NATURAL RESOURCES EVALUATION REPORT

Florida Department of Transportation

District One

Burnt Store Road PD&E Study

Limits of Project: From Van Buren Parkway to Charlotte County Line

Lee County, Florida

Financial Management Number: 436928-1-22-01

ETDM Number: 14380

Date: February 2023

The environmental review, consultation, and other actions required by applicable federal environmental laws for this project are being, or have been, carried out by the Florida Department of Transportation (FDOT) pursuant to 23 U.S.C. § 327 and a Memorandum of Understanding dated May 26, 2022 and executed by the Federal Highway Administration and FDOT.

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EXECUTIVE SUMMARY

The Florida Department of Transportation (FDOT), District One, is conducting a Project Development and Environment (PD&E) Study for the widening of Burnt Store Road (CR 765) in Lee County from Van Buren Parkway to the Charlotte County Line. The study also extends a quarter mile north into Charlotte County to tie into the existing four-lane segment. This study is approximately 5.7 miles. The purpose of the PD&E Study is to evaluate and document the benefits, costs, and impacts of widening Burnt Store Road from the existing two-lane undivided roadway to four lanes, while accommodating a typical section expandable to six lanes. Also evaluated was the addition of paved shoulders/marked bicycle lanes, sidewalks, and/or a shared-use path. This study will aid Lee County, Lee Metropolitan Planning Organization (MPO), FDOT District One, and the FDOT Office of Environmental Management (OEM) in reaching a decision on the type, preliminary design, and location of the proposed improvements. The study was conducted to meet the requirements of the National Environmental Policy Act (NEPA) and other related federal and state laws, rules, and regulations.

The Preferred Alternative has an urban typical section with curb and gutter and a closed roadway drainage system for the four-lane construction. It provides future expandability to 6-lanes by allowing for widening to the median. The 200-foot typical section includes two 11-foot travel lanes in each direction, a 40-foot median, 7-foot paved shoulders, and 10-foot shared use paths on each side of the roadway. Design and posted speeds of 50 miles per hour (mph) are proposed. This report reviews the possible impacts to wetlands systems, essential fish habitat and federal and state protected species related to construction of the Preferred Alternative. The identification of measures to avoid, minimize, and mitigate for any potential impacts is also discussed. A summary of the analysis of potential project impacts for the proposed improvements to Burnt Store Road is presented below.

PROTECTED SPECIES AND HABITATS

The project study area was evaluated for potential occurrences of federal and state protected plant and animal species in accordance with Section 7 of the Endangered Species Act of 1973, as amended, and Chapters 5B-40 and 68A-27 of the Florida Administrative Code (F.A.C.). The evaluation included literature and database reviews, as well as field assessments of the project study area to identify the potential occurrence of protected species and/or presence of federal-designated critical habitat (CH).

Based on evaluation of collected data and field reviews, the federal and state listed species discussed in **Table ES1** and **Table ES2** were observed or were determined to have the potential to occur within or adjacent to the project area. An effect determination was made for each of these federal and state listed species based on an analysis of the potential impacts of the proposed project on each species.

TABLE ES1: FEDERAL LISTED SPECIES IMPACT DETERMINATIONS

Project Effect	Federal Listed Species
No effect	**REPTILES**
	American crocodile (*Crocodylus acutus*)
	BIRDS
	Piping plover (*Charadrius melodus*)
	Eastern black rail (*Laterallus jamaicensis*)
	Rufus red knot (*Calidris canatus rufa*)
	MAMMALS
	Florida bonneted bat Critical Habitat
	Florida panther (*Puma concolor coryi*)
May affect, not likely to adversely affect	**REPTILES**
	Loggerhead sea turtle (*Caretta caretta*)
	Green sea turtle (*Chelonia mydas*)
	Leatherback sea turtle (*Dermochelys coriacea*)
	Hawksbill sea turtle (*Eretmochelys imbricata*)
	Eastern indigo snake (*Drymarchon corais couperi*)
	BIRDS
	Wood stork (*Mycteria americana*)
	Red-cockaded woodpecker (*Picoides borealis*)
	Snail kite (*Rostrhamus sociabilis plumbeus*)
	Florida scrub-jay (*Aphelocoma coerulescens*)
	Crested caracara (*Caracara plancus audubonii*)
	MAMMALS
	West Indian manatee (*Trichechus manatus*)
	West Indian manatee Critical Habitat
	FISH
	Gulf sturgeon (*Acipenser oxyrinchus desotoi*)
	Smalltooth sawfish (*Pristis pectinata*)
	Smalltooth sawfish Critical Habitat
	PLANTS
	Beautiful pawpaw (*Deeringothamnus pulchellus*)
	Aboriginal prickly apple (*Harrisia aboriginum*)
May affect, not likely to adversely affect- C (further consultation required)	Florida bonneted bat (*Eumops floridanus*)

TABLE ES2: STATE LISTED SPECIES IMPACT DETERMINATIONS

Project Effect	State Listed Species
No adverse effect anticipated	**REPTILES**
	Gopher tortoise (*Gopherus polyphemus*)
	Florida pine snake (*Pituophis melanoleucus mugitus*)
	BIRDS
	Florida sandhill crane (*Antigone canadensis pratensis*)
	Florida burrowing owl (*Athene cunicularia floridana*)
	Little blue heron (*Egretta caerulea*)
	Reddish egret (*Egretta rufescens*)
	Tricolored heron (*Egretta tricolor*)
	Southeastern American kestrel (*Falco sparverius paulus*)
	Roseate spoonbill (*Platalea ajaja*)
	MAMMALS
	Sherman's short-tailed shrew (*Blarina carolinensis shermani*)
	PLANTS
	Florida beargrass (*Nolina atopocarpa*)
	Many-flowered grass-pink (*Calopogon multiflorus*)
No effect anticipated	**BIRDS**
	Least tern (Sternula antillarum)
	Snowy plover (Charadrius nivosus)
	PLANTS
	Sand-dune spurge (*Euphorbia cumulicola*)
	Spreading pinweed (*Lechea divaricata*)
	Nodding pinweed (*Lechea cernua*)

CRITICAL HABITAT

The project area is within the critical habitat (CH) of the smalltooth sawfish (*Pristis pectinata*) and the West Indian manatee (*Trichechus manatus*) and within the proposed CH for the Florida bonneted bat (*Eumops floridanus*). The aquatic resource within the project that carries the CH designation for the aquatic species is the Gator Slough Canal. Since construction in this resource will be limited to removing the existing bridge and bridge pilings, and replacing them with a new bridge and bridge pilings similar to the existing northbound bridge, it has been determined that a may affect, not likely to adversely affect determination applies for the West Indian manatee and smalltooth sawfish CH. Since no Florida bonneted bat roosting areas have been documented in the project area, and CH for the Florida bonneted bat remains in "proposed" status, it has been determined that the project will have no effect on potential Florida bonneted bat CH.

WETLANDS AND OTHER SURFACE WATERS

For the Preferred Alternative, 4.82 acres of direct impacts are proposed to jurisdictional wetlands, 0.02-acre of direct impacts are proposed to surface waters (Gator Slough Canal and other canals), and 17.22 acres of direct impacts are proposed to other surface waters. An additional 8.98 acres of wetland and 2.42 acres of other surface water impacts would occur for off-site stormwater management facilities. This results in an overall total of 33.46 acres of impact. A Uniform Mitigation Assessment Method (UMAM) analysis was performed and the estimated UMAM functional loss related to the Preferred Alternative impacts results in 8.17 units for the mainline widening and 4.47 units for the off-site stormwater management facilities.

Lee County will address all state and federal permitting requirements and provide appropriate compensatory wetland mitigation for final determination of jurisdictional wetland boundaries in future phases of this project. Wetland impacts resulting from the construction of this project will be mitigated pursuant to Section 373.4137, F.S., to satisfy all mitigation requirements of Part IV of Chapter 373, F.S., and 33 U.S.C. § 1344. Mitigation for this project will be completed through the use of mitigation banks and any other mitigation options that satisfy state and federal requirements.

The results of the PD&E study indicate there are no practicable alternatives to the proposed impacts due to the need to increase roadway capacity and safety considerations. In accordance with Presidential Executive Order (EO) 11990, the FDOT has undertaken all actions to minimize the destruction, loss or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands in carrying out the agency's responsibilities. Nonetheless, the FDOT has determined that there is no practicable alternative to construction impacts occurring in wetlands.

The proposed project will have no significant short-term or long-term adverse impacts to wetlands because any unavoidable impacts to wetlands will be mitigated to achieve no net loss of wetland function. Furthermore, all wetland impacts will be avoided and minimized to the greatest extent possible and have been limited to those areas of previous disturbance and those which are required to meet minimum safety requirements.

ESSENTIAL FISH HABITAT

The proposed project is within the Gulf of Mexico Fishery Management council's (GMFMC) area of jurisdiction. Essential Fish Habitat (EFH) within the project area is present within Gator Slough Canal. Based on the National Oceanic and Atmospheric Administration (NOAA) Fisheries EFH Mapper, the small tributaries within the project area, which include Yucca Pens Creek, Cape Coral Canal System, and Durden Creek, that flow to Charlotte Harbor are not considered EFH.

Gator Slough Canal, located within the study area, is classified as an excavated, unconsolidated bottom estuarine system with a subtidal water regime (E1UBLx) per the U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI). Potential EFH impacts include construction of a new southbound bridge that would be similar to the recently built northbound bridge. The existing 42 bridge piles, that total 94.5 square feet (sf) of fill in the canal, would be replaced with 24 bridge piles totaling 96 sf of fill in the canal. The new bridge would be approximately 20 feet wider than the existing bridge, which will result in approximately 3,160 sf (0.07 acres) of additional shading to the canal bottom. However, there are no mangroves, submerged aquatic vegetation (e.g. seagrass), or other benthic habitats within the canal. Therefore, nearly no net change is proposed to occur for the new bridge construction, impacts have been avoided and minimized to the extent practicable, and will be mitigated pursuant to Section

373.4137, F.S., to satisfy all mitigation requirements of Part IV of Chapter 373, F.S., and 22 U.S.C.§1344. Compensatory mitigation for this project will be completed through the use of mitigation banks and any other mitigation options that satisfy state and federal requirements. No seagrass, mangroves, or shellfish habitat is identified within the canal or project study area. Due to the nature of the project, no populations of any of the 55 managed species or the coral complex listed by the GMFMC or the 48 highly migratory species listed by NMFS are expected to be adversely affected by the proposed project. The project is therefore anticipated to have minimal effects on EFH.

SPECIAL DESIGNATIONS

The Gasparilla Sound-Charlotte Harbor and Matlacha Pass Aquatic Preserves are designated as Aquatic Preserves (AP) and are also considered Outstanding Florida Waters (OFW). They are approximately 1.5-mile west of the corridor. More stringent water quality criteria are required for projects that directly outfall to OFWs. The project will include stormwater treatment to minimize adverse effects to water quality, aquatic habitats, and wetland-dependent species.

WILDLIFE FEATURES

A wildlife feature such as a culvert modification was considered along the project to provide passage for wildlife such as small and medium-sized mammals, reptiles and amphibians. The Yucca Pens Creek location is one viable location considering the size of the existing culvert, potential to include dry passage, and regional habitat connectivity. A wildlife feature at this or an alternate location will be further evaluated during final design.

1.0 INTRODUCTION

1.1.1 PROJECT DESCRIPTION

The Florida Department of Transportation (FDOT), District One, is conducting a Project Development and Environment (PD&E) Study to evaluate the proposed widening of Burnt Store Road (CR 765) from Van Buren Parkway to the Charlotte County Line in Lee County. The study also extends a quarter mile north into Charlotte County to tie-in to the existing four-lane segment. The total project length is approximately 5.7 miles, and the project limits are shown in **Figure 1**. The Preferred Alternative has an urban typical section with curb and gutter and a closed roadway drainage system for the four-lane construction. It provides future expandability to 6-lanes by allowing for widening to the median. The 200-foot typical section includes two 11-foot travel lanes in each direction, a 40-foot median, 7-foot paved shoulders, and 10-foot shared use paths on each side of the roadway. Design and posted speeds of 50 miles per hour (mph) are proposed.

The project was evaluated through FDOT's Efficient Transportation Decision Making (ETDM) process as project #14380. An ETDM Programming Screen Summary Report containing comments from the Environmental Technical Advisory Team (ETAT) was published on September 4, 2020. The ETAT evaluated the project's effects on various natural, physical and social resources. Comments were received from the U. S. Environmental Protection Agency (EPA), U. S. Army Corps of Engineers (USACE), U. S. National Marine Fisheries Service (NMFS), U.S. Fish and Wildlife Service (USFWS), Florida Department of Environmental Protection (FDEP), Florida Department of Agriculture and Consumer Services (FDACS), Florida Fish and Wildlife Conservation Commission (FWC), and Southwest Florida Water Management District (SWFWMD). All comments will be addressed through the submission of this Natural Resources Evaluation (NRE) document as well as applicable permits.

1.1.2 PURPOSE AND NEED

The purpose of this project is to provide additional roadway capacity along the section of Burnt Store Road from Van Buren Parkway to the Charlotte County Line in order to accommodate future travel demand because of area-wide population and employment growth. Other goals of the project include enhancing system linkage/regional connectivity and improving safety conditions along the Burnt Store Road corridor. Burnt Store Road serves as an important north-south corridor for commuters, in addition to freight traffic, as it runs parallel and connects to regional transportation facilities (i.e., I-75, US 41, and SR 78) and provides access to several developments within Lee and Charlotte Counties. This segment of Burnt Store Road is the only remaining two-lane section within its overall 18-mile length from SR 78 to US 41. While the roadway currently operates above its designated level of service (LOS) of D or better, projected future 2045 traffic volumes would result in a LOS F if widening does not occur. Additionally, serving as part of the emergency evacuation route network designated by the Florida Division of Emergency Management and Lee County, Burnt Store Road plays a critical role in facilitating traffic flow during emergency evacuation periods. This road segment has been identified as critical and needing additional roadway capacity, due to extensive vehicle queues under various evacuation scenarios for different storm events.

FIGURE 1: PROJECT LOCATION MAP

1.2 EXISTING FACILITY AND PROPOSED IMPROVEMENTS

Within the project limits, Burnt Store Road is classified as an “urban principal arterial - other” from Van Buren Parkway to Sand Road and from north of Charlee Road to the Charlotte County Line. It is classified as a “rural principal arterial – other” from north of Sand Road to south of Charlee Road. Burnt Store Road is a two-lane, undivided facility with 12-foot travel lanes (one in each direction) and no paved shoulders. There are no pedestrian or bicycle facilities within the project limits. Stormwater runoff is collected in roadside ditches and swales. There are nine cross drains which includes a bridge culvert and two bridges over Gator Slough. Posted speed limits are 50 and 55 miles per hour. While generally there is an existing 200 feet of right-of-way (ROW) along the project limits, this reduces to approximately 140 feet north of the Lee County Line. South of the project limits, the ROW consists of 355 feet. Within the existing 200 feet of ROW, the current Burnt Store Road horizontal alignment is shifted to the west, with the roadway centerline approximately 68 feet from the west ROW boundary and approximately 132 feet from the east ROW boundary.

1.2.1 PREFERRED ALTERNATIVE DETAILS

The Preferred Alternative has an urban typical section with curb and gutter and a closed roadway drainage system for the four-lane construction. It provides future expandability by widening to the median. A pipe is provided to capture offsite flows from the east and convey the water under the roadway. This alternative nearly eliminates ROW impacts along the mainline, generally fitting within the existing 200-feet of ROW. The proposed typical section for the Preferred Alternative is shown in **Figure 2**.

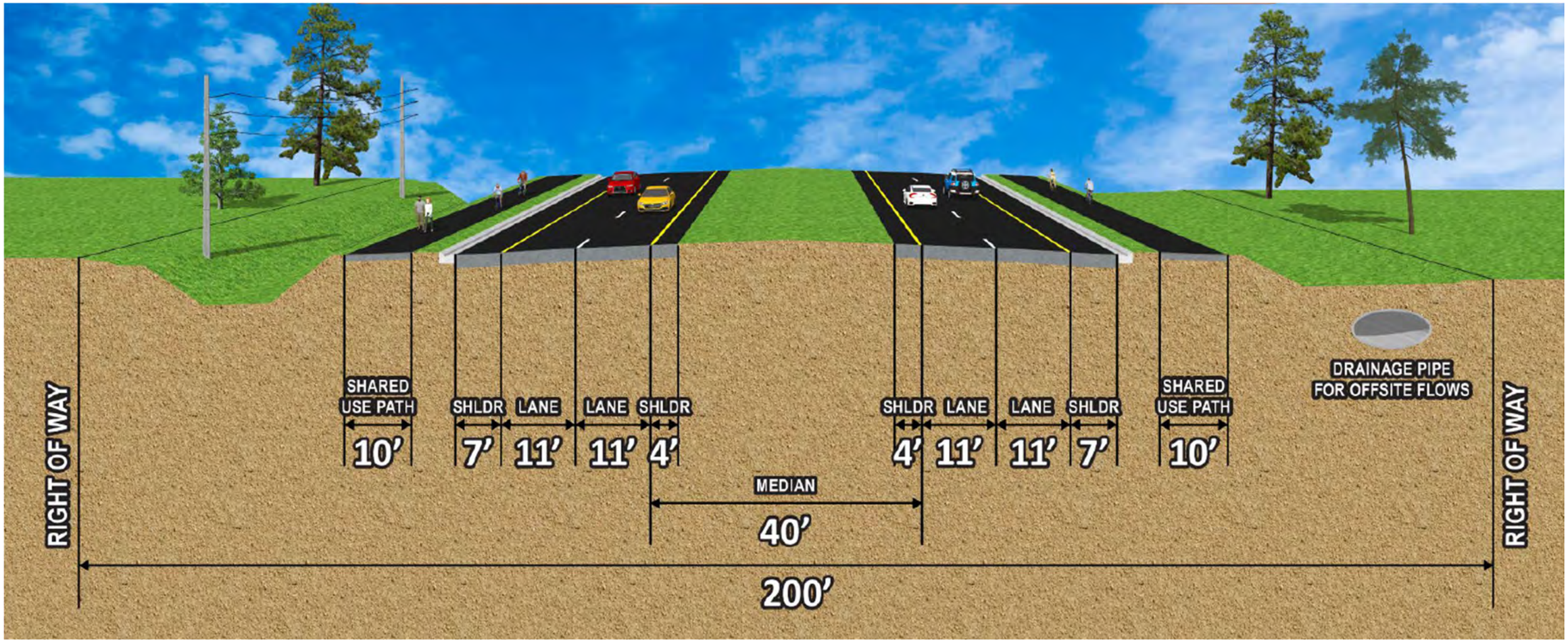
The project also proposes to replace the existing southbound bridge over Gator Slough Canal with a new bridge structure. The new bridge will have a span arrangement matching the existing northbound bridge. The existing bridge culvert over Yucca Pen Creek will be replaced as well. There are nine other cross drains which will be extended or replaced.

1.2.2 STORMWATER MANAGEMENT FACILITIES

New stormwater management facilities (ponds) and floodplain compensation areas will be needed for the project. A wetland and protected species assessment was prepared to support the Pond Siting Report (PSR) effort that addressed the presence or potential presence of federal and state threatened and endangered species and jurisdictional wetlands or surface waters within the 28 pond alternatives. The project buffer of the corridor was prepared to include all the pond alternatives; the preferred sites, which are the sites currently determined to best meet the stormwater needs of the project, are depicted in **Figure 1** as well as several of the following figures.

Placement of the stormwater ponds is not anticipated to adversely affect the conservation of fish and wildlife, including endangered or threatened species, or their habitats, since the project footprint does not include any known nesting or roosting sites, and only minimal habitat known to be specifically utilized by protected species. All measures will be taken to avoid or minimize wetland and water quality impacts during the final pond site design, resulting in minimal net loss of wetland habitat that may be used for species foraging, breeding, nesting, or other biological processes.

FIGURE 2: PROPOSED TYPICAL SECTION



1.3 PURPOSE OF REPORT

The purpose of this report is to document protected species, wetlands, and essential fish habitat (EFH) involvement within the proposed project's study corridor. Potential impacts to Critical Habitat (CH) that may support these species are also addressed in this report. In accordance with Wetlands and Other Surface Waters, Essential Fish Habitat, and Protected Species and Habitat of the FDOT PD&E Manual, the Preferred Alternative was assessed to determine the potential wetland and protected species impacts associated with roadway mainline construction.

2.0 EXISTING ENVIRONMENTAL CONDITIONS

This section presents a description of existing conditions within the project study area, including soils and land use/land cover types within both upland and wetland communities. It also includes information on existing conservation lands and easements, as well as special designations such as Outstanding Florida Waters (OFW) and Aquatic Preserves (AP). For this report, the study area is defined as a 1,000-foot wide corridor extending 500 feet east and west of the Burnt Store Road centerline as well as 500 feet north and south of the project limits.

2.1 METHODOLOGY

In order to assess the approximate locations and boundaries of existing soils, land use and cover, wetlands and surface water, and special designation and conservation areas within the project area, the following site-specific data was collected and reviewed:

- Aerial photographs: ESRI (2020), Lee County (2021), and FDOT (2020);
- Regional studies and plans;
- Florida Association of Environmental Soil Scientists, Hydric Soils of Florida Handbook, 4th ed., (Hurt et al. 2007);
- Florida Department of Transportation (FDOT) Environmental Screening Tool. Available online on the Efficient Transportation Decision Making website: fla-etat.org
- FDOT, Florida Land Use Cover, and Forms Classification System (FLUCFCS) Handbook, 3rd ed., January 1999;
- South Florida Water Management District (SFWMD) FLUCFCS GIS Database (SFWMD 2016);
- U.S. Department of Agriculture (USDA), Natural Resource Conservation Service (NRCS), Soil Survey of Charlotte County, Florida, 1984;
- USDA, NRCS, Soil Survey of Lee County, Florida, 1984;
- U.S. Fish and Wildlife Service (USFWS), National Wetlands Inventory (NWI), Wetlands Online Mapper;
- FDEP, GIS Data
- Florida Natural Areas inventory (FNAI), Florida Managed Areas, 2022
- U.S. Geological Survey (USGS) topographical maps;
- USFWS, Classification of Wetlands and Deepwater Habitats of the United States (Cowardin et al. 1979); and
- Personal communication with Mike Kemmerer, FWC, regarding historic and current hydrological flows and Karyn Allman, Lee County Conservation 20/20, regarding current wetland conditions in county lands.

2.2 RESULTS

Based on site-specific data searches and field evaluations, a total of 27 soil types, 15 upland habitat types, and six (6) wetland, surface water, and other surface water habitat types were identified within 500 feet of the proposed project – see **Appendix A**. The following subsections describe the soils, land use and vegetative cover, wetland resources, and conservation and special designations areas that occur within the project study area.

2.2.1 SOILS

The soil types that occur within 500 feet of the proposed project were determined using the Natural Resource Conservation Service (NRCS) Geographic Information Systems (GIS) soil layer – see **Appendix B** for description of soils. **Table 1** provides a summary of these soil types, including the general hydric designation, hydrologic group, area, and percent of the study area. A map of the 2021 NRCS soils within the project study area is provided in **Figure 3a** as well as a map of the NRCS soils from 2012 shown in **Figure 3b**. **Figure 3a** and **3b** show the historical shift of soil properties throughout the extent of the project area from hydric soils to more non-hydric soils. This suggest a reduction in wetland habitats in the project area which is discussed further in **Section 2.2.4**.

2.2.2 LAND USE AND LAND COVER

Land use along the majority of the corridor consists of natural areas associated with conservation lands and Barren Lands (FLUCFCS 7430, Spoil Areas; FLUCFCS 7400, Disturbed Land) associated with inactive mining operations. Low and medium-density residential uses (FLUCFCS 1110, Fixed Single Family Units less than two per acre; FLUCFCS 1210, Fixed Single Family Units two-five per acre; and FLUCFCS 1180, Rural Residential) are present toward each end of the corridor. Existing land use/land cover was field-verified within 500 feet of the project corridor on March 9-12, 2020. A summary is provided in **Table 2**, the data with field-verified modifications is shown in **Figure 4,** and the land use descriptions are provided in **Appendix A**.

Although there are several historic limestone, sand and gravel mines adjacent to the corridor, all of them have been inactive since approximately 2010 and have naturally revegetated except one that is now within a parcel being developed for residential use. Based on our review of existing SFWMD permits and applications under review, as well as the Development Opportunities in Cape Coral map (2019), there are several planned development projects adjacent to the corridor (shown in **Figure 5**), and many of the existing habitat classifications may change in the next few years as these projects transition into the construction phase. Aside from the conservation lands shown in **Figure 6**, most of the corridor has experienced significant disturbance that has led to the abundance of melaleuca (*Meleleuca quinquenervia*), earleaf acacia (*Acacia auriculiformis*), lead tree (*Leucaena leucocephala*), and Brazilian pepper (*Schinus terebinthifolia*), typically coded as FLUCFCS 4240 (Melaleuca), FLUCFCS 4340 (Mixed Wetland Hardwoods) if mixed with other non-exotic species, and FLUCFS 6190 (Exotic Wetland Hardwoods) when occurring in wetland habitats.

The dominant vegetation within the existing ROW is bahia grass (*Paspalum notatum*) which is regularly mowed. Upland habitats along the project corridor consist mainly of Pine Flatwoods (FLUCFCS 4110) with the predominant species being slash pine (*Pinus elliottii*), Herbaceous (Dry Prairie) (FLUCFCS 3100) consisting primarily of saw palmetto (*Serenoa repens*), and Upland Hardwood Forest (FLUCFCS 4300) with some patches of nuisance exotic vegetation, predominantly melaleuca. Many of these areas are of high quality for wildlife and have not been fragmented due to the conservation status of the preserves. While most of the ponds (FLUCFCS 5300, Reservoirs) are associated with inactive mining activities, some are remnants of historical agricultural uses or appear to have been borrow pits used for the original construction of Burnt Store Road. Several natural wetlands (FLUCFCS 6250, Hydric Pine Flatwoods and FLUCFCS 6170, Mixed Wetland Hardwoods) occur within the project limits, typically draining from northeast to southwest under the road through culverts.

The hydrology along the corridor is uniquely variable over time; xeric upland habitats experience occasional wet-season flooding, while wetlands during the dry season exhibit minimal soil saturation.

TABLE 1: EXISTING NRCS SOIL (2021) TYPES WITHIN 500 FEET OF PROJECT CORRIDOR

County	Soil Number	Soil Type	Hydric Soils	Total Area (Acres)	Percent of Study Area
Charlotte	26	Pineda-Pineda, Wet, Fine Sand, 0 To 2 Percent Slopes	No	1.55	0.22%
	99	Water	Unranked	4.48	0.63%
	123	Myakka Fine Sand-Urban Land Complex, 0 To 2 Percent Slopes	No	1.78	0.25%
	129	Pineda Fine Sand-Urban Land Complex, 0 To 2 Percent Slopes	No	23.26	3.28%
Lee	6	Brynwood Fine Sand, Wet, 0 To 2 Percent Slopes	Yes	16.67	2.35%
	7	Matlacha Gravelly Fine Sand-Urban Land Complex, 0 To 2 Percent Slopes	No	38.39	5.41%
	11	Myakka Fine Sand, 0 To 2 Percent Slopes	No	11.38	1.60%
	17	Daytona Sand, 0 To 5 Percent Slopes	No	1.28	0.18%
	26	Pineda-Pineda, Wet, Fine Sand, 0 To 2 Percent Slopes	No	84.01	11.83%
	28	Immokalee Sand, 0 To 2 Percent Slopes	No	55.92	7.87%
	33	Oldsmar Sand, 0 To 2 Percent Slopes	No	30.57	4.30%
	34	Malabar Fine Sand, 0 To 2 Percent Slopes	Yes	5.16	0.73%
	35	Wabasso Sand, 0 To 2 Percent Slopes	No	128.61	18.11%
	36	Immokalee Sand-Urban Land Complex, 0 To 2 Percent Slopes	No	19.01	2.68%
	40	Anclote Sand, Frequently Ponded, 0 To 1 Percent Slopes	Yes	3.91	0.55%
	42	Wabasso Sand, Limestone Substratum, 0 To 2 Percent Slopes	No	19.34	2.72%
	44	Malabar Fine Sand, Frequently Ponded, 0 To 1 Percent Slopes	Yes	7.45	1.05%
	49	Felda Fine Sand, Frequently Ponded, 0 To 1 Percent Slopes	Yes	1.80	0.25%
	63	Malabar Fine Sand, High, 0 To 2 Percent Slopes	No	36.06	5.08%
	64	Brynwood Fine Sand, Wet-Urban Land Complex, 0 To 2 Percent Slopes	Yes	4.55	0.64%
	73	Pineda Fine Sand, Frequently Ponded, 0 To 1 Percent Slopes	Yes	5.35	0.75%
	99	Water	Unranked	4.31	0.61%
	100	Waters Of The Gulf Of Mexico	Unranked	7.38	1.04%
	119	Malabar Fine Sand-Urban Land Complex, 0 To 2 Percent Slopes	Yes	3.26	0.46%
	121	Malabar Fine Sand, High-Urban Land Complex, 0 To 2 Percent Slopes	No	9.38	1.32%
	122	Matlacha Gravelly Fine Sand, Limestone Substratum-Urban Land Complex, 0 To 2 Percent Slopes	No	25.40	3.58%
	123	Myakka Fine Sand-Urban Land Complex, 0 To 2 Percent Slopes	No	15.88	2.24%
	125	Oldsmar Sand-Urban Land, 0 To 2 Percent Slopes	No	38.21	5.38%
	129	Pineda Fine Sand-Urban Land Complex, 0 To 2 Percent Slopes	No	57.92	8.15%
	137	Wabasso Sand-Urban Land Complex, 0 To 2 Percent Slopes	No	47.97	6.75%
			Total Hydric	**48.16**	**6.78%**
			Total Non-Hydric	**645.93**	**90.94%**
			Total Unranked	**16.17**	**2.28%**
			Total	**710**	**100%**

FIGURE 3A: 2021 NRCS SOILS MAP

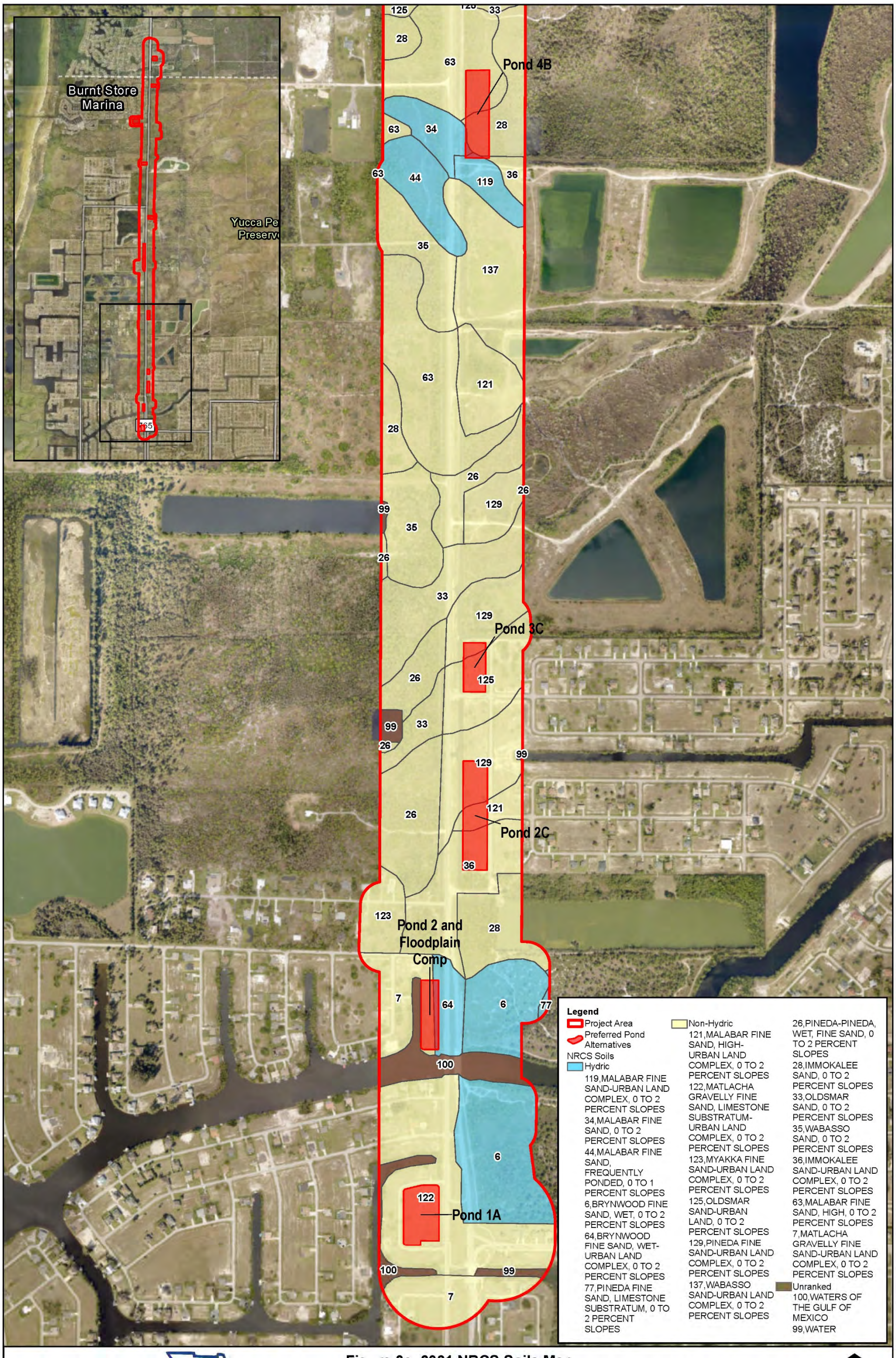
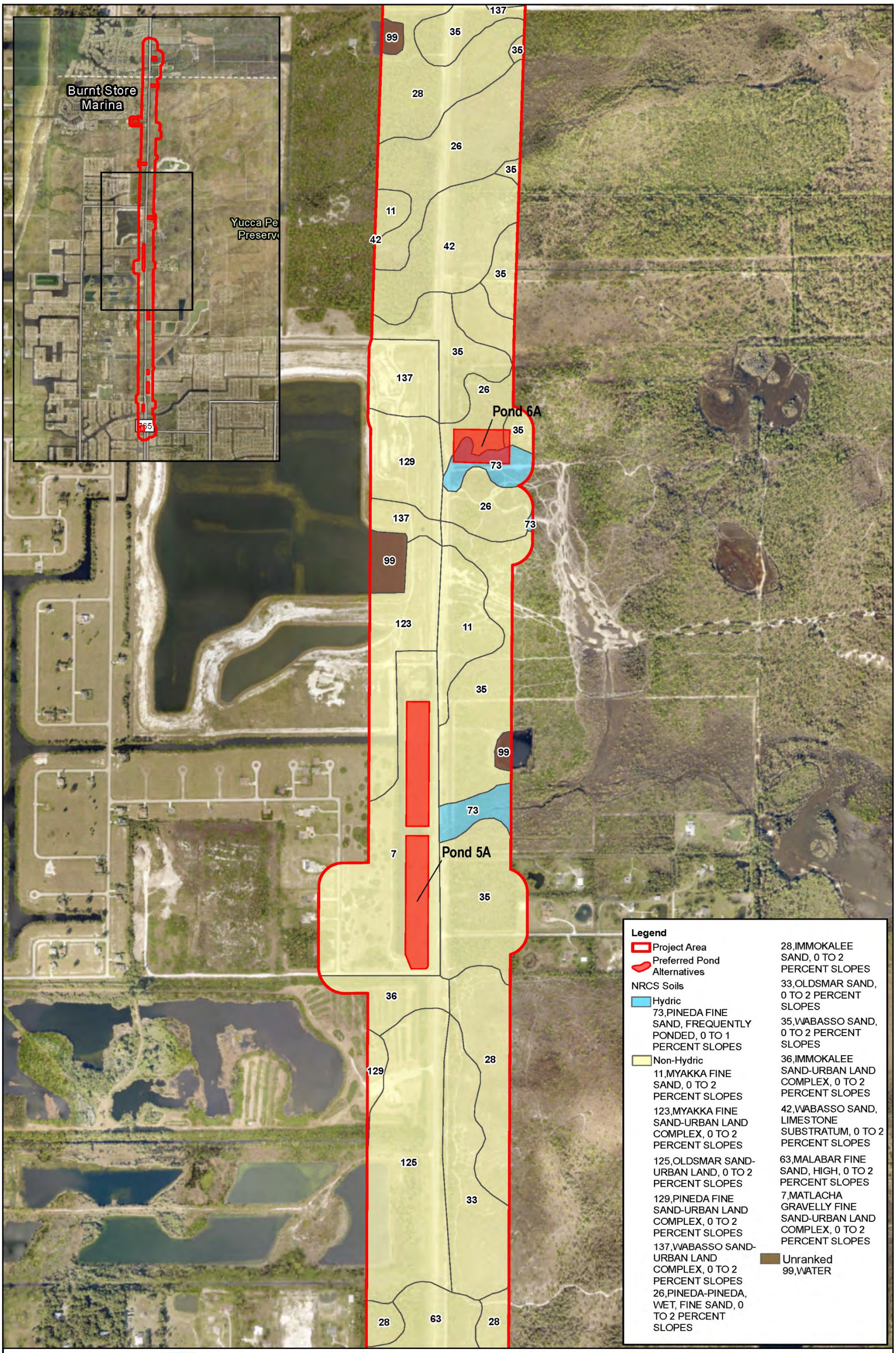


Figure 3a. 2021 NRCS Soils Map
Sheet 1 of 3
Burnt Store Road PD&E Study
From Van Buren Parkway to Charlotte County Line
FPID No. 436928-1-22-01
Lee County

