to resurvey will be included in the ESBA or EIS Update.

Eastern Indigo Snake (*Drymarchon corais couperi*) – The eastern indigo snake, listed by both the FFWCC and the USFWS as Threatened, is a habitat generalist, using a variety of habitats from mangrove swamps to xeric uplands. These snakes are cold-sensitive and require gopher tortoise burrows, other animal holes, or stumps for protection during winter months. They require large tracts of natural, undisturbed habitat, and prefer to forage in and around wetlands for their preferred prey – other snakes.

Numerous gopher tortoise burrows were located throughout the general project area (**all three segments**), and the potential for indigo snakes is moderate, though no indigo snakes were observed during field studies. During the construction phase of the project, FDOT will implement the USFWS Standard Protection Measures for the Eastern Indigo Snake, which contain specific provisions requiring the construction contractor to develop and implement an education plan concerning avoidance of eastern indigo snakes, as well as conduct post-construction reporting.

An effects determination was made by utilizing the USFWS Programmatic Key for the Eastern Indigo Snake (January 2010, updated August 2013). In accordance with this key, all three

segments will implement the Standard Protection Measures for the Eastern Indigo Snake (USFWS, 2013) and will have all permits conditioned such that all active and inactive gopher tortoise burrows will be excavated prior to site manipulation in the vicinity of the burrow.

Segment 2 will not impact more than 25 acres of xeric habitat (scrub, sandhill, or scrubby flatwoods), nor does it contain more than 25 active or inactive gopher tortoise burrows, yielding a **may affect, not likely to adversely affect** determination for this segment individually. Segment 3 will not impact more than 25 acres of xeric habitat, but does have more than 25 active and inactive gopher tortoise burrows. Segment 3 is located in a highly urbanized area with little contiguous habitat that would support the eastern indigo snake, and the closest documented sighting is located approximately six miles to the northwest. In previous coordination with the USFWS (email from Jane Monaghan dated December 11, 2013), they advised that they would support a finding of **may affect, not likely to adversely affect** for this segment. Segment 4 may impact more than 25 acres of xeric habitat and may contain more than 25 active or inactive gopher tortoise burrows. Although this segment does receive a **may effect** determination using the key, there have been no eastern indigo snakes observed during any of the field reviews, the closest documented sighting is approximately four miles to the northwest, and all active and inactive gopher tortoise burrows will be excavated prior to construction. For these reasons, Segment 4 may qualify for a **may affect, not likely to adversely affect** determination.

When all the segments are combined (though they may be constructed at separate times), the project may impact more than 25 acres of xeric habitat and contains more than 25 active and inactive gopher tortoise burrows. However, since the segments individually may qualify for **may affect, not likely to adversely affect** determinations, a **may affect, not likely to adversely affect** determination may be appropriate for the project as a whole.

December 17, 2015 coordination meeting: USFWS indicated that FDOT's proposed mitigation for impacts to Florida scrub-jay (e.g., TNC contribution), as well as utilization of Standard Protection Measures for the Eastern Indigo Snake during construction and survey/relocation of Gopher Tortoises prior to construction should support the effects finding. FDOT confirmed with FHWA that these commitments will be included in the ESBA and EIS Update. FHWA indicated that the USFWS finding should not constitute a significant determination under NEPA.

Avians

Crested caracara (*Polyborus plancus audubonii = Caracara cheriway*) – The crested caracara is listed by both the USFWS and the FFWCC as Threatened. These large raptors inhabit Florida's prairies and rangelands, and forage on many kinds of insects, fish, reptiles, birds, and mammals. They will feed on live captured prey, but also on carrion. Nests are usually constructed within cabbage palms. Sensitivity to human disturbance varies in this species, with

many tolerating human activities, especially when human influence is already present within their home range. If a caracara nest is found to be within the project area, management practices outlined within the *Habitat Management Guidelines for Audubon's Crested Caracara in Central and Southern Florida* should be employed.

Segment 2 occurs at the northernmost edge of the USFWS Consultation Area for this species in Central Florida, though no nesting or foraging habitat has been documented within the project corridor. No caracara or their nests have been observed or were documented within the project corridor either during the current study or during the previous PD&E Study (May 2000). Therefore, this project will have **no effect** on this species.

Snail Kite (*Rostrhamus sociabilis plumbeus*) – The snail kite is listed as Endangered by both the USFWS and the FFWCC. This non-migratory, medium-sized raptor utilizes large open freshwater marsh habitats and lakes with shallow water. Nests are usually located in a low tree or shrub at the water's edge, and the main staple of their diet is the apple snail.

All three segments occur within the USFWS Consultation Area for the snail kite, though no observations have been documented within or near these segments. Nesting snail kites have been documented well to the east of Segment 2 in Kissimmee at both Lake Tohopekaliga and East Lake Toho. No adequate nesting or foraging habitat is located adjacent to the project area, within the proposed right-of-way or pond sites of Segments 2, 3, or 4. Therefore, this project will have **no effect** on this species.

Red-Cockaded Woodpecker (*Picoides borealis*) – This species is listed as Endangered by the USFWS and FFWCC. The colonial red-cockaded woodpecker (RCW) is a habitat specialist, requiring stands of over-mature pine that have contracted the red-heart disease. RCW's require diseased trees for cavity building, which they use for nest and roost cavities. Preferred pine stands need to have a fairly open canopy, with a sparse subcanopy to allow easy flight. RCWs must also have ample foraging habitat consisting of younger pines surrounding the cavity trees.

No suitable nesting habitat was observed in the impact area within the project limits. Segment 2 occurs near to (within 3.5 miles of) an area designated by USFWS as "Occurrence Area"; though the original PD&E Study indicated no suitable habitat or any documented RCW sightings within the proposed right-of-way or pond sites. No suitable habitat or any documented sightings were noted for Segments 3 or 4 during the current field studies. Therefore, this project will have **no effect** on this species.

Wood Stork (*Mycteria americana*) – The wood stork, now listed as Threatened by the USFWS, is the only true species of stork nesting in the United States. Feeding areas for wood storks include marshes, pools or ditches in which fish congregate. This species typically nests in mixed

woodlands comprised of such overstory species as cypress, gum, and southern willow; pond apple and mangrove swamps may also be utilized for nesting.

Based upon the updated colony map prepared by the USFWS in June 2014, Segment 2 is located within the Core Foraging Areas (CFA - 15 miles from an active nesting colony in Central Florida) of two wood stork colonies (Lawne Lake, Gatorland); Segment 3 is located within the CFA of two wood stork colonies (Lawne Lake, Hontoon Island); and Segment 4 is located within one CFA (Hontoon Island). A wood stork was observed within the Segment 2 project area during field surveys, though foraging areas are available throughout the study area, which include drainage features, small water bodies, stormwater ponds, and the wetlands and shoreline associated with Lake Monroe and the St. John's River.

Utilizing the *Corps of Engineers and U. S. Fish and Wildlife Service Effect Determination Key for the Wood Stork in Central and North Peninsular Florida* (2008), the project is not within 2,500 feet of an active colony site, will likely impact Suitable Foraging Habitat (SFH) of greater than 0.5 acres, and is located within the CFA of three wood stork colonies (Lawne Lake, Gatorland, and Hontoon Island). Additionally, FDOT commits to provide SFH compensation within the Service Area of a Service-approved wetland mitigation bank(s) within the CFA, and the Project is not contrary to the Service's *Habitat Management Guidelines for the Wood Stork in the Southeast Region* and in accordance with the Clean Water Act section 404(b)(1) guidelines. There are numerous currently permitted mitigation banks that include the project corridor within the bank service area that have credits available to offset impacts to SFH (nine banks covering Segment 2, five banks covering Segment 3, and six banks covering Segment 4). The FDOT will coordinate with the permitting agencies during the permitting phase of the project on compensatory mitigation and minimization of impacts to suitable foraging habitat. These actions should result in no net loss of foraging habitat; therefore, the project **may affect, but is not likely to adversely affect** the wood stork.

December 17, 2015 coordination meeting: USFWS indicated that FDOT's proposed mitigation for impacts to wood stork SFH should support this finding. FDOT was asked to provide details on the amount and type of wetland impacts (summarized from the Segments 2, 3, and 4 Wetland Evaluation Reports), as well as more specific details on proposed mitigation banks to be utilized for SFH impacts (see ***Attachment).*** *FDOT confirmed with FHWA that the details of the mitigation bank commitment will be included in the ESBA and EIS Update.*

Florida Scrub-Jay (*Aphelocoma coerulescens coerulescens*) – The Florida scrub-jay, listed as Threatened by both the FFWCC and USFWS, is an endemic species found in Florida scrub habitats. This gregarious jay is a habitat specialist and typically lives in scrub and scrubby flatwoods habitats.

During the original PD&E Study, surveys were conducted for scrub-jays in Segment 2 in two areas near Sand Lake Road and I-4. Since then, both of these areas have been developed and no longer contain any scrub or scrub-like habitat. Regardless, cursory surveys for scrub-jays were conducted in April and May of 2013 and April and May of 2014 to evaluate the presence of this species. No scrub-jays were observed within any proposed right-of-way or pond site areas of Segment 2.

Several stations were sampled for the presence of scrub-jays within Segment 3 during the original PD&E Study at the Lake Mary Boulevard interchange: four stations along the I-4 westbound right-of-way south of Lake Mary Boulevard, and two stations along the off-ramp from I-4 eastbound to Lake Mary Boulevard. Field investigations conducted during the present study indicated that these areas no longer contained any suitable habitat. The areas along I-4 westbound have been developed into multi-family residential units with no natural vegetation remaining, and the area along the eastbound off-ramp has been developed (into a Gander Mountain store), with planted pines as a buffer from the road. Regardless, cursory surveys for scrub-jays were conducted in September 2013 to evaluate the presence of this species. No scrub-jays were observed within any proposed right-of-way or pond site areas of Segment 3.

Within Segment 4, numerous stations were sampled for the presence of scrub-jays at the Saxon Boulevard and SR 472 interchanges, and along both sides of I-4 between the interchanges. Cursory surveys for scrub-jays were conducted in September 2013 to evaluate the presence of this species. During these surveys, at least four scrub-jays were observed responding to a call-back recording north of Saxon Boulevard adjacent to I-4 eastbound, and two more responded when the call was played in the northeastern quadrant of the interchange at SR 472. Two scrub-jays were observed at Pond Site 409 A1/A2 as well. A full five-day scrub-jay survey was conducted in October 2014, to ascertain the population size and potential territory size of the scrub-jays within this segment; a supplemental survey of four additional pond sites was conducted in April 2015.

Based on the results of these formal surveys (Segment 4), scrub-jays were observed at 15 of the 119 stations. These scrub-jays comprise five separate families, of which four intersect with the existing or proposed FDOT right-of-way, including pond sites. Impacts to occupied habitat would occur at three of the locations: Family 1 at the westbound I-4 off-ramp to Saxon Boulevard would impact 0.90 acres of occupied territory; Family 2 along eastbound I-4 at Pond Site 409 A1/A2 would impact 1.22 acres of occupied territory; and Family 3 along I-4 eastbound at Pond Site 409 A1/A2 would impact 2.56 acres of occupied territory. The remaining scrub-jays either occur at a pond site that is not going to have any physical changes (Family 5), occur outside the right-of-way (Family 4), or were single incidental observations. Detailed analysis is provided in the Florida Scrub-jay Survey Technical Memorandum prepared for FDOT

(Appendix E, Segment 4 ESBA). The proposed widening and stormwater ponds may have a direct impact on scrub-jays or scrub-jay habitat. Therefore, based on these survey results (Segment 4), this project **may affect** the Florida scrub-jay.

December 17, 2015 coordination meeting: USFWS will coordinate with the Scrub-Jay recovery lead (Todd Mecklenborg) to verify that FDOT's proposed mitigation for direct/indirect impacts (e.g., TNC contribution for the southwest Volusia metapopulation) is still the preferred mitigation strategy. FDOT (Casey Lyon) suggested the use of construction commitments (e.g., no clearing/grubbing during the nesting season) to prevent actual take of scrub-jays. FDOT (Casey Lyon) confirmed with USFWS that resurvey for Segment 4 would be required, and then noted that because this is marginal habitat, in a few years scrub-jays may no longer be present, thus mitigation would no longer be applicable. Based on USFWS' mitigation input, FDOT will prepare a submittal for FHWA's formal consultation with USFWS on this species. FHWA indicated that the USFWS finding should not constitute a significant determination under NEPA.

Southern Bald Eagle (*Haliaeetus leucocephalus*) – The southern bald eagle was delisted by both the USFWS and FFWCC, though it is still protected under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. The USFWS issued the National Bald Eagle Management Guidelines in May 2007 while Florida adopted a Bald Eagle Management Plan (BEMP) in April 2008, written closely to follow the federal guidelines. The BEMP provides guidelines and recommendations to help people avoid violating state and federal eagle laws, and also outlines strategies to maintain the Florida population of bald eagles at or above current levels. Bald eagles almost always nest in the tops of living or dead tall trees along or very near lakes and rivers; these water bodies provide fish, typically their preferred food. Bald eagles generally avoid areas with extensive human activity, so management guidelines must be considered before any construction can be initiated within 660 feet of an active bald eagle nest.

Eleven bald eagle nests are recorded to be in the general vicinity (within one mile) of the project corridor: four within Segment 2 (OR014, OR015, OR047 and OR077), three within Segment 3 (SE 029, SE 030, and SE 069), and four within Segment 4 (SE061, VO014, VO073, and VO012). However, none of these nests is located within 660 feet of the proposed right-of-way or any of the proposed pond sites. For that reason, the project will have **no effect** on the southern bald eagle.

Mammals

Florida Manatee (*Trichechus manatus latirostris*) - This species is listed as Endangered by both the USFWS and the FFWCC and has designated critical habitat along the St. Johns River and within the western and northern shores of Lake Monroe (Segment 4). These herbivores are found in various types of freshwater, brackish, and marine environments, feeding on the wide

range of aquatic vegetation that these habitats provide. Shallow seagrass beds, with ready access to deep channels, are generally preferred feeding areas. Manatees use springs and freshwater runoff sites for drinking water; secluded canals, creeks, embayments, and lagoons for resting, cavorting, mating, calving and nurturing their young; and open waterways and channels as travel corridors. They occupy different habitats during various times of the year, with a focus on warm water sites during winter. Industrial warm water discharges and deep-dredged areas are used as wintering sites, and stormwater/freshwater discharges provide manatees with drinking water.

The impacts proposed along the roadway at Lake Monroe (Segment 4) will not directly impact the lake but rather the adjacent wetlands which are largely inaccessible to the manatee. Therefore, according to the Corps of Engineers, Jacksonville District, and the State of Florida Effect Determination Key for the Manatee in Florida (April 2013), this project **may affect, but is not likely to adversely affect** the Florida manatee.

December 17, 2015 coordination meeting: FDOT noted that, although inaccessible to manatees, grates will be placed on any culverts being added to I-4 in this area (the culverts are proposed mitigation for white shrimp Essential Fish Habitat). FDOT confirmed with FHWA that the Standard Manatee Conditions for In-Water Work will be included as a commitment in the ESBA and EIS Update.

Federally listed plant species

Within Segment 2, a review of agency databases and field review of the project area indicate that there have been few reported occurrences of federally listed plant species. Twelve federally listed species have the potential to occur within Orange County, though not all habitat types are represented within the project area. Information from the previous PD&E Study (May 2000) indicated that one listed plant was observed, the scrub lupine (*Lupinus aridorum*). The observation was made west of Turkey Lake Road, to the west of the SR 528 Interchange at westbound I-4. Follow up protected plant field surveys covering the area of proposed right-of-way widening and pond sites were conducted in May 2013 and April 2014 (and in January 2015) by project botanists and other biologists. No federally listed plant species were identified within the proposed widening impact area or pond sites during the field investigations.

Within Segment 3, a review of agency databases and field review of the project area indicate that there have been few reported occurrences of federally listed plant species. USFWS currently shows that one federally listed species has been demonstrated to have the potential to occur within Seminole County, the pygmy fringe tree (*Chionanthus pygmaeus*), though other sources have listed the potential for the Okeechobee gourd (*Cucurbita okeechobeensis*) to occur. Information from the previous PD&E Study (May 2000) indicated that no listed plants were observed in this segment. Follow up protected plant field surveys covering the area of proposed

right-of-way widening and pond sites were conducted in May 2013 and April 2015 by project botanists and other biologists. No federally listed plant species were identified within the proposed widening impact area or pond sites during the field investigations; though a potential sighting of the Okeechobee gourd was reported in the floodplain between I-4 and the Wayside Park boat ramp, outside of the proposed project area near the St. Johns River. Confirmation was not definitively made as the observation was not made during flowering season; however, there is no appropriate habitat for this species within the project right-of-way or proposed pond sites.

Within Segment 4, a review of agency databases and field review of the project area indicate that there have been few reported occurrences of federally listed plant species. USFWS currently shows that two federally listed species have been demonstrated to have the potential to occur within Volusia County, the Okeechobee gourd and Rugel's pawpaw (*Deeringothamnus rugelii*). Information from the previous PD&E Study (May 2000) indicated that one listed plant was observed in this segment. Vegetation surveys conducted in 1997 by project scientists identified pigeon wings (*Clitoria fragrans*) in some scrubby areas outside of the right-of-way at the Saxon Boulevard and SR 472 interchanges. This plant is not listed as occurring within Volusia County according to current information provided on the USFWS website. A follow up protected plant field survey covering the area of proposed right-of-way widening and pond sites was conducted in May 2013 by project botanists and other biologists. Habitat for both pigeon wings and Rugel's pawpaw does exist along the project corridor, though considerable changes to the land uses where previous sightings were made have occurred since 1997. No federally listed plant species were identified within the proposed widening impact area or pond sites during the field investigations.

For Segments 2, 3 and 4, no federally listed plants were observed during any of the field reviews; therefore, no direct or indirect impacts to federally listed plant species are likely to occur. Thus, a finding of **may affect, not likely to adversely affect** is applicable for any of the federally listed plant species described above.

December 17, 2015 coordination meeting: FDOT noted that although the Federally-listed scrub lupine was not identified within Segment 2, it was identified within the adjacent Segment 1 (the ESBA for that segment will be transmitted to USFWS as a separate consultation).

We ask that USFWS review the ESBAs for **Segments 2, 3 and 4** and provide concurrence with FDOT's determinations for these species. Note that for the Florida scrub-jay, a separate FHWA submittal for initiation of formal consultation will be provided. We appreciate the coordination effort and input already provided and look forward to continued consultation on this project. If you have any questions, feel free to contact either Catherine Owen at (386) 943-5383, catherine.owen@dot.state.fl.us or me at (386) 943-5411, william.walsh@dot.state.fl.us at your convenience. Thank you for your assistance with this project.

Sincerely,

William G. Walsh
Environmental Manager
FDOT, District Five

wgw/cbo

Cc: Cathy Kendall, FHWA
Casey Lyon, FDOT
Beata Stys-Palasz, FDOT
Mike Drauer, Stantec

Attachment (4 pages): Wetland Impact Breakdown and Available Wetland Mitigation

Wetland Impact Breakdown

Segment 2 Summary of Proposed Jurisdictional Wetlands/Other Surface Water Impacts (Type and Hydrologic Basin)			
Hydrological Basin	**Forested Wetlands (acres)**	**Herbaceous Wetlands (acres)**	**Other Surface Waters (acres)**
Shingle Creek	4.43	0.00	9.32
Totals	4.43	0.00	9.32

Segment 3 Summary of Proposed Jurisdictional Wetlands/Other Surface Water Impacts (Type and Hydrologic Basin)			
Hydrological Basin	**Forested Wetlands (acres)**	**Herbaceous Wetlands (acres)**	**Other Surface Waters (acres)**
Lake Jesup Basin	--	0.91	1.65
Wekiva River Basin	0.07	--	--
St. Johns River (Canaveral Marshes to Wekiva)	11.29	--	5.01
Totals	11.36	0.91	6.66

Segment 4 Summary of Proposed Jurisdictional Wetlands/Other Surface Water Impacts (Type and Hydrologic Basin)			
Hydrological Basin	**Forested Wetlands (acres)**	**Herbaceous Wetlands (acres)**	**Other Surface Waters (acres)**
St. Johns River (Canaveral Marshes to Wekiva)	20.49	50.11	23.57
St. Johns River (Wekiva to Walaka)	0.00	2.06	17.62
Totals	20.49	52.17	41.19

Available Wetland Mitigation

SEGMENT 2 AVAILABLE MITIGATION SERVICE AREAS & CREDITS WITHIN THE SHINGLE CREEK BASIN		
MITIGATION BANK (MB)	**MITIGATION SERVICE AREA**	**CREDIT AVAILABILITY/TYPE**
HATCHINEHA RANCH MITIGATION BANK	SHINGLE CREEK	50 FORESTED UMAM CREDITS
SOUTHPORT MITIGATION BANK	SHINGLE CREEK	170 FORESTED AND HERBACEOUS UMAM CREDITS
REEDY CREEK MITIGATION BANK	SHINGLE CREEK	60 FORESTED UMAM CREDITS
BULLFROG BAY MITIGATION BANK	SHINGLE CREEK	14 FORESTED AND HERBACEOUS UMAM CREDITS

SEGMENT 3 AVAILABLE MITIGATION SERVICE AREAS & CREDITS WITHIN THE ST. JOHNS RIVER (CANAVERAL MARSHES TO WEKIVA), LAKE JESUP, WEKIVA RIVER BASINS		
MITIGATION BANK (MB)	**MITIGATION SERVICE AREAS**	**CREDIT AVAILABILITY/TYPE**
LAKE MONROE MITIGATION BANK	ST. JOHNS RIVER (CANAVERAL MARSHES TO WEKIVA)	46.55 FORESTED UMAM CREDITS
BARBERVILLE MITIGATION BANK	ST. JOHNS RIVER (CANAVERAL MARSHES TO WEKIVA)	3.98 FORESTED UMAM CREDITS
COLBERT CAMERON MITIGATION BANK	ST. JOHNS RIVER (CANAVERAL MARSHES TO WEKIVA) & LAKE JESUP	147.09 FORESTED AND HERBACEOUS UMAM CREDITS
FARMTON NORTH MITIGATION BANK	ST. JOHNS RIVER (CANAVERAL MARSHES TO WEKIVA) & LAKE JESUP	822.69 FORESTED AND HERBACEOUS UMAM CREDITS
FARMTON SOUTH MITIGATION BANK	ST. JOHNS RIVER (CANAVERAL MARSHES TO WEKIVA) & LAKE JESUP	433.61 FORESTED AND HERBACEOUS UMAM CREDITS

SEGMENT 3 AVAILABLE MITIGATION SERVICE AREAS & CREDITS WITHIN THE ST. JOHNS RIVER (CANAVERAL MARSHES TO WEKIVA), LAKE JESUP, WEKIVA RIVER BASINS		
MITIGATION BANK (MB)	**MITIGATION SERVICE AREAS**	**CREDIT AVAILABILITY/TYPE**
FARMTON WEST MITIGATION BANK	ST. JOHNS RIVER (CANAVERAL MARSHES TO WEKIVA) & LAKE JESUP	348.63 FORESTED AND HERBACEOUS UMAM CREDITS
TM ECON MITIGATION BANK(PHASE I, II, III)	ST. JOHNS RIVER (CANAVERAL MARSHES TO WEKIVA) & LAKE JESUP	388.14 FORESTED AND HERBACEOUS UMAM CREDITS
TM ECON MITIGATION BANK (PHASE IV)	ST. JOHNS RIVER (CANAVERAL MARSHES TO WEKIVA) & LAKE JESUP	164.83 FORESTED AND HERBACEOUS UMAM CREDITS
BLACKWATER CREEK MITIGATION BANK	ST. JOHNS RIVER (CANAVERAL MARSHES TO WEKIVA) & WEKIVA RIVER	15.75 FORESTED AND HERBACEOUS UMAM CREDITS
WEKIVA RIVER MITIGATION BANK	WEKIVA RIVER & A PORTION OF ST. JOHNS RIVER (CANAVERAL MARSHES TO WEKIVA)	30.0 FORESTED AND HERBACEOUS UMAM CREDITS

SEGMENT 4 AVAILABLE MITIGATION SERVICE AREAS & CREDITS WITHIN THE ST. JOHNS RIVER (CANAVERAL MARSHES TO WEKIVA) AND ST. JOHNS RIVER (WEKIVA TO WALAKA) HYDROLOIC BASINS		
MITIGATION BANK (MB)	**MITIGATION SERVICE AREAS**	**CREDIT AVAILABILITY/TYPE**
TOSOHATCHEE STATE RESERVE	ST. JOHNS RIVER (CANAVERAL MARSHES TO WEKIVA)	32.54 FORESTED UMAM Credits
LAKE MONROE MITIGATION BANK	ST. JOHNS RIVER (CANAVERAL MARSHES TO WEKIVA)	46.55 FORESTED UMAM Credits

SEGMENT 4 AVAILABLE MITIGATION SERVICE AREAS & CREDITS WITHIN THE ST. JOHNS RIVER (CANAVERAL MARSHES TO WEKIVA) AND ST. JOHNS RIVER (WEKIVA TO WALAKA) HYDROLOIC BASINS		
MITIGATION BANK (MB)	**MITIGATION SERVICE AREAS**	**CREDIT AVAILABILITY/TYPE**
BARBERVILLE MITIGATION BANK	ST. JOHNS RIVER (CANAVERAL MARSHES TO WEKIVA) & ST. JOHNS RIVER (WEKIVA TO WALAKA)	3.98 FORESTED UMAM Credits
COLBERT CAMERON MITIGATION BANK	ST. JOHNS RIVER (CANAVERAL MARSHES TO WEKIVA)	147.09 FORESTED AND HERBACEOUS UMAM CREDITS UMAM Credits
FARMTON NORTH MITIGATION BANK	ST. JOHNS RIVER (CANAVERAL MARSHES TO WEKIVA) & ST. JOHNS RIVER (WEKIVA TO WALAKA)	822.69 FORESTED AND HERBACEOUS UMAM CREDITS UMAM Credits
FARMTON SOUTH MITIGATION BANK	ST. JOHNS RIVER (CANAVERAL MARSHES TO WEKIVA) & ST. JOHNS RIVER (WEKIVA TO WALAKA)	433.61 FORESTED AND HERBACEOUS UMAM CREDITS UMAM Credits
FARMTON WEST MITIGATION BANK	ST. JOHNS RIVER (CANAVERAL MARSHES TO WEKIVA) & ST. JOHNS RIVER (WEKIVA TO WALAKA)	248.63 FORESTED AND HERBACEOUS UMAM CREDITS UMAM Credits
TM ECON MITIGATION BANK PHASES 1, 2 & 3	ST. JOHNS RIVER (CANAVERAL MARSHES TO WEKIVA)	388.14 FORESTED AND HERBACEOUS UMAM CREDITS UMAM Credits
TM ECON MITIGATION BANK PHASE IV	ST. JOHNS RIVER (CANAVERAL MARSHES TO WEKIVA)	164.83 FORESTED AND HERBACEOUS UMAM CREDITS UMAM Credits
BLACKWATER CREEK MITIGATION BANK	ST. JOHNS RIVER (WEKIVA TO WALAKA)	15.75 FORESTED AND HERBACEOUS UMAM CREDITS UMAM Credits

January 28, 2015
File: 2024.230168

Attention: Jane Chabre
Florida Fish and Wildlife Conservation Commission
Office of Conservation Planning Services
620 South Meridian Street, Mail Station 5B5
Tallahassee, FL 32399-1600

Via Email: FWCConservationPlanningServices@myfwc.com

Reference: **SR 400 (I-4) Project Development and Environment (PD&E) Study**
Segment 4: Segment 4: from East of SR 15/600 (US 17/92) to ½ mile east of SR 472
Volusia County, FL

Dear Ms. Chabre;

The Florida Department of Transportation (FDOT) District 5 is conducting a PD&E Study on SR 400 (I-4) as part of the overall corridor project for the I-4 Beyond the Ultimate design. The project limits for the segment analyzed in this report are within an approximate ten (10) mile segment of I-4 which extends from east of US 17/92 to east of SR 472, from Milepost 0.086 to 10.227 in Volusia County (herein referred to as I-4, Segment 4) The study area in this section from east of US 17/92 to east of SR 472 includes the interchanges at Dirksen Drive/Debary Avenue, Saxon Boulevard and SR 472/Howland Boulevard. A new interchange with I-4 providing direct access only to the express lanes is proposed to be constructed about halfway between Saxon Boulevard and SR 472, with the Rhode Island Avenue extension. The required stormwater treatment will be provided with 40 pond sites along the corridor including proposed alternatives and treatment swales. A previous study was conducted in 1998, though a Record of Decision was not reached with the Federal Highway Administration. This segment along with three additional segments to the south of Orlando and the are included in the larger PD&E study to enable FDOT to have completed Records of Decision or Findings of No Significant Impact on all potential segments of the I-4 Ultimate design. The project consists of the widening of the roadway from the current configuration of a nominal 4-lane divided interstate highway to a nominal 6-lane divided interstate highway with an additional two managed lanes in each direction.

At this time, we are seeking your concurrence with a species list for potential species and habitat along the project corridor that should be included in the ongoing investigation for this project. Stantec Consulting Services Inc. conducted a background literature search to determine the legally protected species that have the potential to occur in Volusia County as listed by the Florida Fish and Wildlife Conservation Commission (FFWCC) and the United States Fish and Wildlife Service (USFWS). Protected Species lists were compiled using Stantec's computer database containing species occurrence by county and habitat type. These species lists were then customized to include only the species that have the potential to occur within the habitats that occur on this Project site. The database was developed by reviewing current scientific literature and consulting the most current observation and distribution records maintained by the Florida Natural Areas Inventory (FNAI). Listed species descriptions and potential occurrences are described below.

