

FIDDLER'S CREEK ESTANCIA and OYSTER HARBOR EAST: ENVIRONMENTAL SUPPLEMENT

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**Amended
September 29, 2015**

**ESTANCIA and OYSTER HARBOR (Sections 18 & 19): SFWMD & USACE PERMIT APPLICATION
ENVIRONMENTAL SUPPLEMENT**

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1. INTRODUCTION

FCC Creek and FC Oyster Harbor (applicants) seek to develop a residential and a residential / golf course community within the existing Fiddler's Creek development east of Naples, FL. The application includes the eastern phase of the Oyster Harbor development project and the entirety of the proposed Estancia development. The project areas include approximately 812 acres of land and are the remaining undeveloped portions of the 3,932 acre Fiddler's Creek Development of Regional Impact (DRI). The Fiddler's Creek DRI is presently approved for a total of 6,000 residential units, 33.6 acres of business use, community facilities, schools, roads, parks, recreation and open space, golf courses, lakes and environmental preserves. The property is located at the southwestern corner of a larger agricultural area east of the CR951 and US 41 intersection. See the enclosed regional aerial exhibit (*Figure 1*). The property has been in agricultural production since the late 1960's and early 1970's originally by A. Duda and Sons Farms and since 1992 by South Coast Vegetable and Gargiulo Farms (*Figure 2*).

The Project area is approximately 10 miles southeast of Naples (4 miles southeast of the CR 951 and US 41 intersection), immediately south of US 41 in Collier County, Florida (township 50 South, Range 27 East, Portions of Sections 18 and 19; *Figure 1*). Driving directions to the project site would start from Exit 101 south from Interstate 75. Head south on Collier Blvd (CR951) to the Tamiami Trail (US 41) intersection. Turn east on US 41 and approximately 4 miles to the project entrance on the south side of the road. The Project area is currently in use as active and fallow row crop agricultural lands with three remnant isolated depressional wetland areas that have not been farmed (*Figure 3*).

The application includes project areas for two distinct development areas. The Oyster Harbor project area is the eastern phase of the existing Oyster Harbor development project which encompasses the northwest portion of the farm field area as well as the old packing house property and the existing workforce housing area. The project area for this phase of the development is approximately 192 acres. There are no wetlands within the Oyster Harbor project area though there are 8.1 acres of agricultural ditches which have been claimed as non-wetland waters in the August 28, 2015 U.S. Army Corps of Engineers (USACE) Approved Jurisdictional Determination (AJD) (*Figure 5*).

Part of the Estancia project will include conducting wetland enhancement activities on lands within and adjacent to the project site. Three internal wetland preserve areas are currently proposed. While these three areas are isolated and therefore not currently jurisdictional as outlined in the August 28, 2015 U.S. Army Corps of Engineers (USACE) Approved Jurisdictional Determination (AJD) they will be avoided and, as a result of this project, be connected to offsite waters through the proposed storm water management design. These three areas together encompass approximately 30.1 acres of state jurisdictional wetlands and are situated within the existing agricultural operations (*Figure 4*). It should be noted that the wetland acreages presented in this report differ slightly from the acreages presented in the AJD due to surveys of the wetland areas conducted after the PJD submittal. The proposed project will also undertake the enhancement of a small fallow field area located outside of the proposed development boundaries. This fallow area will be regraded to remove the existing berm and ditch around it as well as to create a system of pools designed to provide enhanced foraging opportunities for wading and other birds which can be found on and around the project site. (*Figure 7E*). The Estancia project will impact approximately 39.56 acres of fallow farm field which has been claimed as jurisdictional by the USACE in their August 28, 2015 AJD.

This document provides information concerning the proposed Oyster Harbor and Estancia projects as they relate to natural resources and environmental issues. It was written to support an application submitted to the South Florida Water Management District (SFWMD) and the USACE for an Individual Environmental Resource Permit (ERP) needed for the project. A few tables are presented directly in the main body of this document. Unless otherwise indicated, most tables referenced are contained in Appendix A while most Figures are contained in Appendix E.

Various important terms employed in this document are as follows:

- "ERP plans" or "engineering plans" = these are the 24"x36", 11"x17", and 8.5"x11" engineering plan sets for the project generated by Grady Minor and Associates entitled "Estancia at Fiddler's Creek Surface Water Management Plans". They are provided in the joint permit application package.

- "Enviro plans" or "environmental plans" = these are the 11"x17" and 8.5"x11" environmental plans set for the project generated by Turrell, Hall and Associates. They are provided in the joint permit application package.
- "USACE plans" or "USACE permit drawings" = these are the 8.5" x 11" set of project plans/drawings specifically generated for the project's USACE permit application. They are provided in the joint permit application package.
- "Project lands", "Project site", or "Estancia/Oyster Harbor property" = all lands contained within the Estancia and Oyster Harbor property boundaries (e.g. all the "on-site" lands).
- "Project Preserve" or "Preserves" = that portion of the Estancia property that will be preserved in a conservation easement.

2. EXISTING CONDITIONS (PRE-DEVELOPMENT CONDITIONS)

2.1 VEGETATION ASSOCIATIONS, LAND FORMS, AND LAND USES

The existing habitat types (FLUCFCS map units/categories) present on the project lands and nearby areas are shown on Figures 4 and 5. All existing FLUCFCS categories are described in Appendix B. Tables 1 and 2 list each of the existing major FLUCFCS categories and their extent as mapped on the property while Appendix B contains a table listing all the unique FLUCFCS map units present on the property and their extent.

Of the total 811.7 acres contained within the two property boundaries, 84.9% classify as uplands (689.2 ac.), 5.8% classify as other surface waters (47.0 ac. agricultural irrigation ditches), and 9.3% classify as wetlands (44.6 ac. combined of USACE and SFWMD jurisdictional and 30.1 ac. SFWMD only jurisdictional). The majority of the property consists of actively farmed row crop fields. Other agricultural areas and features constitute most of the remaining area (tree nursery, agricultural irrigation ditches, farm roads and trails, and previously cleared agricultural lands and facilities areas).

There are no rare or exceptional vegetation associations present on any of the project lands.

2.2 EXISTING TOPOGRAPHY & DRAINAGE PATTERNS

Sheet 4 of the ERP plans illustrates existing topography and general surface water drainage patterns. According to the South Florida Water Management District (SFWMD), the project lands as well as surrounding off-site lands extending several miles beyond the site are located within the West Collier Watershed on the border between the Henderson Creek and Southern Coastal drainage sub-basins. The basin boundary (divide) generally follows US 41 East and West across the northern boundary of the project site. The Collier County drainage atlas emphasizes that the exact location of the dividing line between these two basins is stage dependent and thus can vary considerably depending on water table stages in areas on either side of the basin divide.

The majority of the subject property consists of actively managed row crop fields. These crop fields have been graded to drain into internal irrigation field ditches and/or into perimeter rim ditches surrounding groups of fields. The larger groups of crop fields are bordered by large perimeter containment berms. Because of these perimeter berms, no runoff naturally drains from the crop fields to non-field areas, e.g. enclosed system. The field rim ditches are located on the field side of the perimeter berms.

The water table (water levels) within the crop fields (and within the field perimeter berms in general) is strictly managed and controlled. Water levels on the site are controlled by the on-site pumping operations authorized by SFWMD Water Use Permit (11-00095-W) for agricultural irrigation of small vegetables using a seepage irrigation system. Withdrawals are from an onsite lake via one existing withdrawal facility and from the Surficial Aquifer System from shallow wells via four existing withdrawal facilities. Irrigation pumps which pump water into the internal ditches from permitted wells are located at several locations within the project boundary. Outfall pumps move water out of the fields via the internal ditches when high rainfall events (usually during the rainy season) require the water elevations to be dropped to protect the crops or to allow access into and out of the fields. A Perimeter Berm and Rim Ditch completely surround and enclose these agricultural lands and irrigation system (network of ditches, pumps and water withdrawal wells). Within this irrigation system water is artificially held at higher elevation than normal water levels in the area to periodically control nematodes and irrigate the planted crops through elevated groundwater levels. This excess water, when no longer needed, or if rainfall events raise the water levels too high, is then pumped over the perimeter berm and into the wetlands south of the property and/or, on the rare occasion when additional relief is needed in the northern fields due to extremely high rainfall events, into an outfall ditch located along the western boundary of the site, to where it can flow into the existing constructed Fiddler's Creek Marsh Enhancement Buffer and Spreader System (MEBSS).

Surface water flows and elevations in the area are directed and controlled by surrounding structures such as US 41 and CR 951, as well as several man-made conveyance structures such as the US 41 Canal, the Collier County Drainage Canal, and Fiddler's Creek MEBSS. These conveyances are located north, west, and southwest of the property.

Water movement within the areas surrounding the property, is controlled by the various structures mentioned above but influenced by the general historic water movement based on land elevation. Historically, prior to extensive human development of the area, water generally flowed from northeast to southwest driven by the land elevations dropping toward the Gulf of Mexico. Water generally flows in this same direction but largely via the existing stormwater control canals (US 41 Canal, Collier County Drainage Canal and etc.). Surface water moves to tide quickly from US 41 to tidal bays of the Gulf of Mexico via Henderson Creek. Surface water within the project boundary is not tidally connected and will move towards the tidal bays much more slowly via the overland flow through the wetlands south and west of the project site after exiting through the MEBSS. On the other hand, the land elevations are lower in the area of the MEBSS, approximately 2.5 feet NGVD (with small wetland channels and wetland elevations being at 2.0 or less feet NGVD) than they are along the US 41 Canal, where land elevations are approximately 4-5 feet NGVD, north of the project site. Although the weir structure that controls water movement from the US 41 Canal into Henderson Creek from the southeast is in an area of land elevations of approximately 4-5 feet NGVD, the "control elevation" of this weir is approximately 2.0 feet NGVD when open with the US 41 Canal itself at even lower elevations. This weir structure is generally open during the rainy season from June through October of each year. As a result of the more rapid water movement through open canals connecting the Collier County Drainage Canal with the US 41 Canal and Henderson Creek compared to the slower movement of water out of the MEBSS through wetlands with small vegetated channels to the south and west, water tends to flow in both directions when it is staged up by heavy rain events. Therefore, the water at both ends of this water conveyance system (MEBSS to the south and Henderson Creek Weir on the US 41 canal to the north) tends to "seek" an elevation of approximately 2 feet NGVD. This water elevation of approximately 2 feet NGVD at both ends of the system in the rainy season is a result of the Henderson Creek Weir being open while during the typical dry season by lack of water in the system as a whole.

Other than truly severe and extended rainfall events, such as tropical systems or stalled frontal systems, the water in the water control system described above is typically at 2.5 feet or below, except for temporary periods when it is higher during and after rain events. In south Florida groundwater elevation tends to be very similar to these surface water elevations because the sandy soils allow it to fall rapidly and these surface water systems are simply expressions of the surface groundwater level.

The normal or typical water elevation of 2.5 feet NGVD or below in the Fiddler's Creek area is further supported by observed water marks on structures in the US 41 Canal, Collier County Drainage Canal and box culverts connecting these two canals and within the stormwater management systems of existing development. There are a number of water marks on these structures, with the highest fairly clear watermark being around 3.25 feet NGVD on the US 41 to Henderson Creek Weir structure indicating the Ordinary High Water Mark or the highest water typically stays for any extent of time. There are several other distinct watermarks at lower elevations. In particular, there is a distinct heavy white water mark at approximately 2.5 feet NGVD in the existing development's stormwater systems. The 2.5 foot NGVD elevation is the SFWMD control elevation for discharge of water from the Marsh Cove development stormwater management system (developed section of Fiddler's Creek located to the west of the proposed project site) to the MEBSS and is typical of the control elevations in this area. The water clearly stays at this elevation, 2.5 feet NGVD for extended periods since it is controlled at that elevation by the discharge structure. Of course the water outside of this Marsh Cove stormwater system water control structure is at or below 2.5 feet most of the time or the water elevation would express such a distinct watermark at a higher level since water moves freely into and out of the stormwater management system to the MEBSS and Collier County Drainage Canal above 2.5 feet NGVD.

Crop production in the row crop fields generally begins in September and ends in May. Significant field dewatering generally takes place for a period in mid to late July at the onset of field preparation activities. The dewatering typically occurs as needed depending on local rainfall in mid to late August and continues through mid-September, a period coinciding with final preparation of raised crop beds and initial plantings. Throughout the crop production period, fields are irrigated as necessary to hold the water table elevation roughly 6 to 10 inches below the base of the beds (i.e. about 12-16" below typical surface of the raised beds). Although crop production occurs during the dry season, throwout pumps may continue to be run during significant rainfall events, particularly from mid-September through December. Since the fields are being irrigated to maintain a constant water table near the soil surface, relatively minor rainfall events can raise the water table adversely high thereby necessitating the use of the throwout pumps to bring the water table back down to the desired level.

2.3 JURISDICTIONAL WETLANDS AND OTHER SURFACE WATERS

Qualified Turrell, Hall and Associates (THA) environmental staff inspected the project lands for the purpose of delineating wetlands and other surface waters. The wetland delineation methodologies and criteria set forth by the state (in Chapter 62-340, FAC, Delineation of the Landward Extent of Wetlands and Surface Waters) and the US Army Corps of Engineers (USACE) {in accordance with 33 *CFR Part 331, Regulatory Guidance Letter (RGL) No. 08-02* issued June 26, 2008 and subsequent guidance provided by the *Wetlands Regulatory Assistance Program Regional Supplement to the COE Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region (ver. 2.0)*} were followed in determining whether an area classified as a wetland or other surface water and in delineating the limits (boundaries) of potential jurisdictional wetlands and other surface waters.

THA ecologists flagged the boundaries of areas determined to classify as wetlands. There were very few cases where it appeared wetland lines established based on the state methodology would differ from those established based on the federal (USACE) methodology. Where this did occur, the feature boundary was flagged based on the landward-most extent of the two methods -in other words, the methodology that produced the greatest extent of wetlands was used to flag the wetland line (the "safe uplands line" approach). The wetland boundaries flagged (or otherwise marked) by staff ecologists were subsequently survey-located.

The boundaries (limits) of the areas classifying as "other surface waters" (OSWs) present on the property were determined from an aerial topographic survey prepared by Q. Grady Minor, through interpretation of rectified aerial photography taken in conjunction with this survey, and through direct field observations. Limits of off-site wetlands were determined through interpretation of this same photography along with aerial photographs generated by Collier County.

An application requesting a jurisdictional determination (JD) for this project site was submitted to USACE on March 18, 2015. In response to the JD application, a field review of the site was conducted by USACE on April 8, 2015. The final USACE AJD was issued August 28, 2015 and is enclosed as Attachment 3 of Appendix C.

2.3.1 Jurisdictional Wetlands

Figure 4 of the Enviro plans depicts wetlands present on the project lands and immediately adjacent areas. Within the Estancia property there are 6 wetlands that encompass a total of 74.7 acres or about 12.2% of the property. These "on-site" wetlands are identified as wetlands W- 1 through W-6. All six of the on-site wetlands are SFWMD jurisdictional but only wetlands W-4, 5, and 6 (44.6 acres) are USACE jurisdictional with the other three isolated within the field system and not USACE jurisdictional.

Table 3 provides a listing of the various existing FLUCFCS types mapped in the on-site wetlands. The following paragraphs provide a general description of each of the six on-site wetlands. All of the wetlands situated within the agricultural fields are completely isolated by a perimeter berm and agricultural ditch system from the wetlands to the south. Appendix D contains UMAM forms addressing existing conditions in the wetlands discussed below.

Wetland W-1 (11.0 acres; along the north boundary of the property; SFWMD jurisdictional only)

This wetland is surrounded and enclosed by an agricultural berm and a very dense fringe of exotic vegetation, predominately Brazilian pepper. Based on a review of historic aerial photos and field observations, it appears this wetland was once part of a larger system than was bifurcated by US 41 and further reduced as a result of the historical row crop activities. This wetland has been affected by the surrounding agricultural grading (construction of ditches, berms, row crop fields) as well as it being used for direct outfall pumping which has altered the area's hydrology. Wetland W-1 is primarily a pond apple and pop ash depressional wetland. Brazilian pepper has invaded portions of the wetland, in some cases over 75%. Active agricultural manipulation of water levels in the adjacent row crop fields and irrigation ditches currently dictates the wetland's hydroperiod. Relatively deep standing water can be present for significant periods when the area water table is allowed to

remain high though the water table can drop drastically when water is pumped out of this area.

Wetland W-2 (14.0 acres; along the west central boundary of the project; SFWMD jurisdictional only)

This wetland is completely surrounded and enclosed by agricultural berms and irrigation ditches. Indications are that the central portion of the wetland, an area dominated by cypress and pond apple, was historically a depressional wetland but that the surrounding portions were once pine flatwoods. Today, these outer portions of the wetland consist of areas of dense Brazilian pepper, and a scrub/shrub community dominated by an admixture of shrubby species such as Carolina willow, primrose willows, and wax myrtle. The entire wetland can be inundated for significant periods when the water table in the surrounding fields is allowed to remain high. Similar to wetland W-1, this wetland's hydroperiod is controlled by the management of water levels in the adjacent row crop fields and irrigation ditches.

Wetland W-3 (5.1 acres; within the east central portion of the property; SFWMD jurisdictional only)

This wetland is also completely surrounded and enclosed by agricultural berms and irrigation ditches. Indications are that this wetland, like W-2, was also a depressional wetland. Today, the entire wetland is infested with dense Brazilian pepper, and only a rare remnant of the original cypress and wetland hardwoods remain. The entire wetland can be inundated for significant periods when the water table in the surrounding fields is allowed to remain high. Similar to the other wetlands, this wetland's hydroperiod is controlled by the management of water levels in the adjacent row crop fields and ditches.

Wetland W-4 (5.1 acres; in the southeast corner of the property; SFWMD & USACE jurisdictional)

Based on field observations and a review of historic aerial photographs, it is possible that most of this wetland is man-made and once was part of a larger upland area. This wetland is a fallow agricultural row crop area that has not been farmed in several years. It appears that the topographic manipulation associated with past agricultural activities may have lowered the ground elevation enough to create the grades sufficient to establish a hydrologic regime capable of supporting wetland plant species which subsequently colonized the area. This disturbed wetland is now dominated by a mixture of herbaceous wet prairie species. Exotic plant species including para grass, torpedo grass, and Brazilian pepper have invaded a large portion of the wetland and are the dominant cover throughout. The wetland's hydroperiod is largely determined by manipulation of water levels in the nearby row crop fields and irrigation ditches. There are signs that portable throwout pumps sometimes discharge water from adjacent row crop fields into the ditch surrounding this wetland.

Wetland W-5 (26.5 acres; in the south central portion of the property; SFWMD & USACE jurisdictional)

This wetland is a fallow agricultural row crop area that has not been farmed in several years. Based on the Soil Survey of Collier County, this area was composed of non-hydric soils. It appears that the topographic manipulation associated with past agricultural activities may have lowered the ground elevation enough to, in conjunction with the irrigation pumping into the fields, create the grades sufficient to establish an artificial, irrigation maintained hydrologic regime capable of supporting wetland plant species which subsequently colonized the area. This disturbed wetland, which is maintained by ongoing irrigation activities is now dominated by a mixture of herbaceous wet prairie species. Exotic plant species including para grass, torpedo grass, and Brazilian pepper have colonized the wetland and are the dominant cover throughout. The wetland's hydroperiod is largely determined by manipulation of water levels in the abutting row crop fields and irrigation ditches within the enclosed perimeter berm.

Wetland W-6 (13.0 acres; in the southeast corner of the property; SFWMD & USACE jurisdictional)

Like wetlands 4 and 5, this wetland is a fallow agricultural row crop area that has not been farmed in several years. This area, like wetlands 4 and 5 was also composed of non-hydric soils which now exhibit some indication of wetland hydrology which is maintained by the ongoing agricultural irrigation on the abutting actively farmed fields enclosed by the perimeter berm and rim ditch system. The plant community on this wetland is the same as is present on Wetland 5 described above.

Wetland Seasonal High Water Table and Hydroperiod

Ecologists estimated the existing seasonal high water table (SHWT) elevation in each of the wetlands on the project property and in the wetlands offsite to the south. The existing SHWT was estimated based on various physical and biological indicators such as water stains drift lines, tussocks, adventitious rooting, buttressed tree trunks, lichen lines, etc. An elevation marker was established in the wetlands and the elevation of each marker was later determined using standard survey methods. The estimated "normal" SHWT elevations ranged from 2.4 feet to 2.8 feet NGVD. Ecologists also observed the peak water table elevations that were judged to be the result of agricultural manipulation of the water table (through pump discharges into wetlands, manipulation of water table in surrounding fields, etc.).

Former historic SHWT elevations were essentially impossible to gage in the wetlands present on project lands. The hydroperiods in these wetlands have been altered by farming activities for so long that signs of the historic high water levels have vanished or are so faint and/or variable that they could not be estimated with sufficient certainty. In other off-site wetlands at a greater distance from the project lands, there were some faint signs that the regional historic SHWT found in wetlands may have been slightly higher than current SHWT levels. However, these historic SHWT levels have been permanently altered by the regional water control structures such as the 2.0 NGVD control elevation structure on the US 41 canal at Henderson Creek.

One must remember that the existing SHWT elevations determined for wetlands on the property do not necessarily reflect a "natural" hydroperiod. The water levels in these wetlands are governed by how the area water table is regulated in the surrounding agricultural fields and are affected by direct discharges of water (pumping) into and out of the fields as well as allowing fields containing the wetlands to flood on occasions. Water levels in the wetlands adjacent to the property (south) are also affected by how the water table is managed in the nearby fields. In these off-site wetlands typical high water levels are skewed by discharges of water (pumping) from the adjacent fields into the wetland.

As mentioned, the current hydroperiod found in all the on-site wetlands is adversely affected by agricultural surface water management practices. These practices essentially "short-circuit" the typical hydroperiod in a variety of manners, particularly in cases where the wetland is located within row crop fields. Examples of the hydroperiod impacts include:

- For wetlands within crop fields, field irrigation/water table management artificially maintains the wetland's water table much higher than it would normally be during the dry season. During the middle and latter parts of the dry season, the normal water table would typically be 2 to 3 feet below the soil surface. Field irrigation practices instead maintain the water table 8 to 10 inches below the soil surface. Once irrigation ceases near the beginning of the wet season, the water table rapidly declines. This decline is particularly abrupt in cases where the wetland is bordered by one or more agricultural irrigation ditches. Crop fields are allowed to flood during the peak of the wet season to help control nematodes. This practice artificially raises the wetland water table elevation higher than would typically occur. In a natural setting, surface runoff would commonly disperse rainfall inputs. The crop fields are a closed system since they are surrounded by perimeter berms thereby forming impoundment areas. Wetland hydrology would not be present if the agricultural irrigation practices ceased.
- Wetlands subject to water inputs via agricultural pumping and discharge of water into the wetland also have disrupted hydroperiods. Pumping begins (via throwout pumps) during the peak of the wet season when the typical wetland SHWT would be near its maximum elevation. Pumping sends large volumes of water into the wetland raising the water table higher than normal and causing the water level to rise much faster than would occur during typical rainfall events. Pumping can continue intermittently during the dry season. Commonly the water table in the affected wetlands would be well below the soil surface during the majority of this period. The pumping can inundate portions or all of the affected wetland for a brief period and also artificially raises the water table for a longer period. Both the elevation of the water table and the rapid fluctuations in water table elevations that result from pumping are atypical of the normal hydroperiod.

2.3.2 Jurisdictional Status of Other Surface Waters

All the OSWs on the property are man-made agricultural irrigation ditches that are an active part of the current agricultural surface water management system. Characteristics of these ditches are highly variable. Some are largely devoid of vegetation while others have patchy cover by native and exotic herbaceous species alongside slopes and ditch bottoms. Nuisance, exotic, and native woody species can also be present. Maintenance excavation is performed in these ditches as is occasional applications of herbicides, thereby altering vegetative cover following such events. All of the agricultural irrigation ditches within the enclosed agricultural rim ditch and berm system have been determined to be non-wetland waters as identified in the USACE AJD.

Most of the agricultural irrigation ditches mapped on the property are hydraulically connected to one or more other ditch segments within the agricultural irrigation system via pipes. One remnant portion of the historic perimeter rim ditch was isolated from the remainder of the system when farming in the small fallow field (W-4) was abandoned. When the area was being farmed, this OSW was part of the agricultural rim ditch bordering the perimeter of the fields. When the area was abandoned from farming, most of the rim ditch remained but was severed from the former continuations of the ditch. Today this ditch is dominated by dense Brazilian pepper growing along its upper side slopes. A few scattered native trees and shrubs have also colonized the ditch slopes but the peppers are by far dominant. There is practically no littoral vegetation owing to the heavy shading by exotics.

The MEBSS located off-site to the southwest corner of the property is a large constructed stormwater attenuation and outfall component of the Fiddler's Creek DRI. The waters within this system do currently outfall into adjacent wetlands to the south. This water is believed to be jurisdictional to both the SFWMD and the USACE. The project proposal will entail extending this stormwater feature into the proposed development as shown on the plans (Sheets 2 and 3 of the ERP plans).

2.3.3 Jurisdictional Status of Wetlands

All of the wetlands now present on the project lands were assumed to be SFWMD jurisdictional. Wetlands W-1, W-2, and W-3 are all isolated wetlands surrounded by upland crop fields and there are no ditches bordering or in close proximity to these wetlands that have any direct hydrologic connections with off-site wetlands or other Waters of the United States. These three on-site wetlands were assumed to not be USACE jurisdictional because of these factors and this determination was verified by the USACE in their August 28, 2015 AJD.

On-site wetland W-4 is isolated in that it is surrounded by a berm and ditch though it is not part of the current surface water management program associated with the agricultural activities. The southern boundary of wetland W-4 is roughly 60 feet from adjacent off-site wetlands to the south. Given this short upland berm separation distance between the wetland and the ditch combined with the direct hydrologic connection of the off-site wetlands to tidal waters, USACE considers wetland W-4 to be jurisdictional via the "significant nexus" criteria of jurisdiction.

On-site wetlands W-5 and W-6 are isolated from the wetlands to the south in that they are located within the field irrigation system which is surrounded by a berm and ditch. However, the southern boundaries of these two wetland areas are approximately 90 to 120 feet from adjacent off-site wetlands to the south. Given this short separation distance (proximity) between the wetland and the direct hydrologic connection of the off-site wetlands to tidal waters, USACE has considered wetlands W-5 and W-6 to be jurisdictional as adjacent wetlands by proximity (reasonably close to jurisdictional waters and have an inferred ecological interconnection to jurisdictional waters) in the August 28, 2015 AJD, even though this appears to run afoul of interpretations that wetlands cannot be adjacent to other wetlands as provided for in the Corps regulation.

2.4 LISTED PLANT AND ANIMAL SPECIES

A thorough survey for listed animal and plant species was conducted on the project lands by THA ecologists. This listed species survey and its results are discussed in Appendix B. Figure 10 shows the approximate locations where listed animal species were observed on and near the project lands during the course of the

referenced survey. The listed animal species observed on project lands by THA included American alligator, crocodile, little blue heron, snowy egret, tricolored heron, wood stork, sandhill crane, bald eagle, and Everglades snail kite. Other than some alligators, none of the observed listed animal species appear to reside or nest on the project lands. No listed plant species were found by THA on the project lands.

A few listed animal species in addition to those documented on the project lands by THA have some potential for occurring in certain habitats present on project lands. These species are discussed in Appendix B and include; indigo snake, gopher tortoise, gopher frog, roseate spoonbill, limpkin, burrowing owl, crested caracara, white ibis, peregrine falcon, southeastern American kestrel, Florida panther, Big Cypress fox squirrel, and Florida black bear. The probability of these animals utilizing suitable habitats in project lands ranges from very low to moderate depending upon the particular species (see discussion in Appendix B). It is improbable that any of these species currently reside or nest on the project lands. These listed species records and the source of these records are also discussed in Appendix B. It is highly unlikely that any listed plant species could be present on the project lands.

2.5 HISTORIC/ARCHAEOLOGICAL RESOURCES

Agricultural operations have been undertaken on the project site for at least the past 50 years. No evidence of any archaeological artifacts or discoveries has been documented on the project site during that time period.

2.6 SOILS

Based on the National Resource Conservation Service (NRCS) "Soil Survey of Collier County Area, Florida" (NRCS, 1988) there are 9 different soil types (soil map units) present on the project lands. Figure 9 provides a soils map for the project area as derived from the NRCS mapping. The following sub-sections provide a brief description of each soil map unit identified on the project lands. Information is provided about the soil's landscape position (i.e. its typical location in the landscape on a county-wide basis), the soil's profile (i.e. textural composition and thickness or depth range of the layers or horizons commonly present in the soil), and the soil's drainage and hydrologic characteristics.

Under the category of drainage/hydrologic characteristics, certain terms are employed that may warrant explanation. When the seasonal high water table is addressed, the type of water table is identified as being either "apparent" or "perched". An apparent water table is a thick zone of free water in the soil (i.e. vertical movement of the water table is essentially unconfined). A perched water table is water standing above an unsaturated zone. In such cases there is semi-confining layer present that impedes water percolation through the layer. There can be a water table above this layer followed by an unsaturated zone below the layer and a second water table below this zone. The hydrologic soil group is also identified for each soil. There are 4 groups that are used to estimate runoff from precipitation. Soils are grouped according to the rate of infiltration of water when the soils are thoroughly wet and are subject to precipitation from long- duration storms. The four groups range from A (soils with a high infiltration rate, low runoff potential, and a high rate of water transmission) to D (soils having a slow infiltration rate and very slow rate of water transmission). The soils occurring on project lands are as follows:

Holopaw fine sand, limestone substratum (Map Unit #2)

Landscape position –Sloughs and broad poorly defined drainageways

Soil profile -The entire soil profile is fine sand down to a depth about 57 inches. The upper 5 inches or so is dark gray transitioning to white then back to gray at lower layers.

Drainage/Hydrologic characteristics -Poorly drained. Permeability is moderate. The seasonal high water table (apparent) is at a depth of 6 to 18 inches for 1 to 6 months. Hydrologic group is BID. This map unit is classified as a hydric soil by the NRCS.

Immokalee fine sand (Map Unit #7)

Landscape position -Flatwoods.

Soil profile -The entire soil profile is fine sand and has a spodic horizon at a depth of 35 to about 55 inches. The solum thickness ranges from 40 to 80 inches or more.

Drainage/Hydrologic characteristics -Poorly drained. Permeability is moderate. The seasonal high water table (apparent) is at a depth of 6 to 18 inches for 1 to 6 months. Hydrologic group is BID.

Oldsmar fine sand, limestone substratum (Map Unit #10)

Landscape position -Flatwoods.

Soil profile -The entire soil profile is fine sand with a surface layer of 4 to 5 inches of dark gray-brown fine sand transitioning to light grey down to about 35 inches. Subsurface soil is black fine sand and dark gray-brown fine sandy loam to 60 inches.

Drainage/Hydrologic characteristics -Poorly drained. Permeability is moderate. The seasonal high water table (apparent) is at a depth of 6 to 18 inches for 1 to 6 months. Hydrologic group is BID.

Oldsmar fine sand (Map Unit #16)

Landscape position -Flatwoods.

Soil profile -Surface layer to a depth of 3 to 8 inches consists of fine sand. Subsurface layer to depth of about 4 to 50 inches consist of sand or fine sand. Subsurface layers below this to a depth of 30 to 65 inches consist of sand or fine sand. Below these layers the subsoil is fine sandy loam, sandy clay loam, or sandy loam. Limestone bedrock begins at a depth of 60 to 72 inches but may not begin within 80 inches of the surface.

Drainage/Hydrologic characteristics -Poorly drained. Permeability is slow or very slow. The seasonal high water table (apparent) is at a depth of 6 to 18 inches for 1 to 6 months. Hydrologic group is BID.

Basinger fine sand (Map Unit #17)

Landscape position -Sloughs and poorly defined drainageways.

Soil profile -All soil horizons present to a depth of 80 inches or more are comprised of fine sand. A weak spodic horizon occurs beginning at depths ranging from 12 to 38 inches.

Drainage/Hydrologic characteristics -Poorly drained. Permeability is rapid. The seasonal high water table (apparent) is within 12 inches of the surface for 3 to 6 months. Shallow standing water is present for about 7 days following peak rainfall events during the wet season. Hydrologic group is BID. This soil is classified as a hydric soil by the NRCS.

Fort Drum and Malabar high fine sand (Map Unit #20)

Landscape position -Ridges along sloughs.

Soil profile -Surface and subsurface layers to a depth of about 20 inches consist of fine sand. Below this to a depth of about 80 inches or more is fine sand followed by limestone bedrock.

Drainage/Hydrologic characteristics -Poorly drained. Permeability is moderate. The seasonal high water table (apparent) is at a depth of 6 to 18 inches for 1 to 6 months. Hydrologic group is BID.

Boca, Riviera limestone substratum and Copeland fine soils, depressional (Map Unit #25)

Landscape position -Depressions, cypress swamps, and marshes.

Soil profile for Boca soil -Surface layer to a depth of 4 inches consists of very dark gray fine sand. Subsurface layers to a depth of about 32 inches consist of fine sand. Soil below this to a depth to about 32 inches is fine sandy loam. Limestone bedrock typically is found at around 30 inches.

Soil profile for Riviera soil -The surface layer to a depth of 6 inches is gray fine sand. The subsoil layers to a depth of about 26 inches consist of fine sand. Soil below this to a depth to about 54 inches is sandy clay loam. Limestone bedrock typically is found at around 54 inches.

Soil profile for Copeland soil - The surface layer to a depth of 6 inches is black fine sand. The subsoil layers to

a depth of about 18 inches consist of fine sand. Soil below this to a depth to about 24 inches is mottled sandy clay loam. Gray marl lies underneath down to the limestone bedrock at about 30 inches.
Drainage/Hydrologic characteristics -Very poorly drained. Permeability is slow or very slow. Seasonal high water table (apparent) is up to 12 inches above the surface for 6 months or more typically. Hydrologic group is D. This map unit is classified as a hydric soil by the NRCS.

Holopaw fine sand (Map Unit #27)

Landscape position - Sloughs and poorly defined drainage ways.

Soil profile -Surface and subsurface horizons to a depth of about 57 inches consist of fine sand or sand. The subsoil below these layers to a depth of about 62 inches consists of sandy loam, fine sandy loam, or sandy clay loam. Some pedons have a limestone substratum at depths ranging from 50 to 80 inches. Others lack a limestone substratum.

Drainage/Hydrologic characteristics - very poorly drained. Permeability for Holopaw soils is moderate to moderately slow. The seasonal high water table (apparent) can range from 2 feet above the surface to 1 foot below the surface. Typically, these soils are ponded for 6 months or more during the wet season. Hydrologic group is D. This map unit is classified as a hydric soil by the NRCS.