Data Source: NRCS USDA
Image Source: ESRI
Image Date: 2021

0 0.15 0.3 Miles


Burnt Store Marina
Yucca Pe
Preserv
765
Pond 6A
Pond 5A
99
35
137
28
26
11
42
129
73
123
7
36
63
125
33
Legend
Project Area
Preferred Pond Alternatives
NRCS Soils
Hydric
73,PINEDA FINE SAND, FREQUENTLY PONDED, 0 TO 1 PERCENT SLOPES
Non-Hydric
11,MYAKKA FINE SAND, 0 TO 2 PERCENT SLOPES
123,MYAKKA FINE SAND-URBAN LAND COMPLEX, 0 TO 2 PERCENT SLOPES
125,OLDSMAR SAND-URBAN LAND, 0 TO 2 PERCENT SLOPES
129,PINEDA FINE SAND-URBAN LAND COMPLEX, 0 TO 2 PERCENT SLOPES
137,WABASSO SAND-URBAN LAND COMPLEX, 0 TO 2 PERCENT SLOPES
26,PINEDA-PINEDA, WET, FINE SAND, 0 TO 2 PERCENT SLOPES
28,IMMOKALEE SAND, 0 TO 2 PERCENT SLOPES
33,OLDSMAR SAND, 0 TO 2 PERCENT SLOPES
35,WABASSO SAND, 0 TO 2 PERCENT SLOPES
36,IMMOKALEE SAND-URBAN LAND COMPLEX, 0 TO 2 PERCENT SLOPES
42,WABASSO SAND, LIMESTONE SUBSTRATUM, 0 TO 2 PERCENT SLOPES
63,MALABAR FINE SAND, HIGH, 0 TO 2 PERCENT SLOPES
7,MATLACHA GRAVELLY FINE SAND-URBAN LAND COMPLEX, 0 TO 2 PERCENT SLOPES
Unranked
99,WATER
FDOT
Figure 3a. 2021 NRCS Soils Map
Sheet 2 of 3
Burnt Store Road PD&E Study
From Van Buren Parkway to Charlotte County Line
FPID No. 436928-1-22-01
Lee County
Data Source: NRCS USDA
Image Source: ESRI
Image Date: 2021
0
0.15
0.3
Miles
N

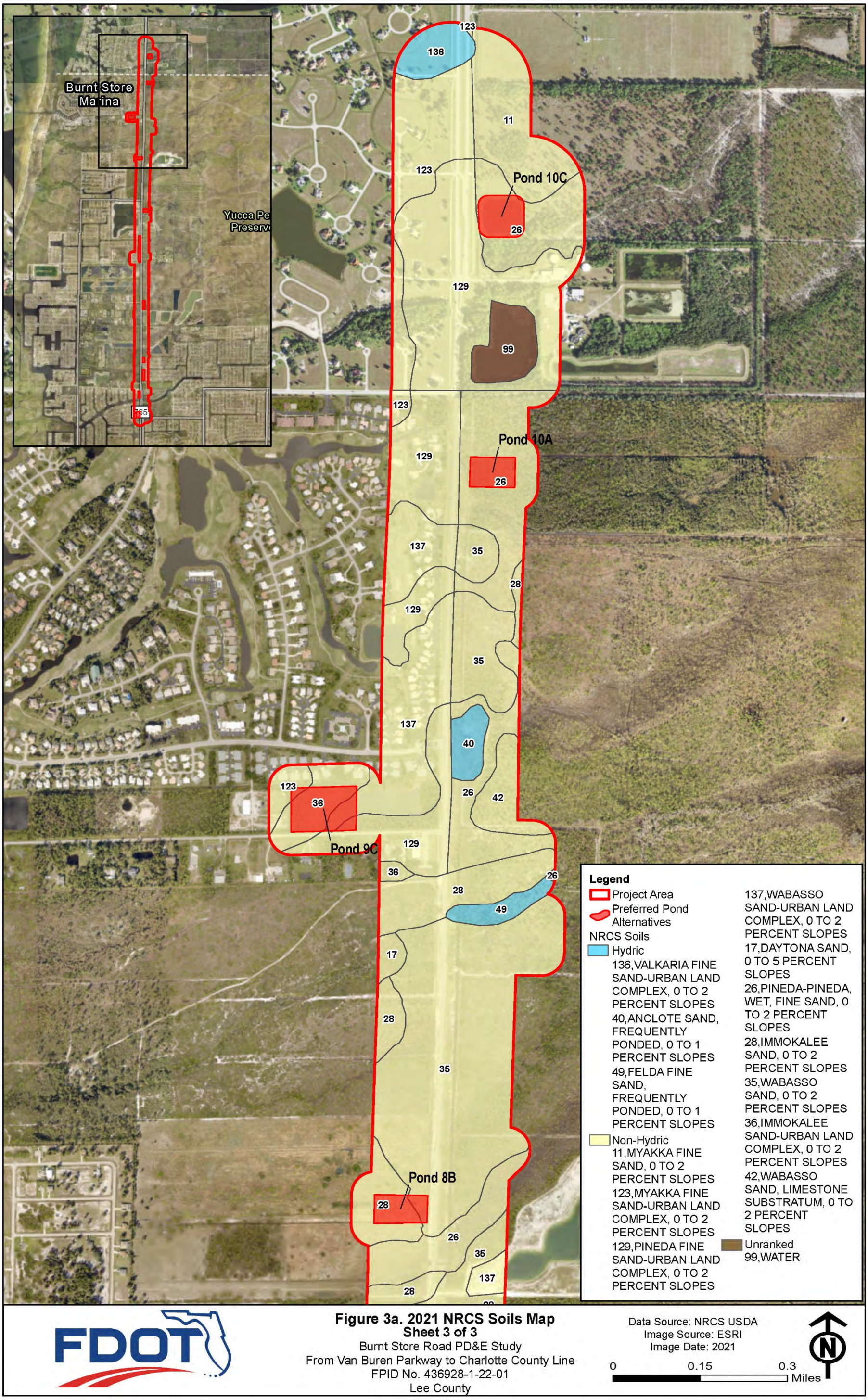


Figure 3a. 2021 NRCS Soils Map
Sheet 3 of 3
Burnt Store Road PD&E Study
From Van Buren Parkway to Charlotte County Line
FPID No. 436928-1-22-01
Lee County

FIGURE 3B: 2012 NRCS SOILS MAP

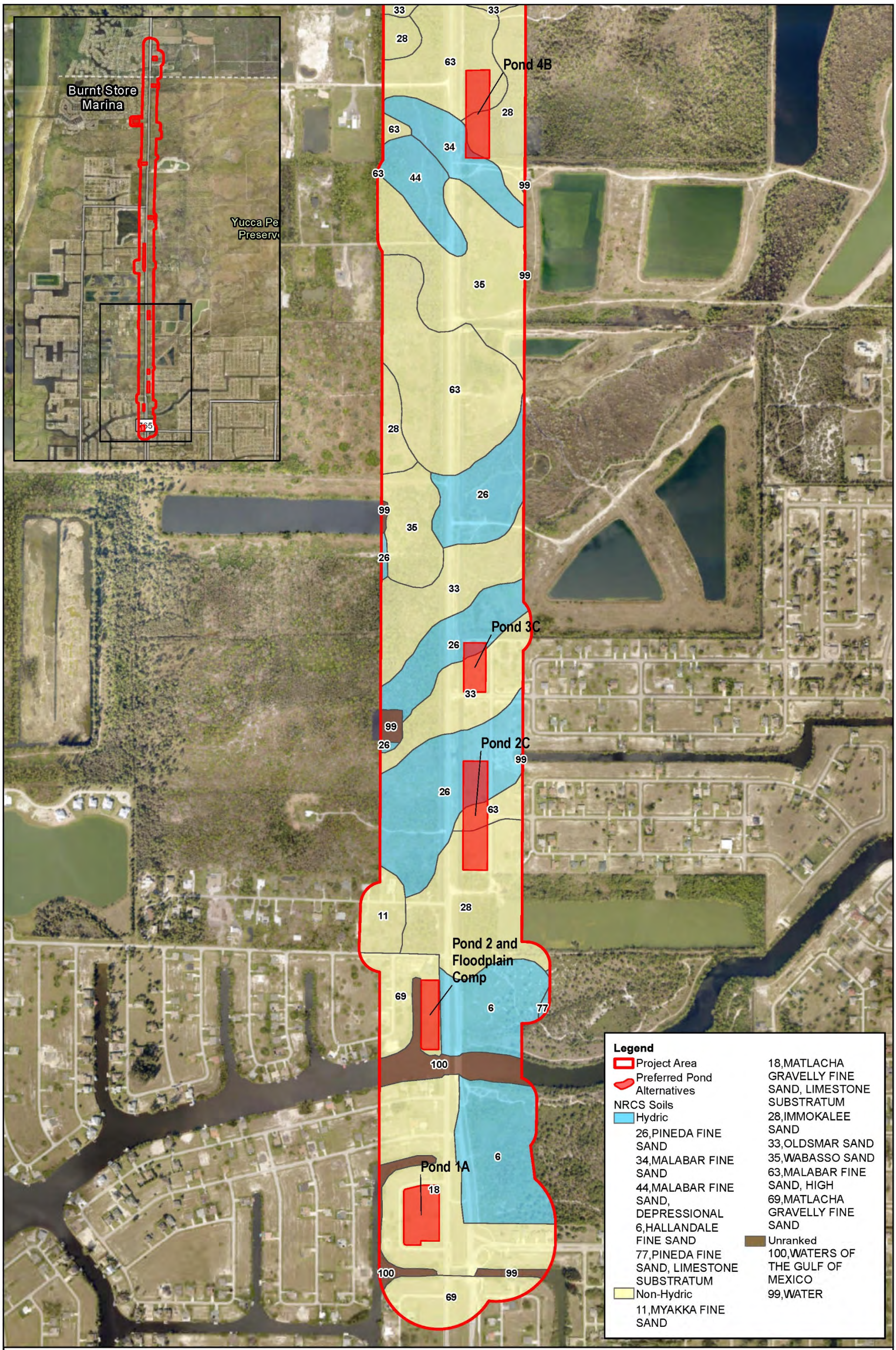


Figure 3b. 2012 NRCS Soils Map
Sheet 1 of 3
Burnt Store Road PD&E Study
From Van Buren Parkway to Charlotte County Line
FPID No. 436928-1-22-01
Lee County

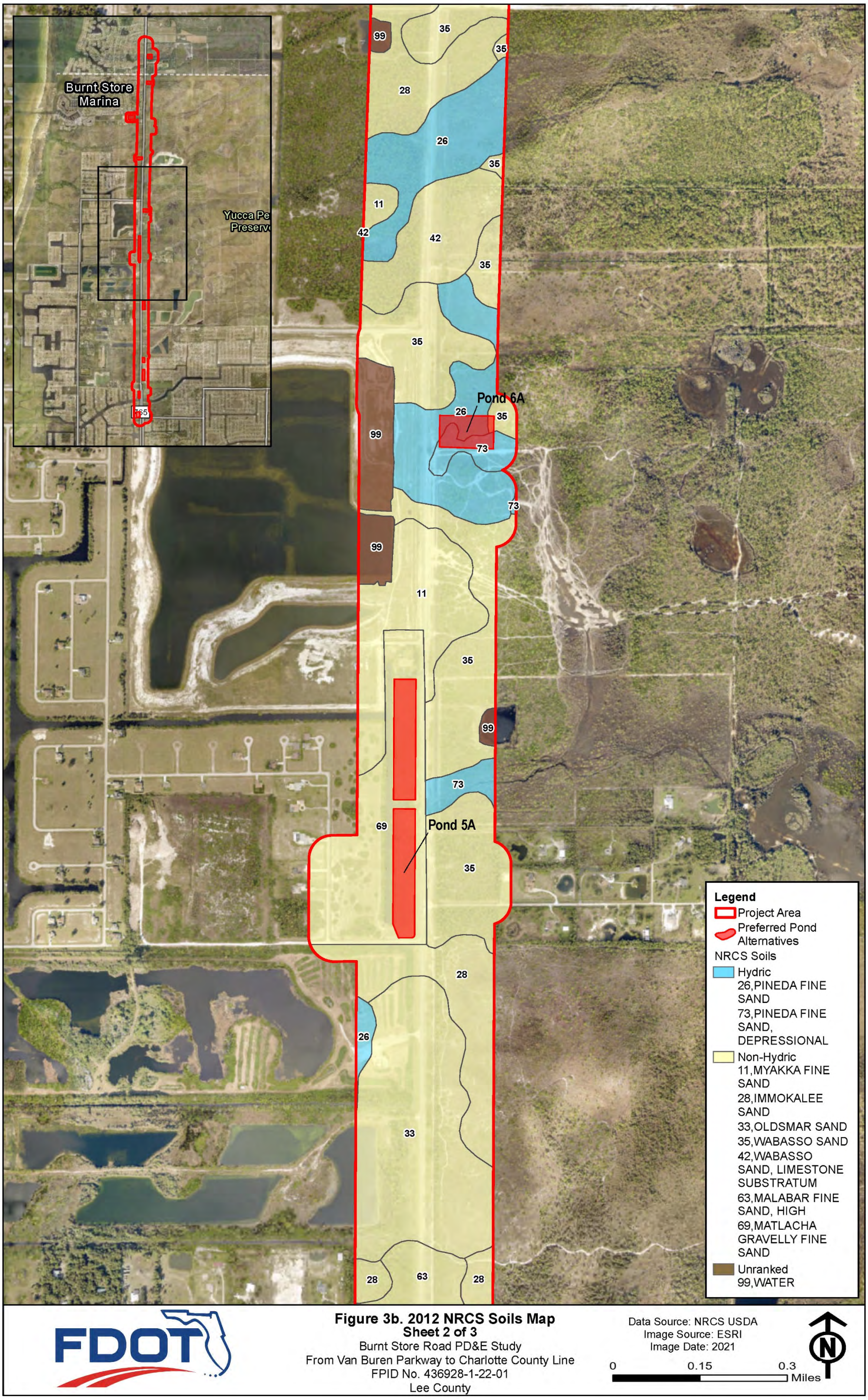


Figure 3b. 2012 NRCS Soils Map
Sheet 2 of 3
Burnt Store Road PD&E Study
From Van Buren Parkway to Charlotte County Line
FPID No. 436928-1-22-01
Lee County

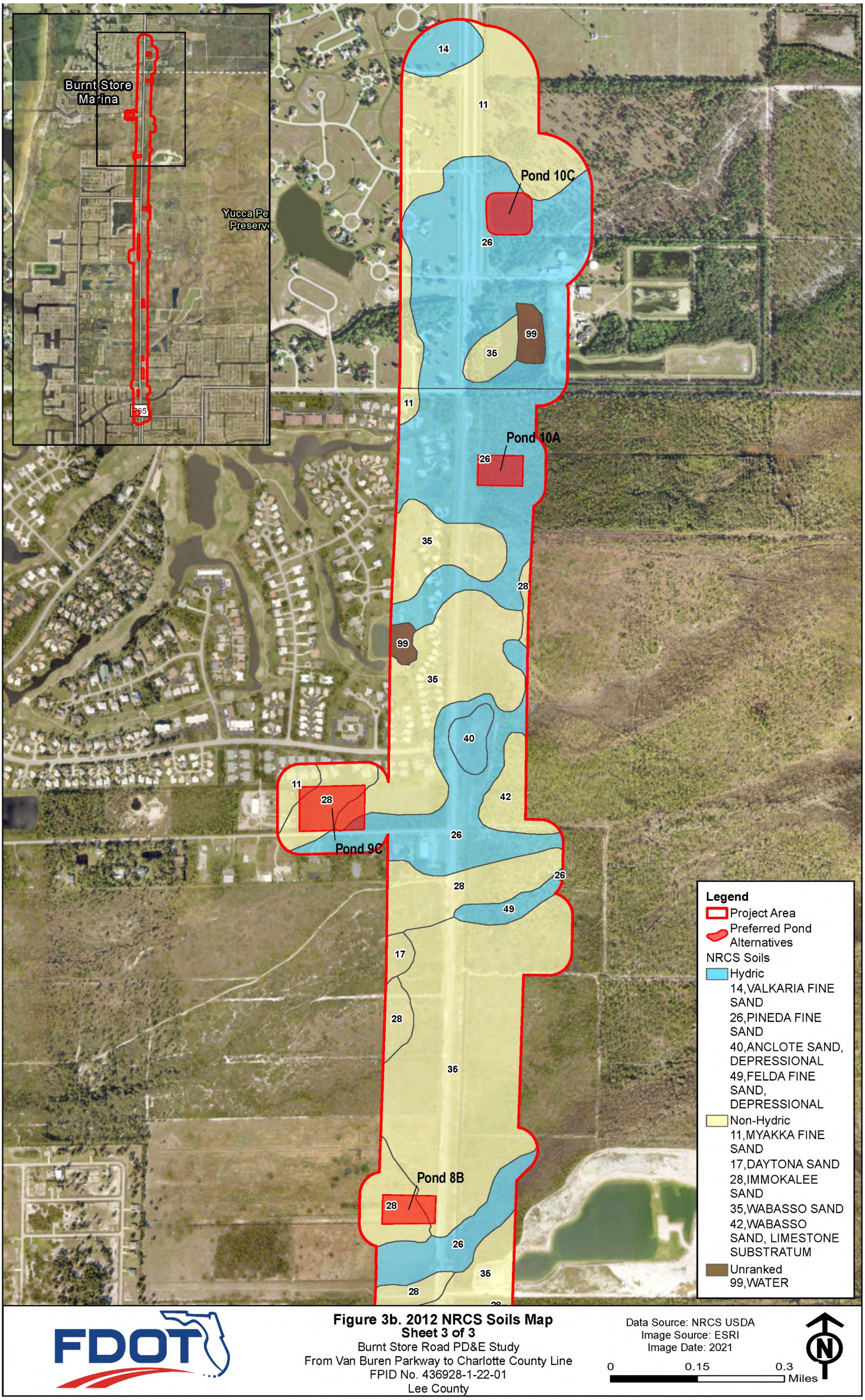


Figure 3b. 2012 NRCS Soils Map
Sheet 3 of 3
Burnt Store Road PD&E Study
From Van Buren Parkway to Charlotte County Line
FPID No. 436928-1-22-01
Lee County

TABLE 2: EXISTING FLUCFCS WITHIN 500 FEET OF PROJECT CORRIDOR

FLUCFCS Code		FLUCFCS Description	Acreage	Percent of Total Project
1000: Urban And Built-Up	1110	Fixed Single Family Units (Less Than Two Dwelling Units Per Acre)	5.35	0.75%
	1180	Rural Residential	59.72	8.41%
	1210	Fixed Single Family Units (Two-Five Dwelling Units Per Acre)	24.00	3.38%
	1630	Rock Quarries	1.30	0.18%
	1800	Recreational	28.96	4.08%
	1820	Golf Courses	7.18	1.01%
	1900	Open Land	10.79	1.52%
		Total	**137.31**	**19.34%**
2000: Agriculture	2120	Unimproved Pastures	26.07	3.67%
	3200	Shrub And Brush	1.75	0.25%
		Total	**27.82**	**3.92%**
3000: Rangeland	3100	Herbaceous (Dry Prairie)	25.87	3.64%
	3200	Shrub And Brushland	4.90	0.69%
	3210	Palmetto Prairies	6.67	0.94%
	3300	Mixed Rangeland	26.66	3.76%
		Total	**64.10**	**9.03%**
4000: Upland Forests	4110	Pine Flatwoods	153.46	21.62%
	4200	Upland Hardwood	5.55	0.78%
	4210	Xeric Oak	0.86	0.12%
	4240	Melaleuca	27.41	3.86%
	4340	Hardwood - Coniferous Mixed	40.80	5.75%
		Total	**228.08**	**32.13%**
5000: Water	5100	Streams And Waterways	16.09	2.27%
	5120	Channelized Waterways - Canals	10.53	1.48%
	5300	Reservoirs	10.18	1.43%
	5340	Reservoirs Larger Then 10 Acres Which Are Dominant Features	4.97	0.70%
		Total	**41.76**	**5.88%**
6000: Wetlands	6170	Mixed Wetland Hardwoods	12.50	1.76%
	6190	Exotic Wetland Hardwoods	12.73	1.79%
	6250	Hydric Pine Flatwoods	24.13	3.40%
	6310	Wetland Shrub	3.73	0.53%
	6410	Freshwater Marshes	0.74	0.10%
	6430	Wet Prairies	2.85	0.40%
	6440	Emergent Aquatic	0.78	0.11%
		Total	**57.46**	**8.10%**
7000: Barren Land	7400	Disturbed Land	29.73	4.19%
	7430	Spoil Areas	10.94	1.54%
		Total	**40.67**	**5.73%**
8000: Transportation, Communication And Utilities	8140	Transportation	112.65	15.87%
		Total	**112.65**	**15.87%**
		Total	**710**	**100%**

FIGURE 4: MAPPED AND FIELD-VERIFIED FLUCFCS MAP

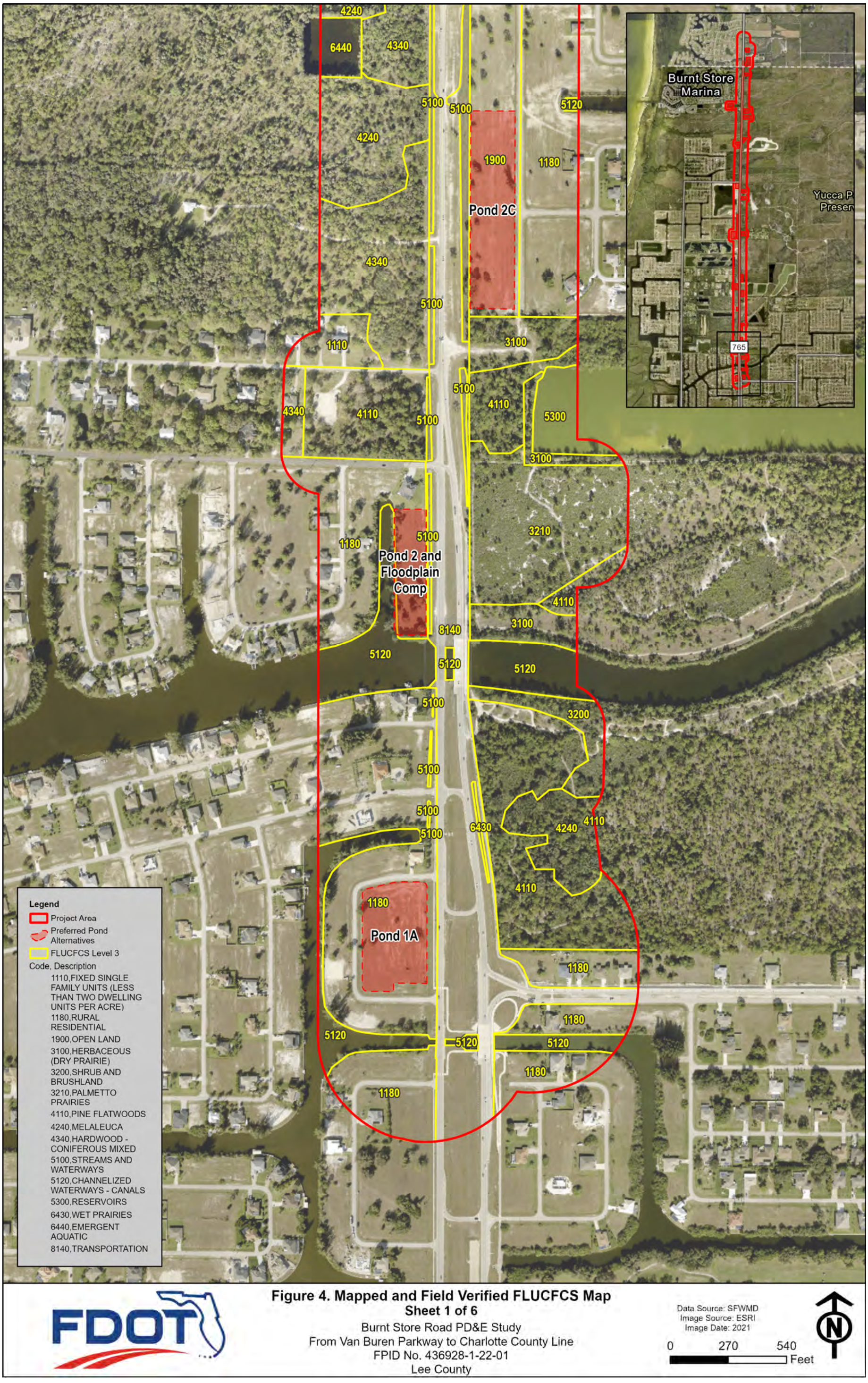


Figure 4. Mapped and Field Verified FLUCFCS Map
Sheet 1 of 6
Burnt Store Road PD&E Study
From Van Buren Parkway to Charlotte County Line
FPID No. 436928-1-22-01
Lee County

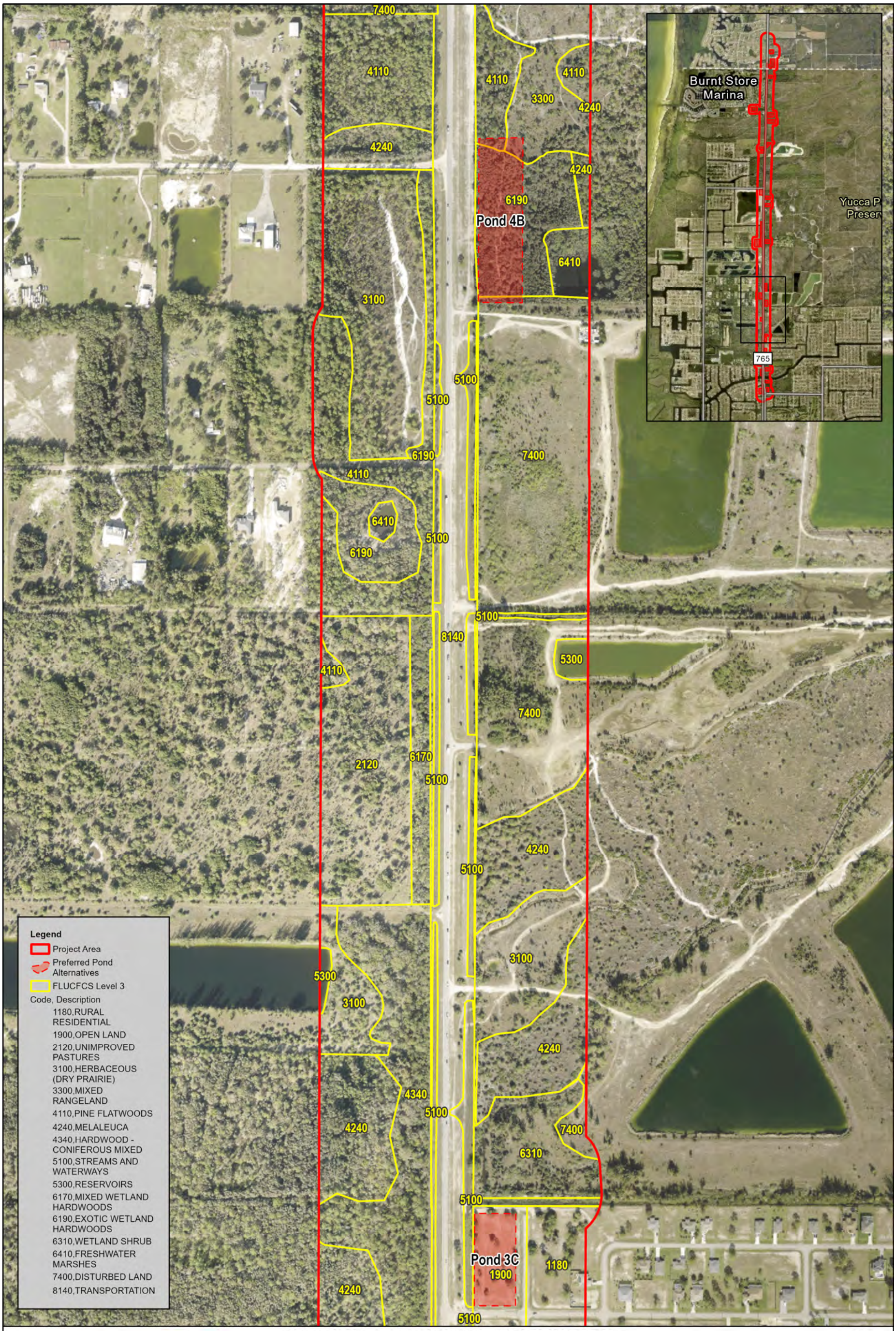


Figure 4. Mapped and Field Verified FLUCFCS Map
Sheet 2 of 6
Burnt Store Road PD&E Study
From Van Buren Parkway to Charlotte County Line
FPID No. 436928-1-22-01
Lee County

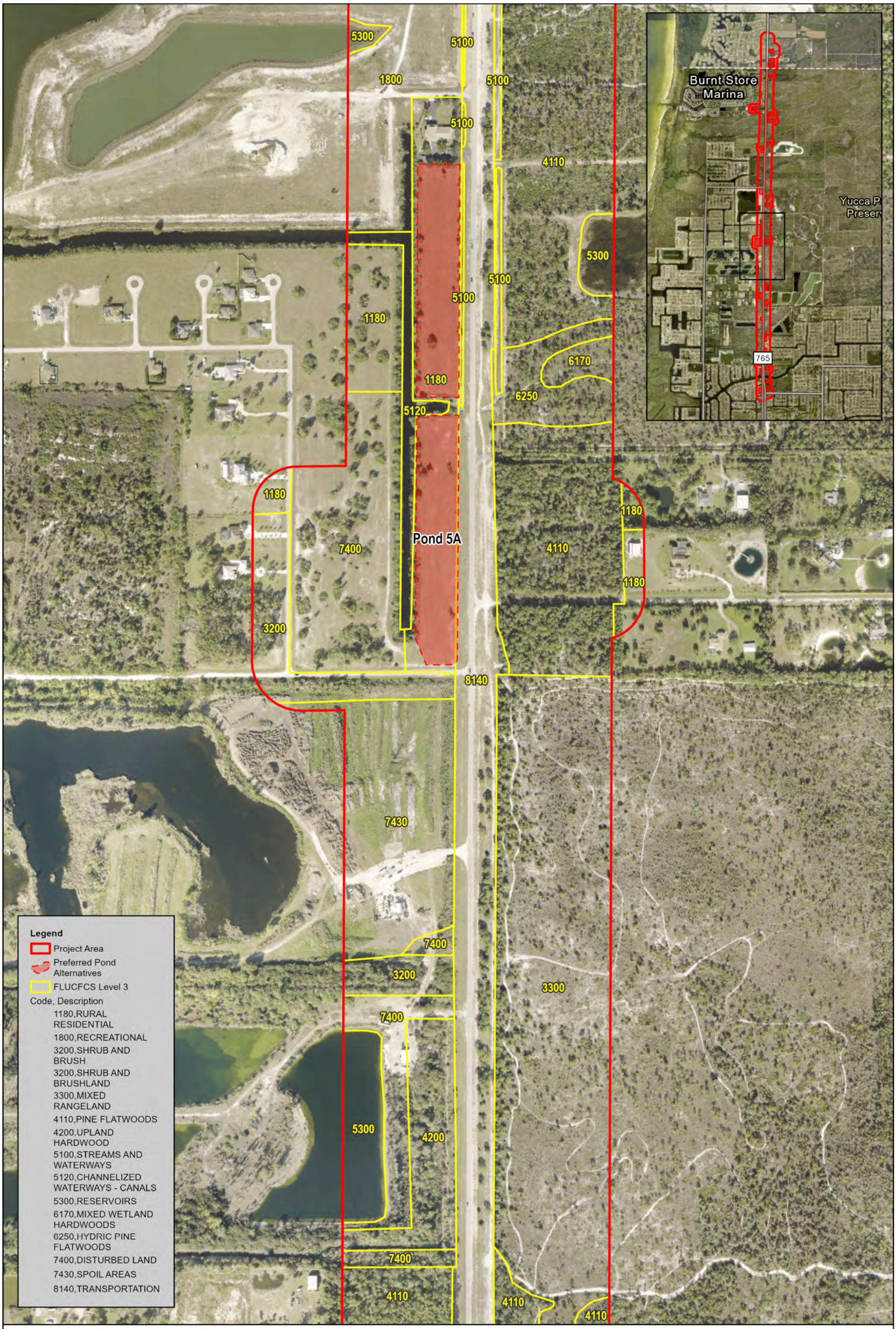


Figure 4. Mapped and Field Verified FLUCFCS Map
Sheet 3 of 6
Burnt Store Road PD&E Study
From Van Buren Parkway to Charlotte County Line
FPID No. 436928-1-22-01
Lee County

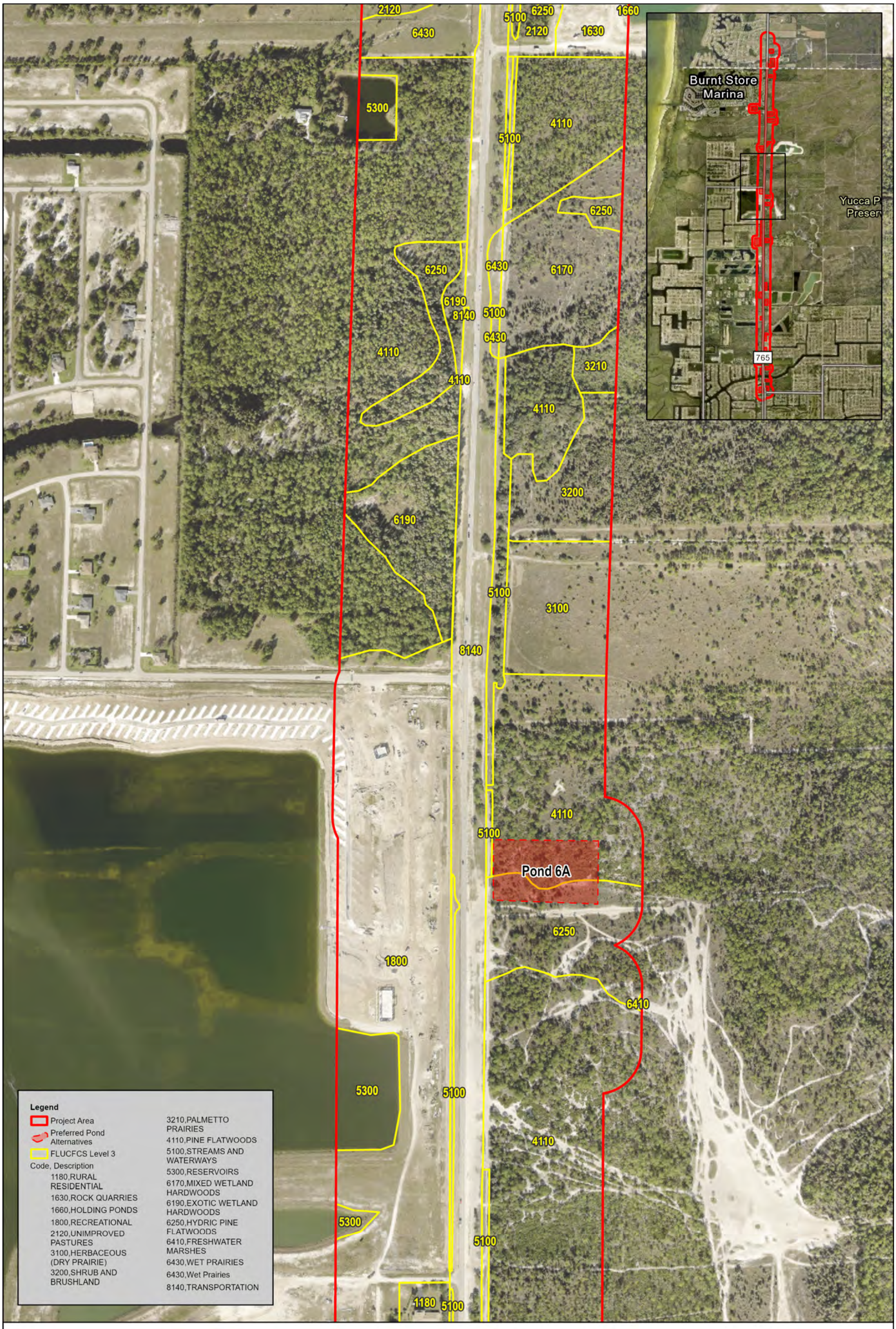


Figure 4. Mapped and Field Verified FLUCFCS Map
Sheet 4 of 6

Burnt Store Road PD&E Study
From Van Buren Parkway to Charlotte County Line
FPID No. 436928-1-22-01
Lee County

Data Source: SFWMD
Image Source: ESRI
Image Date: 2021

0 270 540 Feet

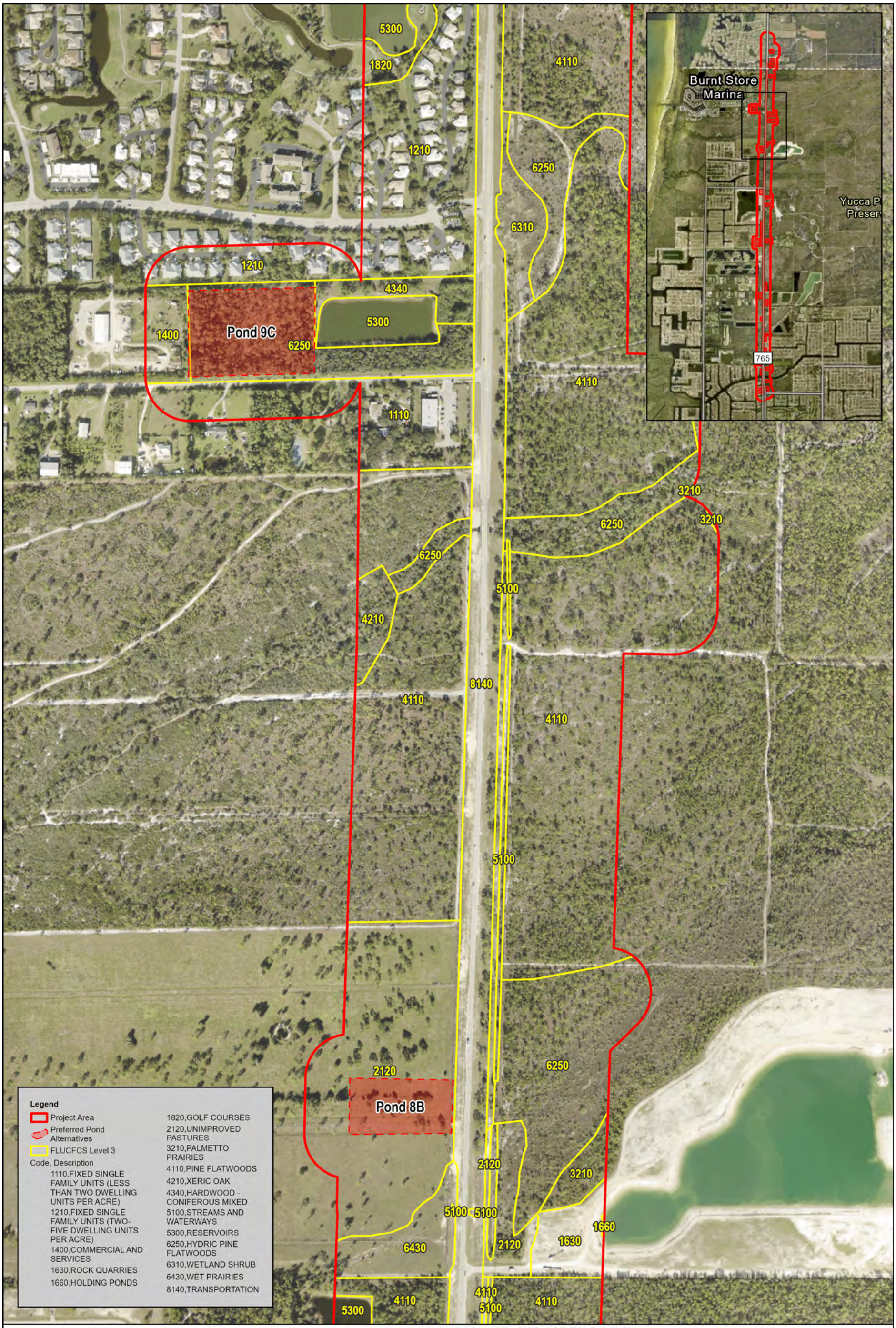


Figure 4. Mapped and Field Verified FLUCFCS Map
Sheet 5 of 6
Burnt Store Road PD&E Study
From Van Buren Parkway to Charlotte County Line
FPID No. 436928-1-22-01
Lee County