Federally Listed Species

Reptiles
Eastern Indigo Snake (Drymarchon corais couperi) – The eastern indigo snake, listed by both the FFWCC and the USFWS as Threatened, is a habitat generalist, using a variety of habitats from mangrove swamps to xeric uplands. These snakes are cold-sensitive and require gopher tortoise burrows, other animal holes, or

stumps for protection during winter months. These snakes require large tracts of natural, undisturbed habitat, and prefer to forage in and around wetlands for their preferred prey – other snakes. Numerous burrows were located within the project area and the potential for indigo snakes is moderate, though no indigo snakes were observed during field studies. If an eastern indigo snake is observed during construction, the contractor will be required to cease any operation that might cause harm to the snake. If the eastern indigo snake does not move away from the construction area, both the FFWCC and USFWS will be contacted. An effects determination was made by utilizing the USFWS Programmatic Key for the Eastern Indigo Snake (January 2010, updated August 2013). In accordance with the key, the project will implement the Standard Protection Measures for the Eastern Indigo Snake (USFWS, 2013), but may impact more than 25 acres of xeric habitat (scrub, sandhill, or scrubby flatwoods) and likely has more than 25 active and inactive gopher tortoise burrows. Therefore, the project would merit a **may affect** determination under the key. The Department will make the commitment to have permits conditioned such that all active and inactive gopher tortoise burrows will be evacuated prior to site manipulation in the vicinity of the burrow, and may then qualify for a **may affect, not likely to adversely affect** determination.

Avians

Snail kite (*Rostrhamus sociabilis plumbeus*) – The snail kite is listed as Endangered by both the USFWS and the FFWCC. This non-migratory, medium-sized raptor utilizes large open freshwater marsh habitats and lakes with shallow water. Nests are usually located in a low tree or shrub at the water's edge. The main staple of their diet is the apple snail, lending to their name. The project does occur within the USFWS consultation area for the snail kite though no observations have been documented within or near the project corridor. Adequate nesting and foraging habitat are located adjacent to the project area, but none of it occurs within the proposed right-of-way or pond site areas. Therefore, this project will have **no effect** on this species.

Florida Scrub-Jay (*Aphelocoma coerulescens coerulescens*) – The Florida scrub-jay, listed as Threatened by both the FFWCC and USFWS, is an endemic species found in Florida scrub habitats. This gregarious jay is a habitat specialist and typically lives in scrub and scrubby flatwoods habitats. Suitable habitat classified as Type I, Type II, and Type III habitat is located within the project corridor. During the initial PD&E field work in 1996-1998, numerous stations were sampled for the presence of scrub-jays at the interchanges at Saxon Boulevard and SR 472, and along both sides of I-4 between the interchanges. Cursory surveys for scrub-jays were conducted in September of 2013 to evaluate the presence of this species. During these surveys, at least four scrub-jays were observed responding to a call-back recording north of Saxon Boulevard adjacent to I-4 eastbound, and two more responded when the call was played in the northeastern quadrant of the interchange at SR 472. Two scrub-jays were observed at Pond Site 420 A-1/A-2 as well. A full five-day scrub-jay survey was conducted in October of 2014 to ascertain the population size and potential home range of scrub-jays within the project corridor.

Based on the results of the 2014 formal survey, scrub-jays were observed at 11 of the 101 stations. These scrub-jays comprise four (4) separate families of which three (3) intersect with the FDOT right-of-way. The remaining scrub-jays are either outside the right-of-way or were single incidental observations. Detailed analysis is provided in the Florida Scrub-jay Survey Technical Memorandum prepared for FDOT. The proposed widening and stormwater ponds may have a direct impact on scrub-jays or scrub-jay habitat. Therefore, this project **may affect** this species.

Red-Cockaded Woodpecker (*Picoides borealis*) – This species is listed as Endangered by the USFWS and Threatened by the FFWCC. The colonial red-cockaded woodpecker (RCW) is a habitat specialist, requiring stands of over-mature pine that have contracted the red-heart disease. RCW's require diseased trees for cavity building, which they use for nest and roost cavities. Preferred pine stands need to have a fairly open canopy, with a sparse subcanopy to allow easy flight. RCWs must also have ample foraging habitat consisting of younger pines surrounding the cavity trees. No suitable nesting habitat was observed in the

impact area within the project limits. The project occurs within the designated USFWS consultation area, though is not documented as having any nesting birds recorded within the project vicinity. The previous PD&E Study (May 2000) indicated no suitable habitat or any documented RCW sightings within the proposed right-of-way or pond sites. Therefore, this project will have **no effect** on the red-cockaded woodpecker.

Mammals

Florida Manatee (*Trichechus manatus latirostris*) - This species is listed as Endangered by both the USFWS and the FFWCC and has designated critical habitat along the St. Johns River and within the western and northern shores of Lake Monroe. Florida manatees are found in freshwater, brackish, and marine environments. Typical coastal and inland habitats include coastal tidal rivers and streams, mangrove swamps, salt marshes, freshwater springs, and vegetated bottoms. As herbivores, manatees feed on the wide range of aquatic vegetation that these habitats provide. Shallow seagrass beds, with ready access to deep channels, are generally preferred feeding areas in coastal and riverine habitats (Smith 1993). Manatees use springs and freshwater runoff sites for drinking water; secluded canals, creeks, embayments, and lagoons for resting, cavorting, mating, calving and nurturing their young; and open waterways and channels as travel corridors. Manatees occupy different habitats during various times of the year, with a focus on warm water sites during winter. Manatees have also adapted to changing ecosystems in Florida. Industrial warm water discharges and deep-dredged areas are used as wintering sites, stormwater/freshwater discharges provide manatees with drinking water, and the imported exotic plant, *Hydrilla* sp. has become an important food source at some wintering sites. The impacts proposed along the roadway at Lake Monroe will not directly impact the lake but rather the wetlands adjacent which are largely inaccessible to the manatee, and therefore, according to the Corps of Engineers, Jacksonville District, and the State of Florida Effect Determination Key for the Manatee in Florida (April 2013) this project **may affect, but is not likely to adversely affect** the Florida manatee.

Wood Stork (*Mycteria americana*) – This species, listed as Endangered by both the USFWS and the FFWCC, is the only true species of stork nesting in the United States. Currently, a proposal by USFWS to downgrade the status of US breeding populations of wood storks from endangered to threatened is in under way. This proposed reclassification would not change any conservation or protection measures for the wood stork under the Endangered Species Act (ESA), rather it would recognize the recovery and the positive impact that conservation efforts have had on breeding populations of storks. Feeding areas for wood storks include marshes, pools, or ditches in which fish congregate. This species typically nests in mixed woodlands comprised of such overstory species as cypress, gum, and southern willow; pond apple and mangrove swamps may also be utilized for nesting.

According to the USFWS data, the project is located within the 15-mile Core Foraging Area (CFA) of a wood stork colony (Hontoon Island Colony). Foraging areas within the study area include drainage features, small water bodies, stormwater ponds, and the wetlands and shoreline associated with Lake Monroe and the St. John's River. Compensation for wetland impacts that are unavoidable, including impacts to potential wood stork foraging habitat, will be mitigated for during permitting where wetland functional assessment results will compare the impacts with the proposed mitigation to ensure a balance is maintained in the drainage basin; therefore, there should be no net loss of wood stork foraging habitat. Utilizing the ACOE Wood Stork Key for Central and North Peninsular Florida (September 2008), the project will likely have impacts to Suitable Foraging Habitat within a CFA. FDOT will commit to provide compensation for foraging area impacts via mitigation through a Service-approved site; therefore, this project **may affect, but is not likely adversely affect** the wood stork.

***Southern Bald Eagle (*Haliaeetus leucocephalus*)** – The southern bald eagle was delisted from both the US Endangered Species Act and FFWCC imperiled list, though it is still protected under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. The USFWS issued the National Bald Eagle Management Guidelines in May 2007 while Florida adopted a Bald Eagle Management Plan (BEMP) in April 2008, written closely to follow the federal guidelines. The BEMP provides guidelines and recommendations

to help people avoid violating state and federal eagle laws. The BEMP also outlines strategies to maintain the Florida population of bald eagles at or above current levels. The BEMP goal is to, "maintain a stable or increasing population of eagles in Florida in perpetuity." Bald eagles almost always nest in the tops of living or dead tall trees along or very near lakes and rivers; these water bodies provide fish, typically their preferred food. Bald eagles generally avoid areas with extensive human activity, so management guidelines must be considered before any construction can be initiated within 660 feet of an active southern bald eagle nest. A juvenile bald eagle was observed flying over I-4 at the northern end of the St. John's River Bridge. Four bald eagles nests are recorded to be in the general vicinity (within 1 mile) of the project corridor (SE061, VO014, VO073, and VO012). However, none of these nests are located within 660 feet of the proposed right-of-way or any of the proposed pond sites. For that reason, the project will have **no effect** on the southern bald eagle.

*The bald eagle is not federally designated as Endangered or Threatened, but it is protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d).

Osprey (Pandion haliaetus) – The osprey, also known as the fish hawk, are expert anglers that typically share the same habitat as bald eagles but are smaller in size. Ospreys build large stick nests located in the tops of large living or dead trees and on manmade structures such as utility poles, channel markers and nest platforms. They are listed as a Species of Special Concern by FFWCC only in Monroe County, but are also still protected under the Migratory Bird Treaty Act. Permits are required throughout the state to remove a nest for these raptors, however, a replacement structure must be erected to mitigate the removal of the nest. Some nests have been observed along the banks of Lake Monroe and the St. Johns River. Should any nests found along the corridor be subject to impacts, a nest removal permit will be applied for from FFWCC. Therefore, this project may affect but not likely adversely affect the osprey.

** The osprey is protected under the Migratory Bird Treaty Act (16 U.S.C. 703-712; Ch. 128; July 13, 1918; 40 Stat. 755) as amended.

FEDERALLY LISTED PLANT SPECIES

A review of agency databases and a field review of the project corridor indicate that there have been few reported occurrences of federally listed plant species within the proposed project area. USFWS currently shows that two (2) federally listed species have been demonstrated to have the potential to occur within Volusia County, the Okeechobee gourd (*Cucurbita okeechobeensis*) and Rugel's pawpaw (*Deeringothamnus rugelii*) (see Table 2, Appendix B). Information from the previous PD&E Study (May 2000) indicated that one listed plant was observed in this segment. Vegetation surveys conducted in 1997 by project scientists identified pigeon wings (*Clitoria fragrans*) in some scrubby areas outside of the right-of-way at the Saxon Boulevard interchange and SR 472 interchange. This plant is not listed as occurring within Volusia County according to current information provided on the USFWS website. A follow up protected plant field survey covering the area of proposed right-of-way widening and pond sites was conducted in May 2013 by project botanists and other biologists. No federally listed plant species were identified within the proposed widening impact area or pond sites during the field investigations; though a potential siting of the Okeechobee gourd was made in the floodplain between I-4 and the Wayside Park boat ramp (west of I-4 at the US 17/92 interchange which is outside the project footprint). Confirmation was not definitively made as the observation was not made during flowering season. Habitat for both pigeon wings and Rugel's pawpaw does exist along the project corridor though considerable changes to the land uses where previous sightings were made have occurred since 1997. No direct or indirect impacts to federally listed plant species are likely to occur and this project should have **no effect** on any of the federally listed plant species.

State Listed Species

Mammals

Florida Mouse (*Podomys floridanus*) – This mouse, listed as a Species of Special Concern by the FFWCC, is one of the two mammal species that are endemic to Florida. It typically lives within gopher tortoise burrows in fire-maintained, xeric uplands. Sub-optimal habitat exists in the xeric uplands that contain gopher tortoise burrows, such as mesic flatwoods (4110), sand pine scrub (4130), and sand pine plantations (4410). Numerous gopher tortoise burrows were located within the project area, but no Florida mice were observed during field surveys. If gopher tortoise burrows are proposed to be impacted, then the relocation of gopher tortoises and their burrow commensals will be conducted prior to construction. Because of this, the project **may affect but not likely adversely affect** the Florida mouse.

Sherman's Fox Squirrel (*Sciurus niger shermani*) – The Sherman's fox squirrel, listed by the FFWCC as a Species of Special Concern, is the largest of the three fox squirrel subspecies that occur in Florida. They have large ranges that can span over 80 acres. Optimum habitat for this subspecies is predominantly longleaf pine-turkey oak sandhills, although they are also reported to occur in mesic forested areas, as well. Some potential habitat is present within the project area, although Sherman's fox squirrels were not observed during the site investigations for this project. The amount of potential habitat for this species impacted by the project will be minimal. Therefore, the proposed project **may affect but not likely adversely affect** the Sherman's fox squirrel.

***Florida Black Bear (*Ursus americanus floridanus*)** – The Florida black bear is a very wide-ranging species formerly listed as Threatened by the FFWCC. Preferred habitat of the black bear includes dense forest, both upland and wetland, but the bear is often encountered in other areas during its seasonal movements. The bear was removed from the list in August 2012 after the approval of the Florida Black Bear Management Plan. The plan was implemented to set a strategy in place to address challenges in bear management, to manage for a sustainable bear population state-wide, and reduce human-bear conflicts. Going forward, FFWCC will continue to engage with landowners and regulating agencies to guide future land use to be compatible with the objectives of the Bear Management Plan. The plan divides the state into seven Bear Management Units (BMU's) which support the seven sub-populations of bear across the state. The project occurs within the Central BMU, which includes Alachua, Bradford, Brevard, Clay, Flagler, Lake, Marion, Orange, Putnam, Seminole, St. Johns, Sumter, and Volusia counties and contains the Ocala/St. Johns subpopulation, named after the Ocala National Forest and St. Johns River watershed. The Central BMU is the only BMU with a subpopulation estimated at 1,000 bears (the highest in the state), which is one of the criteria that determine a species risk for extinction. Black bears are common in Volusia County, especially to the north of the project corridor where bear kills on the I-4 have been recorded. FDOT will make a commitment to work with FFWCC to provide project enhancements such as wildlife fencing to attempt to minimize bear kills in the corridor, though it is not reasonable to provide wildlife crossings in this mostly urban area. As no further fragmentation of bear habitat is proposed, the project **may affect but not likely adversely affect** the Florida black bear.

*The Florida black bear is no longer listed by the State, though an impact analysis within known bear population areas may be requested under the Florida Black Bear Management Plan.

Reptiles

Florida Pine Snake (*Pituophis melanoleucus mugitus*) – This snake, listed as a Species of Special Concern by the FFWCC, is another tortoise burrow commensal organism, utilizing both tortoise burrows and the tunnels of pocket gophers (*Geomys pinetis*) for feeding and shelter. Preferred habitat of the pine snake is xeric uplands, and to a lesser extent, flatwoods and other mesic uplands. Some habitat is available within the project, especially where gopher tortoise burrows and pocket gopher mounds were observed (**see Figure E,**

Appendix A). Both the pocket gophers and the pine snakes live nearly their whole lives underground and are very hard to observe directly. Earth work in suitable habitat may impact subterranean pine snakes. As a precaution, the construction contractor will be advised to the potential presence of the species and its protected status. With implementation of the aforementioned precautionary guidelines and the relocation of commensal organisms from gopher tortoise burrows if impacted, the project **may affect but not likely adversely affect** this species.

Gopher Tortoise (*Gopherus polyphemus*) – The occurrence of this species, listed as Threatened by the FFWCC and as a Candidate species by USFWS, is a key factor in the determination of habitat suitability for certain other listed species because of the large number of other animals that use tortoise burrows for one or more of their life requisites. While it is common to find gopher tortoise burrows in most types of upland communities, the preferred habitats include xeric uplands and disturbed, ruderal areas.
Approximately 23 burrows were observed along the corridor within the right-of-way and proposed potential ponds sites during a preliminary survey. It is likely that impacts to these areas cannot be avoided; therefore relocation of the tortoises and their commensals will be necessary. A conservation permit should be applied for from the FFWCC, and the relocation of any burrows to be impacted should be carried out within 30 days of construction (see **Figure E, Appendix A**). As FDOT will make the commitment to relocate all potentially impacted gopher tortoise burrows, the project **may affect but not likely adversely affect** the gopher tortoise.

Short-tailed snake (*Stilosoma extenuatum*) – The short-tailed snake, listed as Threatened by the FFWCC, belongs to a monotypic genus that is endemic to Florida. Rarely seen due to its earth-burrowing tendencies, it is restricted to xeric uplands, primarily longleaf pine-turkey oak sandhills and sand pine scrub, for its habitat requirements. Herpetologist Paul Moler (FFWCC-retired) reports short-tailed snakes occur in a wider range of ecosystems than indicated in the scant literature on the species, and may be found where prey (small snakes) and loose soils occur in North-Central Florida. Suitable habitat (sand pine scrub) is not present on this project, nor was any of these snakes observed during any field surveys. As some areas of xeric habitat exist, the project **may affect but not likely adversely affect** the short-tailed snake.

Amphibians
Gopher Frog (*Rana capito*) – The gopher frog, listed by the FFWCC as a Species of Special Concern, is a gopher tortoise burrow commensal organism, using tortoise burrows for shelter. Prime gopher frog habitat includes xeric uplands, especially longleaf pine-turkey oak associations with nearby (i.e. within one mile) seasonally flooded marshes or ponds. Field biological surveys have shown that gopher tortoise burrows were located throughout the project corridor, though no gopher frogs were observed. If gopher tortoise burrows are impacted, then this species could be impacted as well, though the excavation of any potentially occupied burrows and the relocation of any gopher tortoises and their burrow commensals should offset any impacts to this species. Therefore, the project **may affect but not likely adversely affect** the gopher frog.

Avians
Florida Sandhill Crane (*Grus canadensis pratensis*) – This non-migratory subspecies, listed as Threatened by the FFWCC, can often be seen foraging in improved pastures, open fields and along the roadside. During the winter months, it is distinguished from its migratory northern cousins by its smaller size and more delicate stature. Sandhill cranes nest in freshwater marshes and feed in adjacent fields and pastures. Adequate nesting habitat is found within the freshwater marshes located adjacent to the project corridor, and foraging habitat was found within the project limits. Sandhill cranes were observed flying over the project area several times during multiple surveying events, and were observed foraging at Pond Site 406A. No evidence of nests was observed within the project area. The proposed project **may affect but not likely to adversely affect** the sandhill crane.

Least tern (*Sterna antillarum*) – Historically, least terns nested on sandy beaches and lakeshores, but presently, they nest almost exclusively on man-made substrates such as spoil islands and gravel rooftops.

This small tern, listed as Threatened by the FGFWFC, is still fairly common in localized areas. However, none have been reported in the project study area. Prime nesting areas are minimal, so this species has only a low possibility of occurring along the project corridor, therefore the proposed project will have **no effect** on the least tern.

Southeastern American Kestrel *(Falco sparverius paulus)* – This resident subspecies of the kestrel, listed as Threatened by the FFWCC, can be distinguished from its cousin, *F. s. sparverius*, a winter migrant, by its smaller size. The Southeastern kestrel requires three components for optimal habitat: large, open fields for foraging, snags for nesting, and snags, fence lines or telephone poles as perching sites from which to hunt. No kestrels were observed along the project corridor, nor within any pond sites or along the portion of the project to be widened. No areas within the project corridor meet this definition for optimal habitat. Therefore, this project **may affect but not likely to adversely affect** this species.

Wading Birds – Wading bird rookeries were not observed and are not known to occur within or adjacent to the study area. Potential foraging habitat for limpkin (*Aramus guarana)*, little blue heron (*Egretta caerulea),* roseate spoonbill (*Ajaia ajaja),* white ibis (*Eudocimus albus*), tri-colored heron (*Egretta tricolor*), and snowy egret (*Egretta thula*), all classified as Species of Special Concern (SSC) by the FFWCC, occurs within the limits of the study area. Little blue heron, snowy egret, and white ibis were observed during field surveys. No wetlands providing critical foraging or nesting habitat for these avian species will be impacted by the proposed project and indirect impacts to wading birds are not anticipated. Therefore, the proposed project **may affect but not likely to adversely affect** the wading bird population in the region.

STATE LISTED PLANT SPECIES

A review of available information revealed that 55 state listed plant species have the potential to occur within the habitats located within the project area in Volusia County (see Table 2, Appendix B). One state listed plant species was observed during the field assessment of project area or during the previous PD&E Study (May 2000). Vegetation surveys conducted in 1997 identified Garberia (*Garberia heterophylla*) within scrubby areas north of Saxon Boulevard. This plant is locally common in this area and was identified during listed plant surveys conducted in May 2013 and is identified on the Listed Species Observation Maps (**Figure E** in **Appendix A**). Therefore, the proposed project **may affect but not likely to adversely affect** state listed plant species.

This project is also being coordinated with the US Fish and Wildlife Service. If you have any questions, please contact Mike Drauer at (407) 765-1661.

Thank you for taking the time to provide assistance with this project.

Regards,

Mike Drauer
Senior Project Manager
Tel:407-585-0157
Fax: 407-585-0158
Mike.Drauer@stantec.com

Attachment: Figures

Florida Fish and Wildlife Conservation Commission

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Brian Yablonski
Vice Chairman
Tallahassee

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February 12, 2015

Mr. Mike Drauer
Senior Project Manager
Stantec Consulting Services, Inc.
Mike.Drauer@Stantec.com

Re: SR 400 (I-4) Project Development and Environment (PD&E) Study, Segment 4: from east of US 17/92 to one-half mile east of SR 472, Volusia County, potential list of protected species

Dear Mr. Drauer:

The Florida Fish and Wildlife Conservation Commission (FWC) staff has reviewed the proposed list of protected species potentially affected by the above-referenced project, prepared as part of the Project Development and Environment Study, and we believe that it is complete except for the American alligator (federally listed as threatened due to similarity with the American crocodile). Although most Endangered Species Biological Assessments within PD&E Studies include the alligator in the discussion of potentially affected species, project impacts to alligators are not why this species was listed under the Endangered Species Act.

We also support your proposed effect determinations and project commitments for each species, although we recommend the addition of pre-construction surveys for nests of Florida sandhill cranes and Sherman's fox squirrels, and coordination with FWC as appropriate.

We look forward to the opportunity to review the Endangered Species Biological Assessment, or its equivalent, in the future.

Sincerely,

Jennifer D. Goff
Land Use Planning Program Administrator
Office of Conservation Planning Services

jdg/bb
ENV 1-13-2
SR 400 (I-4) PDE Segment 4_20566_021215

APPENDIX E
Florida Scrub-Jay
Technical Memorandum

FDOT

SR 400 (I-4) Project Development and Environment (PD&E) Study
FM No.: 432100-1-22-01

Florida Scrub-Jay Survey Technical Memorandum

Segment 4: from east of SR 15/600 (US 17/92) to ½ mile east of SR 472

Volusia County (79110)

July 2015

Stantec
615 Crescent Executive Court
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Lake Mary, FL 32746

HNTB Corporation
610 Crescent Executive Court
Suite 400
Lake Mary, FL 32746

4 EXPRESS

FLORIDA SCRUB-JAY SURVEY

TECHNICAL MEMORANDUM

Date: July 2015

To: FDOT District 5 through HNTB Corporation

From: Stantec Consulting Services, Inc.

Subject: PD&E Study for Interstate 4 Beyond the Ultimate Segment 4: from east of SR 15/600 (US 17/92) to ½ mile east of SR 472

Re: Florida Scrub-Jay Survey

Project Description

The Florida Department of Transportation (FDOT) is proposing to reconstruct and widen I-4 as part of the I-4 Beyond the Ultimate (BtU) concept. This involves the build-out of I-4 to its ultimate condition through Central Florida, including segments in Polk, Osceola, Orange, Seminole, and Volusia Counties. The concept design under evaluation in this Project Development and Environment (PD&E) study proposes the addition of two (2) new express lanes in each direction giving it a total of ten (10) dedicated lanes.

Segment 4 of this study is from east of SR 15/600 (US 17/92) to ½ mile east of SR 472 and includes the interchanges at Dirksen Drive/DeBary Avenue, Saxon Boulevard, and SR 472 (Howland Boulevard) and provides for the required stormwater treatment with a number of potential pond sites and treatment swales along the corridor (see **Figure 1**). The typical section developed includes a 44-foot transit envelope and will be contained within the existing right-of-way in nearly all areas with the exception of the proposed interchange at Rhode Island Avenue and some of the proposed pond sites.

This project is currently undergoing an analysis of the effects of the proposed roadway improvements. As part of this evaluation, it was determined that the habitats within and adjacent to the corridor could potentially be occupied by the Florida scrub-jay (*Aphelocoma coerulescens*). As such, species-specific surveys were conducted in October 2014 and April 2015 to evaluate the corridor for occurrences of this species. The purpose of this technical memorandum is to summarize the results of this survey.

Species Description

The Florida scrub-jay is listed as threatened by both the US Fish and Wildlife Service (USFWS) and Florida Fish and Wildlife Conservation Commission (FWC). This bird is similar to the common blue jay in size and shape, but with a pale blue crestless head, nape, wings, and tail. Sexes cannot be distinguished by plumage; however, immature birds have a dusty brown head and neck.

The scrub-jay is a habitat specialist, primarily inhabiting xeric oak scrub habitats. Other habitats utilized include sand pine scrub, xeric pines, and agricultural or residential lands where scrub oaks have been retained. Scrub-jays prefer areas with open sandy patches to cache large quantities of scrub oak acorns.

Nesting for this species occurs from late February through June. Nests typically have one to five eggs and incubate for 17 days. Scrub-jay young remain with the parents to help as part of a cooperative family group. Family groups use an average of 25 acres of habitat and aggressively defend their territory from other family groups.

Background

The project corridor is within the USFWS Consultation Area for the scrub-jay. The Consultation Area for this species ranges from Collier and Palm Beach Counties in the south to Marion, Putnam and Flagler Counties in the north. The largest populations of this species are presently found in Brevard, Highlands and Marion Counties. Populations of scrub-jays were documented within remnant scrub communities in Deltona adjacent to the I-4 corridor during the FWC 1992-1993 statewide scrub-jay survey (see **Figure 2**). Additional data was also provided by the Volusia County Environmental Management Office, which tracks scrub-jay populations and has potential and occupied habitat data sets that were provided for this study (see **Figure 2A**).

A scrub-jay survey was conducted during the original PD&E Study (Final Environmental Impact Statement (FEIS) for I-4 from SR 528 Beachline Expressway to SR 472, completed in May 2000 with field work from 1996 – 1998) within this alignment corridor. Stations were sampled for the presence of scrub-jays at the Saxon Boulevard interchange, along both sides of the highway between Saxon Boulevard and SR 472, and at the interchange at SR 472. Scrub-jays were observed at fifteen of the call stations during the investigation.

Cursory surveys for scrub-jays were conducted for this project in September and October of 2013 (see **Figure 2B**) to evaluate the potential presence of this species. During these reviews, at least four scrub-jays were observed to respond to a call-back recording north of Saxon Boulevard adjacent to I-4 eastbound, and two more responded when the call was played in the northeast quadrant of the interchange at SR 472. Two scrub-jays were observed at Pond Site 409 A1/A2 as well. As suitable habitat still exists within the corridor, a formal scrub-jay survey was scheduled and conducted in the fall of 2014.

Habitat Types

Prior to establishing scrub-jay call stations, the roadway corridor was field reviewed for scrub habitat, which included an evaluation of soil types, vegetative strata, and management activities. The most important aspect of the habitat assessment was the locations and type of scrub oak species within and adjacent to the corridor. Areas in or adjacent to the presence of scrub oak species were further assessed to ascertain the most suitable locations and offsets for call stations. **Figure 3** depicts the mapped habitat community types based on St. Johns River Water Management District (SJRMWD) Land Use GIS Layers and field reviews.

The following habitat types were observed along the corridor to contain scrub oak species and therefore were included in the survey sample group. Habitat assessment data for each habitat type is included in **Appendix A**.

Improved Pastures (FLUCFCS 2110), Woodland Pastures (FLUCFCS 2130), Herbaceous Upland Non-Forest (FLUCFCS 3100)
These areas are non-forested areas that are, or were recently, pasture areas or areas that are mowed with no obvious intended use. The primary ground cover is bahia grass (*Paspalum notatum*). Portions of these areas were included in the survey because they either had minor amounts of scrub oak, bordered scrub habitat or were identified by Volusia County as scrub habitat.

Shrub and Brushland (FLUCFCS 3200), Mixed Non-forested Uplands (FLUCFCS 3300), Disturbed Land (FLUCFCS 7400)
These areas are non-forested areas that in their current condition are dominated by a prominent shrub layer. Along the I-4 corridor, these are areas that were clear-cut and are currently transitioning into forested areas. A primary component of the shrub layer is composed of immature pines and oaks. Portions of these areas were included in the survey because they either had minor amounts of scrub oak, bordered scrub habitat or were identified by Volusia County as scrub habitat.

Longleaf Pine-Xeric Oak (FLUCFCS 4120), Sand Pine (FLUCFCS 4130), Xeric Oak (FLUCFCS 4210)
These areas have a vegetative composition that includes sand pine (*Pinus clausa*), sand live oak (*Quercus geminata*), longleaf pine (*Pinus palustris*), myrtle oak (*Quercus myrtifolia*), and Chapman's oak (*Quercus chapmanii*) as a canopy component. Midstory and groundcover components within these communities also observed included rusty lyonia (*Lyonia ferruginea*), rosemary (*Ceratiola ericoides*), and gopher apple (*Licania michauxii*). Note that these communities were included in the survey but are primarily overgrown and fire suppressed and do not have the low growing scrub oak with sparse overstory that well-managed "classic" scrub habitat would exhibit.