Urban Land, Immokalee, Oldsmar limestone substratum complex (Map Unit #34)

Landscape position –Urban and other developed areas

Soil profile – See above descriptions for Immokalee and Oldsmar soils

Drainage/Hydrologic characteristics - Poorly drained. Permeability is moderate. The seasonal high water table (apparent) is at a depth of 6 to 18 inches for 1 to 6 months. Hydrologic group is BID.

3. PROPOSED CONDITIONS (POST- DEVELOPMENT CONDITIONS)

3.1 PROPOSED PROJECT

The purpose of the proposed Estancia and Oyster Harbor East projects is to develop new residential and golf course communities within the existing Fiddler's Creek DRI. The location of the project is in a region where there is currently a demand for upscale home sites with access to golf course and other community amenities.

Sheet 3 of the ERP plans and Figure 5 of this document illustrate the overall proposed site plan for the projects. The project site will be accessed from Tamiami Trail (US 41) at the north end of the project. Access will also be available to / from the west through the Oyster Harbor development phase which is currently under construction.

Development will involve excavating lakes and other infrastructure using typical equipment such as backhoes, bulldozers, excavators, front-end loaders, and dump trucks. Roadways, golf course, and home sites will be filled to meet regulatory (FEMA) requirements. Some blasting may be necessary as part of the lake excavation activities. The blasting is conducted 6 to 8 feet below ground and will be conducted only in daylight hours (about 10 AM to 3 PM, possibly later if there are storm delays).

The development will be done in phases and it is likely that agricultural activities may continue in areas that have not yet been brought into the construction schedule.

As part of the project, a stormwater management system will be constructed throughout the development. The lakes, pipes, and swales will all tie into a created spreader system that will run along the southern and eastern boundaries of the project. This system will also tie into the existing Fiddler's Creek MEBSS that exists to the west of the project site, previously required to be constructed as part of an extensive "Wildlife Habitat Enhancement and Management Plan" by USACE and ERP permits for the original development of Fiddler's Creek DRI. Because of the desire to maintain and preserve the integrity of the off-site wetland systems to the south, a wildlife buffer and enhancement plan was incorporated into the original development proposal. The primary concern to off-site public owned wetlands, which has a major impact on wildlife and wildlife habitat in the area, was the invasion of off-road vehicles. To limit access to these areas, a long meandering marsh buffer/spreader system was to be located along the southern fringes of the property. The design and location of the marsh buffer/spreader system incorporated viable wildlife habitat along the southern fringes. (Figure 6, Sheets 2 and 3 of ERP plans). The stormwater management system will be composed of three drainage basins as outlined in the Engineering report. Basin OH encompasses the Oyster Harbor eastern phase in the northwest portion of the project area and will be tied into existing control structures to the west within the Oyster Harbor phase that is currently under construction. Basin E1 is the northern portion of the Estancia project and will be controlled at elevation 3.0 NGVD. Basin E2 is the southern portion of the Estancia project and will be controlled at 2.5 NGVD.

All three basins provide surface water management for the planned residential golf course community and will contain common drainage facilities consisting of curb inlets, yard drains and catch basins along the golf course connected together and interconnected with underground culverts conveying surface water runoff to the series of lakes. The lakes will provide water quality treatment and attenuation required by the regulatory permitting.

There are some special features in this project. The first is improvements to the US 41 outfall canal. The canal is proposed along the entire west property line and for several hundred feet along US 41. FDOT is currently improving US 41 to just past Sandpiper Drive. Plans to improve 41 along the Estancia property will include conveyance of runoff under 41 and into the outfall canal which would then convey water to the MEBSS from where it could flow south in a more natural sheet flow condition.

The water control structure for Basin E-1 is located to discharge into the outfall canal along the east property line and the water control structure for Basin E-2 is located to discharge directly into the MEBSS extension which will be constructed as a part of the project. Basin OH will tie into existing control structures within the rest of the Oyster Harbor development currently under construction to the west.

Both Estancia basins contain isolated wetlands which will be preserved and enhanced through improvements to the vegetative communities and hydrology of those wetlands. Existing berms will be leveled, existing agricultural irrigation ditches will be filled, and littoral shelves will be constructed from at least one internal lake to connect with the preserved wetlands. All the preserved wetlands will become part of the surface water management system except W-4.

Various acreage estimates for the proposed project are provided below.

- Total area within the Estancia property boundary = 811.7 acres
 - Oyster Harbor East = 191.9
 - Estancia = 619.8
- Total wetlands and OSW within the project Boundary = 122.5 acres
 - Total SFWMD only wetlands = 30.1 acres (all in Estancia)
 - Total both SFWMD and USACE wetlands = 44.6 acres (all in Estancia)
 - Total OSW (irrigation ditches) = 44.1 acres
 - Oyster Harbor East = 8.1 acres
 - Estancia – 36 acres
- Total uplands within the project boundary = 689.2 acres
 - Oyster Harbor East = 180.9
 - Estancia = 508.3
- Total area to be developed as part of the project = 774.4 acres
 - Oyster Harbor East = 191.9
 - Estancia = 582.5
- Portion of development area to be preserved = 37.4 acres (all in Estancia)
- Total area outside of the development area boundary to be preserved = 7.2 acres
- Total area to be preserved = 37.3 acres

3.2 PROJECT CONSTRUCTION SCHEDULE AND BEST MANAGEMENT PRACTICES

The initiation of project construction activities will commence shortly after all necessary agency permits and approvals are secured. It is presently estimated that this will occur in the third quarter of 2016. Generally speaking, the operations office and related facilities (parking lot, on-site entry road, etc.), and stormwater ponds will be constructed first as will the perimeter stormwater berms encompassing the current construction area. Soil material resulting from the excavation of the lakes will be utilized on-site for the roadway, golf course, and house pads. Usually there will be multiple lakes being excavated simultaneously. Final completion of development activities is estimated to occur roughly 5 years after project construction is initiated but this could vary.

It is important to understand that the existing row crop farming activities may continue during the initial phases of the project. Crop fields may be retained in areas not being developed and will be eliminated as the development progresses across the property. The fields and agricultural drainage and irrigation ditches associated with these fields will be modified as necessary in advance of the development to allow farming to continue.

During the construction process, appropriate construction best management practices will be employed to help protect water quality and minimize the discharge of sediments and/or turbid water from the project site. The specific erosion/sediment/turbidity control methods and devices used will generally conform to applicable standards and criteria set forth in the "FDER Florida Development Manual," Sections 6-301 through 6-500 (FDER. 1988. "The Florida Development Manual: A Guide to Sound Land and Water Management," Chapter 6: "Storm Water and Erosion Control Best Management Practices for Developing Areas; Guidelines for Using Erosion and Sediment Control Practices," ES BMP1.01-1.67. Tallahassee, FL.). These methods will also typically conform to applicable standards and guidelines set forth in the "Florida Stormwater, Erosion, and Sedimentation Control Inspector's Manual" (FDEP, 2002).

Prior to construction activities immediately adjacent to the conservation areas, the boundaries of those portions of the conservation areas adjacent to the development areas will be delineated with temporary barriers to identify and

protect the conservation areas during project construction. Marker devices such as enviro-fencing, ropes with flagging, and/or silt screens may also be used to help identify these boundaries. Appropriate measures will be taken to help protect water quality, minimize erosion, and control/minimize the discharge of sediments and turbid waters during the initial clearing, grubbing, and grading activities proposed within the conservation areas as part of the wetland enhancement program. Measures will also be taken to ensure the clearing/grading activities within the conservation areas do not inadvertently extend into nearby wetland and upland areas not slated for grading.

3.3 PROJECT IMPACTS TO JURISDICTIONAL WETLANDS AND OTHER SURFACE WATERS

3.3.1 Direct, Permanent Impacts

Development of the proposed Estancia project will result in direct, permanent impacts to 39.56 acres of SFWMD or USACE jurisdictional wetlands. No wetland impacts are associated with the Oyster Harbor East project. As used herein, the term "direct, permanent impacts" refers to actions that will result in the complete elimination or loss of jurisdictional areas (i.e. excavation and fill). All of the remaining on-site wetlands will be preserved.

There are currently multiple other surface waters (OSWs) within the property boundary. These are all segments of man-made agricultural irrigation ditches. Development of the project will result in direct, permanent impacts to the entirety of all but one of these OSWs as shown on Figure 8. These impacted OSWs total approximately 43.6 acres (8.1 acres within Oyster Harbor East and 35.5 acres within the Estancia project) and were determined to be non-wetland waters by USACE in the August 28, 2015 AJD. The un-impacted OSW segment is the ditch that is adjacent to W-4, which will be incorporated into the wetland enhancement program for that area.

The extension of the MEBSS will entail some excavation of the existing MEBSS shoreline to tie in the proposed continuation. This tie-in will result in approximately 0.2 acres of modifications to the shoreline and side slopes and excavation of approximately 1,377 cubic yards of material from the existing MEBSS feature. This impact is more than offset by the miles of new shoreline and side slope that will be created in association with the proposed extension.

Combining the on-site impacts with the off-site impacts, the proposed project will result in direct, permanent impacts to a total of approximately 39.6 acres of wetlands (fallow farm fields), 43.6 acres of on-site OSWs (determined to be non-wetland waters by USACE) and a total of approximately 0.6 acre of off-site OSW.

3.3.2 Temporary Impacts

Conducting the proposed wetland enhancement program for the project will result in temporary "impacts" to certain wetlands within the proposed conservation areas. As used herein, "temporary impacts" refer to those impacts that represent a temporary physical disturbance to wetlands but the affected areas still remain as wetlands following this disturbance.

Proposed grading activities will require mechanized clearing, grubbing, and grading of the berms around all four wetlands as well as along the existing rim ditch. Grading activities associated with W-4 and the wading bird foraging enhancement action will also temporarily impact all of the W-4 wetland. These activities will largely take place in previously disturbed areas that are now dominated by exotics. As illustrated on Figure 9, the enhancement grading activities will "impact" approximately 5.1 acres of wetland W-4 within the boundaries of that preserve area. This wetland is both SFWMD and USACE jurisdictional.

Hence, the proposed wetland mitigation program will necessitate temporary impacts to a total of 5.1 acres of SFWMD and USACE jurisdictional wetlands and to a total of 0.6 acres of OSWs as indicated in Table 4. The effects of the mechanized clearing and grading activities proposed should not really be considered as wetland "impacts" since they are necessary to carry out enhancement actions and will result in positive benefits to the affected wetland areas as well as to immediately adjacent wetland areas.

3.3.3 Secondary Impacts to Off-Site Wetlands and Water Resources

The proposed layout of the project's development features will minimize potential secondary impacts to off-site wetlands by providing an appropriate buffer between the development features and the proximal wetlands. Sheets 2 and 3 of the ERP plans illustrates that the project will extend the MEBSS around the southern and eastern boundary of the project which will provide an undeveloped buffer or "setback" of at least 100 feet between the majority of site development features and off-site wetlands.

The proposed control elevation for the project is such that the on-site stormwater management system will not adversely impact natural hydroperiods in off-site wetlands. In fact the proposed stormwater system should serve to improve hydroperiods in adjacent off-site wetlands by eliminating the agricultural pumping that has been in place for the past 50 years. The lake-wetland separation standards set forth in Section 6.12 of the BOR are more than adequately satisfied by the project's proposed stormwater management system. These standards deal with the hydraulic gradient created between a stormwater lake's control elevation and the typical seasonal high water table (SHWT) of a nearby wetland. The purpose of the gradient standards or guidelines is to avoid drawdown effects of the lake upon the wetland's normal seasonal water table level. The gradient is expressed as: $(\text{SHWT elevation in wetland} - \text{control elevation of lake}) / (\text{distance from lake at control elevation to the wetland edge})$. A gradient of 0.005 or less is considered to pose no risk of wetland drawdown. This project has a gradient that varies from 0.000 to 0.003 as the MEBSS control will be set at 2.5 and the estimated SHWT varied from 2.4 to 2.8 NGVD.

The project, when completed, will provide much greater water storage on the property than exists currently and thus will be a source of groundwater recharge for the general region. The water table in the lakes will reflect the existing regional water table and thereby maintain ambient natural water table levels. In this manner, the proposed lake will not adversely affect natural hydroperiods or peak water table elevations in off-site wetlands. To the contrary, the future lakes should potentially make more water available to off-site wetlands by creating large water storage areas that help recharge the surficial aquifer. These lakes will also more than compensate for the loss of the existing water storage volume provided in the on-site OSWs to be impacted that are isolated from the wetlands to the south by an enclosed perimeter berm and rim ditch system.

The project's proposed stormwater management system is designed to comply with all applicable design standards and requirements set forth in SFWMD's Basis of Review (BOR), including but not limited to those addressing water quality criteria (BOR Section 5.0), water quantity criteria (BOR Section 6.0), and water management design and construction criteria (BOR Section 7.0). Adherence to these criteria will help ensure that, following development, discharges from the stormwater management system to off-site lands meets applicable state and federal surface water quality standards. During the construction process, appropriate best management practices will be employed to control and reduce soil erosion, sediment transport, and turbidity. Given these factors, the proposed project should not adversely impact water quality in off-site wetlands or surface waters.

The current agricultural practices on the property result in significant loadings of nutrients and certain pesticides. These loadings will be substantially reduced by the proposed project, thereby improving water quality in the surficial aquifer. The proposed project stormwater management system will capture and treat on-site stormwater runoff in accordance with SFWMD / FDEP stormwater treatment and attenuation design criteria. The stormwater treatment capacity of the lake network will be large enough that it is anticipated the nutrient concentrations in waters eventually discharging from the lakes via proposed stormwater outfalls will be much lower than currently occurs.

Currently agricultural practices on the property also include the use of throwout pumps to discharge water from the crop fields into off-site uplands and wetlands. This discharge lowers the water quality in the wetlands receiving water from the pumping since the water receives minimal, if any, treatment prior to the pumping. As the development progresses, the on-site farming activities including the use of throwout pumps will be eliminated. Discontinuation of pumping will further benefit water quality in off-site wetlands and other surface waters.

3.4 PRESERVATION OF WETLANDS, UPLANDS, AND CREATED / RESTORED WETLANDS

Development of the proposed Estancia project will impact two of the existing wetlands (Wetlands 5 and 6) present within the property boundaries and within the area enclosed by a perimeter berm and rim ditch system for agricultural irrigation, isolated from the wetlands to the south. These wetlands 5 and 6 have wetland hydrology based on the agricultural irrigation of the abutting active farm fields. In addition, essentially all of the existing OSWs (irrigation ditches), and the majority of the existing uplands. According to Collier County's method of classifying habitats as to whether they constitute "native vegetation" habitats, there are currently only a total of 24.2 acres of habitats (i.e. vegetation associations or FLUCFCS categories) on the property that may be classified as native vegetation. These areas occupy less than 4% of the total property. The proposed project will impact none of the existing "native vegetation" habitat areas on the property. All of the preserved areas will be enhanced through the removal of exotic vegetation and improvements to hydrology.

The proposed Estancia project will include 4 isolated Conservation Areas that will contain preserved and enhanced wetlands and uplands as well as created/restored wetlands. These conservation areas will include the 3 on-site wetland preserve areas (W-1, W-2, & W-3) (37.4 acres), and the 1 off-site area (W-4) (7.2 acres). It should be noted that the W-4 conservation area is isolated from the proposed development but will be contiguous with off-site wetlands to the south.

Both the ERP plans and the attached Figures illustrate the location of the proposed conservation areas. Table 7 indicates this existing composition (FLUCFCS, wetlands, uplands, OSWs) of the proposed preserves. Table 8 indicates the anticipated composition following completion of the proposed wetland enhancement program within the conservation areas.

All of the conservation areas will be placed under appropriate conservation easements, which will protect the future integrity of the wetland and upland habitats contained in these areas. Appropriate access easements will also be provided to insure future maintenance of the preserve areas can be undertaken.

3.5 PROJECT IMPACTS TO LISTED SPECIES

The following subsections provide an assessment of the proposed project's potential impacts to various listed animal species. The species addressed include those observed on or in close proximity to the property as well as certain species that could potentially occur on the property and/or on off-site lands close to the project site.

Wood Storks (*Mycteria americana*)

No wood stork nests, rookeries, or roosting sites have been found on the project lands. The closest documented wood stork colony is located approximately 19 miles northeast of the property in Katherine Island. The proximity of this rookery (colony) places the proposed project outside of the colony's 18.6-mile Core Foraging Area as defined by FWS. Wood storks have been documented foraging in a few of the larger agricultural ditches on the property. None of the on-site wetlands provide suitable foraging habitat for wood storks, mostly due to the density of shrub cover. It is possible that wood storks could occasionally forage in limited portions of on-site wetlands W-1 and W-4, however the quality of these habitats for foraging purposes is minimal. Only the open waters associated with the farm ditches currently provides potential wood stork foraging habitat. None of the on-site wetlands or adjacent off-site wetlands currently offer habitats suitable for establishment of wood stork rookeries.

The proposed project will permanently impact none of the wetlands present on the property. These wetlands will be enhanced to provide more suitable foraging habitat than currently exists. The project will eliminate essentially all of the existing OSWs present on the property (i.e. the existing man-made agricultural irrigation ditches). Some of the OSWs (ditches) to be impacted do provide wood stork foraging opportunities. These particular ditches are generally very shallow and contain limited prey species when water is present. The foraging opportunities provided can vary significantly during a given year due a wide array of factors that include, but are not limited to: water levels present (ditches can be too dry for several months; water depths can be too deep in larger ditches, particularly when fields are being irrigated); variable abundance of prey species; access of prey species to ditch segment (manipulation

control structures such as flashboard risers can block or allow access); maintenance condition of ditch segment (ex. whether vegetation cover is dense or sparse, whether ditch recently re-graded or not, etc.).

The proposed wetland enhancement program will result in the establishment of suitable wood stork foraging habitats that do not currently exist through the proposed wetland restoration and enhancement activities. The herbaceous marsh to be created in W-4 will form 7.2 acres of short hydroperiod wetlands providing good foraging opportunities that are absent today. Enhancement of the 22.0 acres of scrub-shrub wetlands may provide both foraging and roosting or even nesting opportunities.

Upon completion of the development, the lakes (including the MEBSS) will encompass a total of approximately 76 acres. These lakes will provide deep water refugia for fish and habitat for a diversity of other aquatic and semi-aquatic organisms. The vegetated littoral zones along the perimeters of these lakes will also provide some foraging opportunities for wood storks, however the foraging value on a per acre basis will be limited compared to more favorable habitats such as the marsh areas in W-4 (due to factors such as water depth, dispersal of prey species, extended inundation vs. seasonal drying, etc.).

As discussed in Section 4, the development plan proposed has already been refined to avoid and reduce impacts to wetlands and other surface waters, including suitable wood stork foraging habitats, to the greatest extent practicable. The proposed wetland enhancement activities will occur within the same wood stork foraging area in which the proposed OSW impacts will occur. This enhancement is in keeping with the Section 404(b)(1) guidelines and, in conjunction with the creation of the development lakes, should adequately compensate for the loss of the existing low-quality wood stork foraging habitats that will be impacted by the project. Given these considerations, use of the USFWS Wood Stork Key, outlined in the USFWS South Florida Programmatic Concurrence Letter dated January 25, 2010 and the May 18, 2010 addendum, to conduct a sequential effect determination for the species resulted in the following key sequential determination: A-B-C-D-NLAA and it is concluded that the proposed project may affect, but is not likely to adversely affect wood storks.

Various Listed Wading Birds

Little blue herons (*Egretta caerulea*), snowy egrets (*Egretta thula*), white ibis (*Eudocimus alba*), and tricolored herons (*Egretta tricolor*) have occasionally been observed foraging in various agricultural irrigation ditches and swales located on the property. Little blue herons have also been observed temporarily roosting in wetlands W-1 and W-3, where a snowy egret and tricolored heron were also seen foraging. No nests of these species have been observed on the project lands. Besides these species, other listed wading birds that could theoretically frequent appropriate habitats within the project lands include roseate spoonbills (*Ajaja ajaja*) and limpkins (*Aramus guarauna*).

Development of the project will result in the loss of on-site agricultural irrigation ditches thereby reducing potential foraging habitats for the listed wading birds mentioned. The proposed wetland enhancement program will improve and increase wetland habitats that can be used by these species while the lakes and MEBSS will also provide potential foraging habitats. The listed species protection plan includes measures to help protect these species during project construction and operation. Overall, the proposed project will impact existing low-quality foraging habitats but should adequately compensate for these impacts and not threaten the continued existence of the cited listed wading birds.

American Alligators (*Alligator mississippiensis*)

Numerous alligators have been observed in the agricultural irrigation ditches on the property. One alligator nest has been documented in close proximity to the property, specifically on the south side of the MEBSS to the south west of the project site.

The proposed project will affect alligators; however the anticipated impacts (primarily a combination of temporary and permanent displacement) are not likely to adversely affect alligator populations in the general region. Measures are included in the listed species protection plan to help avoid and minimize direct impacts to individual alligators and alligator nests. Once the development is completed, the lakes and MEBSS extension will provide roughly 76 acres of viable alligator habitat, far more than exists presently.

American Crocodile (*Crocodylus acutus*)

While no crocodiles have been observed in the agricultural irrigation ditches on the property, they have been observed within the MEBSS west of the project site. Additionally, crocodiles are known to nest around the Marco Airport located approximately a mile south west of the project site. The property is located within the USFWS crocodile consultation area though it is not within any designated critical habitat.

The proposed project may affect crocodiles in the same manner as the alligators listed above; however the anticipated impacts (primarily a combination of temporary and permanent displacement) are not likely to adversely affect crocodile populations in the general region. Measures are included in the listed species protection plan to help avoid and minimize direct impacts to individual crocodiles and potential crocodile nests. Once the development is completed, the lakes and MEBSS extension will provide roughly 76 acres of viable crocodile habitat, far more than exists presently.

Florida Sandhill Cranes (*Grus canadensis pratensis*)

A few Florida sandhill cranes have been observed on the property foraging in row crop fields prior to planting and these cranes have also been observed in the golf course and herbaceous wetlands near the property. No crane nests have been found on or near the site. Habitats present on the property, including the existing wetlands, are not currently suitable for crane nesting.

Development of the property will eliminate certain on-site upland habitats that provide foraging opportunities for sandhill cranes. Of these, those most suited to crane foraging are the fallow row crop areas that currently occupy approximately 59 acres. This loss should not substantially impact sandhill cranes nor should it adversely impact local sandhill crane populations. The proposed wetland enhancement program will create, enhance, and restore wetland habitats in a manner that provides viable sandhill crane nesting opportunities where none occur now. The listed species protection plan incorporates actions that will help ensure protection of sandhill crane nests in the unlikely event that such nests are established on-site.

Eastern Indigo Snakes (*Drymarchon corais couperi*)

No indigo snakes have been observed on the project lands and the majority of these lands do not provide particularly suitable habitats for indigo snakes. Considering their elusive nature, their large home range, and the wide array of habitats they may utilize, there remains a limited potential that indigo snakes could occasionally frequent portions of the project lands.

The listed species protection plan which will be adopted as part of the project includes appropriate measures for helping ensure the protection of indigo snakes throughout the development of the project. The particulars of the protection plan for indigo snakes set forth in the project's listed species protection plan basically follow the FWS's prescribed "Standard Protection Measures for the Eastern Indigo Snake". There are no gopher tortoise burrows, holes, cavities, or other refugia on the project lands where an indigo snake could be buried or trapped and injured during project activities. In consideration of these points and given the limited probability of any indigo snakes occurring on the project lands, use of the USFWS Eastern Indigo Snake Key outlined in the USFWS' North and South Florida Programmatic Concurrence Letter, dated January 25, 2010 and the August 13, 2013 Addendum, to conduct a sequential effect determination for the species resulted in the following key sequential determination: A-B-C-D-E-NLAA and results in a "May affect, not likely to adversely affect" determination for this species.

Florida Panthers (*Puma concolor coryi*)

Secondary Zone panther habitat conservation overlays are located immediately north of US 41 which runs along the northern boundary of the property as discussed in Appendix B and illustrated in Figure 10. Florida panthers have been documented around the project and one cat has travelled onto the project site on a few occasions being located within the on-site forested wetland areas. It appears as though he has crossed US41 into Wetland W-1 several times. Since traffic coming to and from the project site will pass through or adjacent to Secondary Panther Habitat, it is anticipated that USFWS may require a traffic analysis prior to determining the extent of impacts (if any) that the project may have on Florida panthers. The existing row crop activities result in habitat that is not very

suitable for panther foraging or denning though one male cat has travelled into the forested wetland areas on the site several times. Use of the USFWS Florida Panther Effect Determination Key outlined in the USFWS' Concurrence Letter, dated February 19, 2007 to conduct a sequential effect determination for the species resulted in the following key sequential determination: A-B-MAY EFFECT and results in a "May affect" determination for this species due to the potential increase in vehicular traffic through the panther focus area.

Crested Caracaras (*Caracara cheriway*)

In accordance with the USFWS South Florida Ecological Services Office DRAFT April 20, 2004 Species Conservation Guidelines South Florida the project site falls outside of the consultation area for Caracara. Intensive surveys of the project lands found no caracara nests and no caracaras were observed on the project lands during these surveys. It appears that caracaras do not nest on these lands and that they do not use these lands for hunting/foraging purposes to any significant degree.

There are no known caracara nests in close proximity to the property. Considering this along with the results of the listed species surveys conducted on-site (no nests, no observation of foraging/hunting, limited suitable habitat), proposed development activities should not directly impact caracaras (no effect).

The listed species protection plan proposed prescribes surveying on-site for caracara nests prior to initiation of construction activities to help ensure no caracara nests have been established on the project lands subsequent to the listed species surveys already conducted. Surveys for caracara nests located off-site in the immediate vicinity of the property will also be conducted prior to initiation of construction. These proposed activities are subject to change and will be finalized based on input and guidance received from FWS during their evaluation of the project.

Florida Black Bears (*Ursus americanus floridanus*)

No Florida black bears or positive signs of black bears have been observed on the project lands. Black bears have been documented by others (FFWCC) in the natural habitats occurring within off-site lands to the east and north of the property.

Development of the site should not directly impact black bears nor will development result in a significant loss of suitable bear habitat. The property currently encompasses no primary black bear habitat (FLUCFCS categories 411 and 428) and very little secondary black bear habitat (FLUCFCS 422, 618, 6192, 631, and 6419). Combined, these habitats occupy approximately 5 percent of the total property. The proposed development will directly impact none of the existing secondary habitat though it will isolate it further with residential and golf course development as opposed to the agriculture operations currently in place. It is noted that the vast majority of the secondary habitats affected are within the isolated on-site wetlands. The small size of these wetlands and their isolation within large expanses of surrounding row crop fields would typically eliminate these areas from consideration as "suitable" bear habitat.

The proposed project is not in conflict with the bear habitat management guidelines prescribed by FWC (reference: Maehr, David S., T.S. Hootor, L.J. Quinn, and J.S. Smith. 2001. Black bear habitat management guidelines for Florida; Technical Report #17. Florida Fish and Wildlife Conservation Commission, Tallahassee, FL). Project impacts to black bears are anticipated to largely be restricted to secondary impacts that will affect only a few individuals. These impacts will not be significant enough to adversely affect the integrity or long-term viability of the regional bear population.

Burrowing Owls (*Athene cunicularia*)

Although no burrowing owls or owl burrows have been documented on the property, two active burrows have been observed within the Aviamar development that is currently under construction approximately 3,000 feet west of the project site. It is possible that owls might establish on-site burrows in the future either prior to initial construction activities or afterward, in areas of the property where agricultural activities have ceased and development has not yet expanded. The listed species management plan includes measures to locate and protect any on-site owl burrows during the construction activities associated with the development. Thus, the proposed project should have no direct, significant impact to burrowing owls.

The listed species protection program also incorporates measures to protect off-site owl burrows from blasting activities should new burrows be established in close proximity to proposed blasting areas. After blasting activities begin, it is assumed burrowing owls will avoid establishing burrows in off-site areas where they consider the effects of blasting (noise, ground vibration) to be potentially harmful or disruptive. Potential secondary impacts of blasting activities to off-site owl burrows should not be significant given the proposed protection plan and the anticipated tendency of owls to avoid areas where blasting creates a disturbance.

Florida Bonneted Bat (*Eumops floridanus*)

The project site is within the FBB consultation area and is also within one of the designated focal areas. The project will not be removing any cavity trees as almost the entire site has been historically cleared and under agricultural operations for the past few decades. Enhancement of the wetland preserve areas will involve removal of predominately midstory level exotic vegetation (Brazilian pepper) and will not impact any FBB roosting trees. The project is willing to install bat houses along the preserve and MEBSS boundaries to provide for bat roosting once the project is completed. The proposed project should have no direct, significant impact to Florida bonneted bats.

3.6 PROJECT IMPACTS TO ARCHAEOLOGICAL/HISTORICAL RESOURCES

As previously discussed, this site has been under active agricultural production for at least the past 50 years. No potentially significant cultural resources have been located on the project lands. As such, it is believed that the proposed project will have no effect on cultural resources listed or eligible for listing in the National Register of Historic Places.

If a suspected archaeological or historical artifact is discovered during the course of site development activities (clearing, construction, etc.), the development activities at the specific site will be immediately halted and the appropriate agency notified. Development will be suspended for a sufficient length of time to enable the Collier County or a designated consultant to assess the find and determine the proper course of action.

4. AVOIDANCE & MINIMIZATION OF WETLAND IMPACTS

Alternative Sites

The Fiddler's Creek DRI was originally proposed by the Deltona Corporation in the 1980's following a 1981 lawsuit decision (*Deltona versus the United States*) in which the Court found in favor of the USACE denial of some of Marco Shores' development permits. Following this decision, Deltona entered into a Settlement Agreement with several State and Local regulatory agencies and NGOs based on revised development plans involving newly purchased lands, including Fiddler's Creek, which was at the time known as UNIT 30. Deltona applied for and obtained Corps permits in 1983, following the Corps completion of an Environmental Impact Statement (EIS), to develop Fiddler's Creek (UNIT 30) along with several other Deltona properties. The Settlement Agreement and issued Corps permits required over 18,000 acres of habitat preservation, which included a large expanse of wetlands located south of Fiddler's Creek DRI. A key part of the Corps permit was the *Wildlife Habitat Enhancement and Management Plan* (WHEMP), which included the creation of a buffer between Fiddler's Creek DRI southern development boundary and the wetland preserve to the south consisting of a "spreader swale system" (in this document referred to as the MEBSS). While permits were issued in 1983, Collier County would not allow development to proceed until S.R. 951 was widened. It was not until 1995 that an agreement was reached with Collier County relating to the widening of S.R. 951. The 1983 USACE permit authorizing work for the majority of Fiddler's Creek DRI was then extended through January 2005 due to the delays resulting from the S.R. 951 road widening. Fiddler's Creek DRI was amended over the years to include adding additional sections to be developed resulting in additional Corps permit modifications and extensions of time. The last Corps permit was modified approving work in Sections 11 and 13 for development of VENETA which expired March 2008.

The Fiddler's Creek DRI has been amended over the years to include the addition of other lands to be developed which has resulted in additional USACE permit modifications and extensions. Currently, the Fiddler's Creek DRI consists of all or portions of 10 Sections within Township 51 South, Range 26 and 27 East (*Figure 11*).

An affiliate of the Gulf Bay Group of Companies bought the farmland which is the subject of this application in the early 1990's. The entire purchase was approximately 1800 acres in Sections 13, 18, 19, 24 & 29. The Fiddler's Creek communities of Aviamar, Marsh Cove, and Oyster Harbor have been or are currently under construction from this farm land purchase. The proposed Estancia project is the last remaining portion of this purchase. Since the lands were purchased in the early 1990's for eventual development as residential communities under the Fiddler's Creek DRI, alternative sites were not explored for the currently proposed application. The fact that the lands are part of an existing DRI, they have been in agricultural production for at least 50 years, and they have been previously considered in USACE actions, make this site much less environmentally impactful than development of raw forested land would be.

Alternative Site Plans

The applicant has made considerable efforts to minimize impacts to existing jurisdictional wetlands. The final site plan as presented in this document shows that all of the natural wetlands remaining within the project boundary have been avoided. The three SFWMD jurisdictional wetlands (W-1, W-2, & W-3) currently isolated within the farm fields will be avoided and tied into the projects surface water management system so that hydrology is maintained, and even improved over the current conditions. Wetland W-4 is jurisdictional to both the SFWMD and USACE, has been avoided, and will be enhanced to improve habitat and wading bird foraging functions. This wetland has been buffered from the development by the extension of the MEBSS and will be directly connected to adjacent off-site wetlands to the south of the project site. The two remaining wetlands (W-5 and W-6) are fallow farm fields which have developed wetland characteristics due to the past and ongoing farming and irrigation activities. The NRCS soil survey for Collier County shows that these two areas were underlain by non-hydric soils. It is believed that the lowering of elevation and the higher water table maintained by ongoing irrigation activities associated with the past row crop agriculture have established and maintained wetland hydrology, thus these wetlands demonstrate wetland characteristics as a result of irrigation activities. It is unknown whether or not they would retain wetland characteristics if the irrigation activities were stopped and the perimeter berms and ditches removed. The majority of these two areas will be incorporated into the extension of the MEBSS (i.e. converted from wetland to open water shallow and deeper areas with fringing wetlands) while the remainder will be incorporated into the development footprint. The on-site OSWs (agricultural irrigation field ditches isolated from the wetlands to the south by a perimeter berm and rim ditch system) will be replaced by the lakes and spreader swale associated with the proposed surface water management system.

The extension of the MEBSS will provide a buffer between the development and the off-site adjacent wetlands to the south. The MEBSS will also help to restore sheet flow into those southern wetlands in contrast to the current point source outfalls associated with the throw-out pumping. This should serve to help restore a more natural hydrology to the off-site wetlands.

Avoidance During Construction

During construction, appropriate best management practices will be employed to help protect water quality and minimize the discharge of sediments and/or turbid water from the project site into both the on-site and off-site wetlands. The specific erosion/sediment/turbidity control methods and devices used will generally conform to applicable standards and criteria set forth in the "FDER Florida Development Manual," Sections 6-301 through 6-500 (FDER, 1988. "The Florida Development Manual: A Guide to Sound Land and Water Management," Chapter 6: "Storm Water and Erosion Control Best Management Practices for Developing Areas; Guidelines for Using Erosion and Sediment Control Practices," ES BMP 1.01-1.67. FDER, Tallahassee, FL.). These methods will also typically conform to applicable standards and guidelines set forth in the "Florida Stormwater, Erosion, and Sedimentation Control Inspector's Manual" (FDEP, 2002).

The boundaries of all the wetland areas adjacent to the construction activities will be delineated with silt fencing in order to clearly identify the wetland areas and to protect them from inadvertent impacts or encroachment by the machinery during project construction.

5. WETLAND MITIGATION PROGRAM

The Estancia project has proposed to establish on-site preserve areas to compensate for wetland impacts associated with the conversion from an irrigated agricultural operation, including some physically isolated low functioning wetlands to residential development. The Mitigation Plan provided herein, outlines the creation, restoration, and enhancement activities proposed within the preserve areas as well as within other retained (undisturbed) lands associated with the project. It also outlines the monitoring efforts that will be done to track and document the success of the creation and restoration efforts. A summary of the wetland and upland activities are outlined below.