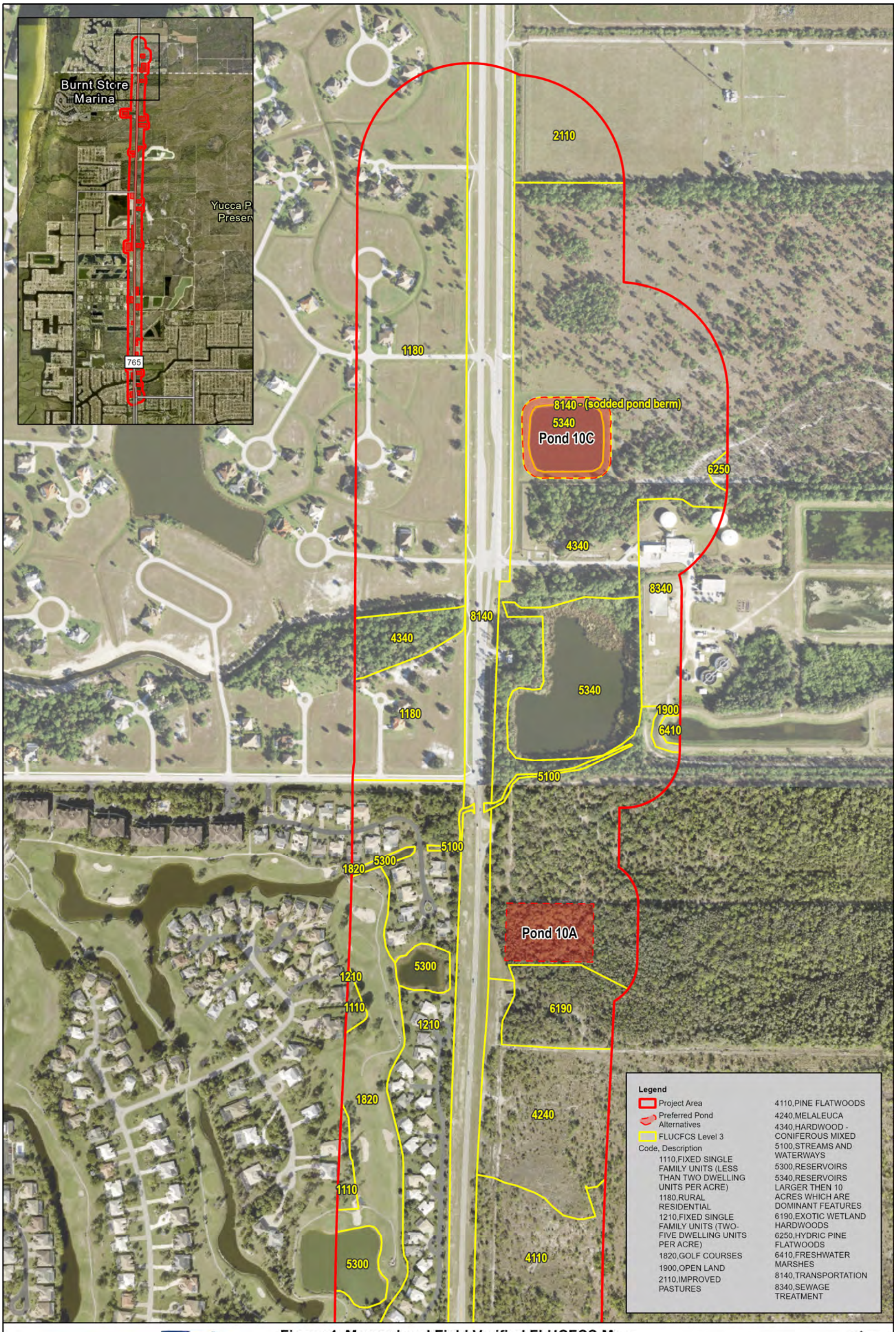

Burnt Store Marina
765
Yucca P
Preserv
2110
1180
8140 - (sodded pond berm)
5340
Pond 10C
6250
4340
8340
8140
4340
5340
1180
1900
6410
5100
5100
1820
5300
Pond 10A
5300
1210
1110
1210
6190
1820
4240
1110
5300
4110
Legend
Project Area
Preferred Pond Alternatives
FLUCFCS Level 3
Code, Description
1110,FIXED SINGLE FAMILY UNITS (LESS THAN TWO DWELLING UNITS PER ACRE)
1180,RURAL RESIDENTIAL
1210,FIXED SINGLE FAMILY UNITS (TWO-FIVE DWELLING UNITS PER ACRE)
1820,GOLF COURSES
1900,OPEN LAND
2110,IMPROVED PASTURES
4110,PINE FLATWOODS
4240,MELALEUCA
4340,HARDWOOD - CONIFEROUS MIXED
5100,STREAMS AND WATERWAYS
5300,RESERVOIRS
5340,RESERVOIRS LARGER THEN 10 ACRES WHICH ARE DOMINANT FEATURES
6190,EXOTIC WETLAND HARDWOODS
6250,HYDRIC PINE FLATWOODS
6410,FRESHWATER MARSHES
8140,TRANSPORTATION
8340,SEWAGE TREATMENT
FDOT
Figure 4. Mapped and Field Verified FLUCFCS Map
Sheet 6 of 6
Burnt Store Road PD&E Study
From Van Buren Parkway to Charlotte County Line
FPID No. 436928-1-22-01
Lee County
Data Source: SFWMD
Image Source: ESRI
Image Date: 2021
0
270
540
Feet
N

FIGURE 5: POTENTIAL AND PLANNED DEVELOPMENTS MAP

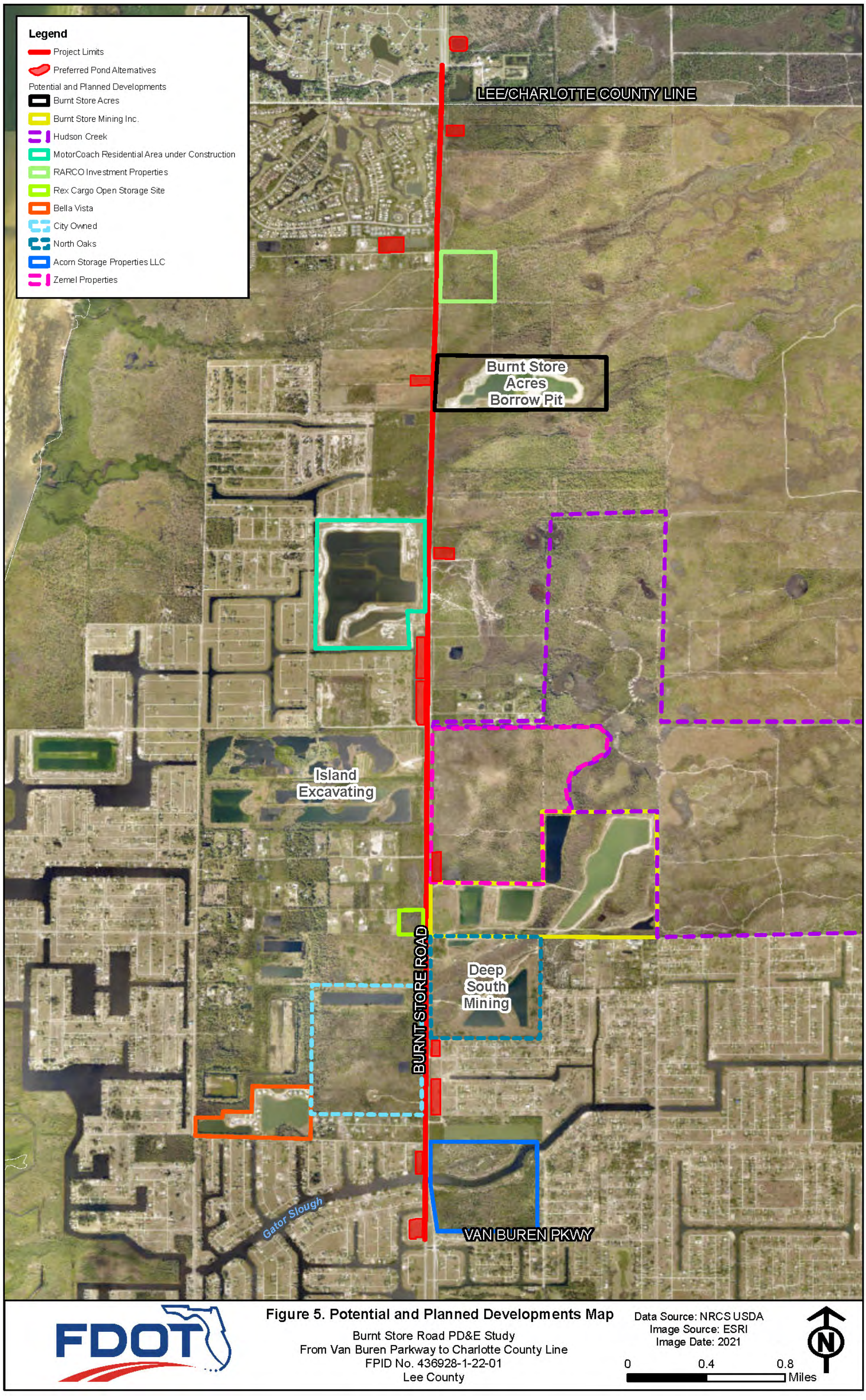
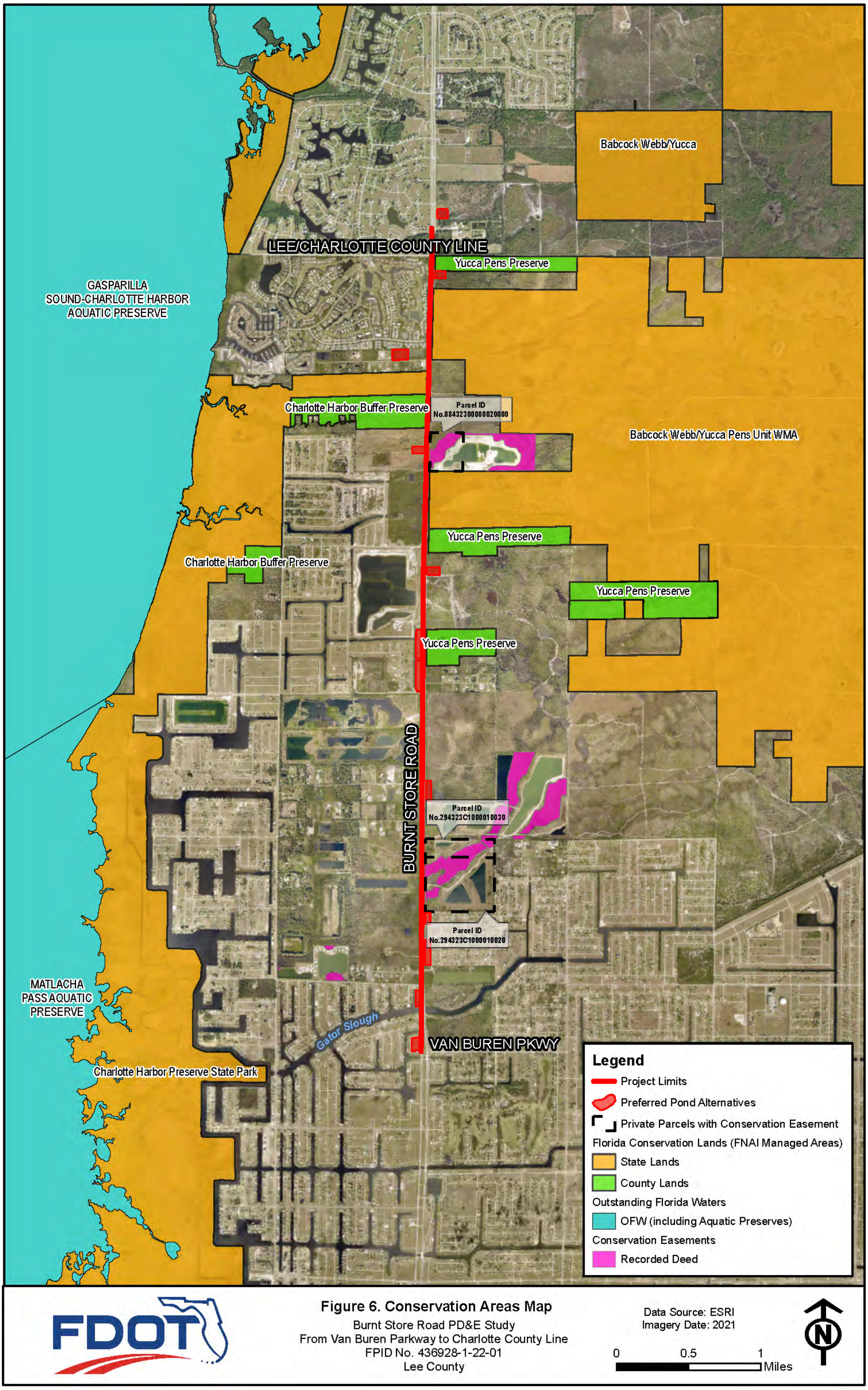


FIGURE 6: CONSERVATION AREAS MAP



Representative photos are provided in **Appendix C**. Floodplains play an important role in attenuating flood waters in the region. Based on historical information provided in regional hydrological studies, it appears that some of these seasonally-flooded uplands may be relics of former wetlands systems that have since been dehydrated. It appears that the frequency and duration of recent inundation in these areas are insufficient to support wetland conditions. **Section 2.2.4** contains additional information.

2.2.3 SPECIAL DESIGNATIONS AND CONSERVATION AREAS

Gasparilla Sound-Charlotte Harbor and Matlacha Pass Aquatic Preserves (also designated as Outstanding Florida Waters (OFW)) are both located approximately 1.5-mile west of the corridor (shown in **Figure 6**). Although streams throughout the project limits eventually feed into these waters, access to the project area by estuarine and marine life is limited to Gator Slough Canal which is not part of the OFW. No waters within the corridor are claimed by FDEP as sovereign submerged lands (SSL). **Appendix D** contains relevant agency correspondence.

There are several state and county managed conservation areas that border the corridor, including Yucca Pens Preserve, Charlotte Harbor Buffer Preserve, Babcock-Webb Yucca Pens Unit Wildlife Management Area (WMA), and Charlotte Harbor Preserve State Park (shown in **Figure 6**). Babcock-Webb Yucca Pens Unit WMA was historically disturbed for agriculture and has been restored with continuous invasive plant removal, hydrologic improvements, pine tree thinning, and prescribed burns. There are several privately-held parcel "gaps" in the preserve properties that agencies have targeted for potential future acquisition. There are also two conservation easements on private property, the first located on parcel Nos. 294323C1000010020 and 294323C1000010030 (2901 Burnt Store Road N) and the second located on parcel No. 08432300000020000 (4751 Burnt Store Road N) (shown in **Figure 6**). These conservation easements were required by SFWMD as mitigation for wetland impacts caused by extraction activities associated with North Oaks Mine and Burnt Store Acres Borrow Pit, respectively.

2.2.4 WETLANDS AND SURFACE WATERS

The wetlands as shown in the NWI data (**Figure 7**) extend over the majority of the land surrounding Burnt Store Road – especially on the east side. However, as discussed in **Section 2.2.1 and 2.2.2**, hydrology and field verified wetlands show that some of the areas that may have historically met wetland criteria are currently considered non-hydric and uplands. Such areas generally exhibit upland soil and vegetation, but at the same time present hydrologic indicators such as water marks 6-12 inches above the soil surface on mature trees and fence posts, fluted trunks on mature trees, dried/charred algal deposits in the soil, and apple snail shells. These areas are considered relics of historical wetland sheet-flow systems and that still may flood periodically. However, the current frequency and duration of saturation is not sufficient to have retained wetland soils or vegetative conditions.

In order to ensure consistency with local agency goals, it is important to note that hydrologic improvement projects have taken place and have been planned for the future within the project corridor. These projects are led by the Florida Fish and Wildlife Conservation Commission (FWC) and the Lee County Natural Resources Department, which aim to reduce flow to Gator Slough and Matlacha Pass and increase flow under Burnt Store Road in order to restore some historical hydrology patterns to adjacent wetland areas and relic wetland areas. Efforts (both planned and previously conducted) include increasing abundance and size of culverts, closing off man-made flow-ways that divert water south to Gator Slough Canal with ditch blocks or similar methods, and removing invasive plants such as melaleuca.

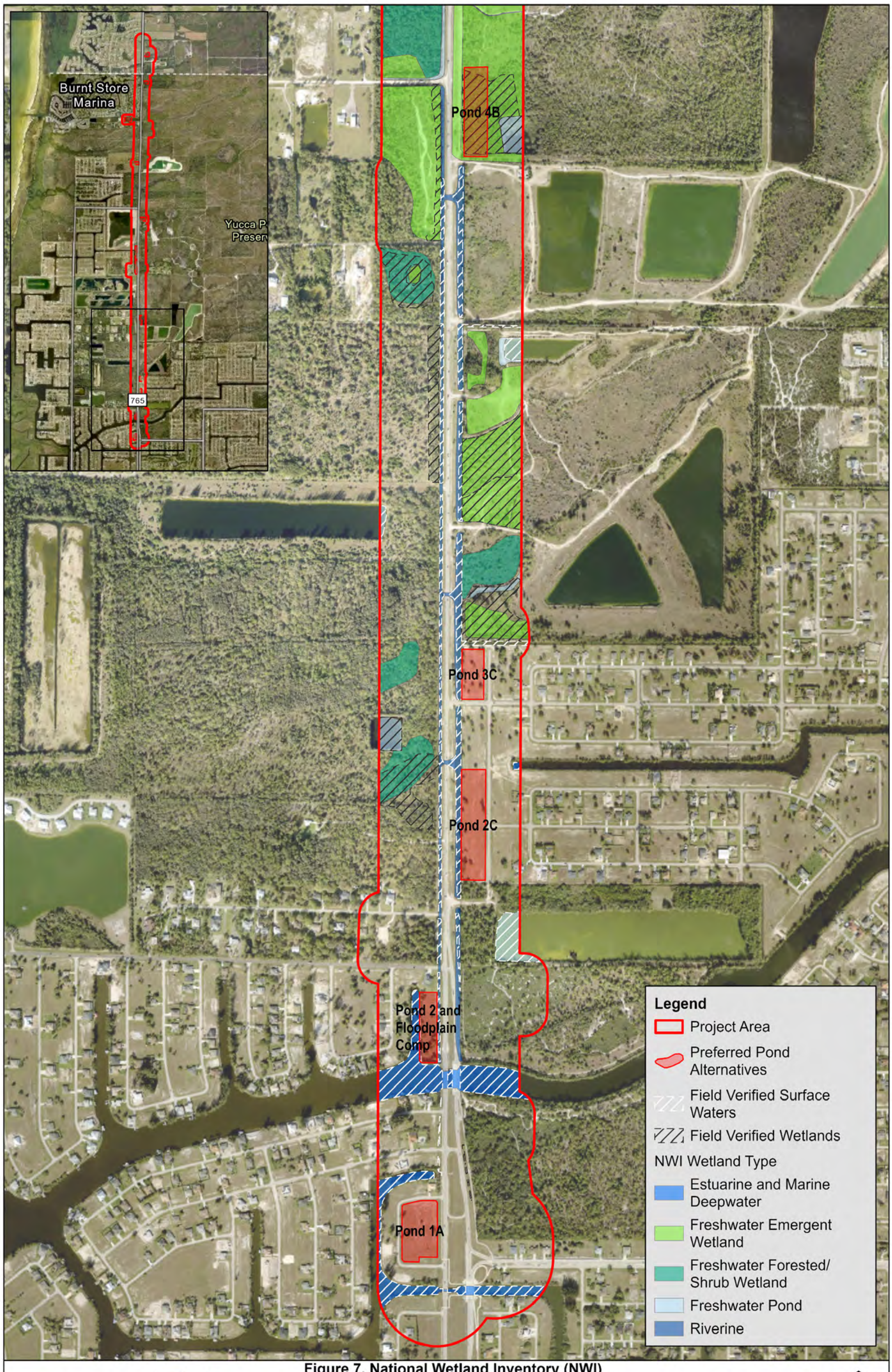


Figure 7. National Wetland Inventory (NWI) and Field Verified Wetlands and Surface Waters Map
Sheet 1 of 3
Burnt Store Road PD&E Study
From Van Buren Parkway to Charlotte County Line
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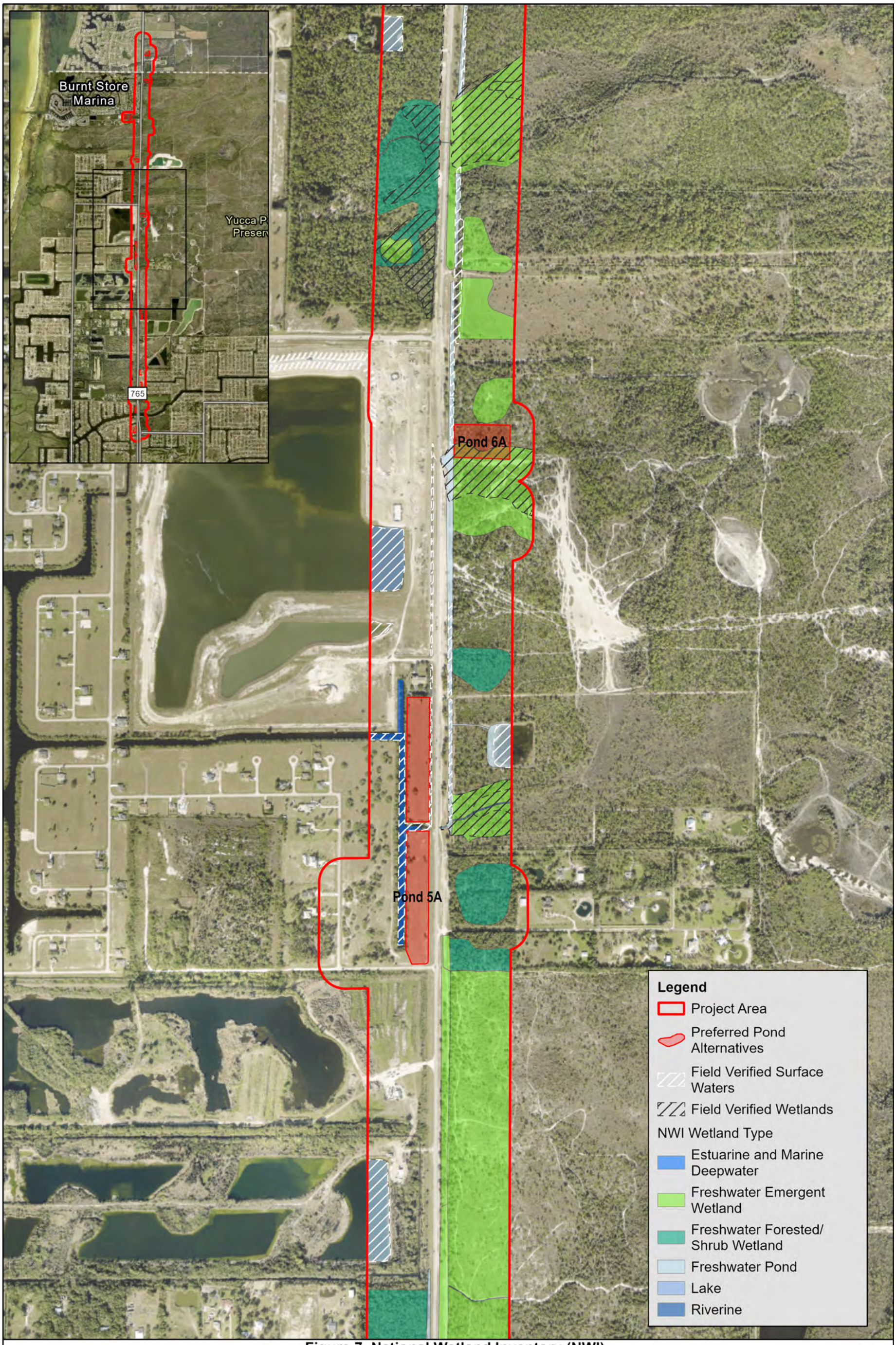

Figure 7. National Wetland Inventory (NWI) and Field Verified Wetlands and Surface Waters Map
Sheet 2 of 3
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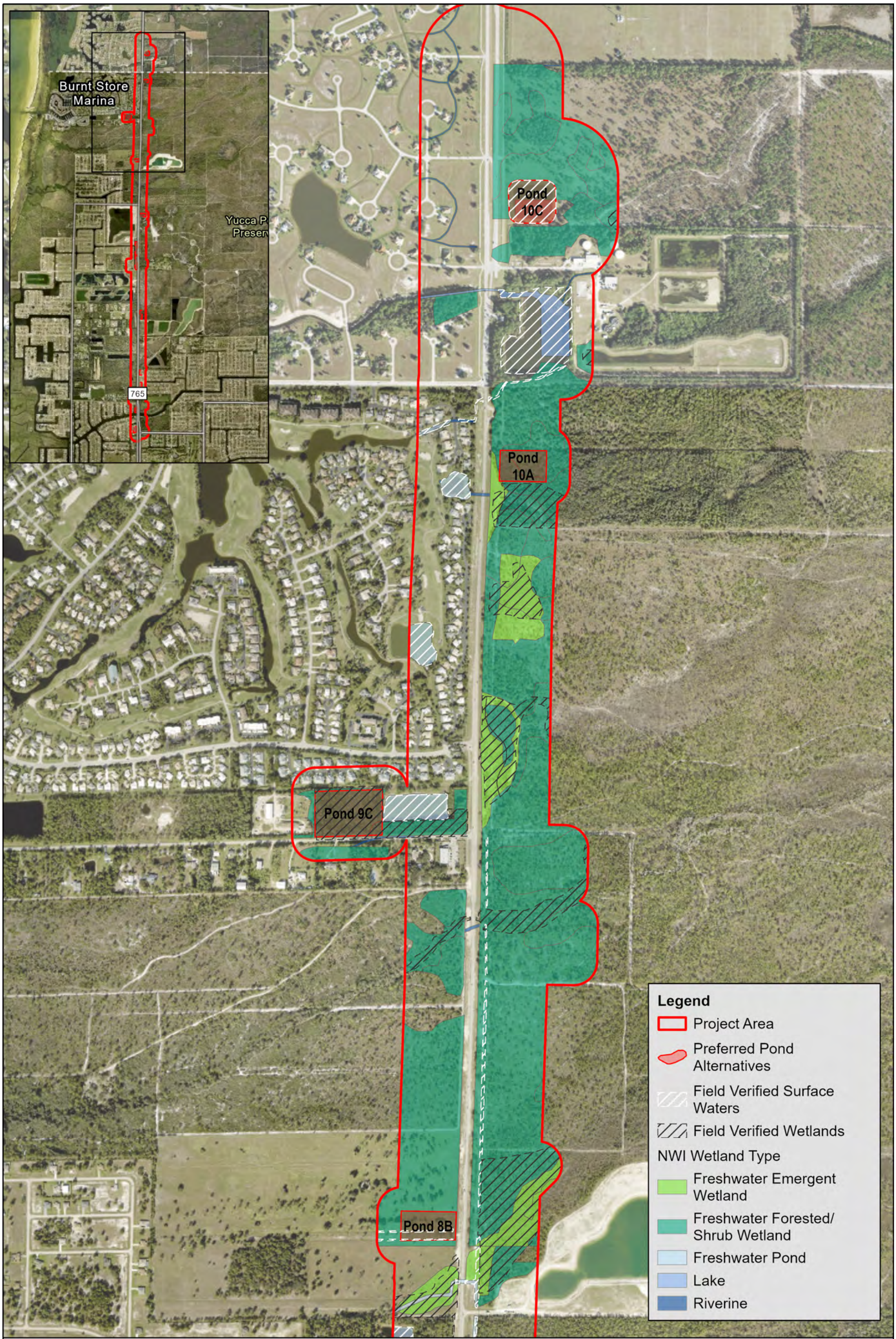

Figure 7. National Wetland Inventory (NWI) and Field Verified Wetlands and Surface Waters Map
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Six wetland types exist within 500 feet of the study area. While some of these wetlands are relatively high quality hydric flatwoods, many of the wetlands are degraded communities dominated by nuisance or exotic vegetation. Degradation may have resulted from historic land clearing, diversion of water flow, and proximity of historical mining operations or other development. Per Chapter 62.600 (D) F.A.C., boundaries of surface waters and other surface waters with slopes of 4 to 1 (horizontal to vertical) or steeper are estimated using the top of bank. These systems include ditches, canals, and holding ponds. These, along with jurisdictional ditches with slopes of less than 4 to 1, are classified as FLUCFCS code 5100 (Streams and Waterways). Wetland acreages are broken down by type in **Table 3.** The UMAM datasheets for all wetlands and other surface waters are provided in **Appendix E**.

TABLE 3: EXISTING NWI WITHIN 500 FEET OF PROJECT CORRIDOR

Wetland System Type	Wetland Description	Acreage	Percentage of Total Project
Estuarine	Estuarine And Marine Deepwater	11.46	1.61%
	Total	**11.46**	**1.61%**
Palustrine	Freshwater Emergent Wetland	109.37	15.40%
	Freshwater Forested/Shrub Wetland	129.12	18.19%
	Freshwater Pond	17.35	2.44%
	Total	**255.83**	**36.03%**
Lacustrine	Lake	3.65	0.51%
	Total	**3.65**	**0.51%**
Riverine	Riverine	14.44	2.03%
	Total	**14.44**	**2.03%**
	Total	**285**	**40%**

Note: The percentage of total project does not equate to 100% because only 40% (285 acres of wetland / 710 acres of total project area) of that area is composed of wetlands and surface waters

3.0 PROTECTED SPECIES AND HABITAT

Listed species are afforded special protective status by federal and state agencies. This protection is federally administered by the United States Department of the Interior, USFWS, and National Oceanic and Atmospheric Administration – National Marine Fisheries Services (NOAA-NMFS) pursuant to the Endangered Species Act (ESA) of 1973 (as amended). The USFWS administers the federal list of Endangered and Threatened Wildlife and Plants (50 CFR 17.11-12). Federal protection of marine species is the responsibility of the NOAA-NMFS. Impacts to CH were also evaluated per Section 3(5)(A) of the ESA. The study area was also evaluated for the occurrence of CH as defined by the Endangered Species Act of 1973 as amended and 50 CFR Part 424.

The State of Florida affords special protection to animal species designated as threatened or endangered, pursuant to Chapter 68A-27, F.A.C. The State of Florida also protects and regulates plant species designated as endangered, threatened or commercially exploited as identified on the Regulated Plant Index (5B- 40.0055, F.A.C.), which is administered by the FDACS, Division of Plant Industry, pursuant to Chapter 5B-40, F.A.C.

The following sections describe the methodology used to assess the potential for occurrence of protected species and to identify the effects that implementation of the proposed project alternative may have on protected species in accordance with Protected Species and Habitat of the FDOT PD&E Manual.

Reviewing agency comments from the ETDM programming screen review ranked effects to wildlife and habitat as “Moderate” (USFWS, FWC, SFWMD) and effects to coastal and marine resources as “Minimal” (NMFS and SFWMD). The FWC noted the value of the adjacent county and state-managed conservation lands for providing wildlife habitat and expressed concern regarding potential loss of habitat, habitat fragmentation, potential adverse effects to listed species, increased wildlife roadkill, potential restrictions on prescribed burns, and potential water quality degradation. USFWS commented on potential presence of several federally-listed species including the Florida bonneted bat and wood stork, and recommended that a biological assessment be prepared as part of the study. SFWMD recommended direct communication with the FWC and USFWS prior to permit submittal, particularly in relation to possible protected species surveys and management plans.

It is important to note that the Preferred Alternative avoids any ROW impacts to the adjacent county and state-managed conservation properties. Avoidance of these sensitive lands was a key goal as part of the development of potential roadway widening options. Therefore, the majority of the agency comments regarding species habitat impact have been addressed with the selection of the Preferred Alternative. While a four-lane typical section will be wider and more difficult for wildlife to cross, there are ten culverts within the project limits with flashy hydrology throughout the year. As a result, dry passage crossing at these locations is anticipated to be possible for much of the year. Additionally, an option for a wildlife feature will be examined during the project’s design phase.

State water quality standards will be met during construction in accordance with the most current edition of the FDOT’s Standard Specifications for Road and Bridge Construction, “Prevention, Control, and Abatement of Erosion and Water Pollution,” and through the use of best management practices (BMP). A new stormwater management system is proposed that will treat roadway stormwater as per SFWMD requirements. This NRE document serves as a biological assessment for the project and has addressed potential impacts to all listed species including the Florida bonneted bat and wood stork as mentioned by the USFWS. A species-specific acoustic survey was completed for the Florida bonneted bat and is included as an appendix in this document.

The project area is within the CH of the smalltooth sawfish (*Pristis pectinata*) and the West Indian manatee (*Trichechus manatus*) and within the proposed CH for the Florida bonneted bat (*Eumops floridanus*). The project is also within the USFWS Consultation Areas (CAs) of the red-cockaded woodpecker (*Picoides borealis*), Florida scrub-jay (*Aphelocoma coerulescens*), Florida bonneted bat (*Eumops floridanus*), piping plover (*Charadrius melodus*), and Southwest plants. The Core Foraging Areas (CFA) of seven wood stork nesting colonies overlap the project. The project is not within a USFWS-designated habitat zone for the Florida panther (*Puma concolor coryi*).

3.1 METHODOLOGY

Literature reviews, agency database searches, and field reviews of potential habitat areas were conducted to identify state and federally protected species occurring or potentially occurring within the project area. The Lee County and Charlotte County Soil Surveys, SFWMD land use/land cover mapping, recent aerial imagery from several sources, management plans from adjacent conservation lands, and several regional studies and plans were reviewed to determine habitat types occurring within and adjacent to the project corridor. Land use/land cover mapping was updated to reflect the current field conditions.

Information sources and databases include the following:

- Audubon Florida- EagleWatch public nest application (2021 nesting data);
- eBird Species Map;
- FNAI- Biodiversity Matrix Report (http://www.fnai.org/biointro.cfm);
- FNAI- Standard Data Report (December 2021) – See **Appendix F**;
- FDACS – Notes on Florida's Endangered and Threatened Plants;
- FDEP – Charlotte Harbor Preserve State Park Unit Management Plan (2007);
- FDOT- Florida Land Use Cover, and Forms Classification System (FLUCFCS) Handbook, 3rd ed. (January 1999);
- FDOT's Efficient Transportation Decision Making (ETDM) Summary Report (September 4th, 2020);
- Environmental Screening Tool (EST);
- FWC
    - Bald eagle (*Haliaeetus leucocephalus*) nest locator (2017-2020) nesting season data);
    - Wading bird rookeries locator (1999);
    - Florida scrub-jay habitat and observations (1992-1993);
    - Bald Eagle Management Plan;
    - A Species Action Plan for the Sherman's Short-tailed Shrew;
    - A Management Plan for Fred C. Babcock-Cecil M. Webb Wildlife Management Area;
    - Florida's Official Endangered and Threatened Species List (Updated December 2018);
- Lee County
    - Wildlife Species List for Charlotte Harbor Buffer Preserve;
    - Wildlife List and Plant List for Yucca Pens Preserve;
    - Yucca Pens Preserve Land Management Plan, Second Edition;
- SFWMD- Yucca Pens Hydrological Restoration Plan (2010)
- USDA NRCS – Lee and Charlotte County soil surveys (FGDL SSURGO, 2018);
- USFWS – https://www.fws.gov/northflorida/
    - Information for Planning and Consultation (IPaC) (IPaC: Getting Started - Draw on Map (fws.gov));

    - Species Profiles
    - CH for threatened and endangered species;
    - Wood stork active colonies (2010-2019) (USFWS, 2020);
    - South Florida wood stork (*Mycteria americana*) CFA (18.6-mile radius);
    - CAs for federally listed species;
    - Species Conservation Guidelines for the Florida Scrub-jay (*Aphelocoma coerulescens*);
- U.S. Army Corps of Engineers (USACE) Effect Determination Keys for the wood stork, eastern indigo snake, Florida bonneted bat, West Indian manatee, and Florida panther; and
- Personal communication with Katie McBride, City of Cape Coral biologist, regarding federal and state listed species sightings in the project area, Hunter Stewart, Babcock-Webb WMA Bat Biologist, regarding the status of Florida bonneted bat roosts within the WMA, and Jim Beever, Southwest Florida Regional Planning Council biologist/planner, regarding historical information on wildlife crossings considered in the project area.

Figure 8a and Figure 8b depicts field observations as well as historic species occurrences from database searches. Based on the review of aerial photographs; soil, land use and NWI mapping; and results of database searches, field survey methods for specific habitat types and tables of potentially occurring protected fauna and flora were developed. Further research for protected flora was conducted to determine the flowering season for selecting the most appropriate seasons for field efforts.