Mixed Upland Hardwood/Conifers (FLUCFCS 4340)
These areas were primarily overgrown, fire suppressed, and dominated by laurel oak (*Quercus laurifolia*) and slash pine (*Pinus elliottii*) with a thick understory of saw palmetto (*Serenoa repens*), American beautyberry (*Callicarpa americana*), gallberry (*Ilex glabra*), and catbrier (*Smilax* spp.). These areas were included within the survey area based on the presence of sand live oak, myrtle oak, and Chapman's oak observed in the understory.

Methods

Prior to the development, design and placement of the call stations, Stantec biologists consulted with Casey Lyon, FDOT District Five Environmental Permit Coordinator. With her assistance and input, the survey station placement and survey method was determined. Following the development of the survey, Stantec biologists solicited comments from Jane Monaghan of the USFWS (in October 2014). She confirmed that the call station placement and survey method were consistent and conforming to the standard survey protocol.

Based on the size of the vegetative stratum, a 200 meter grid was mapped through habitat that contained scrub species and additional areas adjacent to scrub habitat. A total of 101 stations were established along the entire roadway corridor. **Figure 4** depicts the locations of the call stations. The scrub-jay surveys were conducted in the fall (October) to take advantage of the territorial displays that are most frequent at this time of the year. Surveys were carried out by qualified biologists experienced in the surveying and behavior of this species.

Following design changes that occurred in November 2014, additional survey stations were set in areas that had not been included at the time of the October survey. Eighteen (18) additional stations were placed at four proposed pond sites along SR 472 / Howland Blvd. and Dr. Martin Luther King Blvd (**Sheets 4 and 7 of Figure 4**). Surveys at these stations were carried out in the manner previously described, and took place during the week of April 20, 2015.

Survey Results

The scrub-jay calls were conducted on October 7-13, 19-22, 28, and 30 of 2014, and April 20 – 24, 2015. Scrub-jay territorial scolding was broadcasted at each approved call station for a minimum of one minute in all four cardinal directions. Broadcasts were halted once a scrub-jay was observed, in order to observe, count and record data for each group. Notes on scrub-jay behavior were collected on type of responses, number, and whether the specimens were juveniles or adults. Surveys were suspended in instances where predatory bird species such as hawks or eagles were observed in the region. Additionally, surveys were not conducted when winds exceeded 8 mph or if conditions were not conducive for observations such as rain or fog. Surveys began approximately 1 hour after sunrise and were stopped prior to the mid-day heat (~11:30 am).

All of the assigned survey stations were sampled for a minimum of five days. Several additional call stations and transects were established to aid in the development of territory boundaries outside of the project limits. Scrub-jay calls were played at each call station a minimum of 5 times between October 7 and October 28, 2014 (and at the additional stations in April 2015). At some call stations an additional biologist was utilized to simultaneously play calls at adjacent call stations/areas to establish and confirm territory boundaries within FDOT right-of-way. After the call station draft data was analyzed, an additional reconnaissance field event was conducted on October 30, 2014, playing calls outside of the territory boundaries to verify the data. **Appendix B** provides a summary table of the data collected for each of the call stations. **Figure 5** depicts the survey areas where scrub-jays intersected the existing or proposed FDOT right-of-way and pond sites.

Based on the results of the survey, scrub-jays were observed at 15 of the 119 stations. These scrub-jays comprise five (5) separate families of which four (4) intersect with the existing or proposed FDOT right-of-way (including pond sites). The remaining scrub-jays are either outside the right-of-way or were single incidental observations as discussed below:

Family 1: This family was observed from Stations G12-L and G14-A on two separate days. This family is comprised of two adults who likely utilize a portion of the clover-leaf at the Saxon Boulevard Interchange as part of their territory. **Figure 5, Sheet 1** depicts the flight path and the approximate 0.9 acres utilized by scrub-jays within the existing FDOT right-of-way.

On both observation days, this family was observed flying from the adjacent sand pine habitat to the east. Supplemental surveys around the Saxon Boulevard Interchange clover-leaf were conducted to determine whether these individuals were using any additional areas of the right-of-way; however, these birds did not return to the area. In addition, these birds did not respond to adjacent stations G12-K or G12-J.

Family 2: This family was observed from Stations G11-H and G11-J, as well as during supplemental surveys from additional stations around Pond Site 409 A1/A2 in order to determine the approximate territory size. **Figure 5, Sheet 2** depicts the flight path and supplemental call stations. This family is comprised of two adults that are utilizing approximately 1.3 acres within the FDOT right-of-way. This family was observed crossing over I-4 during one of the survey events. Families 2 and 3 were determined to be separate and have abutting territories. This determination is based on observations of each family alert to calls at stations G11-H and G11-H2 but on opposite sides of the associated Pond Site 409 A1/A2. The families were never observed together, and each family could not be called to defend the same location.

Family 3: This family was observed from Stations G11-H, G11-H2, G12-G, and G12-F. This family is comprised of three adults that are utilizing approximately 4.0 acres within the FDOT right-of-way. This family likely utilizes the side slopes of the Pond Site 409 A1/A2 for acorn cache. In addition, this family was also observed within the neighborhood along

Galveston Avenue. **Figure 5, Sheet 2** which depicts the flight path and supplemental call stations. This family was observed crossing over I-4 to respond to calls at stations G12-G and G12-F. Families 2 and 3 were determined to be separate and have abutting territories. This determination is based on observations of each family alert to calls at stations G11-H and G11-H2 but on opposite sides of the associated Pond Site 409 A1/A2. The families were never observed together, and neither individual family could be called to defend the same location.

Family 4: This family was observed from Stations G15-A, G15-B, G15-C, and G15-F adjacent to Howland Blvd. and E. Graves Avenue, east of I-4. The family is composed of two adults and one juvenile and appears to be utilizing approximately 2.3 acres of the pond site. **Figure 5, Sheet 4** depicts the observed flight path and dates. These birds appear to be using the fringe of this dry pond, primarily along the southern side of the pond, and did not respond to calls from the front (northern side) of the pond. The birds may also be utilizing a small patch of sand pine to the southeast of the pond site.

Family 5: This family was observed from Stations G3-L and G3-K along SR 472 east of I-4. This family is comprised of three adults. Please refer to **Figure 5, Sheet 4** which depicts the flight path and dates. This family is likely outside of the proposed improvements within the FDOT right-of-way associated with this project.

Individual Observation 1: A single adult scrub-jay was observed on two separate dates south of Station G1-F, within Pond 414. Please refer to **Figure 5, Sheet 5** which depicts the flight path and dates. Supplemental surveys in the area did not find this bird or additional birds. It is assumed that this bird does not consider Pond 414 a part of its territory.

Individual Observation 2: A single adult scrub-jay was observed south of Station G9-D. This bird was observed moving around the survey station investigating the auditory calls. Supplemental surveys in the area did not find this bird or additional birds. Please refer to **Figure 5, Sheet 3** which depicts the flight path and dates.

SURVEY SUMMARY

Specific species surveys for the scrub-jay occurred during the months of October 2014 and April 2015. Based on the results of the survey, scrub-jays were observed at 15 of the 119 stations. These scrub-jays comprise five (5) separate families, of which four (Families 1, 2, 3, and 4) intersect the proposed or existing FDOT right-of-way (including pond sites), and three (Families 1, 2, and 3) of these families would be subject to impacts by the project (**Figure 6**). The other two families (Families 4 and 5) would not have impacts to their existing habitat as the project is currently designed. The potential impacts for the recommended alternative as proposed would be: Family 1 at the westbound off-ramp from I-4 to Saxon Blvd would have **0.90 acres** of occupied territory impacted, Family 2 along eastbound I-4 at Pond Site 409 A1/A2 would have **1.22 acres** of occupied territory impacted, and Family 3 along I-4 eastbound at Pond Site 409 A1/A2 would have **2.56 acres** of occupied territory impacted. Based upon the results of this survey, the project is anticipated to impact a total of **4.68 acres** of occupied Florida scrub-jay territory within the existing and/or proposed FDOT Right-of-Way and proposed recommended pond sites.

FIGURES

FIGURE 1
PROJECT LOCATION MAP

Map Key

- SR 400 (I-4) Beyond the Ultimate- Segment 4 Right of Way
- Proposed Ponds (11/18/14)

0 5,000 10,000
Feet

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Title:
FLORIDA SCRUB-JAY SURVEY TECHNICAL MEMORANDUM:
Segment 4 - Project Location Map

Client/Project:
Florida Department of Transportation- D5
SR 400 (I-4) Beyond the Ultimate PD&E Study
Segment 4: SR 400 from East of SR 15/600 (US 17/92) to ½ mile East of SR 472

Project Location:
79110 Volusia County
STA 2583+0.00 (Begin) - MP 0.086
STA 3118+46.00 (End) - MP 10.227

Prepared by: mLeonard 2015/01/22
Technical Review by: mDrauer 2015/01/22
Independent Review by: jMoore 2015/01/22

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Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

Figure 1 -Project Location Map

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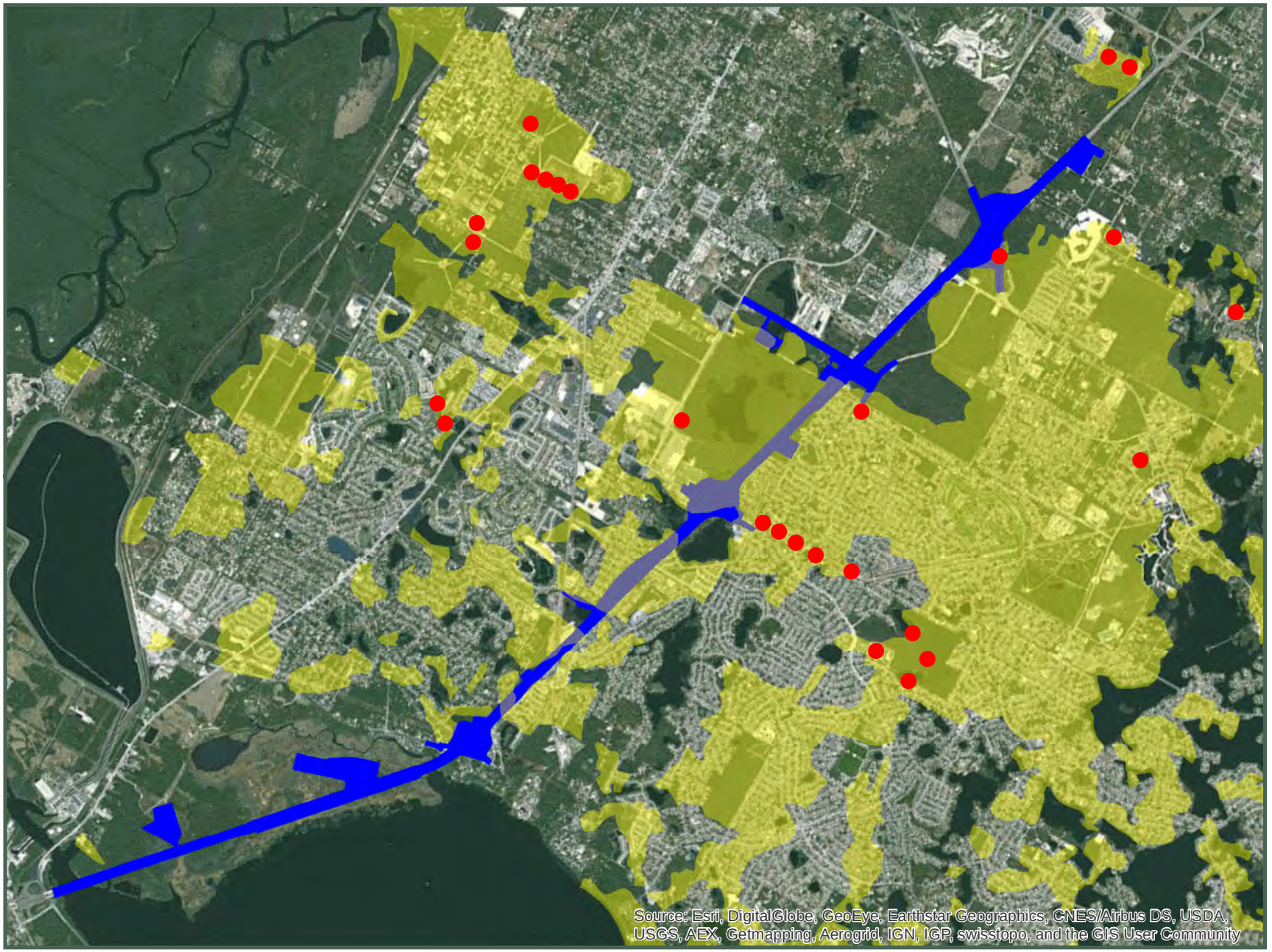
FIGURE 2
FWC HISTORIC SCRUB-JAY OCCURRENCE AND HABITAT MAP



Map Key

- SR 400 (I-4) Beyond the Ultimate- Segment 4 Right of Way
- Florida Scrub-Jay Habitat (FWC) 1993
- Florida Scrub-Jay Occurrences (FWC 1992-1993)

Data Notes:
The 1992-1993 Scrub-Jay data was obtained from Florida Geographic Data Library (FGDL). The accuracy of the data has not beenverified by Stantec. Stantec does not warranty the data and is intented to be used as a planning tool.

0 3,000 6,000
Feet

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Title:
FLORIDA SCRUB-JAY SURVEY TECHNICAL MEMORANDUM:
Segment 4: FWC Historic Scrub-Jay Occurrence/Habitat Map

Client/Project:
Florida Department of Transportation- D5
SR 400 (I-4) Beyond the Ultimate PD&E Study
Segment 4: SR 400 from East of SR 15/600 (US 17/92) to ½ mile East of SR 472

Project Location:
79110 Volusia County
STA 2583+0.00 (Begin) - MP 0.086
STA 3118+46.00 (End) - MP 10.227

Prepared by: mLeonard 6/3/2015
Technical Review by: mDrauer 6/3/2015
Independent Review by: jMoore 6/3/2015

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

Figure 2 - FWC Historic Scrub-Jay Occurrence/Habitat Map

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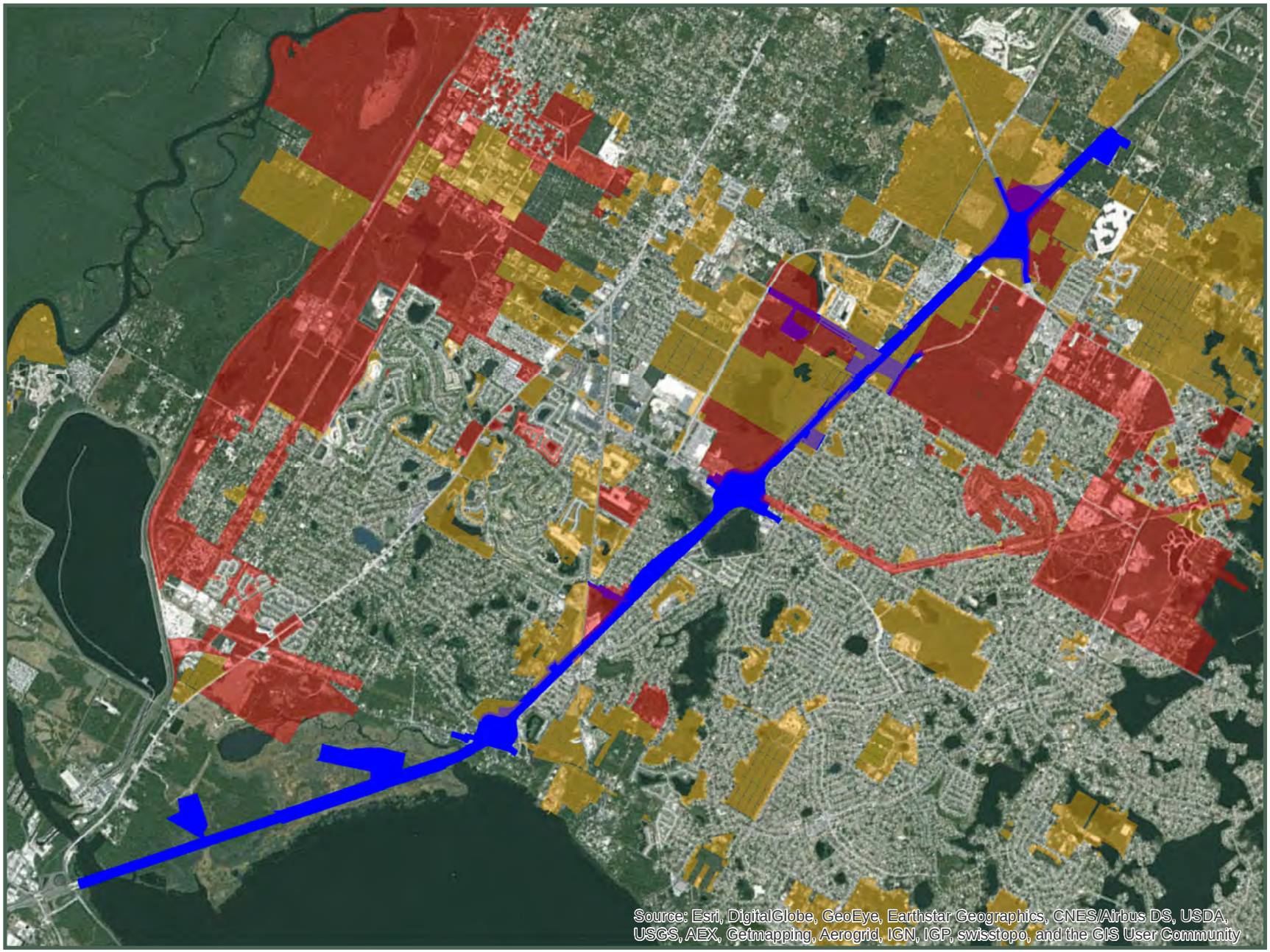
FIGURE 2A
VOLUSIA COUNTY 2012 SCRUB-JAY HABITAT MAP



Map Key

SR 400 (I-4) Beyond the Ultimate- Segment 4 Right of Way

Volusia County Scrub-Jay Data (2012)

Natrual Community (Scrub Habitat)

Occupied Territory (2012)

Data Notes:
The Volusia County Scrub-Jay data was provided by Volusia County. The accuracy of the data has not been verified by Stantec. Stantec does not warranty the data and is intented to be used as a planning tool.

0 3,000 6,000
Feet

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Title:
FLORIDA SCRUB-JAY SURVEY TECHNICAL MEMORANDUM:
Segment 4: Volusia County Scrub-Jay Habitat Map- 2012

Client/Project:
Florida Department of Transportation- D5
SR 400 (I-4) Beyond the Ultimate PD&E Study
Segment 4: SR 400 from East of SR 15/600 (US 17/92) to ½ mile East of SR 472

Project Location:
79110 Volusia County
STA 2583+0.00 (Begin) - MP 0.086
STA 3118+46.00 (End) - MP 10.227

Prepared by: mLeonard 6/3/2015
Technical Review by: mDrauer 6/3/2015
Independent Review by: jMoore 6/3/2015

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

Figure 2A - Volusia County Scrub-Jay Habitat Map-2012

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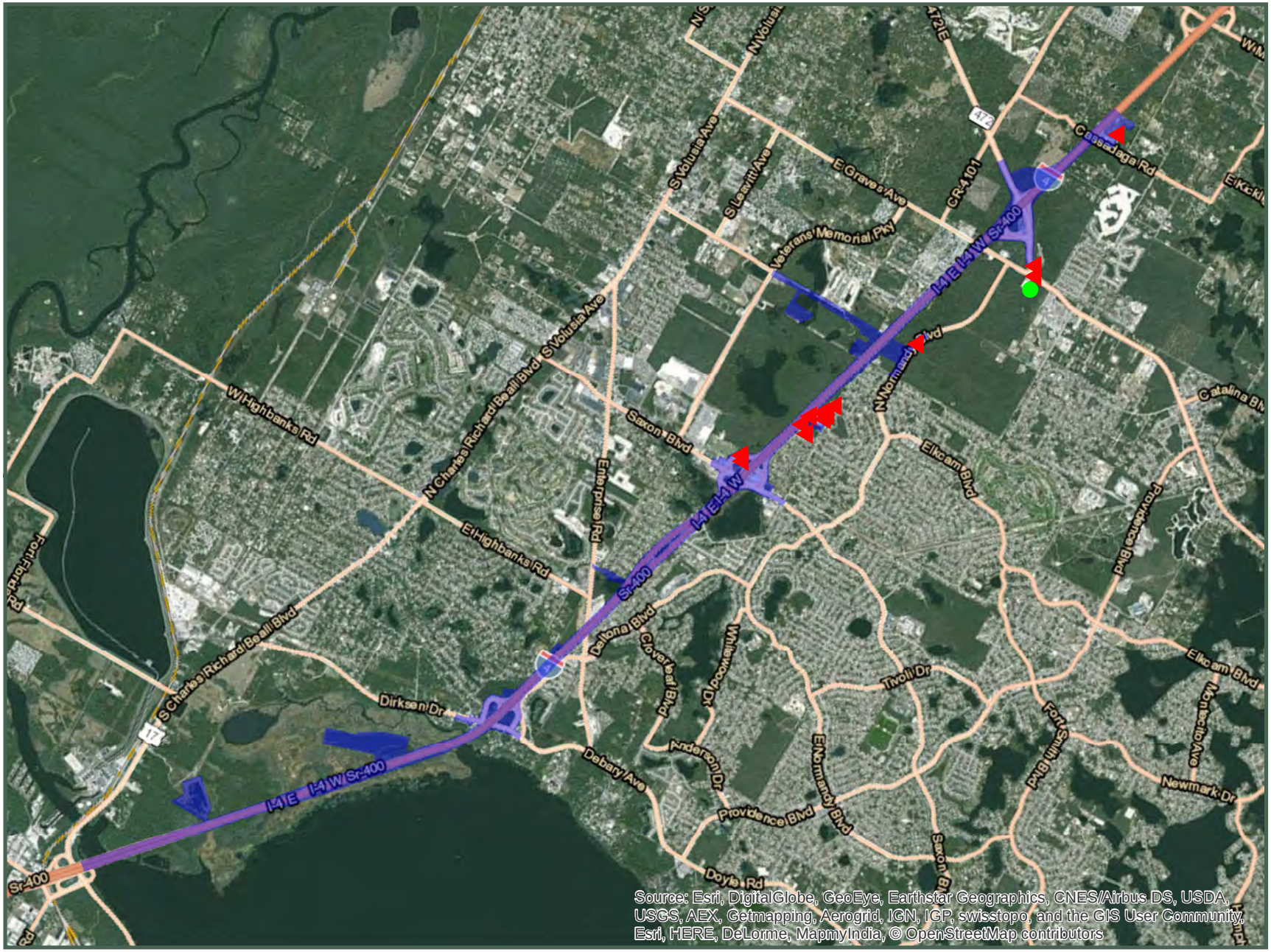
FIGURE 2B
SCRUB-JAY OCCURRENCE MAP



Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

Figure 2B - 2013-2015 Scrub-Jay Occurrence Map

FIGURE 3
LAND USE AND HABITAT MAP

Map Key

- SR 400 (I-4) Beyond the Ultimate- Segment 4 Right of Way
- Proposed Ponds (11/18/14)
- Additional Ponds (2015)
- Other Land Use and Habitats

Potentially Utilized Natural Habitats

- 3100: Herbaceous upland nonforested
- 3200: Shrub and brushland
- 4130: Sand pine
- 4340: Upland mixed coniferous/hardwood

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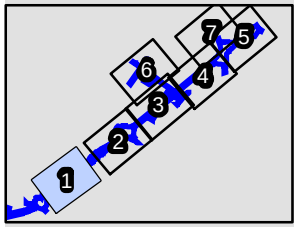
Feet



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Title:
FLORIDA SCRUB-JAY SURVEY TECHNICAL MEMORANDUM:
Segment 4: Land Use and Habitat Map

Client/Project:
Florida Department of Transportation- D5
SR 400 (I-4) Beyond the Ultimate PD&E Study
Segment 4: SR 400 from East of SR 15/600 (US 17/92) to ½ mile East of SR 472

Project Location:
79110 Volusia County
STA 2583+0.00 (Begin) - MP 0.086
STA 3118+46.00 (End) - MP 10.227

Prepared by: mLeonard 2015/01/22
Technical Review by: mDrauer 2015/01/22
Independent Review by: jMoore 2015/01/22

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

Figure 3 : Sheet 1 of 7 - Land Use and Habitat Map

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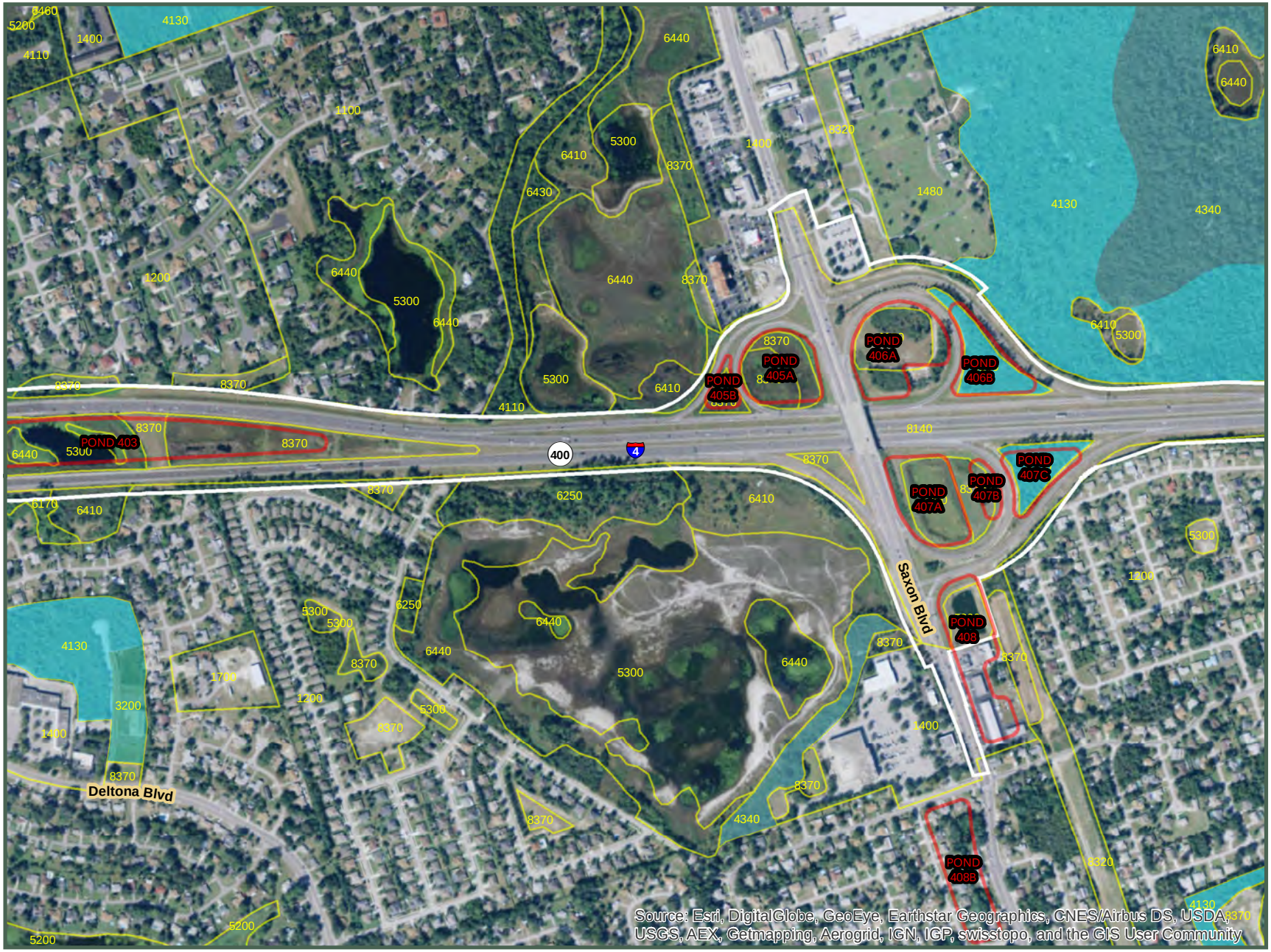

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

Map Key

- SR 400 (I-4) Beyond the Ultimate- Segment 4 Right of Way
- Proposed Ponds (11/18/14)
- Additional Ponds (2015)
- Other Land Use and Habitats

Potentially Utilized Natural Habitats

- 3200: Shrub and brushland
- 4130: Sand pine
- 4340: Upland mixed coniferous/hardwood

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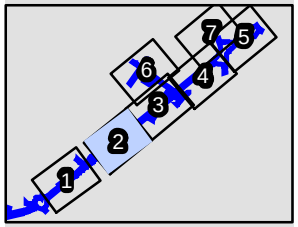
Feet



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Title:
FLORIDA SCRUB-JAY SURVEY TECHNICAL MEMORANDUM:
Segment 4: Land Use and Habitat Map

Client/Project:
Florida Department of Transportation- D5
SR 400 (I-4) Beyond the Ultimate PD&E Study
Segment 4: SR 400 from East of SR 15/600 (US 17/92) to ½ mile East of SR 472

Project Location:
79110 Volusia County
STA 2583+0.00 (Begin) - MP 0.086
STA 3118+46.00 (End) - MP 10.227

Prepared by: mLeonard 2015/01/22
Technical Review by: mDrauer 2015/01/22
Independent Review by: jMoore 2015/01/22

Figure 3 : Sheet 2 of 7 - Land Use and Habitat Map

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Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

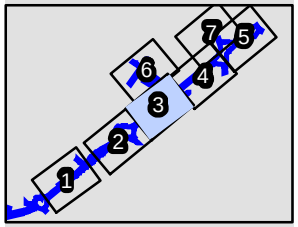
Map Key

- SR 400 (I-4) Beyond the Ultimate- Segment 4 Right of Way
- Proposed Ponds (11/18/14)
- Additional Ponds (2015)
- Other Land Use and Habitats