Development of the Estancia project will permanently impact two of the existing low quality farm field wetlands located within the property boundary. Wetland mitigation will be required for the impacts associated with these two areas and is currently proposed through on-site preservation, creation, and enhancement activities. In addition, some temporary wetland impacts will be associated with the wading bird foraging improvements and wetland enhancement activities. This section outlines the proposed enhancement activities and identifies the temporary impacts which may be associated with the proposed enhancement activities. The proposed Conservation Areas will encompass a total of 37.4 acres. No mitigation is proposed for impacts to existing on-site other surface waters within the Estancia and Oyster Harbor project areas since these are all man-made agricultural irrigation ditches enclosed by a perimeter berm and rim ditch system that are actively used as part of the existing agricultural surface water/storm water management system and since construction of the development's surface water management lakes will more than compensate for the loss of such surface waters.

Conducting the enhancement program will result in temporary impacts (excavation, limited fill, mechanized clearing) to all of wetland area W-4. These impacts will primarily result from clearing and grading activities necessary to establish appropriate grades for the wading bird foraging. No mitigation is proposed for these "impacts" since they are a critical component of the proposed foraging enhancement and since the affected wetland areas will still be viable and enhanced wetlands following the "impacts". Conducting the enhancement program will also result in impacts to one existing other surface water feature (remnant agricultural ditch) located around W-4. The ditch will be filled (graded) in order to restore the affected area to a wetland. No mitigation is proposed for this "impact" since it is an important component of the enhancement program and because the ditch will be converted to a wetland.

Minimal temporary impacts to the remaining wetland areas may be associated with the removal of the agricultural berms and dense exotic vegetation along the perimeters of these wetland areas. Any such impacts associated with the fill or vegetation removal will be re-graded to match the adjacent wetland elevations and immediately planted with appropriate native vegetation. This section describes key components of the wetland enhancement program.

5.1 MITIGATION / ENHANCEMENT ACTIVITY CATEGORIES (TYPES)

Table 6 lists the anticipated or target vegetation associations (FLUCFCS categories; habitat types) that will be present in the preserve areas following successful completion of the enhancement program. The following paragraphs provide brief descriptions for each of the restoration, creation, or enhancement activities within the four wetland areas.

Wetland 1 (W-1)

Wetland Forest Enhancement (619/433 area)

This wetland presently consists of a depressionnal mixed hardwood forest with a mixture of pond apple, pop ash, cypress, and several other species. The wetland has a severe exotic infestation (50-75% cover by exotics, mainly Brazilian pepper) but patches of desirable native plant cover remain, primarily in the canopy stratum. This wetland will be enhanced by eradicating the exotic and nuisance plants. Such vegetation will be eradicated by a combination of selective mechanized clearing and removal of exotics where infestation levels dictate such treatment and through non-mechanized procedures. Desirable native canopy and, to a lesser degree, sub-canopy species will be retained where feasible during this process. Large "gaps" (e.g. areas greater than approximately 1,000 square feet which effectively have no remaining native canopy and sub-canopy vegetation due to the exotic eradication efforts or previously existing disturbances) will be re-planted with native wetland canopy, sub-canopy, and ground cover species to restore native wetland forest

communities in these zones.

Grading (740 and OSW areas)

The perimeter berm which surrounds this wetland will be removed along the east, south, and western boundaries. This will allow the wetland hydrology to be directly tied into the MEBSS which will be constructed along the southern edge of the wetland. The berm along the northern boundary of the wetland will be cleaned up of the exotic infestation and restored to the parameters required by the stormwater management guidelines.

Wetland 2 (W-2)

Wetland Forest Enhancement (621/619 area)

This wetland presently consists of a depressional cypress forest with a scattering of pond apple, maple, holly, and several other species. The wetland has a moderate exotic infestation (25-50% cover by exotics, mainly Brazilian pepper) but good patches of desirable native plant cover remain in all strata. This wetland will also be enhanced by eradicating the exotic and nuisance plants. Exotic vegetation will be eradicated through non-mechanized procedures for this are within the wetland as trying to get mechanized equipment into the area would cause undue damage to the existing viable vegetation. Given the current conditions and presence of desirable vegetation in all strata, it is not anticipated that any plantings will be required within this portion of W-2.

Wetland Scrub Enhancement (619/618 area)

The existing willow marsh area occurring around the depressional cypress area has been severely infested by Brazilian pepper (75-100% coverage). This area will be enhanced through the eradication of exotic and nuisance plant species using a combination of selective mechanized and non-mechanized removal. This area will be re-planted to a combination of wet prairie and scrub-shrub wetland with Carolina willow and wax myrtle shrubs established amongst appropriate ground covers.

Grading (740 and OSW areas)

The perimeter berm which completely surrounds this wetland will be removed and portions outside of the development area will either be graded to match the adjacent wetland elevations or to match the adjacent upland buffer elevations. The graded areas will be planted with appropriate upland or wetland native vegetation depending on the final elevations established.

Wetland 3 (W-3)

Wetland Forest Enhancement (619 area)

This wetland presently consists of a depressional scrub forest with a scattering of remnant cypress and other tree species. The wetland has a severe exotic infestation (75-100% cover by exotics, mainly Brazilian pepper) and very few patches of desirable native plant cover remain in any of the strata. This wetland will be enhanced by eradicating the exotic and nuisance plants. Exotic vegetation will be eradicated primarily through mechanized procedures. A mix of canopy, mid-story, and groundcover vegetation will be planted within the open areas to create a mixed forest central habitat surrounded by a scrub / prairie perimeter.

Wetland Scrub Enhancement (619/433 area)

The existing berm and perimeter area occurring around the depressional center has been completely infested by Brazilian pepper (90-100% coverage). This area will be enhanced through the eradication of exotic and nuisance plant species using predominately mechanized removal. This area will be re-planted to a combination of wet prairie and scrub-shrub wetland with Carolina willow and wax myrtle shrubs established amongst appropriate ground covers.

Grading (740 and OSW areas)

The perimeter berm which completely surrounds this wetland will be removed and portions outside of the development area will either be graded to match the adjacent wetland elevations or to match the adjacent upland buffer elevations. The southern boundary of the wetland will be tied into the littoral shelf and plantings associated with the storm water system lake so that the hydrology of the wetland is augmented

by the surface water management system. The graded areas will be planted with appropriate upland or wetland native vegetation depending on the final elevations established.

Wetland 4 (W-4)

Wetland Marsh and Prairie Restoration (216H area)

This wetland area has been completely impacted by past farming activities and is currently overrun with exotic paragrass. The existing wetland area is 5.1 acres in size but will be expanded to 7.2 acres with the filling of the ditch and grading of the perimeter berm around the wetland. This area will be mechanically cleared and grubbed thereby eradicating the existing exotics. It will then be graded in accordance with grading plans to create a mixed marsh and prairie habitat. The marsh depressions will allow for forage fish concentrations early in the dry season which will provide enhanced foraging opportunities for wood storks and other wading birds. Sandhill cranes and snail kites may also utilize this area for foraging once the enhancements are completed. The area will be graded to form depressions and low areas that largely support an herbaceous freshwater marsh community with some fringe areas designed to support more of an herbaceous wet prairie community.

Grading (740 and OSW areas)

During this process, wetlands will be created from the upland berm around the southern side of the wetland and wetlands will be restored from the filling of the ditch (other surface water) up to the adjacent wetland grades. Following completion of grading efforts, the shallow portions of the enhancement area will be completely planted with appropriate native herbaceous wetland species. The deeper portions of this area will remain unplanted so that foraging availability is not impacted by competing vegetation.

5.2 ADDITIONAL COMPONENTS OF MITIGATION / ENHANCEMENT PROGRAM

In addition to the mitigation and enhancement activity types and features described above, the wetland protection program will have several other facets. These are discussed in the following paragraphs.

Hydrologic Enhancement of Wetlands:

An important component of the wetland enhancement program is improvement of hydrologic conditions (hydrology and hydroperiod) within the preserve wetlands. Currently the water table in row crop fields adjacent to the wetlands is lowered (i.e. fields are de-watered) by pumping water out of field rim ditches and lateral ditches. This water is discharged via throwout pumps off of the site into the adjacent lands. This practice severely disrupts the normal wetland hydroperiod. For example, when the water table is already high in the wetlands the pump discharges can rapidly raise the water table above normal seasonal high water elevations. During the dry season when wetland water table elevations would typically be decreasing and the water table would be below the soil surface, pump discharges can inundate areas that would normally be dry and artificially raise the water table. Once the development has been completed, agricultural pumping of water into and out of the property will be permanently ceased. This will help restore stable hydroperiods that are more typical of natural wetland conditions and prevent artificial over-inundation or drainage of the on-site wetlands. Cessation of agricultural water discharges into the wetlands will also improve water quality in these wetlands. The pumped discharges contain nutrients (from fertilizers) and some pesticides used in the row crop fields since there is no significant treatment of this water prior to pumping.

The existing agricultural irrigation ditches and berms that surround the wetlands block sheetflow and interchange of surface waters. Removal of the berms and ditches via the proposed grading activities will allow for the wetlands (W-1, W-2, & W-3) to be connected to the proposed surface water management system and will help to restore a more normal hydrologic pattern to the wetlands.

The proposed grading activities within W-4 will further improve the hydroperiod as regards maintaining adequate wetland hydrology simply through the process of lowering the existing grade. As discussed, there are strong indications that most of existing wetland W-4 situated south of the current agricultural perimeter berm and rim

ditch was historically not wetlands. It is suspected that current wetland characteristics in these areas are a result of the past farming and current agricultural pumping. With this pumping ceased as the agricultural program is phased out, the hydrology could be inadequate to support hydrology/hydroperiod that meets wetland criteria. The proposed grading plan will lower the existing grade to mimic natural topographic elevations found in wetlands immediately south of the project site. This will allow the natural water table, combined with inputs from direct rainfall and sheetflow, to support adequate wetland hydrology and ensure this area is indeed maintained as wetlands without the need for artificial pumping. The grading design will generate a varied topography where lower elevation zones will be inundated for several months while higher elevation zones will be inundated for a few weeks at a time during the peak of the wet season.

Protection of Wetlands and Uplands via Conservation Easements:

All four of the wetland areas will be placed under appropriate conservation easements which will protect the future integrity of the created, restored, and enhanced wetlands and will ensure these areas are preserved and protected in perpetuity.

Wetland and Upland Enhancement via Maintenance Eradication of Exotic and Nuisance Plants:

The preserve areas will be maintained as needed to ensure that the areas remain free from exotic/invasive plant species to the extent that exotic and nuisance plant species will each constitute no more than 5% of the total plant cover in the interim between maintenance events. Exotic/invasive plant species will include Category I and Category II species identified in the current "Invasive Plant List" published by the Florida Exotic Pest Plant Council (FLEPPC) as well as Class I and Class II Prohibited Aquatic Plants listed in Chapter 62C-52.011, Florida Administrative Code. Nuisance plant species will include native species deemed detrimental due to their potential adverse competition with desirable native species. Examples of potential nuisance plant species include: dog-fennel (*Eupatorium spp.*), ragweed (*Ambrosia spp.*), cattail (*Typha spp.*), grapevine (*Vitis spp.*), wild balsam apple (*Momordica charantia*), climbing hempvine (*Mikania scandens*, *M. micrantha*), pepper vine (*Ampelopsis arborea*), and love vine (*Cassytha filiformis*).

Visual inspection for exotic, non-native and nuisance plant invasion will be conducted annually and all exotic, non-native and nuisance vegetation including those defined by County codes and the Florida Exotic Pest Plant Council, found within the preserve areas will be flagged, mapped and reported for treatment. Felled material will be removed from the preserve areas where possible or killed in place where removal would cause unacceptable damage to the surrounding native areas. Any stumps remaining after the exotic, non-native and nuisance removal will be treated with a U.S. EPA approved herbicide and visible tracer dye to prevent regeneration from the roots. These maintenance activities will be performed as needed until success criteria are met (see Section 6 below).

Preserve Delineation:

Preserves will be clearly delineated with appropriate signage both during and after construction activities. Protective barricades will be used to cordon off construction areas and keep construction equipment out of preserve areas. A double row of silt fence will be used along preserve areas to separate them from the construction activities. The silt fence will remain in place until the perimeter berm is installed around the area of excavation. Appropriate signage will be placed along the perimeter of the preserves at 100 to 150 foot spacing.

5.3 GENERAL MITIGATION SPECIFICATIONS

The proposed mitigation program will require exotic and nuisance plant eradication activities, grading activities, and planting activities as previously noted. The following paragraphs provide additional information and specifications regarding these activities.

Exotic & Nuisance Vegetation Eradication:

The previously noted eradication methods will be employed throughout the proposed wetland preserves. They may

include physical removal of exotics and/or directed herbicide applications as dictated by the specific conditions and species encountered. Initial exotic and nuisance plant eradication efforts will involve a combination of methods including directed herbicide applications and cutting down exotics with subsequent application of herbicides to the stumps. Mechanized exotic clearing methods will be employed in portions of the wetland areas, especially along the perimeters of these areas where exotic infestations are the densest. Such methods involve the use of heavy machinery such as excavators, hydroaxes, gyro-tracs, etc. to fell and remove exotic vegetation from areas where said vegetation has replaced the native plant community. In areas to be graded, exotic and nuisance vegetation will also be physically removed using heavy machinery during the clearing, grubbing, and grading process. Non-mechanized exotic and nuisance plant eradication methods will be employed in other areas. Such methods include the use of hand implements such as chainsaws and machetes to cut down exotic vegetation with follow-up applications of herbicides as well as directed herbicide applications alone.

During the initial exotic/nuisance vegetation eradication process, felled materials will be generally removed from the preserve areas. Some felled woody plants may be stacked or chipped on-site, however chipping will be avoided unless deemed necessary to best preserve desirable vegetation and provide for re-growth of desirable plants. Where (and if) chipping is employed, chips will be segregated into a limited number of scattered piles rather than spreading the chips. Stacking, if employed will be done into segregated piles placed at least 100 feet on center from each other.

Following initial eradication process, subsequent maintenance events will commonly employ non-mechanized exotic and nuisance plant eradication methods. These methods may include directed herbicide applications and/or physical removal of exotics.

Clearing & Grading Activities:

The mitigation program includes grading activities that will affect certain existing wetland and perimeter berm areas around wetlands W-1, W-2, and W-3. Grading will affect all of wetland W-4 as well as the perimeter berm and ditch surrounding it. The process will involve mechanized clearing and grubbing of the areas to be graded followed by the actual grading work. Cleared vegetation will be removed from the preserve areas for disposal either within portions of the property to be developed or via a duly licensed off-site disposal facility. It is anticipated that excess soil excavated during the grading process will be removed from the preserve areas and used as fill in areas to be developed.

Prior to the clearing, grubbing, and grading activities, the exact limits of zones requiring complete clearing and grading will be determined in the field and will be marked with protective barriers such as flagging, ropes, silt fence, enviro-fence, or a combination of such items. These marker barriers will remain in place until grading activities are completed. Prior to initiation of the clearing and grading activities, silt fences will also be installed at appropriate locations adjacent to existing wetlands to control erosion and sediment transport. These erosion/sediment control devices will remain in place until grading activities are completed and the graded areas are stabilized. Machinery/vehicle ingress and egress routes to the areas requiring grading will be restricted to avoid unnecessary damage to upland and wetland areas both within the boundaries of the wetland areas and to areas situated outside the property boundary.

Planting Specifications:

Certain enhancement activities may require planting native vegetation. The Tables below provide a potential list of species which may be employed when planting wetland forest, scrub, marsh, and prairie areas. The final determination of plant species to install may vary from these tables depending on site conditions and the species availability. Specifications for planting enhancement activity are as follows:

Wetland Forest ---- Canopy species will be planted on 25-foot centers (average). Canopy species will be minimum 3 gallon stock with a minimum height of 4 feet. Sub-canopy species will be planted on 20-foot centers (average) using minimum 3-gallon stock. Ground cover species will be planted on 4-foot centers (average) using minimum bare-root or liner stock. Planting configurations will vary, likely employing uniform spacing and scattered groups or clusters.

Wetland Scrub ---- Sub-canopy (shrub) species will be planted on 15-foot centers (average) using minimum 3-gallon stock. Ground cover species will be planted on maximum 3-foot centers (average) using minimum bare-root or liner stock. The shrubs and herbaceous species will typically be planted in staggered rows and clusters. A total of at least 1 tree for every 20 shrubs will also be installed using minimum 3-gallon stock with a minimum height of 4 feet. These trees will be planted within that portion of the scrub areas where the elevations are lowest. Trees will generally be planted in scattered groups with varied spacing.

CYPRESS and SHRUB PLANTING AREAS		
Canopy	Mid-story	Ground Cover
Cypress (<i>Taxodium distichum</i>)	Button Bush (<i>Cephalanthus occidentals</i>)	Sawgrass (<i>Cladium jamaicense</i>)
Red Maple (<i>Acer rubrum</i>)	Marlberry (<i>Ardisia escallonioides</i>)	St. John's Wort (<i>Hypericum spp.</i>)
Dahoon Holly (<i>Ilex cassine</i>)	Pond Apple (<i>Annona glabra</i>)	Swamp Fern (<i>Blechnum serrulatum</i>)
Laurel Oak (<i>Quercus laurifolia</i>)	Cocoplum (<i>Chrysobalanus icaco</i>)	Sand Cordgrass (<i>Spartina alterniflora</i>)
Pop Ash (<i>Fraxinus caroliniana</i>)	Wax Myrtle (<i>Myrica cerifera</i>)	Crinum Lily (<i>Crinum americanum</i>)

Wetland Marsh ---- Ground cover species will be planted on maximum 3-foot centers (average) using minimum bare-root or liner stock. They will typically be planted in staggered rows and in clusters.

Wetland Prairie ---- Appropriate ground cover species will be planted on maximum 3-foot centers (average) using minimum bare-root or liner stock. Portions prairie areas may be seeded with native ground cover species in cases where this treatment will better attain the vegetative cover goal. Only areas lacking the required minimum viable ground cover following completion of initial exotic eradication efforts will need to be planted. Such areas and their associated planting requirements will be determined in the field.

MARSH and PRAIRIE AREAS		
<u>Zone 1:</u> ≥ project control elevation	<u>Zone 2:</u> ≤ 1' below control elevation	<u>Zone 3:</u> 1' to 2' below control elevation
Sand Cordgrass (<i>Spartina alterniflora</i>)	Bacopa (<i>Bacopa caroliniana</i>)	Duck Potato (<i>Sagittaria latifolia</i>)
Wiregrass (<i>Aristida spp.</i>)	Beak Rush (<i>Rhynchospora spp</i>)	Bulrush (<i>Schoenoplectus californicus</i>)
Yellow-eyed Grass (<i>Xyris spp.</i>)	Iris (<i>Iris virginica</i>)	Spike Rush (<i>Eleocharis spp.</i>)
Swamp Fern (<i>Blechnum serrulatum</i>)	Alligator Flag (<i>Thalia geniculata</i>)	Alligator Flag (<i>Thalia geniculata</i>)
Crinum Lily (<i>Crinum americanum</i>)	Pickrelweed (<i>Pontedaria cordata</i>)	Pickrelweed (<i>Pontedaria cordata</i>)
Sawgrass (<i>Cladium jamaicense</i>)	Canna Lily (<i>Canna generalis</i>)	Creeping Primrosewillow (<i>Ludwigia repens</i>)
Red root (<i>Lachnanthes caroliniana</i>)	Sand Cordgrass (<i>Spartina alterniflora</i>)	
St. John's Wort (<i>Hypericum spp.</i>)	Duck Potato (<i>Sagittaria latifolia</i>)	

	Maidencane (<i>Panicum hemitomon</i>)	
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These lists are not all inclusive and alternative appropriate native vegetation may be used.

5.4 ANTICIPATED ENHANCEMENT PROGRAM SCHEDULE

The approach employed during the initial phases of the proposed enhancement activities will be somewhat atypical. It is common to begin re-planting activities as soon as feasible following completion of initial exotic eradication activities and initial clearing and grading activities. This will not be the case for the proposed enhancement program. Instead, the initial plantings necessary will not be conducted until near the beginning of the wet season of the next year following completion of the initial exotic/nuisance plant eradication activities and completion of the clearing and grading activities (i.e. 12+ months may elapse between completion of initial exotic/nuisance eradication and grading activities and installation of initial plantings needed).

There are two main reasons for taking this approach. The primary reason is that it will allow very intensive exotic and nuisance plant eradication activities to occur during the year prior to planting without fear of killing planted species. This is especially important in W-4 where the eradication of the paragrass is expected to take several treatments. The first growing season following initial eradication efforts and particularly clearing/grading activities is often a time of rapid colonization of treated areas by ruderal species (both desirable native species and especially nuisance species) as well as re-growth of exotics not fully killed and sprouting of exotics from seed sources and propagules. Too often the intensity of follow-up exotic and nuisance plant eradication required during this first year results in inadvertent damage to planted species. Competition by nuisance and exotic species can also hinder growth of planted species, particularly planted ground cover. Another reason for this approach is that it will allow time for some initial colonization of treated areas by desirable native plant species. The establishment of these pioneer native species can reduce the quantity of plantings needed somewhat and the established desirable species can help serve as a guide to appropriate species to utilize for the plantings that are necessary.

All of the mitigation activities associated with the wetland restoration, creation, and enhancement will be conducted concurrently with the development construction. No phasing is proposed.

Using this approach, a preliminary estimation of the schedule key milestone activities involved in the enhancement program is as follows:

Milestones	Approximate Date
All necessary permits for site development acquired.	July 2016
Begin initial exotic/nuisance eradication and clearing & grading activities.	January 2017
Complete initial exotic/nuisance eradication and clearing/grading activities.	March 2017
Intensive follow-up exotic/nuisance plant eradication activities prior to initial plantings.	March 2017 – June 2018
Install initial plantings.	June – July 2018
Time Zero monitoring (actual monitoring activities prior to report submittal).	August 2018
Routine management/maintenance activities	April – May every subsequent year
Annual monitoring (actual monitoring activities, 5-year period)	September 2018-2023

6. WETLAND MITIGATION PROGRAM SUCCESS CRITERIA

Success criteria for the Estancia wetland mitigation program are described in the following paragraphs.

1. Record Conservation Easement(s).
2. Complete initial eradication of exotic/invasive and nuisance plant species. Exotic/invasive plant species will include Category I and Category II species identified in the current "Invasive Plant List" published by the Florida Exotic Pest Plant Council (FLEPPC) as well as Class I and Class II Prohibited Aquatic Plants listed in Chapter 62C-52.011, Florida Administrative Code. Nuisance plant species will include native species deemed detrimental due to their potential adverse competition with desirable native species. Examples of potential nuisance plant species include: dog-fennel (*Eupatorium spp.*), ragweed (*Ambrosia spp.*), cattail (*Typha spp.*), grapevine (*Vitis spp.*), wild balsam apple (*Momordica charantia*), climbing hempvine (*Mikania scandens*, *M. micrantha*), pepper vine (*Ampelopsis arborea*), and love vine (*Cassytha filiformis*).
3. Complete initial clearing, grubbing, and grading activities.
4. Maintain wetland preserve areas exotic free through intensive exotic removal maintenance follow-up treatments. Reduce exotic vegetation regeneration to less than 5% coverage.
5. Complete initial planting of native canopy, sub-canopy, and ground cover plant species.
6. Achieve a minimum average ground cover of 70% by planted ground cover species and/or naturally recruited native ground cover species. This criterion does not apply to the open marsh areas which will be left partially bare (40% to 60% coverage) to facilitate wading bird foraging opportunities.
7. Monitor preserve areas at least annually to track planting success and exotic and nuisance vegetation infestations.
8. Maintain all conservation areas such that the total vegetative cover accounted for by exotic and nuisance plants each constitute no more than 5% of the total plant cover.

7. WETLAND MONITORING PROGRAM

The permittee will submit monitoring reports to the SFWMD and USACE documenting general conditions in the Estancia preserve areas established for the project's wetland impact mitigation program. One "baseline", one "time zero", and five annual monitoring reports will be submitted.

The "baseline" monitoring report (with monitoring conducted prior to initiation of mitigation activities) will provide the following information:

1. Brief description of current conditions within the preserve area.
2. Brief description of anticipated maintenance/management work to be conducted over the next year.
3. A summary of rainfall data collected during the year preceding the monitoring report based on rainfall data recorded at an onsite station.
4. Photographs documenting conditions in the preserve areas at the time of monitoring. Photos will be taken at permanent photo stations within the on-site preserves. At least two photos will be taken at each station with the view of each photo always oriented in the same general direction from one year to the next.
5. Quantitative data collected from various habitat types documenting existing vegetation composition and wildlife utilization.

The "time zero" monitoring report (with monitoring conducted shortly after completion of all initial mitigation activities) and the five annual monitoring reports will provide the following information:

1. Brief description of maintenance and/or management and/or mitigation work performed since the previous monitoring report along with discussion of any other significant occurrences.
2. Brief description of anticipated maintenance/management work to be conducted over the next year.
3. A summary of rainfall data collected during the year preceding the monitoring report based on rainfall data recorded at an onsite station.
4. A summary of water table elevation data collected from the on-site piezometers or continuous recording water level gauges. Data (water table elevations) will be collected at least bi-weekly during the peak of the wet season (late July through mid-October).
5. Photographs documenting conditions in the preserve areas at the time of monitoring. Photos will be taken at permanent photo stations within the on-site preserves. At least two photos will be taken at each station with the view of each photo always oriented in the same general direction from one year to the next.
6. Quantitative data will be collected from mitigation/enhancement areas as outlined in the following paragraphs.

Wetland Forest Areas (FLUCFCS 618, 621)

To gather data concerning canopy and sub-canopy species, belt transects approximately 50 feet wide will be established. The location and length of these transects will be determined in the field and will be oriented to pass through planted areas. Data recorded within these transects will include: average percent survival of planted canopy and sub-canopy species (as necessary pursuant to success criteria); average density of native canopy and sub-canopy species, and; average percent cover by exotic and nuisance species in the canopy or sub-canopy strata. Large sampling plots may be substituted for belt transects to gather these data or the data may be collected using the point-centered quarter method or nearest neighbor method of sampling. Data from multiple transects, plots, or points will be averaged for reporting.

Data concerning ground cover species and nuisance and exotic plant species will be gathered from sampling quadrats. Quadrats will be established either along the axis of the belt transects, within the boundaries of large sampling plots, or at sampling points established for point-centered quarter/nearest neighbor measurements, depending on which sampling method is used for monitoring canopy and sub-canopy vegetation. Each sampling quadrat will be approximately 2 meters X 2 meters in size. Data recorded in each quadrat will include average percent cover by native ground cover species (both planted and naturally recruited species), average percent cover by exotic and nuisance species, and, as necessary pursuant to success criteria, average % survival of planted species. Data collected from individual quadrats will be averaged by transect for reporting.

Wetland Marsh and Prairie Areas (FLUCFCS 641 & 643)

A minimum of 3 quadrats will be established at roughly equal-spaced increments along each monitoring transect. Transect locations will be determined in the field to provide data best representing overall conditions in a particular marsh or wet prairie area. Each sampling quadrat will be approximately 2 meters X 2 meters in size. Data recorded in each quadrat will include average percent cover by native ground cover species (both planted and naturally recruited species), average percent cover by exotic and nuisance species, and, as necessary pursuant to success criteria, average % survival of planted species. Data collected from individual quadrats will be averaged by transect for reporting.

7. Other general observations made in various portions of the preserve area. These observations will address potential problem zones, general condition of native vegetation including planted species, wildlife utilization as observed during monitoring, and other pertinent factors.
8. A plan view drawing of the preserve area showing mitigation features, monitoring transects/sampling plots, photo stations, and piezometers/staff gage locations.
9. A summary assessment of all data and observations along with recommendations as to actions necessary to help meet mitigation and management/maintenance goals and mitigation success criteria.
10. A summary of all observed wildlife sightings and evidence of wildlife utilization.

In addition to the information described above, the time zero monitoring report will also provide "as built" drawings depicting the topography of those portions of the preserve where grading was conducted as part of the mitigation program.

The following provides the currently anticipated monitoring schedule for the Immokalee Sand Mine wetland mitigation program:

Monitoring Event Report	Report Submittal Date
Baseline Monitoring Report	Feb. 15, 2017
Time Zero Monitoring Report	Aug. 15, 2018
1 st Annual Monitoring Report	Oct. 15, 2019
2 nd Annual Monitoring Report	Oct. 15, 2020
3 rd Annual Monitoring Report	Oct. 15, 2021
4 th Annual Monitoring Report	Oct. 15, 2022
5 th Annual Monitoring Report	Oct. 15, 2023

The time zero report will be submitted following completion of the initial exotic eradication efforts, grading activities, and initial planting activities. This report will document initial conditions in the preserve area following the initial plantings and the number, size, and species of plants installed. It will also contain the information and data described above for annual reports along with exhibits depicting the graded areas. One should remember that the approach to mitigation will involve first conducting clearing, grubbing, and grading activities along with initial exotic eradication activities. Then a period of roughly one year will elapse during which time mitigation activities will focus on further intensive exotic and nuisance plant eradication and control. The majority of initial plantings will not be installed until near the beginning of the first wet season that follows. Thus, the time span beginning when the initial mitigation activities are first started (initial exotic eradication, initial grading) and ending when these initial activities are completed (time of initial plantings) could encompass 18 months or more. The time zero monitoring will not be conducted until after initial plantings have been completed.

Subsequent annual monitoring reports will be submitted over a period of five consecutive years following submittal of the time zero report. These annual reports will contain the monitoring information described and will focus on changes from the conditions documented in the preceding monitoring report, and attainment of success criteria. The permittee will notify the FDEP and USACE if alterations to the anticipated monitoring schedule become necessary.

The permittee shall retain the ability to modify this monitoring program should it become necessary to make the program consistent with monitoring requirements of any government agencies or to improve the information provided by the monitoring program.

8. PRESERVE AREAS MAINTENANCE PROGRAM

The Estancia preserve areas, which encompass the existing wetlands on the project site, will be maintained to suppress infestation by exotic/invasive and nuisance plant species. Maintenance/management actions will be conducted as required to meet the enhancement success criteria previously described. These areas will be maintained in perpetuity such that exotic and nuisance plant infestations do not exceed the maximum allowed by the original success criteria.

After initial eradication efforts are complete, follow-up exotic and nuisance plant control will include directed herbicide applications and/or physical removal methods throughout all portions of the preserve areas. Exotic/nuisance plant control is likely to occur on at least a semi-annual basis for the first three years following completion of initial eradication efforts. Such maintenance events may be conducted more frequently if field observations indicate the need. At the end of this period, the frequency of activities necessary to adequately control nuisance and exotic plants will be re-assessed and a program developed for future maintenance. At a minimum there will be at least one exotic/nuisance plant control event per year.

Follow-up plantings of previously planted areas will be conducted as necessary when and where survivorship, density, and/or percent cover goals are not achieved. The need for such re-plantings will typically be assessed on an annual basis. Management/maintenance activities may include removal of dead, dying, or diseased plants (both planted and existing plants) as deemed necessary.

A qualified biologist or similar environmental professional will initially inspect the conservation areas at least once a year. During the first few years inspections will likely occur more frequently in an effort to rectify any potential problem situations (e.g., exotic/nuisance plant infestations, mortality of planted species, etc.) before they worsen. The necessary maintenance activities will be determined by the biologist during these inspections. Future inspections may be modified to a two or three year time period if preserves are shown to be maintaining success criteria without intervention.

Following completion of the mitigation monitoring program, the preserve area will be maintained such that the total vegetative cover accounted for by exotic and nuisance plants each constitute no more than 5% of total plant cover.

9. FINANCIAL RESPONSIBILITY FOR THE WETLAND MITIGATION PROGRAM

Table 10 of Appendix A provides the estimated costs of the proposed wetland mitigation program, including estimated costs for initial mitigation/enhancement activities, for maintenance exotic and nuisance plant eradication (control) activities during the monitoring period, and for mitigation monitoring activities. The total estimated cost for this program is \$246,395 while the total estimated cost plus an additional ten percent is \$271,035.

The permittee will provide SFWMD with a performance bond, an irrevocable letter of credit, or other form of surety acceptable to the District in order to establish a financial responsibility mechanism for the mitigation program pursuant to applicable sub-sections within Section 4.3.7 of the BOR. The amount of financial responsibility ensured through this mechanism would be \$271,035 (total estimated mitigation cost plus 10%).

As the mitigation activities are concluded, the permittee will request SFWMD to release portions of this bond in amounts applicable to the portion of mitigation, maintenance, and/or monitoring successfully completed. Appropriate documentation would be provided with these written requests pursuant to Section 4.3.7.7.1 of the BOR.

Long term maintenance will become the responsibility of the Community Development District (CDD) which is a taxing authority with the ability to levy funds for undertaking the maintenance of the preserve areas.

10. BASIS OF WETLAND MITIGATION PROGRAM AS ADEQUATE COMPENSATION FOR PROPOSED WETLAND IMPACTS

The wetland mitigation program proposed involves various wetland restoration and enhancement activities within the Estancia conservation areas (wetland preserves). As demonstrated through UMAM calculations/analyses, it is anticipated that this mitigation program will compensate for the project's proposed impacts.

UMAM forms (e.g. Part 1 and Part 2 forms) for existing conditions in wetlands W-5 and W-6 that will be impacted by the proposed project are provided in Appendix D. UMAM forms for the proposed conditions in the preserved wetlands are also provided in Appendix D. UMAM net functional gain calculations or "functional lift" that will be derived from the proposed enhancement program as calculated using state (SFWMD) and federal (USACE) mitigation time lag factors are also contained in Appendix D.

The two tables that follow summarize the results of the UMAM calculations provided in Appendix D. As can be seen in these tables, the proposed mitigation program will generate a total net functional gain that compensates for the functional loss that will result from the project's proposed impacts to USACE jurisdictional wetlands (total functional loss = 7.91; total net functional gain = 8.57; gain exceeds loss by 0.66 wetland functional units).

Table A. Wetland functional loss resulting from proposed wetland impacts

Wetland Impacted	UMAM Score	Impact Acres	UMAM Functional Loss
W-5	0.20	26.52	5.30
W-6	0.20	13.04	2.61
Totals for Wetland Impacts		39.56	7.91

Table B. Total net functional gain anticipated from the proposed wetland enhancement program: calculations using USACE mitigation time lag factors.