FIGURE 8A: LISTED AND PROTECTED SPECIES OVERVIEW MAP

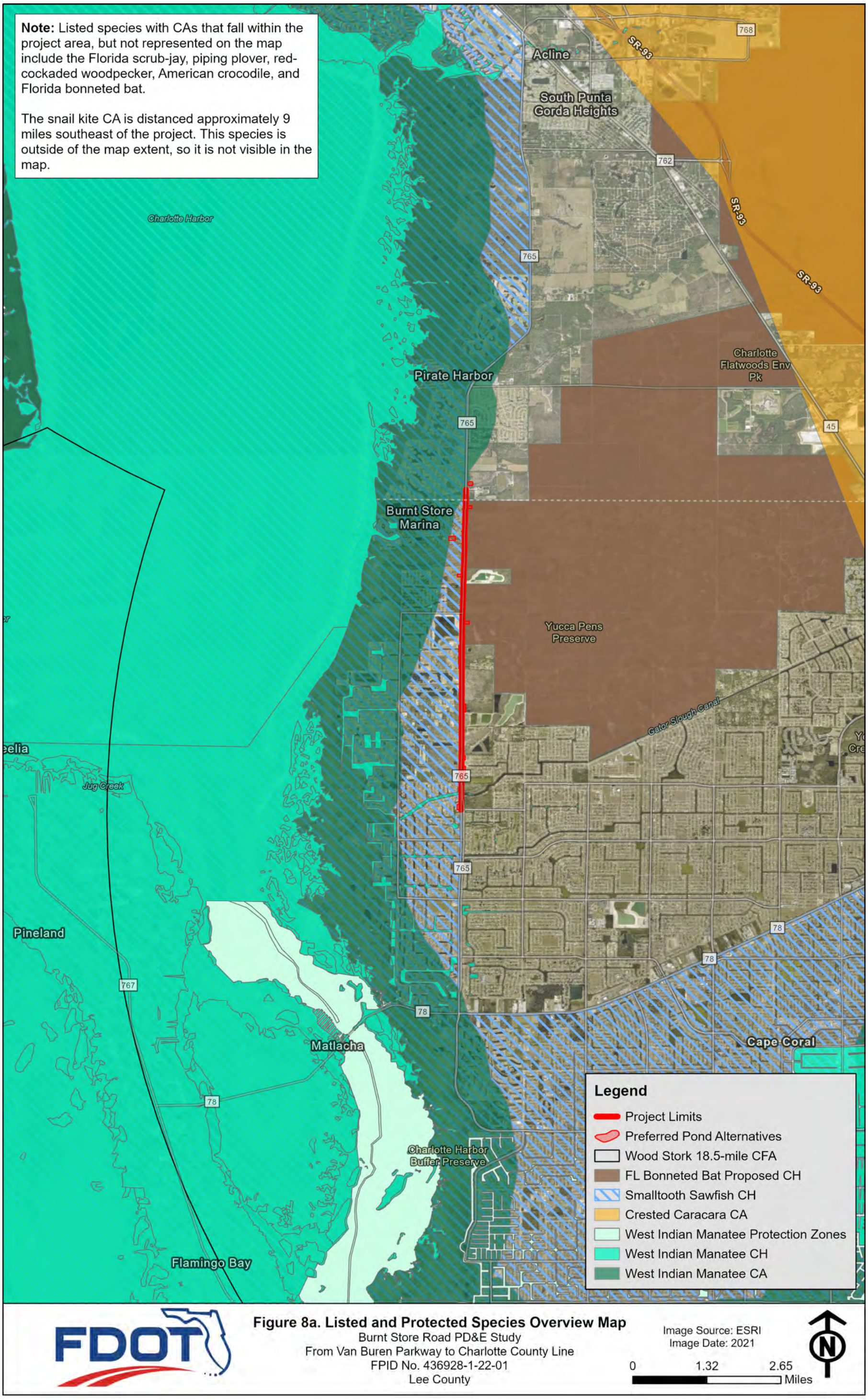
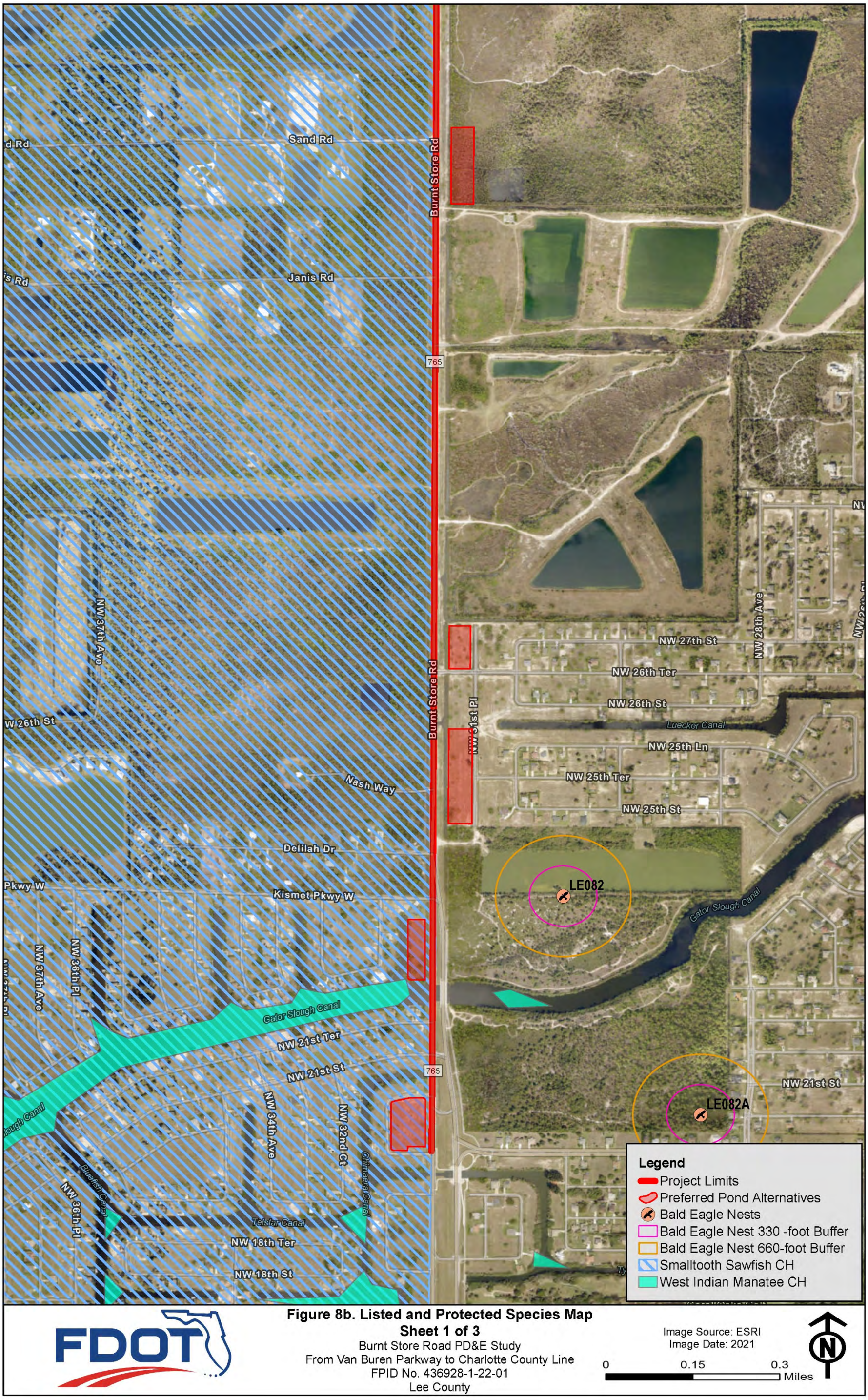


FIGURE 8B: LISTED AND PROTECTED SPECIES MAP



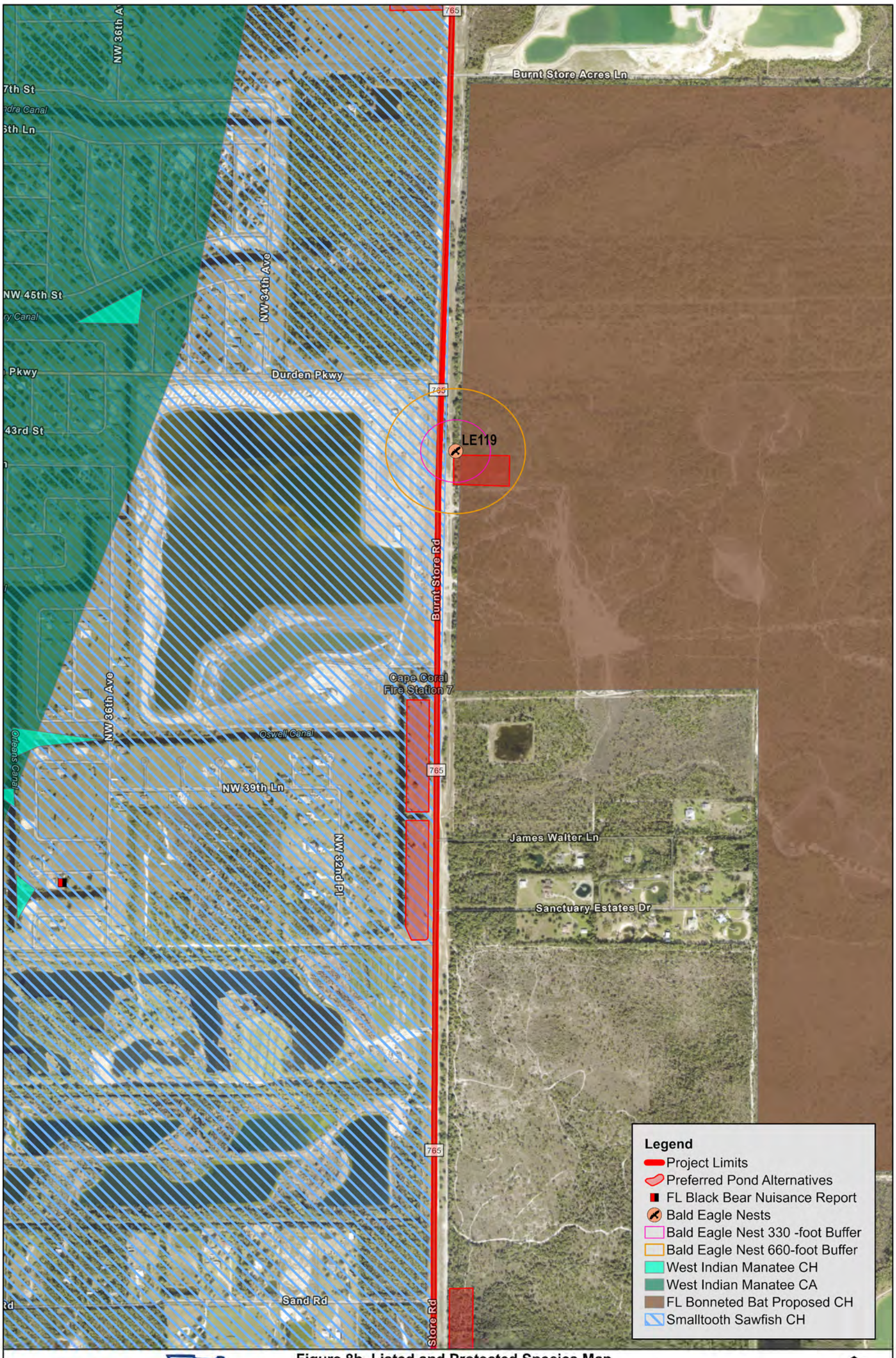


Figure 8b. Listed and Protected Species Map
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FPID No. 436928-1-22-01
Lee County

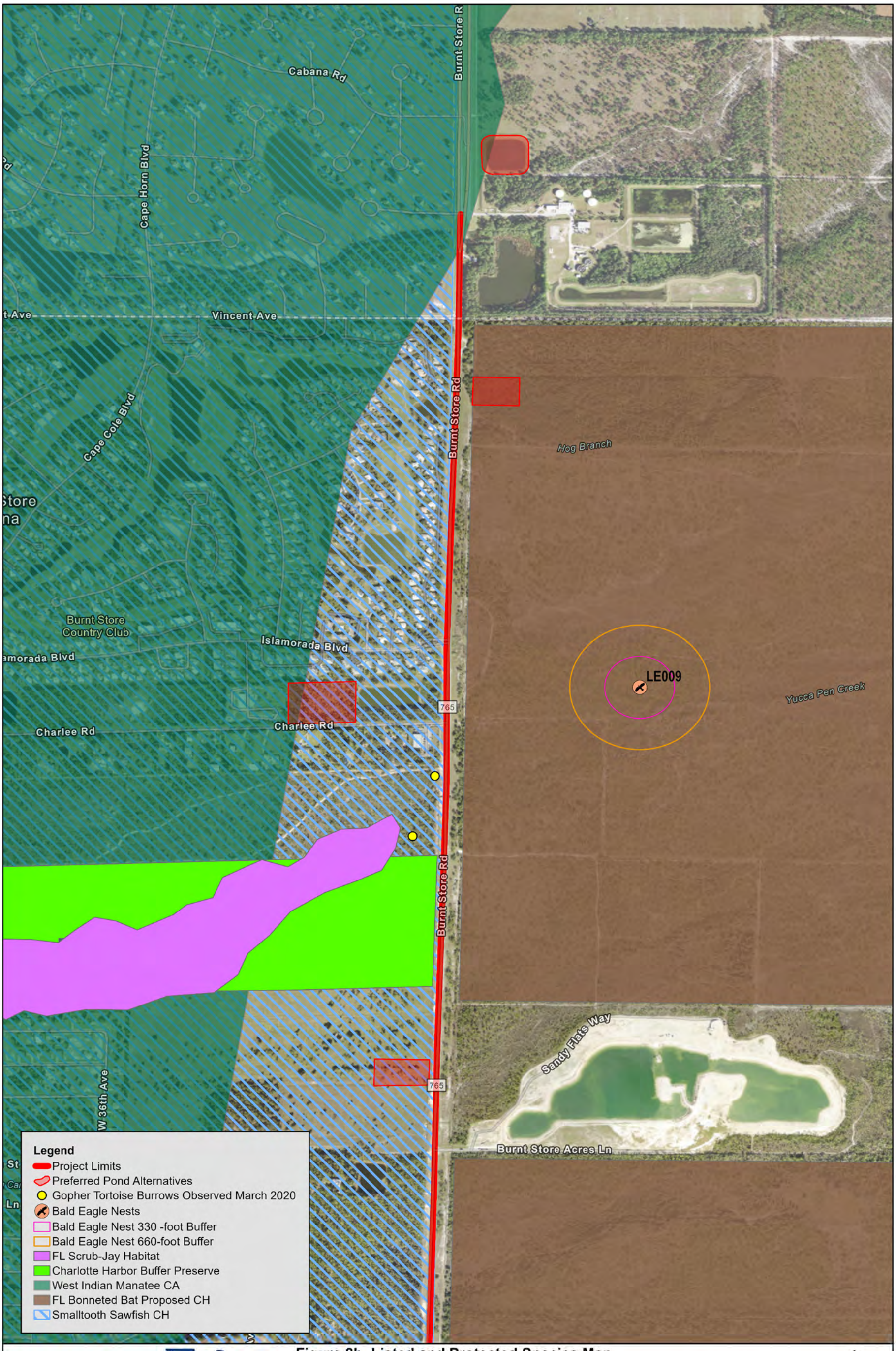

Figure 8b. Listed and Protected Species Map
Sheet 3 of 3
Burnt Store Road PD&E Study
From Van Buren Parkway to Charlotte County Line
FPID No. 436928-1-22-01
Lee County

Field reviews consisted of vehicular surveys and detailed pedestrian surveys through natural areas and altered habitats with the potential to support protected species. In the absence of physical evidence of a protected species, evaluation of the appropriate habitat was conducted to determine the likelihood of a species being present.

3.2 RESULTS

Project scientists conducted initial general surveys on March 9-12, 2020 and September 16-18, 2020. On each field event, the field team consisted of ecologists with a minimum of bachelor's degrees in a biological science, and several years of field experience in Florida ecosystems. Using vehicular and meandering pedestrian transect survey methods during daylight hours, appropriate habitat within 500 feet of the project area was visually scanned for evidence of listed species as well as general wildlife. All natural areas were considered as appropriate wildlife habitat and protected floral species habitat. All occurrences of wildlife in the study area were recorded and observation locations were depicted on project aerials. These occurrence records could include observations of the actual species, or signs of their presence including tracks, burrows, dens, scat, nests, or calls. Special attention was given to identifying signs of federal and state listed and protected species. In addition to the general faunal and floral surveys, specific morning observation time for wetland-dependent birds was spent at appropriate habitat locations (e.g. wetlands and surface waters). Similarly, on the mornings of March 10-11, 2020, preliminary presence-absence surveys for the Florida scrub-jay were conducted using a call-back recording at 10 stations within the nearest potential scrub-jay habitat. Follow-up field surveys were conducted on April 7 and 15, 2022 to inspect the 28 pond site alternatives and re-visit select areas along the mainline corridor. A brief field review on November 3, 2022 was conducted to verify the current status of eagle nests.

To further summarize the results of desktop and field data collection efforts, each potentially occurring species was assigned a likelihood for occurrence of "none", "low", "moderate", or "high" within habitats found on the project corridor as well as an indicator of suitable habitat proximity to the project area of "distant", "near", or "contiguous". Definitions of probability of species presence and habitat proximity are provided below.

Likelihood of Species Presence

None – Species has been documented in Lee County or the bio-region, but due to complete absence of suitable habitat, could not be naturally present within the project corridor.

Low – Species with a low likelihood of occurrence within the project corridor are defined as those species that are known to occur in Lee County or the bio-region, but preferred habitat is limited on the project corridor, or the species is rare.

Moderate - Species with a moderate likelihood for occurrence are those species known to occur in Lee or the bio-region, and for which suitable habitat is well represented on the project corridor, but no observations or positive indications exist to verify presence.

High - Species with a high likelihood for occurrence are suspected within the project corridor based on known ranges and existence of sufficient preferred habitat on the corridor; are known to occur adjacent to the corridor; or have been previously observed or documented in the vicinity.

Habitat Proximity

Distant - Appropriate habitat is distant from the project footprint when accounting for the species' home range size and level of mobility.

Near - Appropriate habitat is near the project footprint when accounting for the species' home range size and level of mobility.

Contiguous - Appropriate habitat occurs within or immediately adjacent to the project footprint.

Table 6 lists the federally and state-listed and otherwise protected wildlife species known to occur within Lee County and Charlotte County that could potentially occur near the project area based on potential availability of suitable habitat and known ranges.

3.2.1 FEDERALLY LISTED WILDLIFE SPECIES

3.2.1.1 REPTILES

American Crocodile (*Crocodylus acutus*)

The American crocodile is listed as threatened by the USFWS. Crocodiles inhabit mangrove swamps and low-energy, mangrove-lined bays, creeks, and inland swamps. The current distribution of the species is limited to South Florida. The CA for the species does not overlap with the project and minimal habitat is present within the project footprint. Additionally, this species was not observed during field reviews and there are no documented occurrences within one mile of the project; therefore, the project is expected to have no effect on the American crocodile.

Loggerhead Sea Turtle (*Caretta caretta*)

The loggerhead sea turtle is federally listed as threatened and can be found in inshore areas such as bays, lagoons, salt marshes, creeks, ship channels, and the mouths of large rivers. Nesting occurs mainly on open beaches or along narrow bays with suitable sand. Several loggerhead occurrences have been documented one to two miles away in 2013, 2007, 2001, and 1990. The only location where potential swimming (non-nesting) sea turtle habitat intersects with the project is at Gator Slough Canal. Since only bridge piling replacement and minor shading impacts to unconsolidated bottom estuarine habitat are proposed to potential sea turtle swimming habitat, and since the NMFS Sea Turtle and Smalltooth Sawfish Construction Conditions (**Appendix G**) will be implemented during construction, a determination of may affect, not likely to adversely affect is appropriate for this species.

Green Sea Turtle *(Chelonia mydas)*

The green sea turtle is federally listed as threatened and can be found in fairly shallow waters (except when migrating) inside reefs, bays, and inlets. The turtles are attracted to lagoons and shoals with an abundance of marine grass and algae. Open beaches with a sloping platform and minimal disturbance are required for nesting. No occurrences have been documented near the project area, and the only location where potential swimming (non-nesting) sea turtle habitat intersects with the project is at Gator Slough Canal. Since only bridge piling replacement and minor shading impacts to unconsolidated bottom estuarine habitat are proposed to potential sea turtle swimming habitat, and since the NMFS Sea Turtle and Smalltooth Sawfish Construction Conditions will be implemented during construction, a determination of may affect, not likely to adversely affect is appropriate for this species.

TABLE 4: POTENTIALLY OCCURRING AND OBSERVED LISTED WILDLIFE SPECIES

Species	Common Name	FWC	USFWS	Habitat	Habitat in Relation to Project Footprint	Potential for Occurrence
REPTILES						
Caretta caretta	Loggerhead sea turtle	-	T	Marine/estuarine waters, sandy shorelines	Contiguous	Moderate
Chelonia mydas	Green sea turtle	-	T	Marine/estuarine waters, sandy shorelines	Contiguous	Low
Crocodylus acutus	American crocodile	-	T	Coastal (saltwater/brackish/tidal) waters	Contiguous	Low
Dermochelys coriacea	Leatherback sea turtle	-	E	Marine/estuarine waters, east coast beaches	Contiguous	Low
Drymarchon corais couperi	Eastern indigo snake	-	T	Hydric hammock, palustrine, sandhill scrub, upland pine forest, mangrove swamp	Contiguous	Moderate
Eretmochelys imbricata	Hawksbill sea turtle	-	E	Marine/estuarine waters, sandy shorelines	Contiguous	Low
Gopherus polyphemus	Gopher tortoise	T	-	Sandhill, scrub, xeric hammock, ruderal, dry prairie, pine flatwood	Contiguous	High
Lepidochelys kempii	Kemp's ridley sea turtle	-	E	Marine/estuarine waters, sandy shorelines	Contiguous	Low
Pituophis melanoleucus mugitus	Florida pine snake	T	-	Well-drained sandy soils with a moderate to open canopy	Contiguous	Moderate
BIRDS						
Grus canadensis pratensis	Florida sandhill crane	T	-	Basin marsh, depression marsh, dry prairies, marl prairie, pastures	Contiguous	Moderate
Aphelocoma coerulescens	Florida scrub-jay	-	T	Relict dune ecosystems or scrub on well drained sandy soils; scrubby oaks	Near	Low
Athene cunicularia floridana	Florida burrowing owl	T	-	Native prairies and cleared areas with short groundcover	Contiguous	High
Polyborus plancus audubonii	Audubon's crested caracara	-	T	Prairies with cabbage palms, wooded areas with saw palmetto, scrub oaks, pastures	Contiguous	Low
Charadrius melodus	Piping plover	-	T	Sandy beaches, sand flats, and mudflats along coastal areas	Near	Low
Charadrius nivosus	Snowy Plover	T	-	Sandy beaches, sand flats	Near	Low
Laterallus jamaicensis	Eastern black rail	-	T	Brackish, salt, and freshwater wetlands	Near	Low
Calidris canatus rufa	Rufus red knot	-	T	Sandy beaches, saltmarshes, lagoons, estuarine mudflats, and mangrove swamps	Near	Low
Egretta caerulea	Little blue heron	T	-	Shallow edges of any surface waters	Contiguous	Moderate
Egretta rufescens	Reddish egret	T	-	Shallow edges of any surface waters	Contiguous	Moderate
Egretta tricolor	Tricolored heron	T	-	Shallow edges of any surface waters	Contiguous	Moderate
Falco sparverius paulus	Southeastern American kestrel	T	-	Sandhill, mesic flatwoods, ruderal, dry prairie	Contiguous	Moderate
Haliaeetus leucocephalus	Bald eagle	-	*	Estuarine, lacustrine, riverine, tidal marsh, tall trees or structures for nesting	Contiguous	High
Mycteria americana	Wood stork	-	T	Shallow edges of surface waters	Contiguous	Moderate
Picoides borealis	Red-cockaded woodpecker	-	E	Mature pine forests containing living longleaf pine trees	Near	Low
Platalea ajaja	Roseate spoonbill	T	-	Shallow edges of any surface waters	Contiguous	Moderate
Rostrhamus sociabilis plumbeus	Snail kite	-	E	Lowland freshwater marshes and littoral shelves of lakes	Near	Low
Sternula antillarum	Least tern	T	-	Coastal beaches, estuaries, and bays, occasional use of rooftops	Near	Low
MAMMALS						
Blarina carolinensis shermani	Sherman's short-tailed shrew	T	-	Drainage ditches with dense grass; forested areas with thick tree debris and detritus	Contiguous	Low
Eumops floridanus	Florida bonneted bat	-	E	Cavities in natural and manmade structures	Contiguous	High
Puma concolor coryi	Florida panther	-	E	Swamps, tropical hammocks, pine flatwoods, cabbage palm forests, sawgrass marshes, Brazilian pepper thickets	Near	Low
Tadarida brasiliensis	Brazilian free-tailed bat and several other bat species	**	-	Cavities in structures, trees, and land formations	Contiguous	High
Trichechus manatus	West Indian manatee	-	T	Coastal waters, bays, rivers	Contiguous	Moderate
Ursus americanus floridanus	Florida black bear	**	-	Flatwoods, swamps, scrub oak ridges, bayheads	Contiguous	Moderate
FISH						
Acipenser oxyrinchus desotoi	Gulf sturgeon	-	T	Marine and estuarine waters	Contiguous	Low

Species	Common Name	FWC	USFWS	Habitat	Habitat in Relation to Project Footprint	Potential for Occurrence
Pristis pectinata	Smalltooth sawfish	-	E	Marine and estuarine waters	Contiguous	Low

Sources:

(1) USFWS - U.S. Fish and Wildlife Service status, Official lists of Threatened and Endangered species, 50 CFR 17.11

(2) FWC – Florida Fish and Wildlife Conservation Commission, Florida's Threatened and Endangered Species List, Updated December 2018.

[ranking: E - endangered, T – threatened]

http://ecos.fws.gov/tess_public/reports/species-by-current-range-county?fips=12105 accessed February 2020

http://www.fnai.org/bioticssearch.cfm accessed February 2020

USFWS Notations:

*The Bald Eagle is afforded federal protection through the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA).

FWC Notations:

** Brazilian free-tailed bat and several other bat species are not listed, however are still protected in Florida per Chapter 68A of the Florida Administrative Code. The Florida black bear is no longer listed as threatened, however is still protected under the FWC Florida Black Bear Management Plan. This species has a significant vulnerability to habitat modification, environmental alteration, human disturbance, or human exploitation which, in the foreseeable future may result in becoming a threatened species unless appropriate protective/management techniques are initiated/maintained.

Note:

In accordance with Florida Administrative Code (FAC) Title 68A-27.0012, Procedures for Listing and Removing Species from Florida's Endangered and Threatened Species List, federally endangered or threatened species under the Endangered Species Act will be listed by the FWC by their federal designation.

Leatherback Sea Turtle *(Dermochelys coriacea)*

The leatherback sea turtle is federally listed as endangered and can be found in bays, lagoons, salt marshes, ship channels, and the mouths of large rivers. Nesting does not occur on the west coast of Florida. No occurrences have been documented near the project area, and the only location where potential sea turtle habitat intersects with the project is at Gator Slough Canal. Since only bridge piling replacement and minor shading impacts to unconsolidated bottom estuarine habitat are proposed to potential sea turtle swimming habitat, and since the NMFS Sea Turtle and Smalltooth Sawfish Construction Conditions will be implemented during construction, a determination of may affect, not likely to adversely affect is appropriate for this species.

Hawksbill Sea Turtle (*Eretmochelys imbricata*)

The Hawksbill sea turtle is federally listed as endangered. This species inhabits the Gulf of Mexico and coastal estuaries, nesting on sandy beaches. No hawksbill occurrences have been documented near the project area. Since only bridge piling replacement and minor shading impacts to unconsolidated bottom estuarine habitat are proposed to potential sea turtle swimming habitat, and since the NMFS Sea Turtle and Smalltooth Sawfish Construction Conditions will be implemented during construction, a determination of may affect, not likely to adversely affect is appropriate for this species.

Kemp's Ridley Sea Turtle (*Lepidochelys kempii*)

The Kemp's Ridley sea turtle is federally listed as endangered. Habitat includes nearshore and inshore waters of the Gulf of Mexico; nesting habitat includes sandy beaches. A Kemp's ridley occurrence was documented approximately two miles away in 1998. Since only bridge piling replacement and minor bridge shading impacts to unconsolidated bottom estuarine habitat are proposed to potential sea turtle swimming habitat, and since the NMFS Sea Turtle and Smalltooth Sawfish Construction Conditions will be implemented during construction, a determination of may affect, not likely to adversely affect is appropriate for this species.

Eastern Indigo Snake (*Drymarchon corais couperi*)

The Eastern indigo snake is designated as threatened by the USFWS. This species may inhabit a variety of natural areas including forested uplands and wetlands as well as wet and dry prairies. It may also utilize gopher tortoise burrows for shelter to escape hot or cold ambient temperatures within its range. It is documented to have occurred within Babcock-Webb Yucca Pens Unit WMA (FWC, 2014); however, not within 1 mile of the project corridor. Suitable habitat for the species exists within and adjacent to the project corridor. Therefore, the FDOT will implement the USFWS Standard Protection Measures for the Eastern Indigo Snake (**Appendix H**). Based on the USFWS Consultation Key for the Eastern Indigo Snake- Revised (2017) (**Appendix I**), the determination of effect is (A>B>C>D "MANLAA") for this species. Given the use of this key and implementation of the Standard Protection Measures for the Eastern Indigo Snake, a determination of may affect, not likely to adversely affect is appropriate for this species.

3.2.1.2 BIRDS

Florida Scrub-Jay (*Aphelocoma coerulescens*)

The Florida scrub-jay is designated as threatened by the USFWS and the project is within the CA for the species. Optimal scrub-jay habitat occurs on scrub ridges with well drained to excessively well drained soils that have scrubby oaks (*Quercus* spp.) one to three meters in height interspersed with ten to 50%

unvegetated sandy opening, and a sand pine (*Pinus clausa*) canopy of less than 20%. However, scrub-jay habitat is generally defined as scrub and scrubby flatwoods or any upland community where scrub oak species make up 15% or more of the ground cover (Fitzpatrick et al., 1991). The project footprint does not contain habitat for the Florida scrub-jay. Within the study area, but beyond 400 feet from the project footprint, some habitats provide the community structure required for the Florida scrub-jay. Specifically, historic (from 1992-1993 inventory) scrub-jay suitable habitat is located within Charlotte Harbor Buffer Preserve (shown in **Figure 8**). According to available GIS data and correspondence with land managers of adjacent public lands, the nearest Florida scrub-jay observation was documented in 1992-1993 approximately 0.78-mile west of the project limits at the aforementioned preserve. Because of that observation, the habitat polygon was created. However, eBird (a website where wildlife professionals and recreational birders document avian species observations) records an observation from February 2019 within the preserve (west of the study area). The species has not been previously documented in the other adjacent state and county-managed conservation lands. Similarly, the project team reviewed permit applications and species supporting documentation for all of the adjacent properties that have undergone state and federal permitting. No Florida scrub-jays were reported to occur in these properties.

No evidence of Florida scrub-jays was observed during the course of project surveys. Based on lack of previously documented individuals near the project footprint, lack of suitable habitat within the project footprint and 400-foot buffer, and degraded habitat beyond this buffer, a determination of may affect, not likely to adversely affect is appropriate for this species.

Crested Caracara (*Polyborus plancus audubonii*)

The Audubon's crested caracara is listed as threatened by the USFWS. The project is located six miles outside of the CA for the species. Ideal caracara habitat consists of a mix of wet prairie with cabbage palms, wooded areas with saw palmetto, cypress, scrub oak (*Quercus inopina*) ecosystems, and open pasturelands. As caracaras forage on carrion, they are somewhat adapted to non-natural areas and opportunistically feed on roadkill. Cabbage palms are the preferred nesting location for the caracara. Cabbage palms occur intermittently adjacent to the corridor. It is possible that the proximity to roadways would provide a reliable food source (carrion) for caracaras.

The project is located approximately 11 miles northeast of the nearest GIS-documented caracara observation, which occurred in 1991. Land managers of the county and state-managed conservation lands stated that they have seen caracara flying over the project corridor, and an individual was reported in January 2020 west of the project at Charlotte Harbor Buffer Preserve (eBird, 2020). This species is also documented to occur to the east of the project within Babcock-Webb Yucca Pens Unit WMA (FWC, 2014). All reported observations were of individual flying caracara, not nests. In addition, the project team reviewed permit applications and species supporting documentation for all of the adjacent properties that have undergone state and federal permitting. No caracara were reported to occur in these properties. Since this species is known to fly almost 30 miles away from its nest, and since the project is not within the CA of the species, a determination of may affect, not likely to adversely affect is appropriate for this species.

Rufus Red Knot (*Calidris canutus rufus*)

The rufus red knot is a federally listed threatened species that inhabits sandy beaches, saltmarshes, lagoons, estuarine mudflats, and mangrove swamps. This species travels in flocks, using Florida coastal areas as wintering grounds; breeding does not take place in Florida. The primary food source for this

species is horseshoe crab eggs, but they also rely on invertebrates such as mussels, clams and small crustaceans. An individual was documented to have been observed in January 2019 at Charlotte Harbor Preserve State Park, approximately two miles west of the project (eBird, 2020). However, no appropriate habitat or food source exists within the study area, and no individuals were observed during field reviews. Therefore, the project is expected to have no effect on the rufus red knot.

Piping Plover (*Charadrius melodus*)

The piping plover is federally listed threatened by the USFWS, and the project area is within the CA of this species with CH present 13 miles to the west. These small birds primarily inhabit intertidal sandy beaches with no or very sparse vegetation. However, they have also been known to utilize sand flats and mudflats along coastal areas. This species uses Florida habitats as wintering grounds, migrating here after nesting has occurred in its northern territories. Availability of quality foraging and roosting habitat in the wintering grounds is necessary in order to ensure that an adequate number of adults survive to migrate back to breeding sites and successfully nest during early summer. Although there are some areas near the project that could be considered sand flats (dry exposed white sandy soil with little vegetation), these areas are generally disturbed sites resulting from inactive mining operations, residential development, and use of all-terrain vehicles (ATVs) that create vegetation-free areas. Individuals were documented in January 2018 approximately two miles west of the corridor at Charlotte Harbor Preserve State Park (eBird, 2020). There are no observation records of this species within one mile of the project limits and no individuals were observed during field reviews. Therefore, the project is expected to have no effect on the piping plover.

Eastern Black Rail (*Laterallus jamaicensis*)

The Eastern black rail is federally listed as threatened by the USFWS, and the current range is approximately 30 miles north of the project area. However, this species is known to inhabit coastal areas along the western coast of Florida year-round, specifically brackish, salt, and freshwater wetlands. This marsh bird is wetland dependent, requiring moist to saturated soils and gentle slopes that allow for shallow inundation to provide foraging areas. They also require dense vegetation to provide shelter from predators. Although there are wetland areas within and near the project, these areas have generally short hydroperiods and have been field-verified to not provide constant inundation for foraging. There are no records of this species within one mile of the project limits and no individuals were observed during field reviews. Therefore, the project is expected to have no effect on the eastern black rail.

Wood Stork (*Mycteria americana*)

The wood stork is listed as threatened by the USFWS. Wood storks are known to use freshwater marshes, swamps, lagoons, ponds, flooded fields, depressions in marshes and brackish wetlands, open pine-cypress wetlands, and manmade wetlands (i.e., ditches, canals, and stormwater retention ponds). Wood storks are typically colonial nesters and construct their nests in medium to tall trees located within wetlands or on islands. Wood storks are known to forage within a large area, up to 40 miles, from the colony.

For south Florida, the USFWS has defined the CFA for a wood stork colony as the area within an 18.6-mile radius from the colony location. The project corridor is located within, completely or in part, the CFA of seven wood stork colonies: 619012 Peace River, 616165 Morganton Central, Morganton South, Morganton North, Morganton New, Caloosahatchee River East, and 619041 Caloosahatchee River West. As defined by the USFWS, wood stork suitable foraging habitat (SFH) includes wetlands and surface

waters that have areas of water that are relatively calm, uncluttered by dense thickets of aquatic vegetation, and have permanent or seasonal water depth between two and 15 inches.

The wetlands and other surface waters within the project footprint generally provide such habitat. Currently, the project proposes permanent impacts to both short-hydroperiod and long-hydroperiod wetlands and other surface waters. Mitigation for wetland and surface water impacts would likely exceed what is required to offset impacts to wood stork SFH. Due to the availability of a viable mitigation option (discussed in **Section 4.4**), and use of the USFWS South Florida Programmatic Concurrence for the wood stork (2010) (A>B>C>D>E "MANLAA") (**Appendix J**), indicates a determination of may affect, not likely to adversely affect for this species.

Red-Cockaded Woodpecker (*Picoides borealis*)

The red-cockaded woodpecker is federally listed as endangered by the USFWS. The project is within the CA for the red-cockaded woodpecker. The nearest documented species observation is approximately 3.2 miles east of the project, and populations are known to currently exist within the Babcock-Webb Yucca Pens Unit WMA according to state biologists. The known populations are not near Burnt Store Road. This species is known to have historically occurred in Charlotte Harbor Buffer Preserve as well (Lee County, 2003), but no evidence exists to indicate that there is currently a population there. Additionally, the project team reviewed permit applications and species supporting documentation for all of the adjacent properties that have undergone state and federal permitting. No red-cockaded woodpeckers were reported to occur in these properties. The species is extremely habitat specific; optimal habitat consists of forests of mature live longleaf pine (*Pinus palustris*) and/or loblolly pine (*Pinus taeda*). Red-cockaded woodpeckers are primary excavators of these trees; their behavioral adaptations require them to excavate cavities in the live wood. However, there have been limited observations of the species inhabiting suboptimal habitats in south Florida. As suitable old-growth forest is absent from the project area and limited in the nearby surroundings, a determination of may affect, not likely to adversely affect is appropriate for this species.

Snail Kite (*Rostrhamus sociabilis plumbeus*)

The snail kite is designated by the USFWS as endangered. The project is located approximately nine miles outside of the CA for the species. However, this species was documented to have been observed in October 2018 at Babcock-Webb Yucca Pens Unit WMA (eBird, 2020). The nearest USFWS-documented observation is approximately 21 miles to the southeast of the project. The snail kite's diet consists almost exclusively of apple snails (*Pomacea paludosa*) and they require habitat consisting of freshwater marshes and shallow vegetated marsh or lake edges where these snails are found. Apple snails are abundant within the study area, and shells were found in nearly every habitat type. The project area generally does not provide suitable foraging or nesting habitat for the snail kite because inundated conditions exist infrequently and for short durations. There are only small water bodies near the corridor that are inundated year-round and support apple snails. However, the small size of the ponds and vegetative conditions (lack thereof, or melaleuca-dominated) are not suitable for snail kite nesting. As the project footprint is dry most of the year and provides little to no foraging, perching, or nesting habitat, a determination of may affect, not likely to adversely affect is appropriate for this species.

3.2.1.3 MAMMALS

Florida Bonneted Bat (*Eumops floridanus*)

The Florida bonneted bat inhabits forests, wetlands, open water areas, and both natural and manmade structures in southern Florida. The project is within the CA for the species. The proposed CH for this species also partially overlaps the project (See **Figure 8**). The nearest documented Florida bonneted bat population is within the Babcock-Webb Wildlife Management Area (approximately six miles northeast of the project limits), inhabiting natural tree cavities and man-made bat houses. Currently, as of June 2022, bonneted bats are known to exist within several bat houses within the Babcock-Webb Wildlife Management Area, as stated by Hunter Stewart, bat biologist at the WMA. During field reviews, potential Florida bonneted bat roosts consisted of numerous large trees and snags with suitably sized cavities. Upon inspection of the bridges over Gator Slough, no evidence of bat roosting was noted.