Potentially Utilized Natural Habitats

- 3200: Shrub and brushland
- 3300: Mixed upland nonforested
- 4130: Sand pine
- 4340: Upland mixed coniferous/hardwood

0 400 800
Feet



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Title:
FLORIDA SCRUB-JAY SURVEY TECHNICAL MEMORANDUM:
Segment 4: Land Use and Habitat Map

Client/Project:
Florida Department of Transportation- D5
SR 400 (I-4) Beyond the Ultimate PD&E Study
Segment 4: SR 400 from East of SR 15/600 (US 17/92) to ½ mile East of SR 472

Project Location:
79110 Volusia County
STA 2583+0.00 (Begin) - MP 0.086
STA 3118+46.00 (End) - MP 10.227

Prepared by: mLeonard 2015/01/22
Technical Review by: mDrauer 2015/01/22
Independent Review by: jMoore 2015/01/22

Figure 3 : Sheet 3 of 7 - Land Use and Habitat Map

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Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

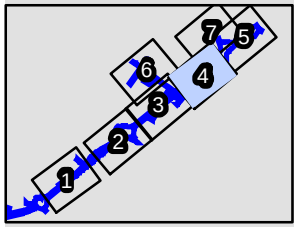
Map Key

- SR 400 (I-4) Beyond the Ultimate- Segment 4 Right of Way
- Proposed Ponds (11/18/14)
- Additional Ponds (2015)
- Other Land Use and Habitats

Potentially Utilized Natural Habitats

- 3300: Mixed upland nonforested
- 4120: Longleaf pine - xeric oak
- 4130: Sand pine
- 4340: Upland mixed coniferous/hardwood
- 7400: Disturbed land

0 400 800
Feet



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Title:
FLORIDA SCRUB-JAY SURVEY TECHNICAL MEMORANDUM:
Segment 4: Land Use and Habitat Map

Client/Project:
Florida Department of Transportation- D5
SR 400 (I-4) Beyond the Ultimate PD&E Study
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Project Location:
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STA 2583+0.00 (Begin) - MP 0.086
STA 3118+46.00 (End) - MP 10.227

Prepared by: mLeonard 2015/01/22
Technical Review by: mDrauer 2015/01/22
Independent Review by: jMoore 2015/01/22

Figure 3 : Sheet 4 of 7 - Land Use and Habitat Map

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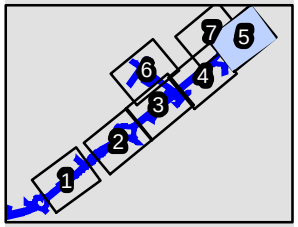
Map Key

- SR 400 (I-4) Beyond the Ultimate- Segment 4 Right of Way
- Proposed Ponds (11/18/14)
- Additional Ponds (2015)
- Other Land Use and Habitats

Potentially Utilized Natural Habitats

- 2110: Improved pastures
- 2130: Woodland pastures
- 3100: Herbaceous upland nonforested
- 3300: Mixed upland nonforested
- 4130: Sand pine
- 4340: Upland mixed coniferous/hardwood

0 400 800
Feet



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Title:
FLORIDA SCRUB-JAY SURVEY TECHNICAL MEMORANDUM:
Segment 4: Land Use and Habitat Map

Client/Project:
Florida Department of Transportation- D5
SR 400 (I-4) Beyond the Ultimate PD&E Study
Segment 4: SR 400 from East of SR 15/600 (US 17/92) to ½ mile East of SR 472

Project Location:
79110 Volusia County
STA 2583+0.00 (Begin) - MP 0.086
STA 3118+46.00 (End) - MP 10.227

Prepared by: mLeonard 2015/01/22
Technical Review by: mDrauer 2015/01/22
Independent Review by: jMoore 2015/01/22

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

Figure 3 : Sheet 5 of 7 - Land Use and Habitat Map

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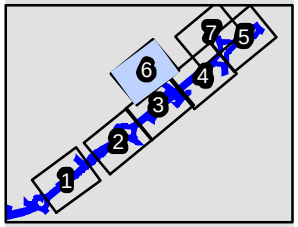
Map Key

- SR 400 (I-4) Beyond the Ultimate- Segment 4 Right of Way
- Proposed Ponds (11/18/14)
- Additional Ponds (2015)
- Other Land Use and Habitats

Potentially Utilized Natural Habitats

- 3200: Shrub and brushland
- 3300: Mixed upland nonforested
- 4130: Sand pine
- 4210: Xeric oak
- 4340: Upland mixed coniferous/hardwood

0 400 800
Feet



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Title:
FLORIDA SCRUB-JAY SURVEY TECHNICAL MEMORANDUM:
Segment 4: Land Use and Habitat Map

Client/Project:
Florida Department of Transportation- D5
SR 400 (I-4) Beyond the Ultimate PD&E Study
Segment 4: SR 400 from East of SR 15/600 (US 17/92) to ½ mile East of SR 472

Project Location:
79110 Volusia County
STA 2583+0.00 (Begin) - MP 0.086
STA 3118+46.00 (End) - MP 10.227

Prepared by: mLeonard 2015/01/22
Technical Review by: mDrauer 2015/01/22
Independent Review by: jMoore 2015/01/22

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

Figure 3 : Sheet 6 of 7 - Land Use and Habitat Map

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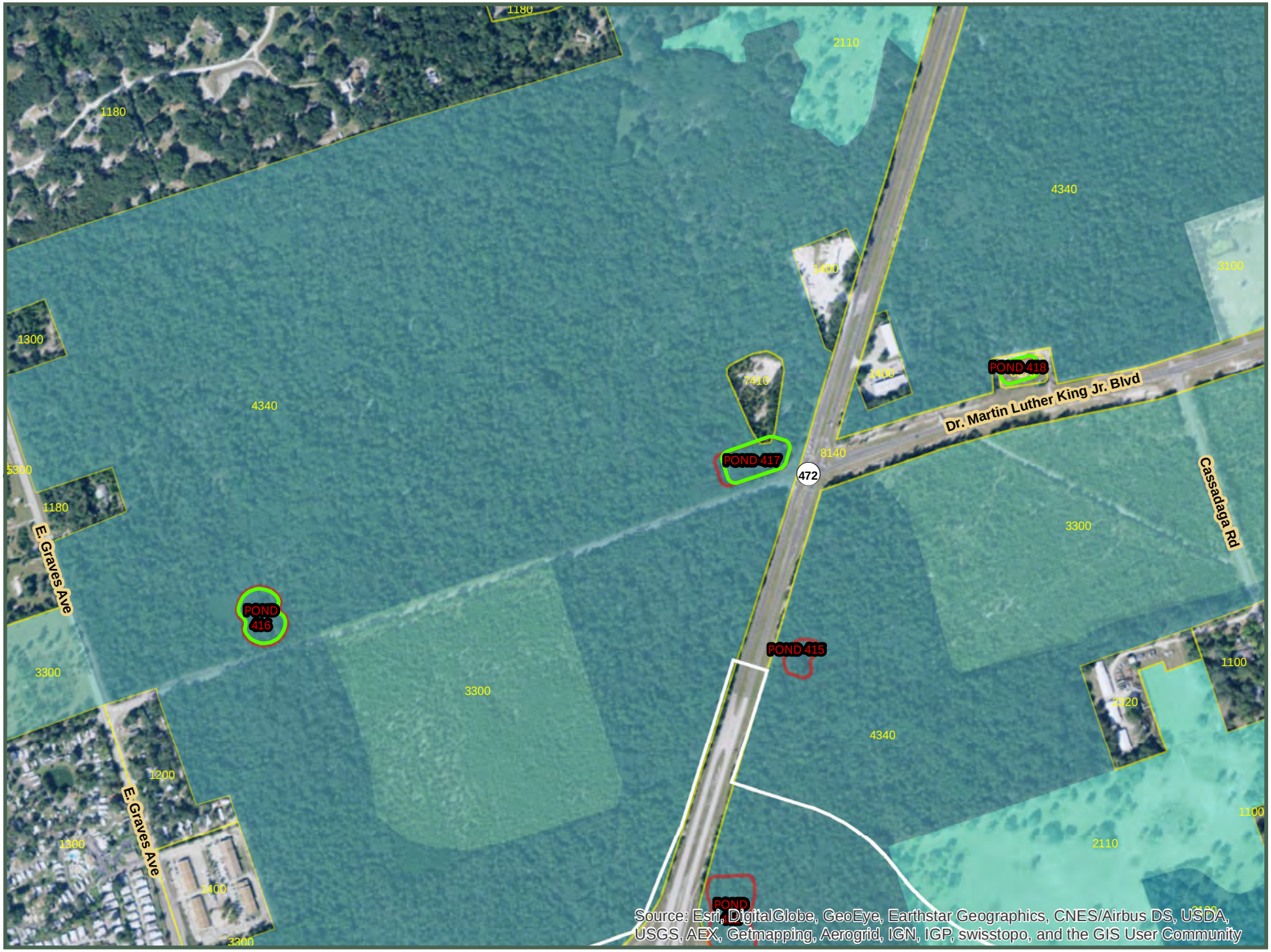


Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

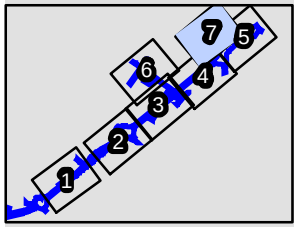
Map Key

- SR 400 (I-4) Beyond the Ultimate- Segment 4 Right of Way
- Proposed Ponds (11/18/14)
- Additional Ponds (2015)
- Other Land Use and Habitats

Potentially Utilized Natural Habitats

- 2110: Improved pastures
- 2130: Woodland pastures
- 3100: Herbaceous upland nonforested
- 3300: Mixed upland nonforested
- 4340: Upland mixed coniferous/hardwood

0 400 800
Feet



2024230168

Title:
FLORIDA SCRUB-JAY SURVEY TECHNICAL MEMORANDUM:
Segment 4: Land Use and Habitat Map

Client/Project:
Florida Department of Transportation- D5
SR 400 (I-4) Beyond the Ultimate PD&E Study
Segment 4: SR 400 from East of SR 15/600 (US 17/92) to ½ mile East of SR 472

Project Location:
79110 Volusia County
STA 2583+0.00 (Begin) - MP 0.086
STA 3118+46.00 (End) - MP 10.227

Prepared by: mLeonard 2015/01/22
Technical Review by: mDrauer 2015/01/22
Independent Review by: jMoore 2015/01/22

Figure 3 : Sheet 7 of 7 - Land Use and Habitat Map

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FIGURE 4
SCRUB-JAY CALL STATION MAP

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

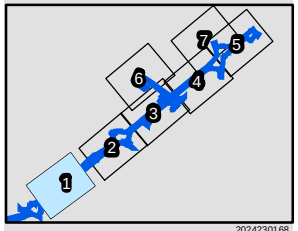
Map Key

- SR 400 (I-4) Beyond the Ultimate- Segment 4 Right of Way
- Proposed Pond Sites (11/18/14)
- Additional Ponds (2015)

Call Stations

- Scrub-jay Call Stations 2014
- Scrub-jay Call Stations 2015

0 400 800
Feet



2024230168

Title:
FLORIDA SCRUB-JAY SURVEY TECHNICAL MEMORANDUM:
Segment 4: Scrub-Jay Call Station Map

Client/Project:
Florida Department of Transportation- D5
SR 400 (I-4) Beyond the Ultimate PD&E Study
Segment 4: SR 400 from East of SR 15/600 (US 17/92) to ½ mile East of SR 472

Project Location:
79110 Volusia County
STA 2583+0.00 (Begin) - MP 0.086
STA 3118+46.00 (End) - MP 10.227

Prepared by: mleonard 6/3/2015
Technical Review by: mdrauer 6/3/2015
Independent Review by: jmoore 6/3/2015

Figure 4: Sheet 1 of 7 - Scrub-Jay Call Station Map

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Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

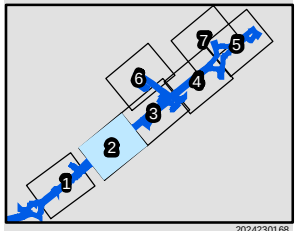
Map Key

- SR 400 (I-4) Beyond the Ultimate- Segment 4 Right of Way
- Proposed Pond Sites (11/18/14)
- Additional Ponds (2015)

Call Stations

- Scrub-jay Call Stations 2014
- Scrub-jay Call Stations 2015

0 400 800
Feet



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Title:
FLORIDA SCRUB-JAY SURVEY TECHNICAL MEMORANDUM:
Segment 4: Scrub-Jay Call Station Map

Client/Project:
Florida Department of Transportation- D5
SR 400 (I-4) Beyond the Ultimate PD&E Study
Segment 4: SR 400 from East of SR 15/600 (US 17/92) to ½ mile East of SR 472

Project Location:
79110 Volusia County
STA 2583+0.00 (Begin) - MP 0.086
STA 3118+46.00 (End) - MP 10.227

Prepared by: mleonard 6/3/2015
Technical Review by: mdrauer 6/3/2015
Independent Review by: jmoore 6/3/2015

Figure 4: Sheet 2 of 7 - Scrub-Jay Call Station Map

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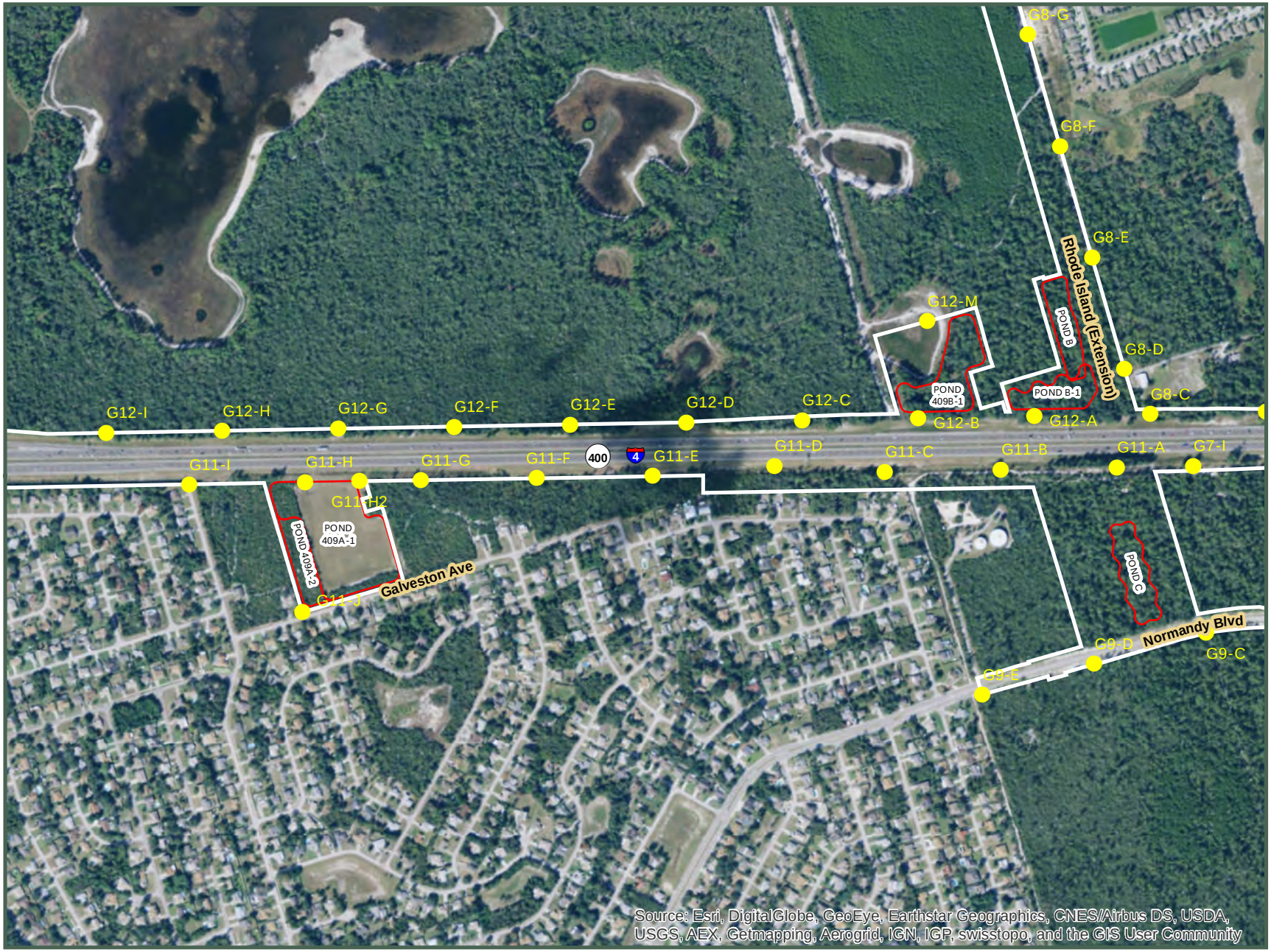


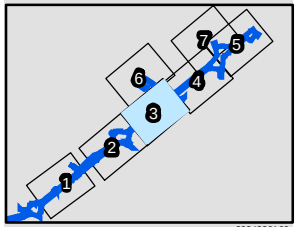
Map Key

- SR 400 (I-4) Beyond the Ultimate- Segment 4 Right of Way
- Proposed Pond Sites (11/18/14)
- Additional Ponds (2015)

Call Stations

- Scrub-jay Call Stations 2014
- Scrub-jay Call Stations 2015

0 400 800
Feet



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Title:
FLORIDA SCRUB-JAY SURVEY TECHNICAL MEMORANDUM:
Segment 4: Scrub-Jay Call Station Map

Client/Project:
Florida Department of Transportation- D5
SR 400 (I-4) Beyond the Ultimate PD&E Study
Segment 4: SR 400 from East of SR 15/600 (US 17/92) to ½ mile East of SR 472

Project Location:
79110 Volusia County
STA 2583+0.00 (Begin) - MP 0.086
STA 3118+46.00 (End) - MP 10.227

Prepared by: mleonard 6/3/2015
Technical Review by: mdrauer 6/3/2015
Independent Review by: jmoore 6/3/2015

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

Figure 4: Sheet 3 of 7 - Scrub-Jay Call Station Map

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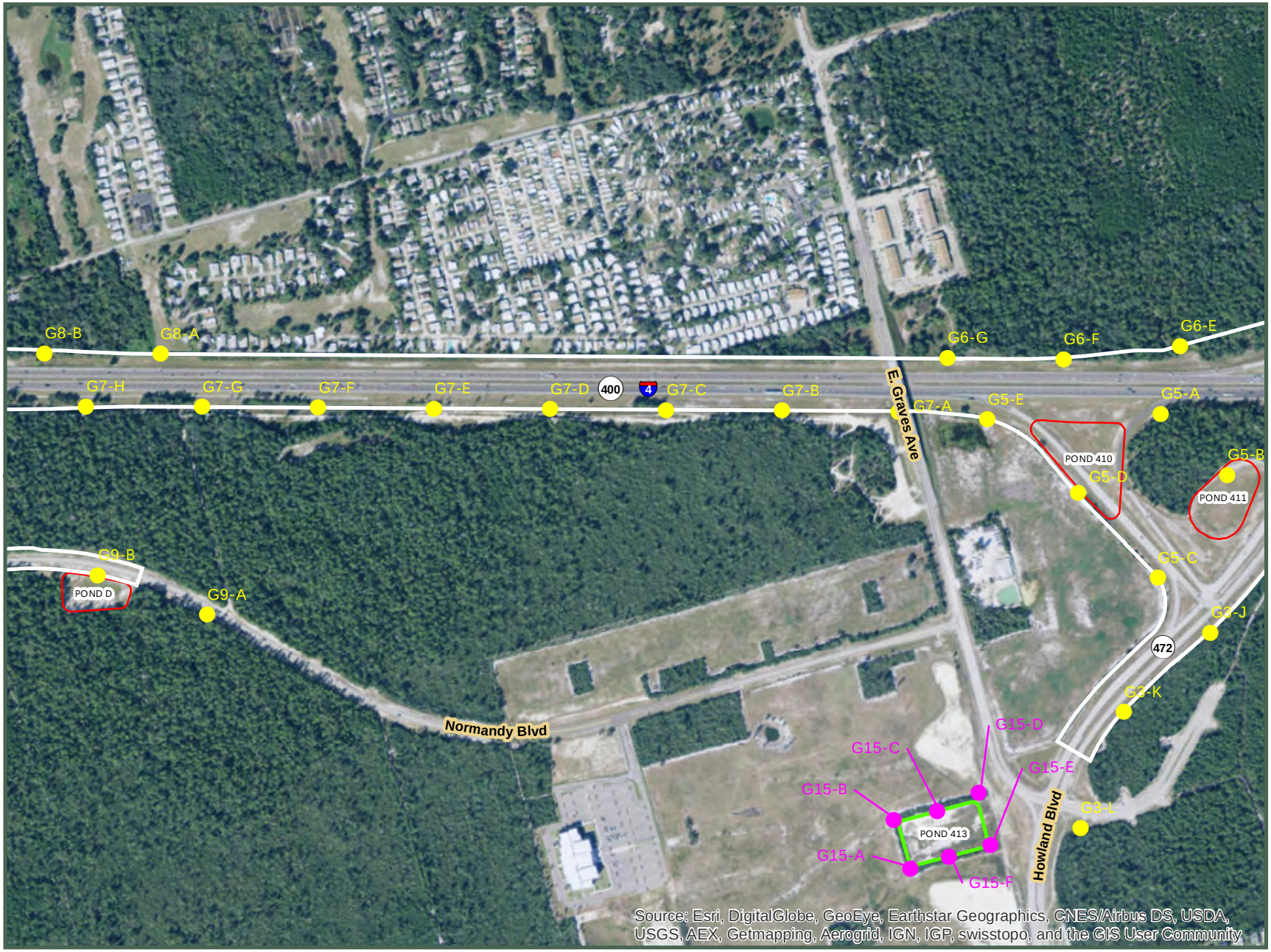


Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

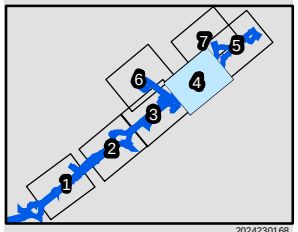
Map Key

- SR 400 (I-4) Beyond the Ultimate- Segment 4 Right of Way
- Proposed Pond Sites (11/18/14)
- Additional Ponds (2015)

Call Stations

- Scrub-jay Call Stations 2014
- Scrub-jay Call Stations 2015

0 400 800
Feet



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Title:
FLORIDA SCRUB-JAY SURVEY TECHNICAL MEMORANDUM:
Segment 4: Scrub-Jay Call Station Map

Client/Project:
Florida Department of Transportation- D5
SR 400 (I-4) Beyond the Ultimate PD&E Study
Segment 4: SR 400 from East of SR 15/600 (US 17/92) to ½ mile East of SR 472

Project Location:
79110 Volusia County
STA 2583+0.00 (Begin) - MP 0.086
STA 3118+46.00 (End) - MP 10.227

Prepared by: mleonard 6/3/2015
Technical Review by: mdrauer 6/3/2015
Independent Review by: jmoore 6/3/2015

Figure 4: Sheet 4 of 7 - Scrub-Jay Call Station Map

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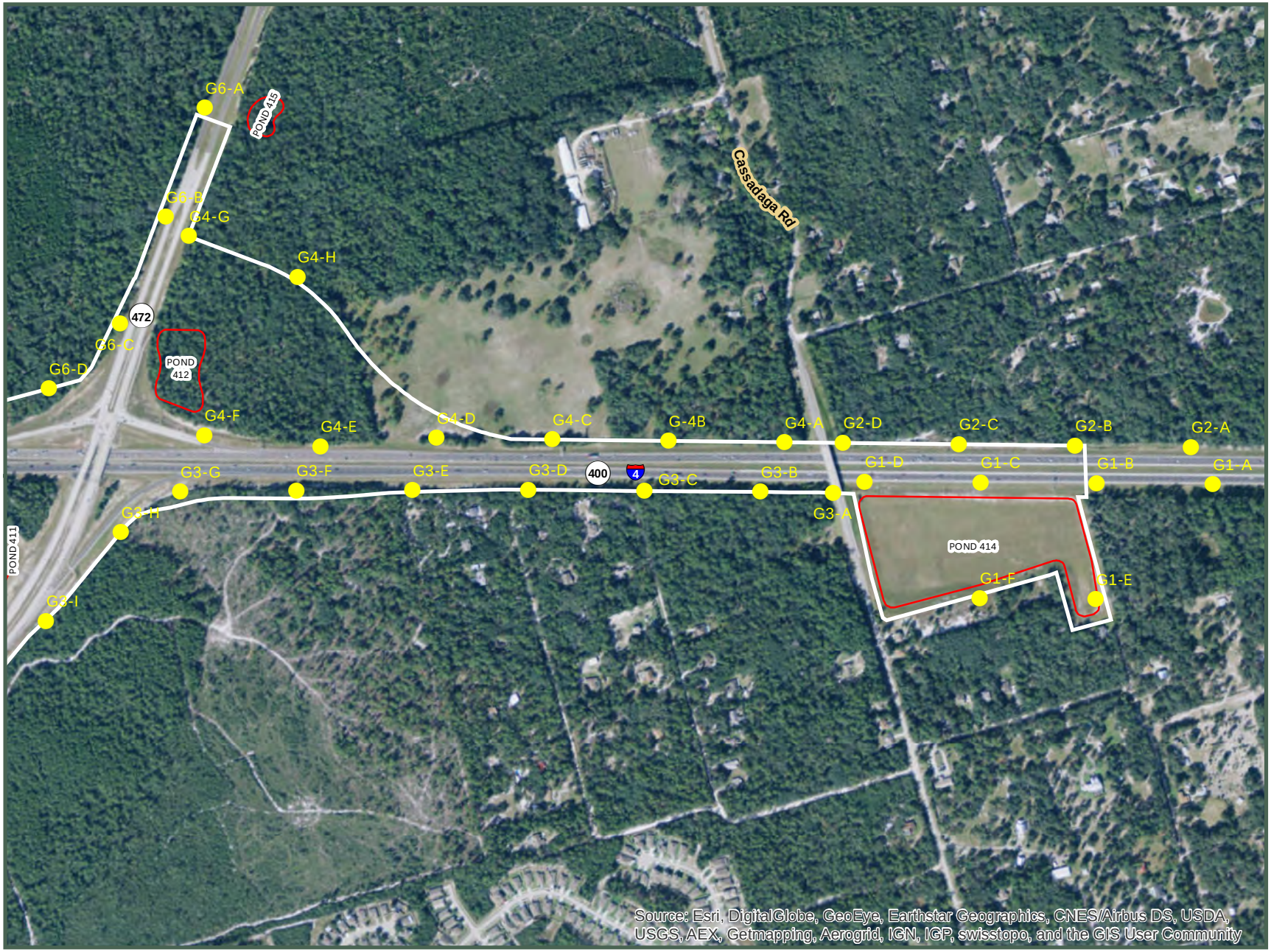


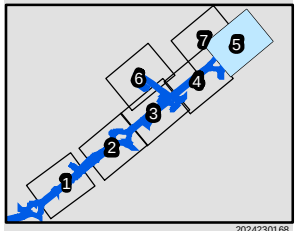
Map Key

- SR 400 (I-4) Beyond the Ultimate- Segment 4 Right of Way
- Proposed Pond Sites (11/18/14)
- Additional Ponds (2015)

Call Stations

- Scrub-jay Call Stations 2014
- Scrub-jay Call Stations 2015

0 400 800
Feet



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Title:
FLORIDA SCRUB-JAY SURVEY TECHNICAL MEMORANDUM:
Segment 4: Scrub-Jay Call Station Map

Client/Project:
Florida Department of Transportation- D5
SR 400 (I-4) Beyond the Ultimate PD&E Study
Segment 4: SR 400 from East of SR 15/600 (US 17/92) to ½ mile East of SR 472

Project Location:
79110 Volusia County
STA 2583+0.00 (Begin) - MP 0.086
STA 3118+46.00 (End) - MP 10.227

Prepared by: mleonard 6/3/2015
Technical Review by: mdrauer 6/3/2015
Independent Review by: jmoore 6/3/2015