Wetland ID	FLUCFCS Code	FLUCFCS Description	Acres Preserved, Created or Retained	Functional Score (existing)	Functional Score (with project)	Functional Delta	Net Functional Gain
W-1	616 (E3)	Pop Ash and Pond Apple	11.01	0.33	0.57	0.24	2.04
	740	Agricultural Berm	3.27	0.00	0.43	0.43	1.41
	OSW	Agricultural Ditches	0.45	0.00	0.43	0.43	0.19
W-2	618 (E4)	Willow and Brazilian Pepper	5.91	0.27	0.57	0.30	1.77
	621 (E2)	Cypress	8.11	0.37	0.60	0.23	1.86
	740	Agricultural Berm	2.17	0.00	0.43	0.43	0.93
	OSW	Agricultural Ditches	0.29	0.00	0.43	0.43	0.12
W-3	618 (E4)	Willow and Brazilian Pepper	5.11	0.27	0.57	0.30	1.53
	740	Agricultural Berm	0.95	0.00	0.43	0.43	0.41
	OSW	Agricultural Ditches	0.14	0.00	0.43	0.43	0.06
W-4	216H	Fallow Ag Lands (Hydric)	5.06	0.20	0.67	0.47	2.38
	OSW	Agricultural Berm	1.59	0.0	0.67	0.67	1.06
	740	Agricultural Ditches	0.55	0.0	0.67	0.67	0.37
							13.751
				6 yrs	Time Lag	1.0696	
					Risk	1.50	
TOTALS			44.6				8.57

It is clear from the UMAM calculations that the proposed wetland enhancement program will compensate for the project's impacts to jurisdictional wetlands associated with the development activities. There will be no net loss of wetland functions/values. Instead, there will be a net increase in wetland functions/values following successful completion of the mitigation and enhancement program.

The applicant does not propose any mitigation for the project's anticipated impacts to jurisdictional other surface waters (OSWs). All of the on-site OSWs that will be impacted are man-made irrigation ditches that are actively used and managed as part of the existing agricultural operation's surface water management system. The lakes and MEBSS that will remain on-site following completion of the development will constitute "new" OSWs encompassing a total of approximately 76 acres. These lakes will more than compensate for the proposed impacts to the existing irrigation ditches.

USACE Mitigation Plan (33 CFR 332.4(c) (2) – (14))

The USACE, when looking at unavoidable wetland impacts, uses the following criteria to determine whether or not mitigation is suitable for the impacts proposed. As described, the project proposes direct permanent wetland impacts and therefore is subject to this review. These criteria as well as the project's compliance with such have been provided to give the USACE the assurances that the project will not result in any loss to wetland resources or functions.

- Objectives. The proposed project is occurring on a site which has been heavily impacted by past row crop farming activities. The proposed development does impact two fallow farm fields which have developed wetland vegetation as a result of irrigation activities and according to the USACE are waters of the U.S based on their proximity to other jurisdictional wetlands. However, these wetlands are very low functioning wetlands and their long term viability is questionable. A wetland enhancement program is proposed (described earlier in this report) which will improve the long term viability prospect of the remaining on-site wetlands as well as provide increased functional value and wading bird foraging values to the local watershed.

- Site selection. The mitigation sites were selected because of they are onsite and provide excellent opportunities to enhance the wetland functions and services of the mitigation areas.

- Site protection instrument. As described above, the wetland preserve areas will be protected via recorded conservation easements.

- Baseline information. This has been provided above in Sections 2 and 3 of this report as well as in Appendix B attached. Additional information on the mitigation sites baseline information is provided in the UMAM analysis Qualitative sheets in Appendix D.

- Determination of credits. As described in Section 10 of this analysis, 7.91 credits will be lost as a result of the proposed wetland impacts. The proposed mitigation / enhancement activities result in a functional lift of 8.57 credits associated with the project which is sufficient to compensate for these permanent impacts. The UMAM analysis provided in Appendix D supports this determination. The appropriate USACE time lag factors have been included in the calculations to account for temporal loss.

- Mitigation work plan. A detailed summary of the proposed wetland mitigation and enhancement program has been provided in Sections 5 of this report.

- Maintenance plan. A description and schedule of the proposed mitigation enhancement activities as well as the long term maintenance commitment has been provided in Sections 7 and 8 of this report.

- Performance standards. Success criteria for the enhancement activities tied to exotic removal, regeneration, and planting success associated with the proposed mitigation enhancement activities have been provided in Section 6.

- Monitoring requirements. Monitoring of the mitigation enhancement success will be conducted annually for the first 5 years and then as needed to make sure the efforts remain successful. The details of this monitoring are outlined in Section 7 of this report.
- Long-term management plan. Section 8 of this report outlines the maintenance program anticipated for the wetland areas.
- Adaptive management plan. Unexpected changes to the wetland areas or the mitigation enhancement activities could result in mitigation deficits on the project. Future issues will be addressed as needed in conjunction with the long-term monitoring program outlined in Section 7 of this report.
- Financial assurances. Financial assurances for the mitigation activities are addressed in Section 9 of this report.

11. CUMULATIVE IMPACTS ANALYSIS

Development of the Estancia and Oyster Harbor East projects will not result in any permanent loss to wetland functions within the drainage basin. Though the Estancia project will impact jurisdictional wetlands, all of the wetlands on the project site are isolated by a perimeter berm and rim ditch system as well as being substantially degraded by exotic vegetation infestation and subject to hydrological extremes. The proposed wetland mitigation and enhancement program will improve significantly the functions and services of wetland habitats located within and adjacent to the project boundaries. The functional lift or net functional gain anticipated from the wetland enhancement program will offset the existing wetland functions and services that will be impacted on the site. Thus, there will be no net loss of wetland functions (functional values) as a result of the proposed project. Instead, the proposed project coupled with its wetland protection and enhancement program should ultimately increase total wetland functional value in the immediate project area in the long term.

The wetlands involved in the enhancement program are all located within the West Collier watershed (drainage basin) according to SFWMD. Since the proposed project will increase wetland functional values within the immediate area of the project site, there should be no adverse cumulative impacts upon wetlands and other surface waters within the drainage basin.

The proposed project should not adversely affect the quality of receiving waters located in the drainage basin. Appropriate best management practices employed during project construction and operation will ensure protection of off-site water quality. The project's stormwater management system has been designed to provide water quality treatment and attenuation that meets applicable BOR design standards/criteria. Because of this, discharges from the project's lakes following development should not adversely impact water quality in off-site wetlands or OSWs.

The proposed development is consistent in character with other ongoing and past development of the area. The proposed development continues the development of degraded wetlands and preservation of high functioning wetlands to the south of the project in accordance with the area DRI. The Western Collier drainage basin is extensive and contains several areas where future development is either already permitted or is anticipated. It is assumed that other development projects in the basin seeking to impact wetlands similar to those on the property will typically provide mitigation for these impacts in the same basin. It can also be reasonably assumed that this mitigation will fully compensate for the wetland functions lost via proposed impacts and that the projects will adequately protect regional water quality, otherwise the projects would not receive necessary permits. The impacts of these other projects should therefore not cause unacceptable cumulative impacts upon wetlands and OSWs in the Western Collier watershed.

12. PUBLIC INTEREST ANALYSIS

The SFWMD requests that applicants for ERPs address certain topics to help determine whether a project is or is not contrary to the public interest, primarily regarding project activities in wetlands and other surface waters. The following sub-sections identify the public interest test topics identified by the state and address each topic as it specifically relates to the Estancia and Oyster Harbor East projects.

Public Health, Safety, or Welfare or the Property of Others

The projects have been designed to meet applicable county, state and federal regulations. Therefore, the proposed projects will not be contrary to the public health, safety and welfare. The projects will not affect any areas classified for shellfish harvesting as there are no such areas present in or near the project. Development should not cause flooding of off-site properties since the surface water management system has been designed in accordance with SFWMD criteria. In fact, the proposed project may actually help reduce flood stages slightly in the immediate vicinity through the increased surface water storage capacity that will be realized upon completion of the project lakes and MEBSS extension.

Fish and Wildlife and Their Habitats

Wildlife surveys have been conducted on the property to determine what species utilize the project lands property and what species have the potential to occur on the project lands. Several listed species have been observed on project lands during these surveys including American alligator, Florida Sandhill crane, wood stork, little blue heron, snowy egret, snail kite, and tricolored heron. Of these, only the alligator was considered to be a potential resident species and there were no indications that any of the listed birds ever nest on project lands.

Considering the adaptability of alligators to use created water management lakes, this project will not adversely affect the conservation of this species. Following completion of the project, lakes and their vegetated littoral zones will provide aquatic habitats that can be exploited by the listed wading birds, fish, and other aquatic organisms. The wetland enhancement program will substantially improve the habitat values of wetlands within the project's preserve areas. These improved wetland habitats will provide foraging opportunities for the listed wading birds and may provide a potential communal roosting and/or rookery site for certain listed wading birds. Certain freshwater marsh and wet prairie habitats within the preserve areas may provide suitable nesting sites for Sandhill cranes. Considering these points along with the proposed protection program that will be implemented for listed wading birds and Sandhill cranes, the project should not adversely affect the conservation of these species.

Navigation, Water Flow, Erosion and Shoaling

The project will not affect navigation or shoaling as there are no navigable waters within the affected area and no activities related to shoaling issues are proposed. The project should have minimal effects on erosion and runoff since the project plans include implementation of adequate erosion/sedimentation control measures. Sheetflow over the majority of the property is currently restricted to the property itself because of perimeter berms and ditches that surround the row crop fields. Water flow to off-site lands does not occur to a significant degree except when throwout pumps are used to manually discharge water from the fields into off-site areas. The perimeter stormwater containment berms to be constructed as part of the proposed project will also contain runoff on-site similar to current conditions. The lakes have been designed to meet the water quantity and quality criteria set forth in the BOR, thus the project should not adversely impact water flow.

Fisheries, Recreation, and Marine Productivity

There are no sport or commercial fisheries in or near the project lands, nor are there any marine resources. None of the wetlands or OSWs on project lands are presently used for any type of recreational purpose. Due to these factors, the proposed project will have no effect on fishing values, recreational values, or marine productivity.

Temporary or Permanent Nature

The impacts proposed to existing wetlands will be permanent. The proposed enhancement program will include grading activities in the preserve areas that will temporarily "impact" portions of the sites wetlands. These temporary impacts associated with the mitigation and enhancement program should really not be considered as adverse impacts since the net result will be substantial improvements to the functional values of the wetlands involved. All the wetland areas affected by grading will remain as wetlands following completion of grading activities.

Historical or Archaeological Resources

No cultural or historical resources have been identified on the property during the past 50+ years of agricultural operations. It is anticipated that the proposed project will have no effect on cultural resources listed or eligible for listing in the National Register of Historic Places.

Current Condition and Relative Value of Functions

The current condition of the existing on-site wetlands on the project site is extremely poor and their functions have been substantially degraded. The value of the functions provided by these wetlands, isolated from the wetlands to the south by a perimeter berm and rim ditch system, is minimal relative to the functional values provided by most other wetlands in the immediate project vicinity. The wetlands would continue to further degrade over time without the proposed project, largely through the combined effects of agricultural water management activities and the continued spread of exotic and nuisance plant species. Implementation of the proposed wetland preserve and enhancement program is intended to enhance wetland hydrology and habitat quality of the wetlands involved in the program. This should result in greater long-term ecological benefits than those that could be provided by the affected wetlands if left in their current state. All of the on-site OSWs that will be affected by the project are man-made agricultural irrigation ditches. Development of the proposed project will ultimately create a substantially greater acreage of OSWs than presently exists in the form of the project lakes and Marsh Enhancement Buffer and Spreader System (MEBSS) extension. The aquatic habitats provided by these lakes should more than compensate for the proposed impacts to existing ditches. The lakes may also serve as a valuable source of surface water storage.

FC ESTANCIA and OYSTER HARBOR

APPENDIX A

TABLES

Table 1. Existing Major FLUCFCS categories present on the FC ESTANCIA property.

FLUCFCS Code	FLUCFCS Description	Acres	% of Total Property
190	Open Land	23.5	3.8
214	Row Crops	374.1	60.4
216	Fallow Ag Land	54.0	8.7
216H	Hydric Fallow Ag Land	5.1	0.8
241	Tree Nursery	15.0	2.4
422/429	Brazilian Pepper / Wax Myrtle	2.1	0.3
619/433	Exotic Wetland Hardwoods / Hydric Hardwoods	16.1	2.6
619/618	Exotic Wetland Hardwoods / Willow	5.9	1.0
621/619	Cypress / Exotic Wetland Hardwoods	8.1	1.3
740	Disturbed Lands / Berms / Filled	79.9	12.9
OSW	Agricultural Ditches	36.0	5.8
TOTAL ACRES		619.8	

Table 2. Existing Major FLUCFCS categories present on the Oyster Harbor East property.

FLUCFCS Code	FLUCFCS Description	Acres	% of Total Property
112	Mobile Home Units	8.3	4.3
151	Vegetable packing Plant	6.6	3.4
214	Row Crops	133.9	69.8
740	Disturbed Lands / Berms / Filled	31.3	16.3
814	Roads	3.7	1.9
OSW	Agricultural Ditches	8.1	4.2
TOTAL ACRES		191.9	

Table 3. Existing Native Vegetation FLUCFCS mapping units present on the FC ESTANCIA property.

FLUCFCS Code	FLUCFCS Description	Acres	% of Total Native Vegetation
619/433	Exotic Wetland Hardwoods / Hydric Hardwoods	16.1	66.5
621/619	Cypress / Exotic Wetland Hardwoods	8.1	33.5
TOTAL ACRES		24.2	

Table 4. Existing wetlands present on the FC ESTANCIA property and the FLUCFCS composition of these wetlands.

Wetland ID	FLUCFCS Code	FLUCFCS Description	Acres	USACE JURISDICTION	SFWMD JURISDICTION
W-1	616 (E3)	Pop Ash and Pond Apple (50% to 75% Exotics)	11.0	No	YES
W-2	618 (E4)	Willow and Brazilian Pepper (75% to 100% Exotics)	5.9	No	YES
	621 (E2)	Cypress (25% to 50% Exotics)	8.1	No	YES
W-3	618 (E4)	Willow and Brazilian Pepper (75% to 100% Exotics)	5.1	No	YES
W-4	216H	Fallow Ag Lands (Hydric)	5.1	YES	YES
W-5	216H	Fallow Ag Lands (Hydric)	26.5	YES	YES
W-6	216H	Fallow Ag Lands (Hydric)	13.0	YES	YES
TOTAL ACRES OF WETLAND			44.6		74.7

Table 5. Existing wetland and surface water FLUCFCS mapping units present on the FC ESTANCIA property that will be impacted by the project and the extent of these impacts.

FLUCFCS Code	FLUCFCS Description	Acres	% of Total Impact
216H	Fallow Ag Lands (Hydric)	39.5	100
216H	Fallow Ag Lands (Hydric)	5.1	**
533	Storm Water Spreader Flow-way	0.6	
OSW	Farm Ditches	35.5	
TOTAL ACRES OF WETLAND and OSW IMPACTS		80.7**	

**** Impacts to 5.1 acres will be temporary in nature for enhancement activities. Fallow crop land will be scraped, contoured, and replanted to enhance habitat value.**

Table 6. Existing wetland and surface water FLUCFCS mapping units present on the Oyster Harbor property that will be impacted by the project and the extent of these impacts.

FLUCFCS Code	FLUCFCS Description	Acres	% of Total Impact
OSW	Farm Ditches	8.1	
TOTAL ACRES OF WETLAND IMPACTS		0.0	

All impacts proposed are to existing farm field ditches deemed non wetland waters by USACE.

Table 7. Existing vegetation FLUCFCS mapping units present in the Preserves proposed on the FC ESTANCIA property.

Wetland ID	FLUCFCS Code	FLUCFCS Description	Acres	Wetland / OSW	Upland
W-1	616 (E3)	Pop Ash and Pond Apple (50% to 75% Exotics)		11.01	
	740	Disturbed, Filled, Berms			3.27
	OSW	Agricultural Ditches		0.45	
		TOTAL	14.73	11.46	3.27
W-2	618 (E4)	Willow and Brazilian Pepper (75% to 100% Exotics)		5.91	
	621 (E2)	Cypress (25% to 50% Exotics)		8.11	
	740	Disturbed, Filled, Berms			2.17
	OSW	Agricultural Ditches		0.29	
		TOTAL	16.48	14.31	2.17
W-3	618 (E4)	Willow and Brazilian Pepper (75% to 100% Exotics)		5.11	
	740	Disturbed, Filled, Berms			0.95
	OSW	Agricultural Ditches		0.14	
		TOTAL	6.20	5.25	0.95
W-4	216H	Fallow Ag Lands (Hydric)		5.06	
	740	Disturbed, Filled, Berms			1.59
	OSW	Agricultural Ditches		0.55	
		TOTAL	7.20	5.61	1.59
TOTAL ACRES OF WETLAND			44.61	36.63	7.98

Table 8. Proposed (post-mitigation) conditions for the Preserve areas.

FLUCFCS Code	FLUCFCS Description	Acres	% of Total Preserve
616	Pop Ash and Pond Apple	14.7	33.0
618	Willow Marsh	14.1	31.6
621	Cypress	8.6	19.3
641	Freshwater Marsh	5.4	12.1
643	Wet Prairie	1.8	4.0
TOTAL PRESERVE ACREAGE		44.6	

Table 9. UMAM assessment for the FC ESTANCIA project (A and B below).

A. UMAM scores for existing USACE wetlands to be impacted and the functional loss resulting from these impacts.

Wetland ID	FLUCFCS Code	FLUCFCS Description	Acres Impacted	Functional Score	Functional Loss
W-5	216H	Fallow Ag Lands (Hydric)	26.52	0.20	5.30
W-6	216H	Fallow Ag Lands (Hydric)	13.04	0.20	2.61
MEBSS		Stormwater swale	0.63	0.00	0.00
TOTALS			40.19		7.91

B. Relative Functional Gain (RFG) for enhancement area wetlands and the net functional gain for these wetlands resulting from completion of the proposed wetland enhancement program.

Wetland ID	FLUCFCS Code	FLUCFCS Description	Acres Preserved, Created or Retained	Functional Score (existing)	Functional Score (with project)	Functional Delta	Net Functional Gain
W-1	616 (E3)	Pop Ash and Pond Apple	11.01	0.33	0.57	0.24	2.04
	740	Agricultural Berm	3.27	0.00	0.43	0.43	1.41
	OSW	Agricultural Ditches	0.45	0.00	0.43	0.43	0.19
W-2	618 (E4)	Willow and Brazilian Pepper	5.91	0.27	0.57	0.30	1.77
	621 (E2)	Cypress	8.11	0.37	0.60	0.23	1.86
	740	Agricultural Berm	2.17	0.00	0.43	0.43	0.93
	OSW	Agricultural Ditches	0.29	0.00	0.43	0.43	0.12
W-3	618 (E4)	Willow and Brazilian Pepper	5.11	0.27	0.57	0.30	1.53
	740	Agricultural Berm	0.95	0.00	0.43	0.43	0.41
	OSW	Agricultural Ditches	0.14	0.00	0.43	0.43	0.06
W-4	216H	Fallow Ag Lands (Hydric)	5.06	0.20	0.67	0.47	2.38
	OSW	Agricultural Berm	1.59	0.0	0.67	0.67	1.06
	740	Agricultural Ditches	0.55	0.0	0.67	0.67	0.37
							13.751
				6 yrs	Time Lag	1.0696	
					Risk	1.50	
TOTALS			44.6				8.57

Table 10. Mitigation Cost Estimate for Preserve Areas.

Wetland W-1

Activity		Quantity	Unit	Unit Cost		Total Cost
Clearing and Grubbing		3.3	acres	\$1,500		\$4,950
Contouring		3.7	acres	\$1,000		\$3,700
Exotic Vegetation Removal		11.0	acres	\$2,000		\$22,000

Wetland W-2

Activity		Quantity	Unit	Unit Cost		Total Cost
Clearing and Grubbing		2.2	acres	\$1,500		\$3,300
Contouring		2.5	acres	\$1,000		\$2,500
Exotic Vegetation Removal		5.9	acres	\$3,000		\$17,700
		8.1	acres	\$1,500		\$21,150

Wetland W-3

Activity		Quantity	Unit	Unit Cost		Total Cost
Clearing and Grubbing		1.0	acres	\$1,500		\$1,500
Contouring		1.1	acres	\$1,000		\$1,100
Exotic Vegetation Removal		5.1	acres	\$3,000		\$15,300

Wetland W-4

Activity		Quantity	Unit	Unit Cost		Total Cost
Clearing and Grubbing		6.6	acres	\$1,700		\$11,220
Contouring		7.2	acres	\$1,000		\$7,200
Revegetation						
Canopy Trees (3 gal)		800		\$7.50		\$6,000
Woody Shrubs (3 gal)		2,500		\$4.50		\$11,250
Groundcover (liner, bare root, 1-gal)		9,000		\$1.50		\$13,500
Initial Costs Sub Total						\$142,370

Exotic and Nuisance Vegetation Control						
Year 1 (2 events)		44.7	acres	\$250		\$11,175
Year 2 (3 events)		44.7	acres	\$150		\$6,705
Year 3 (3 events)		44.7	acres	\$150		\$6,705
Year 4 (2 events)		44.7	acres	\$100		\$4,470
Year 5 (2 events)		44.7	acres	\$100		\$4,470
Maintenance Sub Total						\$33,525

TOTAL ESTIMATED COST FOR PRESERVE						\$175,895
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COST ESTIMATE FOR MONITORING PRESERVE AREA

Mitigation Monitoring							
Time Zero		1.00	Total Cost	\$18,000		\$18,000	
1st Annual		1.00	Total Cost	\$10,000		\$10,000	
2nd Annual		1.00	Total Cost	\$10,000		\$10,000	
3rd Annual		1.00	Total Cost	\$10,000		\$10,000	
4th Annual		1.00	Total Cost	\$10,000		\$10,000	
5th Annual		1.00	Total Cost	\$12,500		<u>\$12,500</u>	
Monitoring Sub Total						\$70,500	

TOTAL ESTIMATED COST FOR MITIGATION		\$246,395
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TOTAL COST + 10%	\$271,035
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FIDDLER'S CREEK, ESTANCIA and OYSTER HARBOR EAST: EXISTING VEGETATION ASSOCIATIONS (FLUCFCS) AND LISTED SPECIES SURVEY

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1. INTRODUCTION

FC Creek and FCC Oyster Harbor (applicants) seek to develop a residential (Oyster Harbor East) and residential / golf course (Estancia) community within the existing Fiddler's Creek development east of Naples, FL. The project area includes approximately 812 acres of land and is the remaining undeveloped portion of the 3,932 acre Fiddler's Creek Development of Regional Impact (DRI). The Fiddler's Creek DRI is presently approved for a total of 6,000 residential units, 33.6 acres of business use, community facilities, schools, roads, parks, recreation and open space, golf courses, lakes and environmental preserves. The property is located at the southwestern corner of a larger agricultural area east of the CR951 and US 41 intersection. The property has been in agricultural production since the late 1960's and early 1970's originally by A. Duda and Sons Farms and since 1992 by South Coast Vegetable and Gargiulo Farms.

The Project area is approximately 10 miles southeast of Naples (4 miles southeast of the CR 951 and US 41 intersection), immediately south of US 41 in Collier County, Florida (township 50 South, Range 27 East, Portions of Sections 18 and 19). Driving directions to the project site would start from Exit 101 south from Interstate 75. Head south on Collier Blvd (CR951) to the Tamiami Trail (US 41) intersection. Turn east on US 41 and approximately 4 miles to the project entrance on the south side of the road. The Project area is currently in use as active and fallow row crop agricultural lands with three remnant isolated depressional wetland areas that have not been farmed (*Figure 3*).

Part of the FC Estancia project will include conducting wetland enhancement activities on lands within and adjacent to the project site. Three internal wetland preserve areas are currently proposed. While these three areas are isolated and therefore not currently believed to be jurisdictional under the federal guidelines they will be avoided and, as a result of this project, be connected to offsite waters through the proposed storm water management design. These three areas together encompass approximately 30.1 acres and are situated within the existing agricultural operations (*Figure 4*). The proposed project will also undertake the enhancement of a small fallow field area located outside of the proposed development boundaries. This fallow area will be regraded to remove the existing berm and ditch around it as well as to create a system of pools designed to provide enhanced foraging opportunities for wading and other birds which can be found on and around the project site. (*Figure 9*). There are no wetlands present on the Oyster Harbor East project property.

This report documents the results of FLUCFCS mapping efforts. It further documents the results of the listed species/wildlife surveys conducted by Turrell, Hall and Associates (THA). In reviewing this report, the reader should refer to the various Figures (drawings) contained in Appendix E of the overall Environmental Supplement document prepared for the project. The referenced figures include:

- Figure 1 - Location Map.
- Figures 4 & 5 - Existing FLUCFCS and Wetlands.
- Figure 7E – Wading Bird Foraging Improvements
- Figure 10 - Listed Species Observed.

2. EXISTING VEGETATION ASSOCIATIONS, LAND FORMS, & LAND USES (FLUCFCS)

2.1 METHODOLOGY

Vegetation associations, land forms, and land uses (FLUCFCS categories) present on and near the project lands were mapped using direct field observations and interpretation of aerial photographs. Field observations were conducted primarily during the period from October 2013 through June 2015. These observations included pedestrian transects across the lands recording vegetation community characteristics as well as recording location points along the boundaries of certain communities/land forms using handheld GPS units.

The methods and class descriptions found in the Florida Land Use, Cover and Forms Classification System (FLUCFCS) manual (FDOT, 1999) were generally followed when delineating areas and assigning areas to an appropriate FLUCFCS category (class) or "code". Level III classifications were generally employed. Certain modifications and/or additions were made to the FLUCFCS class definitions and numeric codes presented in this manual in order to better describe and differentiate both plant communities and land uses. Since an

emphasis was placed on plant communities and the type and quality of habitats formed by these communities, the vegetation association present was given more weight than the prevailing land use in some cases.

The sections that follow list and describe the FLUCFCS categories mapped within the project lands and in other adjacent lands. Major FLUCFCS categories are presented first. The FLUCFCS code number for each category is indicated followed by the brief name (description) of the category. If applicable, plants common to each significant vegetation stratum present are indicated. A general description of the FLUCFCS category is then provided together with any nuances specific to the project site that are worthy of mention. Following the major categories, FLUCFCS category modifiers may also be included. For example, the major FLUCFCS category of 621 (cypress forest) might be modified by using the suffix codes "D" and "E2". In this example, a FLUCFCS code shown as 621 D, E2 would indicate a cypress forest which has been disturbed (the "D" modifier) and has exotic plants present which form a cover ranging from 25 to 49 percent (the "E2" modifier). Modifiers are used when the effects of disturbance or exotic species have significantly altered common characteristics of a major FLUCFCS class.

One should note that the standard FLUCFCS system labels certain groups of vegetation associations (FLUCFCS categories) as "uplands" and others as "wetlands". In assigning FLUCFCS categories, THA uses the FLUCFCS category which best describes the dominant vegetation association, generally without regard to whether the FLUCFCS system considers the community as an "upland" or "wetland".

2.2 MAJOR FLUCFCS CATEGORIES

Figures 4 and 5 illustrate detailed FLUCFCS map polygons present on the project lands. A FLUCFCS map unit is a unique area (or polygon) mapped using either a major FLUCFCS category code only (ex., FLUCFCS 621) or a major FLUCFCS category code together with one or more modifiers (ex., FLUCFCS 621 E2). Table 1 lists each of the FLUCFCS map unit codes present on the property and total acreage encompassed by each unique FLUCFCS type.

The existing habitat types (FLUCFCS map units/categories) present on the project lands and nearby areas are shown on Figure 4. All existing FLUCFCS categories are described in Appendix B. Table 1 lists each of the existing major FLUCFCS categories and their extent as mapped on the property while Appendix B contains a table listing all the unique FLUCFCS map units present on the property and their extent.

Of the total 619.8 acres contained within the property boundary, 88.5% classify as uplands (548.6 ac.), 5.8% classify as other surface waters (36.0 ac.; agricultural irrigation ditches), and 5.7% classify as wetlands (35.2 ac of both jurisdictional (5.1 ac) and non-jurisdictional (30.1 ac)). The majority of the property consists of actively farmed row crop fields. Other agricultural areas and features constitute most of the remaining area (tree nursery, agricultural irrigation ditches, farm roads and trails, and previously cleared agricultural lands and facilities areas).

There are no rare or exceptional vegetation associations present on any of the project lands.

The following sub-sections describe each major FLUCFCS category mapped on the project lands. Modifiers attached to these categories are described separately. One should read both the major FLUCFCS categories and their modifiers to understand the FLUCFCS map units present.

112: Mobile Home Units

Canopy - none.

Subcanopy - none.

Ground Cover – Mown grasses, primarily bahiagrass (*Paspalum notatum*).

Comments:

This category includes the workforce housing area on the farm and is maintained on a weekly basis.

151: Vegetable Packing Plant

Canopy - none.

Subcanopy - none.

Ground Cover – Mown grasses, primarily bahiagrass (*Paspalum notatum*).

Comments:

This category includes the packing house which is in operation during harvesting activities. Primarily used as a storage and staging area. Is maintained on a monthly to bi-monthly basis.

190: Open Land

Canopy - none.

Subcanopy - none.

Ground Cover - various graminoids, forbs, ruderals. Examples include bahiagrass (*Paspalum notatum*), bermudagrass (*Cynodon dactylon*), various panicums (*Panicum* spp.), chickweed (*Stellaria* spp.), dog-fennel (*Eupatorium* spp.), Caesarweed (*Urena lobata*), bluestems (*Andropogon* spp.), etc.

Comments:

This category includes development lands that have been planted with domestic grasses and are regularly and intensively maintained. The mapping includes a portion of a stormwater lake associated with the FC Marsh Cove development.

214: Row Crops

Canopy - none.

Subcanopy – none.

Ground Cover - Various small vegetable row crops, especially tomatoes, when fields are in production. When fallow, various graminoids, forbs, ruderals may be present.

Comments:

These agricultural lands are actively used and managed for row crop production. Mapped areas include berms and smaller irrigation ditches associated with the row crop fields. Larger irrigation ditches are separately mapped as OSW. Perimeter berms surrounding the fields and internal field berms adjacent to irrigation ditches can be dominated by a wide array of woody and herbaceous species. Typically, Brazilian pepper is the dominant cover on the larger berms.

216: Fallow Ag Land

Canopy - none

Subcanopy - Generally absent. Sparsely scattered species can include Brazilian pepper (*Schinus terebinthifolius*), wax myrtle (*Myrica cerifera*), cabbage palm (*Sabal palmetto*), saltbush (*Baccharis halimifolia*).

Ground Cover - various graminoids, forbs and ruderals. Examples include dog-fennel (*Eupatorium* spp.), bahiagrass (*Paspalum notatum*), bluestems (*Andropogon* spp.), panicums (*Panicum* spp.), ceasar weed (*Urena lobata*), beggar-ticks (*Bidens* spp.), etc.

Comments:

This FLUCFCS category is representative of areas in which the canopy, subcanopy, and ground cover strata have been previously cleared in association with converting the land to agricultural production. The cessation of agricultural activities has allowed for the re-colonization of various groundcover and scattered sub-canopy vegetation.

241: Tree Nursery

Canopy - Dominant: live oak (*Quercus virginiana*), laurel oak (*Quercus laurifolia*), various palms.

Subcanopy - none

Ground Cover - various graminoids, forbs, ruderals.

Comments:

This FLUCFCS category is representative of areas in which the land was cleared and graded for planting nursery stock for eventual use within the development communities. Some areas were once planted with domesticated grasses and occasionally native grasses, however limited maintenance has allowed other ground cover species to colonize the areas. This area is subject to periodic management (limited brush hogging,

etc.) activities. Small drainage swales and berms are present within the mapped areas.

429 E4: Brazilian Pepper / Wax Myrtle

Canopy - generally less than 10% cover, if remnant trees remain.

Subcanopy - Dominant: Brazilian pepper (*Schinus terebinthifolius*). Other: cabbage palm (*Sabal palmetto*), coastal willow (*Salix caroliniana*), primrose willow (*Ludwigia peruviana*), wax myrtle (*Myrica cerifera*), saltbush (*Bacharis* spp.), etc.

Ground Cover – extremely scarce and sparse, but can include widely scattered various graminoids, forbs, woody species, and ferns.

Comments:

Areas mapped as FLUCFCS 422 are essentially Brazilian pepper monocultures. This designation is applied to areas having a cover by native species of less than 10-15 percent and the total cover by Brazilian pepper in the subcanopy strata is 85 percent or greater. Brazilian pepper monocultures within project lands occur where these highly invasive species have overtaken the native plant community. This often occurs in previously disturbed areas (ex., cleared for agricultural lands, ditching) or where the native community is stressed by other factors (ex., hydrologic alterations, fire) but these factors are not pre-requisites. The composition of the remaining native species can be highly variable. The number and diversity of native canopy and subcanopy trees and shrubs remaining is greatly restricted by the dense Brazilian pepper. Similarly, the percent cover and species diversity found within the groundcover stratum is severely restricted by shading, crowding, and competition from the overstory Brazilian pepper.

616 E4: Brazilian Pepper / Hydric Hardwoods

Canopy - Dominant: Brazilian pepper. Other: coastal willow (*Salix caroliniana*), primrose willows (*Ludwigia* spp.), pond apple (*Annona glabra*), popash (*Fraxinus caroliniana*), wax myrtle (*Myrica cerifera*), saltbush (*Baccharis* spp.),

Subcanopy - Dominant: Brazilian pepper (*Schinus terebinthifolius*). Other: variable depending on location. Examples: coastal willow, wax myrtle, primrose willows (*Ludwigia* spp.), saltbush (*Baccharis* spp.), cabbage palm, pond apple, etc.

Ground Cover – sparse to absent, but can include predominately ferns with various graminoids, forbs and small woody species.

Comments:

Areas mapped as FLUCFCS 616 E4 are essentially Brazilian pepper monocultures. This designation is applied to wetland areas having a canopy/subcanopy cover by native species of less than 10 to 15 percent and the total cover by Brazilian pepper in the subcanopy strata is 85 percent or greater. Brazilian pepper shrubs and trees are typically the dominant stratum. The number and diversity of native canopy and subcanopy trees and shrubs remaining is greatly restricted by the dense Brazilian pepper. Similarly, the percent cover and species diversity found within the groundcover stratum is severely restricted by shading, crowding, and competition from the overstory Brazilian pepper. The normal hydroperiod has also been altered by the ongoing agricultural practices.

618 E4: Brazilian Pepper / Willow Wetland

Canopy - Dominant: Brazilian pepper. Other: coastal willow (*Salix caroliniana*), primrose willows (*Ludwigia peruviana*, *L. octovalis*, *L. leptocarpa*), wax myrtle (*Myrica cerifera*), saltbush (*Baccharis* spp.),

Subcanopy - Dominant: Brazilian pepper (*Schinus terebinthifolius*). Other: variable depending on location. Examples: coastal willow, wax myrtle, primrose willows (*Ludwigia* spp.), saltbush (*Baccharis* spp.), cabbage palm, red maple, etc.

Ground Cover – sparse to absent, but can include various graminoids, forbs and small woody species.

Comments:

As above, the areas mapped as FLUCFCS 618 E4 are essentially Brazilian pepper monocultures. The normal hydroperiod has also been altered by the ongoing agricultural practices.