Given that the project footprint contains potential roosting habitat and greater than five acres of potential habitat will be affected, the Consultation Key for the Florida bonneted bat (2019) (**Appendix K**) indicates that the project (1a>2a>3b>Conduct full acoustic/roost surveys then go to 6) required a species-specific survey before the USFWS could consult on this species. An acoustic survey for this species was conducted from October 25, 2022 to November 15, 2022 and the summary memorandum is provided in **Appendix L**. While evidence of high Florida bonneted bat activity was documented in the southern project limits, no evidence of roosting was noted. Additionally, no calls were recorded within 30 minutes before sunset to 1½ hours following sunset or within 1½ hours before sunrise. These findings are consistent with ongoing surveys conducted on the Babcock/Webb WMA Yucca Pens Unit where no roost areas have been identified near Burnt Store Road. **Table 5** provides land use calculations for the current condition and “with-project” condition to depict the Florida bonneted bat habitat impact calculations. The Preferred Alternative will result in 30.97 acres of impact to potential Florida bonneted bat foraging habitat. The acreage within proposed stormwater pond sites was not considered as habitat impact, but rather as habitat enhancement since new open water features, which are desirable foraging habitat, will be created. As per the species key, because high Florida bonneted bat activity was detected, and less than 50 acres of foraging habitat will be affected (6a>7b>10a>11b), a determination of may affect, not likely to adversely affect-C, was reached. This determination requires further consultation with USFWS as well as use of Best Management Practices (BMPs) for the species. The BMPs being considered for this project include #1, 4, 7, 10, 11, and 12 (**Appendix K**).

TABLE 5 : FLORIDA BONNETED BAT POTENTIAL HABITAT IN THE PRE AND POST PROJECT CONDITIONS

FLUCFCS Code		FLUCFCS Description	Preferred Alternative (Alt 3) Habitat (acres)		Preferred Ponds Habitat (acres)	
			Pre-Conditions	Post Conditions	Pre-Conditions	Post Conditions
1000: URBAN AND BUILT-UP	1900	OPEN LAND	0.00	0.00	6.11	0.00
	1180	RURAL RESIDENTIAL	0.00	0.00	14.57	0.00
	TOTAL		**0.00**	**0.00**	**20.68**	**0.00**
2000: AGRICULTURE	2120	UNIMPROVED PASTURES	0.00	0.00	2.62	0.00
	TOTAL		**0.00**	**0.00**	**2.62**	**0.00**
3000: RANGE LAND	3300	MIXED RANGELAND	0.00	0.00	0.15	0.00
	TOTAL		**0.00**	**0.00**	**0.15**	**0.00**
4000: UPLAND FOREST	4110	PINE FLATWOODS	12.64	0.00	2.10	0.00
	4220	BRAZILIAN PEPPER	0.05	0.00	0.00	0.00
	4240	MELALEUCA	1.30	0.00	0.00	0.00
	4340	HARDWOOD-CONIFEROUS MIXED	1.50	0.00	2.37	0.00
	TOTAL		**15.49**	**0.00**	**4.48**	**0.00**
5000: WATER	5100	STREAMS AND WATERWAYS	15.17	4.50	0.00	0.00
	5120	CHANNELIZED WATERWAYS - CANALS	0.022	0.002	0.00	0.00
	5340	RESERVOIRS <10 ACRES	0.00	0.00	2.17	19.29
	TOTAL		**15.19**	**4.50**	**2.17**	**19.29**
6000: WETLANDS	6190	EXOTIC WETLAND HARDWOODS	0.27	0.00	2.98	0.00
	6250	HYDRIC PINE FLATWOODS	0.61	0.00	6.04	0.00
	6310	WETLAND SHRUB	1.75	0.00	0.00	0.00
	6430	WET PRAIRIES	2.15	0.00	0.00	0.00
	TOTAL		**4.78**	**0.00**	**9.01**	**0.00**
8000: TRANSPORTATION	*8100*	*ROAD/SIDEWALK/PATH PAVEMENT*	*(26.62)*	*(85.01)*	--	--
	8140	*SODDED MEDIAN*	*(5.67)*	*(22.97)*	--	--
	8140	SODDED POND BERMS AND SLOPES	--	--	0.99	20.80
	8140	*SODDED AREAS ALONG R/W EDGE*	*(84.02)*	*(39.30)*	--	--
	TOTAL		**116.31**	**147.28**	**0.99**	**20.80**
TOTAL ACRES			**151.78**	**151.78**	**40.09**	**40.09**
TOTAL FBB POTENTIAL HABITAT			**35.46**	**4.50**	**40.09**	**40.09**
NET FBB POTENTIAL HABITAT IMPACT = 30.97				**30.97**		**0.00**

Note: Refined land use mapping was completed to include only pavement and sodded areas in the 8000 series. Roadside ditches, areas of native vegetation in the road ROW and other habitats were coded as other series/codes in this table. Series 8000 (except for sodded pond berms and slopes) was not considered to provide suitable FBB foraging habitat *and is shown in grey fill and italics*. Additionally, the proposed stormwater ponds (post conditions) are considered to be potential FBB foraging habitat. The acreage depicted as code 5340 was calculated using the acreage at the pond control elevations. In summary, all land uses in both the current and proposed project conditions are considered to be suitable Florida bonneted bat habitat with the exception of sodded roadway medians and sodded roadside areas that could not otherwise be classified as a more natural habitat code (e.g. 3000, 4000, 5000, or 6000 series).

Tri-colored Bat (*Perimyotis subflavus*)

The tri-colored bat is proposed for federal listing as endangered on September 13, 2022. There is no consultation area for this species at this time. This species hibernates in caves during the winter and roosts in tree foliage, palm fronds, and man-made structures during the summer. There is potential roosting habitat within and adjacent to the study area. During field surveys, visual inspection of potential roosting trees, cavities, and existing bridges was conducted to identify potential bat roosting sites within the study area; however, no evidence (guano, staining, smell or aural sounds) of roosting bat habitat was observed within or adjacent to the study area. Although no evidence of bat roosting was observed, the acoustic survey conducted for the Florida bonneted bat detected a few calls of the tri-colored bat. Since no roosting was observed during the field surveys, the Preferred Alternative will likely have no impact on the tricolored bat. Additionally, if the listing status of the tricolored bat is elevated by USFWS to Threatened or Endangered and the Preferred Alternative is located within the consultation area during the design and permitting phase of the proposed project, Lee County commits to re-initiating consultation with the USFWS to determine the appropriate survey methodology and to address USFWS regulations regarding the protection of the tricolored bat.

West Indian Manatee (*Trichechus manatus*)

The West Indian manatee is a federally listed threatened species. The species is also federally protected under the Marine Mammal Protection Act. The project is within the CA and the CH of this species. The nearest documented species observation occurred in 2019 one mile west of the corridor within Burnt Store Marina. The nearest documented mortality occurred one mile southwest of the project limits in 2009. Manatees may inhabit marine and freshwater habitats and seek warm-water sites during the winter season. Gator Slough Canal is the only waterway within the project limits that is accessible to the manatee; however, the water control structure a few feet to the east of the northbound bridge is a barrier to manatee movement. Therefore, fewer manatees are expected to traverse the area than would be expected if the waterway east of the bridge were open for wildlife movement. FDOT will follow the Standard Manatee Conditions for In-Water Work (**Appendix M**). The USFWS Effect Determination Key for the Manatee in Florida (2013) (A>B>C>G>N>O>P "MANLAA") (**Appendix N**) indicates a determination of may affect, not likely to adversely affect for this species.

Florida Panther (*Puma concolor coryi*)

The Florida panther is a federally endangered species found primarily in South Florida. The project is located outside of any of the USFWS Florida panther habitat zones; however, male panthers have historically been known to access Yucca Pens Unit of the Babcock-Webb WMA. The nearest Florida panther vehicle-caused mortality to this project occurred in 2006 and was documented 15 miles to the southeast on I-75 in Fort Myers. Using FWC's data collected from 1972 to 2021 the closest telemetry data is 13 miles southeast from 2001 and 16 miles northeast from 2004. Given that the project does not propose impacts to a designated panther zone, with use of the Florida Panther Determination of Effect Key (2007) (**Appendix O**) (A>B> "No Effect"), it is anticipated that the project will have no effect on the Florida panther.

3.2.1.4 FISH

Gulf Sturgeon (*Acipenser oxyrinchus desotoi*)

The Gulf sturgeon is federally listed as threatened. Habitat includes benthic stratum within the Gulf of Mexico, bays, estuaries, and major rivers. It spends most of the year in freshwater where it spawns and

it then migrates to saltwater in the fall. Adult fish are bottom feeders, with a diet consisting mostly of invertebrates. Gator Slough Canal is the only waterway within the project limits that is accessible to the Gulf sturgeon; however, the water control structure a few feet to the east of the northbound bridge is a barrier to eastbound movement. The only impacts to these waters will be bridge and bridge piling replacement, resulting in a mere 1.5 additional square feet (sf) of impact to the canal bottom and minor additional shading of unconsolidated bottom estuarine habitat. During construction, vibration from pile installation can be reduced with techniques such as predrilling of the piles, ramp-up methods, and starting pile driving when the piles are deeper, to result in less wave propagation. Specific pile driving methods will be developed later during the final design and permitting project phase. Due to the very limited impacts within estuarine resources, a determination of may affect, not likely to adversely affect is appropriate for this species.

Smalltooth Sawfish (*Pristis pectinata*)

The smalltooth sawfish is federally listed as endangered. The project is within the CH of this species. Habitat includes shallow (less than three feet deep) estuarine and coastal habitats including bays, lagoons, rivers, and muddy or sandy bottom shorelines. Although this species prefers euryhaline conditions, characterized as fluctuating salinity, it can tolerate freshwater. Juveniles use shallow vegetated habitats, such as mangrove forests, particularly red mangrove (*Rhizophora mangle*), as nursery grounds. No mangroves or other estuarine vegetation is present within Gator Slough Canal and water depths are greater than three feet. Additionally, the water control structure just upstream of the northbound bridge serves as a barrier to movement for the sawfish and other aquatic species. The only impacts to the waters will be bridge and bridge piling replacement, resulting in a mere 1.5 additional sf of impact to the canal bottom and minor additional shading of unconsolidated bottom estuarine habitat. During construction, vibration from pile installation can be reduced with techniques such as predrilling of the piles, ramp-up methods, and starting pile driving when the piles are deeper, to result in less wave propagation. Specific pile driving methods will be developed later during the final design and permitting project phase. FDOT will follow the NMFS Sea Turtle and Smalltooth Sawfish Construction Conditions during construction **(Appendix G)**. Due to the very limited impacts within estuarine resources and precautions discussed, a determination of may affect, not likely to adversely affect is appropriate for this species.

3.2.2 STATE-LISTED WILDLIFE SPECIES

3.2.2.1 REPTILES

Gopher Tortoise (*Gopherus polyphemus*)

The gopher tortoise is listed by the FWC as threatened. Gopher tortoise burrows provide habitat for many commensal species. Ideal habitats include xeric areas with sandy soils, open canopy and low groundcover. This species is known to inhabit all four adjacent conservation areas, and several burrows were observed during field surveys of appropriate habitat (**Figure 8**). A comprehensive, 100 percent gopher tortoise burrow survey will be conducted prior to construction. Based on current FWC regulations, any gopher tortoise located within 25 feet of the project construction area must be relocated to an FWC-approved recipient site or temporarily relocated onsite. Lee County will survey the project area prior to construction to determine the presence of this species within the project area. If gopher tortoises or burrows are found within 25 feet of the limits of construction, Lee County will coordinate with the FWC to secure all permits needed to relocate the tortoises. Because a 100 percent survey with relocation, if

needed, will be conducted prior to construction, the project will have no adverse effect anticipated on the gopher tortoise.

Florida Pine Snake (*Pituophis melanoleucus mugitus*)

The Florida pine snake is a state designated threatened species that inhabits areas featuring well-drained sandy soils with a moderate to open canopy. This species is known to occur in Babcock-Webb WMA. There are several areas along the project corridor that could provide habitat for this species, although no individuals were observed during field reviews. Since impacts to such habitat are expected to be minimal, and since the surrounding preserves and Wildlife Management Areas provide extensive suitable habitat for the species to move into and use, the project will have no adverse effect anticipated on the Florida pine snake.

3.2.2.2 BIRDS

Florida Sandhill Crane (*Grus canadensis pratensis*)

The Florida sandhill crane is listed as threatened by the FWC. These birds nest on mats of vegetation approximately two feet in diameter and in shallow freshwater marshes, prairies, and pastures. Foraging habitat can include any type of open land, wet or dry. No potential nesting habitat exists in the project footprint; however, potential foraging habitat is present adjacent to the corridor, and Florida sandhill cranes have been known to nest within Yucca Pens Preserve along the square borrow pond in the vicinity of NW 40th Lane. This location is approximately 300 feet from the existing ROW. Other similar habitat within the study area may also provide nesting habitat. No Florida sandhill cranes were observed during field surveys, but this species is known to frequent the area according to documented occurrences at all of the adjacent preserves. Lee County will survey areas of suitable nesting habitat prior to construction if construction activities take place during the nesting season (January through July) and will coordinate with the FWC if nesting pairs are identified within 400 feet of the project's construction limits. With the implementation of these measures, the project will have no adverse effect anticipated on the Florida sandhill crane.

Florida Burrowing Owl (*Athene cunicularia floridana*)

The Florida burrowing owl is designated by the FWC as threatened. The nearest recorded observation occurred 2.5 miles south of the project area in 1999. However, surrounding residential areas are known to currently support this species (according to local biologists), and numerous occupied and potentially occupied burrows are marked within a mile of the project limits (but not within 500 feet). Individuals were documented to have been observed in February 2018 in Yucca Pens Preserve (eBird, 2020) and are known to have occurred in Charlotte Harbor Buffer Preserve (Lee County, 2003). Cape Coral in general is known as a hotspot for the burrowing owl. The species utilizes existing subterranean burrows created by other species (including gopher tortoises, opossums, and armadillos) in native prairies and cleared pastures. Dry prairies and upland pasture-like land is present throughout the project area but no burrows were observed during field reviews. Any burrows that are intact (not collapsed) that could potentially support a burrowing owl is considered a potentially-occupied burrow. A 100 percent survey is recommended within the limits of construction during final design. Lee County will initiate technical assistance during the project's design phase to determine the need and extent for pre-construction surveys pursuant to the FWC Imperiled Species Management Plan and Permitting Guidelines for the

Florida burrowing owl. If burrowing owls are found, coordination with the FWC will establish avoidance, minimization, and permitting options. As a result of these measures, the project will have no adverse effect anticipated on the Florida burrowing owl.

Snowy Plover (*Charadrius nivosus*)

The snowy plover is a state listed threatened species that inhabits sandy beaches. Breeding occurs in the region between February and August. Nests consist of small scrapes in the sand, sometimes with bits of shell, and are well camouflaged to avoid detection by predators. No individuals have been documented to occur within the adjacent preserves; the nearest recorded observation was 7.5 miles west on Pine Island in April 2019 (eBird, 2020). Although the project corridor contains sandy soils, there are no sand flats considered to provide habitat to this shorebird; the project will therefore have no effect anticipated on the snowy plover.

Southeastern American Kestrel (*Falco sparverius paulus*)

The southeastern American kestrel is listed by the FWC as threatened. The species inhabits sandhills, flatwoods, and open pastures with scattered pine. The species is commonly observed perched on power lines in rural to suburban areas. Nesting habitat includes cavities in snags (dead trees), which are occasional along the project corridor. No kestrels were observed during field reviews. This species was documented in January 2020 at Babcock-Webb Yucca Pens Unit WMA, in January 2018 at Yucca Pens Preserve, and in March 2020 at CHBP (eBird, 2020). Lee County will conduct updated surveys during the final design phase and will coordinate with FWC if any nests are found, to establish avoidance, minimization, and permitting options. Based on this measure and since no kestrels are known to nest within the project footprint, the project is anticipated to have no adverse effect anticipated on the Southeastern American kestrel.

Least Tern (*Sternula antillarum*)

The least tern is a species of shorebird which is known to occur within Lee County and is listed as threatened by the FWC. These are coastal species that occasionally inhabit inland sandy areas. Individuals were documented to have been observed in 2006 at Babcock-Webb Yucca Pens Unit WMA (eBird, 2020), and have been known to occur in Charlotte Harbor Buffer Preserve (Lee County, 2003) and Yucca Pens Preserve (Lee County, 2004) as well. The project footprint does not provide appropriate habitat, and no individuals were observed during field reviews or historically documented nearby; therefore, the project will have no effect anticipated on this shorebird species.

Wading Birds

Wading birds such as the little blue heron (*Egretta caerulea*), reddish egret (*Egreta rufescens*), tricolored heron (*Egretta tricolor*), and roseate spoonbill (*Platalea ajaja*), are state listed threatened and are afforded some levels of federal protection by the Migratory Bird Treaty Act (MBTA) (16 U.S.C. 703-712). Although these species were not observed during field reviews, there is potential foraging habitat in the wetlands and other surface waters within the study area. The closest documented wading bird rookery is approximately 2.3 miles north as recorded in 1999. The project proposes to impact wetlands and surface waters which provide foraging habitat for wading birds. All wetland impacts will be mitigated to prevent a net loss of wetland functions and values. Based on the proposed mitigation, it is anticipated that the project will have no adverse effect anticipated on state-protected wading birds.

3.2.2.3 MAMMALS

Sherman's Short-Tailed Shrew (*Blarina carolinensis shermani*)

The Sherman's short-tailed shrew is listed as threatened by the FWC. It occurs only in Lee and Collier Counties. This rodent inhabits dense, herbaceous habitats and moist forests such as mixed wetland forests, mixed hardwood-pine forests, ditches, and disturbed transitional habitats. A main species threat is the loss of woody debris and drying of soils. Although the project area contains appropriate habitat, impacts to such habitat are expected to be minimal. Therefore, the project will have no adverse effect anticipated on the Sherman's short-tailed shrew.

3.2.2.4 PROTECTED NON-LISTED WILDLIFE SPECIES

Bald Eagle (*Haliaeetus leucocephalus*)

This species receives federal protection under the MBTA and the Bald and Golden Eagle Protection Act (BGEPA). Protection buffers of eagle nests include a 330-foot buffer, in which construction activity cannot occur during the eagle nesting season (October 1 – May 15), and a 660-foot buffer, in which construction during the nesting season can only occur if monitored by a biologist and confirmed that no nest disturbance results. A desktop review using FWC data and Audubon EagleWatch 2022 nesting data indicates that nest LE119 is the closest documented nest to the project, occurring near the center of the corridor on the east side approximately 130 feet from existing pavement (approximately 10 feet from existing ROW; first recorded in September 2020 and last known active in November 2020). It was recorded as unsuccessful in the 2020-2021 nesting season and inactive during the 2021-2022 nesting season. The nest was not observed during project surveys, including a site review on November 3, 2022. While the nest status is currently inactive, nests are considered to be active for the purposes of state and federal permit regulations for five years following documented activity, even if the nest tree is no longer present.

Both the 330-foot and 660-foot protection buffers therefore overlap with the project footprint. The Preferred Alternative would not directly result in a nest take but given proximity of project construction, it likely would be treated as a take by the USFWS. In addition to the discussed proximities to the roadway widening, LE119 is located 38 feet from stormwater pond alternative 6A. LE082 is the second closest documented nest, occurring on the east side of the southern limits of the corridor approximately 995 feet from the existing ROW (last known active in 2017). This project is located beyond the nest protection buffers of this nest. Other bald eagle nests in the general area exist but are all significantly further than 660 feet away from the project footprint. A bald eagle was observed in flight just east of Burnt Store Road in April 2022 between nests LE009 and LE119. An updated survey is recommended prior to construction to verify the status of LE119 and to identify potential future nests within 660 feet of the project area. If any active nests are determined to exist within the 660-foot buffer the year construction is to occur, Lee County will coordinate with USFWS and will implement the protection measures required of projects within the primary and secondary protection buffer zones of eagle nests or obtain a nest disturbance permit. Therefore, the project will have no anticipated impacts on the bald eagle.

Should bald eagle nest LE119 be deemed active at the time of permitting, or should any newly occupied bald eagle nests be identified during pre-construction surveys between 660 feet of the project that cannot be avoided during the nesting season, a permit must be secured from the USFWS. Eagle nest permits include an eagle take permit, associated with, but not the purpose of, an activity (incidental take) as per Chapter 50, CFR 22.26, and an eagle nest take permit, which is authorized in limited circumstances to

authorize the take of a nest in accordance with Chapter 50 CFR 22.27. If take is unavoidable, Lee County will apply for an obtain an Eagle Take Permit from USFWS.

Osprey (*Pandion haliaetus*)

The osprey receives federal protection under the MBTA and has the potential to occur within the project area. Ospreys predate fish in open fresh and saltwater wetlands. Although several ospreys were observed during field surveys, no nests were observed within the project footprint. Lee County will conduct an updated survey prior to construction, and any nests identified for impact would be removed during non-nesting season. Therefore, the project will have no anticipated impacts on the osprey.

Florida Black Bear (*Ursus americanus floridanus*)

The Florida black bear is no longer listed as a threatened species by the FWC. While it was removed from the state list of protected species in August 2012, it is still protected through the Florida Administrative Code 68A-4.009 Florida Black Bear Conservation. The project area occurs within the secondary range of the Big Cypress population. Bears are considered rare within this area of the South Bear Management Unit. Two nuisance reports of Florida black bears have occurred within one mile of the project area (nine reports within five miles). The nearest bear nuisance event was reported 0.58-mile west of the project area in 2018. No bear mortalities have been documented within one mile of the project. Although suitable habitat occurs in pockets surrounding the project area, this project is not anticipated to result in an increase in the chance for road-associated mortalities given the lack of documented bear activity in the area. Therefore, the project will have no anticipated impacts on the Florida black bear.

Non-Listed Bat Species

All bat species are protected in Florida per chapter 68A of the Florida Administrative Code. The following bat species are known to occur in the region: the Mexican free-tail (*Tadarida brasiliensis*), evening (*Nycticeius humeralis*), big brown (*Eptesicus fuscus*), northern yellow (*Dasypterus intermedius*), and Rafinesque's big-eared (*Corynorhinus rafinesquii*). Bats utilize structures such as bridges as well as cavities in trees for roosting habitat. A survey was conducted within the project bridge and bridge culvert structures proposed for replacement to identify potential bat presence, and no evidence of bats was found. If future surveys conducted during the final design phase identify roosting bats in the bridge or bridge culvert proposed for replacement, Lee County will coordinate with FWC to prepare a bat exclusion plan. As a result of this measure, the project will have no anticipated impacts on bat species.

3.2.3 PLANTS

The project is within the CA for Southwest plants**. Table 6** lists the federally and state-protected plant species that could potentially occur near the project area based on potential availability of suitable habitat and known ranges. A total of 12 protected plant species could occur. Of these, two species are federally listed as endangered: beautiful pawpaw (*Deeringothamnus pulchellus*) and aboriginal prickly apple (*Harrisia aboriginum*). The remainder are state listed threatened or endangered by the Florida Department of Agriculture and Consumer Services (FDACS) and/or FNAI. The preferred habitats utilized by these plant species is shown in **Table 6**.

Two of these species have been documented to occur near the study area. Beautiful pawpaw was documented to have occurred in 1997 on parcel No. 204323C4000010020, which is just south of 4101 Burnt Store Road North and was relocated to a small upland conservation easement on parcel No. 204323C3000020000 as part of the FWC authorization of extraction activities conducted for the Lee

County Mine project. Florida beargrass (*Nolina atopocarpa*) is documented to have occurred in Yucca Pens Preserve (Lee County, 2004).

The dominant vegetation along the corridor is bahia grass which is regularly mowed and maintained. Additionally, the majority of the preferred stormwater pond sites are either routinely mowed and maintained or have experienced prior disturbances; native communities no longer remain. However, since there are adjacent fire-maintained upland areas and other suitable habitat types, it is possible for any of these plants to be found along the corridor, although no individuals were observed during field reviews.

TABLE 6: POTENTIALLY OCCURRING AND OBSERVED LISTED PLANT SPECIES

Species	Common Name	FDACS – Division of Plant Industry*	USFWS	Habitat	Probability of Presence or Occurrence
Deeringothamnus pulchellus	Beautiful pawpaw	E	E	Flatwoods	Moderate
Harrisia aboriginum	Aboriginal prickly-apple	E	E	Coastal hammocks, shell middens	Low
Nolina atopocarpa	Florida Beargrass	T	-	Wet flatwoods	Moderate
Calopogon multiflorus	Many-flowered grass-pink	T	-	Dry to moist flatwoods	Moderate
Euphorbia cumulicola	Sand-dune spurge	E	-	Dunes and scrub	Low
Lechea divaricata	Spreading pinweed	E	-	Scrubby flatwoods	Low
Lechea cernua	Nodding pinweed	T	-	Scrub and Scrubby flatwoods	Low

*T = Threatened, E = Endangered, "-" = Not currently listed, nor currently being considered for listing but on FNAI's tracking list

Sources:

1. FNAI; Matrix of habitats and distribution by county of rare/endangered species in Florida, published April, 1990
2. FDACS. Notes on Florida's Endangered and Threatened Plants. 2010. Patti J Anderson and Richard E Weaver.
3. USFWS Species Reports, Listings and Occurrences for Florida http://ecos.fws.gov/tess_public/pub/stateListingAndOccurrenceIndividual.jsp?state=FL
4. USFWS Endangered Species Search http://ecos.fws.gov/tess_public/county
5. Habitats described by: Hansen, B.F. and Wunderlin, R.P. 2003. Guide to the vascular plants of Florida. University Press of Florida. Gainesville.

3.2.3.1 FEDERALLY LISTED PLANTS

Beautiful Pawpaw (*Deeringothamnus pulchellus*)

This species is listed as endangered and inhabits pine flatwoods with wiregrass, saw palmetto, and dwarf live oak in the understory. It is a low, deciduous shrub that blooms only after fire or disturbance. It is known to occur within the Charlotte Harbor Preserve State Park which spans across the Charlotte Harbor from the City of Rotonda to the City of Cape Coral. However, there were no documented observations within the project, none were observed during field reviews and existing ROW is regularly mowed and experiences regular flooding. Therefore, a determination of may affect, not likely to adversely affect is appropriate for this species.

Aboriginal prickly-apple (*Harrisia aboriginum*)

This species is listed as endangered and inhabits coastal hammocks and shell middens. It is a cylindrical-shaped cactus that produces white flowers and yellow fruits. The CH for this species is located approximately seven miles west across the intercoastal waterway in the northern region of Pine Island. The existing ROW is regularly mowed and experiences regular flooding and there are no documented observations within or adjacent to the project; therefore, a determination of may affect, not likely to adversely affect is appropriate for this species.

3.2.3.2 STATE- PROTECTED PLANTS

Florida Beargrass (*Nolina atopocarpa*)

This species is listed as threatened and inhabits grassy areas of mesic and wet flatwoods. It appears similar to a grass and grows as a rosette that forms bulblike bases. A small population (nine plants) occurring in mesic flatwoods was observed in 2019 approximately 0.50 mile away from the project within Yucca Pen Preserve. A second observation was recorded in 2017 north of Burnt Store Acres. However, no individuals were observed during project field surveys. There is no adverse effect anticipated on the Florida beargrass.

Many-flowered grass-pink (*Calopogon multiflorus*)

This species is listed as threatened and inhabits dry to moist flatwoods. These orchids depend on fire to flower. No documented records of the species occur within one mile of the project and no individuals were observed during project field surveys. There is no adverse effect anticipated on the many-flowered grass-pink.

Scrub-habitat plants

The sand-dune spurge (*Euphorbia cumulicola*), spreading pinweed (*Lechea divaricata*), and nodding pinweed (*Lechea cernua)* were originally considered and evaluated for potential occurrence within the project area based on vouchered specimens and FNAI data. These species inhabit coastal dunes, scrub, and scrubby flatwoods. However, following the field-verification of habitats and land use along the project corridor, this habitat was not identified. Therefore, there is no effect anticipated on these species.

3.2.3.3 NON-LISTED RARE PLANTS

As per the April 2021 FDOT Native Florida Plant Coordination Guidance, peninsular Florida non-listed plants of interest or concern were reviewed for this project. According to the Charlotte Harbor Preserve State Park Unit Management Plan and Yucca Pens Preserve Land Management Plan 2nd Edition, some

non-listed rare plants have been documented within both preserves. The plants listed below in **Table 7** were ranked as critically imperiled, imperiled, or rare by the Institute for Regional Conservation (IRC). During previous project field reviews, these species were not identified. However, since the predominance of the field reviews occurred prior to the 2021 guidance, the entirety of the corridor was not specifically surveyed for these plants. A follow-up field review on December 2, 2022, was conducted in locations of the project with the highest quality habitat and least land use impacts; no species were identified. Should non-listed rare plants be identified in later project phases, Lee County will report them to the FDACS. The agency may choose to forward the documentation to the Endangered Plant Advisory Council or similar organizations for plant preservation.

TABLE 7: NON-LISTED RARE PLANTS

Species	Common Name	IRC	Habitat	Probability of Presence or Occurrence
Asclepias tuberosa	Butterflyweed	Rare	mesic and scrubby flatwoods	Moderate
Calopogon pallidus	Pale grasspink	Imperiled	mesic and wet flatwoods	Moderate
Dalea carnea	Whitetassels	Rare	disturbed uplands, mesic flatwoods, and pine rocklands	Moderate
Polygala boykinii	Boykin's milkwort	Rare	disturbed uplands, mesic flatwoods, and pine rocklands	Moderate
Polygala cymosa	Tall milkwort	Imperiled	basin and depression marshes, and wet flatwoods	Moderate
Polygala lutea	Orange milkwort	Imperiled	depression marshes, disturbed uplands, disturbed wetlands, and mesic and wet flatwoods	Moderate
Polygala ramosa	Low pinebarren milkwort	Imperiled	basin and depression marshes, disturbed wetlands, dome swamps, and wetland flatwoods	Moderate
Polygala rugelii	Yellow milkwort	Imperiled	depression marshes, disturbed wetlands, and mesic and wet flatwoods	Moderate
Tephrosia chrysophylla	Hoary pea	Critically Imperiled	mesic flatwoods and pine rocklands	Moderate
Polygala setacea	Coastal milkwort	Imperiled	depression marshes, mesic and wet flatwoods	Moderate
Asclepias lanceolata	Fewflower milkweed	Rare	depression marshes, disturbed wetlands, marl prairies, pine rocklands, wet prairies, and mesic and wet flatwoods	Moderate
Polygala balduinii	Baldwin’s milkwort	Rare	basin and depression marshes, disturbed wetlands, marl prairies,	Moderate

Species	Common Name	IRC	Habitat	Probability of Presence or Occurrence
			pine rocklands, and mesic and wet flatwoods	
Polygala nana	Candyroot	Rare	depression marshes, disturbed uplands, scrubby, mesic and wet flatwoods	Moderate

3.2.4 CRITICAL HABITAT

The project area was evaluated for the occurrence of CH as defined by the Endangered Species Act of 1973 as amended and 50 CFR Part 424. The USFWS and NMFS are the authorities for protection of CH from destruction or adverse modification of the biological or physical constituent elements essential to the conservation of listed species. CH is defined as the specific areas within the geographical area occupied by a species on which are found those physical or biological features essential to the conservation of the species and which may require special management considerations or protections.

The project area is within the CH of the smalltooth sawfish and the West Indian manatee and within the proposed CH for the Florida bonneted bat. The aquatic resource within the project that carries the CH designation is the Gator Slough Canal. Construction in this resource will be limited to removing the existing bridge and replacing it with a new bridge and bridge pilings. The Preferred Alternative includes removing the 42 existing bridge piles, likely by cutting them below the mud line so as to not impede water flows with remaining structure in the water. The existing piles are 18 inches by 18 inches in size, and constructing 24 new bridge piles, proposed to be 24 inches x 24 inches in size. Therefore, the current 94.5 sf of impact to the canal bottom will be modified to 96 sf. The new bridge would be approximately 20 feet wider than the existing bridge, which will result in approximately 3,160 sf (0.07 acres) of additional shading to the canal bottom. However, there are no mangroves, submerged aquatic vegetation (e.g. seagrass), or other benthic habitats within the canal. Therefore, a determination of may affect, not likely to adversely affect is appropriate for smalltooth sawfish and West Indian manatee CH.

At the time of this report, there is proposed CH for the Florida bonneted bat within a portion of the project area. The proposed CH was revised on November 22, 2022. Prior to the revision, the proposed CH was outside of the project footprint with the exception of a small portion that extended west of Burnt Store Road between Durden Parkway and the Charlotte Harbor Buffer Preserve. In the November 2022 revision, the proposed CH is solely on the east side of Burnt Store Road but the area was enlarged to now include public and private lands from approximately NW 40th Lane to the Charlotte County line with a portion carved out in the vicinity of Burnt Store Acres Lane.

A Florida bonneted bat acoustic survey was completed for this project. While high Florida bonneted bat activity was detected, roosting was not. These results are consistent with ongoing surveys in the Babcock/Webb WMA that have not identified Florida bonneted bat roosts near Burnt Store Road. Since no Florida bonneted bat roosting areas have been documented in the project area, and CH for the Florida bonneted bat remains in “proposed” status, it has been determined that the project will have no effect on potential Florida bonneted bat CH.

3.3 WILDLIFE CROSSINGS AND CROSSING FEATURES

A wildlife *crossing* is a road-related structure that provides wildlife an option to cross under roadways. These crossings have the potential to reduce motor vehicle collisions with wildlife, consequently reducing the likelihood of injuries and mortalities to humans and wildlife as well as reducing the potential for damage to motor vehicles. As per the FDOT Wildlife Crossing Guidelines (2018), wildlife crossings are generally only considered to address the presence of listed, protected or otherwise regulated species that the USFWS and/or FWC have jurisdiction. A wildlife *feature* may include, but is not limited to new or modified structures, such as bridges, bridges with shelves, specially designed culverts, enlarged culverts or drainage culverts and/or exclusionary devices such as fencing, walls or other barriers, or some combination of these features. A wildlife feature such as a modified drainage culvert could address a wider variety of wildlife.

A wildlife crossing is not currently being considered for this project. The need for wildlife crossings and/or passages was not referenced by the Environmental Technical Advisory Team (ETAT) during the programming screen review as part of the ETDM process. Large, listed and/or protected species are not known to routinely cross Burnt Store Road. Florida black bear data indicates that the project is within the secondary range of the Big Cypress population, there have been no mortalities along the roadway due to vehicular interactions or other causes, and there have been only infrequent “nuisance” reports of bears reported in the surrounding area. The project is not within or near a Florida panther habitat zone, panthers are not known to traverse this portion of the state in search of habitat, and there are no telemetry or mortality reports of the species in the area. While there are both county and state-owned conservation lands on both sides of the roadway, currently there are no areas where conservation lands or easements are located directly opposite each other on both sides of the roadway. The project does not cross or fragment designated CH or a documented landscape-level habitat linkage, ecological greenway, or similar mapped areas where that location is known to be used by wildlife species.

A wildlife feature such as a culvert modification was considered for the project. The Yucca Pens Creek location is a viable option to provide passage for unprotected wildlife such as small and medium-sized mammals, reptiles and amphibians. This location was considered due to its size and regional habitat connectivity; the structure is a bridge culvert and consists of two, eight-foot by 10-foot concrete boxes. Since the bridge culvert is proposed for replacement, the new structure could include a cantilevered concrete slab on the side of one culvert wall or could include a third box that would contain a built-up berm/shelf. Alternatively, a wildlife feature could be cited elsewhere along the project limits to include a pipe (e.g. two to three foot diameter) with an invert elevation higher than the seasonal high water elevation to provide dry passage. Lee County will further evaluate the viability of including a wildlife feature within the project during final design.

4.0 WETLAND EVALUATION

In accordance with EO 11990 Protection of Wetlands, U.S. DOT Order 5660.1A, FHWA Technical Advisory T6640.8A, and Wetlands and Other Surface Waters of the FDOT PD&E Manual, the FDOT has undertaken all action to minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands in carrying out the agency's responsibilities. The FDOT has determined that there is no practicable alternative to construction occurring in wetlands. Unavoidable wetland impacts are necessary to meet transportation safety standards. However, wetland impacts have been minimized to the extent possible by incorporating a stormwater management system, which will be constructed to meet state water quality criteria and will minimize water quality impacts from stormwater discharges of the roadway. Any unavoidable impacts to wetlands will be mitigated to achieve no net loss of wetland function.

Reviewing agency comments from the ETDM programming screen review ranked effects to wetlands and surface waters as both "Minimal" (NMFS, FDEP) and "Moderate" (SFWMD, USACE, USEPA, USFWS) and effects to coastal and marine resources as "Minimal" (NMFS and SFWMD). The USEPA noted that the project is within the Caloosahatchee River watershed, which is within the Northern Everglades and Estuary Protection Program (NEEP). The USACE noted a significant difference between the wetland acreages reported by the NWI database and the SFWMD wetlands database. FWC noted that the project bisects one of the largest hydrological restoration projects in Florida, which, in part, requires the movement of water under Burnt Store Road from the Babcock-Webb WMA through the Yucca Pens Preserve to Charlotte Harbor and Matlacha Pass.

As described in Section 2.2, hydrology and field verified wetlands show that some of the areas that may have historically met wetland criteria are currently considered non-hydric and uplands. This explains the difference in NWI and FLUCFCS databases for wetlands. This difference and the apparent dehydration of area wetlands is likely attributed to the historical hydrological degradation in the area. The PD&E project team communicated with the Charlotte Harbor Flatwoods Initiative (CHFI), a team comprised of multiple local, state and federal agencies, the CHNEP, and other stakeholders, at their request during the course of the study to share information and to stay apprised of the hydrological restoration project concepts. More detail is provided within the *Preliminary Engineering Report* prepared for this project, located in the project file. As the area-wide restoration modeling and projects progress, and as the final design phase of this project begins and more detailed data is collected, the CHFI can coordinate with Lee County for any collaborative project opportunities.

4.1 METHODOLOGY

Literature reviews, desktop reviews and field reviews were conducted to identify wetlands, surface waters and other surface waters occurring within the project area. The following sources were reviewed during this process:

- U.S. Fish and Wildlife Service (USFWS) NWI Maps;
- Land use and land cover maps (SFWMD 2017-2019);
- Land use and land cover maps (SWFWMD 2020);
- FDOT's Efficient Transportation Decision Making (ETDM) Summary Report (September 4th, 2020);

- NRCS Soil Survey of Lee County, Florida (1984);
- Updated NRCS Soils Survey of Lee County, Florida (2021);
- NRCS Soil Survey of Charlotte County, Florida (1984);
- Updated NRCS Soil Survey of Charlotte County, Florida (2021); and
- FDOT APLUS recent aerial imagery (2020).