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

Figure 4: Sheet 5 of 7 - Scrub-Jay Call Station Map

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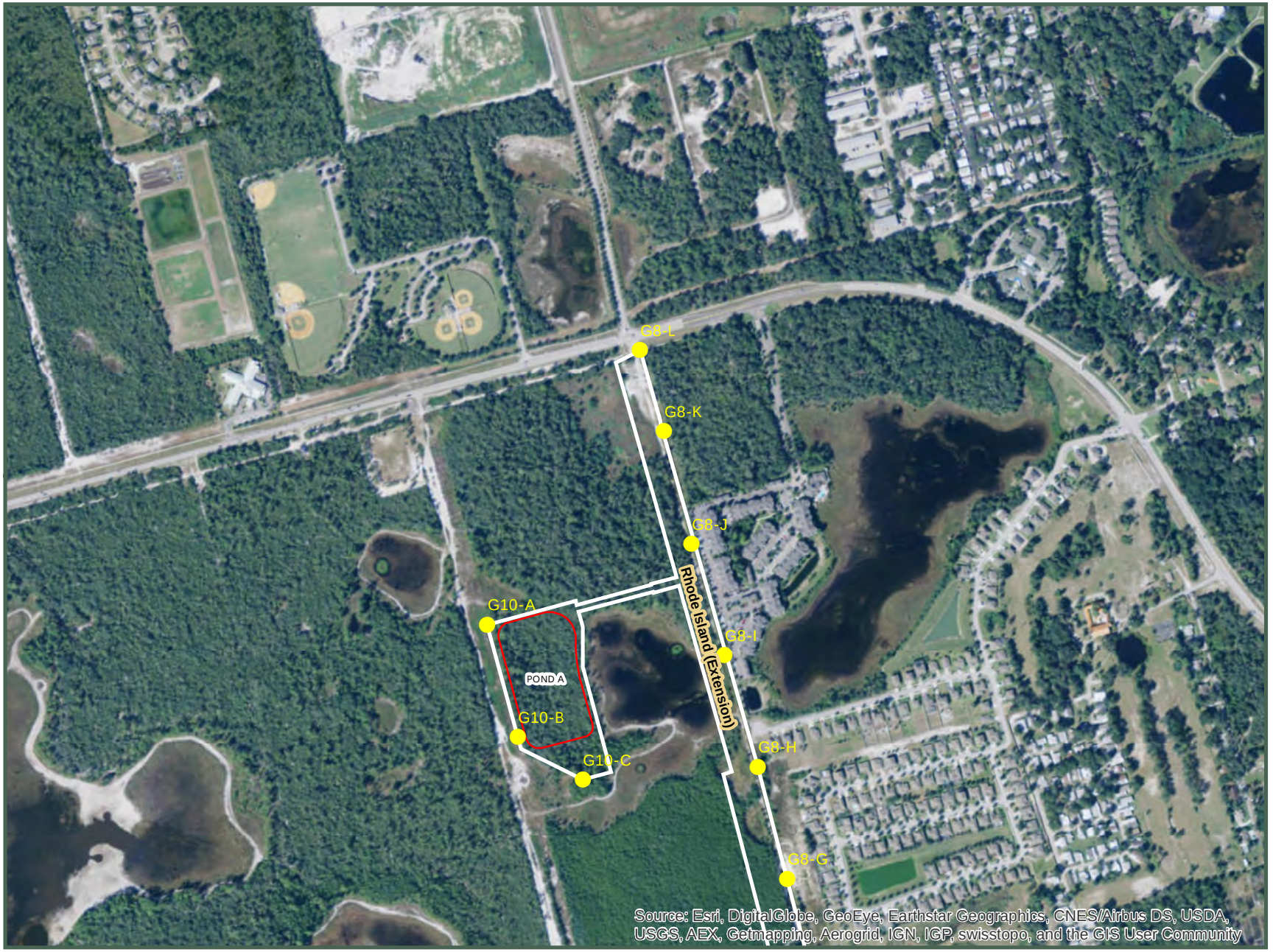


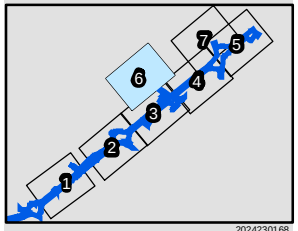
Map Key

- SR 400 (I-4) Beyond the Ultimate- Segment 4 Right of Way
- Proposed Pond Sites (11/18/14)
- Additional Ponds (2015)

Call Stations

- Scrub-jay Call Stations 2014
- Scrub-jay Call Stations 2015

0 400 800
Feet



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Title:
FLORIDA SCRUB-JAY SURVEY TECHNICAL MEMORANDUM:
Segment 4: Scrub-Jay Call Station Map

Client/Project:
Florida Department of Transportation- D5
SR 400 (I-4) Beyond the Ultimate PD&E Study
Segment 4: SR 400 from East of SR 15/600 (US 17/92) to ½ mile East of SR 472

Project Location:
79110 Volusia County
STA 2583+0.00 (Begin) - MP 0.086
STA 3118+46.00 (End) - MP 10.227

Prepared by: mleonard 6/3/2015
Technical Review by: mdrauer 6/3/2015
Independent Review by: jmoore 6/3/2015

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

Figure 4: Sheet 6 of 7 - Scrub-Jay Call Station Map

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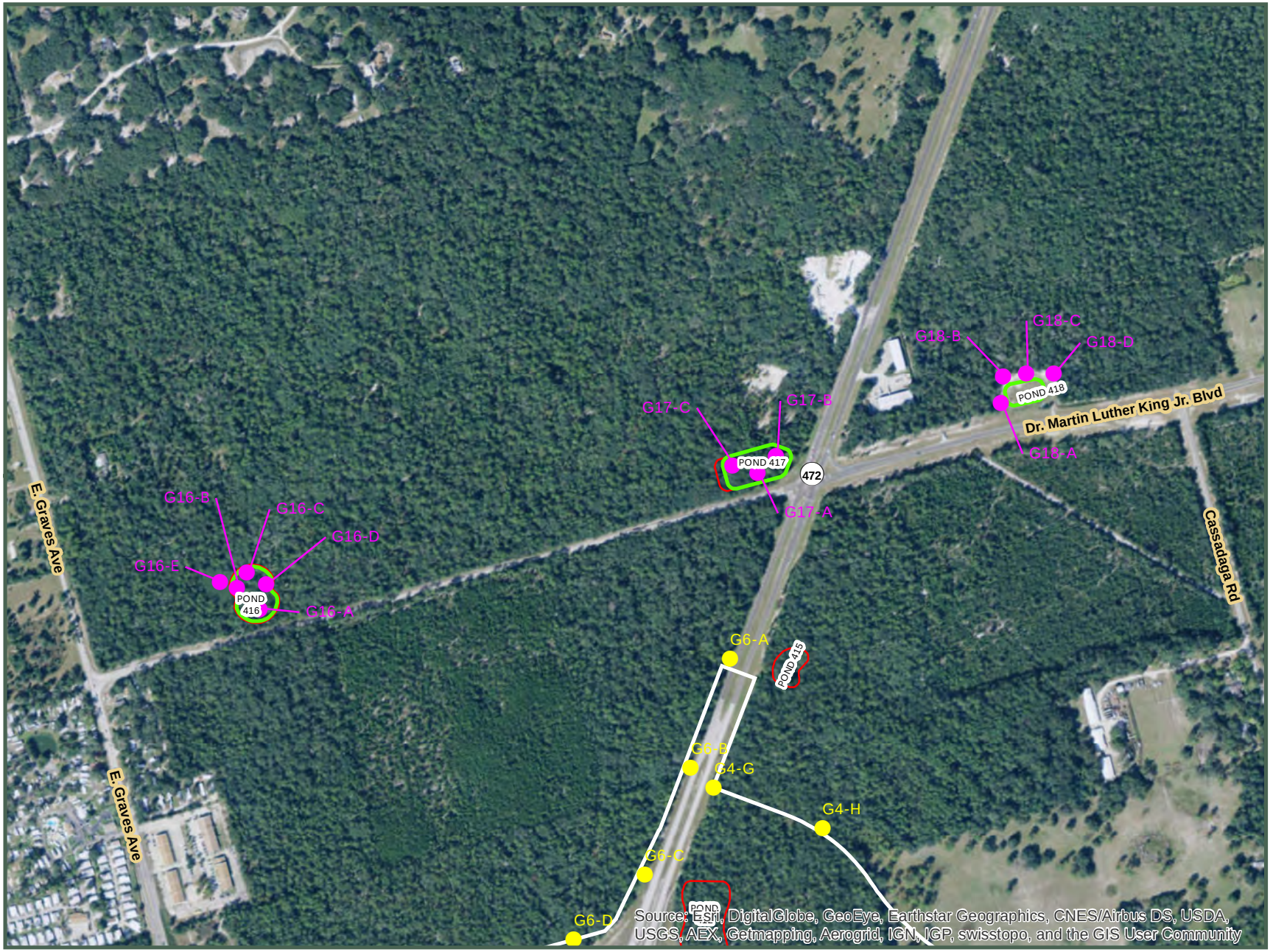


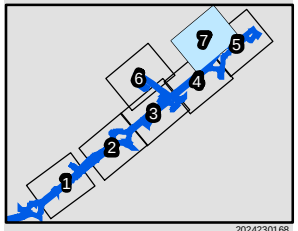
Map Key

- SR 400 (I-4) Beyond the Ultimate- Segment 4 Right of Way
- Proposed Pond Sites (11/18/14)
- Additional Ponds (2015)

Call Stations

- Scrub-jay Call Stations 2014
- Scrub-jay Call Stations 2015

0 400 800
Feet



2024230168

Title:
FLORIDA SCRUB-JAY SURVEY TECHNICAL MEMORANDUM:
Segment 4: Scrub-Jay Call Station Map

Client/Project:
Florida Department of Transportation- D5
SR 400 (I-4) Beyond the Ultimate PD&E Study
Segment 4: SR 400 from East of SR 15/600 (US 17/92) to ½ mile East of SR 472

Project Location:
79110 Volusia County
STA 2583+0.00 (Begin) - MP 0.086
STA 3118+46.00 (End) - MP 10.227

Prepared by: mleonard 6/3/2015
Technical Review by: mdrauer 6/3/2015
Independent Review by: jmoore 6/3/2015

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

Figure 4: Sheet 7 of 7 - Scrub-Jay Call Station Map

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FIGURE 5
SCRUB-JAY RIGHT-OF-WAY UTILIZATION AND FLIGHT MAP

Map Key

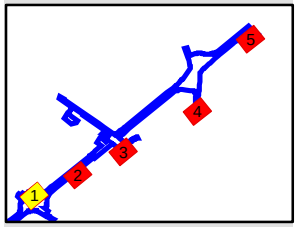
- SR 400 (I-4) Beyond the Ultimate- Segment 4 Right of Way
- Scrub-Jay Call Stations (2014)
- Supplemental Call Stations (2014)
- Proposed Ponds (11/18/14)

Utilized R/W (2014)

- Family 1 (0.9 ac)

Flight Patterns

- 10/9/2014
- 10/20/2014



2024230168

Title:
FLORIDA SCRUB-JAY SURVEY TECHNICAL MEMORANDUM:
Segment 4: Scrub-Jay R/W Utilization and Flight Map

Client/Project:
Florida Department of Transportation- D5
SR 400 (I-4) Beyond the Ultimate PD&E Study
Segment 4: SR 400 from East of SR 15/600 (US 17/92) to ½ mile East of SR 472

Project Location:
79110 Volusia County
STA 2583+0.00 (Begin) - MP 0.086
STA 3118+46.00 (End) - MP 10.227

Prepared by: mleonard 6/3/2015
Technical Review by: mdrauer 6/3/2015
Independent Review by: jmoore 6/3/2015

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

0 100 200
Feet

Figure 5: Sheet 1 of 5 - Scrub-Jay R/W Utilization & Flight Map

1 " = 200 '

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Map Key

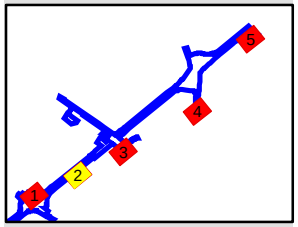
- SR 400 (I-4) Beyond the Ultimate- Segment 4 Right of Way
- Scrub-Jay Call Stations (2014)
- Supplemental Call Stations (2014)
- Proposed Ponds (11/18/14)

Utilized R/W (2014)

- Family 2 (1.3 ac)
- Family 3 (4.0 ac)

Flight Patterns

- 10/8/2014
- 10/13/2014
- 10/14/2013
- 10/20/2014
- 10/22/2014
- 10/30/2014



2024230168

Title:
FLORIDA SCRUB-JAY SURVEY TECHNICAL MEMORANDUM:
Segment 4: Scrub-Jay R/W Utilization and Flight Map

Client/Project:
Florida Department of Transportation- D5
SR 400 (I-4) Beyond the Ultimate PD&E Study
Segment 4: SR 400 from East of SR 15/600 (US 17/92) to ½ mile East of SR 472

Project Location:
79110 Volusia County
STA 2583+0.00 (Begin) - MP 0.086
STA 3118+46.00 (End) - MP 10.227

Prepared by: mleonard 6/3/2015
Technical Review by: mdrauer 6/3/2015
Independent Review by: jmoore 6/3/2015

Figure 5: Sheet 2 of 5 - Scrub-Jay R/W Utilization & Flight Map

0 100 200
Feet

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

1 " = 200 '

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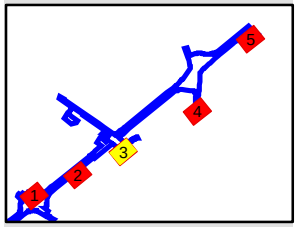
Map Key

- SR 400 (I-4) Beyond the Ultimate- Segment 4 Right of Way
- Scrub-Jay Call Stations (2014)
- Proposed Ponds (11/18/14)

Flight Patterns

- 10/8/2014



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Title:
FLORIDA SCRUB-JAY SURVEY TECHNICAL MEMORANDUM:
Segment 4: Scrub-Jay R/W Utilization and Flight Map

Client/Project:
Florida Department of Transportation- D5
SR 400 (I-4) Beyond the Ultimate PD&E Study
Segment 4: SR 400 from East of SR 15/600 (US 17/92) to ½ mile East of SR 472

Project Location:
79110 Volusia County
STA 2583+0.00 (Begin) - MP 0.086
STA 3118+46.00 (End) - MP 10.227

Prepared by: mleonard 6/3/2015
Technical Review by: mdrauer 6/3/2015
Independent Review by: jmoore 6/3/2015

Figure 5: Sheet 3 of 5 - Scrub-Jay R/W Utilization & Flight Map

0 100 200
Feet

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

1 " = 200 '

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Map Key

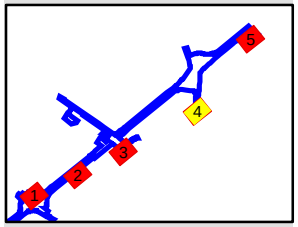
- SR 400 (I-4) Beyond the Ultimate- Segment 4 Right of Way
- Scrub-Jay Call Stations (2014)
- Proposed Ponds (11/18/14)
- Additional Ponds (2015)

Utilized R/W (2014)

- Family 4 (2.3 ac)

Flight Patterns

- 4/21/2015
- 4/23/2015
- 4/24/2015
- 4/20/2015
- 11/24/2014
- 10/8/2014
- 10/14/2013



2024230168

Title:
FLORIDA SCRUB-JAY SURVEY TECHNICAL MEMORANDUM:
Segment 4: Scrub-Jay R/W Utilization and Flight Map

Client/Project:
Florida Department of Transportation- D5
SR 400 (I-4) Beyond the Ultimate PD&E Study
Segment 4: SR 400 from East of SR 15/600 (US 17/92) to ½ mile East of SR 472

Project Location:
79110 Volusia County
STA 2583+0.00 (Begin) - MP 0.086
STA 3118+46.00 (End) - MP 10.227

Prepared by: mleonard 6/3/2015
Technical Review by: mdrauer 6/3/2015
Independent Review by: jmoore 6/3/2015

Figure 5: Sheet 4 of 5 - Scrub-Jay R/W Utilization & Flight Map

0 100 200
Feet

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

1 " = 200 '

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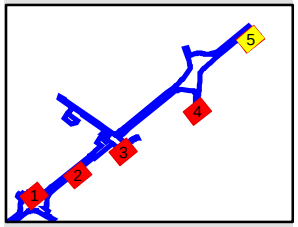
Map Key

- SR 400 (I-4) Beyond the Ultimate- Segment 4 Right of Way
- Scrub-Jay Call Stations (2014)
- Supplemental Call Stations (2014)
- Proposed Ponds (11/18/14)

Flight Patterns

- 10/8/2014
- 10/9/2014



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Title:
FLORIDA SCRUB-JAY SURVEY TECHNICAL MEMORANDUM:
Segment 4: Scrub-Jay R/W Utilization and Flight Map

Client/Project:
Florida Department of Transportation- D5
SR 400 (I-4) Beyond the Ultimate PD&E Study
Segment 4: SR 400 from East of SR 15/600 (US 17/92) to ½ mile East of SR 472

Project Location:
79110 Volusia County
STA 2583+0.00 (Begin) - MP 0.086
STA 3118+46.00 (End) - MP 10.227

Prepared by: mleonard 6/3/2015
Technical Review by: mdrauer 6/3/2015
Independent Review by: jmoore 6/3/2015

Figure 5: Sheet 5 of 5 - Scrub-Jay R/W Utilization & Flight Map

0 100 200
Feet

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

1 " = 200 '

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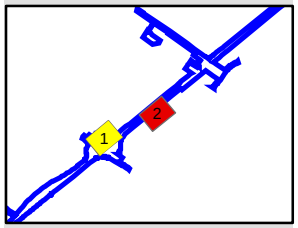
FIGURE 6
SCRUB-JAY HABITAT IMPACT MAP

Map Key

SR 400 (I-4) Beyond the Ultimate- Segment 4 Right of Way

Habitat Impacts

Family 1 Pond 406B & R/W



2024230168

Title:

FLORIDA SCRUB-JAY SURVEY TECHNICAL MEMORANDUM:
Segment 4: Scrub-Jay Habitat Impact Map

Client/Project:
Florida Department of Transportation- D5
SR 400 (I-4) Beyond the Ultimate PD&E Study
Segment 4: SR 400 from East of SR 15/600 (US 17/92) to ½ mile East of SR 472

Project Location:
79110 Volusia County
STA 2583+0.00 (Begin) - MP 0.086
STA 3118+46.00 (End) - MP 10.227

Prepared by: mleonard 7/6/2015
Technical Review by: mdrauer 7/6/2015
Independent Review by: jmoore 7/6/2015

Figure 6: Sheet 1 of 4 - Scrub-Jay Habitat Impact Map

0 100 200
Feet

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

1 " = 200 '

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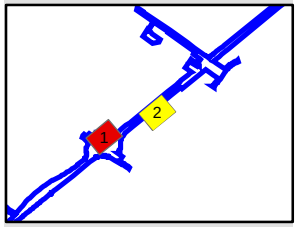
Map Key

SR 400 (I-4) Beyond the Ultimate- Segment 4 Right of Way

Habitat Impacts

Family 2 Pond 409A1

Family 3 Pond 409A1



2024230168

Title:

FLORIDA SCRUB-JAY SURVEY TECHNICAL MEMORANDUM:
Segment 4: Scrub-Jay Habitat Impact Map

Client/Project:
Florida Department of Transportation- D5
SR 400 (I-4) Beyond the Ultimate PD&E Study
Segment 4: SR 400 from East of SR 15/600 (US 17/92) to ½ mile East of SR 472

Project Location:
79110 Volusia County
STA 2583+0.00 (Begin) - MP 0.086
STA 3118+46.00 (End) - MP 10.227

Prepared by: mleonard 7/7/2015
Technical Review by: mdrauer 7/7/2015
Independent Review by: jmoore 7/7/2015

Figure 6: Sheet 2 of 4 - Scrub-Jay Habitat Impact Map

0 100 200
Feet

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

1 " = 200 '

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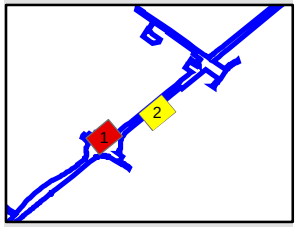
Map Key

SR 400 (I-4) Beyond the Ultimate- Segment 4 Right of Way

Habitat Impacts

Family 2 Pond 409A2

Family 3 Pond 409A2



2024230168

Title:

FLORIDA SCRUB-JAY SURVEY TECHNICAL MEMORANDUM:
Segment 4: Scrub-Jay Habitat Impact Map

Client/Project:
Florida Department of Transportation- D5
SR 400 (I-4) Beyond the Ultimate PD&E Study
Segment 4: SR 400 from East of SR 15/600 (US 17/92) to ½ mile East of SR 472

Project Location:
79110 Volusia County
STA 2583+0.00 (Begin) - MP 0.086
STA 3118+46.00 (End) - MP 10.227

Prepared by: mleonard 7/6/2015
Technical Review by: mdrauer 7/6/2015
Independent Review by: jmoore 7/6/2015

Figure 6: Sheet 3 of 4 - Scrub-Jay Habitat Impact Map

0 100 200
Feet

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

1 " = 200 '

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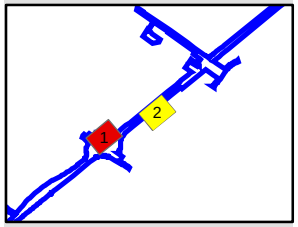
Map Key

SR 400 (I-4) Beyond the Ultimate- Segment 4 Right of Way

Habitat Impacts

Family 2 R/W Impacts

Family 3 R/w Impacts



2024230168

Title:

FLORIDA SCRUB-JAY SURVEY TECHNICAL MEMORANDUM:
Segment 4: Scrub-Jay Habitat Impact Map

Client/Project:
Florida Department of Transportation- D5
SR 400 (I-4) Beyond the Ultimate PD&E Study
Segment 4: SR 400 from East of SR 15/600 (US 17/92) to ½ mile East of SR 472

Project Location:
79110 Volusia County
STA 2583+0.00 (Begin) - MP 0.086
STA 3118+46.00 (End) - MP 10.227

Prepared by: mleonard 7/6/2015
Technical Review by: mdrauer 7/6/2015
Independent Review by: jmoore 7/6/2015

Figure 6: Sheet 4 of 4 - Scrub-Jay Habitat Impact Map

0 100 200
Feet

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

1 " = 200 '

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APPENDIX A
SCRUB-JAY HABITAT ASSESSMENT DATA

Habitat Assessment Data

October 2014 / April 2015 Scrub Jay Survey Results
I-4 Beyond the Ultimate Segment 4
FPID # 432100-1-22-01

Call Station Number	Reviewer	Location	FLUCFCS Code	Habitat Description	Canopy (include % Scrub Oak)	Shrub (% Scrub Oak:)	Herbaceous
G4-A, G4-B, G4-C, G4-D, G1-E, G1-D, G1- C,	CC, KM, MLD, MRD, MH, ML	Volusia	2110: Improved Pasture; 2130: WoodlandPasture; 3100: Herbaceous Upland Non-Forested	Upland pasture - cattle grazing - managed land	scattered slash pine -<5%	scattered wax myrtle -<5%; <5%scrub oaks	Bahiagrass, dog fennel, carpet grass, broom sedge, smut grass, torpedo grass
G5-D, G5-C, G6-G, G13-A, G13-B, G13-C, G11-G, G11-H, G11-H2. G11-J, G11-I, G1-F, G8-G, G8H, G8-I, G18-A, G18-B, G18-C, G18-D	CC, KM, MLD, MRD, MH, ML	Volusia	3200: Shrub and Brushland; 3300: Mixed Non-Forested Uplands; 7400: Disturbed Land	Disturbed transistional areas	10-30% immature pine	wax myrtle -<15%; <5%scrub oaks	grapevine, smilax sp, pawpaw, gopher apple,
G13-D, G13-E, G13-F, G13-G, G12-L, G14-A, G11-K, G12-K, G12-J, G12-I, G11-H, G11-G, G8-C, G8-D, G8-E, G8-F, G11-A, G11-B, G11-C, G11-D, G11-E, G11-F, G7-A, G7-B, G7-C, G7-D, G7-E, G7-F,G7-G, G7-H, G7-I, G9-C, G9-D, G9-E, G5-A, G5-B, G3-I, G1 -E, G9-A, G9-B, G12-C, G12-E, G12-F	CC, KM, MLD, MRD, MH, ML	Volusia	4120: Longleaf Pine-Xeric Oak; 4130: Sand Pine; 4210: Xeric Oak;	Scrub habitat dominated by sand pine and mixed scrub oak, with and longleaf pine and pine seedlings.	40-60% sand pine, 15 - 20%, sand live oak - 15 - 20', 5 - 10% long leaf Pine	saw palmetto 20 - 40%, mixed scrub oak species 5 - 20%, wax myrtle, rusty lyonia staggerbush, beauty berry, wax myrtle, winged sumac, gallberry	Wire grass, penny royal, grave vine, smilax sp., paw paw, prickly pear cactus, shiny blueberry, bracken fern, Aristida sp, runner oak, gallberry, rabbit tobacco, bachelor button, milkwort, hypericum, sunshine mimosa, rosemary, grapevine, smilax sp, pawpaw, gopher apple, prickly pear cactus, gallberry, blueberry.
G1-A, G1-B, G1-E, G2-A, G2-B, G2-C, G2-D, G3-B, G3-C, G3-D, G3-E, G3-F, G3-G, G3-H, G3-J, G3-K,G4-E, G4-F, G4-G, G4-H, G5-E, G6-A, G6-B, G6-C, G6-D, G6-E, G6-F, G8-A, G8-B, G12-A, G12-B, G12-D, G12-M, G3-L, G8-F, G8-J, G8-K, G8-L, G10-A,. G10-B, G10-C, G16-A, G16-B, G16-C, G16-D, G16-E, G17-A, G17-B, G17-C	CC, KM, MLD, MRD, MH, ML	Volusia	4340: Upland Mixed Conifer/Hardwood	Hardwood - Conifer Mixed habitat lot of large live and laurel oak, some long leaf pine	laurel oak - 50-65%, longleaf pine 5 - 15%, scattered cabbage palm, scattered dahoon holly	30% oak, 10% pine, very little saw palmetto 5 - 10%, beautyberry, B. pepper, wax myrtle	Bahia, broom sedge, grapevine, dog fennel, beauty berry, sweet grass, carpet grass, bracken fern, smilax, blackberry

Stantec Biologists: MH = Mike Holdsworth, ML = Matthew Leonard, MLD = Mike Dinardo, MRD = Mike Drauer, KM = Kevin Muldrew, CC = Crystal Clark

APPENDIX B
SCRUB-JAY STATION DATA

October 2014 Scrub Jay Survey Results
I-4 Beyond the Ultimate Segment 4
FPID # 432100-1-22-01

Stantec Biologists: MH = Mike Holdsworth, ML = Matthew Leonard, MLD = Mike Dinardo, MRD = Mike Drauer, KM = Kevin Muldrew, CC = Crystal Clark

Call Station #	*Survey Call Event #*	*Reviewer*	*Date*	*Start Time*	*Adults Observed*	*Juveniles Observed*	*Direction of Flight*	*Temp (F)*	*Wind Speed & Direction (mph)*	*Precipitation & Visibility*	*Notes*
G10-A	1	MH	10/8/2014	10:21 AM	0	0	N/A	80	1	0 - Clear	No Scrub Jays Observed
G10-A	2	MH	10/9/2014	11:01 AM	0	0	N/A	81	1.8-4.8	0 - Clear	No Scrub Jays Observed
G10-A	3	MH	10/11/2014	10:09 AM	0	0	N/A	80	1-2 E	0 - Clear	No Scrub Jays Observed
G10-A	4	MH	10/19/2014	8:38 AM	0	0	N/A	63	2-5 NW	0 - Clear	No Scrub Jays Observed: songbird activity, nothing came to tape
G10-A	5	MH	10/22/2014	10:15 AM	0	0	N/A	71	3 NW	0 - Clear	No Scrub Jays Observed
G10-B	1	MH	10/8/2014	10:11 AM	0	0	N/A	80	1	0 - Clear	No Scrub Jays Observed: pileated woodpecker
G10-B	2	MH	10/9/2014	10:51 AM	0	0	N/A	81	1.7	0 - Clear	No Scrub Jays Observed
G10-B	3	MH	10/11/2014	9:57 AM	0	0	N/A	79	0	0 - Clear	No Scrub Jays Observed
G10-B	4	MH	10/19/2014	8:47 AM	0	0	N/A	63	2-5 NW	0 - Clear	No Scrub Jays Observed
G10-B	5	MH	10/22/2014	10:05 AM	0	0	N/A	70	3 NW	0 - Clear	No Scrub Jays Observed
G10-C	1	MH	10/8/2014	9:59 AM	0	0	N/A	79	0	0 - Clear	No Scrub Jays Observed
G10-C	2	MH	10/9/2014	10:40 AM	0	0	N/A	81	1.7	0 - Clear	No Scrub Jays Observed
G10-C	3	MH	10/11/2014	9:46 AM	0	0	N/A	78	0	0 - Clear	No Scrub Jays Observed
G10-C	4	MH	10/19/2014	8:57 AM	0	0	N/A	65	1-4 NW	0 - Clear	No Scrub Jays Observed: Flicker, titmouse
G10-C	5	MH	10/22/2014	9:54 AM	0	0	N/A	70	7 NW	0 - Clear	No Scrub Jays Observed
G11-A	1	ML	10/8/2014	10:32 AM	0	0	N/A	80	1	0 - Clear	No Scrub Jays Observed
G11-A	2	ML	10/9/2014	9:14 AM	0	0	N/A	73	1.8	0 - Clear	No Scrub Jays Observed
G11-A	3	MH	10/10/2014	9:47 AM	0	0	N/A	79	3.2	0 - Clear	No Scrub Jays Observed
G11-A	4	MRD	10/20/2014	9:23 AM	0	0	N/A	74	2 E	0 - Clear	No Scrub Jays Observed
G11-A	5	MH	10/28/2014	10:23 AM	0	0	N/A	72	1 NW	0 - Clear	No Scrub Jays Observed
G11-B	1	ML	10/9/2014	9:07 AM	0	0	N/A	72	1.8	0 - Clear	No Scrub Jays Observed
G11-B	2	MH	10/10/2014	9:37 AM	0	0	N/A	77	3.2	0 - Clear	No Scrub Jays Observed: downy woodpecker, mocking bird, blue jay
G11-B	3	MRD	10/13/2014	10:19 AM	0	0	N/A	81	10 SE	0 - Clear	No Scrub Jays Observed
G11-B	4	MRD	10/20/2014	9:15 AM	0	0	N/A	74	2 E	0 - Clear	No Scrub Jays Observed
G11-B	5	MH	10/28/2014	10:33 AM	0	0	N/A	72	1 NW	0 - Clear	No Scrub Jays Observed
G11-C	1	ML	10/8/2014	10:22 AM	0	0	N/A	80	1	0 - Clear	No Scrub Jays Observed
G11-C	2	ML	10/9/2014	9:00 AM	0	0	N/A	72	1.8	0 - Clear	No Scrub Jays Observed
G11-C	3	MH	10/10/2014	9:25 AM	0	0	N/A	76	3.2	0 - Clear	No Scrub Jays Observed: blue jay
G11-C	4	MRD	10/20/2014	9:07 AM	0	0	N/A	74	2 E	0 - Clear	No Scrub Jays Observed
G11-C	5	MH	10/28/2014	10:44 AM	0	0	N/A	73	2 NW	0 - Clear	No Scrub Jays Observed
G11-D	1	MLD/MH	10/7/2014	10:50AM	0	0	N/A	75	2 SE	0 - Clear	No Scrub Jays Observed
G11-D	2	MLD	10/8/2014	10:26 AM	0	0	N/A	80	1	0 - Clear	No Scrub Jays Observed
G11-D	3	ML	10/9/2014	8:52 AM	0	0	N/A	72	0-1.7	0 - Clear	No Scrub Jays Observed
G11-D	4	MH	10/10/2014	9:15 AM	0	0	N/A	75	3.2	0 - Clear	No Scrub Jays Observed: two mocking birds
G11-D	5	MRD	10/20/2014	8:57 AM	0	0	N/A	72	3 E	0 - Clear	No Scrub Jays Observed
G11-E	1	MLD/MH	10/7/2014	10:41 AM	0	0	N/A	75	1.9 SE	0 - Clear	No Scrub Jays Observed
G11-E	2	MLD	10/8/2014	10:17 AM	0	0	N/A	80	1	0 - Clear	No Scrub Jays Observed
G11-E	3	ML	10/9/2014	8:45 AM	0	0	N/A	71	0-1.7	0 - Clear	No Scrub Jays Observed
G11-E	4	MH	10/10/2014	9:05 AM	0	0	N/A	74	1.4	0 - Clear	No Scrub Jays Observed
G11-E	5	MRD	10/20/2014	8:51 AM	0	0	N/A	70	3 E	0 - Clear	No Scrub Jays Observed
G11-F	1	MLD/MH	10/7/2014	10:32 AM	0	0	N/A	75	0.8 SE	0 - Clear	No Scrub Jays Observed
G11-F	2	MLD	10/8/2014	10:08 AM	0	0	N/A	78	1	0 - Clear	No Scrub Jays Observed
G11-F	3	ML	10/9/2014	8:38 AM	0	0	N/A	71	0-1.7	0 - Clear	No Scrub Jays Observed
G11-F	4	MH	10/10/2014	8:55 AM	0	0	N/A	73	1.4	0 - Clear	No Scrub Jays Observed
G11-F	5	MRD	10/13/2014	10:00 AM	0	0	N/A	81	8 SE	0 - Clear	No Scrub Jays Observed
G11-F	6	MRD	10/20/2014	8:44 AM	0	0	N/A	70	3 E	0 - Clear	No Scrub Jays Observed