621 E3: Cypress Forest / Brazilian Pepper

Canopy - Dominant: bald cypress (*Taxodium distichum*). Other: cabbage palm (*Sabal palmetto*), red maple (*Acer rubrum*), etc.

Subcanopy - Dominant: Brazilian pepper (*Schinus terebinthifolius*). Other: variable depending on location. Examples: coastal willow, wax myrtle, primrose willows (*Ludwigia* spp.), saltbush (*Baccharis* spp.), etc.

Ground Cover - various forbs and ferns along with some woody species. Examples include beak rush (*Rhynchospora* spp.), yellow-eyed grass (*Xyris* spp.), fringe-rush (*Fimbristylis* spp.), swamp fern (*Blechnum serrulatum*) bog-buttons (*Lachnocaulon* spp.), flatsedge (*Cyperus* spp.), stinkweed (*Pluchea* spp.), various ferns, etc.

Comments:

These forests are dominated by cypress and Brazilian pepper. The subcanopy is dominated by Brazilian pepper while other species present include coastal willow, primrose willow, and cabbage palm. The groundcover is sparse as the dense Brazilian pepper has restricted species diversity.

740: Disturbed Land

Canopy – none.

Subcanopy - typically none. Where present, widely scattered Brazilian pepper (*Schinus terebinthifolius*), cabbage palm (*Sabal palmetto*), wax myrtle (*Myrica cerifera*), saltbush, etc.

Ground Cover - barren areas mixed with areas dominated by various graminoids and ruderals such as bahiagrass (*Paspalum notatum*), bermudagrass (*Cynodon dactylon*), bluestems (*Andropogon* spp.), panicums (*Panicum* spp.), dog-fennel (*Eupatorium* spp.), beggar-ticks (*Bidens* spp.), etc.

Comments:

Lands mapped FLUCFCS 740 are areas that have been previously cleared for various reasons. Most are currently in use as roads or agricultural berms used in the agricultural irrigation and drainage system.

OSW: Agricultural Irrigation Ditches

Canopy - none

Subcanopy - none

Ground Cover – various graminoids and other herbaceous species along with small woody species in places. Examples: primrose willow (*Ludwigia peruviana*), willow (*Salix* spp.), maidencane (*Panicum hemitomon*), torpedo grass (*Panicum repens*), cattail (*Typha* spp.), pickerelweed (*Pontederia cordata*), duck potato (*Sagittaria latifolia*), duckweed (*Lemna* spp.), water lettuce (*Pistia stratiotes*), green arum (*Peltandra virginica*), arrowhead (*Sagittaria* spp.), flatsedges (*Cyperus* spp.), various upland grasses, etc.

Comments:

Areas mapped OSW represent man-made irrigation ditches. Ditches differ from canals in that ditches are typically narrower and shallower, and convey water across relatively limited areas rather than from a larger region or watershed. Mapped areas typically do not include berms associated with some ditches nor do they include smaller irrigation ditches and swales that are present. Irrigation ditches on the property are actively managed as part of the farming operation. Management activities include things such as excavation to remove accumulated sediments and spraying herbicides to control plant growth that could restrict flows. The vegetation present along ditch side slopes and within inundated portions of the ditches is highly variable. Practically no vegetation is present in certain areas while vegetation can be relatively dense in other places. The mapped ditches are classified as other surface waters rather than as wetlands.

2.3FLUCFCS CATEGORY MODIFIERS (FLUCFCS SUFFIXES)

Exotic Plant Invasion (FLUCFCS Modifiers E1, E2, E3, & E4)

An “E” modifier following a FLUCFCS category indicates the area has been invaded by a significant number of exotic (e.g., non-native) invasive plants. Four levels of exotic plant infestation are employed in mapping; E1, E2, E3, and E4. The levels are assigned based on the total percent cover accounted for by the exotic species. When dealing with exotic trees such as melaleuca and Australian pine, any tree having a diameter at breast height (DBH) of 1 inch or greater is counted in the percent cover estimate while trees smaller than this are excluded. This typically accounts for trees in the canopy and/or subcanopy strata but excludes most saplings in the ground cover stratum. When dealing with exotic “shrubs” such as Brazilian pepper and downy rose myrtle, any plant over about 4.5 feet in height is counted in the percent cover estimates while others are excluded. This typically accounts for shrubs in the subcanopy strata but excludes many young plants in the ground cover stratum. If the invaded plant community has no native canopy and subcanopy strata (less than 10% cover in either strata), then all exotic trees, shrubs, and groundcover species are counted in the percent cover estimates.

When an “E” modifier is attached to a particular FLUCFCS category, the reader should assume that the normal description of the vegetation association (FLUCFCS category) is changed in accordance with the general guidelines provided below for the four “E” levels.

- **E1 - 10 to 24 percent cover by exotic species.**

Exotics have little effect on the characteristics of the native plant community unless the area is naturally without canopy and subcanopy strata.

- **E2 - 25 to 49 percent cover by exotic species.**

In forested or shrub dominated systems, exotics may be co-dominant species in subcanopy or canopy. A slight to significant reduction in native ground cover can result from exotics along with a possible reduction in the number of native subcanopy species. In other systems, exotics are dominant species and number and diversity of native plants are reduced.

- **E3 - 50 to 75 percent cover by exotic species.**

In forested or shrub dominated systems, exotics are often dominant in the subcanopy and can be the dominant or co-dominant species in the canopy. The native ground cover is significantly reduced and exotics may be the dominant species. Species diversity and numbers are significantly reduced in the subcanopy and, to a lesser degree, in the canopy. Growth of native woody species is reduced. In other systems, exotics are the dominant species and the number and diversity of native plants are severely reduced.

- **E4 - >75 percent cover by exotic species.**

In forested or shrub dominated systems, exotics are typically dominant in the subcanopy and, in the case of exotic trees, are the dominant or co-dominant species in the canopy. Ground cover is highly restricted. The population of native species in the subcanopy is drastically reduced and diversity is lowered. The population of native species in the canopy is also severely restricted and diversity may be reduced. Exotics are often the dominant ground cover species. Species richness and diversity in the ground cover stratum are greatly diminished. In other systems, exotics are the dominant species and would typically be classified as a monoculture of the exotic species involved.

- **Exotic Monocultures -**

Once exotic species completely dominate the area, such an area is given a FLUCFCS designation appropriate to the dominant exotic rather than using the FLUCFCS code for the native vegetation association replaced by the exotic together with an “E” modifier. Examples of such exotic “monocultures” are FLUCFCS 422 (Brazilian pepper) and 424 (Melaleuca). Areas are mapped using an exotic monoculture FLUCFCS code where there is less than a 15 percent cover by native species in the canopy or upper-most stratum and where the percent cover by exotic species exceeds approximately 85 percent.

One should note that the standard FLUCFCS system states that once a particular species accounts for 66 percent or more of the dominant stratum’s cover, the area should be classified in accordance with this dominant species. Thus, using the standard system, some areas mapped with an E3 modifier and most areas mapped with an E4 modifier would be classified according to the dominant exotic rather than the remnant native community.

On the project lands E1, E2, E3 and E4 modifiers were typically used to map invasion primarily by Brazilian pepper, and to a lesser extent, paragrass, cogon grass, torpedo grass, West Indian marsh grass, and alligator weed (typically addressed with E suffixes when the groundcover is the dominant stratum).

Hydric Areas (FLUCFCS Modifier “H”)

In certain instances, the most appropriate major FLUCFCS code to assign to an area may be a code that generally implies the area is an upland or otherwise does not seem to indicate the area may be a wetland. There are cases where the particular area may indeed classify as a wetland, however. When this occurs and there is no proper existing wetland FLUCFCS code available, the best fitting FLUCFCS code is assigned but is also given a suffix of “H” indicating hydric conditions are present and the area likely classifies as a wetland. For example, there can be actively managed areas within larger fallow fields (FLUCFCS 216) that are depressions. Some of these depressions can have wetland characteristics and may have several

wetland plant species present. Such depressions would be mapped as FLUCFCS 216 H indicating these areas are part of a fallow field but have hydric characteristics.

3. LISTED SPECIES SURVEYS

Wildlife and listed species surveys were conducted by THA on the project lands. As used herein, the term "listed animal species" refers to those animals listed as endangered or threatened by the US Fish and Wildlife Service (FWS) or the Florida Fish and Wildlife Conservation Commission (FWC) as well as those animal species listed as species of special concern by the FWC. The term "listed plant species" refers to those plants listed as endangered or threatened by the FWS. Several animal species listed by FWC are also classified (listed) by the South Florida Water Management District (SFWMD) as wetland dependent species. THA's wildlife/listed species surveys were supplemented by research concerning listed species. The following subsections document these efforts and the results of these efforts.

3.1 DATABASE RESEARCH

Prior to field investigations, aerial photos, soils maps, and prior mapping for the Estancia property were reviewed to identify the various vegetation associations potentially present on and adjacent to project lands. Various publications and databases were reviewed to determine listed plant and wildlife species which could occur and those that had been previously documented on or near the project lands as well as to gather information concerning listed species (see listed references in Section 4).

Based on the habitat types identified, existing knowledge of the project area, contacts with other consultants, and review of publications and databases, a preliminary list of listed plant and animal species with the potential to occur within or near the project lands was determined.

3.2 FIELD BIOTIC SURVEY METHODOLOGY

Intensive biotic and listed species surveys for the proposed project were conducted by THA in from October 2013 to June 2015. Table 4 provides the specific dates and times of these surveys, the total number of man-hours spent surveying on a given date, and the ecologists who conducted the surveys on a given date. In excess of 80 staff hours (man-hours) have thus far been spent conducting the surveys. Surveys were conducted such that observations included time periods ranging from sunrise to sunset. Barring seasonal considerations, the survey dates allowed for observations during likely times of probable occurrence for the majority of the listed animal species which could occur on or immediately adjacent to the project lands.

The field surveys consisted of ecologists walking relatively straight and meandering transects through the various habitats found on the project lands. Space between transects usually varied, depending on type of habitat, visibility limits, and density of vegetation. Some observations were made from field vehicles driving slowly through open areas such as the interiors of active row crop fields. Observers were equipped with compass, aerials, wildlife and plant identification books and notes, binoculars, field notebooks, and hand-held GPS units. Along the transects, the biologists periodically stopped, looked for wildlife and signs of wildlife, looked for listed plant species in appropriate habitats, and listened for wildlife vocalizations. The approximate location of observed listed wildlife and plant species and their numbers were mapped on aerials and recorded in field notebooks on a daily basis as were signs of listed wildlife species that were noted. In the same fashion, observed non-listed wildlife species encountered or signs of such species were recorded daily.

When performing pedestrian transects through appropriate habitats, particular consideration was given to looking for signs of gopher tortoises, burrowing owls, crested caracaras, and snail kites. Potentially suitable gopher tortoise habitats were surveyed for gopher tortoise tracks, scat, burrows, and individuals while potentially suitable burrowing owl habitats were examined for owl burrows and the owls themselves. These efforts included examining berms associated with the property's row crop fields (e.g. perimeter berms, larger berms along irrigation ditches, etc.) and fallow areas

The field survey methodologies utilized on the project lands were generally consistent with those prescribed by the FWC (GFC, 1988). The following provides a discussion of how the methodologies employed deviated from the specific subcategories of wildlife survey methods recommended in the referenced FWC (formerly GFC) document.

"Wetland Surveys"

Methods used were consistent except for: (1) most wetland areas received greater than five days of surveying; (2) Surveys addressed more species than those listed in the 1988 GFC publication.

"Upland Surveys"

Methods used were consistent except for: (1) the density of transects surveyed exceeded the recommended density; (2) Surveys addressed more species than those listed in the 1988 GFC publication.

"Small Mammal Sampling"

No small mammal trapping was performed. None of the species listed under this methodology could be reasonably expected to occur on the project lands due to inappropriate habitat and/or the range of the species not extending into the project area.

"Herpetofaunal Surveys"

Methods used were consistent except the funnel trapping recommended was not conducted. Only two of the species listed, indigo snake and gopher frog, could reasonably be expected to occur on the project lands. It is possible that indigo snakes exist but were not encountered during pedestrian transect surveys due to their elusive nature. Gopher frogs could theoretically exist in limited areas, however this is extremely unlikely.

"Gopher Tortoise Burrow Surveys"

Methods used were consistent except for: (1) surveys included covering habitat types not listed in the GFC publication; (2) survey transects occupied a higher density of transects than is recommended plus covered a higher percentage of potentially suitable habitats than is recommended; (3) survey transects included habitat types not normally considered appropriate for gopher tortoises.

The surveys were performed by the following THA personnel:

Tim Hall

Education: B.S. in Forest Resources and Conservation, M.S. in Wildlife Ecology. Experience: 26 years as an environmental consultant with emphasis on listed species surveys and management plans, environmental impact analyses and assessments, wetland delineation, environmental permitting, and various other environmental topics.

Jeff Rogers

Education: B.S. in Environmental Science. Experience: 9 years of professional environmental consulting and ecological studies experience in Florida including performing wetland delineations, listed species/wildlife surveys, marine studies and surveys, habitat mapping, and environmental permitting.

Lauren Gibson

Education: B.S. in Biology, Minor in Computer Science. Experience: 4 years as a professional environmental consultant and ecologist with emphasis on ecological assessments, wildlife surveys, environmental permitting, habitat restoration plans, environmental assessments and impact statements.

3.3 RESULTS

3.3.1 Research Results

The review conducted of the various existing databases concerning documented listed species (FWC, FWS, FNAI) did not reveal records of any listed plant or animal species documented on the project lands. THA's review of these existing databases included searching records for documented listed species occurring within approximately 5,000 feet of the subject property boundary. Figures 12 through 16 shows the locations of various listed species consultation areas occurring in the "query" area (i.e. the Estancia property itself plus lands within 5,000 feet of the property) as documented in the databases searched. Listed animal species previously documented outside the project lands but within 5,000 feet of the Estancia property included burrowing owl, little blue heron, tricolored heron, bald eagle,

snail kite, Florida black bear, and Florida panther. There were no records of any listed plant species occurring in the query area.

3.3.2 Listed Animal Species Observed

Several different animal species, including some listed species, were observed during the course of THA's wildlife/listed species surveys. Table 3 provides a listing of all the wildlife (animal) species observed on the Estancia property during the course of THA's surveys. Figure 10 illustrates the approximate locations where listed animal species were observed in these areas as well as the approximate locations where listed animal species were observed on lands adjacent to the Estancia property. The following subsections briefly address the listed animal species observed on-site (i.e. within the Estancia property boundary).

American Alligator

Several American alligators (*Alligator mississippiensis*) were observed on the Estancia property on multiple occasions. Alligators were primarily observed within the main agricultural irrigation ditches (OSW) although one alligator was also observed within the outer fringe of wetland W-3. Most alligators observed were mid-sized adults but a few juveniles were also seen.

It is likely that some alligators reside on-site throughout the majority of the year whereas others may typically reside in off-site wetlands, migrating to the Estancia ditches when water levels decline in the off-site wetlands.

American Crocodile

One American crocodile (*Crocodylus acutus*) was observed adjacent to the Estancia property within the MEBSS. It is also known that crocodiles are present around the Marco airport approximately 1 mile south west of the project site.

It is possible that some crocodiles may venture onto the project site ditches when water levels decline in the off-site wetlands but more likely that they would travel to the MEBSS and stormwater management system of the adjacent development areas.

Little Blue Heron

Several little blue herons (*Egretta caerulea*) were observed on-site on various occasions. Most of these sightings involved solitary herons foraging in the agricultural irrigation ditches. No little blue heron nests were seen on-site or in adjacent off-site wetlands.

The little blue heron is an opportunistic feeder and travels long distances to find optimal feeding conditions, going where conditions are favorable and food is potentially abundant. This is also the case with the other listed wading birds discussed below (i.e. snowy egret and tricolored heron). It is highly unlikely that these species ever nest within the on-site wetlands considering the proximity of the adjacent agricultural operations and the inappropriate habitat types present in some of the on-site wetlands. The observed listed wading birds certainly utilize the Estancia property for feeding purposes and possibly occasional roosting, but these species are not permanent residents.

Snowy Egret

A number of snowy egrets (*Egretta thula*) were observed on different occasions foraging within the main agricultural irrigation ditches on the Estancia property. No snowy egret nests or signs of nesting were observed on-site or in the adjacent areas.

Tricolored Heron

Several tricolored herons (*Egretta tricolor*) were observed on different occasions foraging within the main agricultural irrigation ditches on the Estancia property and two were seen foraging in on-site wetland W-1. Tricolored herons were also seen once foraging along the bank of the adjacent MEBSS. No tricolored

heron nests or signs of nesting were observed on-site or in adjacent areas.

Wood Stork

Congregations of wood storks (*Mycteria americana*) were observed on two separate occasions during the survey time-frame. The wood storks were foraging within the larger agricultural irrigation ditches on the Estancia property. It is likely wood storks frequent the site on occasions to forage in the irrigation ditches when water levels within the ditches are low enough to make foraging possible. No wood stork nests or signs of nesting were observed in the project lands. The closest documented wood stork colony is located a little over 19 miles north of the Estancia site in Audubon's Corkscrew Swamp Sanctuary.

Florida Sandhill Crane

There are two subspecies of sandhill cranes that can regularly be observed in Florida. These are the Florida sandhill crane (*Grus canadensis pratensis*) and the Eastern greater sandhill crane (*Grus c. tabida*), which arrives in Florida in October and begins spring migration in February. The two subspecies cannot be distinguished from each other in the field, however, sandhill cranes observed in Florida during May through September can be assumed to be the Florida sandhill crane. The Florida sandhill crane is listed as a state threatened species by the FWC. The greater sandhill crane is not listed. Given the time of year when THA performed biotic surveys for this project, it was assumed, but not confirmed, that all sandhill cranes observed during the surveys were the listed Florida sandhill crane.

Florida sandhill cranes were observed on-site on 3 different days during the survey period. Those seen on the Estancia property included: pairs of cranes seen foraging in recently tilled row crop fields (FLUCFCS 214) in the central portion of the site.

No Florida sandhill crane nests were found on the Estancia property or in the adjacent areas. Habitats present on-site, including the on-site wetlands, are primarily not suitable for nesting. Although this species will sometimes nest in dry pastures (present on-site as FLUCFCS 216), cranes prefer nesting in open areas of standing shallow water such as wet prairies and shallow herbaceous marshes. The hydric fallow field (FLUCFCS 216H) could be considered as suitable nesting habitat, however no signs of any current or past nests were seen in this wetland. It is deemed likely that Florida sandhill cranes visit open fields of the Estancia property for foraging purposes but do not nest on-site.

Bald Eagle

A bald eagle (*Haliaeetus leucocephalus*) was observed flying over the project site on three separate occasions during the survey time-frame. No evidence of any foraging or nesting was documented on the Estancia property. Nesting has been documented approximately ½ mile north of the project site and approximately ¾ of a mile west of the project site. It is likely that the eagle(s) observed were simply flying over the property on their way to somewhere else and were not actively foraging over the property. Some foraging has been documented in the MEBSS and stormwater ponds of the adjacent Fiddler's Creek developments.

Snail Kite

Snail kites (*Rostrhamus sociabilis plumbeus*) were observed on several occasions during the survey time-frame hovering or actively searching along the farm field ditches. No evidence of roosting or nesting was observed on-site or immediately adjacent to the property. The snail kite(s) were foraging within the larger agricultural irrigation ditches on the Estancia property. It is likely kites occasionally visit the site to forage in the irrigation ditches when water levels within the ditches are low enough to make foraging possible. No kite nests or signs of nesting were observed in the project lands. The closest documented snail kite nesting is located about ½ to ¾ of a mile north and east of the Estancia site.

3.3.3 Listed Animal Species Which Have the Potential to Occur but Were Not Observed

Although not observed on the project lands during the extensive listed species surveys, additional state and/or federally listed faunal species could potentially occur on the Estancia property or on lands adjacent to the property. Based on habitats present within these areas, land uses, species observed near the

project during biotic surveys, habitats present in the general area, review of various sources of information previously, and personal experience of project ecologists, assessments were made as to the probability of occurrence of other listed species on the project lands.

Three species of mammals, 2 species of reptiles, 1 amphibian species, and 8 species of birds were considered to have some potential for occurring on the Estancia property. These species are listed in Table 4. This table provides the state and federal designation status of each species along with a generalized rating as to the probability for each species to occur on project lands. By "occur", it is meant that the species could either utilize project lands for hunting/foraging purposes, traverse/pass through project lands, directly reside on the project lands (unlikely), or use the lands for nests, burrows, or dens as applicable to the species. The following sub-sections address the identified species.

Big Cypress Fox Squirrel

The Big Cypress fox squirrel (*Sciurus niger avicennia*) (BCFS) is considered a threatened species by the FWC and is classified as a wetland dependent species by SFWMD. BCFS typically reside in pine flatwoods and mixed pine and cypress forests and prefer mature forests that are open and "park-like" (e.g., have a scattered subcanopy and a ground cover not dominated by woody species or vines). BCFS can also be found in melaleuca infested forests provided some desirable habitat remains in the general area and can also forage areas containing hardwoods such as oaks and cabbage palms.

There are no remnant areas of pine flatwoods present on-site though there are pockets of this habitat south and east of the property. Considering this point that BCFS could theoretically occupy some habitats around of the project lands, there is a very limited possibility that BCFS may occasionally forage in semi-appropriate habitats present adjacent to the property.

During the course of the listed species/wildlife surveys, no BCFS individuals, day beds, or chewed cones were observed on-site or on lands immediately adjacent to these areas. Given this and the absence of suitable habitats, the potential for BCFS residing on the project lands is judged to be very unlikely.

Florida Black Bear

The Florida black bear (*Ursus americanus floridanus*) is listed as threatened by the FWC and is classified as a wetland dependent species by SFWMD. Black bears are known to travel great distances to forage and mate. The range of habitat types used and traversed by the Florida black bear is very broad and could theoretically encompass portions of the project lands. A review of FWC data for black bear revealed several records within a mile of the project lands. One record documented a bear that was observed swimming in a golf course lake about $\frac{3}{4}$ of a mile east of the project site on 7/21/14. There were two records approximately $\frac{1}{2}$ mile north of the project site of a bear or bears getting into garbage cans and entering a pool lanai off of Trinity Place.

During the course of THA's biotic surveys, staff did not find any Florida black bears or positive signs of this species' presence. It is extremely unlikely that any black bears would den on the project lands due to the agricultural operations. Suitability of the majority of the project lands for bear foraging is very low, thus it is anticipated that chances of bears using the project lands to any significant degree are limited. There is a fair chance that black bears may occasionally roam through portions of the project lands considering the absence of intensive development.

Florida Panther

The Florida panther (*Puma concolor coryi*) is listed as endangered by both the FWC and FWS. It is also considered a wetland dependent species by SFWMD. Panthers roam extremely large areas that cover various parts of south Florida, including extensive areas in Collier County. According to the FWC's database for radio-collared panthers (FWC, 2015a) and their panther mortality database (FWC, 2015b), one Florida panther was killed within 2 miles (west) of the Estancia property crossing US41.

The available FWC telemetry and mortality data for panthers did not document any panthers occurring on the Estancia property. As can be seen in Figure 5, panthers were largely found in the remaining relatively "natural" upland and wetland habitats to the west, north, and northeast of the Estancia property.

The FWS established a Multi-species/Ecosystem Recovery Implementation Team (MERIT) to help implement FWS's Multi-species Recovery Plan. A Florida Panther Subteam of MERIT was also formed to develop a strategy for conservation of the Florida panther population. This subteam generated landscape-scale panther habitat conservation zones for south Florida (Kautz et al., 2006). The 3 habitat conservation zones are:

- (1) Primary Zone – Lands essential to the long-term viability and survival of the panther. The FWS indicates that panther habitat conservation efforts should focus on maintaining the total available area, quality, and spatial extent of habitat within the Primary Zone (USFWS, 2006a).
- (2) Secondary Zone – Natural and disturbed lands contiguous to the Primary Zone that few panthers use but may be important to transient sub-adult male panthers and, given sufficient habitat restoration, have potential to support an expanded panther population south of the Caloosahatchee River. The FWS notes that extensive habitat restoration would need to occur to allow the Secondary Zone lands to contribute meaningfully to panther recovery, and thus considers conservation of such lands to be a lower priority than conservation of the Primary and Dispersal Zones (USFWS, 2006a).
- (3) Dispersal Zone – An area intended to function as a landscape linkage maintaining connectivity to potentially suitable habitat north of the Caloosahatchee River and thus may facilitate future panther expansion north of the river. Although panthers move through the Secondary and Dispersal Zones, they are not permanently occupied (USFWS, 2006a).

Figure 5 illustrates lands classified as panther habitat conservation zones according to the mapping produced by Kautz (Kautz et al., 2006). Secondary Zone panther habitat lands cover extensive areas north of the Estancia property though the property itself is not contained within any of the conservation zones.

No evidence of panthers (scat, tracks, etc.) was observed nor were any panthers sighted on the Estancia property or on immediately adjacent lands during the course of THA's biotic surveys. The panther telemetry data collected thus far indicate that panthers tend to avoid the Estancia property as well as adjacent development areas. The majority of the habitat types present on the Estancia property are not particularly suitable for panthers. Despite these factors, there is a fair probability that panthers may have roamed across portions of the Estancia or adjacent areas in the past and could do so in the future. It is highly unlikely that panthers would utilize any of these areas for denning purposes given the inappropriate habitats currently present.

Florida Bonneted Bat

The Florida bonneted bat (*Eumops floridanus*) (FBB) is listed as endangered by FWS and FWC. Not a lot is known about this species. Most documented roosts are in manmade structures and they can apparently hunt in a wide variety of habitats. They can also be associated with cavities in living and dead trees.

The project site is within the FBB consultation area and is also within one of the designated focal areas. The project will not be removing any cavity trees as almost the entire site has been historically cleared and under agricultural operations for the past few decades. Enhancement of the wetland preserve areas will involve removal of predominately midstory level exotic vegetation (Brazilian pepper) and will not impact any FBB roosting trees. The project is willing to install bat houses along the preserve and MEBSS boundaries to provide for bat roosting once the project is completed. The proposed project should have no direct, significant impact to Florida bonneted bats.

Gopher Tortoise

The gopher tortoise (*Gopherus polyphemus*) is listed as a Threatened Species by the FWC and as a candidate species by the FWS. No gopher tortoise burrows or gopher tortoises were observed on the Estancia property or on adjacent lands.

Gopher tortoises prefer upland habitats, particularly xeric scrub communities and higher elevation pine flatwoods. They can also be found in disturbed upland areas including fallow and abandoned agricultural fields, perimeters of active crop fields, and pastures. It is deemed unlikely that this species resides on the

Estancia property. Indications are that, during the wet season, the area water table is relatively close to the surface. This condition does not favor the presence of gopher tortoises. There is a very limited probability that a few gopher tortoises could reside in the agricultural berms though none were observed. Since no signs of gopher tortoises were observed in these areas and given the poor quality of these habitats and the high ground water table, chances seem remote that any gopher tortoises are actually present but were not found during the biotic surveys performed on project lands.

Gopher Frog

Gopher frogs (*Rana capito*), listed as a Species of Special Concern (SSC) by the FWC, are potential commensals with gopher tortoises. No gopher tortoises or signs of such tortoises (scat, burrows) were found on the Estancia property or adjacent lands. As discussed above, the probability that any gopher tortoises inhabit project lands is minimal hence it is also unlikely that any gopher frogs reside on project lands. Although gopher frogs are highly dependent upon gopher tortoise burrows for shelter, they occasionally also find refuge in other burrows (crayfish, rodent) and features such as stump holes. Such features are present on the Estancia property, however the on-site wetlands are not suitable gopher frog habitats and nearby wetlands are a necessary component of the frog's life cycle.

Eastern Indigo Snake

The eastern indigo snake (*Drymarchon corais couperi*) is listed as threatened by FWS and FWC. Generally this species lives and hunts in a wide variety of habitats and its territory can cover large areas. They can be associated with gopher tortoise burrows (as a commensal) and favor pine flatwoods, palmetto prairies, and scrub habitats as well as wetland edges. They are relatively reclusive in nature and observations in the wild are rather rare.

There would seem to be a low to moderate probability that one or more eastern indigo snakes may occasionally utilize any number of different habitats present in the project lands. It seems unlikely that such snakes actually reside on the Estancia property given the active agricultural operations and conditions present, with the possible exception of the on-site fallow fields (FLUCFCS 216). Indigo snakes could theoretically reside on the property, however chances seem remote.

Burrowing Owl

The burrowing owl (*Athene cunicularia*) is listed as a Species of Special Concern by the FWC. Burrowing owls could theoretically nest in the perimeter berms surrounding row crop fields (FLUCFCS 214), or in certain portions of cleared areas (FLUCFCS 241 or 190) present on the Estancia property. These areas were thoroughly inspected during the extensive field surveys. No signs of current or past nest burrow activity were observed and no burrowing owls were seen. Since the listed species surveys should have detected any owls or owl burrows, it appears quite unlikely that burrowing owls inhabit the Estancia property. Two occupied burrowing owl burrows have been observed on the adjacent Fiddler's Creek Avian project site. These burrows were created after the development of the project was underway and are within the ongoing development footprint. Permits to displace those burrows have been submitted to FWC. It is possible that the owls could relocate onto the Estancia property after displacement so ongoing observations will be needed.

Crested Caracara

Both the FWC and the FWS classify the crested caracara (*Caracara cheriway*) as a threatened species. No crested caracaras were observed by THA ecologists during the course of the biotic survey. There are no habitats suitable for caracara nesting on the project lands and the project is outside of the FWS consultation area for this species.

Considering no documented presence of these birds near the project, it is unlikely that the property supports any caracara nesting or foraging activities.

Peregrine Falcon

The peregrine falcon (*Falco peregrinus*), classified as an endangered species by FWC, winters in and migrates through Florida but is not a permanent resident. These birds are rarely encountered in Collier

County, but there is a slight possibility that peregrine falcons may occasionally utilize open areas within project lands for hunting their favored prey which is other avian species. It is highly doubtful that any peregrine falcons ever nest on project lands. Habitats are not suitable for nesting and the region is not known to be an area where peregrine falcons nest.

Southeastern American Kestrel

American kestrels are represented in south Florida by two subspecies. The year-round resident, the Southeastern American kestrel (*Falco sparverius paulus*), is listed by FWC as threatened, while the second subspecies, the Eastern American kestrel (*F. sparverius sparverius*) migrates to Florida in the winter months and is not listed by the FWC. Kestrels typically forage for insects and lizards in pastures, open fields, and park-like landscapes with a relatively open midstory and canopy and short herbaceous groundcover (Stys, 1993). They typically nest in dead trees in cavities created by other avian species. The nest trees are usually in close proximity to suitable foraging areas.

Listed kestrels may infrequently spend time hunting the row crop fields, fallow fields, and pasture-like open lands located on the Estancia property. Although listed kestrels may forage in such areas on occasion, it is unlikely that any reside on the property. No listed kestrels were seen on the property nor were signs of possible kestrel nests observed.

Bald Eagle

The bald eagle (*Haliaeetus leucocephalus*) is no longer listed as threatened by either the FWC or FWS, although it is still protected under the Bald and Golden Protection Act. There are three documented bald eagle nesting sites within a mile of the project site. Nest #CO013, is ¼ mile south of the southern Estancia property boundary. Nest #CO037, is about ½ mile north of the northern Estancia property boundary. Nest #CO055, is approximately ¾ mile west of the south west corner of the Estancia property boundary.

No eagles were observed on project lands though birds were seen flying in the immediate area. There is a limited chance that bald eagles may occasionally search for prey in the agricultural irrigation ditches present on the Estancia property or seek carrion in open areas of the site.

Listed Wading Birds

Various listed wading birds in addition to those observed on-site could theoretically visit the project lands. These include white ibis (*Eudocimus albus*), limpkin (*Aramus guarauna*), and roseate spoonbill (*Ajaja ajaja*). Such birds are opportunistic feeders and travel substantial distances to find potential foraging areas. All of these noted species are listed as Species of Special Concern by FWC. All of these noted species are classified as a wetland dependent species by SFWMD.

The cited birds may sometimes forage in the Estancia property's agricultural irrigation ditches and some of the on-site wetlands when water levels are appropriate. It is doubtful that any significant foraging occurs in the wetlands due to the density of Brazilian pepper. Of all the listed wading birds addressed, it is most probably that white ibis utilize project lands for foraging on occasions. Ibis may forage both inundated areas as well as pasture settings and even row crop fields, particularly when these fields are tilled. Scatters of empty shells of aquatic snails characteristic of limpkin foraging were not seen on project lands, but there remains a limited possibility that limpkins may forage appropriate habitats on occasions. Although roseate spoonbills are more frequently found in coastal settings, there also is some chance that spoonbills may visit the site's irrigation ditches and shallow wetland areas as well as the freshwater marsh portions of off-site MEBSS when water levels are suitable.

It is unlikely that any of the mentioned species nest on the Estancia property or on adjacent lands. No signs of listed wading bird nests, wading bird rookeries, or fairly permanent roosting sites were found on the project lands.

3.3.4 Listed Animal General Wildlife Observations

During the biotic surveys conducted on the project lands, ecologists recorded sightings and signs of non-listed wildlife in addition to listed species. Table 3 contains all non-listed wildlife observed on the

project lands.

Signs of larger mammals, such as bobcat, feral dog, and white-tailed deer, were observed in portions of the Estancia property. Other mammals actually observed on the Estancia and Oyster harbor properties were armadillo, opossum, raccoon, and marsh rabbit. A couple of gray squirrels were noted along the fringes of off-site lands.

Observations of non-listed bird species were generally widely scattered and low in number and were particularly infrequent in the farm fields. Although several species of non-listed birds are indicated in Table 5, the actual number of individuals and number of species observed during any given period of wildlife observations was typically low. A few of the non-migratory bird species may reside on the project lands, however very few nests were observed. Observations of non-listed herps were largely restricted to the agricultural irrigation ditches. Frogs and turtles were seen at various locations in these ditches and a few were seen in wetlands W-1 and W-3. All of the fish species observed were seen in the Estancia property's larger irrigation ditches.

3.3.5 Listed Plant Species

According to the FWS, no federally listed plant species have been documented in Collier County (USFWS, 2006b). No listed plant species were observed on the project lands during the course of the listed species/wildlife surveys conducted and a review of pertinent databases concerning listed plant species found no records of such plants occurring on project lands or within 5,000 feet of these lands. Considering these points, it seems highly improbable that any plant species currently listed by FWS may be present on project lands.

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APPENDIX 1

TABLES

Appendix 1: Tables

Table 1. Existing FLUCFCS categories present on the Estancia property.