Subsequent to the review of all available materials, a field assessment was conducted on March 9-12, 2020 to identify the presence of wetland vegetation, evidence of hydrology, and hydric soil indicators. During field reviews of the project study area, environmental scientists aerially-delineated the approximate boundaries of existing wetland, surface water, and other surface water communities. Each system within the project study area was classified using FLUCFCS (FDOT 1999) and the USFWS Classification of Wetlands and Deepwater Habitats of the United States (Cowardin, et al. 1979). Approximate boundaries were identified in accordance with the Florida statewide unified wetland delineation methodology as adopted by the Florida Department of Environmental Protection (FDEP) and the Water Management Districts per Chapter 62-340 of the Florida Administrative Code (F.A.C.), and described in The Florida Wetlands Delineation Manual, the U.S. Army Corps of Engineers (USACE) 1987 Corps of Engineers Wetland Delineation Manual (Y-87-1) and the 2010 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coast Plain Region (Version 2.0) (ERDC/EL TR-10-20). Formal wetland boundaries were not determined as part of this study and will be completed during the design and permitting phase of this project. In addition, project biologists evaluated wetland, surface water and other surface water systems using the Uniform Mitigation Assessment Method (UMAM) to estimate wetland mitigation needs. Like the approximate wetland boundaries, these assessments are not binding and are to be used for estimation purposes. The results presented in this report are a compilation of information collected from field assessment performed by project biologists and from the data sources described above.

4.2 WETLAND AND SURFACE WATER IMPACTS

4.2.1 DIRECT IMPACTS

Table 8 shows the expected direct impacts to wetlands and surface waters by mainline build alternative and combined off-site stormwater management facilities. **Appendix P** includes a map of the proposed wetland and surface water impacts by the Preferred Alternative. The Preferred Alternative is anticipated to impact 22.06 acres of wetlands, surface waters, and other surface waters. There are 4.82 acres of direct impacts proposed to jurisdictional wetlands, 0.02-acre of direct impacts proposed to surface waters (Gator Slough Canal and other canals), and 17.22 acres of direct impacts proposed to other surface waters. In addition, the stormwater management facilities would impact 8.98 acres of wetlands and 2.42 acres of other surface waters. This results in a total of 33.46 acres of impact overall.

4.2.2 INDIRECT, SECONDARY, AND CUMULATIVE IMPACTS

Indirect and secondary effects are those impacts that are reasonably certain to occur later in time as a result of the proposed project. They may occur outside of the area directly affected by the proposed project. Potential secondary effects include increased contaminants such as trash or oil entering the wetlands or increased light penetration. Cumulative effects include the effects of future state, local, or private actions that are reasonably certain to occur in the project area. During permitting, secondary wetland impacts will be assessed by the SFWMD and USACE. Wetland mitigation will be required for

TABLE 8: PROPOSED WETLAND AND SURFACE WATER IMPACTS

ID	FLUCFCS Classification	NWI Classification	Preferred Alternative Impacts (acres)	Preferred Ponds Impacts (acres)
SW-2 (Gator Slough Canal)	5120	E1UBLx	less than 0.01	0.00
OSW-3	5100	R2UBFx	0.28	0.00
OSW-4	5100	R2UBFx	0.16	0.00
OSW-6	5100	R2UBFx	0.30	0.00
OSW-7	5100	R2UBFx	1.53	0.00
OSW-9	5100	R2UBFx	1.35	0.00
OSW-11	5100	R2UBFx	2.13	0.00
OSW-13	5100	R2UBFx	0.78	0.00
OSW-15	5100	R2UBFx	0.50	0.00
OSW-16	5100	R2UBFx	0.45	0.00
OSW-17	5100	R2UBFx	1.14	0.00
OSW-18	5100	R2UBFx	0.34	0.00
SW-19 (Onyx Canal)	5120	E1UBLx	0.02	0.00
OSW-20	5100	PUBFx	0.59	0.00
OSW-22	5100	PUBFx	0.35	0.00
OSW-23	5100	PUBFx	0.07	0.00
OSW-26	5100	PUBFx	0.64	0.00
OSW-28	5100	PUBHx	0.57	0.00
OSW-29	5100	PUBHx	0.27	0.00
OSW-30	5100	PUBHx	0.24	0.00
OSW-31	5100	PUBCx	1.38	0.00
OSW-32	5100	PUBCx	0.39	0.00
OSW-34	5100	PUBCx	0.03	0.00
OSW-35	5100	PUBCx	0.00	0.10
OSW-36	5100	PUBCx	0.00	0.15
OSW-37	5100	PUBCx	0.97	0.00
OSW-39	5100	PUBCx	0.12	0.00
OSW-42	5100	PUBCx	0.09	0.00
OSW-44	5300	PUBHx	0.00	0.00
OSW-45	5340	L1UBH	2.17	2.17
OSW-46	5100	PUBHx	0.05	0.00
OSW-47	5100	PUBHx	0.05	0.00
OSW-48	5100	PUBHx	0.01	0.00
OSW-49	5100	PUBHx	0.27	0.00
WL-1	6170	PFO1C	0.00	0.00
WL-2	6310	PEM1C	0.00	0.00
WL-3 F	6250	PFO2/SS3C	0.00	0.00
WL-3 H	6410	PEM1/SS3C	0.00	0.00
WL-4	6170	PFO1C	0.00	0.00
WL-6	6190	PFO3C	0.00	0.00
WL-8	6190	PFO3C	0.22	2.98
WL-9	6310	PEM1C	less than 0.01	0.00
WL-10	6250	PFO4/SS1C	0.23	0.00
WL-12	6190	PFO3C	0.00	0.00
WL-13	6310	PSS3C	0.37	1.05
WL-14	6250	PFO2/SS3C	0.09	0.00
WL-15	6430	PEM1/SS3C	1.08	0.00
WL-16	6430	PEM1C	0.56	0.00
WL-18	6410	PEM1C	0.00	0.00
WL-19	6250	PFO2/SS3C	0.06	4.96
WL-20 (Yucca Pen Creek LT of Burnt Store Rd)	6250	PFO2/SS3C	0.03	0.00
WL-21 (Yucca Pen Creek RT of Burnt Store Rd)	6250	PFO2/SS3C	0.21	0.00
WL-22	6310	PEM1/SS3C	1.54	0.00
WL-23	6430	PEM1C	0.28	0.00
WL-24	6430	PEM1C	0.13	0.00
WL-25	6190	PFO3C	0.03	0.00
Total Wetlands Impacts			**4.82**	**8.98**
Total Impacts to Other Surface Waters			**17.22**	**2.42**
Total Impacts to Surface Waters			**0.02**	**0.00**
Total Impacts			**22.06**	**11.40**

Note: only wetland and surface waters that are impacted by the Preferred Alternative (and preferred ponds) have been included in the table.

direct impacts and is expected to also be required for secondary impacts. Cumulative impacts will also be assessed during state and federal wetland permitting. Currently, there is no wetland mitigation bank within the same cumulative impact basin as the project. The wetland mitigation bank most appropriate to address wetland mitigation needs for this project is currently a bank that is not located within any designated cumulative impact basins. Should cumulative impacts be assessed during the permitting process, a cumulative impact assessment will be prepared to demonstrate that the proposed wetland mitigation does not result in cumulative wetland impacts to the basin. See **Section 4.4** for more details.

4.3 UNIFORM MITIGATION ASSESSMENT METHODOLOGY AND RESULTS

The Uniform Mitigation Assessment Method (UMAM) per Chapter 62-345, F.A.C., is a state and federal approved method to assess wetlands in the State of Florida. UMAM was developed by FDEP and the Water Management Districts (WMDs) to determine the amount of mitigation required to offset adverse impacts to wetlands. The methodology was designed to assess functions provided by wetlands, the amount those functions are reduced by a proposed impact, and the amount of mitigation necessary to offset the proposed functional losses. This method is also used to determine the degree of improvement in ecological value that will be created by proposed mitigation activities. While wetlands are the commonly referred resource for which the UMAM addresses, surface waters and other surface waters at times also require a UMAM analysis and mitigation for proposed impacts. For example, a drainage ditch that provides conveyance for roadway stormwater may also be characterized by hydrophytic vegetation that could support wildlife including listed species, such as by affording suitable foraging habitat for the wood stork and other wading birds. In addition, ditches and other surface waters may be excavated within hydric soils, and some permitting agencies, in particular the SFWMD, place emphasis on this characteristic when determining if wetland mitigation would be required for such systems. To provide a more conservative estimate of wetland mitigation for this study, this report therefore provides UMAM analysis for all wetlands and surface waters with the only exception being those permitted for stormwater management.

The UMAM assessment includes a Qualitative Characterization (Part 1) as well as a Quantitative Assessment and Scoring (Part 2). The Qualitative Assessment is a basic descriptor of the site being evaluated. The variables described include significant nearby features; water classifications; assessment area size; hydrology and relationship to contiguous off-site wetlands; uniqueness of the assessment area; functions of the assessment area; and wildlife utilization. The Quantitative Assessment provides a score of the assessment area in both the current conditions and “with impact” condition. The assessment scoring evaluates location and landscape support, water environment and vegetative community.

In order to calculate functional loss, the difference between the existing condition (current) scores and the proposed condition (with project construction) scores for each habitat type was multiplied by the acreage of the proposed impact to determine the lost value of functions to fish and wildlife resulting from construction of the proposed project (**Table 9**). The completed UMAM data sheets for each habitat type are provided in **Appendix E**. Functional loss was calculated by habitat type for the Preferred Alternative. The Preferred Alternative results in 8.17 functional units. Construction of the preferred stormwater pond sites results in an additional 4.47 functional units. These calculations are estimates based on existing conditions. The UMAM scores and values presented in **Tables 9 and 10** are subject to agency review and may change during the state and federal permitting process.

TABLE 9: REPRESENTATIVE UMAM SCORES FOR WETLANDS AND OTHER SURFACE WATERS

FLUCFCS Code	FLUCFCS Description	Wetland Type	Representative Wetlands	Location and Landscape Support		Water Environment		Community Structure		Score (Sum/30)		Delta
				Current	With	Current	With	Current	With	Current	With	
5100	Streams and Waterways	Other Surface Water	OSW-3, 4, 6, 7, 9, 11, 13, 15, 16, 17, 18, 20, 22, 23, 26, 28, 29, 30, 31, 32, 34, 35, 36, 37, 38, 39, 42, 46, 47, 48, and 49	5	0	2	0	5	0	0.400	0	0.4
5120	Channelized Waterways - Canals	Surface Water	SW-1, 2, 8 and 19	5	0	5	0	1	0	0.367	0	0.37
5300	Reservoirs	Other Surface Water	OSW-5, 8, 10, 12, 14, 21, 24, 25, 27, 33, 38, 41, 44, 45	6	0	4	0	1	0	0.367	0	0.37
6410, 6310, 6430	Freshwater Marshes, Wetland Shrub, and Wet Prairies	Herbaceous	WL-2, WL-3 H, WL-5, WL-7, WL-9, WL-13, WL-15, WL-16, WL-18, WL-22, WL-23 and WL-24	7	0	3	0	3	0	0.433	0	0.43
6190	Exotic Wetland Hardwoods	Forested	WL-5, WL-6, WL-8, WL-12, and WL 25	6	0	3	0	2	0	0.367	0	0.37
6250, 6170	Hydric Pine Flatwoods and Mixed Wetland Hardwoods	Forested	WL-1, WL-3 F, WL-4, WL-10, WL-14, WL-19, WL-20, and WL-21	7	0	3	0	7	0	0.567	0	0.57

Note: UMAM scores have not been approved by permitting agencies and are subject to change during the permitting process. All wetlands and other surface waters were assigned to UMAM analyses regardless of proposed impact or not.

TABLE 10: ESTIMATED UMAM FUNCTIONAL LOSS FROM WETLAND AND OTHER SURFACE WATER IMPACTS

ID	FLUCFCS Classification	UMAM Delta	Preferred Alternative Impacts (acres)	*Functional Loss for Preferred Alternative*	Preferred Ponds Impacts (acres)	*Functional Loss for Preferred Ponds*
SW-2 (Gator Slough Canal)	5120	0.37	less than 0.01	***0.00***	0.00	***0.00***
OSW-3	5100	0.40	0.28	***0.11***	0.00	***0.00***
OSW-4	5100	0.40	0.16	***0.06***	0.00	***0.00***
OSW-6	5100	0.40	0.30	***0.12***	0.00	***0.00***
OSW-7	5100	0.40	1.53	***0.61***	0.00	***0.00***
OSW-9	5100	0.40	1.35	***0.54***	0.00	***0.00***
OSW-11	5100	0.40	2.13	***0.85***	0.00	***0.00***
OSW-13	5100	0.40	0.78	***0.31***	0.00	***0.00***
OSW-15	5100	0.40	0.50	***0.20***	0.00	***0.00***
OSW-16	5100	0.40	0.45	***0.18***	0.00	***0.00***
OSW-17	5100	0.40	1.14	***0.46***	0.00	***0.00***
OSW-18	5100	0.40	0.34	***0.14***	0.00	***0.00***
SW-19 (Onyx Canal)	5120	0.37	0.02	***0.01***	0.00	***0.00***
OSW-20	5100	0.40	0.59	***0.24***	0.00	***0.00***
OSW-22	5100	0.40	0.35	***0.14***	0.00	***0.00***
OSW-23	5100	0.40	0.07	***0.03***	0.00	***0.00***
OSW-26	5100	0.40	0.64	***0.26***	0.00	***0.00***
OSW-28	5100	0.40	0.57	***0.23***	0.00	***0.00***
OSW-29	5100	0.40	0.27	***0.11***	0.00	***0.00***
OSW-30	5100	0.40	0.24	***0.10***	0.00	***0.00***
OSW-31	5100	0.40	1.38	***0.55***	0.00	***0.00***
OSW-32	5100	0.40	0.39	***0.16***	0.00	***0.00***
OSW-34	5100	0.40	0.03	***0.01***	0.00	***0.00***
OSW-35	5100	0.40	0.00	***0.00***	0.10	***0.04***
OSW-36	5100	0.40	0.00	***0.00***	0.15	***0.06***
OSW-37	5100	0.40	0.97	***0.39***	0.00	***0.00***
OSW-39	5100	0.40	0.12	***0.05***	0.00	***0.00***
OSW-42	5100	0.40	0.09	***0.04***	0.00	***0.00***
OSW-44	5300	0.37	0.00	***0.00***	0.00	***0.00***
OSW-45	5340	-	2.17	***-***	2.17	***-***
OSW-46	5100	0.40	0.05	***0.02***	0.00	***0.00***
OSW-47	5100	0.40	0.05	***0.02***	0.00	***0.00***
OSW-48	5100	0.40	0.01	***0.00***	0.00	***0.00***
OSW-49	5100	0.40	0.27	***0.11***	0.00	***0.00***
WL-1	6170	0.57	0.00	***0.00***	0.00	***0.00***
WL-2	6310	0.43	0.00	***0.00***	0.00	***0.00***
WL-3	6250	0.57	0.00	***0.00***	0.00	***0.00***
WL-3	6410	0.43	0.00	***0.00***	0.00	***0.00***
WL-4	6170	0.57	0.00	***0.00***	0.00	***0.00***
WL-6	6190	0.37	0.00	***0.00***	0.00	***0.00***
WL-8	6190	0.37	0.22	***0.08***	2.98	***1.10***
WL-9	6310	0.43	less than 0.01	***0.00***	0.00	***0.00***
WL-10	6250	0.57	0.23	***0.13***	0.00	***0.00***
WL-12	6190	0.37	0.00	***0.00***	0.00	***0.00***
WL-13	6310	0.43	0.37	***0.16***	1.05	***0.45***
WL-14	6250	0.57	0.09	***0.05***	0.00	***0.00***
WL-15	6430	0.43	1.08	***0.46***	0.00	***0.00***
WL-16	6430	0.43	0.56	***0.24***	0.00	***0.00***
WL-18	6410	0.43	0.00	***0.00***	0.00	***0.00***
WL-19	6250	0.57	0.06	***0.03***	4.96	***2.82***

ID	FLUCFCS Classification	UMAM Delta	Preferred Alternative Impacts (acres)	*Functional Loss for Preferred Alternative*	Preferred Ponds Impacts (acres)	*Functional Loss for Preferred Ponds*
WL-20 (Yucca Pen Creek LT of Burnt Store Rd)	6250	0.57	0.03	***0.02***	0.00	***0.00***
WL-21 (Yucca Pen Creek RT of Burnt Store Rd)	6250	0.57	0.21	***0.12***	0.00	***0.00***
WL-22	6310	0.43	1.54	***0.66***	0.00	***0.00***
WL-23	6430	0.43	0.28	***0.12***	0.00	***0.00***
WL-24	6430	0.43	0.13	***0.06***	0.00	***0.00***
WL-25	6190	0.37	0.03	***0.01***	0.00	***0.00***
			Total Functional Loss by Alternative	***8.17***		***4.47***

Note: OSW-45 is an existing stormwater pond therefor there is no UMAM score or FL

4.4 WETLAND IMPACT MITIGATION

The project is located within the service area of Little Pine Island Mitigation Bank (LPIMB), which offers the appropriate credit types and is the only bank option at the time of this report. The project is located within the Tidal Caloosahatchee basin; the LPIMB is not located within a designated cumulative impact drainage basin. Therefore, while it is possible that a Cumulative Impact Analysis will be required by the SFWMD to demonstrate that credit purchase from this bank is appropriate given its location outside of the Tidal Caloosahatchee Basin, it is anticipated that this mitigation bank will be satisfactory for SFWMD permitting. The USACE does not consider drainage basins, but instead mitigation bank service areas and wood stork CFA as part of the geographical component of the mitigation assessment. It is anticipated that this mitigation bank will therefore be satisfactory for USACE permitting since the project shares wood stork CFAs with the bank. At this time, credits are available; however, the status of available mitigation banks and credits will be re-assessed as this project moves forward into design and permitting.

All UMAM scores, UMAM calculations, preliminary surface water boundaries and determinations discussed are subject to revisions and approval by regulatory agencies during the permitting process. LPIMB uses a proprietary wetland assessment method in lieu of UMAM; however, the scores are generally the same between UMAM and the proprietary method, as stated by the LPIMB representative. The exact type of mitigation to offset impacts will be coordinated with the USACE and the SFWMD during the permitting phase(s) of this project. Mitigation will be addressed pursuant to Chapter 373.4137, Florida Statutes (F.S.) in order to satisfy all mitigation requirements of Part IV, Chapter 373, F.S. and 33 U.S.C. §1344.

4.5 AGENCY COORDINATION AND PERMITTING

Agency coordination has been initiated through the ETDM process. The purpose of the ETDM is to incorporate environmental considerations into transportation planning to inform project delivery. Both the SFWMD and USACE were commenting agencies through the ETDM process. Pre-application meetings were held with the SFWMD on August 27, 2020 and January 27, 2021. The USACE and SFWMD regulate wetlands within the study area and will issue wetland impact-related permits or authorizations for this project. Other agencies, including the USFWS and the FWC review and comment on wetland permitting and potential effects to protected wildlife species.

Federal Permits

Section 404 Dredge and Fill Permit

For the USACE, it is anticipated that the project will qualify for a Section 10/404 SAJ-92 Permit. This permit type requires compliance with the 404(b)(1) guidelines, including verification that all wetland impacts have first been avoided to the greatest extent possible, that unavoidable impacts have been minimized to the greatest extent possible, and lastly that unavoidable impacts have been mitigated in the form of wetland creation, restoration, and/or enhancement. In addition, coordination with the USFWS and the NMFS will be necessary for potential effects to federally listed protected species and CH.

While the state (FDEP) has assumed Section 404 permitting in the state of Florida, the USACE retained certain waters which will remain under their permitting purview. Since the Gator Slough Canal is a retained water, and we anticipate that impacts will be associated with this water of the U.S, the project is expected to require a Section 404 permit from the USACE and not the FDEP. However, if the project is separated into multiple segments for final design and permitting, then only the southern-most segment

which would include the Gator Slough Canal would qualify for a USACE permit. Remaining project segments would be permitted with the FDEP under the state 404 program.

State Permits

Environmental Resource Permit

For the SFWMD, it is currently anticipated that the project will qualify for an Environmental Resource Individual Permit under F.A.C. Chapter 62-330.054. SFWMD requires an ERP when construction of any project results in the creation of a new or modification of an existing surface water management system, or results in impacts to waters of the state. As with USACE permits, the complexity associated with the ERP permitting process will depend on the size of the project and/or the extent of wetland impacts.

National Pollutant Discharge Elimination System Permit

40 CFR Part 122 prohibits point source discharges of stormwater to waters of the U.S. without a NPDES permit. Under the State of Florida's delegated authority to administer the NPDES program, construction sites that will result in greater than one (1) acre of disturbance must file for and obtain either coverage under an appropriate generic permit contained in Chapter 62-621, F.A.C. or an individual permit issued pursuant to Chapter 62-620, F.A.C. The FDEP issues these permits. A major component of the NPDES permit is the development of a Stormwater Pollution Prevention Plan (SWPPP). The SWPPP identifies potential sources of pollution that may reasonably be expected to affect the quality of stormwater discharges from the site and discusses good engineering practices (i.e., best management practices) that will be used to reduce the pollutants.

Sovereign Submerged Lands Authorization (not required)

A SSL title determination request was submitted to the FDEP's Division of State Lands (DSL) in Tallahassee for tributaries of Charlotte Harbor crossed by the proposed project, such as Yucca Pen Creek and Gator Slough Canal. The DSL recommended that the proprietary requirements normally applied to state-owned lands not apply to those waters. A copy of the correspondence with DSL is provided in **Appendix D**.

5.0 ESSENTIAL FISH HABITAT

This section documents Essential Fish Habitat (EFH) in accordance with Essential Fish Habitat of the FDOT PD&E Manual and the *Magnuson-Stevens Fishery Conservation and Management Act*, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267). EFH is defined as "those waters and substrates necessary to fish for spawning, breeding, feeding, or growth to maturity"; the term "fish" includes finfish, crabs, shrimp, and lobsters that are under federal Fishery Management Plans. 1997 NMFS rules further clarify EFH with the following definitions:

Waters – aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate;

Substrate – sediment, hard bottom, structures underlying the waters, and associated biological communities;

Necessary – the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and spawning, breeding, feeding, or growth to maturity – stages representing a species' full life cycle.

In 2002, regulations were established by NMFS to provide a process for NMFS to coordinate and consult with federal and state agencies on activities that may adversely affect EFH in order to minimize adverse effects while identifying other actions to conserve and enhance EFH. Consultation for this project will be initiated in accordance with the Magnuson-Stevens Fishery Act.

Reviewing agency comments from the ETDM programming screen review related to EFH were restated from the Wetlands and Surface Water section. The NMFS commented that no direct impacts to NMFS trust resources seemed apparent. The creeks that drain under the roadway ultimately outfall to Charlotte Harbor which supports estuarine habitats used by federally-managed fish species and their prey. However, upgrades to the stormwater management system and use of BMPs are anticipated to minimize any downstream indirect impacts. Both the NMFS and SFWMD recommended "Minimal" as the degree of effect to coastal and marine habitats. As the NMFS stated, this project would construct a new stormwater management system to treat roadway runoff; currently, there is no treatment of stormwater which directly outfalls to the creeks and canals that ultimately reach Charlotte Harbor. Additionally, impacts to water quality from construction activities will be avoided and minimized through implementation of FDOT's Standard Specifications for Road and Bridge Construction and BMPs which will protect EFH resources.

5.1 METHODOLOGY

In order to determine essential fish habitat that has potential to occur within the study area, available site-specific data was collected and evaluated. The project area has been reviewed to assess the potential occurrence of the highly migratory species during any stage of their life cycle. **Appendix Q** lists each of the Gulf of Mexico Fishery Management Council (GMFMC) managed species and highly migratory species and its potential to occur within the project area.

Environmental scientists familiar with Florida natural communities conducted field reviews of the project area, adjacent habitats, and species surveys during March 9-11, 2020. For the purposes of this study, the project study area is defined as a 1,000-foot corridor extending 500 feet east and west of the Burnt Store Road centerline, and proposed stormwater management pond sites. Based on the evaluation of

collected data, field reviews, and database searches, the managed species and habitat discussed in **Section 5.2** were considered as having the potential to occur within or adjacent to the study area.

5.2 RESULTS

The proposed project is within the GMFMC's area of jurisdiction. EFH within the project area includes Gator Slough Canal. All other waterways within the study area are too far upstream to be tidally influenced and are not accessible to protected estuarine species. For instance, the tidally influenced section of Yucca Pen Creek ends approximately 0.6-mile (3,200 feet) west of the existing ROW, according to a study conducted by The Charlotte Harbor National Estuary Partnership (University of South Florida Water Atlas, 2013). The creek within the study area is shallow (less than one foot in depth during the majority of the year based on field surveys with surges in depth during summer months) and exhibits dark, tanic water supporting the finding that there is no tidal influence/flushing. Gator Slough Canal, however, is tidally influenced, however mostly a freshwater canal that is considered Essential Fish Habitat (EFH) for 55 representative managed species identified by the GMFMC. These species are broken into six (6) Fishery Management Plans (FMP): Coastal Migratory Pelagic, Red Drum, Reef Fish, Shrimp, Spiny Lobster, and Stone Crab management plans. The species accounts of each of the 55 representative managed species were reviewed to assess the potential occurrences of these species within the proposed project area during any stage of their life cycle. Although not managed by the GMFMC, 48 highly migratory species have NMFS-designated EFH requirements and occur within the Gulf of Mexico. The 48 highly migratory species are broken into six (6) groups: billfish, large coastal sharks, pelagic sharks, small coastal sharks, swordfish, and tuna. There are FMPs for the following species, known to exist in Charlotte Harbor/Gasparilla Sound/Matlacha Pass:

Coastal Migratory Pelagic EFH consists of Gulf of Mexico waters and substrates extending from the U.S./Mexico border to the boundary between the areas covered by the GMFMC and the South Atlantic FMC from estuarine waters out to depths of 600 feet. Cero (*Scomberomorus regalis*), cobia (*Rachycentron canadum*), king mackerel (*Scomberomorus cavalla*). Little tunny (*Euthynnus alletteratus*), and Spanish mackerel (*Scomberomorus maculates*) are species managed by the South Atlantic FMC. Spanish mackerel is known to occur within or near the project area. Spanish mackerel are prevalent throughout Florida waters inshore, offshore, and nearshore. The species is frequently found over grass beds and reefs. Spanish mackerel are migratory fish that swim to the north in the spring and return to southern waters when the temperatures drop below 70 degrees Fahrenheit.

Red Drum (*Sciaenops ocellatus*) is found throughout Florida estuaries within the Gulf of Mexico in primarily euryhaline waters. Adults are common in Charlotte Harbor and juveniles are common to abundant. Red drum is estuarine dependent. After hatching, larvae are carried into the shallow water of bays and estuaries with the tide. Once in an estuarine area they seek the shelter of grassy covers, tidal flats, and lagoons for protection. Juveniles prefer shallow, protected, open estuarine waters with depths up to 10 feet. Adults are found in littoral and shallow nearshore waters off beaches and off-shore in depths from 130 to 230 feet.

Reef Fish EFH consists of Gulf of Mexico waters and substrates extending from the U.S./Mexico Border to the boundary between the areas covered by the GMFMC and the South Atlantic FMC from estuarine waters out to depths of 600 feet. The Gulf of Mexico reef fish primarily consists of grouper and snapper species. Gray Snapper (*Lutjanus griseus*) is a tropical, marine reef fish that occur from the U.S. mid-Atlantic south to Rio de Janeiro, Brazil. Juveniles are common to inshore waters throughout Florida, and adults are found in areas of moderate to high relief on the continental shelf. Spawning occurs during

summer (June-September) in offshore waters around reefs, wrecks, and other bottom structures. Adult gray snapper are nocturnal predators that forage away from their reef habitats. Juveniles feed diurnally among seagrass beds and feed primarily on penaeid shrimp and crabs. Adult gray snappers feed on fish (largely grunts), shrimp, and crabs.

Pink Shrimp (*Farfantepenaeus duorarum*) distribution is associated with seagrasses in general, and shoal grass in particular. They are distributed throughout the west coast of Florida. The juveniles occur in oligohaline to euryhaline estuaries and bays. They seek the shelter of dense seagrasses with smaller juveniles preferring shoal grass and the adults preferring the refuge of turtle grass. Adults inhabit deep offshore marine waters commonly nine to 44 meters (145 feet) deep and inhabit substrates including shell-sand, sand, coral-mud, and mud.

Spiny Lobster (*Panulirus argus*) occurs throughout the Caribbean Sea, along the shelf waters of the southeastern United States north to North Carolina, in Bermuda, and south to Brazil and the Gulf of Mexico. They are found from just below the water surface to depths of 1,650 feet. The spawning season occurs from April through September in the southeastern U.S. and throughout the year in the Caribbean and they Florida Keys offshore reefs. Adults move along shore and offshore seasonally. Caribbean spiny lobsters migrate to deeper water in order to evade the stresses of the cold and turbid waters.

The EFH review indicates that two (2) of the representative managed Highly Migratory Species of Large Coastal Sharks, three (3) Highly Migratory Species of Small Coastal Sharks, and five (5) Reef Fish have a low potential for occurrence in the project study area. This potential occurrence determination has been made because there is suitable habitat for these species found near the project study area; however, the species range is not near the project study area.

Three (3) Coastal Migratory Pelagic fish, 11 Highly Migratory Species of Large Coastal Sharks, two (2) Highly Migratory Species of Small Coastal Sharks, one (1) Red Drum, 17 Reef Fish, three (3) Shrimp, and two (2) Stone Crabs have a medium potential for occurrence in the project area. This potential occurrence determination has been made because there is suitable habitat for these species in the project study area and the project area is within the EFH or species range (i.e. the species is known to commonly exist in the area).

5.3 IMPACTS

While the proposed project has taken all practicable measures to avoid and minimize impacts to potentially occurring managed species and their habitats, unavoidable impacts may occur as a result of roadway construction for the southbound bridge. Proposed construction includes replacement of a bridge that spans over Gator Slough Canal, an estuarine system. This waterway connects to Gasparilla Sound, which is within the Charlotte Harbor Aquatic Preserve and the Matlacha Pass Aquatic Preserve. The crossing consists of a set of bridges with a water control structure located immediately on the upstream side of the northbound bridge. The northbound bridge was recently constructed as part of the roadway improvements to the south. However, the southbound bridge will be replaced as part of this road widening project. The surrounding areas consist of residential areas, open land, and some forested areas. Dominant species within these systems include Brazilian pepper, Australian pine, cattail, slash pine, and sabal palm.

Construction in the EFH resource will be limited to removing the existing bridge and bridge pilings and replacing them with a new bridge and bridge pilings. The 42 existing bridge piles will likely be cut below the mud line so as to not impede water flows with remaining structure in the water. The existing pilings

are 18 inches by 18 inches in size, and constructing 24 new bridge piles, proposed to be 24 inches x 24 inches in size. Therefore, the current 94.5 sf of impact to the canal bottom will be modified to 96 sf. In addition, the Preferred Alternative will require a new bridge approximately 20 feet wider than the existing bridge, which will result in approximately 3,160 sf (0.07 acres) of additional shading to the canal bottom. However, there are no mangroves, submerged aquatic vegetation (e.g. seagrass), or other benthic habitats within the canal. Although the waterway within the existing and proposed ROW is accessible to estuarine wildlife, it is important to note that the water control structure located just upstream (a few feet east) from the northbound bridge precludes wildlife from moving upstream. This is expected to limit utilization of EFH within the project footprint.

5.4 AVOIDANCE, MINIMIZATION, AND MITIGATION

Degradation of water quality resulting from construction of the project or excess pollutant loading of stormwater runoff from the project has the potential to adversely affect adjacent waters. Impacts to water quality from construction activities will be avoided and minimized through implementation of FDOT's Standard Specifications for Road and Bridge Construction. Best Management Practices (BMPs), which will protect EFH resources, generally include phased construction, turbidity screens including floating turbidity barriers, silt fences, hay bales, cofferdams, and other construction techniques approved by the regulatory agencies. Construction will be of a temporary nature and these strategies will be implemented throughout the duration of construction. Additionally, a stormwater management system will be constructed to meet state water quality criteria, thereby minimizing water quality impacts from stormwater discharges from roadway surfaces. This new stormwater management system will be of a permanent nature and will provide perpetual treatment of roadway runoff.

No seagrass, mangroves, or shellfish habitat is identified within the canal or project study area. Due to the nature of the project, no populations of any of the 50 managed species and the coral complex listed by the GMFMC are expected to be adversely affected by the proposed project. EFH impacts which will result from the construction of this project will be mitigated pursuant to Section 373.4137, F.S., to satisfy all mitigation requirements of Part IV of Chapter 373, F.S., and 22 U.S.C. §1344. Compensatory mitigation for this project will be completed through the use of mitigation banks and any other mitigation options that satisfy state and federal requirements. Due to the nature of the project, no populations of any of the 50 managed species listed by the GMFMC are expected to be adversely affected by the proposed project. The project is therefore anticipated to have minimal effects on EFH.

6.0 PERMITTING AND REVIEW AGENCIES

Both the USACE and the SFWMD regulate impacts to wetlands within the project area. Other agencies, including the USFWS, NMFS, EPA, and the FWC, review and comment on wetland permit applications. The FWC also issues permits for gopher tortoise relocation activities and the USFWS also issues permits for bald eagle nest take permits. In addition, the FDEP regulates stormwater discharges from construction sites. A detailed discussion of permits was included in prior sections of this report. The complexity of the permitting process will depend on the degree of impact to jurisdictional areas. It is anticipated that the following permits will be required for this project:

Permit	Issuing Agency
Section 404 Dredge and Fill Permit	USACE
Environmental Resource Permit (ERP)	SFWMD
National Pollutant Discharge Elimination System (NPDES)	FDEP
Gopher Tortoise Relocation Permit (as necessary)	FWC
Eagle Take Permit (as necessary)	USFWS

7.0 CONCLUSIONS

7.1 WETLANDS AND SURFACE WATERS

The Preferred Alternative was evaluated for impacts to wetlands in accordance with Executive Order 11990 Protection of Wetlands, U.S. DOT Order 5660.1A, and the FDOT PD&E Manual. Based on the type and location of project impacts, the FDOT has determined that there is no practicable alternative to the proposed construction in wetlands. The proposed project will have no significant short-term or long-term adverse impacts to wetlands. In accordance with Executive Order 11990, the FDOT has undertaken all actions to minimize the destruction, loss, or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands in carrying out the agency's responsibilities. Nonetheless, the FDOT has determined that there is no practicable alternative to construction impacts occurring in wetlands. Any unavoidable impacts to wetlands will be mitigated to achieve no net loss of wetland function. **Table 11** provides a summary of anticipated impacts.

TABLE 11: SUMMARY OF WETLAND AND OTHER SURFACE WATER IMPACTS

System Type	Preferred Alternative Impacts (acres)	Preferred Ponds Impacts (acres)
Herbaceous wetlands (marsh, wetland shrub, wet prairie)	**3.96**	**1.05**
Forested wetlands (hydric pine flatwoods, mixed wetland hardwoods)	**0.62**	**4.96**
Exotic forested wetlands (melaleuca and/or Brazilian pepper-dominated)	**0.25**	**2.98**
Other Surface Waters (roadside ditches, reservoirs)	**17.22**	**2.42**
Surface Waters (channelized waterways/canals)	**0.02**	**0.00**
Totals	**22.06**	**11.40**
Overall Total	**33.46**	

Wetland impacts which will result from the construction of this project will be mitigated pursuant to Section 373.4137, F.S. to satisfy all mitigation requirements of Part IV Chapter 373, F.S. and 33 U.S.C. §1344. Compensatory mitigation for this project will be completed through the use of mitigation banks and any other mitigation options that satisfy state and federal requirements. A UMAM analysis (**Appendix E**) was performed to estimate the functional loss due to wetland impacts resulting from the Preferred Alternative.

7.2 PROTECTED SPECIES AND HABITAT

The project area was evaluated for the presence of federal and/or state protected species and their suitable habitat in accordance with Section 7 of the ESA and the PD&E Manual. **Tables 12** and **13** summarize the impact determinations that have been made for each federal and state listed species based upon their probability ranking and the implementation measures and/or commitments to offset any potential impacts to each species.

TABLE 12: FEDERAL LISTED SPECIES IMPACT DETERMINATIONS

Project Effect	Federal Listed Species	Listing Status
No effect	**REPTILES**	
	American crocodile (*Crocodylus acutus*)	T
	BIRDS	
	Piping plover (*Charadrius melodus*)	T
	Eastern black rail (*Laterallus jamaicensis*)	T
	Rufus red knot (*Calidris canatus rufa*)	T
	MAMMALS	
	Florida bonneted bat Critical Habitat	
	Florida panther (*Puma concolor coryi*)	E
May affect, not likely to adversely affect	**REPTILES**	
	Loggerhead sea turtle (*Caretta caretta*)	T
	Green sea turtle (*Chelonia mydas*)	T
	Leatherback sea turtle (*Dermochelys coriacea*)	E
	Hawksbill sea turtle (*Eretmochelys imbricata*)	T
	Eastern indigo snake (*Drymarchon corais couperi*)	E
	BIRDS	
	Wood stork (*Mycteria americana*)	T
	Red-cockaded woodpecker (*Picoides borealis*)	E
	Snail kite (*Rostrhamus sociabilis plumbeus*)	E
	Florida scrub-jay (*Aphelocoma coerulescens*)	T
	Crested caracara (*Caracara plancus audubonii*)	T
	MAMMALS	
	West Indian manatee (*Trichechus manatus*)	T
	West Indian manatee Critical Habitat	
	FISH	
	Gulf sturgeon (*Acipenser oxyrinchus desotoi*)	T
	Smalltooth sawfish (*Pristis pectinata*)	E
	Smalltooth sawfish Critical Habitat	
	PLANTS	
	Beautiful pawpaw (*Deeringothamnus pulchellus*)	E
	Aboriginal prickly apple (*Harrisia aboriginum*)	E
May affect, not likely to adversely affect- C (further consultation required)	Florida bonneted bat (*Eumops floridanus*)	E

TABLE 13: STATE LISTED SPECIES IMPACT DETERMINATIONS

Project Effect	State Listed Species	Listing Status
No adverse effect anticipated	**REPTILES**	
	Gopher tortoise (*Gopherus polyphemus*)	T
	Florida pine snake (*Pituophis melanoleucus mugitus*)	T
	BIRDS	
	Florida sandhill crane (*Antigone canadensis pratensis*)	T
	Florida burrowing owl (*Athene cunicularia floridana*)	T
	Little blue heron (*Egretta caerulea*)	T
	Reddish egret (*Egretta rufescens*)	T
	Tricolored heron (*Egretta tricolor*)	T
	Southeastern American kestrel (*Falco sparverius paulus*)	T
	Roseate spoonbill (*Platalea ajaja*)	T
	MAMMALS	
	Sherman's short-tailed shrew (*Blarina carolinensis shermani*)	T
	PLANTS	
	Florida beargrass (*Nolina atopocarpa*)	T
	Many-flowered grass-pink (*Calopogon multiflorus*)	T
No effect anticipated	**BIRDS**	
	Least tern (Sternula antillarum)	T
	Snowy plover (Charadrius nivosus)	T
	PLANTS	
	Sand-dune spurge (*Euphorbia cumulicola*)	E
	Spreading pinweed (*Lechea divaricata*)	E
	Nodding pinweed (*Lechea cernua*)	T

7.3 ESSENTIAL FISH HABITAT

The proposed project is within the GMFMC area of jurisdiction. EFH was analyzed in accordance with the GMFMC and the PD&E Manual. EFH within the project area includes Gator Slough Canal. There is no submerged aquatic vegetation (e.g. seagrass), mangroves, or shellfish habitat identified within the project study area. Due to the nature of the project, no populations of any of the 55 managed species listed by the GMFMC or the 48 highly migratory species listed by NMFS are expected to be adversely affected by the proposed project. The project is anticipated to have minimal effects on EFH.