Scrub-Jay Station Data

Call Station #	*Survey Call Event #*	*Reviewer*	*Date*	*Start Time*	*Adults Observed*	*Juveniles Observed*	*Direction of Flight*	*Temp (F)*	*Wind Speed & Direction (mph)*	*Precipitation & Visibility*	*Notes*
G11-G	1	MLD/MH	10/7/2014	10:13 AM	0	0	N/A	75	3 SE	0 - Clear	No Scrub Jays Observed
G11-G	2	MLD	10/8/2014	9:58 AM	0	0	N/A	77	0	0 - Clear	Birds from G11-H2 stayed and called back but did not follow.
G11-G	3	ML	10/9/2014	8:30 AM	0	0	N/A	71	0-1.7	0 - Clear	No Scrub Jays Observed
G11-G	4	MH	10/10/2014	8:44 AM	0	0	N/A	73	1.4	0 - Clear	No Scrub Jays Observed
G11-G	5	MRD	10/13/2014	9:50 AM	0	0	N/A	80	8 SE	0 - Clear	No Scrub Jays Observed
G11-G	6	MRD	10/20/2014	8:33 AM	0	0	N/A	70	3 E	0 - Clear	2 Jays sitting near G11-H2, but not coming toward G11-G
G11-H	1	MLD/MH	10/7/2014	9:56 AM	5	0	NE to SW, and SE to NW	72	0	0 - Clear	Two families observed (2 and 3 birds each) one group defended the landscaped live oak (north group/3 birds), other group (south/2 birds) did not defend (see field map notes)
G11-H	2	MLD	10/8/2014	9:27 AM	2	0	N/A	76	0	0 - Clear	Two adults west of pond - not defending or scolding - darting into brush
G11-H	3	ML	10/9/2014	8:12 AM	0	0	N/A	70	0-1.7	0 - Clear	No Scrub Jays Observed
G11-H	4	MH	10/10/2014	8:32 AM	1	0	N/A	73	1.4	0 - Clear	One jay remained perched on sand pine from G11-H2 call (same individual for both stations). Bird flew south after hearing tape at this station. A goldfinch and thrasher were seen here as well.
G11-H	5	MRD	10/13/2014	9:40 AM	1	0	S TO N	79	5 SE	0 - Clear	Sat on fence briefly
G11-H2	1	MLD/MH	10/7/2014	10:23 AM	2	0	N/A	75	3 SE	0 - Clear	Two scrub jays in the distance at the northwest corner of the pond, alert
G11-H2	2	MLD	10/8/2014	9:46 AM	3	0	S TO N	77	0	0 - Clear	Three adults flew from the south, stayed in oaks within the R/W, scolded, flew back to the south.
G11-H2	3	ML	10/9/2014	8:25 AM	0	0	N/A	70	0-1.7	0 - Clear	No Scrub Jays Observed
G11-H2	4	MH	10/10/2014	8:21 AM	1	0	N/A	72	1.4	0 - Clear	first call to north, one of south birds alerted, perched on sand pine in south of retention pond area. No north of retention pond group could be called.
G11-H2	5	MRD	10/20/2014	8:27 AM	3	0	N TO S	68	3 E	0 - Clear	Three birds flew from north to south
G11-I	1	MLD/MH	10/7/2014	9:45 AM	0	0	N/A	72	0	0 - Clear	No Scrub Jays Observed
G11-I	2	MLD	10/8/2014	9:16 AM	0	0	N/A	72	0	0 - Clear	No Scrub Jays Observed
G11-I	3	ML	10/8/2014	10:41 AM	0	0	N/A	83	0	0 - Clear	No Scrub Jays Observed
G11-I	4	ML	10/9/2014	8:06 AM	0	0	N/A	70	0-1.7	0 - Clear	No Scrub Jays Observed
G11-I	5	MH	10/11/2014	7:33 AM	0	0	N/A	69	0	0 - Clear	No Scrub Jays Observed
G11-I	6	MRD	10/13/2014	9:30 AM	0	0	N/A	79	8 SE	0 - Clear	No Scrub Jays Observed
G11-I	7	MRD	10/20/2014	8:21 AM	0	0	N/A	68	0	0 - Clear	No Scrub Jays Observed
G11-J	1	MLD/MH	10/7/2014	9:20 AM	1	0	unknown	72	0	0 - Clear	one scrub jay observed on side of Galveston Avenue on way to call station. Bird was north of the call station on Galveston Avenue. No birds came to station G11-J, but played tape at approximate area where individual scrub jay was seen and had 3 birds defending supplemental station (see field notes on map). Area where they were defending was approximately west of corner of Galveston and Geraldine.
G11-J	2	MLD	10/8/2014	8:59 AM	0	0	N/A	72	0	0 - Clear	No Scrub Jays Observed
G11-J	3	MRD	10/9/2014	8:00 AM	0	0	N/A	70	0-1.7	0 - Clear	No Scrub Jays Observed
G11-J	4	MRD	10/10/2014	8:57 AM	0	0	N/A	73	1.4	0 - Clear	No Scrub Jays Observed
G11-J	5	MRD	10/13/2014	10:37 AM	2	0	W TO E	82	8 SE	0 - Clear	called back - didn't show defence
G11-K	1	MH	10/10/2014	8:06 AM	0	0	N/A	72	1.4	0 - Clear	No Scrub Jays Observed: mocking bird, blue jay, thrasher
G11-K	2	MH	10/11/2014	7:23 AM	0	0	N/A	69	1 SW	0 - Clear	No Scrub Jays Observed
G11-K	3	MH	10/12/2014	8:23 AM	0	0	N/A	70	0	0 - Clear	No Scrub Jays Observed
G11-K	4	MH	10/19/2014	11:08 AM	0	0	N/A	74	1-3 N	0 - Clear	No Scrub Jays Observed: mocking bird
G11-K	5	MRD	10/20/2014	8:09 AM	0	0	N/A	64	0	0 - Clear	No Scrub Jays Observed
G12-A	1	ML	10/8/2014	8:05 AM	0	0	N/A	67	0	0 - Clear	No Scrub Jays Observed
G12-A	2	ML	10/9/2014	11:20 AM	0	0	N/A	81	1.8-4.8	0 - Clear	No Scrub Jays Observed
G12-A	3	ML	10/10/2014	10:04 AM	0	0	N/A	80	2.1-4.6	0 - Clear	No Scrub Jays Observed
G12-A	4	MLD	10/20/2014	8:29 AM	0	0	N/A	68	3 E	0 - Clear	No Scrub Jays Observed: catbirds
G12-A	5	KM	10/22/2014	8:21 AM	0	0	N/A	68	0	0 - Clear	No Scrub Jays Observed
G12-B	1	ML	10/8/2014	8:13 AM	0	0	N/A	67	0	0 - Clear	No Scrub Jays Observed
G12-B	2	ML	10/9/2014	11:31 AM	0	0	N/A	81	1.8-4.8	0 - Clear	No Scrub Jays Observed
G12-B	3	ML	10/10/2014	10:08 AM	0	0	N/A	80	2.1-4.6	0 - Clear	No Scrub Jays Observed
G12-B	4	MLD	10/20/2014	8:39 AM	0	0	N/A	70	3 E	0 - Clear	No Scrub Jays Observed
G12-B	5	KM	10/22/2014	8:30 AM	0	0	N/A	68	0	0 - Clear	No Scrub Jays Observed

Scrub-Jay Station Data

Call Station #	*Survey Call Event #*	*Reviewer*	*Date*	*Start Time*	*Adults Observed*	*Juveniles Observed*	*Direction of Flight*	*Temp (F)*	*Wind Speed & Direction (mph)*	*Precipitation & Visibility*	*Notes*
G12-C	1	ML	10/8/2014	8:22 AM	0	0	N/A	67	0	0 - Clear	No Scrub Jays Observed
G12-C	2	ML	10/9/2014	11:36 AM	0	0	N/A	83	1.8-4.8	0 - Clear	No Scrub Jays Observed
G12-C	3	ML	10/10/2014	10:15 AM	0	0	N/A	80	2.1-4.6	0 - Clear	No Scrub Jays Observed
G12-C	4	MLD	10/20/2014	8:51 AM	0	0	N/A	70	3 E	0 - Clear	No Scrub Jays Observed
G12-C	5	KM	10/22/2014	8:39 AM	0	0	N/A	68	0	0 - Clear	No Scrub Jays Observed
G12-D	1	ML	10/8/2014	8:29 AM	0	0	N/A	72	0	0 - Clear	No Scrub Jays Observed
G12-D	2	ML	10/9/2014	11:42 AM	0	0	N/A	83	1.8-4.8	0 - Clear	No Scrub Jays Observed
G12-D	3	ML	10/10/2014	10:20 AM	0	0	N/A	80	2.1-4.6	0 - Clear	No Scrub Jays Observed
G12-D	4	MLD	10/20/2014	9:02 AM	0	0	N/A	72	3 E	0 - Clear	No Scrub Jays Observed
G12-D	5	KM	10/22/2014	8:50 AM	0	0	N/A	68	1-4 NW	0 - Clear	No Scrub Jays Observed
G12-E	1	ML	10/8/2014	8:36 AM	0	0	N/A	73	0	0 - Clear	No Scrub Jays Observed
G12-E	2	MH	10/9/2014	11:37 AM	0	0	N/A	83	1.8-4.8	0 - Clear	No Scrub Jays Observed
G12-E	3	ML	10/10/2014	10:26 AM	0	0	N/A	81	2.1-4.6	0 - Clear	No Scrub Jays Observed
G12-E	4	MLD	10/20/2014	9:12 AM	0	0	N/A	74	2 E	0 - Clear	No Scrub Jays Observed
G12-E	5	KM	10/22/2014	8:59 AM	0	0	N/A	69	4 NW	0 - Clear	No Scrub Jays Observed
G12-F	1	ML	10/8/2014	8:44 AM	0	0	N/A	72	0	0 - Clear	No Scrub Jays Observed
G12-F	2	MH	10/9/2014	11:48 AM	0	0	N/A	82	1.8-4.8	0 - Clear	No Scrub Jays Observed
G12-F	3	ML	10/10/2014	10:32 AM	0	0	N/A	81	2.1-4.6	0 - Clear	No Scrub Jays Observed
G12-F	4	MLD	10/20/2014	9:20 AM	0	0	N/A	74	2 E	0 - Clear	No Scrub Jays Observed
G12-F	5	KM	10/22/2014	9:08 AM	1	1	E TO W	69	3 NNW	0 - Clear	Birds came across I-4 from the area of the retention pond on the opposite side of I-4 (eastbound side) scolding heavily at first. Gathered acorns on westbound side. Birds were flying approximately 30 to 40 feet above I-4
G12-G	1	MRD	10/9/2014	11:30 AM	0	0	N/A	81	1.8-4.8	0 - Clear	No Scrub Jays Observed
G12-G	2	ML	10/10/2014	10:38 AM	0	0	N/A	81	2.1-4.6	0 - Clear	No Scrub Jays Observed
G12-G	3	MH	10/19/2014	11:32 AM	0	0	N/A	76	3-8 N	0 - Clear	No Scrub Jays Observed - including E side of road. Played several different call varieties.
G12-G	4	MLD	10/20/2014	9:30 AM	0	0	N/A	74	2 E	0 - Clear	No Scrub Jays Observed
G12-G	5	KM	10/22/2014	9:21 AM	3	0	E TO W	69	2 NW	0 - Clear	One adult came to edge of the retention pond on the opposite side of I-4 but did not cross over. Two jays were spotted crossing back and forth approximately 30 to 40 feet over I-4 toward station G12-H. Jays seen at station G12-F did not respond.
G12-H	1	ML	10/8/2014	8:51 AM	0	0	N/A	72	0	0 - Clear	No Scrub Jays Observed
G12-H	2	MRD	10/9/2014	11:38 AM	0	0	N/A	83	1.8-4.8	0 - Clear	No Scrub Jays Observed
G12-H	3	ML	10/10/2014	10:43 AM	0	0	N/A	81	2.1-4.6	0 - Clear	No Scrub Jays Observed
G12-H	4	MLD	10/20/2014	9:40 AM	0	0	N/A	74	2 E	0 - Clear	No Scrub Jays Observed
G12-H	5	KM	10/22/2014	9:30 AM	2	0	E TO W	69	3 NW	0 - Clear	Two jays crossed over I-4 from the south edge of the retention pond and crossed over I-4 (two round trips). Saw them through binoculars approximately 30 to 40 feet above I-4.
G12-I	1	ML	10/8/2014	8:58 AM	0	0	N/A	72	0	0 - Clear	No Scrub Jays Observed
G12-I	2	MRD	10/9/2014	11:47 AM	0	0	N/A	82	1.8-4.8	0 - Clear	No Scrub Jays Observed
G12-I	3	ML	10/10/2014	10:49 AM	0	0	N/A	81	2.1-4.6	0 - Clear	No Scrub Jays Observed
G12-I	4	MLD	10/20/2014	9:55 AM	0	0	N/A	74	2 E	0 - Clear	No Scrub Jays Observed
G12-I	5	KM	10/22/2014	9:49 AM	0	0	N/A	70	7 NW	0 - Clear	No Scrub Jays Observed
G12-J	1	ML	10/8/2014	9:06 AM	0	0	N/A	72	0	0 - Clear	No Scrub Jays Observed
G12-J	2	MRD	10/9/2014	11:55 AM	0	0	N/A	82	1.8-4.8	0 - Clear	No Scrub Jays Observed
G12-J	3	ML	10/10/2014	10:56 AM	0	0	N/A	81	2.1-4.6	0 - Clear	No Scrub Jays Observed
G12-J	4	MLD	10/20/2014	10:10 AM	0	0	N/A	76	2 E	0 - Clear	No Scrub Jays Observed
G12-J	5	KM	10/22/2014	10:08 AM	0	0	N/A	70	3 NW	0 - Clear	No Scrub Jays Observed
G12-K	1	ML	10/8/2014	9:18 AM	0	0	N/A	72	0	0 - Clear	No Scrub Jays Observed
G12-K	2	ML	10/9/2014	11:54 AM	0	0	N/A	82	1.8-4.8	0 - Clear	No Scrub Jays Observed
G12-K	3	ML	10/10/2014	11:03 AM	0	0	N/A	82	1.6-3.6 NW	0 - Clear	No Scrub Jays Observed
G12-K	4	MRD	10/13/2014	8:16 AM	0	0	N/A	71	5 NNE	0 - Clear	No Scrub Jays Observed
G12-K	5	MLD	10/20/2014	10:20 AM	0	0	N/A	76	2 E	0 - Clear	No Scrub Jays Observed

Scrub-Jay Station Data

Call Station #	*Survey Call Event #*	*Reviewer*	*Date*	*Start Time*	*Adults Observed*	*Juveniles Observed*	*Direction of Flight*	*Temp (F)*	*Wind Speed & Direction (mph)*	*Precipitation & Visibility*	*Notes*
G12-L	1	ML	10/8/2014	9:25 AM	0	0	N/A	76	0	0 - Clear	No Scrub Jays Observed
G12-L	2	ML	10/9/2014	11:59 AM	2	0	NW TO SE	82	1.8-4.8	0 - Clear	1st bird perched nearly parallel to the edge of the R/W. perched on pine tree 30-40 yards away from station. 2nd bird came from NW, perched on snag pine tree directly in front of station. Birds arrive during 3 minutes of play.
G12-L	3	ML	10/10/2014	11:11 AM	0	0	N/A	82	1.6-3.6 NW	0 - Clear	No Scrub Jays Observed
G12-L	4	MRD	10/13/2014	8:35 AM	0	0	N/A	77	5 NNE	0 - Clear	No Scrub Jays Observed
G12-L	5	MLD	10/20/2014	10:29 AM	2	0	W TO E	76	2 E	0 - Clear	Two adults appeared at G12-L and scolded then crossed to G14-A (see G14-A)
G12-M	1	MH	10/8/2014	8:09 AM	0	0	N/A	72	0	0 - Clear	No Scrub Jays Observed
G12-M	2	MH	10/9/2014	8:50 AM	0	0	N/A	72	0-1.7	0 - Clear	No Scrub Jays Observed
G12-M	3	MH	10/11/2014	7:57 AM	0	0	N/A	70	0	0 - Clear	No Scrub Jays Observed: Coopers hawk nearby
G12-M	4	MH	10/19/2014	10:31 AM	0	0	N/A	70	1-2 NW	0 - Clear	No Scrub Jays Observed
G12-M	5	MH	10/22/2014	9:39 AM	0	0	N/A	69	3 NW	0 - Clear	No Scrub Jays Observed
G13-A	1	ML	10/10/2014	8:56 AM	0	0	N/A	73	1.4	0 - Clear	No Scrub Jays Observed
G13-A	2	MH	10/12/2014	7:20 AM	0	0	N/A	69	0	0 - Clear	No Scrub Jays Observed: cardinal
G13-A	3	MH	10/19/2014	10:51 AM	0	0	N/A	72	1-3 NW	0 - Clear	No Scrub Jays Observed: cat bird, blue jay
G13-A	4	MLD	10/20/2014	10:45 AM	0	0	N/A	77	2 NE	0 - Clear	No Scrub Jays Observed
G13-A	5	MH	10/22/2014	10:54 AM	0	0	N/A	73	4 NW	0 - Clear	No Scrub Jays Observed: thrasher, three blue jays, two mocking birds
G13-B	1	ML	10/10/2014	9:05 AM	0	0	N/A	74	3.2	0 - Clear	No Scrub Jays Observed
G13-B	2	MH	10/12/2014	7:11 AM	0	0	N/A	69	0	0 - Clear	No Scrub Jays Observed: crows, cat bird, grackle, coopers hawk
G13-B	3	MRD	10/13/2014	12:00 PM	0	0	N/A	86	4 SE	0 - Clear	No Scrub Jays Observed
G13-B	4	MLD	10/20/2014	10:56 AM	0	0	N/A	77	4 NE	0 - Clear	No Scrub Jays Observed
G13-B	5	MH	10/22/2014	11:04 AM	0	0	N/A	73	3 NW	0 - Clear	No Scrub Jays Observed
G13-C	1	ML	10/8/2014	9:41 AM	0	0	N/A	77	1	0 - Clear	No Scrub Jays Observed - vegetation thick at this point, some other birds were observed
G13-C	2	ML	10/10/2014	8:18 AM	0	0	N/A	72	1.4	0 - Clear	No Scrub Jays Observed - Waited for fog to burn off in the morning before 8.
G13-C	3	MH	10/12/2014	7:38 AM	0	0	N/A	68	0	0 - Clear	No Scrub Jays Observed
G13-C	4	MRD	10/13/2014	9:05 AM	0	0	N/A	77	5 NNE	0 - Clear	No Scrub Jays Observed
G13-C	5	MH	10/20/2014	11:08 AM	0	0	N/A	77	4 NE	0 - Clear	No Scrub Jays Observed
G13-D	1	ML	10/8/2014	9:47 AM	0	0	N/A	77	0	0 - Clear	No Scrub Jays Observed - vegetation thick at this point, some other birds were observed
G13-D	2	ML	10/10/2014	8:28 AM	0	0	N/A	72	1.4	0 - Clear	No Scrub Jays Observed
G13-D	3	MH	10/12/2014	7:48 AM	0	0	N/A	68	0	0 - Clear	No Scrub Jays Observed
G13-D	4	MRD	10/13/2014	9:18 AM	0	0	N/A	77	4 NNE	0 - Clear	No Scrub Jays Observed
G13-D	5	MH	10/20/2014	10:55 AM	0	0	N/A	77	4 NE	0 - Clear	No Scrub Jays Observed
G13-F	1	ML	10/8/2014	9:54 AM	0	0	N/A	77	1	0 - Clear	No Scrub Jays Observed - vegetation thick at this point, some other birds were observed
G13-F	2	ML	10/10/2014	8:35 AM	0	0	N/A	73	1.4	0 - Clear	No Scrub Jays Observed
G13-F	3	MH	10/12/2014	7:58 AM	0	0	N/A	68	0	0 - Clear	No Scrub Jays Observed
G13-F	4	MH	10/20/2014	11:18 AM	0	0	N/A	78	5 E	0 - Clear	No Scrub Jays Observed
G13-F	5	MH	10/22/2014	10:32 AM	0	0	N/A	71	4 NW	0 - Clear	No Scrub Jays Observed
G13-G	1	ML	10/8/2014	10:06 AM	0	0	N/A	78	1	0 - Clear	No Scrub Jays Observed - vegetation thick at this point, some other birds were observed
G13-G	2	ML	10/10/2014	8:43 AM	0	0	N/A	73	1.4	0 - Clear	No Scrub Jays Observed
G13-G	3	MH	10/12/2014	8:08 AM	0	0	N/A	69	0	0 - Clear	No Scrub Jays Observed: cardinal, mocking bird
G13-G	4	MH	10/20/2014	11:28 AM	0	0	N/A	78	5 E	0 - Clear	No Scrub Jays Observed
G13-G	5	MH	10/22/2014	10:41 AM	0	0	N/A	73	3 NW	0 - Clear	No Scrub Jays Observed
G14-A	1	ML	10/8/2014	9:30 AM	0	0	N/A	76	0	0 - Clear	No Scrub Jays Observed
G14-A	2	ML	10/9/2014	12:10 PM	2	0	NW TO SE	82	1.8-4.8	0 - Clear	Birds from station G12-L follow call to station G14-A on opposite side of ramp pavement. Both birds defended the habitat within the infield of the clover-leaf ramp system. 2nd bird continued to hang around long after playing was stopped.
G14-A	3	ML	10/10/2014	11:20 AM	0	0	N/A	82	1.6-3.6 NW	0 - Clear	No Scrub Jays Observed
G14-A	4	MRD	10/13/2014	8:47 AM	0	0	N/A	77	5 NNE	0 - Clear	No Scrub Jays Observed

Scrub-Jay Station Data

Call Station #	*Survey Call Event #*	*Reviewer*	*Date*	*Start Time*	*Adults Observed*	*Juveniles Observed*	*Direction of Flight*	*Temp (F)*	*Wind Speed & Direction (mph)*	*Precipitation & Visibility*	*Notes*
G14-A	5	MLD	10/20/2014	10:33 AM	2	0	N TO S, S TO N	76	2 E	0 - Clear	Once crossed off-ramp to G14-A from G12-L, 1 of 2 birds from G12-L followed over to G14-A and continued scolding until I left. Did not follow calls when I traversed approximately 100 feet toward I-4
G1-A	1	CC	10/8/2014	10:56 AM	0	0	N/A	84	0	0 - Clear	No Scrub Jays Observed
G1-A	2	CC	10/9/2014	11:10 AM	0	0	N/A	81	1.8-4.8	0 - Clear	No Scrub Jays Observed
G1-A	3	MRD	10/10/2014	11:34 AM	0	0	N/A	82	1.6-3.6 NW	0 - Clear	No Scrub Jays Observed
G1-A	4	MH	10/12/2014	11:17 AM	0	0	N/A	83	2-4 E	0 - Clear	No Scrub Jays Observed
G1-A	5	KM	10/20/2014	10:50 AM	0	0	N/A	77	4 NE	0 - Clear	No Scrub Jays Observed
G1-B	1	CC	10/8/2014	10:46 AM	0	0	N/A	83	0	0 - Clear	No Scrub Jays Observed
G1-B	2	CC	10/9/2014	11:00 AM	0	0	N/A	81	1.8-4.8	0 - Clear	No Scrub Jays Observed
G1-B	3	MRD	10/10/2014	11:21 AM	0	0	N/A	82	1.6-3.6 NW	0 - Clear	No Scrub Jays Observed
G1-B	4	MH	10/12/2014	11:08 AM	0	0	N/A	83	2-4 E	0 - Clear	No Scrub Jays Observed
G1-B	5	KM	10/20/2014	10:40 AM	0	0	N/A	77	2 NE	0 - Clear	No Scrub Jays Observed
G1-C	1	CC	10/8/2014	10:00 AM	0	0	N/A	78	1	0 - Clear	No Scrub Jays Observed
G1-C	2	CC	10/9/2014	10:51 AM	0	0	N/A	81	1.7	0 - Clear	No Scrub Jays Observed
G1-C	3	MRD	10/10/2014	11:13 AM	0	0	N/A	82	1.6-3.6 NW	0 - Clear	No Scrub Jays Observed
G1-C	4	MH	10/19/2014	11:21 AM	0	0	N/A	75	3-8 N	0 - Clear	No Scrub Jays Observed
G1-C	5	KM	10/20/2014	10:30 AM	0	0	N/A	77	2 NE	0 - Clear	No Scrub Jays Observed
G1-D	1	CC	10/8/2014	9:50 AM	0	0	N/A	77	1	0 - Clear	No Scrub Jays Observed
G1-D	2	CC	10/9/2014	10:09 AM	0	0	N/A	78	1.7	0 - Clear	No Scrub Jays Observed
G1-D	3	MRD	10/10/2014	10:50 AM	0	0	N/A	81	2.1-4.6	0 - Clear	No Scrub Jays Observed
G1-D	4	MH	10/12/2014	10:41 AM	0	0	N/A	82	2 E	0 - Clear	No Scrub Jays Observed
G1-D	5	KM	10/20/2014	10:20 AM	0	0	N/A	76	2 E	0 - Clear	No Scrub Jays Observed
G1-E	1	CC	10/8/2014	10:29 AM	0	0	N/A	80	1	0 - Clear	No Scrub Jays Observed
G1-E	2	CC	10/9/2014	10:40 AM	0	0	N/A	81	1.7	0 - Clear	No Scrub Jays Observed
G1-E	3	MRD	10/10/2014	11:04 AM	0	0	N/A	82	1.6-3.6 NW	0 - Clear	No Scrub Jays Observed
G1-E	4	MH	10/12/2014	10:59 AM	0	0	N/A	82	2-4 E	0 - Clear	No Scrub Jays Observed: cardinal, blue jay
G1-E	5	KM	10/20/2014	11:00 AM	0	0	N/A	77	4 NE	0 - Clear	No Scrub Jays Observed
G1-F	1	CC	10/8/2014	10:13 AM	1	0	W TO S	80	0	0 - Clear	One adult came from west, stayed in tree stand to south.
G1-F	2	CC	10/9/2014	10:22 AM	1	0	NE TO SW	79	1.7	0 - Clear	One adult scrub jay. Hawk nearby
G1-F	3	MRD	10/10/2014	10:57 AM	0	0	N/A	81	2.1-4.6	0 - Clear	No Scrub Jays Observed
G1-F	4	MH	10/12/2014	10:50 AM	0	0	N/A	82	2 E	0 - Clear	No Scrub Jays Observed
G1-F	5	MRD	10/13/2014	11:20 AM	0	0	N/A	83	4 N	0 - Clear	No Scrub Jays Observed
G1-F	6	KM	10/20/2014	11:10 AM	0	0	N/A	77	4 NE	0 - Clear	No Scrub Jays Observed
G2-A	1	MRD/ML	10/7/2014	8:10 AM	0	0	N/A	66	0	0 - Clear	No Scrub Jays Observed
G2-A	2	MRD	10/8/2014	7:50 AM	0	0	N/A	66	0	0 - Clear	No Scrub Jays Observed
G2-A	3	MRD	10/9/2014	9:14 AM	0	0	N/A	73	1.8	0 - Clear	No Scrub Jays Observed
G2-A	4	MH	10/20/2014	8:03 AM	0	0	N/A	63	0	0 - Clear	No Scrub Jays Observed
G2-A	5	KM	10/21/2014	7:28 AM	0	0	N/A	68	0	0 - Clear	No Scrub Jays Observed
G2-B	1	MRD/ML	10/7/2014	8:21 AM	0	0	N/A	66	0	0 - Clear	No Scrub Jays Observed
G2-B	2	MRD	10/8/2014	7:58 AM	0	0	N/A	66	0	0 - Clear	No Scrub Jays Observed
G2-B	3	MRD	10/9/2014	9:20 AM	0	0	N/A	74	1.8	0 - Clear	No Scrub Jays Observed
G2-B	4	MH	10/20/2014	8:11 AM	0	0	N/A	64	0	0 - Clear	No Scrub Jays Observed
G2-B	5	KM	10/21/2014	7:37 AM	0	0	N/A	68	0	0 - Clear	No Scrub Jays Observed
G2-C	1	MRD/ML	10/7/2014	8:32 AM	0	0	N/A	66	0	0 - Clear	No Scrub Jays Observed
G2-C	2	MRD	10/8/2014	8:07 AM	0	0	N/A	72	0	0 - Clear	No Scrub Jays Observed
G2-C	3	MRD	10/9/2014	9:28 AM	0	0	N/A	74	1.8	0 - Clear	No Scrub Jays Observed
G2-C	4	MH	10/20/2014	8:20 AM	0	0	N/A	68	0	0 - Clear	No Scrub Jays Observed
G2-C	5	KM	10/21/2014	7:47 AM	0	0	N/A	68	0	0 - Clear	No Scrub Jays Observed
G2-D	1	MRD/ML	10/7/2014	8:40 AM	0	0	N/A	66	0	0 - Clear	No Scrub Jays Observed