FLUCFCS Code	FLUCFCS Description	Acres	% of Total Property
190	Open Land	23.5	3.8
214	Row Crops	374.1	60.4
216	Fallow Ag Land	54.0	8.7
216H	Hydric Fallow Ag Land	5.1	0.8
241	Tree Nursery	15.0	2.4
422/429	Brazilian Pepper / Wax Myrtle	2.1	0.3
619/433	Exotic Wetland Hardwoods / Hydric Hardwoods	16.1	2.6
619/618	Exotic Wetland Hardwoods / Willow	5.9	1.0
621/619	Cypress / Exotic Wetland Hardwoods	8.1	1.3
740	Disturbed Lands / Berms / Filled	79.9	12.9
OSW	Agricultural Ditches	36.0	5.8
TOTAL ACRES		619.8	

Table 2. Existing FLUCFCS categories present on the Oyster Harbor East property.

FLUCFCS Code	FLUCFCS Description	Acres	% of Total Property
112	Mobile Home Units	8.3	4.3
151	Vegetable Packing Plant	6.6	3.4
214	Row Crops	133.9	69.8
740	Disturbed Lands / Berms / Filled	31.3	16.3
814	Roads	3.7	1.9
OSW	Agricultural Ditches	8.1	4.2
TOTAL ACRES		191.9	

Appendix 1: Tables

Table 3. Information for the dates listed species/general wildlife surveys were conducted for the proposed Estancia and Oyster Harbor projects.

Survey Date	Survey Staff	Weather Conditions	Survey Time Period	Total Survey Man-Hours
10/18/2013	TH, LG	Windy, Partly cloudy. Low 72° High 79°	0800 – 1000	4
10/23/2013	TH	Partly cloudy to overcast. Low 71° High 82°	0700 – 1300	6
10/28/2013	LG	Clear and breezy Low 77° High 87°	1000 – 1800	8
11/04/2013	TH, JR	Partly cloudy and breezy Low 80° High 86°	1400 – 1800	8
11/09/2013	TH	Clear and calm Low 63° High 77°	0700 – 1100	4
12/29/2014	TH, JR	Clear to partly cloudy. Low 65° High 79°	0645 – 1800	22.5
01/05/2015	TH	Partly cloudy to overcast. Low 70° High 81°	0630 – 1900	12.5
01/20/2015	TH	Partly cloudy to overcast. Low 64° High 71°	0700 – 1500	8
01/26/2015	TH	Partly cloudy to overcast some light rain. Low 65° High 71°	1430 – 1830	4
02/13/2015	TH	Clear and breezy Low 57° High 66°	1300 – 1830	5.5
02/20/2015	TH	Clear and Calm. Low 37° High 57°	0645 – 1400	7.25
02/23/2015	TH	Clear and Sunny. Low 51° High 67°	0630 – 1130	5
03/09/2015	TH	Partly cloudy to overcast. Low 75° High 82°	1330 – 1830	5
03/16/2015	TH	Clear to Partly cloudy. Low 77° High 81°	1200 – 2000	8
05/08/2015	TH	Clear and Breezy. Low 84° High 87°	1400 – 1930	5.5
05/26/2015	TH	Partly cloudy to overcast. Gusty. Low 86° High 91°	1000 – 1700	7
06/04/2015	TH	Clear to Partly cloudy. Low 71° High 90°	0630 – 1500	8.5
Total Survey Man-Hours				128.75

TH = Tim Hall JR = Jeff Rogers LG = Lauren Gibson

Appendix 1: Tables

Table 4. Wildlife species observed on the Estancia and Oyster Harbor properties and/or within the project's off-site mitigation areas.

COMMON NAME	SCIENTIFIC NAME	STATUS		
		FWC	FWS	SFWMD
REPTILES & AMPHIBIANS				
Cottonmouth	Agkistrodon piscivorus	--	--	--
American alligator	Alligator mississippiensis	SSC	T(S/A)	WDS
Green anole	Anolis carolinensis	--	--	--
Brown anole	Anolis sagrei	--	--	--
Oak toad	Bufo quercicus	--	--	--
Southern toad	Bufo terrestris	--	--	--
Southern black racer	Coluber constrictor priapus	--	--	--
American crocodile	Crocodylus acutus	T	T	WDS
Florida chicken turtle	Deirochelys reticularia chrysea	--	--	--
Green treefrog	Hyla cinerea	--	--	--
Florida red-bellied turtle	Pseudemys nelsoni	--	--	--
Pig frog	Rana grylio	--	--	--
Leopard frog	Rana sphenoccephala	--	--	--
Common musk turtle	Sternotherus odoratus	--	--	--
BIRDS				
Red-winged blackbird	Agelaius phoeniceus	--	--	--
Anhinga	Anhinga anhinga	--	--	--
Great blue heron	Ardea herodias	--	--	--
Cattle egret	Bubulcus ibis	--	--	--
Red-tailed hawk	Buteo jamaicensis	--	--	--
Red-shouldered hawk	Buteo lineatus	--	--	--
Green heron	Butorides virescens	--	--	--
Chuck-will's-widow	Caprimulgus carolinensis	--	--	--
Northern cardinal	Cardinalis cardinalis	--	--	--
Turkey vulture	Cathartes aura	--	--	--
Common killdeer	Charadrius vociferus	--	--	--
Ground dove	Columbina passerina	--	--	--
Black vulture	Coragyps atratus	--	--	--
American crow	Corvus brachyrhynchos	--	--	--
Great egret	Egretta alba	--	--	--
Little blue heron	Egretta caerulea	SSC	--	WDS
Snowy egret	Egretta thula	SSC	--	WDS
Tricolored heron	Egretta tricolor	SSC	--	WDS
Swallow-tailed kite	Elanoides forficatus	--	--	--
White ibis	Eudocimus albus	SSC	--	WDS
Common yellowthroat	Geothlypsis trichas	--	--	--
Florida sandhill crane	Grus canadensis pratensis	T	--	WDS
Bald eagle	Haliaeetus leucocephalus			
Red-bellied woodpecker	Melanerpes carolinus	--	--	--
Northern mockingbird	Mimus polyglottos	--	--	--
Wood stork	Mycteria americana	E	E	WDS

Appendix 1: Tables

COMMON NAME	SCIENTIFIC NAME	STATUS		
		FWC	FWS	SFWMD
House sparrow	<i>Passer domesticus</i>	--	--	--
Double-crested cormorant	<i>Phalacrocorax auritus</i>	--	--	--
Boat-tailed grackle	<i>Quiscalus major</i>	--	--	--
Carolina wren	<i>Thryothorus ludovicianus</i>	--	--	--
Mourning dove	<i>Zenaida macroura</i>	--	--	--
MAMMALS				
Feral dog (Coyote?)*	<i>Canis spp.</i>	--	--	--
Nine-banded armadillo*	<i>Dasypus novemcinctus</i>	--	--	--
Virginia opossum	<i>Didelphis virginiana</i>	--	--	--
Bobcat*	<i>Felis rufus</i>	--	--	--
White-tailed deer*	<i>Odocoileus virginianus</i>	--	--	--
Raccoon	<i>Procyon lotor</i>	--	--	--
Gray squirrel	<i>Sciurus carolinensis</i>	--	--	--
Marsh rabbit	<i>Sylvilagus palustris</i>	--	--	--
FISH				
Chain pickerel	<i>Esox niger</i>	--	--	--
Mosquitofish	<i>Gambusia spp.</i>	--	--	--
Topminnow	<i>Fundulus sp.</i>	--	--	--
Least killifish	<i>Heterandria Formosa</i>	--	--	--
Redear sunfish	<i>Lepomis microlophus</i>	--	--	--

FWC = Florida Fish and Wildlife Conservation Commission
 FWS = United States Fish and Wildlife Service
 SFWMD = South Florida Water Management District
 E = Endangered
 SSC = Species of Special Concern
 T = Threatened
 T (S/A) = Threatened (due to similarity of appearance to crocodile)
 WDS = Wetland dependent species
 -- = Not Listed
 * = Indicates species not directly observed but signs of the species (i.e. scat, tracks, etc.) were documented.

Note: This table is based on species the results of listed species/wildlife surveys conducted by THA, Inc.

Appendix 1: Tables

Table 5. Animal species listed by FWS and FWC that were not observed on-site but could utilize or reside on the Estancia and Oyster Harbor properties, along with their relative probability of occurrence.

COMMON NAME	SCIENTIFIC NAME	STATUS		PROBABILITY OF OCCURRENCE
		FWS	FWC	
REPTILES & AMPHIBIANS				
Eastern indigo snake	<i>Drymarchon corais couperi</i>	T	T	Moderate
Gopher tortoise	<i>Gopherus polyphemus</i>	--	SSC	Low / Very Low
Gopher frog	<i>Rana capito</i>	--	SSC	Very Low
BIRDS				
Roseate spoonbill	<i>Ajaja ajaja</i>	--	SSC	Low
Limpkin	<i>Aramus guarauna</i>	--	SSC	Moderate
Burrowing owl	<i>Athene cunicularia</i>	--	SSC	Low / Very Low
Crested caracara	<i>Caracara cheriway</i>	T	T	Moderate / Low
Peregrine falcon	<i>Falco peregrinus</i>	--	E	Low
Southeastern American kestrel	<i>Falco sparverius paulus</i>	--	T	Moderate / Very Low
MAMMALS				
Florida panther	<i>Puma concolor coryi</i>	E	E	Low
Big Cypress fox squirrel	<i>Sciurus niger avicennia</i>	--	T	Very Low
Florida black bear	<i>Ursus americanus floridanus</i>	--	T	Moderate

FWC = Florida Fish and Wildlife Conservation Commission

FWS = United States Fish and Wildlife Service

E = Endangered

SSC = Species of Special Concern

T = Threatened

-- = Not Listed

Probability of Occurrence = Relative probability of indicated species inhabiting or utilizing the sites as based on the following scale: Very High, High, Moderate, Low, Very Low. A rating of "none" indicates it is highly unlikely that the species may inhabit or utilize the area (no probability).



This record search is for informational purposes only and does NOT constitute a project review. This search only identifies resources recorded at the Florida Master Site File and does NOT provide project approval from the Division of Historical Resources. Contact the Compliance and Review Section of the Division of Historical Resources at 850-245-6333 for project review information.

July 24, 2015



Tim Hall
Turrell, Hall & Associates, Inc.
Marine and Environmental Consulting
3584 Exchange Ave.
Naples, FL 34104-3732
Phone: 239.643.0166
Email: Tim@Turrell-associates.com

In response to your inquiry of July 24, 2015, the Florida Master Site File lists no archaeological sites, two surveys, three resource groups, and no standing structures, found in the following parcels of Collier County:

The portions of T51S R26E Sections 12, 13, 24, & 25, and T51S R27E Sections 07, 08, 17-20, 29, & 30, indicated by the map submitted with search request (including a project area, and a ½ mile buffer).

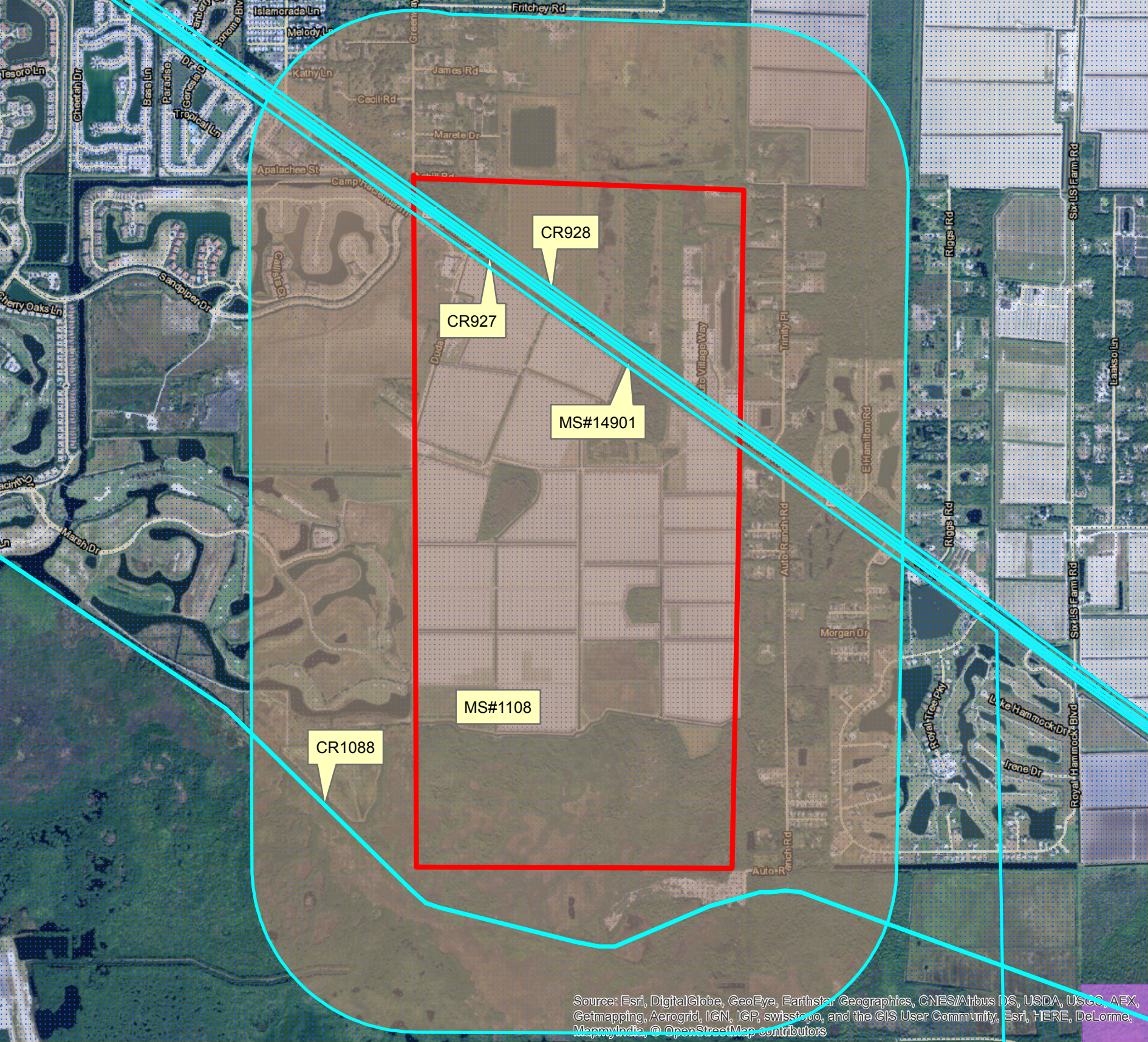
When interpreting the results of our search, please consider the following information:

- **This search area may contain *unrecorded* archaeological sites, historical structures or other resources even if previously surveyed for cultural resources.**
- **Because vandalism and looting are common at Florida sites, we ask that you limit the distribution of location information on archaeological sites.**
- **While many of our records document historically significant resources, the documentation of a resource at the Florida Master Site File does not necessarily mean the resource is historically significant.**
- **Federal, state and local laws require formal environmental review for most projects. This search DOES NOT constitute such a review. If your project falls under these laws, you should contact the Compliance and Review Section of the Division of Historical Resources at 850-245-6333.**

Please do not hesitate to contact us if you have any questions regarding the results of this search.

Sincerely,

Gabrielle McDonnell
Archaeological Data Analyst
Florida Master Site File
Gabrielle.McDonnell@DOS.myflorida.com



FIDDLER'S CREEK ESTANCIA and OYSTER HARBOR EAST:
Listed Species Protection Plan

Prepared for:

FCC Creek
and
FC Oyster Harbor
3470 Club Center Blvd
Naples, FL 34114

Prepared by:

Turrell, Hall & Associates, Inc.

3584 Exchange Ave.
Naples, FL 34104

Updated

September 2015

GENERAL

Listed species protection associated with this project will be undertaken under two circumstances, construction activities and post construction residential activities. Educational pamphlets will be prepared and distributed to residents and employees of the development. A supply of these will also be maintained at the construction office for distribution to appropriate construction personnel and contractors during the initial clearing and construction associated with the development. These pamphlets will contain: illustrations of the species discussed in the following subsections; general descriptions of these species; potential habitats in which each species may occur; as applicable, descriptions and/or illustrations of species nests/burrows/dens; general protocols and procedures to follow if a particular species or species nest/burrow/den is encountered, and; contact information for parties to be notified if a particular species or species nest/burrow/den is encountered. These pamphlets will emphasize that harming or harassing listed species as well as disturbing or damaging a listed species nest/burrow/den is strictly prohibited.

ALLIGATORS and CROCODILES

Several American alligators (*Alligator mississippiensis*) and American crocodiles (*Crocodylus acutus*) have been documented throughout the properties as well as on adjacent developed properties utilizing the larger agricultural ditches and some of the stormwater management features. These animals likely include individuals that frequent the property on an occasional basis and individuals that reside in appropriate habitats on a relatively permanent basis. To protect alligators and crocodiles during project construction, modifications to the existing on-site drainage ditches and wetlands will be conducted mindful of the potential presence of alligators. Egress points, for alligators and crocodiles to move out of the area being filled or excavated, will be made available. Construction employees, contractors, and other field personnel will be notified that alligators and crocodiles may be present and that construction activities must be conducted to minimize the potential for them to be harmed.

Should an alligator or crocodile occupying an on-site ditch or wetland that is being cleared, filled, or excavated not initially leave the area on its own accord through the established egress point(s), all activities that might harm the animal will be ceased temporarily and will not be resumed until the animal has departed the area. If it appears the animal may not leave the area, a designated employee will contact the Florida Fish and Wildlife Conservation Commission's (FWC) Nuisance Alligator Hotline (1-866-392-4286) for further direction. For alligators, it may be necessary for a duly licensed nuisance alligator trapper to capture the alligator and relocate it. Captured alligators may be relocated to other areas in the general project vicinity that are under the control of the current property owner. Potential relocation areas include existing agricultural ditches far from the habitat areas slated for impacts or other suitable off-site wetlands. For crocodiles, additional coordination with FWC and FWS officers will be undertaken if it becomes necessary to relocate a crocodile from the work area.

No more than 3 weeks prior to conducting activities that will impact on-site ditches or wetlands, the areas to be impacted will be inspected by a qualified environmental professional. If an active alligator

nest site is found during this inspection, the FWC will be contacted by the contractor for further guidance. No work that could harm the nest site will be conducted without authorization from FWC. The FWC may direct that the alligator eggs be removed and relocated by a licensed nuisance alligator trapper prior to resuming work that will impact the nest site.

No disturbance of any alligator nests shall be allowed without first obtaining an appropriate permit from FWC. Typically alligators lay their eggs in late June or early July with the eggs hatching in late August or September, however this nesting period may vary. Should an aggressive alligator be encountered, workers should contact the FWC by phoning the Nuisance Alligator Hotline (1-866-FWC-GATOR is current number; may change over time). Construction workers are prohibited from taking any actions against alligators.

Residents moving into the development will be informed that alligators and crocodiles may be present in the stormwater management system lakes throughout the development. Pamphlets outlining safety precautions relative to living with alligators will be provided. These safety precautions will include prohibitions against feeding, pet care and control, and other safety measures.

LISTED WADING BIRDS

Little blue herons (*Egretta caerulea*), snowy egrets (*Egretta thula*), white ibis (*Eudocimus albus*), tricolored herons (*Egretta tricolor*), and wood storks (*Mycteria americana*) have been documented foraging in various agricultural ditches and certain wetlands on both properties. Other listed wading birds may also occasionally visit the on-site ditches, some of the on-site wetlands, and appropriate wetland habitats in nearby off-site areas. These species could theoretically include roseate spoonbill (*Ajaja ajaja*) and limpkin (*Aramus guarauna*). No listed wading bird nests or rookeries have been found on the property or in the nearby areas. Although it is unlikely that any of the cited listed wading birds will establish nests within the on-site wetlands or in the wetlands present in the adjacent areas, this possibility cannot be completely ignored.

No more than 3 weeks prior to conducting any activities that will impact a particular on-site wetland during the nesting season (i.e. clearing, excavation, filling), a qualified environmental professional will inspect the wetland for the presence of listed wading bird nests. Similarly, no more than 3 weeks prior to conducting any mitigation activities that will significantly disturb an existing wetland areas during the nesting season (i.e. grading activities, initial clearing/removal of larger Brazilian pepper shrubs and trees), a qualified environmental professional will also inspect the wetland for the presence of listed wading bird nests. If active nests are found, a buffer zone extending approximately 300 feet beyond the nests in all directions will be established. No activities that might disturb the nests or nesting activities will be conducted in the established buffer zone until after the eggs have hatched and the surviving young birds have fledged and left the nests. Field personnel will be notified of the presence of the nest site(s) and buffer zones, which will be clearly marked, and advised to that any activities near the buffer zones should be conducted to minimize the potential for disruption of nesting.

FLORIDA SANDHILL CRANES

A couple Florida sandhill cranes (*Grus canadensis pratensis*) have been documented foraging in fields located on the Estancia property. No crane nests have been found on-site or in the nearby areas. It is doubtful that sandhill cranes will elect to establish nests on the property at some point in the future but the possibility, although remote, cannot be overlooked. There are no suitable nesting habitats currently present.

No more than 3 weeks prior to conducting construction activities that will impact potentially "suitable" Florida sandhill crane nesting habitats on the property (i.e. clearing, grading, excavation, filling), the areas will be inspected by a qualified environmental profession to determine if any active crane nests are present.

Similarly, no more than 3 weeks prior to conducting initial enhancement activities in the Preserve area that could disturb potential crane nests (i.e. grading activities, removal of larger Brazilian pepper shrubs), the wetland areas within the enhancement areas will be inspected. If an active Florida sandhill crane nest is found, a buffer zone extending approximately 750 feet beyond the nest in all directions will be established. No activities that might disturb the nests or nesting activities will be conducted in the established buffer zone until after the eggs are hatched and the surviving young birds have left the nest. Field personnel will be notified of the presence of the nest site(s) and buffer zones, which will be clearly marked, and advised that any activities near the buffer zones should be conducted to minimize the potential for disruption of nesting.

CRESTED CARACARAS

No crested caracaras (*Caracara cheriway*) have been observed on either of the properties, and very limited nesting habitat is present. However it is possible that potential nesting areas are nearby. There is a remote possibility that caracaras could establish an on-site nest prior to commencement of project construction, hence pre-clearing surveys will be performed.

An on-site survey for caracaras and their nests will be performed during the first breeding season preceding commencement of clearing/construction activities proposed and in nearby off-site areas. Observations will be made along pedestrian transects and stationary points during the mornings and evenings (crepuscular). The survey will be conducted 6 times (on 6 different days) during the period from January through March with 4 to 7 days between each survey event. If a caracara nest is found, the nest location will be marked and the FWS will be contacted for further guidance. No clearing/construction activities will commence within the primary management zone (300 meter radius surrounding nest) or the secondary management zone (1,000 meter radius surrounding nest) associated with the nest until appropriate authorization is obtained from FWS. Under this scenario, a Special Purpose Permit may also need to be acquired from FWC should FWS recommend removal (incidental take) of the nest tree during the non-nesting season.

FLORIDA PANTHERS

Florida panthers (*Puma concolor coryi*) have been documented on and adjacent to the project lands primarily within the more natural habitats present in the wetland islands within the farm fields as well as in the wetlands south of the project site. Certain measures will be taken to help minimize potential impacts of the Estancia and Oyster Harbor East projects to panthers. These measures will include:

- Prior to the start of clearing activities, the Florida Fish and Wildlife Conservation Commission will be contacted to insure that no known collared or un-collared panthers are present within or immediately adjacent to the clearing limits.
- Construction traffic on the job site will be limited to 30 mph.
- The site development includes a perimeter stormwater management feature that will act as a buffer between the development and the forested areas to the east and south of the project site.
- Residents will be provided with educational signage and other information related to living with panthers in an effort to minimize the potential for adverse resident / panther interactions.

EASTERN INDIGO SNAKES

Eastern indigo snakes (*Drymarchon corais couperi*) have not been documented on the property but could theoretically be present. Because the eastern indigo snake is protected under the Endangered Species Act of 1973, there are civil and criminal penalties for injuring, harming, harassing or killing this species. The permittee and/or the permittee's contractors may be held responsible for any eastern indigo snakes harmed, harassed, or killed as a result of the construction activities.

To help avoid harm to these snakes and to help maintain any existing populations, the permittee will engage in a protection program during initial stages of construction (i.e. clearing, excavation, filling) on-site as well as during initial enhancement activities in the conservation areas (i.e. initial clearing and grading activities, initial mechanized eradication of exotic plants).

Educational pamphlets will be prepared and distributed to all mitigation and construction crews prior to commencement of construction and mitigation activities. These pamphlets will generally describe laws pertaining to the eastern indigo snake, characteristics of the snake (description, habitats, etc.), protocols and procedures to follow if an eastern indigo snake is encountered, and telephone numbers of pertinent agencies to be contacted if an indigo snake is found dead.

If an eastern indigo snake is sighted during clearing/construction operations, the following measures will be taken: (1) Immediately cease construction/clearing activities in the area of the sighting; (2) Notify the construction or mitigation supervisor, as applicable, and the designated biologist of the sighting; (3) Allow the snake to move out of the construction/clearing area on its own before resuming construction activities in the area of sighting, or; (4) If the snake remains within or immediately adjacent to the construction/clearing area, the designated biologist will capture the snake, at which time construction/clearing operations can resume, and will relocate it to a suitable area off-site that is within the immediate project vicinity. Only the designated biologist shall come in contact with or relocate an eastern indigo snake. Any snake captured will be immediately released into appropriate habitat. Indigo

snakes are to be held in captivity only long enough to transport them to the release site. At no time will two or more snakes be kept in the same container during transport.

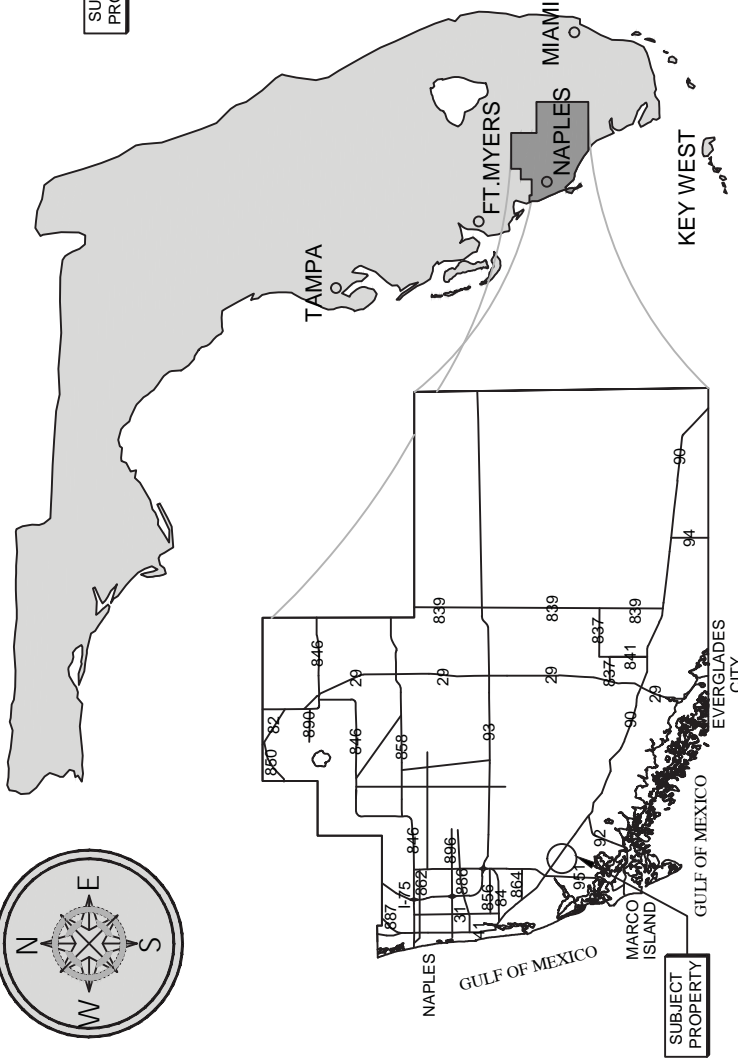
The designated biologist, or another qualified biologist acting under the direction and supervision of the designated biologist, will be present during the first week of major construction clearing/grading activities that occur in potentially suitable indigo snake habitats. Thereafter, said biologist will conduct spot checks of these areas during initial clearing/construction operations as deemed necessary by the biologist. The biologist will also be present during the first week of the initial clearing and grubbing activities in the project's conservation areas. Following this, the biologist will conduct spot checks of affected portions of the conservation areas during initial clearing, grubbing, and grading activities and during initial mechanized exotic eradication activities as deemed necessary by the biologist. The purpose of these inspections will be to monitor construction/clearing areas for the presence of eastern indigo snakes and to help ensure that appropriate measures are being taken to protect this species.

BURROWING OWLS

No burrowing owls (*Athene cunicularia*) have been found on the property though owls have been documented less than ½ mile to the west of the project site within the Fiddler's Creek Aviamar development site. It is unlikely that any burrowing owls currently reside on the Estancia or Oyster Harbor East properties given the active agricultural operations, however it is possible that they could move onto the project site once these activities cease and portions of the site go fallow.

Prior to any clearing or construction activities, another survey will be completed to examine the project areas for burrows. This will include qualified biologists examining the site in walking transects to scout any active burrows. Should any owl burrows be located, a permit from FWC will be obtained to relocate the owl if it is within a project development area. This burrow take procedure will follow all FWC regulations.

STATE OF FLORIDA



COLLIER COUNTY

SITE ADDRESS:
 <> US 41
 NAPLES, FL 34114

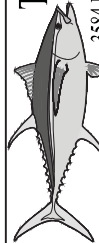
NOTES:
 <> THESE DRAWINGS ARE FOR PERMITTING PURPOSES ONLY
 AND ARE NOT INTENDED FOR CONSTRUCTION USE.

<> LATITUDE: N 26° 1' 13.597"
 <> LONGITUDE: W 81° 38' 54.314"

VICINITY MAP



COUNTY AERIAL



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FIDDLERS CREEK - ESTANCIA & OYSTER HARBOR LOCATION MAP

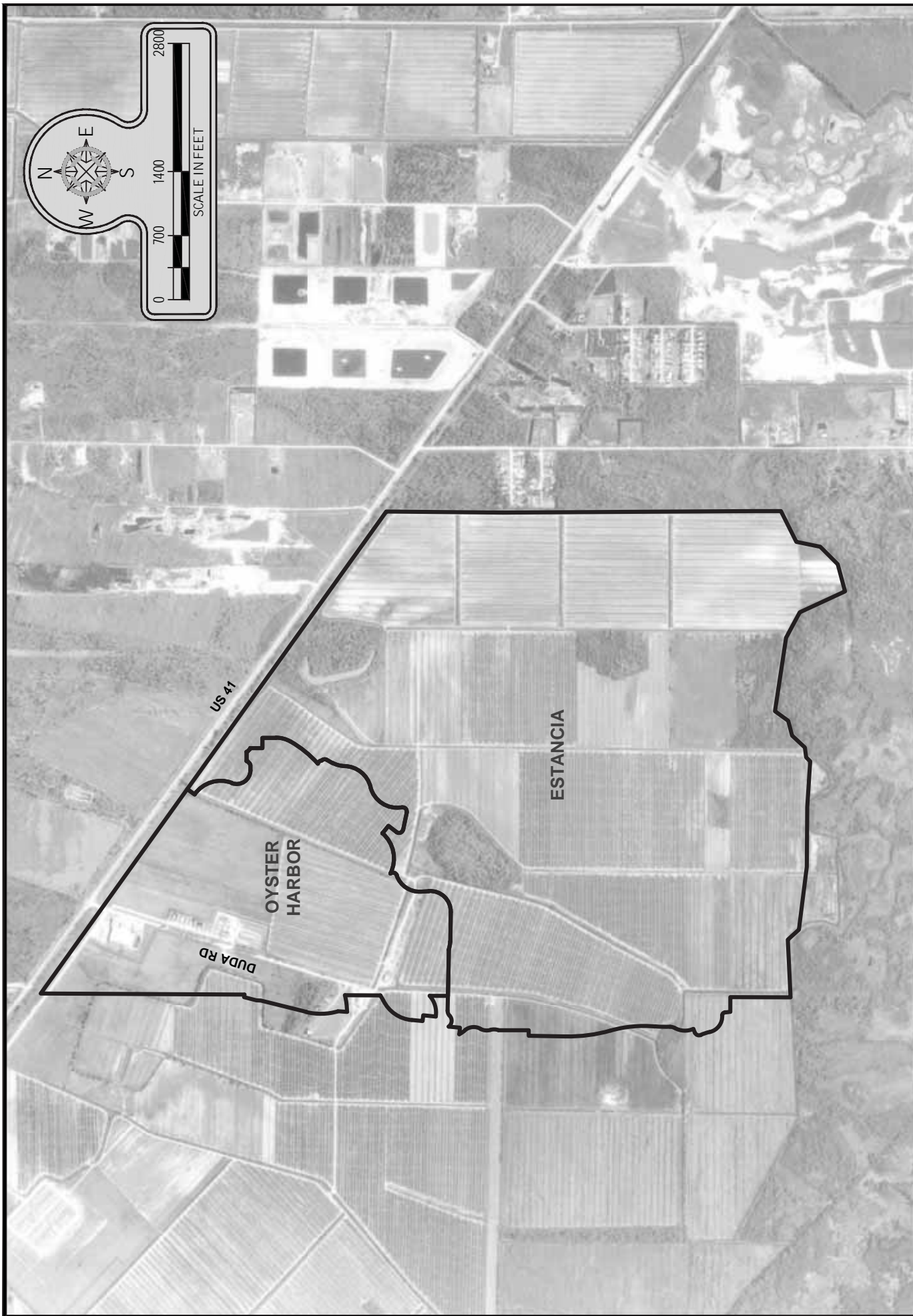
FIGURE 1

DESIGNED:	TH	DATE	CHK BY:	CHANGES:
DRAWN BY:	RMJ	09-18-15	TH	REVISED FLUCCS
CREATED:	07-27-15	-	-	-
JOB NO.:	1305.2	-	-	-
SHEET NO.:	01 OF 16	-	-	-

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SECTION- 18&19 TOWNSHIP- 50S