7.4 IMPLEMENTATION MEASURES

Based on the field and literature reviews outlines in this report, federal and state protected species have the potential to occur within the project area. In order to assure that the proposed project will not adversely impact these species, the following measures will be followed:

- Prior to the construction phase of this project, a gopher tortoise survey will be conducted and if any burrows are found within 25 feet of construction limits, Lee County will coordinate with FWC to secure any necessary permits before construction.
- Prior to the construction phase of this project, Lee County will perform additional surveys to confirm the status of eagle nests along the corridor. If active bald eagle nests are identified within 660 feet of the proposed project, Lee County will coordinate with the USFWS to secure all necessary approvals.
- Lee County will perform additional wildlife surveys for the Florida sandhill crane, Florida burrowing owl, osprey, southeastern American kestrel, and non-listed bats prior to construction. If these species are found to be present in the project area, then the appropriate measures discussed in this report will be followed.
- Should non-listed rare plants be identified in later project phases, Lee County will report them to the FDACS.

7.5 COMMITMENTS

To minimize project impacts on protected species to the greatest extent practicable, the following project commitments will be adhered to:

- As per the Florida bonneted bat consultation key, two BMPs are required and an additional four BMPs selected from a list are also required. BMP numbers 1, 4, 7, 10, 11, and 12 are under consideration for the project.
- The most current version of USFWS' Standard Protection Measures for the Eastern Indigo Snake will be implemented during construction.
- The most current version of the FWC Standard Manatee Conditions for In-Water Work will be implemented during construction.
- The most current version of the NMFS Sea Turtle and Smalltooth Sawfish Construction Conditions will be implemented during construction.
- If the listing status of the tricolored bat is elevated by USFWS to Threatened or Endangered and the Preferred Alternative is located within the consultation area during the design and permitting phase of the proposed project, Lee County commits to re-initiating consultation with the USFWS to determine the appropriate survey methodology and to address USFWS regulations regarding the protection of the tricolored bat.
- Impacts to suitable foraging habitat for the wood stork will be mitigated through the purchase of credits from a USFWS-approved mitigation bank pursuant to Section 373.4137, F.S. or as otherwise agreed to by Lee County and the USFWS.

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Appendix A
FLUCFCS Descriptions

Land Use and Habitat - Classifications and Descriptions

The following numeric codes represent FDOT-designated Land Use and Cover Classifications as specified in the Florida Land Use, Cover, and Forms Classification System Manual (1999). The descriptions relate to project-specific conditions as well as supplemental language from the manual.

WETLANDS

6170: Mixed Wetland Hardwoods

> This class is reserved for those wetland hardwood communities which are composed of a large variety of hardwood species tolerant of hydric conditions yet exhibit an ill-defined mixture of species.

6190: Exotic Wetland Hardwoods

> This refers to wetlands with a dominance of exotic species. In the project area, the dominant nuisance/exotic species is melaleuca (*Melaleuca quinquenervia*) with other interspersed exotics including earleaf acacia (*Acacia auriculiformis*) and Brazilian pepper (*Schinus terebinthifolius*).

6250: Hydric Pine Flatwoods

> This includes freshwater forested wetlands with a sparse to moderate canopy of slash pine (*Pinus elliottii*). The understory consists of grasses, wiregrass, and forbs.

6310: Wetland Shrub

> This community is associated with topographic depressions and poorly drained soils. Species in this habitat type in the project area include Carolina willow (*Salix caroliniana*) and other low shrubs with no dominant species.

6410: Freshwater Marshes

> The communities included in this category within the project area are characterized by having one or more of species such as sawgrass (*Cladium jamaicensis*), cattail (*Typha spp*.), arrowhead (*Sagittaria sp*.), maidencane (*Panicum hemitomon*), common reed (*Phragmites spp*.), and arrowroot (*Thalia geniculata*).

6430: Wet Prairies

> This classification is composed predominantly of grassy vegetation on hydric soils and is usually distinguished from marshes by having less water and shorter herbage. These communities are dominated by sawgrass, maidencane, rushes (*Rhynchospora spp*. and *Eleocharis spp.),* St. Johns wort (*Hypericum spp*.), and whitetop sedge (*Dichromena colorata*).

6440: Emergent Aquatic Vegetation

> This category of wetland plant species includes both floating vegetation and vegetation which is found either partially or completely above the surface water. Within the project

area species observed included spatterdock (*Nuphar spp*.), water lettuce (*Pistia stratiotes*), duck week (*Lemna spp*.), water lily (*Nymphaecea*)

SURFACE WATERS AND OTHER SURFACE WATERS

5100: Streams and Waterways

This category could include rivers, creeks, canals, and other linear water bodies such as conveyance ditches, but typically include excavated ditches and creeks.

5120: Channelized Waterways - Canals

This category also includes rivers, creeks, canals, and other linear water bodies such as conveyance ditches. Gator Slough is the only waterway within the project limits that experiences tidal effects and is not considered entirely freshwater. Even so, vegetation along the edges of the canal within 500ft of the project limits consists of only freshwater species (cattail, melaleuca, etc.). No mangroves, seagrass, or other salt-tolerant vegetation is present along this section of canal. However, the canal is still considered Essential Fish Habitat for numerous species described in **Section 5.0**.

5300: Reservoirs

These are artificial impoundments of water. They are used for irrigation, flood control, municipal and rural water supplies, and recreation. The presence of water control structures or the purpose of the original excavation is used to aid in the differentiation between reservoirs and holding ponds.

5340: Reservoirs Less than 10 Acres

These are artificial impoundments of water less than 10 acres which are dominant features.

UPLANDS, NOT MAINTAINED BY LANDSCAPING AND NOT RECENTLY DISTURBED (THEREFORE CONSIDERED POTENTIAL HABITAT)

1900: Open Land

This includes undeveloped lands within urban areas and inactive land with street patterns but without structures. Open land usually does not exhibit any structured or any indication of intended use.

2120: Unimproved Pastures

This category includes cleared land with major stands of trees and brush where native grasses have been allowed to develop. Normally, this land will not be managed with brush control and/or fertilizer application.

3100: Herbaceous (Dry Prairie)

This category includes upland prairie grasses which occur on non-hydric soils but may be occasionally inundated by water. These grasslands are generally treeless with a variety of vegetation types dominated by grasses, sedges, rushes, and other herbs including wire grasses with some saw palmetto present.

3200: Shrub and Brushland

This includes saw palmettos (*Serenoa repens*), gallberry (*Ilex coriacea*), wax myrtle (*Myrica cerifera*), Brazilian pepper, and other shrubs and brush. Generally, saw palmetto is the most prevalent plant cover intermixed with a wide variety of other woody scrub plant species as well as short herbs and grasses.

3210: Palmetto Prairies

These are areas in which saw palmetto is the most dominant vegetation. Common associates of saw palmetto in this cover type are tar flower (*Bejaria racemosa*), gallberry, wiregrass, and brown grasses.

3300: Mixed Rangeland

This class is reserved for lands that are one-third intermixed with grassland or shrub-brushland range species.

4110: Pine Flatwoods

These forests are dominated by slash pine, or sometimes longleaf pine (*Pinus palustris*), with an understory dominated by saw palmetto and often containing wax myrtle, gallberry, and a wide variety of herbs and grasses. Originally, longleaf pines were common on drier sites while slash pines, which are less fire-resistant, were confined to moister sites; wildfire being the contributing factor in this distribution. However, fire control and artificial reforestation have extended the range of slash pine into former longleaf sites.

4200: Upland Hardwood Forests

This classification has a crown canopy with at least a 66 percent dominance of hardwood tree species. This is reserved for naturally generate stands of trees.

4210: Xeric Oak

This forest community is dominated by xeric oak (*Quercus spp*.) as the name implies. In many cases longleaf pine may have been present prior to harvesting but never regenerated.

4240: Melaleuca

This exotic tree species occurs in almost pure stands. It is an aggressive competitor, invading and often taking over a site. This species is highly tolerant of wetland conditions, but can also thrive in uplands including xeric areas. Many areas classified as Melaleuca forest may have historically been considered wetlands; however, melaleuca is excellent at absorbing water and dehydrating wetlands, and is one of many contributors to degradation of historic wetland conditions along the corridor.

4340: Hardwood – Coniferous Mixed

This class is reserved for those forested areas in which neither upland conifers nor hardwoods achieve a 66% crown canopy dominance. Species typically include live oaks, slash pine, and sabal palm (*sabal palmetto*).

UPLANDS, LANDSCAPED OR SIGNIFICANTLY DISTURBED

1110: Fixed Single Family Units (Less than 2 Dwelling Units/Acre)

These areas contain less than two dwelling units per acre, and are fixed, non-mobile homes.

1180: Rural Residential

This area is characterized by relatively small number of homes per acre.

1210: Fixed Single Family Units (2 to 5 Dwelling Units/Acre)

These areas contain two-to-five dwelling units per acre.

1630: Rock Quarries

This class is reserved for excavation of building materials.

1800: Recreational

These are areas whose physical structure indicates that active user-oriented recreation is or could be occurring within the area. The land use that appears to meet this code is the luxury motorcoach development that is in construction south of Durden Parkway.

1820: Golf Courses

This includes actively maintained golf courses. The golf course within the project limits occurs on the Burnt Store Marina development.

7400: Disturbed Lands

Disturbed lands are those which have been changed by human activities other than mining. Disturbed lands are generally barren or vegetated with grasses and are sometimes regularly maintained. The Extractive category, which would have applied extensively along this corridor 15 years ago, includes the active or recent excavation of building materials, including limestone. Abandoned or inactive mining operations are a part of the extractive category until natural revegetation occurs. Once a mining operation has been discontinued and natural re-vegetation of the area has taken place, the area is then considered historically disturbed rather than currently extractive. The effects of the historical disturbance may include dehydration due to drainage alterations, removal of native vegetation, introduction of nuisance/exotic plant species, and soil profile alteration.

7430: Spoil Areas

Spoil is a deposit of dredged material. For this project, spoil refers to raised linear landmarks that were created from piles of mining debris.

8100: Transportation

The primary feature within the project area that falls under this category is existing roadway- either Burnt Store Road or adjacent roads. For the purposes of the land use evaluations, roadway edges, which can include wetlands, surface waters, and natural upland habitats if not regularly mowed and maintained, were excluded from this classification.

Appendix B

NRCS Soil Descriptions

Soils - Classifications and Descriptions

The following categories represent USDA NRCS soil classifications as specified by each County, Charlotte and Lee. The soil types have been revised since the manuscript for each county was published in the 1980s; therefore, some descriptions from the manuscript for each county does not include the specific soil descriptions but instead the soil series (these soils will be noted with a “*”).

CHARLOTTE COUNTY SOILS

26: Pineda-Pineda, Wet, Fine Sand, 0 to 2 Percent Slopes

Pineda fine sands are poorly drained, nearly level soils that occur in sloughs. Slopes are smooth to slightly concave and range from 0 to 1 percent. The water table is within 10 inches of the surface for 2 to 4 months. It is at a depth of 10 to 40 inches for more than 6 months, and it recedes to a depth of more than 40 inches during extended dry periods. The available water capacity is very low in the surface and subsurface layers and the upper, sandy part of the subsoil and medium in the lower, loamy part of the subsoil. Natural fertility is low. Permeability is rapid in the surface and subsurface layers and the upper, sandy part of the subsoil and slow or very slow in the lower, loamy part for the subsoil. Pineda fine sands are classified as hydric soils by the NRCS Web Soil Survey (NRCS 2021); however, Pineda-Pineda, wet, fine sand, 0 to 2 percent slopes are not classified as hydric.

*123: Myakka Fine Sand-Urban Land Complex, 0 to 2 Percent Slopes

Myakka fine sands are poorly drained, nearly level soils that occur in broad flatwoods areas. Slopes are smooth and are 0 to 2 percent. The water table is within 10 inches of the surface for 1 to 3 months and 10 to 40 inches below the surface for 2 to 6 months. The available water capacity is medium in the subsoil and very low in the surface layers. Permeability is rapid in the surface and subsurface layers and moderate to moderately rapid in the subsoil. Natural fertility is low. Myakka fine sands are not classified as hydric soils by the NRCS Web Soil Survey (NRCS 2021).

*129: Pineda Fine Sand-Urban Land Complex, 0 to 2 Percent Slopes

Pineda fine sands are poorly drained, nearly level soils that occur in sloughs. Slopes are smooth to slightly concave and range from 0 to 1 percent. The water table is within 10 inches of the surface for 2 to 4 months. It is at a depth of 10 to 40 inches for more than 6 months, and it recedes to a depth of more than 40 inches during extended dry periods. The available water capacity is very low in the surface and subsurface layers and the upper, sandy part of the subsoil and medium in the lower, loamy part of the subsoil. Natural fertility is low. Permeability is rapid in the surface and subsurface layers and the upper, sandy part of the subsoil and slow or very slow in the lower, loamy part for the subsoil. Pineda fine sands are classified as hydric soils by the NRCS Web Soil Survey (NRCS 2021); however, Pineda Fine Sand-Urban Land Complex, 0 to 2 Percent Slopes, are not classified as hydric.

LEE COUNTY SOILS

*6: Brynwood Fine Sand, Wet, 0 to 2 Percent Slopes

This soil series was not included in the 1984 manuscript. Brynwood fine sands are very poorly drained soils. Slopes are 0 to 2 percent. Depths to the seasonal high water table are 0 to 12 inches for 4 to 5 months of the year, and within a depth of 12 to 20 inches remaining months (NRCS 2020).

*7: Matlacha Gravelly Fine Sand – Urban Land Complex, 0 to 2 Percent Slopes

Matlacha gravelly find sand, is nearly level, somewhat poorly drained soil formed by filing and earthmoving operations. Slopes are smooth to slightly convex and range from 0 to 2 percent. In most years the water table is 24 to 36 inches below the surface of the fill material for 2 to 4 months. The available water capacity is variable, but it is estimates to be low. Permeability is variable within short distances but is estimated to be moderately rapid to rapid in the dill material and rapid in the underlying material. Natural fertility is estimates to be low. Matlacha gravelly fine sands are not classified as hydric soils by the NRCS Web Soil Survey (NRCS 2021).

11: Myakka Fine Sand, 0 to 2 Percent Slopes

Myakka fine sands are poorly drained, nearly level soils that occur in broad flatwoods. Slopes are smooth to slightly concave and range from 0 to 2 percent. The water table is within 10 inches of the surface for 1 to 3 months and 10 to 40 inches below the surface for 2 to 6 months. The available water capacity is medium in the subsoil and very low in the surface and subsurface layers. Natural fertility is low. Permeability is rapid in the surface and subsurface layers and moderate to moderately rapid in the subsoil. Myakka fine sand are not classified as hydric soils by the NRCS Web Soil Survey (NRCS 2021).

17: Daytona Sand, 0 to 5 Percent Slopes

Daytona sands are moderately well drained, nearly level to gently sloping soils that occur in low ridges on flatwoods. Slopes are smooth to convex and range from 0 to 5 percent. The water table is at a depth of 24 to 40 inches for about 1 to 4 months. It is at a depth of 40 to 60 inches for 8 months. The available water capacity is very low, except in the subsoil where it is medium. Natural fertility is low. Permeability is very rapid in the surface layer and moderately rapid in the subsoil. Daytona sands are not classified as hydric soils by the NRCS Web Soil Survey (NRCS 2021).

*26: Pineda-Pineda, Wet, Fine Sand, 0 to 2 Percent Slopes

Pineda fine sands are poorly drained, nearly level soils that occur in sloughs. Slopes are smooth to slightly concave and range from 0 to 1 percent. The water table is within 10 inches of the surface for 2 to 4 months and 10 to 40 inches below the surface for more than 6 months. The available water capacity is very low in the surface and subsurface layers and in the upper, sandy part of the subsoil and medium in the lower, loamy part of the subsoil. Natural fertility is low. Permeability is rapid in the surface and subsurface layers and the upper, sandy part of the subsoil and slow or very slow in the lower, loamy part of the subsoil. Pineda fine sands are classified as hydric soils by the NRCS Web Soil

Survey (NRCS 2021); Pineda-Pineda, wet, fine sand, 0 to 2 percent slopes are not classified as hydric.

28: Immokalee Sand, 0 to 2 Percent Slopes

Immokalee sands are poorly drained, nearly level soils that occur in flatwoods. Slopes are smooth to convex and range from 0 to 2 percent. The water table is within 10 inches of the surface for 1 to 3 months and 10 to 40 inches below the surface for 2 to 6 months. The available water capacity is medium in the subsoil and very low in the surface and subsurface layers. Natural fertility is low. Permeability is rapid in the surface and subsurface layers and moderate or moderately rapid in the subsoil. Immokalee sands are not classified as hydric soils by the NRCS Web Soil Survey (NRCS 2021).

33: Oldsmar Sand, 0 to 2 Percent Slopes

Oldsmar sands are poorly drained, nearly level soils that occur in broad flatwoods. Slopes are smooth to slightly convex and range from 0 to 2 percent. The water table is at a depth of less than 10 inches for 1 to 3 months. The available water capacity is low in the surface layer and medium in the subsoil. Natural fertility is low. Permeability is rapid in the surface and subsurface layers, moderate in the upper part of the subsoil, and slow or very slow in the lower part of the subsoil. Oldsmar sands are not classified as hydric soils by the NRCS Web Soil Survey (NRCS 2021).

*34: Malabar Fine Sand, 0 to 2 Percent Slopes

Malabar fine sands are poorly drained, nearly level soils that occur in sloughs. Slopes are smooth to concave and range from 0 to 1 percent. The water table is at depth of less than 10 inches for 2 to 4 months. The available water capacity is low in the surface and subsurface layers and the upper part of the subsoil and medium in the lower part of the subsoil. Natural fertility is low. Permeability is rapid in the surface and subsurface layers and the upper part of the subsoil and slow or very slow in the lower part of the subsoil. Malabar fine sands are classified as hydric soils by the NRCS Web Soil Survey (NRCS 2021).

35: Wabasso Sand, 0 to 2 Percent Slopes

Wabasso sands are poorly drained soils, nearly level soils that occur in flatwoods. Slopes are smooth to slightly convex and range from 0 to 2 percent. The water table is less than 10 inches below the surface for 2 to 4 months. The available water capacity is low in the surface and subsurface layers and medium in the subsoils. Natural fertility is low. Permeability is raid in the surface and subsurface layers, moderate in the upper part of the subsoil, and slow or very slow in the lower part of the subsoil. Wabasso sands are not classified as hydric soils by the NRCS Web Soil Survey (NRCS 2021).

36: Immokalee Sand – Urban Land Complex, 0 To 2 Percent Slopes

Immokalee sands are poorly drained, nearly level soils that occur in flatwoods. Slopes are smooth to convex and range from 0 to 2 percent. The water table is within 10 inches of the surface for 1 to 3 months and 10 to 40 inches below the surface for 2 to 6 months. The available water capacity is medium in the subsoil and very low in the surface and subsurface layers. Natural fertility is low. Permeability is rapid in the surface and

subsurface layers and moderate or moderately rapid in the subsoil. Immokalee sands are not classified as hydric soils by the NRCS Web Soil Survey (NRCS 2021).

40: Anclote Sand, Frequently Ponded, 0 to 1 Percent Slopes

Anclote sands, depressional, are very poorly drained, nearly level soils that occur in isolated depressions. Slopes are smooth to concave and less than 1 percent. The soil is ponded for more than 6 months. The available water capacity is medium in the surface layer and low in the substratum. Natural fertility is medium. Permeability is rapid. Anclote sands, depressional, are classified as hydric soils by the NRCS Web Soil Survey (NRCS 2021).

42: Wabasso Sand, Limestone Substratum, 0 to 2 Percent Slopes

Wabasso sands, limestone substratum, are poorly drained, nearly leveled soils that occur in broad flatwoods. Slopes range from 0 to 2 percent. The water table is within 10 inches of the surface for 1 to 3 months. The available water capacity is low in the surface and subsurface layers and the upper part of the subsoil and medium in the lower part of the subsoil. Natural fertility is low. Permeability is rapid in the surface and subsurface layers and the upper part of the subsoil. It is slow in the lower part of the subsoil. Wabasso sands, limestone substratum, are not classified as hydric soils by the NRCS Web Soil Survey (NRCS 2021).

44: Malabar Fine Sand, Frequently Ponded, 0 to 1 Percent Slopes

Malabar fine sand, depressional, are poorly drained, nearly leveled soils that occur in depressions. Slopes are concave and are less than 1 percent. The water table is 10 to 40 inches below the surface for 4 to 6 months. The available water capacity is low in the surface and subsurface layers and medium in the subsoil. Natural fertility is low. Permeability is rapid in the surface and subsurface layers and slow or very slow in the subsoil. Malabar fine sands, depressional, are classified as hydric soils by the NRCS Web Soil Survey (NRCS 2021).

49: Felda Fine Sand, Frequently Ponded, 0 to 1 Percent Slopes

Felda fine sand, depressional, are poorly drained, nearly leveled soils that occur in depressions. Slopes are concave and less than 1 percent. The water table is within a depth of 10 to 40 inches for 4 to 6 months. The available water capacity is low in the surface and subsurface layers and medium in the subsoil. Natural fertility is low. Permeability is rapid in the surface and subsurface layers and moderate or moderately rapid in the subsoil. Felda fine sands, depressional, are classified as hydric soils by the NRCS Web Soil Survey (NRCS 2021).

63: Malabar Fine Sand, High, 0 to 2 Percent Slopes

Malabar fine sand, high, are poorly drained, nearly leveled soils that occur in flatwoods. Slopes are smooth to slightly convex and range from 0 to 2 percent. The water table is 10 to 40 inches below the surface for up to 6 months. It recedes to more than 40 inches below the surface during extended dry periods. The available water capacity is low in the surface and subsurface layers and medium in the subsoil. Natural fertility is low. Permeability is rapid in the surface and subsurface layers and the sandy part of the subsoil and

moderately slow in the lower, loamy part of the subsoil. Malabar fine sands, high, are not classified as hydric soils by the NRCS Web Soil Survey (NRCS 2021).

*64: Brynwood Fine Sand, Wet – Urban Land Complex, 0 to 2 Percent Slopes

This soil series was not included in the 1984 manuscript. This soil series was not included in the 1984 manuscript. Brynwood fine sands are very poorly drained soils. Slopes are 0 to 2 percent. Depths to the seasonal high water table are 0 to 12 inches for 4 to 5 months of the year, and within a depth of 12 to 20 inches remaining months (NRCS 2020).

73: Pineda Fine Sand, Frequently Ponded, 0 to 1 Percent Slopes

Pineda fine sand, depressional, are very poorly drained, nearly leveled soils that occur in depressions. Soils are concave and are less than 1 percent. The water table is within a depth of 10 to 40 inches for 4 to 6 months. The available water capacity is low in the surface and subsurface layers and medium in the subsoil. Natural fertility is low. Permeability is rapid in the surface and subsurface layers and slow or vey slow inn the loamy subsoil. Pineda fine sands, depressional, are classified as hydric soils by the NRCS Web Soil Survey (NRCS 2021).

*119: Malabar Fine Sand-Urban Land Complex, 0 To 2 Percent Slopes

Malabar fine sands are poorly drained, nearly level soils that occur in sloughs. Slopes are smooth to concave and range from 0 to 1 percent. The water table is at depth of less than 10 inches for 2 to 4 months. The available water capacity is low in the surface and subsurface layers and the upper part of the subsoil and medium in the lower part of the subsoil. Natural fertility is low. Permeability is rapid in the surface and subsurface layers and the upper part of the subsoil and slow or very slow in the lower part of the subsoil. Malabar fine sands are classified as hydric soils by the NRCS Web Soil Survey (NRCS 2021).

*121: Malabar Fine Sand, High-Urban Land Complex, 0 To 2 Percent Slopes

Malabar fine sand, high, are poorly drained, nearly leveled soils that occur in flatwoods. Slopes are smooth to slightly convex and range from 0 to 2 percent. The water table is 10 to 40 inches below the surface for up to 6 months. It recedes to more than 40 inches below the surface during extended dry periods. The available water capacity is low in the surface and subsurface layers and medium in the subsoil. Natural fertility is low. Permeability is rapid in the surface and subsurface layers and the sandy part of the subsoil and moderately slow in the lower, loamy part of the subsoil. Malabar fine sands, high, are not classified as hydric soils by the NRCS Web Soil Survey (NRCS 2021).

*122: Matlacha Gravelly Fine Sand, Limestone Substratum – Urban Land Complex, 0 to 2 Percent

Matlacha gravelly fine sands, limestone substratum, are nearly level, somewhat poorly drained soil that formed as a result of earthmoving operations in areas that are underlain but limestone bedrocks. Slopes are smooth to slightly convex and range from 0 to 2 percent. The water table is at a depth of 18 to 30 inches for 2 to 4 months. The available water capacity is low. Permeability is variable, but it is estimated to be moderately rapid to rapid in the fill material and rapid in the upper part of the underlying material. It is moderately slow in lower horizon. Natural fertility is estimated to be low. Matlacha gravelly

fine sands, limestone substratum, are not classified as hydric soils by the NRCS Web Soil Survey (NRCS 2021).

*123: Myakka Fine Sand-Urban Land Complex, 0 To 2 Percent Slopes

Myakka fine sands are poorly drained, nearly level soils that occur in broad flatwoods. Slopes are smooth to slightly concave and range from 0 to 2 percent. The water table is within 10 inches of the surface for 1 to 3 months and 10 to 40 inches below the surface for 2 to 6 months. The available water capacity is medium in the subsoil and very low in the surface and subsurface layers. Natural fertility is low. Permeability is rapid in the surface and subsurface layers and moderate to moderately rapid in the subsoil. Myakka fine sand are not classified as hydric soils by the NRCS Web Soil Survey (NRCS 2021).

*125: Oldsmar Sand-Urban Land, 0 To 2 Percent Slopes

Oldsmar sands are poorly drained, nearly level soils that occur in broad flatwoods. Slopes are smooth to slightly convex and range from 0 to 2 percent. The water table is at a depth of less than 10 inches for 1 to 3 months. The available water capacity is low in the surface layer and medium in the subsoil. Natural fertility is low. Permeability is rapid in the surface and subsurface layers, moderate in the upper part of the subsoil, and slow or very slow in the lower part of the subsoil. Oldsmar sands are not classified as hydric soils by the NRCS Web Soil Survey (NRCS 2021).

*129: Pineda Fine Sand – Urban Land Complex, 0 to 2 Percent Slopes

Pineda fine sands are poorly drained, nearly level soils that occur in sloughs. Slopes are smooth to slightly concave and range from 0 to 1 percent. The water table is within 10 inches of the surface for 2 to 4 months and 10 to 40 inches below the surface for more than 6 months. The available water capacity is very low in the surface and subsurface layers and in the upper, sandy part of the subsoil and medium in the lower, loamy part of the subsoil. Natural fertility is low. Permeability is rapid in the surface and subsurface layers and the upper, sandy part of the subsoil and slow or very slow in the lower, loamy part of the subsoil. Pineda fine sands are classified as hydric soils by the NRCS Web Soil Survey (NRCS 2021); however, Pineda fine sand – urban land complex, 0 to 2 percent slopes are not classified as hydric.

*137: Wabasso Sand – Urban Land Complex, 0 to 2 Percent

Wabasso sands are poorly drained soils, nearly level soils that occur in flatwoods. Slopes are smooth to slightly convex and range from 0 to 2 percent. The water table is less than 10 inches below the surface for 2 to 4 months. The available water capacity is low in the surface and subsurface layers and medium in the subsoils. Natural fertility is low. Permeability is raid in the surface and subsurface layers, moderate in the upper part of the subsoil, and slow or very slow in the lower part of the subsoil. Wabasso sands are not classified as hydric soils by the NRCS Web Soil Survey (NRCS 2021).

Appendix C
Field Photographs

Photo 1. Ditch on the west side of the roadway, photo taken during the dry season in March 2020.

Photo 2. Small cross drain, photo taken during the dry season in March 2020.

Photo 3. Ditch leading to a cross drain on the west side of the roadway, photo taken during the dry season in March 2020.

Photo 4. Cross drain on the east side of the roadway, photo taken during the dry season in March 2020.

Photo 5. Ditch leading to a cross drain on the east side of the roadway, photo taken during the wet season in September 2020. Water overtops the embankment and floods the roadside edge.

Photo 6. Cross drain on the east side of the roadway, photo taken during the wet season in September 2020.

Photo 7. Flooded ditch on the east side of the roadway, photo taken during the wet season in September 2020.

Photo 8. Cross drain with ditch in the background, photo taken during the wet season in September 2020.

Appendix D

Agency Correspondence

FLORIDA DEPARTMENT OF
Environmental Protection

Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, FL 32399

Ron DeSantis
Governor

Jeanette Nuñez
Lt. Governor

Shawn Hamilton
Secretary

April 13, 2022

Dara Jarvis
Scalar Consulting Group Inc.
13337 N. 56th St.
Tampa, Florida 33617

RE: Gator Slough/Burnt Store Rd/Yucca Pen Creek/Hog Branch
Worksheet # 123911

Dear Ms. Dara Jarvis:

This letter is in response to your recent inquiry requesting a determination of state owned lands in Section 5,6,7,8,17,18,19,20,29,30,31,32 Township 43 South, Range 23 East; Lee County.

Gator Slough has been dredged and altered and the Title and Land Records Section has not conducted the research and analysis necessary to determine the original location of the mean high water line of Gator Slough, Yucca Pen Creek and Hog Branch at the subject site. Therefore, this is not a determination of the boundaries of Board of Trustees owned sovereignty lands. For regulatory permitting purposes only, we recommend proprietary authorization normally required for the use of state owned lands not be required for the subject site at Gator Slough at this time. The Board of Trustees holds title to the lands adjacent to the subject site by deed O.R. Book 3410 Page 1901 (DMID 312102), O.R. Book 3453 Page 2106 (DMID 312101) and O.R. Book 3411 Page 4286 and is subject to lease 4095 (DMID 311394) and deed O.R. Book 2905 Page 2477 (DMID 15279) and is subject to lease 4085 (DMID 330435).

The conclusions stated herein are based on a review of records currently available within the Department of Environmental Protection as supplemented, in some cases, by information furnished by the requesting party and do not constitute a legal opinion of title. A permit from the Department of Environmental Protection and other federal, state and local agencies may be required prior to conducting activities.

Should you have any questions regarding this determination, please contact Clayton Hall, Government Operations Consultant, at mail station 108 at the above address or call at (850) 245-2643.

Sincerely,

Marcus Ashman for

Scott Woolam, PSM, Bureau Chief
Division of State Lands
Bureau of Survey and Mapping
SW/dw
"\\Fldep1\dsl_data\TITLE\Clayton Hall\202204-06\Lee\Gator Slough\Letter To Dara Jarvis Scalar Consulting Group Inc 20220413.docx"

FLORIDA DEPARTMENT OF
Environmental Protection

Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, FL 32399

Ron DeSantis
Governor

Jeanette Nuñez
Lt. Governor

Noah Valenstein
Secretary

April 21, 2020

Katie Castor
Scalar Consulting Group Inc.
13337 North 56th Street
Tampa, Florida 33617

RE: Yucca Pen Creek

Dear Ms. Castor:

This letter is in response to your recent inquiry requesting a determination of state owned lands in Section 5 & 6, Township 43 South, Range 23 East; Lee County.

Our records indicate that the submerged lands lying below the mean high water line of Yucca Pen Creek at the proposed site are Board of Trustees owned. For the other crossings along the project corridor, the title & land records section has not conducted the research and analysis necessary to determine the original location of the mean high water line. This is not a determination of the boundaries of Board of Trustees owned sovereignty lands. Therefore, we recommend proprietary authorization normally required for the use of Board of Trustees owned lands not be required for the crossings, other than the Yucca Pen Creek crossing, at this time.

The conclusions stated herein are based on a review of records currently available within the Department of Environmental Protection as supplemented, in some cases, by information furnished by the requesting party. Additional records will be reviewed if provided.

Should you have any questions regarding this determination, please contact Marcus Gordon, GOC I, at mail station 108 at the above address or call at (850) 245-2788.

Sincerely,

Richard Malloy, PSM, Bureau Chief
Division of State Lands
Bureau of Survey and Mapping
RM/mg
F:\TITLE\Marcus Gordon\2020 January thru March\Lee\YUCCA PENS CREEK AS WELL AS ANY OTHER SUBMERGED LANDS WITHIN 200FT OF THE ATTACHED ROADWAY PROJECT

Appendix E

UMAM Datasheets

PART I – Qualitative Description
(See Section 62-345.400, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Burnt Store Road PD&E	N/A	OSW-5, 8, 10, 12, 14, 21, 24, 25, 27, 33, 38, 41, 44, 45

FLUCCs code	Further classification (optional)	Impact or Mitigation Site?	Assessment Area Size
5300: Reservoir	Borrow pits and ponds (historic or current use)	Impact	Varies

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
Tidal Caloosahatchee and Charlotte Harbor Drainage	Unnamed surface waters (Class III)	No

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

These features are not directly connected to wetlands or other surface waters, and are generally surrounded by disturbed uplands that are part of historic mining operations. Wetlands are present nearby.

Assessment area description

The assessment areas include the ponds and the edges of the ponds, which are generally devoid of vegetation or exhibit sparse herbaceous vegetation. The ponds contain sandy bottom with side slopes that are too steep for recruitment of littoral vegetation.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Yucca Pens Unit of Babcock-Webb Wildlife Management Area; Yucca Pens Preserve	There are many similar features throughout the regional landscape.

Functions	Mitigation for previous permit/other historic use
Water storage, potential habitat for small freshwater fish, reptiles, and amphibians; potential drinking area for mammals.	N/A

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)
Although no wildlife was observed in these ponds during field reviews, it is expected that there could be fish, frogs, alligators, and other aquatic species inhabiting these waters. Potential drinking area for deer, hogs, and other mammals.	None (not suitable wood stork foraging habitat).

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

None.

Additional relevant factors:

Since there is no flow in or out of these features, the water is expected to be fairly stagnant and not of good quality. Wildlife utilization is expected to be minimal.

Assessment conducted by:	Assessment date(s):
Katie Castor, M.S.	9/17/2020

PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Burnt Store Road PD&E	N/A	OSW-5, 8, 10, 12, 14, 21, 24, 25, 27, 33, 38, 41, 44, 45
Impact or Mitigation	**Assessment conducted by:**	**Assessment date:**
Impact	Katie Castor	9/17/2020

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

.500(6)(a) Location and Landscape Support w/o pres or current: 6 with: 0	These are old borrow pits or ponds in a rural area with nearby conservation lands; although these areas were historically highly disturbed, they appear to generally be abandoned now and therefore available for use by wildlife. OSW-43 is a pond that appears to function as stormwater treatment for adjacent utility land uses although no pemit exists. In addition to being near the road, many of these ponds are surrounded by barren land that provides little cover for wildlife, while some are surrounded by invasive forest (melaleuca) that lowers the score.	
.500(6)(b)Water Environment (n/a for uplands) w/o pres or current: 4 with: 0	These ponds are inundated year-round, with varying water levels between wet season and dry season. Water does not appear to flow in or out of most of these systems; they act as rain catchment basins (retention ponds). Therefore, the water is expected to be somewhat stagnant.	
.500(6)(c)Community structure 1. Vegetation and/or 2. Benthic Community w/o pres or current: 1 with: 0	Most of these ponds are devoid of vegetation since the edges are steep and the bottom is generally too deep. Some contain small amounts of herbaceous vegetation along the bank, such as blue maidencane (*Amphicarpum muhlenbergianum*), and during the dry season some areas become shallow enough to temporarily support vegetation such as alligator flag (*Thalia geniculata*).	

Score = sum of above scores/30 (if uplands, divide by 20)		If preservation as mitigation,	For impact assessment areas
current or w/o pres: 0.36667	with: 0	Preservation adjustment factor =	FL = delta x acres =
		Adjusted mitigation delta =	

Delta = [with-current]	If mitigation	For mitigation assessment areas
-0.366666667	Time lag (t-factor) =	RFG = delta/(t-factor x risk) =
	Risk factor =	

PART I – Qualitative Description
(See Section 62-345.400, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Burnt Store Road PD&E	N/A	SW-1, 2, 8 and 19

FLUCCs code	Further classification (optional)	Impact or Mitigation Site?	Assessment Area Size
5120: Channelized Waterways, Canals	Gator Slough Canal and branches to the north and south	Impact	Varies

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
Tidal Caloosahatchee	Canals (Class III)	No (drains to an OFW downstream)

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Several upstream wetlands and other surface waters drain into these man-made features, which flow to the estuary.

Assessment area description

The assessment areas include the canals and the edges of the canals. The side slopes are steep and contain herbaceous vegetation, shrubs, and trees (a mixture of native and invasive vegetation). The canal bottom appears to contain riprap and no aquatic vegetation was observed. Although the vegetation indicates that these areas are freshwater in SW-1 and SW-2, they may experience tidal effects and potentially a small amount of salinity. SW-8 is separated from downstream waters by a water control structure. SW-19 is the Onyx Canal and does not experience any tidal

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Yucca Pens Unit of Babcock-Webb Wildlife Management Area; Yucca Pens Preserve	There are many similar features throughout the regional landscape.