Scrub-Jay Station Data

Call Station #	*Survey Call Event #*	*Reviewer*	*Date*	*Start Time*	*Adults Observed*	*Juveniles Observed*	*Direction of Flight*	*Temp (F)*	*Wind Speed & Direction (mph)*	*Precipitation & Visibility*	*Notes*
G2-D	2	MRD	10/8/2014	8:15 AM	0	0	N/A	67	0	0 - Clear	No Scrub Jays Observed
G2-D	3	MRD	10/9/2014	9:36 AM	0	0	N/A	76	1.8	0 - Clear	No Scrub Jays Observed
G2-D	4	MH	10/20/2014	8:29 AM	0	0	N/A	68	3 E	0 - Clear	No Scrub Jays Observed
G2-D	5	KM	10/21/2014	7:57 AM	0	0	N/A	68	0	0 - Clear	No Scrub Jays Observed
G3-B	1	CC	10/8/2014	9:33 AM	0	0	N/A	75	1	0 - Clear	No Scrub Jays Observed
G3-B	2	CC	10/9/2014	9:56 AM	0	0	N/A	77	1.8	0 - Clear	No Scrub Jays Observed: mocking bird and red-shoulder hawk
G3-B	3	MRD	10/10/2014	10:43 AM	0	0	N/A	81	2.1-4.6	0 - Clear	No Scrub Jays Observed
G3-B	4	MH	10/12/2014	10:32 AM	0	0	N/A	81	2 SE	0 - Clear	No Scrub Jays Observed
G3-B	5	KM	10/20/2014	10:10 AM	0	0	N/A	76	2 E	0 - Clear	No Scrub Jays Observed
G3-C	1	CC	10/8/2014	9:22 AM	0	0	N/A	72	0	0 - Clear	No Scrub Jays Observed
G3-C	2	CC	10/9/2014	9:45 AM	0	0	N/A	76	1.8	0 - Clear	No Scrub Jays Observed: Two king birds
G3-C	3	MRD	10/10/2014	10:35 AM	0	0	N/A	81	2.1-4.6	0 - Clear	No Scrub Jays Observed
G3-C	4	MH	10/12/2014	10:23 AM	0	0	N/A	81	2 SE	0 - Clear	No Scrub Jays Observed
G3-C	5	KM	10/20/2014	9:24 AM	0	0	N/A	74	2 E	0 - Clear	No Scrub Jays Observed
G3-D	1	CC	10/8/2014	9:10 AM	0	0	N/A	72	0	0 - Clear	No Scrub Jays Observed
G3-D	2	CC	10/9/2014	9:35 AM	0	0	N/A	76	1.8	0 - Clear	No Scrub Jays Observed
G3-D	3	MRD	10/10/2014	10:27 AM	0	0	N/A	81	2.1-4.6	0 - Clear	No Scrub Jays Observed
G3-D	4	MH	10/12/2014	10:14 AM	0	0	N/A	80	1 SE	0 - Clear	No Scrub Jays Observed
G3-D	5	KM	10/20/2014	9:15 AM	0	0	N/A	74	2 E	0 - Clear	No Scrub Jays Observed
G3-E	1	CC	10/8/2014	9:01 AM	0	0	N/A	72	0	0 - Clear	No Scrub Jays Observed
G3-E	2	CC	10/9/2014	9:25 AM	0	0	N/A	74	1.8	0 - Clear	No Scrub Jays Observed
G3-E	3	MRD	10/10/2014	10:19 AM	0	0	N/A	80	2.1-4.6	0 - Clear	No Scrub Jays Observed
G3-E	4	MH	10/12/2014	10:05 AM	0	0	N/A	79	0	0 - Clear	No Scrub Jays Observed
G3-E	5	KM	10/20/2014	9:05 AM	0	0	N/A	74	2 E	0 - Clear	No Scrub Jays Observed
G3-F	1	CC	10/8/2014	8:50 AM	0	0	N/A	72	0	0 - Clear	No Scrub Jays Observed: king bird observed
G3-F	2	CC	10/9/2014	9:16 AM	0	0	N/A	73	1.8	0 - Clear	No Scrub Jays Observed
G3-F	3	MRD	10/10/2014	10:11 AM	0	0	N/A	80	2.1-4.6	0 - Clear	No Scrub Jays Observed
G3-F	4	MH	10/12/2014	9:56 AM	0	0	N/A	78	0	0 - Clear	No Scrub Jays Observed
G3-F	5	KM	10/20/2014	8:55 AM	0	0	N/A	72	3 E	0 - Clear	No Scrub Jays Observed
G3-G	1	CC	10/8/2014	8:38 AM	0	0	N/A	72	0	0 - Clear	No Scrub Jays Observed: Mocking bird call
G3-G	2	CC	10/9/2014	9:04 AM	0	0	N/A	72	1.8	0 - Clear	No Scrub Jays Observed
G3-G	3	MRD	10/10/2014	10:03 AM	0	0	N/A	80	3.2	0 - Clear	No Scrub Jays Observed
G3-G	4	MH	10/12/2014	9:47 AM	0	0	N/A	77	0	0 - Clear	No Scrub Jays Observed
G3-G	5	KM	10/20/2014	8:45 AM	0	0	N/A	70	3 E	0 - Clear	No Scrub Jays Observed
G3-H	1	CC	10/8/2014	8:26 AM	0	0	N/A	72	0	0 - Clear	No Scrub Jays Observed
G3-H	2	CC	10/9/2014	8:53 AM	0	0	N/A	72	0-1.7	0 - Clear	No Scrub Jays Observed
G3-H	3	MRD	10/10/2014	9:55 AM	0	0	N/A	79	3.2	0 - Clear	No Scrub Jays Observed
G3-H	4	MH	10/12/2014	9:37 AM	0	0	N/A	76	0	0 - Clear	No Scrub Jays Observed: cardinals (pair), thrasher, downy woodpecker
G3-H	5	KM	10/20/2014	8:32 AM	0	0	N/A	68	3 E	0 - Clear	No Scrub Jays Observed
G3-I	1	CC	10/8/2014	8:15 AM	0	0	N/A	67	0	0 - Clear	No Scrub Jays Observed
G3-I	2	CC	10/9/2014	8:43 AM	0	0	N/A	71	0-1.7	0 - Clear	No Scrub Jays Observed
G3-I	3	MRD	10/10/2014	9:46 AM	0	0	N/A	79	3.2	0 - Clear	No Scrub Jays Observed
G3-I	4	MH	10/12/2014	9:28 AM	0	0	N/A	75	0	0 - Clear	No Scrub Jays Observed
G3-I	5	KM	10/20/2014	8:22 AM	0	0	N/A	68	0	0 - Clear	No Scrub Jays Observed
G3-J	1	CC	10/8/2014	8:03 AM	0	0	N/A	67	0	0 - Clear	No Scrub Jays Observed
G3-J	2	CC	10/9/2014	8:33 AM	0	0	N/A	71	0-1.7	0 - Clear	No Scrub Jays Observed
G3-J	3	MRD	10/10/2014	9:34 AM	0	0	N/A	76	3.2	0 - Clear	No Scrub Jays Observed
G3-J	4	MH	10/12/2014	9:18 AM	0	0	N/A	74	0	0 - Clear	No Scrub Jays Observed: cardinal
G3-J	5	KM	10/20/2014	8:09 AM	0	0	N/A	64	0	0 - Clear	No Scrub Jays Observed
G3-K	1	CC	10/8/2014	7:53 AM	0	0	N/A	66	0	0 - Clear	No Scrub Jays Observed

Scrub-Jay Station Data

Call Station #	*Survey Call Event #*	*Reviewer*	*Date*	*Start Time*	*Adults Observed*	*Juveniles Observed*	*Direction of Flight*	*Temp (F)*	*Wind Speed & Direction (mph)*	*Precipitation & Visibility*	*Notes*
G3-K	2	CC	10/9/2014	8:20 AM	1	0	W TO E	70	0-1.7	0 - Clear	One adult sitting on fence
G3-K	3	MRD	10/10/2014	9:26 AM	0	0	N/A	76	3.2	0 - Clear	No Scrub Jays Observed
G3-K	4	MH	10/12/2014	9:07 AM	0	0	N/A	73	0	0 - Clear	No Scrub Jays Observed
G3-K	5	KM	10/20/2014	7:57 AM	0	0	N/A	63	0	0 - Clear	No Scrub Jays Observed
G3-L	1	CC	10/8/2014	7:40 AM	3	0	unknown	66	0	0 - Clear	Sat in tree behind station and defended. Kingbird also observed.
G3-L	2	CC	10/9/2014	8:03 AM	0	0	N/A	70	0-1.7	0 - Clear	No Scrub Jays Observed: Three cardinals
G3-L	3	MRD	10/10/2014	9:14 AM	0	0	N/A	74	3.2	0 - Clear	No Scrub Jays Observed
G3-L	4	MH	10/12/2014	8:57 AM	0	0	N/A	72	0	0 - Clear	No Scrub Jays Observed: 2 doves and a red-headed woodpecker
G3-L	5	MRD	10/13/2014	11:10 AM	0	0	N/A	82	6 E	0 - Clear	No Scrub Jays Observed
G4-A	1	MRD/ML	10/7/2014	8:54 AM	0	0	N/A	66	0	0 - Clear	No Scrub Jays Observed
G4-A	2	MRD	10/8/2014	8:22 AM	0	0	N/A	72	0	0 - Clear	No Scrub Jays Observed
G4-A	3	MRD	10/9/2014	9:42 AM	0	0	N/A	76	1.8	0 - Clear	No Scrub Jays Observed
G4-A	4	MH	10/20/2014	8:38 AM	0	0	N/A	70	3 E	0 - Clear	No Scrub Jays Observed
G4-A	5	KM	10/21/2014	8:07 AM	0	0	N/A	69	0	0 - Clear	No Scrub Jays Observed
G4-B	1	MRD/ML	10/7/2014	9:03 AM	0	0	N/A	66	0	0 - Clear	No Scrub Jays Observed
G4-B	2	MRD	10/8/2014	8:30 AM	0	0	N/A	72	0	0 - Clear	No Scrub Jays Observed
G4-B	3	MRD	10/9/2014	9:50 AM	0	0	N/A	76	1.8	0 - Clear	No Scrub Jays Observed
G4-B	4	MH	10/20/2014	8:47 AM	0	0	N/A	70	3 E	0 - Clear	No Scrub Jays Observed
G4-B	5	KM	10/21/2014	8:17 AM	0	0	N/A	69	0	0 - Clear	No Scrub Jays Observed
G4-C	1	MRD/ML	10/7/2014	9:12 AM	0	0	N/A	72	0	0 - Clear	No Scrub Jays Observed
G4-C	2	MRD	10/8/2014	8:37 AM	0	0	N/A	73	0	0 - Clear	No Scrub Jays Observed
G4-C	3	MRD	10/9/2014	9:58 AM	0	0	N/A	77	1.8	0 - Clear	No Scrub Jays Observed
G4-C	4	MH	10/20/2014	8:56 AM	0	0	N/A	72	3 E	0 - Clear	No Scrub Jays Observed
G4-C	5	KM	10/21/2014	8:27 AM	0	0	N/A	69	0	0 - Clear	No Scrub Jays Observed
G4-D	1	MRD/ML	10/7/2014	9:24 AM	0	0	N/A	72	0	0 - Clear	No Scrub Jays Observed
G4-D	2	MRD	10/8/2014	8:45 AM	0	0	N/A	72	0	0 - Clear	No Scrub Jays Observed
G4-D	3	MRD	10/9/2014	10:05 AM	0	0	N/A	78	1.7	0 - Clear	No Scrub Jays Observed
G4-D	4	MH	10/20/2014	9:06 AM	0	0	N/A	74	2 E	0 - Clear	No Scrub Jays Observed
G4-D	5	KM	10/21/2014	8:37 AM	0	0	N/A	70	0	0 - Clear	No Scrub Jays Observed
G4-E	1	MRD/ML	10/7/2014	9:33 AM	0	0	N/A	72	0	0 - Clear	No Scrub Jays Observed
G4-E	2	MRD	10/8/2014	8:54 AM	0	0	N/A	72	0	0 - Clear	No Scrub Jays Observed
G4-E	3	MRD	10/9/2014	10:13 AM	0	0	N/A	78	1.7	0 - Clear	No Scrub Jays Observed
G4-E	4	MH	10/20/2014	9:15 AM	0	0	N/A	74	2 E	0 - Clear	No Scrub Jays Observed
G4-E	5	KM	10/21/2014	8:47 AM	0	0	N/A	70	0	0 - Clear	No Scrub Jays Observed
G4-F	1	MRD/ML	10/7/2014	9:40 AM	0	0	N/A	72	0	0 - Clear	No Scrub Jays Observed
G4-F	2	MRD	10/8/2014	9:04 AM	0	0	N/A	72	0	0 - Clear	No Scrub Jays Observed
G4-F	3	MRD	10/9/2014	10:22 AM	0	0	N/A	79	1.7	0 - Clear	No Scrub Jays Observed
G4-F	4	MH	10/20/2014	9:25 AM	0	0	N/A	74	2 E	0 - Clear	No Scrub Jays Observed
G4-F	5	KM	10/21/2014	8:57 AM	0	0	N/A	70	0	0 - Clear	No Scrub Jays Observed
G4-G	1	MRD/ML	10/7/2014	9:52 AM	0	0	N/A	72	0	0 - Clear	No Scrub Jays Observed
G4-G	2	MH	10/8/2014	10:49 AM	0	0	N/A	84	0	0 - Clear	No Scrub Jays Observed
G4-G	3	MH	10/9/2014	8:10 AM	0	0	N/A	70	0-1.7	0 - Clear	No Scrub Jays Observed
G4-G	4	MH	10/11/2014	11:05 AM	0	0	N/A	81	1-4 E	0 - Clear	No Scrub Jays Observed
G4-G	5	MH	10/19/2014	8:09 AM	0	0	N/A	63	2 NW	0 - Clear	No Scrub Jays Observed: Cardinals (pair)
G4-H	1	MRD/ML	10/7/2014	10:20 AM	0	0	N/A	75	4 SE	0 - Clear	No Scrub Jays Observed
G4-H	2	MH	10/8/2014	11:04 AM	0	0	N/A	84	0	0 - Clear	No Scrub Jays Observed: cardinals (pair)
G4-H	3	MH	10/9/2014	7:54 AM	0	0	N/A	70	0-1.7	0 - Clear	No Scrub Jays Observed
G4-H	4	MH	10/11/2014	10:49 AM	0	0	N/A	80	1-4 E	0 - Clear	No Scrub Jays Observed
G4-H	5	MH	10/19/2014	7:53 AM	0	0	N/A	63	2 NW	0 - Clear	No Scrub Jays Observed: Blue jay
G5-A	1	MLD	10/8/2014	11:26 AM	0	0	N/A	84	0	0 - Clear	No Scrub Jays Observed

Scrub-Jay Station Data

Call Station #	*Survey Call Event #*	*Reviewer*	*Date*	*Start Time*	*Adults Observed*	*Juveniles Observed*	*Direction of Flight*	*Temp (F)*	*Wind Speed & Direction (mph)*	*Precipitation & Visibility*	*Notes*
G5-A	2	ML	10/9/2014	10:43 AM	0	0	N/A	81	1.7	0 - Clear	No Scrub Jays Observed
G5-A	3	MH	10/10/2014	11:37 AM	0	0	N/A	84	1.6-3.6 NW	0 - Clear	No Scrub Jays Observed
G5-A	4	MH	10/12/2014	8:36 AM	0	0	N/A	71	0	0 - Clear	No Scrub Jays Observed: Cardinals (pair)
G5-A	5	MRD	10/20/2014	10:57 AM	0	0	N/A	77	4 NE	0 - Clear	No Scrub Jays Observed
G5-B	1	CC	10/8/2014	11:23 AM	0	0	N/A	84	0	0 - Clear	No Scrub Jays Observed
G5-B	2	ML	10/9/2014	10:54 AM	0	0	N/A	81	1.8-4.8	0 - Clear	No Scrub Jays Observed
G5-B	3	MH	10/10/2014	11:48 AM	0	0	N/A	84	1.6-3.6 NW	0 - Clear	No Scrub Jays Observed
G5-B	4	MH	10/12/2014	8:46 AM	0	0	N/A	71	0	0 - Clear	No Scrub Jays Observed
G5-B	5	MRD	10/20/2014	11:05 AM	0	0	N/A	77	4 NE	0 - Clear	No Scrub Jays Observed
G5-C	1	ML	10/8/2014	11:12 AM	0	0	N/A	84	0	0 - Clear	No Scrub Jays Observed
G5-C	2	ML	10/9/2014	10:34 AM	0	0	N/A	79	1.7	0 - Clear	No Scrub Jays Observed
G5-C	3	MH	10/10/2014	11:58 AM	0	0	N/A	84	1.6-3.6 NW	0 - Clear	No Scrub Jays Observed
G5-C	4	MRD	10/20/2014	10:49 AM	0	0	N/A	77	2 NE	0 - Clear	No Scrub Jays Observed
G5-C	5	KM	10/21/2014	10:39 AM	0	0	N/A	78	0	0 - Clear	No Scrub Jays Observed
G5-D	1	MLD	10/8/2014	11:16 AM	0	0	N/A	84	0	0 - Clear	No Scrub Jays Observed
G5-D	2	ML	10/9/2014	10:26 AM	0	0	N/A	79	1.7	0 - Clear	No Scrub Jays Observed
G5-D	3	MH	10/10/2014	11:27 AM	0	0	N/A	82	1.6-3.6 NW	0 - Clear	No Scrub Jays Observed
G5-D	4	MRD	10/20/2014	10:42 AM	0	0	N/A	77	2 NE	0 - Clear	No Scrub Jays Observed
G5-D	5	KM	10/21/2014	10:29 AM	0	0	N/A	76	0	0 - Clear	No Scrub Jays Observed
G5-E	1	MRD	10/8/2014	11:10 AM	0	0	N/A	84	0	0 - Clear	No Scrub Jays Observed
G5-E	2	ML	10/9/2014	10:21 AM	0	0	N/A	79	1.7	0 - Clear	No Scrub Jays Observed - no habitat/next to wetland
G5-E	3	MH	10/10/2014	11:18 AM	0	0	N/A	82	1.6-3.6 NW	0 - Clear	No Scrub Jays Observed
G5-E	4	MRD	10/20/2014	10:34 AM	0	0	N/A	77	2 NE	0 - Clear	No Scrub Jays Observed
G5-E	5	KM	10/21/2014	10:20 AM	0	0	N/A	75	0	0 - Clear	No Scrub Jays Observed
G6-A	1	MRD/ML	10/7/2014	10:34 AM	0	0	N/A	75	0.8 SE	0 - Clear	No Scrub Jays Observed
G6-A	2	MRD	10/8/2014	10:05 AM	0	0	N/A	78	1	0 - Clear	No Scrub Jays Observed
G6-A	3	MRD	10/9/2014	10:34 AM	0	0	N/A	79	1.7	0 - Clear	No Scrub Jays Observed
G6-A	4	MH	10/20/2014	9:45 AM	0	0	N/A	74	2 E	0 - Clear	No Scrub Jays Observed
G6-A	5	KM	10/21/2014	9:10 AM	0	0	N/A	70	0	0 - Clear	No Scrub Jays Observed
G6-B	1	MRD/ML	10/7/2014	10:46 AM	0	0	N/A	75	1.9 SE	0 - Clear	No Scrub Jays Observed
G6-B	2	MRD	10/8/2014	10:14 AM	0	0	N/A	80	0	0 - Clear	No Scrub Jays Observed
G6-B	3	MRD	10/9/2014	10:41 AM	0	0	N/A	81	1.7	0 - Clear	No Scrub Jays Observed
G6-B	4	MH	10/20/2014	9:55 AM	0	0	N/A	74	2 E	0 - Clear	No Scrub Jays Observed
G6-B	5	KM	10/21/2014	9:19 AM	0	0	N/A	71	0	0 - Clear	No Scrub Jays Observed
G6-C	1	MRD/ML	10/7/2014	10:53 AM	0	0	N/A	75	1.9 SE	0 - Clear	No Scrub Jays Observed
G6-C	2	MRD	10/8/2014	10:22 AM	0	0	N/A	80	1	0 - Clear	No Scrub Jays Observed
G6-C	3	MRD	10/9/2014	10:49 AM	0	0	N/A	81	1.7	0 - Clear	No Scrub Jays Observed
G6-C	4	MH	10/20/2014	10:04 AM	0	0	N/A	76	2 E	0 - Clear	No Scrub Jays Observed
G6-C	5	KM	10/21/2014	9:29 AM	0	0	N/A	72	0	0 - Clear	No Scrub Jays Observed
G6-D	1	MRD/ML	10/7/2014	11:02 AM	0	0	N/A	75	1.9 SE	0 - Clear	No Scrub Jays Observed
G6-D	2	MRD	10/8/2014	10:31 AM	0	0	N/A	80	1	0 - Clear	No Scrub Jays Observed
G6-D	3	MRD	10/9/2014	10:56 AM	0	0	N/A	81	1.8-4.8	0 - Clear	No Scrub Jays Observed
G6-D	4	MH	10/20/2014	10:13 AM	0	0	N/A	76	2 E	0 - Clear	No Scrub Jays Observed
G6-D	5	KM	10/21/2014	9:38 AM	0	0	N/A	72	0	0 - Clear	No Scrub Jays Observed
G6-E	1	MRD/ML	10/7/2014	11:10 AM	0	0	N/A	75	1.9 SE	0 - Clear	No Scrub Jays Observed
G6-E	2	MRD	10/8/2014	10:40 AM	0	0	N/A	83	0	0 - Clear	No Scrub Jays Observed
G6-E	3	MRD	10/9/2014	11:03 AM	0	0	N/A	81	1.8-4.8	0 - Clear	No Scrub Jays Observed
G6-E	4	MH	10/20/2014	10:23 AM	0	0	N/A	76	2 E	0 - Clear	No Scrub Jays Observed
G6-E	5	KM	10/21/2014	9:48 AM	0	0	N/A	73	0	0 - Clear	No Scrub Jays Observed
G6-F	1	MRD/ML	10/7/2014	11:22 AM	0	0	N/A	75	1.9 SE	0 - Clear	No Scrub Jays Observed

Scrub-Jay Station Data

Call Station #	*Survey Call Event #*	*Reviewer*	*Date*	*Start Time*	*Adults Observed*	*Juveniles Observed*	*Direction of Flight*	*Temp (F)*	*Wind Speed & Direction (mph)*	*Precipitation & Visibility*	*Notes*
G6-F	2	MRD	10/8/2014	10:48 AM	0	0	N/A	83	0	0 - Clear	No Scrub Jays Observed
G6-F	3	MRD	10/9/2014	11:11 AM	0	0	N/A	81	1.8-4.8	0 - Clear	No Scrub Jays Observed
G6-F	4	MH	10/20/2014	10:32 AM	0	0	N/A	77	2 NE	0 - Clear	No Scrub Jays Observed
G6-F	5	KM	10/21/2014	9:57 AM	0	0	N/A	73	0	0 - Clear	No Scrub Jays Observed
G6-G	1	MRD/ML	10/7/2014	11:34 AM	0	0	N/A	75	1.9 SE	0 - Clear	No Scrub Jays Observed
G6-G	2	MRD	10/8/2014	10:56 AM	0	0	N/A	84	0	0 - Clear	No Scrub Jays Observed
G6-G	3	MRD	10/9/2014	11:17 AM	0	0	N/A	81	1.8-4.8	0 - Clear	No Scrub Jays Observed
G6-G	4	MH	10/20/2014	10:41 AM	0	0	N/A	77	2 NE	0 - Clear	No Scrub Jays Observed
G6-G	5	KM	10/21/2014	10:07 AM	0	0	N/A	74	0	0 - Clear	No Scrub Jays Observed
G7-A	1	MLD	10/8/2014	11:10 AM	0	0	N/A	84	0	0 - Clear	No Scrub Jays Observed
G7-A	2	ML	10/9/2014	10:15 AM	0	0	N/A	79	1.7	0 - Clear	No Scrub Jays Observed
G7-A	3	MH	10/10/2014	11:10 AM	0	0	N/A	82	1.6-3.6 NW	0 - Clear	No Scrub Jays Observed: crow
G7-A	4	KM	10/21/2014	7:10 AM	0	0	N/A	67	0	0 - Clear	No Scrub Jays Observed
G7-A	5	KM	10/22/2014	7:20 AM	0	0	N/A	63	0	0 - Clear	No Scrub Jays Observed
G7-B	1	ML	10/8/2014	11:08 AM	0	0	N/A	84	0	0 - Clear	No Scrub Jays Observed
G7-B	2	ML	10/9/2014	10:08 AM	0	0	N/A	78	1.7	0 - Clear	No Scrub Jays Observed
G7-B	3	MH	10/10/2014	11:02 AM	0	0	N/A	82	2.1-4.6	0 - Clear	No Scrub Jays Observed
G7-B	4	MRD	10/20/2014	10:26 AM	0	0	N/A	76	2 E	0 - Clear	No Scrub Jays Observed
G7-B	5	KM	10/22/2014	11:20 AM	0	0	N/A	75	2 NW	0 - Clear	No Scrub Jays Observed
G7-C	1	MLD	10/8/2014	11:01 AM	0	0	N/A	84	0	0 - Clear	No Scrub Jays Observed
G7-C	2	ML	10/9/2014	10:01 AM	0	0	N/A	78	1.7	0 - Clear	No Scrub Jays Observed
G7-C	3	MH	10/10/2014	10:53 AM	0	0	N/A	81	2.1-4.6	0 - Clear	No Scrub Jays Observed: mocking bird
G7-C	4	MRD	10/20/2014	10:19 AM	0	0	N/A	76	2 E	0 - Clear	No Scrub Jays Observed
G7-C	5	KM	10/22/2014	11:09 AM	0	0	N/A	73	3 NW	0 - Clear	No Scrub Jays Observed
G7-D	1	ML	10/8/2014	11:00 AM	0	0	N/A	84	0	0 - Clear	No Scrub Jays Observed
G7-D	2	ML	10/9/2014	9:53 AM	0	0	N/A	77	1.8	0 - Clear	No Scrub Jays Observed
G7-D	3	MH	10/10/2014	10:44 AM	0	0	N/A	81	2.1-4.6	0 - Clear	No Scrub Jays Observed: blue jay
G7-D	4	MRD	10/20/2014	10:13 AM	0	0	N/A	76	2 E	0 - Clear	No Scrub Jays Observed
G7-D	5	KM	10/22/2014	10:59 AM	0	0	N/A	73	3 NW	0 - Clear	No Scrub Jays Observed
G7-E	1	ML	10/8/2014	10:54 AM	0	0	N/A	84	1	0 - Clear	No Scrub Jays Observed
G7-E	2	ML	10/9/2014	9:47 AM	0	0	N/A	76	1.8	0 - Clear	No Scrub Jays Observed
G7-E	3	MH	10/10/2014	10:35 AM	0	0	N/A	81	2.1-4.6	0 - Clear	No Scrub Jays Observed
G7-E	4	MRD	10/20/2014	10:06 AM	0	0	N/A	76	2 E	0 - Clear	No Scrub Jays Observed
G7-E	5	KM	10/22/2014	10:48 AM	0	0	N/A	73	4 NW	0 - Clear	No Scrub Jays Observed
G7-F	1	MLD	10/8/2014	10:51 AM	0	0	N/A	84	1	0 - Clear	No Scrub Jays Observed: mocking bird
G7-F	2	ML	10/9/2014	9:42 AM	0	0	N/A	76	1.8	0 - Clear	No Scrub Jays Observed
G7-F	3	MH	10/10/2014	10:25 AM	0	0	N/A	81	2.1-4.6	0 - Clear	No Scrub Jays Observed
G7-F	4	MRD	10/20/2014	10:00 AM	0	0	N/A	76	2 E	0 - Clear	No Scrub Jays Observed
G7-F	5	KM	10/22/2014	10:39 AM	0	0	N/A	73	3 NW	0 - Clear	No Scrub Jays Observed
G7-G	1	ML	10/8/2014	10:49 AM	0	0	N/A	84	0	0 - Clear	No Scrub Jays Observed
G7-G	2	ML	10/9/2014	9:36 AM	0	0	N/A	76	1.8	0 - Clear	No Scrub Jays Observed
G7-G	3	MH	10/10/2014	10:16 AM	0	0	N/A	80	2.1-4.6	0 - Clear	No Scrub Jays Observed
G7-G	4	MRD	10/20/2014	9:51 AM	0	0	N/A	74	2 E	0 - Clear	No Scrub Jays Observed
G7-G	5	KM	10/22/2014	10:30 AM	0	0	N/A	71	4 NW	0 - Clear	No Scrub Jays Observed
G7-H	1	MLD	10/8/2014	10:43 AM	0	0	N/A	83	0	0 - Clear	No Scrub Jays Observed: flicker
G7-H	2	ML	10/9/2014	9:31 AM	0	0	N/A	74	1.8	0 - Clear	No Scrub Jays Observed
G7-H	3	MH	10/10/2014	10:06 AM	0	0	N/A	80	2.1-4.6	0 - Clear	No Scrub Jays Observed
G7-H	4	MRD	10/20/2014	9:39 AM	0	0	N/A	74	2 E	0 - Clear	No Scrub Jays Observed
G7-H	5	KM	10/22/2014	10:21 AM	0	0	N/A	71	3 NW	0 - Clear	No Scrub Jays Observed
G7-I	1	MLD	10/8/2014	10:35 AM	0	0	N/A	83	0	0 - Clear	No Scrub Jays Observed: mockingbird