RANGE- 27E



FIDDLERS CREEK - ESTANCIA & OYSTER HARBOR

1980 HISTORICAL AERIAL

FIGURE 2

AERIAL DATE: 1980

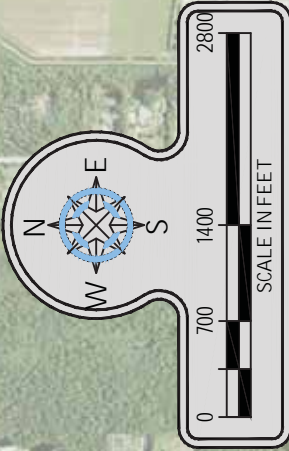
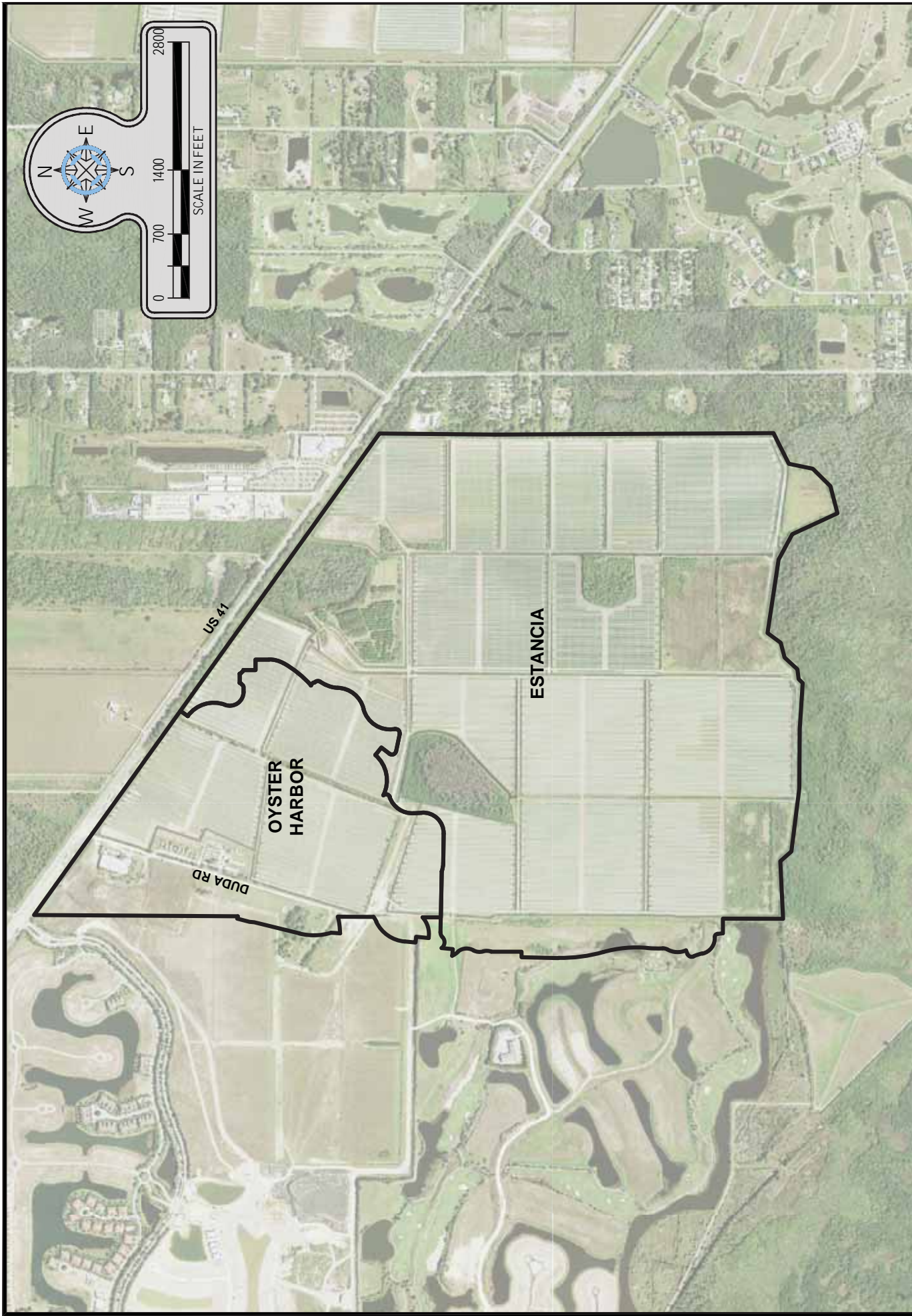
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DESIGNED:	TH	DATE	CHECKED:	DATE
DRAWN BY:	RMJ	1	-	-
CREATED:	07-27-15	2	-	-
JOB NO.:	1305.2	3	-	-
SHEET NO.:	02 OF 16	4	-	-
		5	-	-

SECTION- 18&19 TOWNSHIP- 50S RANGE- 27E



FIDDLERS CREEK - ESTANCIA & OYSTER HARBOR

EXISTING AERIAL

AERIAL DATE: 2015

FIGURE 3

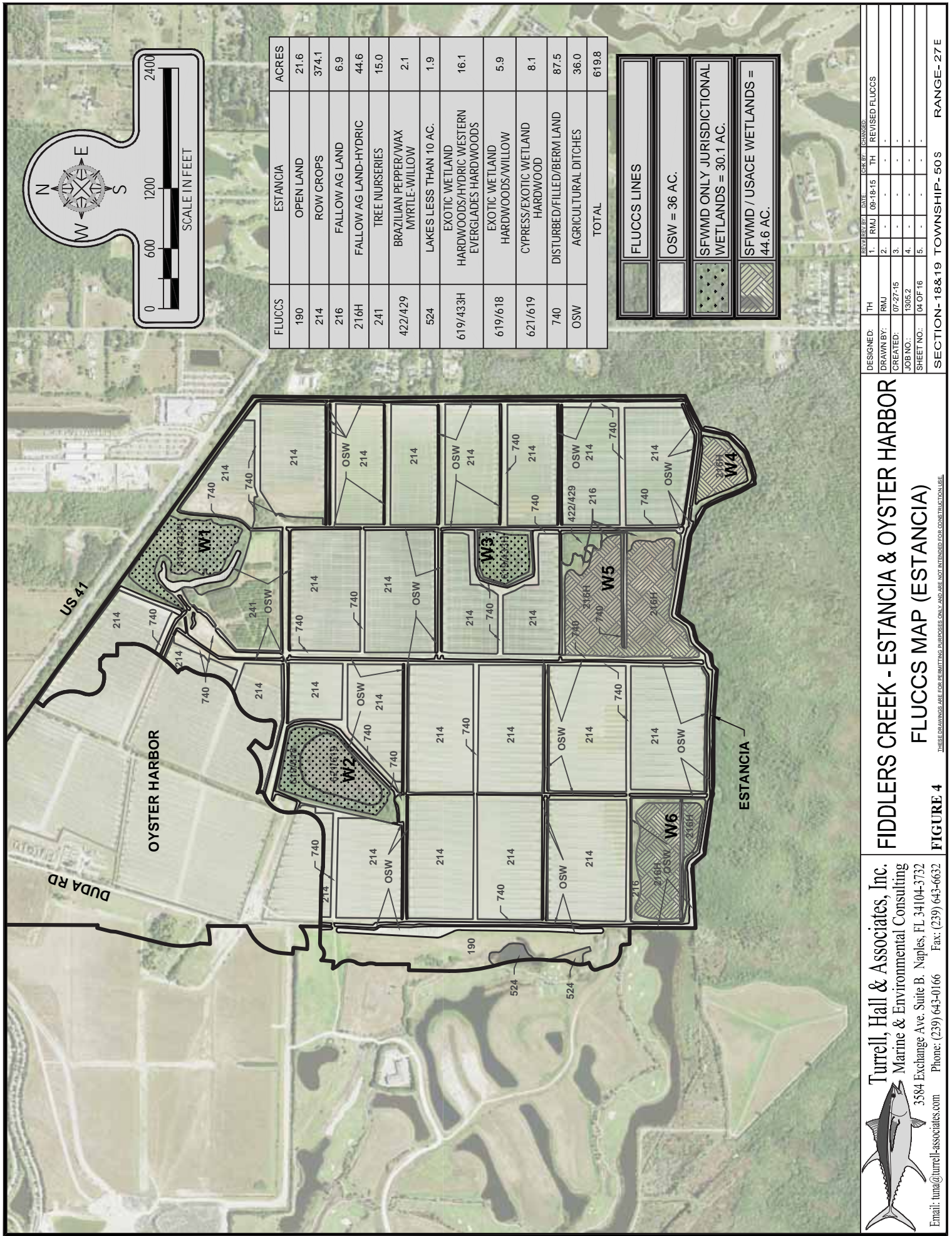
THESE DRAWINGS ARE FOR PERMITTING PURPOSES ONLY AND ARE NOT INTENDED FOR CONSTRUCTION USE.

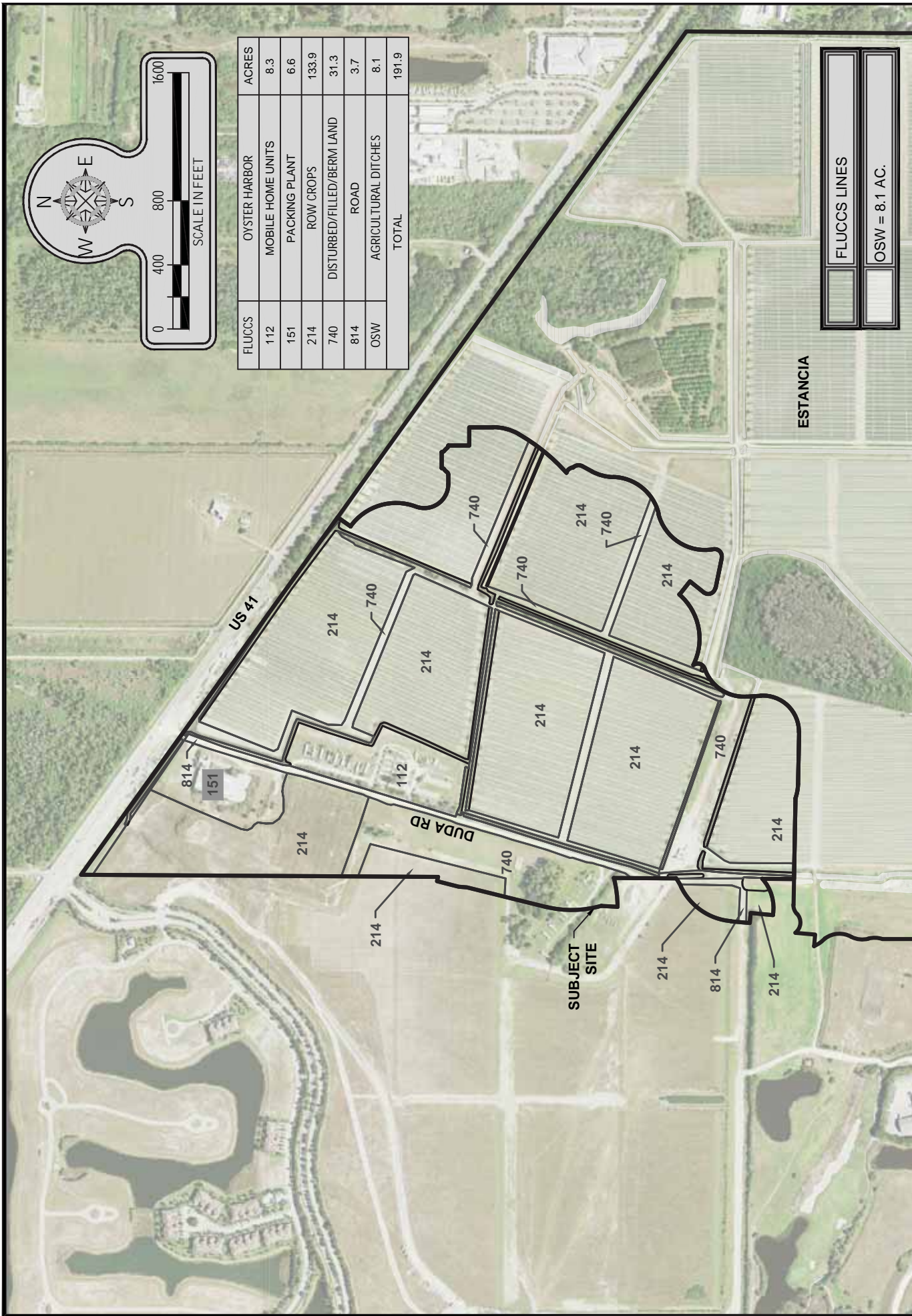


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DESIGNED:	TH	DATE	CHECKED:	DATE
DRAWN BY:	RWJ	1.	-	-
CREATED:	07-27-15	2.	-	-
JOB NO.:	1305.2	3.	-	-
SHEET NO.:	03 OF 16	4.	-	-
		5.	-	-

SECTION- 18&19 TOWNSHIP- 50S RANGE- 27E





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FIGURE 5

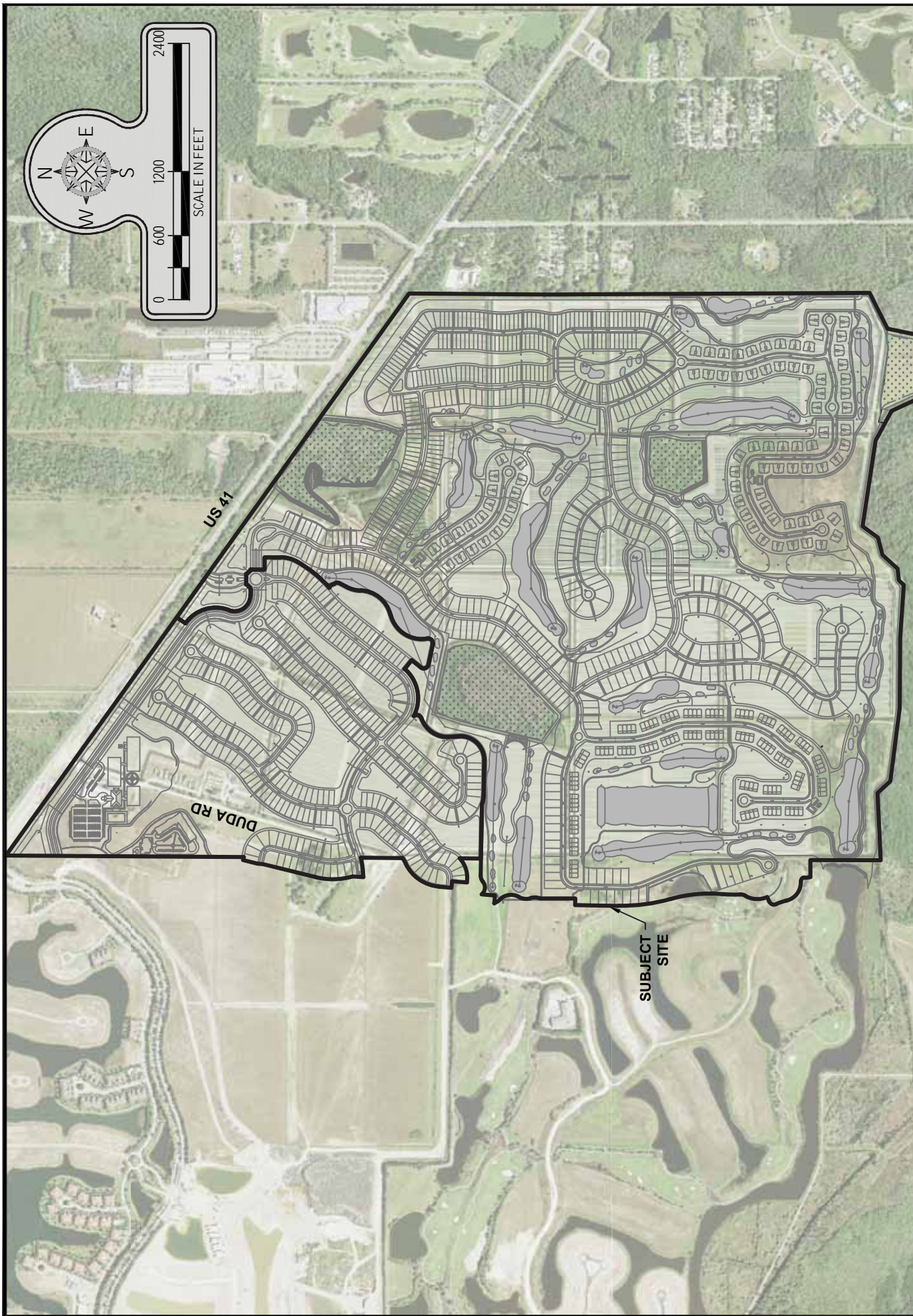
FIDDLERS CREEK - ESTANCIA & OYSTER HARBOR

FLUCCS MAP (OYSTER HARBOR)

SECTION- 18&19 TOWNSHIP- 50 S RANGE- 27 E

DESIGNED:	TH	DATE:	DATE:	DATE:	DATE:
1. RMJ	10-07-15	TH	FLUCCS TABLE		
2. RMJ	06-18-15				
3. RMJ	1305.2				
4. RMJ	05 OF 16				
5. RMJ					

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DESIGNED:	TH	DATE	CHECKED:	DATE
1.	-	-	-	-
DRAWN BY:	RWJ	-	-	-
2.	-	-	-	-
CREATED:	07-27-15	-	-	-
3.	-	-	-	-
JOB NO.:	1305.2	-	-	-
4.	-	-	-	-
SHEET NO.:	06 OF 16	-	-	-
5.	-	-	-	-

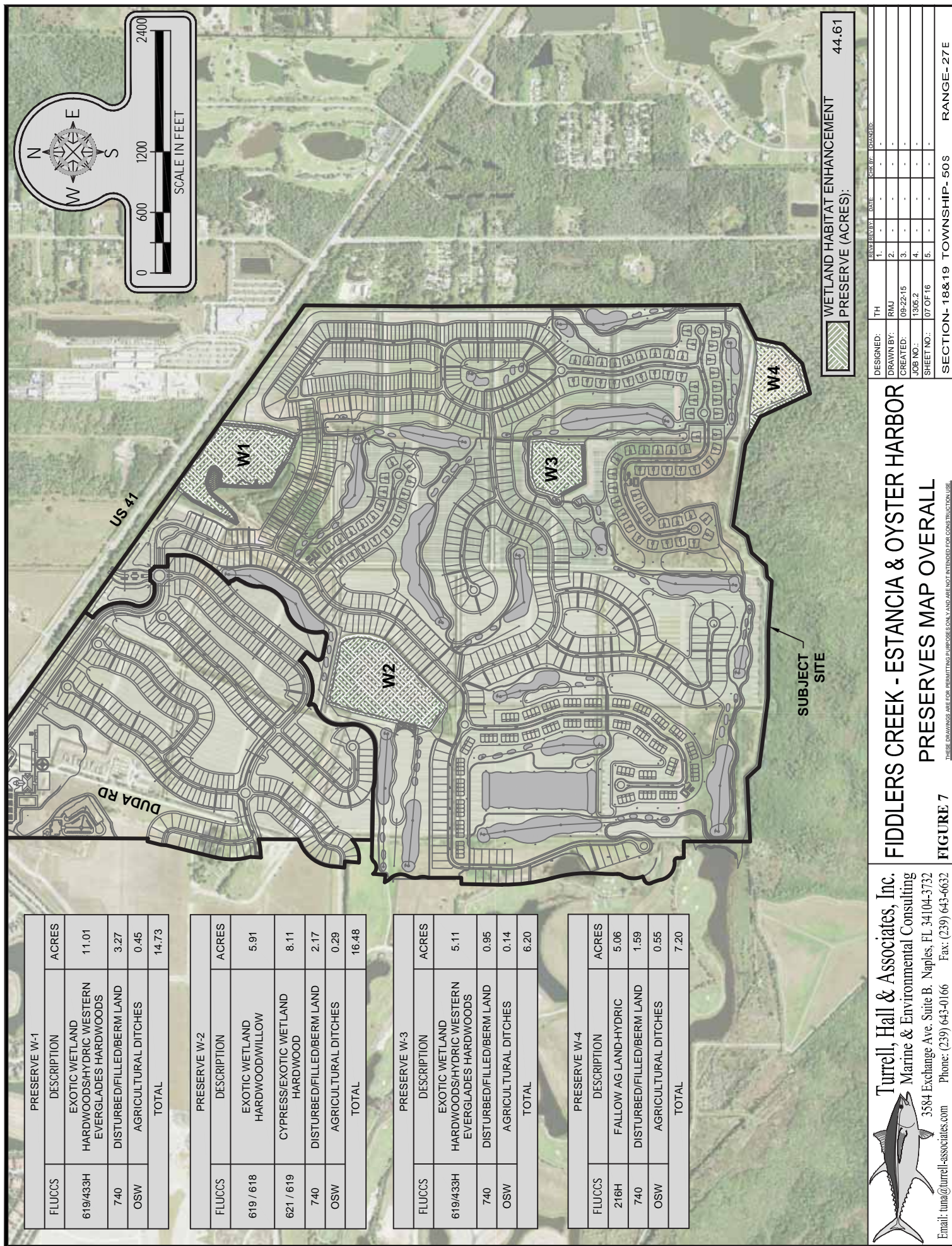
FIDDLERS CREEK - ESTANCIA PROPOSED SITE PLAN

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FIGURE 6

SECTION- 18&19 TOWNSHIP- 50S RANGE- 27E


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PRESERVE W-1		
FLUCCS	DESCRIPTION	ACRES
619/433H	EXOTIC WETLAND HARDWOODS/HYDRIC WESTERN EVERGLADES HARDWOODS	11.01
740	DISTURBED/FILLED/BERM LAND	3.27
OSW	AGRICULTURAL DITCHES	0.45
TOTAL		14.73

PRESERVE W-2		
FLUCCS	DESCRIPTION	ACRES
619 / 618	EXOTIC WETLAND HARDWOOD/WILLOW	5.91
621 / 619	CYPRESS/EXOTIC WETLAND HARDWOOD	8.11
740	DISTURBED/FILLED/BERM LAND	2.17
OSW	AGRICULTURAL DITCHES	0.29
TOTAL		16.48

PRESERVE W-3		
FLUCCS	DESCRIPTION	ACRES
619/433H	EXOTIC WETLAND HARDWOODS/HYDRIC WESTERN EVERGLADES HARDWOODS	5.11
740	DISTURBED/FILLED/BERM LAND	0.95
OSW	AGRICULTURAL DITCHES	0.14
TOTAL		6.20

PRESERVE W-4		
FLUCCS	DESCRIPTION	ACRES
216H	FALLOW AG LAND-HYDRIC	5.06
740	DISTURBED/FILLED/BERM LAND	1.59
OSW	AGRICULTURAL DITCHES	0.55
TOTAL		7.20


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FIDDLERS CREEK - ESTANCIA & OYSTER HARBOR

PRESERVES MAP OVERALL

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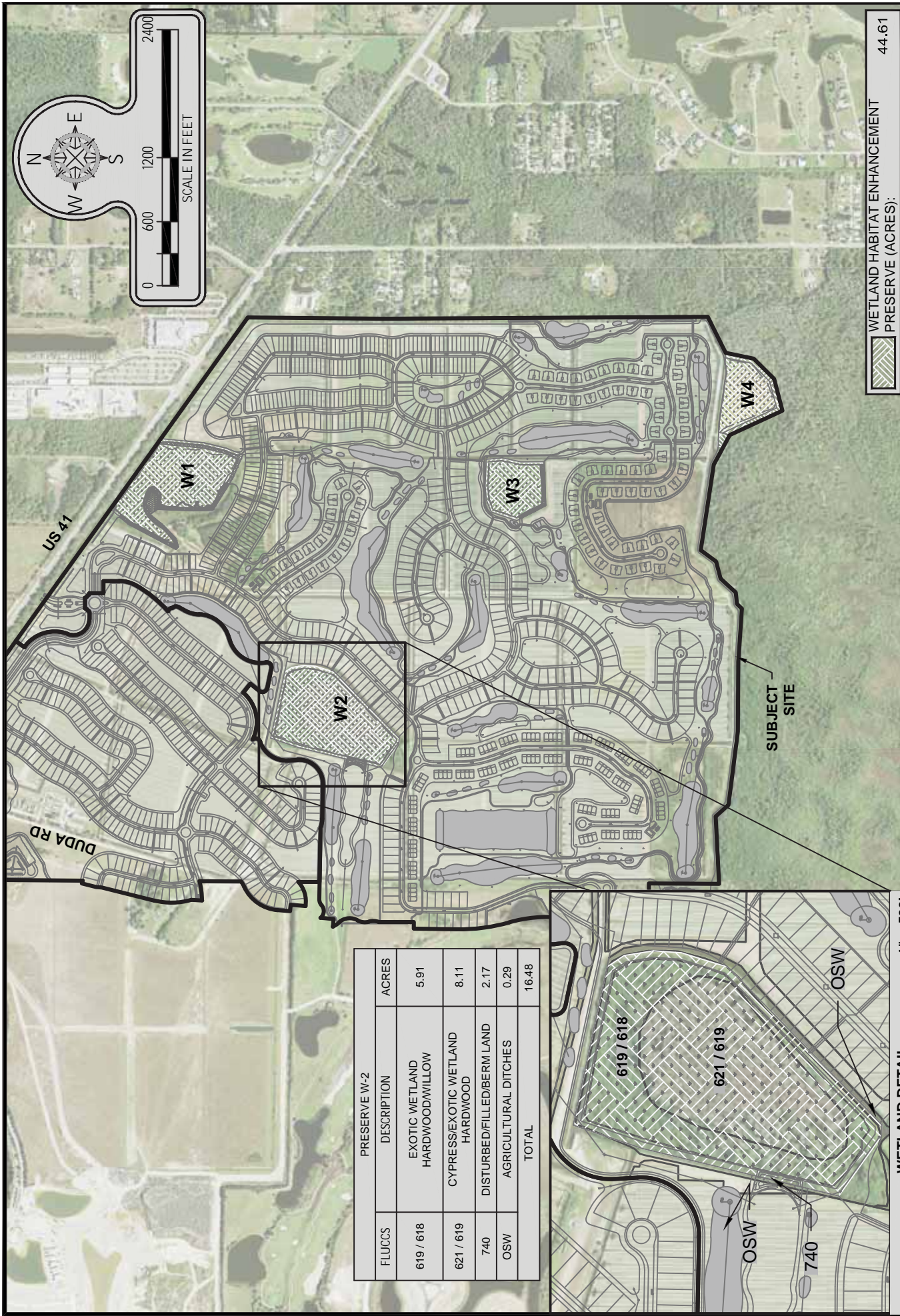
FIGURE 7

WETLAND HABITAT ENHANCEMENT
 PRESERVE (ACRES): 44.61

DESIGNED:	TH	REVISED:	DATE	CHECKED:	DATE
DRAWN BY:	RMJ	1.	-	-	-
CREATED:	08-22-15	2.	-	-	-
JOB NO.:	1306.2	3.	-	-	-
SHEET NO.:	07 OF 16	4.	-	-	-
		5.	-	-	-

RANGE - 27E

SECTION- 18&19 TOWNSHIP- 50S



PRESERVE W-2		
FLUCCS	DESCRIPTION	ACRES
619 / 618	EXOTIC WETLAND HARDWOOD/WILLOW	5.91
621 / 619	CYPRESS/EXOTIC WETLAND HARDWOOD	8.11
740	DISTURBED/FILLED/BERM LAND	2.17
OSW	AGRICULTURAL DITCHES	0.29
TOTAL		16.48



WETLAND HABITAT ENHANCEMENT
PRESERVE (ACRES): 44.61

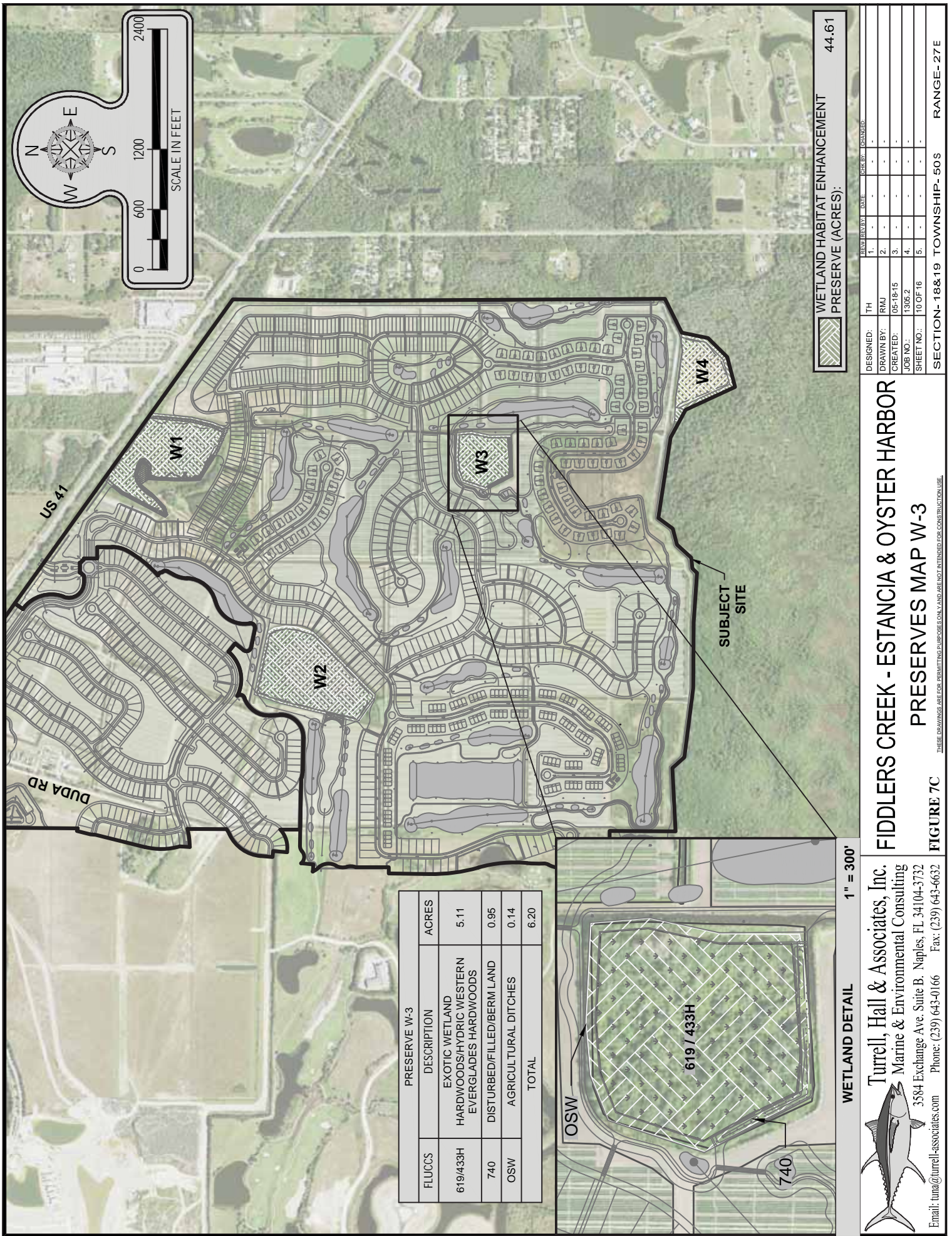
FIDDLERS CREEK - ESTANCIA & OYSTER HARBOR PRESERVES MAP W-2

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DESIGNED:	TH	REVISED:	DATE	CHECK BY:	DATE
DRAWN BY:	RMJ	1.	-	-	-
CREATED:	08-22-15	2.	-	-	-
JOB NO.:	1306.2	3.	-	-	-
SHEET NO.:	09 OF 16	4.	-	-	-
		5.	-	-	-

SECTION- 18&19 TOWNSHIP- 50S RANGE- 27E

FIGURE 7B THESE DRAWINGS ARE FOR PERMITTING PURPOSES ONLY AND ARE NOT INTENDED FOR CONSTRUCTION USE.