Scrub-Jay Station Data

Call Station #	*Survey Call Event #*	*Reviewer*	*Date*	*Start Time*	*Adults Observed*	*Juveniles Observed*	*Direction of Flight*	*Temp (F)*	*Wind Speed & Direction (mph)*	*Precipitation & Visibility*	*Notes*
G7-I	2	ML	10/9/2014	9:22 AM	0	0	N/A	74	1.8	0 - Clear	No Scrub Jays Observed
G7-I	3	MH	10/10/2014	9:55 AM	0	0	N/A	80	3.2	0 - Clear	No Scrub Jays Observed
G7-I	4	MRD	10/20/2014	9:31 AM	0	0	N/A	74	2 E	0 - Clear	No Scrub Jays Observed
G7-I	5	KM	10/22/2014	10:09 AM	0	0	N/A	71	3 NW	0 - Clear	No Scrub Jays Observed
G8-A	1	ML	10/8/2014	7:35 AM	0	0	N/A	66	0	0 - Clear	No Scrub Jays Observed
G8-A	2	CC	10/9/2014	11:24 AM	0	0	N/A	81	1.8-4.8	0 - Clear	No Scrub Jays Observed
G8-A	3	ML	10/10/2014	9:29 AM	0	0	N/A	76	3.2	0 - Clear	No Scrub Jays Observed
G8-A	4	MLD	10/20/2014	8:03 AM	0	0	N/A	63	0	0 - Clear	No Scrub Jays Observed
G8-A	5	KM	10/22/2014	7:53 AM	0	0	N/A	65	0	0 - Clear	No Scrub Jays Observed
G8-B	1	ML	10/8/2014	7:42 AM	0	0	N/A	71	0	0 - Clear	No Scrub Jays Observed
G8-B	2	CC	10/9/2014	11:35 AM	0	0	N/A	83	1.8-4.8	0 - Clear	No Scrub Jays Observed
G8-B	3	ML	10/10/2014	9:46 AM	0	0	N/A	79	3.2	0 - Clear	No Scrub Jays Observed
G8-B	4	MLD	10/20/2014	8:12 AM	0	0	N/A	64	0	0 - Clear	No Scrub Jays Observed
G8-B	5	KM	10/22/2014	8:02 AM	0	0	N/A	68	0	0 - Clear	No Scrub Jays Observed
G8-C	1	ML	10/8/2014	7:55 AM	0	0	N/A	66	0	0 - Clear	No Scrub Jays Observed
G8-C	2	CC	10/9/2014	11:45 AM	0	0	N/A	83	1.8-4.8	0 - Clear	No Scrub Jays Observed
G8-C	3	ML	10/10/2014	9:56 AM	0	0	N/A	80	3.2	0 - Clear	No Scrub Jays Observed
G8-C	4	MLD	10/20/2014	8:20 AM	0	0	N/A	68	0	0 - Clear	No Scrub Jays Observed
G8-C	5	KM	10/22/2014	8:11 AM	0	0	N/A	68	0	0 - Clear	No Scrub Jays Observed
G8-D	1	MH	10/8/2014	7:42 AM	0	0	N/A	71	0	0 - Clear	No Scrub Jays Observed: cardinal, blue jays
G8-D	2	MH	10/9/2014	8:26 AM	0	0	N/A	71	0-1.7	0 - Clear	No Scrub Jays Observed: cardinals (pair), catbird
G8-D	3	MH	10/11/2014	10:26 AM	0	0	N/A	80	1-2 E	0 - Clear	No Scrub Jays Observed: mocking bird
G8-D	4	MRD	10/13/2014	11:40 AM	0	0	N/A	84	3 SSE	0 - Clear	No Scrub Jays Observed
G8-D	5	MH	10/19/2014	8:22 AM	0	0	N/A	63	2 NW	0 - Clear	No Scrub Jays Observed
G8-E	1	MH	10/8/2014	8:24 AM	0	0	N/A	72	0	0 - Clear	No Scrub Jays Observed: towhee
G8-E	2	MH	10/9/2014	9:07 AM	0	0	N/A	73	1.8	0 - Clear	No Scrub Jays Observed: two red-shoulder hawks nearby
G8-E	3	MH	10/11/2014	8:15 AM	0	0	N/A	70	0	0 - Clear	No Scrub Jays Observed: Towhee
G8-E	4	MH	10/19/2014	10:19 AM	0	0	N/A	69	1-5 NW	0 - Clear	No Scrub Jays Observed
G8-E	5	MH	10/22/2014	8:15 AM	0	0	N/A	68	0	0 - Clear	No Scrub Jays Observed: songbird activity, nothing came to tape
G8-F	1	MH	10/8/2014	8:35 AM	0	0	N/A	73	0	0 - Clear	No Scrub Jays Observed: blue jay
G8-F	2	MH	10/9/2014	9:19 AM	0	0	N/A	74	1.8	0 - Clear	No Scrub Jays Observed
G8-F	3	MH	10/11/2014	8:26 AM	0	0	N/A	71	0	0 - Clear	No Scrub Jays Observed: cardinal, pileated woodpecker, mocking bird
G8-F	4	MH	10/19/2014	10:10 AM	0	0	N/A	68	1-5 NW	0 - Clear	No Scrub Jays Observed
G8-F	5	MH	10/22/2014	8:25 AM	0	0	N/A	68	0	0 - Clear	No Scrub Jays Observed: mocking bird, blue jay
G8-G	1	MH	10/8/2014	8:49 AM	0	0	N/A	73	0	0 - Clear	No Scrub Jays Observed
G8-G	2	MH	10/9/2014	10:25 AM	0	0	N/A	79	1.7	0 - Clear	No Scrub Jays Observed
G8-G	3	MH	10/11/2014	8:36 AM	0	0	N/A	72	0	0 - Clear	No Scrub Jays Observed
G8-G	4	MH	10/19/2014	10:01 AM	0	0	N/A	68	1-5 NW	0 - Clear	No Scrub Jays Observed
G8-G	5	MH	10/22/2014	8:35 AM	0	0	N/A	68	0	0 - Clear	No Scrub Jays Observed
G8-H	1	MH	10/8/2014	8:59 AM	0	0	N/A	74	0	0 - Clear	No Scrub Jays Observed: cardinal and five blue jays
G8-H	2	MH	10/9/2014	10:15 AM	0	0	N/A	79	1.7	0 - Clear	No Scrub Jays Observed: three mocking birds, flicker, blue jay and observed a kestrel and little blue heron nearby
G8-H	3	MH	10/11/2014	8:46 AM	0	0	N/A	72	0	0 - Clear	No Scrub Jays Observed: mocking bird
G8-H	4	MH	10/19/2014	9:52 AM	0	0	N/A	67	1-4 NW	0 - Clear	No Scrub Jays Observed: cardinal
G8-H	5	MH	10/22/2014	8:45 AM	0	0	N/A	68	0	0 - Clear	No Scrub Jays Observed: songbird activity, nothing came to tape
G8-I	1	MH	10/8/2014	9:13 AM	0	0	N/A	74	0	0 - Clear	No Scrub Jays Observed: two mocking birds, blue jay, and a feral cat nearby
G8-I	2	MH	10/9/2014	10:02 AM	0	0	N/A	78	1.7	0 - Clear	No Scrub Jays Observed: mocking bird, catbird
G8-I	3	MH	10/11/2014	8:56 AM	0	0	N/A	73	0	0 - Clear	No Scrub Jays Observed: mocking bird, blue jay
G8-I	4	MH	10/19/2014	9:43 AM	0	0	N/A	67	1-5 NW	0 - Clear	No Scrub Jays Observed: catbird, cardinals
G8-I	5	MH	10/22/2014	8:54 AM	0	0	N/A	68	1-4 NW	0 - Clear	No Scrub Jays Observed: blue jay, cardinal, flicker, mocking bird

Scrub-Jay Station Data

Call Station #	*Survey Call Event #*	*Reviewer*	*Date*	*Start Time*	*Adults Observed*	*Juveniles Observed*	*Direction of Flight*	*Temp (F)*	*Wind Speed & Direction (mph)*	*Precipitation & Visibility*	*Notes*
G8-J	1	MH	10/8/2014	9:23 AM	0	0	N/A	76	0	0 - Clear	No Scrub Jays Observed: mocking bird
G8-J	2	MH	10/9/2014	9:52 AM	0	0	N/A	77	1.8	0 - Clear	No Scrub Jays Observed: two mocking birds, cardinals (pair)
G8-J	3	MH	10/11/2014	9:06 AM	0	0	N/A	74	0	0 - Clear	No Scrub Jays Observed
G8-J	4	MH	10/19/2014	9:34 AM	0	0	N/A	66	1-5 NW	0 - Clear	No Scrub Jays Observed
G8-J	5	MH	10/22/2014	9:04 AM	0	0	N/A	69	4 NW	0 - Clear	No Scrub Jays Observed: two flickers
G8-K	1	MH	10/8/2014	9:34 AM	0	0	N/A	77	1	0 - Clear	No Scrub Jays Observed
G8-K	2	MH	10/9/2014	9:42 AM	0	0	N/A	76	1.8	0 - Clear	No Scrub Jays Observed: mocking bird
G8-K	3	MH	10/11/2014	9:16 AM	0	0	N/A	75	0	0 - Clear	No Scrub Jays Observed: Coopers hawk nearby
G8-K	4	MH	10/19/2014	9:25 AM	0	0	N/A	66	1-5 NW	0 - Clear	No Scrub Jays Observed: fly catcher, cardinal, catbird, goldfinch
G8-K	5	MH	10/22/2014	9:13 AM	0	0	N/A	69	3 NNW	0 - Clear	No Scrub Jays Observed
G8-L	1	MH	10/8/2014	10:34 AM	0	0	N/A	83	1	0 - Clear	No Scrub Jays Observed: mocking bird
G8-L	2	MH	10/9/2014	9:33 AM	0	0	N/A	76	1.8	0 - Clear	No Scrub Jays Observed
G8-L	3	MH	10/11/2014	9:27 AM	0	0	N/A	76	0	0 - Clear	No Scrub Jays Observed: cardinal
G8-L	4	MH	10/19/2014	9:16 AM	0	0	N/A	65	1-5 NW	0 - Clear	No Scrub Jays Observed: catbird, cardinal
G8-L	5	MH	10/22/2014	9:22 AM	0	0	N/A	69	2 NW	0 - Clear	No Scrub Jays Observed: cardinals, blue jay, mocking bird, catbird
G9-A	1	MLD/MH	10/7/2014	8:16 AM	0	0	N/A	66	0	0 - Clear	No Scrub Jays Observed
G9-A	2	MLD	10/8/2014	7:47 AM	0	0	N/A	66	0	0 - Clear	No Scrub Jays Observed
G9-A	3	MRD	10/9/2014	8:57 AM	0	0	N/A	72	0-1.7	0 - Clear	No Scrub Jays Observed
G9-A	4	MRD	10/10/2014	8:05 AM	0	0	N/A	72	1.4	0 - Clear	No Scrub Jays Observed
G9-A	5	MH	10/22/2014	11:46 AM	0	0	N/A	75	2 NW	0 - Clear	No Scrub Jays Observed
G9-B	1	MLD/MH	10/7/2014	8:26 AM	0	0	N/A	66	0	0 - Clear	No Scrub Jays Observed: Two blue jays and one cardinal
G9-B	2	MLD	10/8/2014	7:59 AM	0	0	N/A	66	0	0 - Clear	No Scrub Jays Observed
G9-B	3	MRD	10/9/2014	8:45 AM	0	0	N/A	71	0-1.7	0 - Clear	No Scrub Jays Observed
G9-B	4	MRD	10/10/2014	8:14 AM	0	0	N/A	72	1.4	0 - Clear	No Scrub Jays Observed
G9-B	5	MRD	10/13/2014	11:00 AM	0	0	N/A	82	8 E	0 - Clear	No Scrub Jays Observed
G9-C	1	MLD/MH	10/7/2014	8:40 AM	0	0	N/A	66	0	0 - Clear	No Scrub Jays Observed: mocking bird and blue jay
G9-C	2	MLD	10/8/2014	8:11 AM	0	0	N/A	67	0	0 - Clear	No Scrub Jays Observed: mocking birds
G9-C	3	MRD	10/9/2014	8:36 AM	0	0	N/A	71	0-1.7	0 - Clear	No Scrub Jays Observed
G9-C	4	MRD	10/10/2014	8:25 AM	0	0	N/A	72	1.4	0 - Clear	No Scrub Jays Observed
G9-C	5	MH	10/22/2014	11:36 AM	0	0	N/A	75	3 NW	0 - Clear	No Scrub Jays Observed
G9-D	1	MLD/MH	10/7/2014	8:52 AM	0	0	N/A	66	0	0 - Clear	No Scrub Jays Observed
G9-D	2	MLD	10/8/2014	8:21 AM	1	0	S TO NW	67	0	0 - Clear	One adult SJ scalding and moving from station to across the street and back. Bird came from the south, scolded from pine, moved across the street and scolded, then moved back to pine and flew to the west (see map).
G9-D	3	MRD	10/9/2014	8:27 AM	0	0	N/A	71	0-1.7	0 - Clear	No Scrub Jays Observed
G9-D	4	MRD	10/10/2014	8:35 AM	0	0	N/A	73	1.4	0 - Clear	No Scrub Jays Observed
G9-D	5	MRD	10/13/2014	10:50 AM	0	0	N/A	82	8 E	0 - Clear	No Scrub Jays Observed
G9-D	6	MH	10/22/2014	11:27 AM	0	0	N/A	75	3 NW	0 - Clear	No Scrub Jays Observed
G9-E	1	MLD/MH	10/7/2014	9:03 AM	0	0	N/A	66	0	0 - Clear	No Scrub Jays Observed: blue jays
G9-E	2	MLD	10/8/2014	8:32 AM	0	0	N/A	72	0	0 - Clear	No Scrub Jays Observed: mocking birds, blue jays
G9-E	2	MRD	10/8/2014	9:22 AM	0	0	N/A	72	0	0 - Clear	No Scrub Jays Observed
G9-E	3	MRD	10/9/2014	8:16 AM	0	0	N/A	70	0-1.7	0 - Clear	No Scrub Jays Observed
G9-E	4	MRD	10/10/2014	8:46 AM	0	0	N/A	73	1.4	0 - Clear	No Scrub Jays Observed
G9-E	5	MH	10/22/2014	11:18 AM	0	0	N/A	75	2 NW	0 - Clear	No Scrub Jays Observed
G15-A	1	ML	4/20/2015	8:05 AM	2	1	N TO S, S TO N	68	0	0 - Clear	2 Adults and 1 possible JV scrub jay observed. Flew in from the N to the left and right of the station. Birds did not defend aggressively and were not interested in the tape as other families in the area. The JV was observed for the shortest period of time to the left of the station. The adults stayed for the about 2-3 min and the left. Birds continued to scold but did not reappear.
G15-A	2	ML	4/21/2015	7:50 AM	1	0	UNKNOWN	66	1.5	0 - Clear	One adult appeared quickly and then left with minimal vocalization.
G15-A	3	ML	4/22/2015	9:33 AM	0	0	N/A	70	2.6	0 - Clear	No Scrub Jays Observed

Scrub-Jay Station Data

Call Station #	*Survey Call Event #*	*Reviewer*	*Date*	*Start Time*	*Adults Observed*	*Juveniles Observed*	*Direction of Flight*	*Temp (F)*	*Wind Speed & Direction (mph)*	*Precipitation & Visibility*	*Notes*
G15-A	4	ML	4/23/2015	10:13 AM	0	0	N/A	74	1.9	0 - Clear	No Scrub Jays Observed
G15-A	5	ML	4/24/2015	8:00 AM	2	0	E TO W	69	4 to 5	0 - Clear	Two adults observed. Vocalizations minimal. Did not stay at station
G15-B	1	ML	4/20/2015	8:14 AM	1	0	E TO W, S TO N	68	0	0 - Clear	One adult appeared - followed from station A. minimal vocalization. Quickly left
G15-B	2	ML	4/21/2015	7:58 AM	0	0	N/A	66	1.5	0 - Clear	No Scrub Jays Observed
G15-B	3	ML	4/22/2015	9:41 AM	0	0	N/A	70	2.6	0 - Clear	No Scrub Jays Observed
G15-B	4	ML	4/23/2015	10:23 AM	2	0	S TO NE	74	1.9	0 - Clear	Two adults made a quick appearance and left.
G15-B	5	ML	4/24/2015	8:48 AM	1	0	S TO NE	70	4 to 5	0 - Clear	One adult. Minimal scolding, however landed on sand on fromt of oaks and did not leave as quickly as oberseved on previous days
G15-C	1	ML	4/20/2015	8:23 AM	0	1	N TO S	68	0	0 - Clear	One JV appear from te west and quickly departure to the north. Only scolded 2-3 times before leaving
G15-C	2	ML	4/21/2015	8:06 AM	2	0	TO E, N TO S, S TO	66	1.5	0 - Clear	No Scrub Jays Observed
G15-C	3	ML	4/22/2015	9:49 AM	1	0	N/A	72	2.6	0 - Clear	One adult observed flew from the north. Did not scold and left quickly
G15-C	4	ML	4/23/2015	10:36 AM	0	0	N/A	74	1.9	0 - Clear	No Scrub Jays Observed
G15-C	5	ML	4/24/2015	8:39 AM	0	0	N/A	70	4 to 5	0 - Clear	No Scrub Jays Observed
G15-D	1	ML	4/20/2015	8:34 AM	0	0	N/A	68	0	0 - Clear	No Scrub Jays Observed
G15-D	2	ML	4/21/2015	8:14 AM	1	0	N TO S, S TO N	66	1.5	0 - Clear	One adult observed flew in from the west. Minimal vocalizations. Departed quickly.
G15-D	3	ML	4/22/2015	9:58 AM	0	0	N/A	72	2.6	0 - Clear	No Scrub Jays Observed
G15-D	4	ML	4/23/2015	10:47 AM	0	0	N/A	75	1.9	0 - Clear	No Scrub Jays Observed
G15-D	5	ML	4/24/2015	8:31 AM	0	0	N/A	70	4 to 5	0 - Clear	No Scrub Jays Observed
G15-E	1	ML	4/20/2015	8:41 AM	0	0	N/A	68	0	0 - Clear	No Scrub Jays Observed
G15-E	2	ML	4/21/2015	8:21 AM	0	0	N/A	66	1.5	0 - Clear	No Scrub Jays Observed
G15-E	3	ML	4/22/2015	10:09 AM	0	0	N/A	73	2.6	0 - Clear	No Scrub Jays Observed
G15-E	4	ML	4/23/2015	9:58 AM	0	0	N/A	74	1.9	0 - Clear	No Scrub Jays Observed
G15-E	5	ML	4/24/2015	8:20 AM	0	0	N/A	71	4 to 5	0 - Clear	No Scrub Jays Observed
G15-F	1	ML	4/20/2015	8:53 AM	0	0	N/A	68	0	0 - Clear	No Scrub Jays Observed
G15-F	2	ML	4/21/2015	8:29 AM	0	0	N/A	66	1.5	0 - Clear	No Scrub Jays Observed
G15-F	3	ML	4/22/2015	10:18 AM	0	0	N/A	72	2.6	0 - Clear	No Scrub Jays Observed
G15-F	4	ML	4/23/2015	10:06 AM	0	0	N/A	73	1.9	0 - Clear	No Scrub Jays Observed
G15-F	5	ML	4/24/2015	8:12 AM	2	0	S TO N	70	4 to 5	0 - Clear	Two adults approached from the north. Scolded and moved on. Observed flying toward station A
G16-A	1	ML	4/20/2015	9:32 AM	0	0	N/A	69	0	0 - Clear	No Scrub Jays Observed
G16-A	2	ML	4/21/2015	8:40 AM	0	0	N/A	68	0	0 - Clear	No Scrub Jays Observed
G16-A	3	ML	4/22/2015	9:21 AM	0	0	N/A	71	0	0 - Clear	No Scrub Jays Observed
G16-A	4	ML	4/23/2015	8:10 AM	0	0	N/A	74	0	0 - Clear	No Scrub Jays Observed
G16-A	5	ML	4/24/2015	9:00 AM	0	0	N/A	70	0	0 - Clear	No Scrub Jays Observed
G16-B	1	ML	4/20/2015	9:45 AM	0	0	N/A	69	0	0 - Clear	No Scrub Jays Observed
G16-B	2	ML	4/21/2015	8:51 AM	0	0	N/A	68	0	0 - Clear	No Scrub Jays Observed
G16-B	3	ML	4/22/2015	9:00 AM	0	0	N/A	71	0	0 - Clear	No Scrub Jays Observed
G16-B	4	ML	4/23/2015	8:20 AM	0	0	N/A	73	0	0 - Clear	No Scrub Jays Observed
G16-B	5	ML	4/24/2015	9:11 AM	0	0	N/A	72	0	0 - Clear	No Scrub Jays Observed
G16-C	1	ML	4/20/2015	9:58 AM	0	0	N/A	69	0	0 - Clear	No Scrub Jays Observed
G16-C	2	ML	4/21/2015	9:10 AM	0	0	N/A	68	0	0 - Clear	No Scrub Jays Observed
G16-C	3	ML	4/22/2015	9:08 AM	0	0	N/A	72	0	0 - Clear	No Scrub Jays Observed
G16-C	4	ML	4/23/2015	8:37 AM	0	0	N/A	71	0	0 - Clear	No Scrub Jays Observed
G16-C	5	ML	4/24/2015	9:26 AM	0	0	N/A	72	0	0 - Clear	No Scrub Jays Observed
G16-D	1	ML	4/20/2015	10:08 AM	0	0	N/A	69	0	0 - Clear	No Scrub Jays Observed
G16-D	2	ML	4/21/2015	9:18 AM	0	0	N/A	70	0	0 - Clear	No Scrub Jays Observed
G16-D	3	ML	4/22/2015	9:16 AM	0	0	N/A	71	0	0 - Clear	No Scrub Jays Observed
G16-D	4	ML	4/23/2015	8:44 AM	0	0	N/A	72	0	0 - Clear	No Scrub Jays Observed
G16-D	5	ML	4/24/2015	9:33 AM	0	0	N/A	73	0	0 - Clear	No Scrub Jays Observed
G16-E	1	ML	4/20/2015	10:21 AM	0	0	N/A	71	0	0 - Clear	No Scrub Jays Observed

Scrub-Jay Station Data

Call Station #	*Survey Call Event #*	*Reviewer*	*Date*	*Start Time*	*Adults Observed*	*Juveniles Observed*	*Direction of Flight*	*Temp (F)*	*Wind Speed & Direction (mph)*	*Precipitation & Visibility*	*Notes*
G16-E	2	ML	4/21/2015	9:02 AM	0	0	N/A	70	0	0 - Clear	No Scrub Jays Observed
G16-E	3	ML	4/22/2015	8:52 AM	0	0	N/A	71	0	0 - Clear	No Scrub Jays Observed
G16-E	4	ML	4/23/2015	8:28 AM	0	0	N/A	70	0	0 - Clear	No Scrub Jays Observed
G16-E	5	ML	4/24/2015	9:17 AM	0	0	N/A	72	0	0 - Clear	No Scrub Jays Observed
G17-A	1	ML	4/20/2015	10:34 AM	0	0	N/A	73	0	0 - Clear	No Scrub Jays Observed
G17-A	2	ML	4/21/2015	9:29 AM	0	0	N/A	70	0	0 - Clear	No Scrub Jays Observed
G17-A	3	ML	4/22/2015	8:43 AM	0	0	N/A	68	0	0 - Clear	No Scrub Jays Observed
G17-A	4	ML	4/23/2015	8:53 AM	0	0	N/A	71	0	0 - Clear	No Scrub Jays Observed
G17-A	5	ML	4/24/2015	9:45 AM	0	0	N/A	74	0	0 - Clear	No Scrub Jays Observed
G17-B	1	ML	4/20/2015	10:43 AM	0	0	N/A	73	0	0 - Clear	No Scrub Jays Observed
G17-B	2	ML	4/21/2015	9:37 AM	0	0	N/A	71	0	0 - Clear	No Scrub Jays Observed
G17-B	3	ML	4/22/2015	8:27 AM	0	0	N/A	68	0	0 - Clear	No Scrub Jays Observed
G17-B	4	ML	4/23/2015	9:01 AM	0	0	N/A	70	0	0 - Clear	No Scrub Jays Observed
G17-B	5	ML	4/24/2015	9:52 AM	0	0	N/A	74	0	0 - Clear	No Scrub Jays Observed
G17-C	1	ML	4/20/2015	10:50 AM	0	0	N/A	74	0	0 - Clear	No Scrub Jays Observed
G17-C	2	ML	4/21/2015	9:44 AM	0	0	N/A	70	0	0 - Clear	No Scrub Jays Observed
G17-C	3	ML	4/22/2015	8:36AM	0	0	N/A	68	0	0 - Clear	No Scrub Jays Observed
G17-C	4	ML	4/23/2015	9:10 AM	0	0	N/A	70	0	0 - Clear	No Scrub Jays Observed
G17-C	5	ML	4/24/2015	10:00 AM	0	0	N/A	75	0	0 - Clear	No Scrub Jays Observed
G18-A	1	ML	4/20/2015	10:58 AM	0	0	N/A	74	0	0 - Clear	No Scrub Jays Observed
G18-A	2	ML	4/21/2015	9:58 AM	0	0	N/A	72	1.6	0 - Clear	No Scrub Jays Observed
G18-A	3	ML	4/22/2015	8:17 AM	0	0	N/A	68	1.2	0 - Clear	No Scrub Jays Observed
G18-A	4	ML	4/23/2015	9:20 AM	0	0	N/A	70	2.4	0 - Clear	No Scrub Jays Observed
G18-A	5	ML	4/24/2015	10:08 AM	0	0	N/A	75	3.6	0 - Clear	No Scrub Jays Observed
G18-B	1	ML	4/20/2015	11:06 AM	0	0	N/A	75	0	0 - Clear	No Scrub Jays Observed
G18-B	2	ML	4/21/2015	10:07 AM	0	0	N/A	74	1.6	0 - Clear	No Scrub Jays Observed
G18-B	3	ML	4/22/2015	8:08AM	0	0	N/A	66	1.2	0 - Clear	No Scrub Jays Observed
G18-B	4	ML	4/23/2015	9:27 AM	0	0	N/A	70	2.4	0 - Clear	No Scrub Jays Observed
G18-B	5	ML	4/24/2015	10:16 AM	0	0	N/A	76	3.6	0 - Clear	No Scrub Jays Observed
G18-C	1	ML	4/20/2015	11:12 AM	0	0	N/A	75	0	0 - Clear	No Scrub Jays Observed
G18-C	2	ML	4/21/2015	10:15 AM	0	0	N/A	74	1.6	0 - Clear	No Scrub Jays Observed
G18-C	3	ML	4/22/2015	8:01 AM	0	0	N/A	66	1.2	0 - Clear	No Scrub Jays Observed
G18-C	4	ML	4/23/2015	9:35 AM	0	0	N/A	70	2.7	0 - Clear	No Scrub Jays Observed
G18-C	5	ML	4/24/2015	10:23 AM	0	0	N/A	75	3.6	0 - Clear	No Scrub Jays Observed
G18-D	1	ML	4/20/2015	11:18 AM	0	0	N/A	75	0	0 - Clear	No Scrub Jays Observed
G18-D	2	ML	4/21/2015	10:22 AM	0	0	N/A	73	1.6	0 - Clear	No Scrub Jays Observed
G18-D	3	ML	4/22/2015	7:50 AM	0	0	N/A	66	1.2	0 - Clear	No Scrub Jays Observed
G18-D	4	ML	4/23/2015	9:42 AM	0	0	N/A	70	2.4	0 - Clear	No Scrub Jays Observed
G18-D	5	ML	4/24/2015	10:30 AM	0	0	N/A	74	3.6	0 - Clear	No Scrub Jays Observed

Stantec Biologists: MH = Mike Holdsworth, ML = Matthew Leonard, MLD = Mike Dinardo, MRD = Mike Drauer, KM = Kevin Muldrew, CC = Crystal Clark