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**FIDDLERS CREEK - ESTANCIA & OYSTER HARBOR
 PRESERVES MAP W-3**

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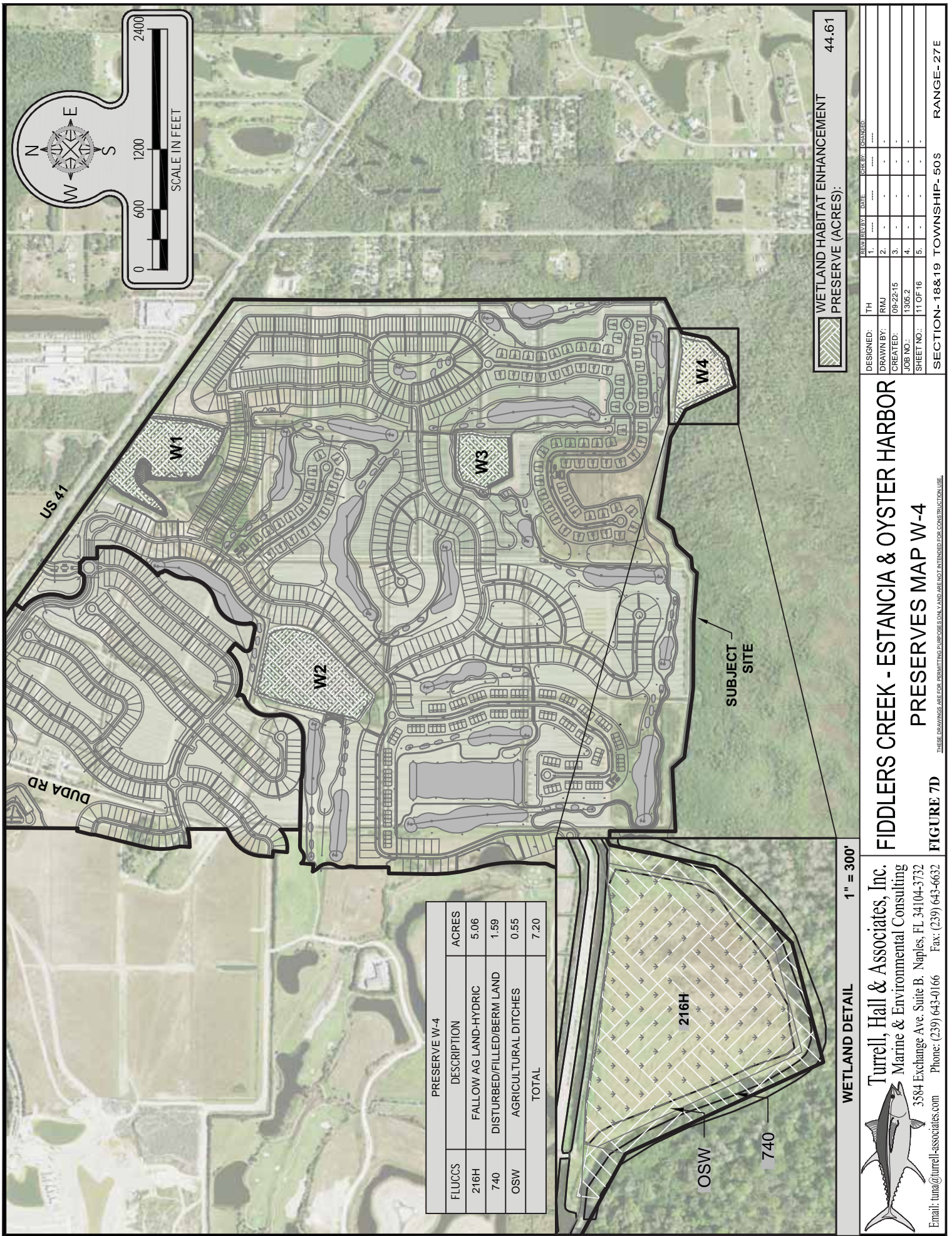
FIGURE 7C

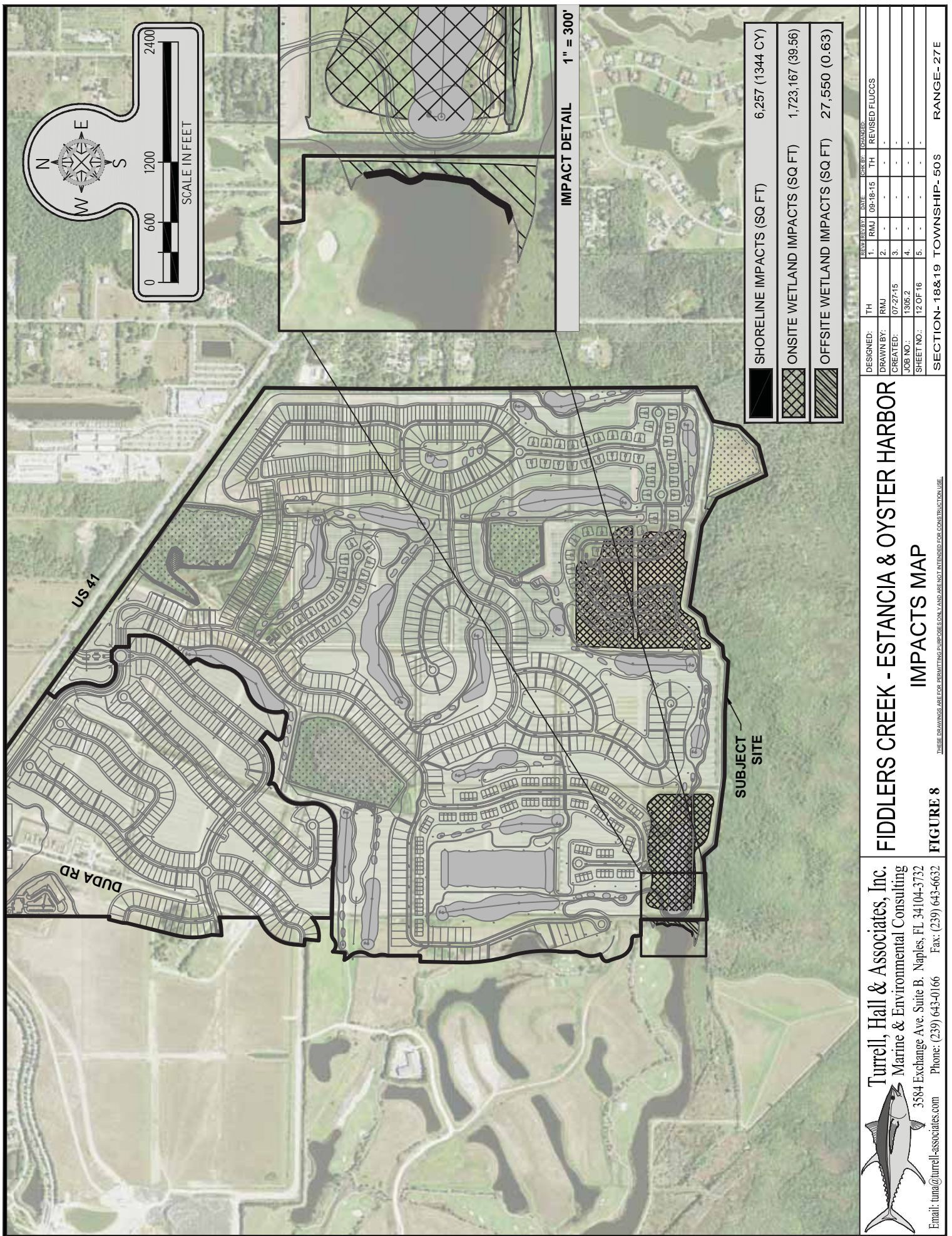
SECTION- 18&19 TOWNSHIP- 50S

RANGE- 27E

**WETLAND HABITAT ENHANCEMENT
 PRESERVE (ACRES): 44.61**

WETLAND DETAIL 1" = 300'

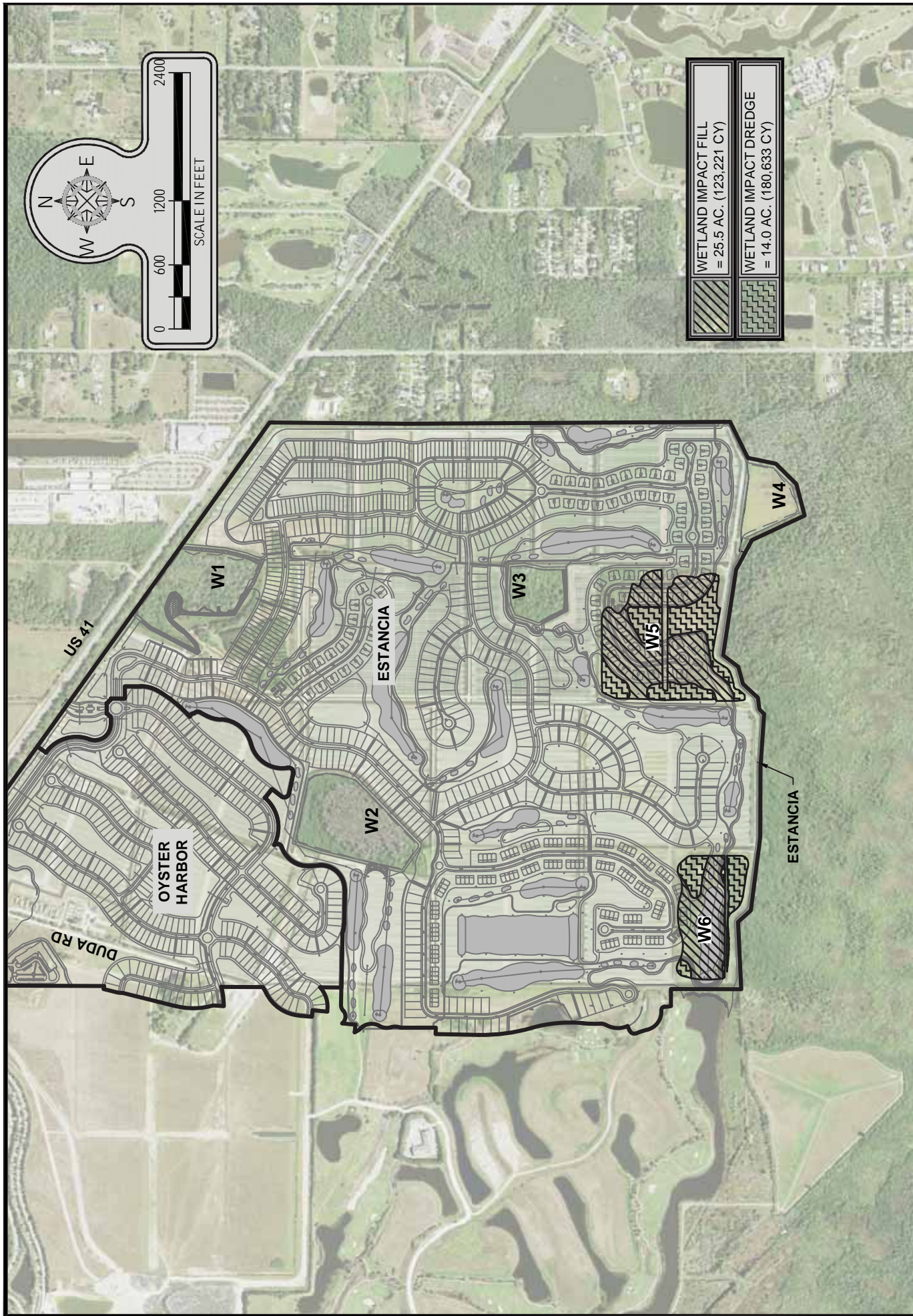




FIDDLERS CREEK - ESTANCIA & OYSTER HARBOR **IMPACTS MAP**

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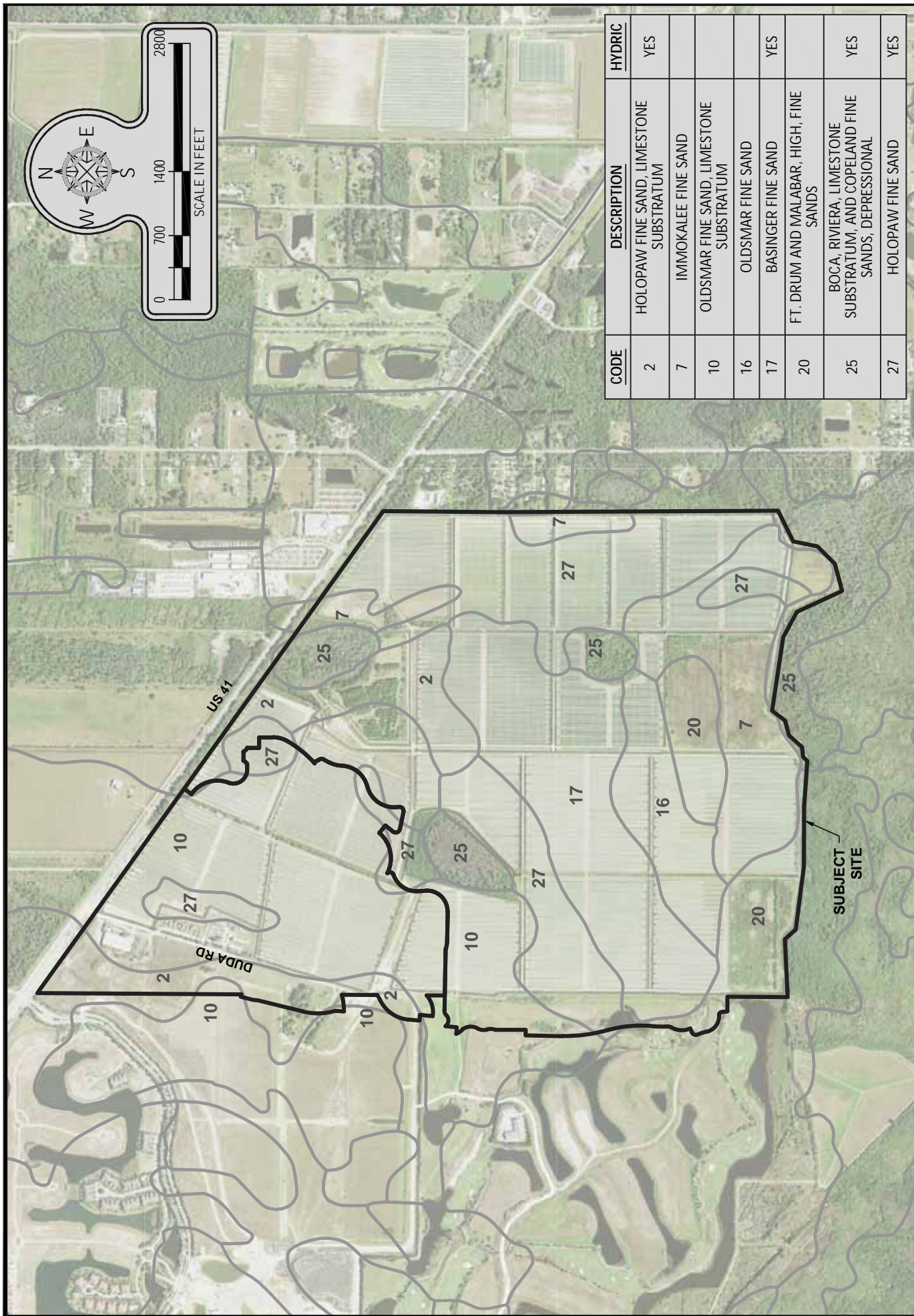
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DESIGNED:	TH	REVISED BY:	DATE:	CHK BY:	CHANGES:
DRAWN BY:	RMJ	1.	-	-	-
CREATED:	10-08-15	2.	-	-	-
JOB NO.:	1305.2	3.	-	-	-
SHEET NO.:	13 OF 16	4.	-	-	-
		5.	-	-	-

FIDDLERS CREEK - ESTANCIA & OYSTER HARBOR FILL & DREDGE MAP FIGURE 9 SECTION- 18&19 TOWNSHIP- 50 S RANGE- 27 E

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CODE	DESCRIPTION	HYDRIC
2	HOLOPAW FINE SAND, LIMESTONE SUBSTRATUM	YES
7	IMMOKALEE FINE SAND	
10	OLDSMAR FINE SAND, LIMESTONE SUBSTRATUM	
16	OLDSMAR FINE SAND	
17	BASINGER FINE SAND	YES
20	FT. DRUM AND MALABAR, HIGH, FINE SANDS	
25	BOCA, RIVIERA, LIMESTONE SUBSTRATUM, AND COPELAND FINE SANDS, DEPRESSIONAL	YES
27	HOLOPAW FINE SAND	YES

FIDDLERS CREEK - ESTANCIA & OYSTER HARBOR
SOILS MAP

FIGURE 10

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DESIGNED: TH
DRAWN BY: RMJ
CREATED: 07-27-15
JOB NO.: 1305.2
SHEET NO.: 14 OF 16

SECTION- 18&19 TOWNSHIP- 50S **RANGE- 27E**

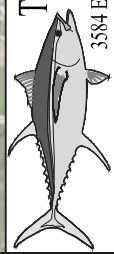
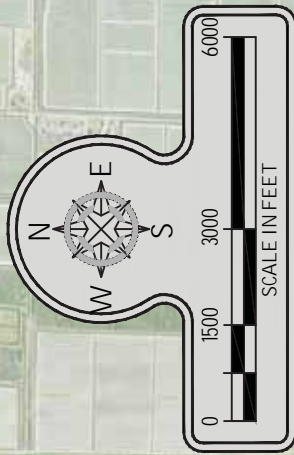
COLLIER BLVD (SR 951)

US 41
DUDA RD
OYSTER
HARBOR

ESTANCIA

DRI
BOUNDARY

DRI
BOUNDARY



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Email: tuno@turrell-associates.com

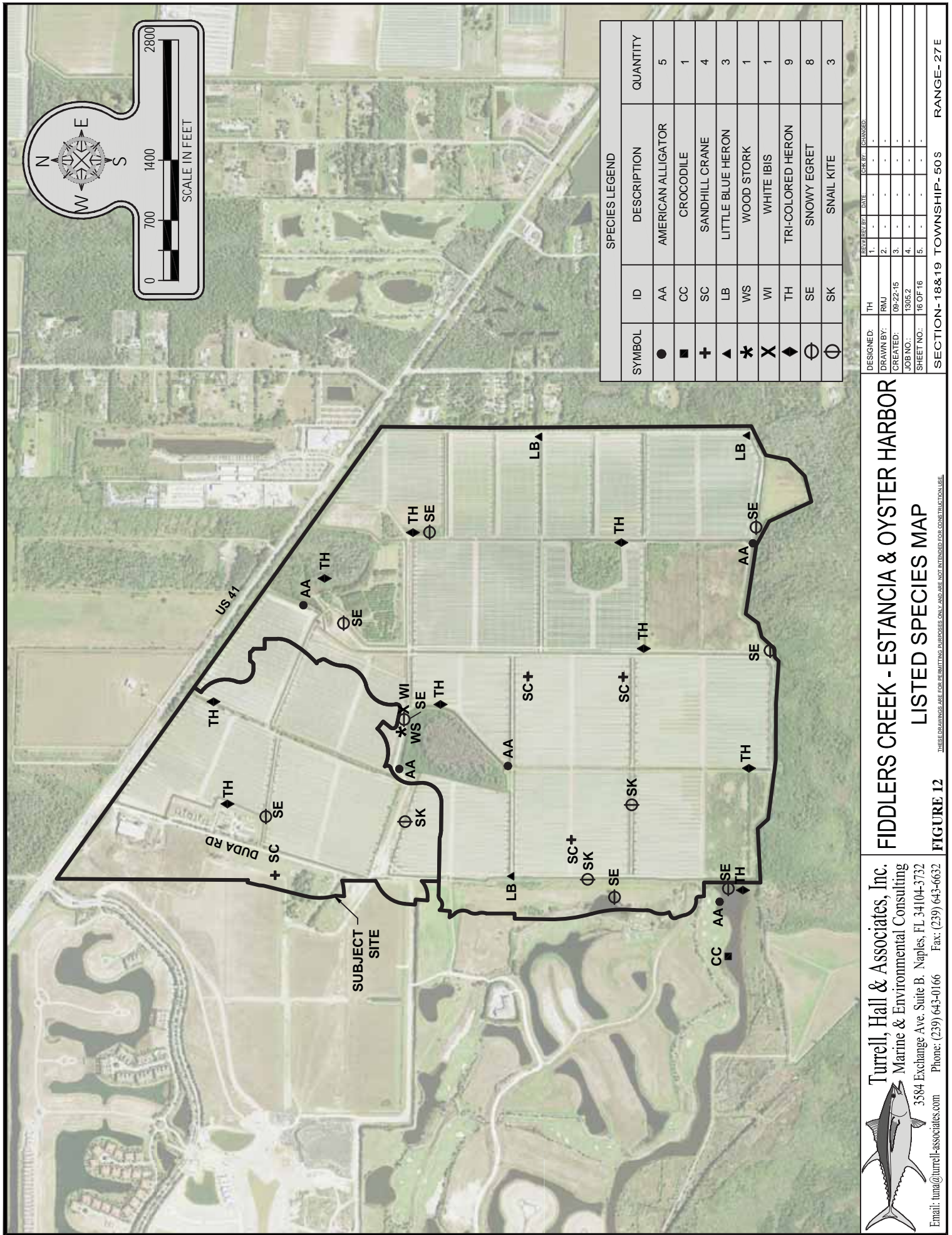
FIDDLERS CREEK - ESTANCIA & OYSTER HARBOR

AERIAL DATE: 2015
FIGURE 11
DRI BOUNDARY

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DESIGNED:	TH	REVISION	DATE	CHK BY	CHANGED
DRAWN BY:	RMJ	1.	-	-	-
CREATED:	08-06-15	2.	-	-	-
JOB NO.:	1306.2	3.	-	-	-
SHEET NO.:	15 OF 16	4.	-	-	-
		5.	-	-	-

SECTION- 18&19 TOWNSHIP- 50S RANGE- 27E



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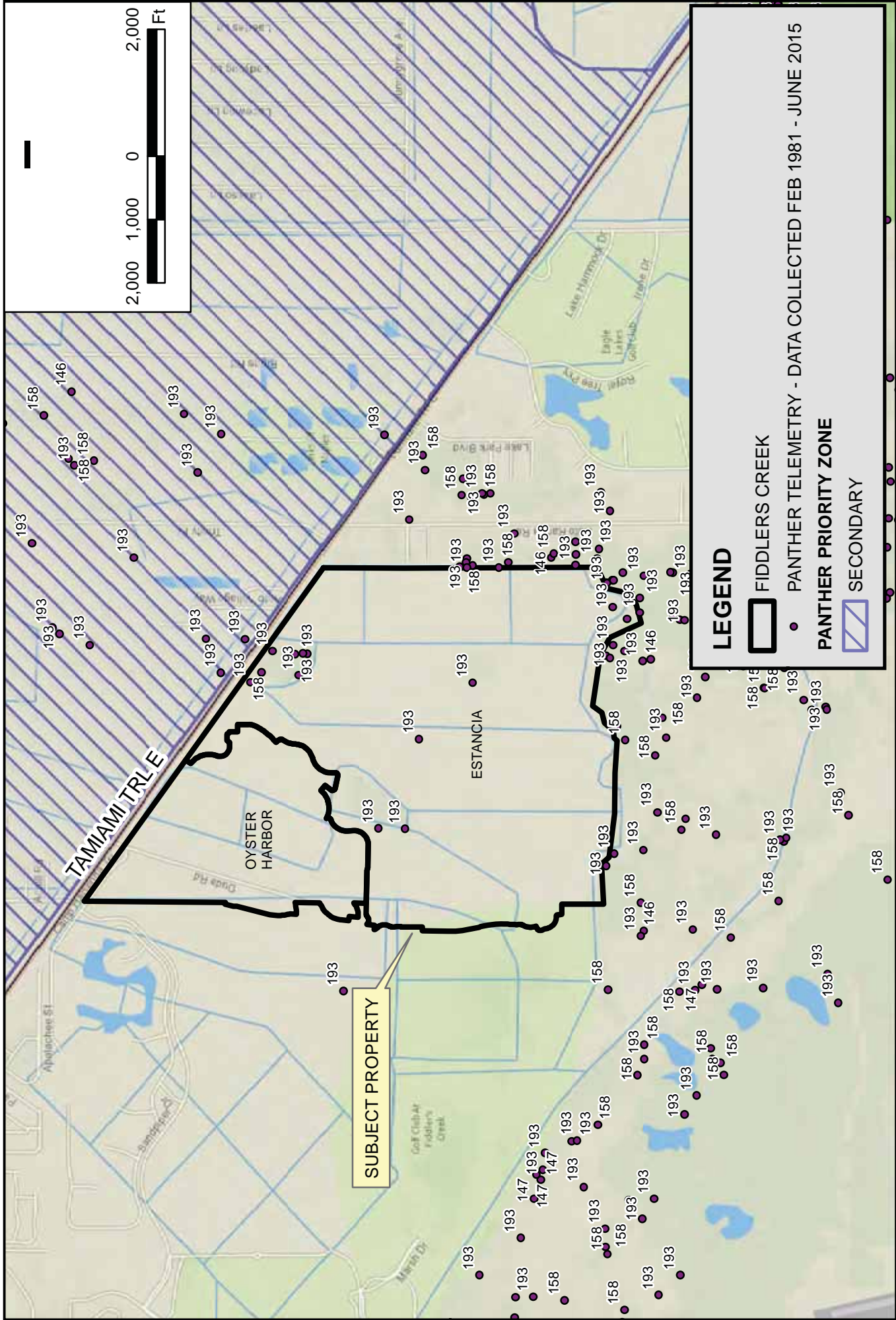
FIDDLERS CREEK - ESTANCIA & OYSTER HARBOR LISTED SPECIES MAP FIGURE 12

DESIGNED:	TH	REVISED BY:	DATE:	CHK BY:	CHANGES:
DRAWN BY:	RMJ	1	-	-	-
CREATED:	08-22-15	2	-	-	-
JOB NO.:	1305.2	3	-	-	-
SHEET NO.:	16 OF 16	4	-	-	-
		5	-	-	-

RANGE - 27 E

SECTION - 18&19 TOWNSHIP - 50 S

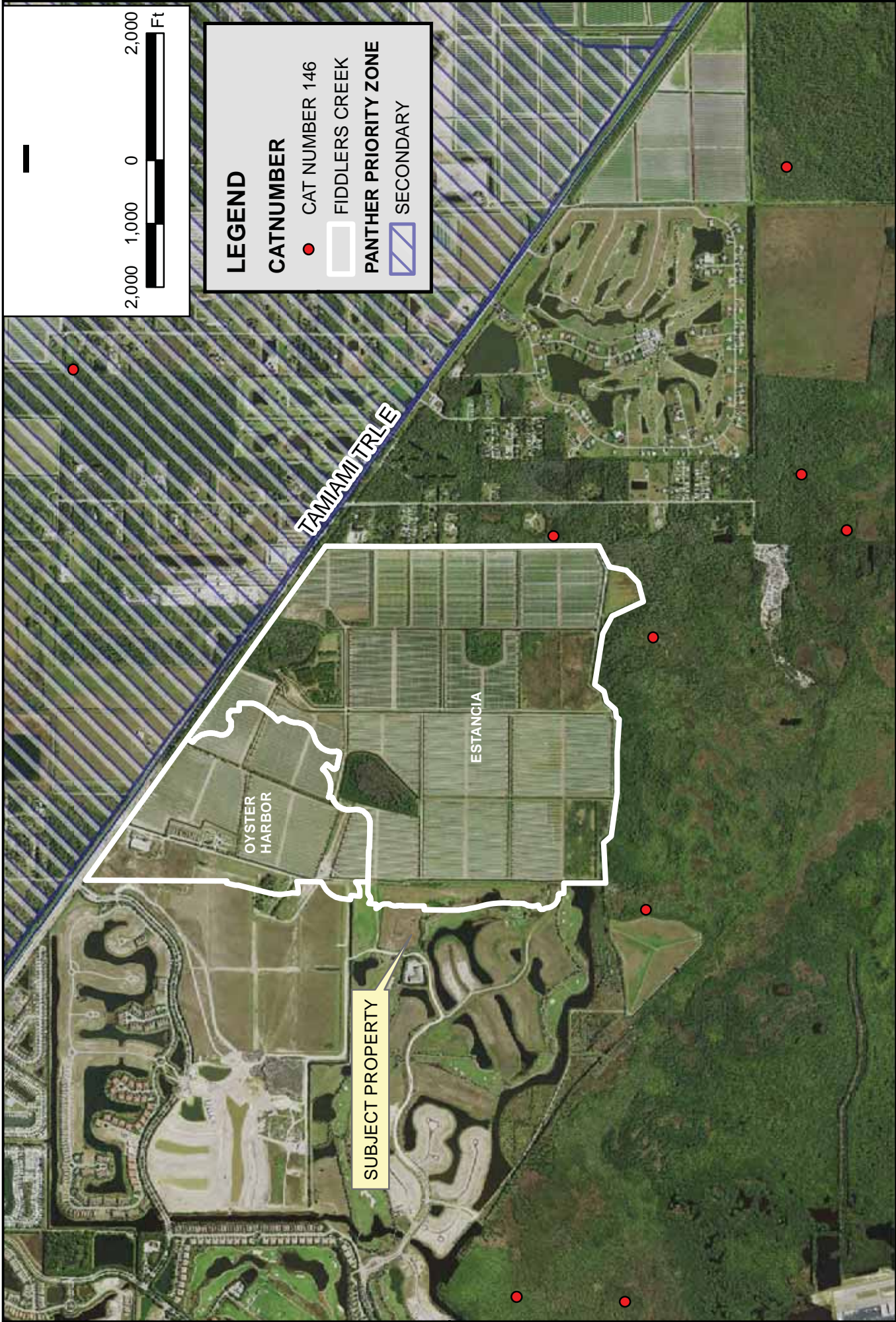
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LEGEND

-  FIDDLERS CREEK
-  PANTHER TELEMTRY - DATA COLLECTED FEB 1981 - JUNE 2015
-  PANTHER PRIORITY ZONE
-  SECONDARY

FIGURE 13



FIDDLERS CREEK - ESTANCIA & OYSTER HARBOR
 PANTHER PRIORITY ZONE & TELEMETRY MAP

DRAWN BY:	RMJ	REVISION:	SCALE:	1"=2,000'
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JOB NO.:	1305.2	N/A	P:\1305.2\JC Estancia\GIS\	
SHEET:	1	N/A	1305-PANTHER_140.mxd	

FIGURE 13A

SECTION- 18&19 TOWNSHIP-50S RANGE-27E



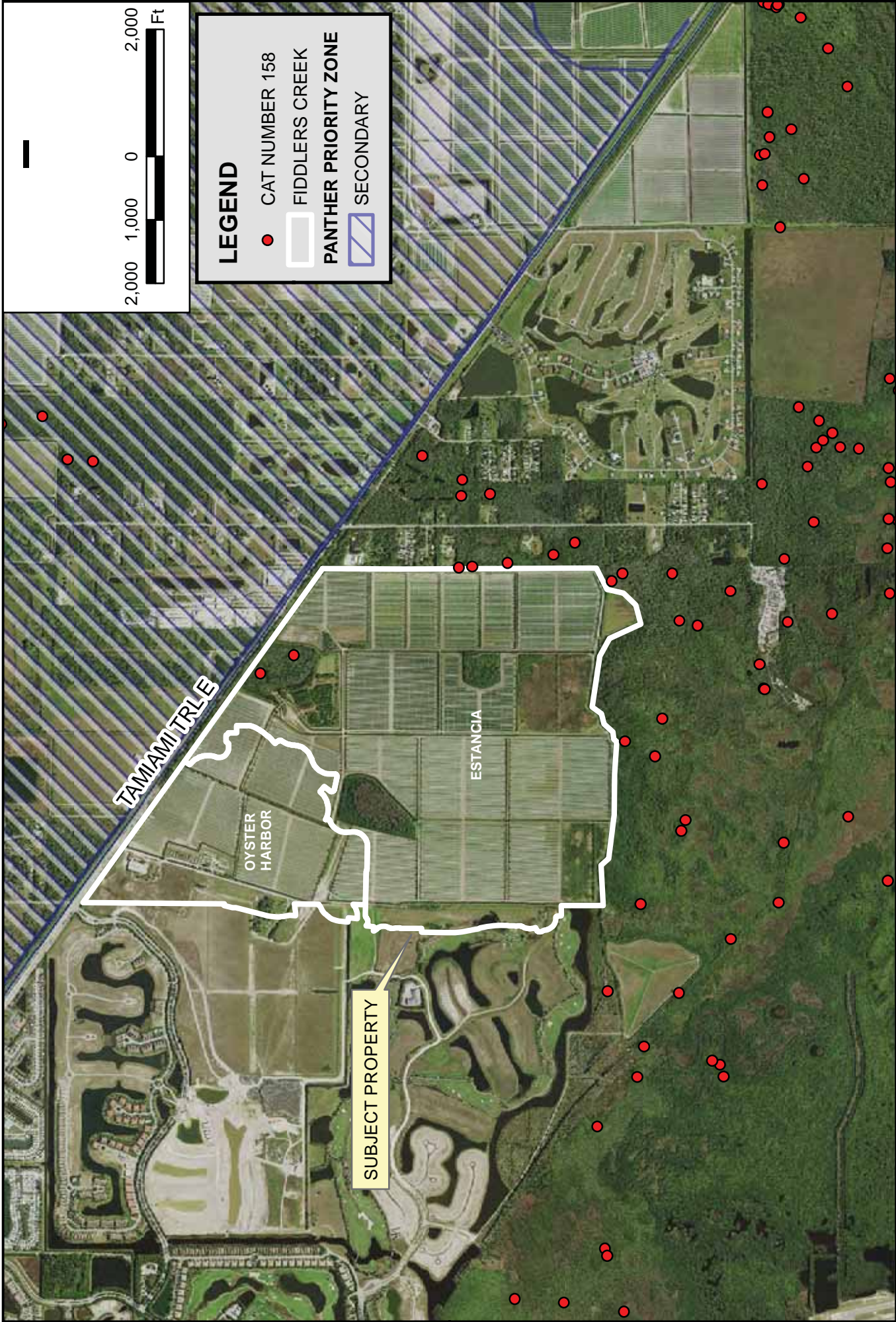


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FIDDLERS CREEK - ESTANCIA & OYSTER HARBOR
PANTHER PRIORITY ZONE & TELEMETRY MAP

FIGURE 13B

DRAWN BY:	RMJ	REVISION:	SCALE:
CREATED:	09-30-15	N/A	FILE PATH:
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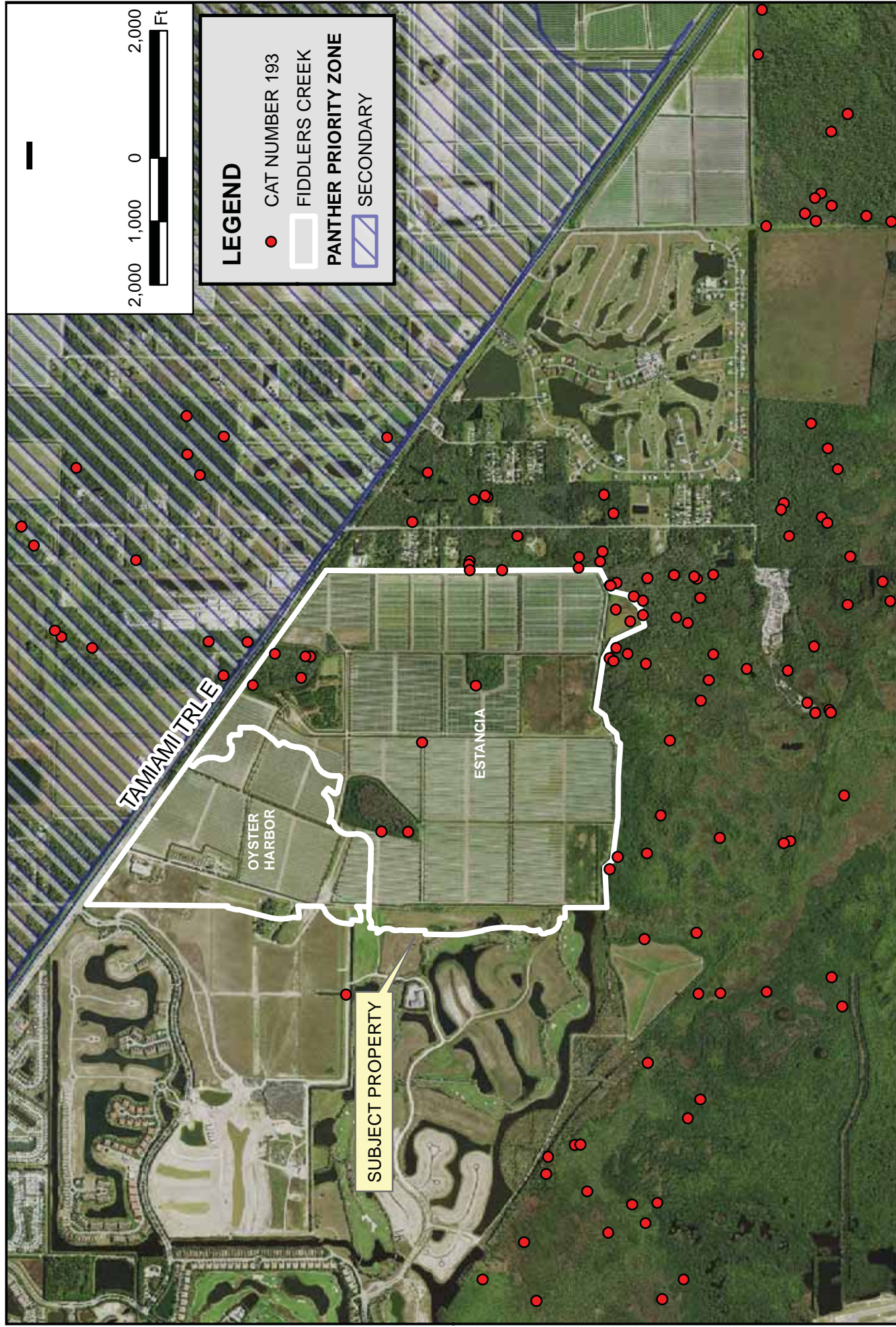


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FIDDLERS CREEK - ESTANCIA & OYSTER HARBOR
PANTHER PRIORITY ZONE & TELEMETRY MAP

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FIGURE 13C





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FIDDLERS CREEK - ESTANCIA & OYTSEER HARBOR
PANTHER PRIORITY ZONE & TELEMETRY MAP

FIGURE 1.3D

DRAWN BY:	RMJ	REVISION:	SCALE: 1"=2,000'
CREATED:	09-30-15		FILE PATH:
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SECTION: 18&19 TOWNSHIP- 50S RANGE- 27E