Functions	Mitigation for previous permit/other historic use
Water storage and conveyance, freshwater flow into downstream estuary, habitat for fish, reptiles, and amphibians.	N/A

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)
Fish, frogs, alligators, and other aquatic species. Potential drinking area for deer, hogs, and other mammals.	SW-1 and SW-2 are considered EFH for 50 representative managed species identified by the GMFMC, including the smalltooth sawfish. However, no mangroves or seagrasses are present and involvement is expected to be minimal since conditions are freshwater.

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Fish were observed in the water.

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
Katie Castor, M.S.	9/17/2020

PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Burnt Store Road PD&E	N/A	SW-1, 2, 8 and 19
Impact or Mitigation	**Assessment conducted by:**	**Assessment date:**
Impact	Katie Castor	9/17/2020

Scoring Guidance
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed

Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

.500(6)(a) Location and Landscape Support w/o pres or current: 5 with: 0	These surface waters include Gator Slough Canal and its branches to the north and south, as well as the Onyx Canal on the west side of Burnt Store Road. Gator Slough and its associated waterways are located in a rural/suburban area and are partially lined with seawalls. The Onyx Canal is in a rural setting and is lined with riprap. Most of the surroundings consist of residential properties and vacant lots, with one natural forested area adjacent to the main canal.	
.500(6)(b)Water Environment (n/a for uplands) w/o pres or current: 5 with: 0	Gator Slough Canal is a channelized/excavated portion of an originally natural system. The associated canals are man-made and some areas are used as a water source for irrigation. Nutrient pollution is likely. Although the downstream conditions are estuarine, the water within the study area exhibits low enough salinity levels that there is no salt-tolerant vegetation present. A water control structure several feet north of the northbound bridge separates the freshwater flow from the slightly brackish downstream conditions. Water depth is estimated to range up to 10 feet. The Onyx Canal assessment area is a very small, open water channel area by the roadside culvert. It also was excavated and channelized.	
.500(6)(c)Community structure 1. Vegetation and/or 2. Benthic Community w/o pres or current: 1 with: 0	There is no vegetation in the systems themselves and no benthic community. On the banks, vegetation consists of cattail (*Typha spp.*), brazilian pepper (*Schinus terebinthifolia*), Australian pine (*Casuarina equisetifolia*), slash pine (*Pinus elliottii*), cabbage palm (*Sabal palmetto*), carolina willow (*Salix caroliniana*) and wax myrtle (*Myrica cerifera*). Brazilian pepper and Australian pine are the dominant species. Benthic conditions appear to be sandy bottom with riprap lining the edges of the canals. No seagrasses or mangroves were observed.	

Score = sum of above scores/30 (if uplands, divide by 20)		
current or w/o pres: 0.36667	with: 0	

If preservation as mitigation,
Preservation adjustment factor =
Adjusted mitigation delta =

For impact assessment areas
FL = delta x acres =

Delta = [with-current]
-0.366666667

If mitigation
Time lag (t-factor) =
Risk factor =

For mitigation assessment areas
RFG = delta/(t-factor x risk) =

PART I – Qualitative Description
(See Section 62-345.400, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Burnt Store Road PD&E	N/A	OSW-3, 4, 6, 7, 9, 11, 13, 15, 16, 17, 18, 20, 22, 23, 26, 28, 29, 30, 31, 32, 34, 35, 36, 37, 38, 39, 42, 46, 47, 48, and 49

FLUCCs code	Further classification (optional)	Impact or Mitigation Site?	Assessment Area Size
5100: Streams and Waterways	Ditches	Impact	Varies

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
Tidal Caloosahatchee	Ditches (Class III)	No (drains to an OFW downstream)

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

These ditches are hydrologically connected with upstream and downstream wetlands and downstream streams, canals, and eventually the estuary.

Assessment area description

Wet season conditions are inundated with slow-flowing tannic water. Water depth generally ranges from 1ft to 3ft (deeper where culverts carry the water under the road). These areas are not inundated during the dry season, but some do have saturated soils during the dry season. All of these features exhibit hydric soils. Vegetation during the wet season consists of cattail (*Typha* spp.), pickerel weed *(Pontederia cordata*), broadleaf arrowhead (*Sagittaria latifolia*), Tracy's beaksedge (*Rhynchospora tracy* i), blue maidencane (*Amphicarpum muhlenbergianum*), soft rush (*Juncus effusus*), bluejoint panicum (*Panicum tenerum*), and southern beaksedge (*Rhynchospora microcarpa*). During the dry season, many of these species die off and bahia grass (*Paspalum notatum*) encroaches into the ditches.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Yucca Pens Unit of Babcock-Webb Wildlife Management Area; Yucca Pens Preserve	There are many similar features throughout the regional landscape.

Functions	Mitigation for previous permit/other historic use
Water storage and conveyance, freshwater flow into downstream estuary, habitat for fish, reptiles, and amphibians.	N/A

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)
Fish, frogs, alligators, and other aquatic species. Potential drinking area for deer, hogs, and other mammals.	Wood storks (FT) and wading birds (4 species ST) could use these areas for foraging.

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Fish were observed in the water, one small alligator was observed swimming, and several wading birds were observed foraging.

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
Katie Castor, M.S.	9/17/2020

PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Burnt Store Road PD&E	N/A	OSW-3, 4, 6, 7, 9, 11, 13, 15, 16, 17, 18, 20, 23, 24, 26, 28, 29, 30, 31, 32, 35, 36, 37, 38, 39, 42, 46, 47, 48, and 49
Impact or Mitigation	**Assessment conducted by:**	**Assessment date:**
Impact	Katie Castor	9/17/2020

Scoring Guidance	**Optimal (10)**	**Moderate(7)**	**Minimal (4)**	**Not Present (0)**
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

.500(6)(a) Location and Landscape Support	w/o pres or current: 5	with: 0
These ditches are generally parallel to the road on each side, with a few running perpendicular. Most of these ditches are connected with culverts, and are dry during the dry season and inundated during the wet season.		
.500(6)(b)Water Environment (n/a for uplands)	w/o pres or current: 2	with: 0
Wet season conditions are inundated with slow-flowing tannic water. Water depth generally ranges from 1ft to 3ft (deeper where culverts carry the water under the road). These areas are not inundated during the dry season, but some do have saturated soils during the dry season. All of these features exhibit hydric soils.		
.500(6)(c)Community structure 1. Vegetation and/or 2. Benthic Community	w/o pres or current: 5	with: 0
Vegetation during the wet season consists of cattail (*Typha spp.*), pickerel weed (*Pontederia Cordata*), broadleaf arrowhead (*Sagittaria latifolia*), Tracy's beaksedge (*Rhynchospora tracyi*), blue maidencane (*Amphicarpum muhlenbergianum*), soft rush (*Juncus effusus*), bluejoint panicum (*Panicum tenerum*), and southern beaksedge (*Rhynchospora microcarpa*). During the dry season, many of these species die off and bahia grass (*Paspalum notatum*) encroaches into the ditches.		

Score = sum of above scores/30 (if uplands, divide by 20)	current or w/o pres: 0.4	with: 0

If preservation as mitigation,
Preservation adjustment factor =
Adjusted mitigation delta =

For impact assessment areas
FL = delta x acres =

Delta = [with-current]
-0.4

If mitigation
Time lag (t-factor) =
Risk factor =

For mitigation assessment areas
RFG = delta/(t-factor x risk) =

PART I – Qualitative Description
(See Section 62-345.400, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Burnt Store Road PD&E	N/A	WL-2, WL-3 H, WL-5, WL-7, WL-9, WL-13, WL-15, WL-16, WL-18, WL-22, WL-23 and WL-24

FLUCCs code	Further classification (optional)	Impact or Mitigation Site?	Assessment Area Size
6410: Freshwater Marshes; 6310: Wetland Shrub; 6430: Wet Prairie	Herbaceous wetlands	Impact	Varies

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
Tidal Caloosahatchee	Unnamed wetlands (Class III)	No (drains to an OFW downstream)

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

These wetlands are interconnected with other herbaceous and forested wetlands, flatwood uplands, creeks, and ditches that make up the network of northeast to southwest drainage that is characteristic of the area.

Assessment area description

Wet season conditions are inundated with slow sheetflow of tannic water. Water depth generally ranges from 0ft to 2ft. During the dry season, these areas do not experience inundation or saturated soils. They do exhibit hydric soils, morphological plant adaptations, and water marks, indicating that although the areas are very dry for most of the year, seasonal flooding during the rainy season causes wetland vegetation to persist. Historic diversion of upstream runoff has dehydrated many of these areas. These areas are dominated by grasses, sedges, and shrubs such as little bluestem (*Schizachyrium stoloniferum*), bristle grass (*Setaria geniculata*), wax myrtle (*Myrica cerifera*). Sparse slash pines (*Pinus elliottii*) are also present in some areas. Other vegetation includes invasive (mostly immature) species such as melaleuca (*Melaleuca quinquenervia*), earleaf acacia (*Acacia auriculiformis*), and lead tree *(Leucaena leucocephala*). During the wet season, additional herbaceous vegetation recruits including Tracy's beaksedge (*Rhynchospora tracyi*), blue maidencane (*Amphicarpum muhlenbergianum*), bluejoint panicum (*Panicum tenerum*), and southern beaksedge (*Rhynchospora microcarpa*).

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Yucca Pens Unit of Babcock-Webb Wildlife Management Area; Yucca Pens Preserve	There are many similar features throughout the regional landscape.

Functions	Mitigation for previous permit/other historic use
Water storage and conveyance, freshwater flow into downstream estuary, habitat for fish, reptiles, birds, and amphibians.	N/A

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)
Fish, frogs, alligators, and other aquatic species. Potential drinking area for deer, hogs, and other mammals. Nesting and foraging area for birds.	Wood storks (FT) and wading birds (4 species ST) could use these areas for foraging. The snail kite (FE) could also use these areas for nesting and foraging, although likelihood of presence is low.

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Several wading birds were observed foraging.

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
Katie Castor, M.S.	9/17/2020

PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Burnt Store Road PD&E	N/A	WL-2, WL-3 H, WL-5, WL-7, WL-9, WL-13, WL-15, WL-16, WL-18, WL-22, WL-23 and WL-24
Impact or Mitigation	**Assessment conducted by:**	**Assessment date:**
Impact	Katie Castor	9/17/2020

Scoring Guidance	**Optimal (10)**	**Moderate(7)**	**Minimal (4)**	**Not Present (0)**
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

.500(6)(a) Location and Landscape Support w/o pres or current: 7 with: 0	Most of these areas are within or near conservation areas, and are within a rural setting with little current disturbance (many have experienced historical disturbance).
.500(6)(b)Water Environment (n/a for uplands) w/o pres or current: 3 with: 0	Wet season conditions are inundated with slow sheetflow of tannic water. Water depth generally ranges from 0ft to 2ft. During the dry season, these areas do not experience inundation or saturated soils. They do exhibit hydric soils, morphological plant adaptations, and water marks, indicating that although the areas are very dry for most of the year, seasonal flooding during the rainy season causes wetland vegetation to persist. Historic diversion of upstream runoff has dehydrated many of these areas.
.500(6)(c)Community structure 1. Vegetation and/or 2. Benthic Community w/o pres or current: 3 with: 0	These areas are dominated by grasses, sedges, and shrubs such as little bluestem (*Schizachyrium stoloniferum*), bristle grass (*Setaria geniculata*), wax myrtle (*Myrica cerifera*). Sparse slash pines (*Pinus elliottii*) are also present in some areas. Other vegetation includes invasive (mostly immature) species such as melaleuca (*Melaleuca quinquenervia*), earleaf acacia (*Acacia auriculiformis*), and lead tree (*Leucaena leucocephala*). During the wet season, additional herbaceous vegetation recruits including Tracy's beaksedge (*Rhynchospora tracyi*), blue maidencane (*Amphicarpum muhlenbergianum*), bluejoint panicum (*Panicum tenerum*), and southern beaksedge (*Rhynchospora microcarpa*).

Score = sum of above scores/30 (if uplands, divide by 20)	
current or w/o pres	with
0.43333	0

If preservation as mitigation,
Preservation adjustment factor =
Adjusted mitigation delta =

For impact assessment areas
FL = delta x acres =

Delta = [with-current]
-0.433333333

If mitigation
Time lag (t-factor) =
Risk factor =

For mitigation assessment areas
RFG = delta/(t-factor x risk) =

PART I – Qualitative Description
(See Section 62-345.400, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Burnt Store Road PD&E	N/A	WL-5, WL-6, WL-8, WL-12, and WL 25

FLUCCs code	Further classification (optional)	Impact or Mitigation Site?	Assessment Area Size
6190: Exotic Wetland Hardwood	Forested wetlands	Impact	Varies

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
Tidal Caloosahatchee	Unnamed wetlands (Class III)	No (drains to an OFW downstream)

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

These wetlands are interconnected with other herbaceous and forested wetlands, flatwood uplands, creeks, and ditches that make up the network of northeast to southwest drainage that is characteristic of the area.

Assessment area description

Most of these areas are within or near conservation areas, and are within a rural setting with low-density residential land use nearby. Wet season conditions are inundated with slow sheetflow of tannic water. Water depth generally ranges from 0ft to 2ft. These areas are not inundated during the dry season and do not have saturated soils during the dry season. All of these wetlands exhibit hydric soils, morphological plant adaptations, and water marks, indicating that although the areas are very dry for most of the year, seasonal flooding during the rainy season causes wetland vegetation to persist. Historic diversion of upstream runoff has dehydrated many of these areas. These areas are dominated by melaleuca *(Melaleuca quinquenervia*). Other vegetation includes slash pine (*Pinus elliottii)* , saw palmetto (*Serenoa repens*), sabal palm (*Sabal palmetto*), earleaf acacia (*Acacia auriculiformis*), and downy rose myrtle *(Rhodomyrtus tomentosa*). During the wet season, herbaceous vegetation recruits including Tracy's beaksedge (*Rhynchospora tracyi*), blue maidencane (*Amphicarpum muhlenbergianum*), bluejoint panicum (*Panicum tenerum*), and southern beaksedge (*Rhynchospora microcarpa*).

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Yucca Pens Unit of Babcock-Webb Wildlife Management Area; Yucca Pens Preserve	There are many similar features throughout the regional landscape.

Functions	Mitigation for previous permit/other historic use
Water storage and conveyance, freshwater flow into downstream estuary, habitat for fish, reptiles, birds, and amphibians.	N/A

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)
Fish, frogs, alligators, snakes, and other aquatic species. Potential drinking area for deer, hogs, and other mammals. Nesting and foraging area for birds.	Wood storks (FT) and wading birds (4 species ST) could use these areas for foraging. The Florida bonneted bat (FE) could also use these areas for foraging or roosting.

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Several wading birds were observed foraging.

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
Katie Castor, M.S.	9/17/2020

PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Burnt Store Road PD&E	N/A	WL-5, WL-6, WL-8, WL-12, and WL 25
Impact or Mitigation	**Assessment conducted by:**	**Assessment date:**
Impact	Katie Castor	9/17/2020

Scoring Guidance	**Optimal (10)**	**Moderate(7)**	**Minimal (4)**	**Not Present (0)**
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

.500(6)(a) Location and Landscape Support	w/o pres or current: 6	with: 0	Most of these areas are within or near conservation areas, and are within a rural setting with low-density residential land use nearby.
.500(6)(b)Water Environment (n/a for uplands)	w/o pres or current: 3	with: 0	Wet season conditions are inundated with slow sheetflow of tannic water. Water depth generally ranges from 0ft to 2ft. These areas are not inundated during the dry season and do not have saturated soils during the dry season. All of these wetlands exhibit hydric soils, morphological plant adaptations, and water marks, indicating that although the areas are very dry for most of the year, seasonal flooding during the rainy season causes wetland vegetation to persist. Historic diversion of upstream runoff has dehydrated many of these areas.
.500(6)(c)Community structure 1. Vegetation and/or 2. Benthic Community	w/o pres or current: 2	with: 0	These areas are dominated by melaleuca (*Melaleuca quinquenervia*). Other vegetation includes slash pine (*Pinus elliottii*), saw palmetto (*Serenoa repens*), sabal palm (*Sabal palmetto*), earleaf acacia (*Acacia auriculiformis*), and downy rose myrtle (*Rhodomyrtus tomentosa*). During the wet season, herbaceous vegetation recruits including Tracy's beaksedge (*Rhynchospora tracyi*), blue maidencane (*Amphicarpum muhlenbergianum*), bluejoint panicum (*Panicum tenerum*), and southern beaksedge (*Rhynchospora microcarpa*).

Score = sum of above scores/30 (if uplands, divide by 20)	current or w/o pres: 0.36667	with: 0

If preservation as mitigation,
Preservation adjustment factor =
Adjusted mitigation delta =

For impact assessment areas
FL = delta x acres =

Delta = [with-current]
-0.366666667

If mitigation
Time lag (t-factor) =
Risk factor =

For mitigation assessment areas
RFG = delta/(t-factor x risk) =

PART I – Qualitative Description
(See Section 62-345.400, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Burnt Store Road PD&E	N/A	WL-1, WL-3 F, WL-4, WL-10, WL-14, WL-19, WL-20, and WL-21

FLUCCs code	Further classification (optional)	Impact or Mitigation Site?	Assessment Area Size
6250: Hydric Pine Flatwoods; 6170: Mixed Wetland Hardwoods	Forested wetlands	Impact	Varies

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
Tidal Caloosahatchee	Unnamed wetlands (Class III)	No (drains to an OFW downstream)

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

These wetlands are interconnected with other herbaceous and forested wetlands, flatwood uplands, creeks, and ditches that make up the network of northeast to southwest drainage that is characteristic of the area.

Assessment area description

Most of these areas are within or near conservation areas, and are within a rural setting with little disturbance. Wet season conditions are inundated with slow sheetflow of tannic water. Water depth generally ranges from 0ft to 2ft. These areas are not inundated during the dry season and do not have saturated soils during the dry season. All of these wetlands exhibit hydric soils, morphological plant adaptations, and water marks, indicating that although the areas are very dry for most of the year, seasonal flooding during the rainy season causes wetland vegetation to persist. Historic diversion of upstream runoff has dehydrated many of these areas. Hydric Pine Flatwoods are dominated by slash pine (*Pinus elliottii*)and the Mixed Hardwoods are dominated by oaks. Other vegetation includes sabal palm (*Sabal palmetto*), low-density saw palmetto (*Serenoa repen* s), little bluestem (*Schizachyrium stoloniferum*), bristle grass *(Setaria geniculata*), wax myrtle *(Myrica cerifera*), and sparse invasives such as melaleuca (*Melaleuca quinquenervia*) earleaf acacia (*Acacia auriculiformis*), and downy rose myrtle *(Rhodomyrtus tomentosa*). During the wet season, additional herbaceous vegetation recruits including Tracy's beaksedge (*Rhynchospora tracyi*), blue maidencane (*Amphicarpum muhlenbergianum*), bluejoint panicum *(Panicum tenerum*), and southern beaksedge (*Rhynchospora microcarpa*).

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Yucca Pens Unit of Babcock-Webb Wildlife Management Area; Yucca Pens Preserve	There are many similar features throughout the regional landscape.

Functions	Mitigation for previous permit/other historic use
Water storage and conveyance, freshwater flow into downstream estuary, habitat for fish, reptiles, birds, and amphibians.	N/A

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)
Fish, frogs, alligators, snakes, and other aquatic species. Potential drinking area for deer, hogs, and other mammals. Nesting and foraging area for birds.	Wood storks (FT) and wading birds (4 species ST) could use these areas for foraging. The Florida bonneted bat (FE) could also use these areas for foraging or roosting.

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Several wading birds were observed foraging.

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
Katie Castor, M.S.	9/17/2020

PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Burnt Store Road PD&E	N/A	WL-1, WL-3 F, WL-4, WL-10, WL-14, WL-19, WL-20, and WL-21
Impact or Mitigation	**Assessment conducted by:**	**Assessment date:**
Impact	Katie Castor	9/17/2020

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

.500(6)(a) Location and Landscape Support	w/o pres or current: 7	with: 0	Most of these areas are within or near conservation areas, and are within a rural setting with little disturbance.
.500(6)(b)Water Environment (n/a for uplands)	w/o pres or current: 3	with: 0	Wet season conditions are inundated with slow sheetflow of tannic water. Water depth generally ranges from 0ft to 2ft. These areas are not inundated during the dry season and do not have saturated soils during the dry season. All of these wetlands exhibit hydric soils, morphological plant adaptations, and water marks, indicating that although the areas are very dry for most of the year, seasonal flooding during the rainy season causes wetland vegetation to persist. Historic diversion of upstream runoff has dehydrated many of these areas.
.500(6)(c)Community structure 1. Vegetation and/or 2. Benthic Community	w/o pres or current: 7	with: 0	Vegetation includes oaks, slash pine (*Pinus elliottii*) sabal palm (*Sabal palmetto*), low-density saw palmetto (*Serenoa repens*), little bluestem (*Schizachyrium stoloniferum*), bristle grass (*Setaria geniculata*), wax myrtle (*Myrica cerifera*), and sparse invasives such as melaleuca (*Melaleuca quinquenervia*) earleaf acacia (*Acacia auriculiformis*), and downy rose myrtle (*Rhodomyrtus tomentosa*). During the wet season, additional herbaceous vegetation recruits including Tracy's beaksedge (*Rhynchospora tracyi*), blue maidencane (*Amphicarpum muhlenbergianum*), bluejoint panicum (*Panicum tenerum*), and southern beaksedge (*Rhynchospora microcarpa*).

Score = sum of above scores/30 (if uplands, divide by 20)	current or w/o pres: 0.56667	with: 0

If preservation as mitigation,
Preservation adjustment factor =
Adjusted mitigation delta =

For impact assessment areas
FL = delta x acres =

Delta = [with-current]
-0.566666667

If mitigation
Time lag (t-factor) =
Risk factor =

For mitigation assessment areas
RFG = delta/(t-factor x risk) =

Appendix F

FNAI Standard Data Report

FLORIDA
Natural Areas
INVENTORY

1018 Thomasville Road
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Tallahassee, FL 32303
850-224-8207
fax 850-681-9364
www.fnai.org

December 9, 2021

Dara Jarvis
Scalar Consulting Group, Inc
13337 North 56th Street
Tampa, FL 33617

Dear Ms. Jarvis,

Thank you for requesting information from the Florida Natural Areas Inventory (FNAI). At your request we have produced the following report for your project area.

The purpose of this Standard Data Report is to provide objective scientific information on natural resources located in the vicinity of a site of interest, in order to inform those involved in project planning and evaluation. This Report makes no determination of the suitability of a proposed project for this location, or the potential impacts of the project on natural resources in the area.

Project: PD&E Study for Burnt Store Road

Date Received: 12/2/2021

Location: Charlotte County

Based on the information available, this site appears to be located in a significant region of natural areas and habitat for several rare species.

Element Occurrences

A search of our maps and database indicates that we currently have several element occurrences mapped in the vicinity of the study area (see enclosed map and element occurrence table). Please be advised that a lack of element occurrences in the FNAI database is not a sufficient indication of the absence of rare or endangered species on a site.

Federally Listed Species

Our data indicate federally listed species are present on or very near this site, specifically beautiful pawpaw (*Deeringothamnus pulchellus*) (see enclosed map and tables for details). This statement should not be interpreted as a legal determination of presence or absence of federally listed species on a property.

The element occurrences data layer includes occurrences of rare species and natural communities. The map legend indicates that some element occurrences occur in the general vicinity of the label point. This may be due to lack of precision of the source data, or an element that occurs over an extended area (such as a wide ranging species or large natural community). For animals and plants, element occurrences generally refer to more than a casual sighting; they usually indicate a viable population of the species. Note that some element occurrences represent historically documented observations which may no longer be extant. Extirpated element occurrences will be marked with an 'X' following the occurrence label on the enclosed map.

*Several of the species and natural communities tracked by the Inventory are considered **data sensitive**. Occurrence records for these elements contain information that we consider sensitive due to collection*

Florida Resources
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Analysis Center

Institute of Science
and Public Affairs

The Florida State University

pressures, extreme rarity, or at the request of the source of the information. The Element Occurrence Record has been labeled "Data Sensitive." We request that you not publish or release specific locational data about these species or communities without consent from the Inventory. If you have any questions concerning this please do not hesitate to call.

Likely and Potential Rare Species

In addition to documented occurrences, other rare species and natural communities may be identified on or near the site based on habitat models and species range models (see enclosed Biodiversity Matrix Report). These species should be taken into consideration in field surveys, land management, and impact avoidance and mitigation.

FNAI habitat models indicate areas, which based on land cover type, offer suitable habitat for one or more rare species that is known to occur in the vicinity. Habitat models have been developed for approximately 300 of the rarest species tracked by the Inventory, including all federally listed species.

FNAI species range models indicate areas that are within the known or predicted range of a species, based on climate variables, soils, vegetation, and/or slope. Species range models have been developed for approximately 340 species, including all federally listed species.

The FNAI Biodiversity Matrix Geodatabase compiles Documented, Likely, and Potential species and natural communities for each square mile Matrix Unit statewide.

CLIP

The enclosed map shows natural resource conservation priorities based on the Critical Lands and Waters Identification Project. CLIP is based on many of the same natural resource data developed for the Florida Forever Conservation Needs Assessment, but provides an overall picture of conservation priorities across different resource categories, including biodiversity, landscapes, surface waters, and aggregated CLIP priorities (that combine the individual resource categories). CLIP is also based primarily on remote sensed data and is not intended to be the definitive authority on natural resources on a site.

For more information on CLIP, visit https://www.fnai.org/services/clip.

Florida Scrub-jay Survey – U.S. Fish and Wildlife Service

This survey was conducted by staff and associates of the Archbold Biological Station from 1992 to 1996. An attempt was made to record all scrub-jay (*Aphelocoma coerulescens*) groups, although most federal lands were not officially surveyed. Each map point represents one or more groups.

This data layer indicates that there are potential scrub-jay populations on or very near your site. For additional information:

Fitzpatrick, J.W., B. Pranty, and B. Stith, 1994, Florida scrub jay statewide map, 1992-1993. U. S. Fish and Wildlife Service Report, Cooperative Agreement no. 14-16-004-91-950.

Managed Areas

Portions of the site appear to be located:

- Adjacent to the Yucca Pens Unit, managed by the FL Fish and Wildlife Conservation Commission.
- Adjacent to Burnt Store Acres Conservation Easement managed by South Florida Water Management District.
- Adjacent to the Charlotte Harbor Buffer Preserve, managed by Lee County.
- Adjacent to Yucca Pens Preserve, managed by Lee County.
- Adjacent to Charlotte Harbor Preserve State Park, managed by FL Dept. of Environmental Protection, Div. of Recreation and Parks.

The Managed Areas data layer shows public and privately managed conservation lands throughout the state. Federal, state, local, and privately managed conservation lands are included.

Land Acquisition Projects

This site appears to be located near the Charlotte Harbor Flatwoods Florida Forever BOT Project and near the Charlotte Harbor Estuary Florida Forever BOT, which are parts of the State of Florida's Conservation and Recreation Lands land acquisition program. For more information on these Florida Forever Project, contact the Florida Department of Environmental Protection, Division of State Lands.

Florida Forever Board of Trustees (BOT) projects are proposed and acquired through the Florida Department of Environmental Protection, Division of State Lands. The state has no specific land management authority over these lands until they are purchased.

The Inventory always recommends that professionals familiar with Florida's flora and fauna conduct a site-specific survey to determine the current presence or absence of rare, threatened, or endangered species.

Please visit www.fnai.org/species-communities/tracking-main for county or statewide element occurrence distributions and links to more element information.

The database maintained by the Florida Natural Areas Inventory is the single most comprehensive source of information available on the locations of rare species and other significant ecological resources. However, the data are not always based on comprehensive or site-specific field surveys. Therefore this information should not be regarded as a final statement on the biological resources of the site being considered, nor should it be substituted for on-site surveys. Inventory data are designed for the purposes of conservation planning and scientific research, and are not intended for use as the primary criteria for regulatory decisions.

Information provided by this database may not be published without prior written notification to the Florida Natural Areas Inventory, and the Inventory must be credited as an information source in these publications. **The maps contain sensitive environmental information, please do not distribute or publish without prior consent from FNAI.** FNAI data may not be resold for profit.

Thank you for your use of FNAI services. An invoice will be mailed separately. If I can be of further assistance, please contact me at (850) 224-8207 or at kbrinegar@fnai.fsu.edu.

Sincerely,

Kerri Brinegar

Kerri Brinegar
GIS / Data Services

Encl

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FLORIDA Natural Areas INVENTORY

PD&E Study for Burnt Store Road

Site boundaries are approximate.

Charlotte County

Element Occurrences
- Animals
- Plants
- Communities
- Other
- Data Sensitive

Point Indicates General Vicinity of Element

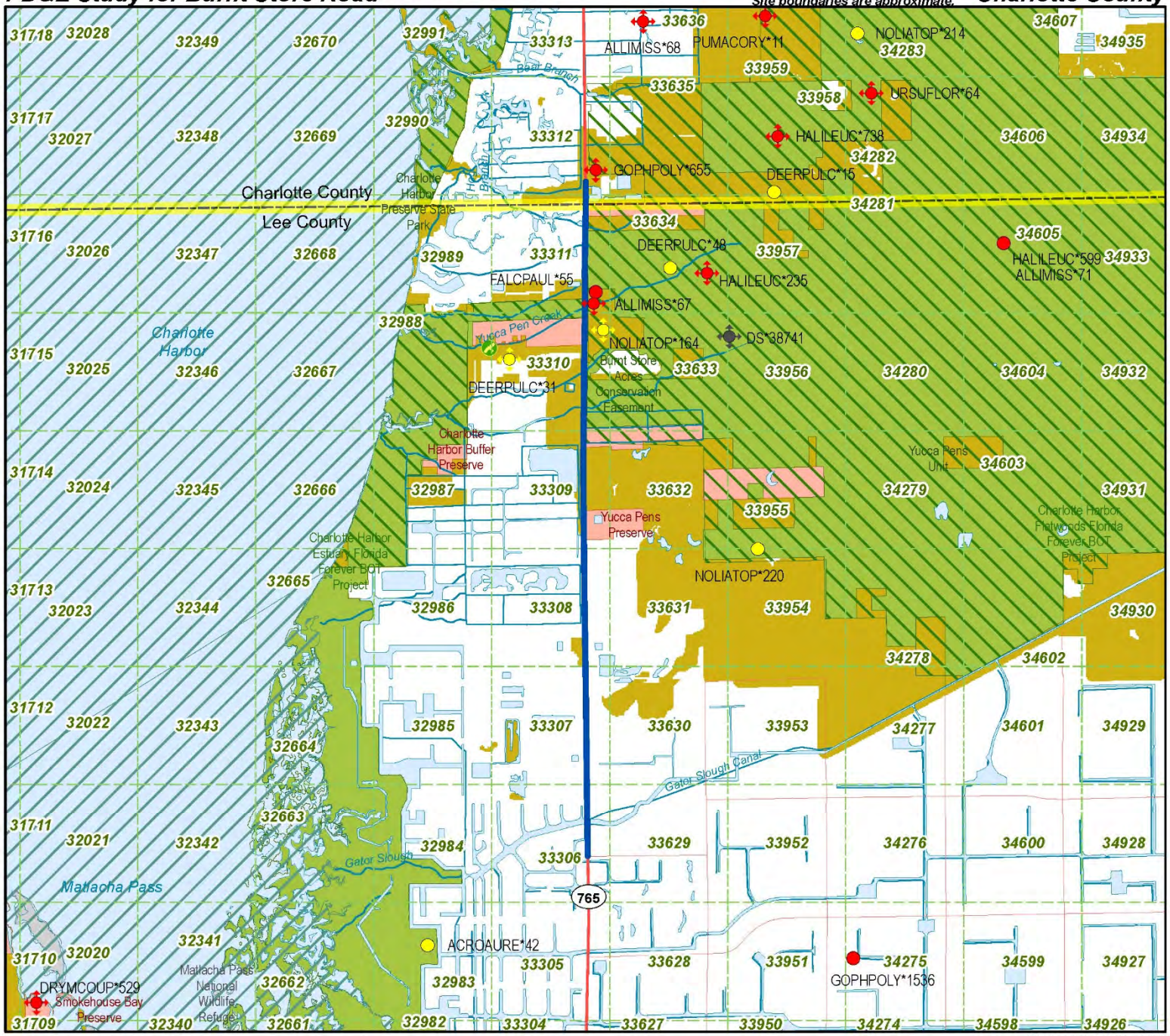
U.S. Fish & Wildlife Service Scrub Jay Survey 1992-96

Conservation Lands
- Federal
- State
- Local
- Private
- State Aquatic Preserves

Land Acquisition Projects
- Florida Forever Board of Trustees Projects

- FNAI Rare Species Habitat
- FNAI Biodiversity Matrix Square Mile Units
- County Boundary
- Roads
- Water

N



0 0.75 1.5 3 Miles

NOTE
This map contains environmentally sensitive information. Please do not distribute or publish without prior consent from FNAI. Map should not be interpreted without accompanying documents.

Map produced by KAB
12/9/2021

PD&E Study for Burnt Store Road

Site boundaries are approximate.

Charlotte County

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FLORIDA Natural Areas INVENTORY

CLIP v4.0 Resource Priorities

Biodiversity Resource Category
- Priority 1 - highest
- Priority 2
- Priority 3
- Priority 4
- Priority 5

Landscape Resource Category
- Priority 1 - highest
- Priority 2
- Priority 3
- Priority 4
- Priority 5

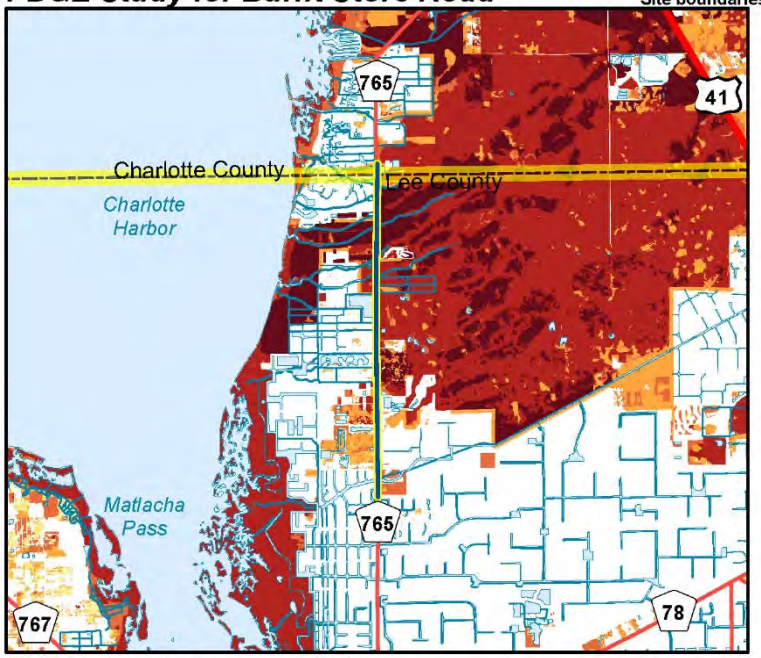
Surface Water Resource Category
- Priority 1 - highest
- Priority 2
- Priority 3
- Priority 4
- Priority 5

Aggregated CLIP Priorities
- Priority 1 - highest
- Priority 2
- Priority 3
- Priority 4
- Priority 5

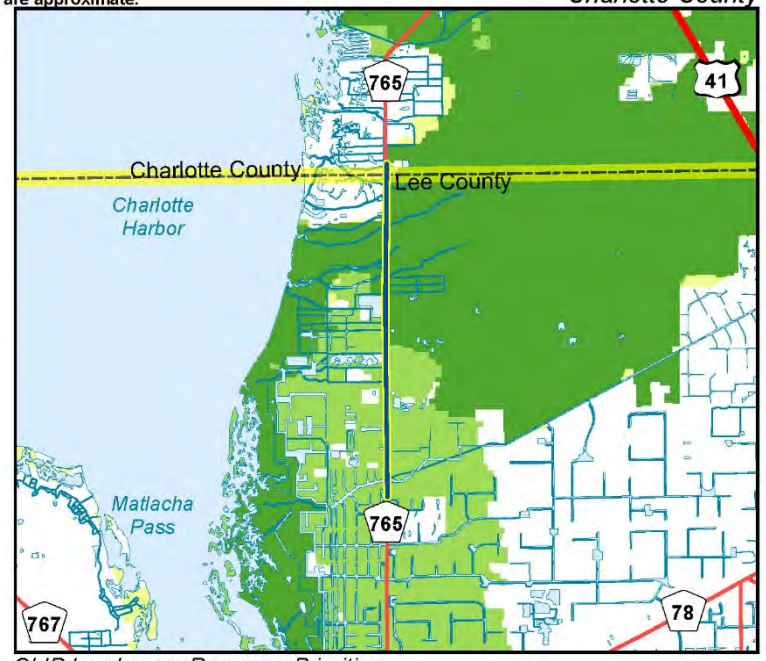
Site Boundary

Map should not be interpreted without accompanying documents.

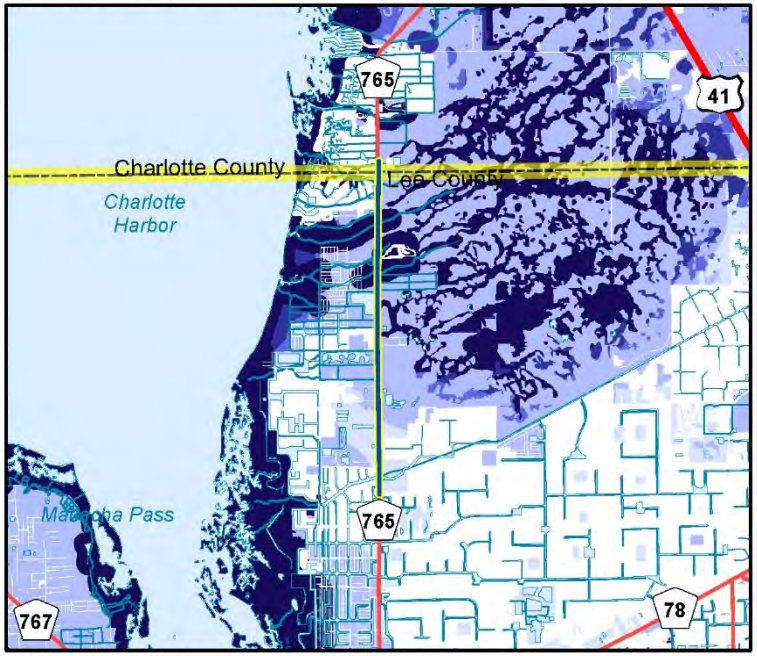
Critical Lands and Waters Identification Project (CLIP) is a cooperative effort between the FSU Florida Natural Areas Inventory, UF Center for Landscape Conservation Planning, and FL Fish & Wildlife Conservation Commission, with additional funding from FL Dept of Environmental Protection and US Fish & Wildlife Service.



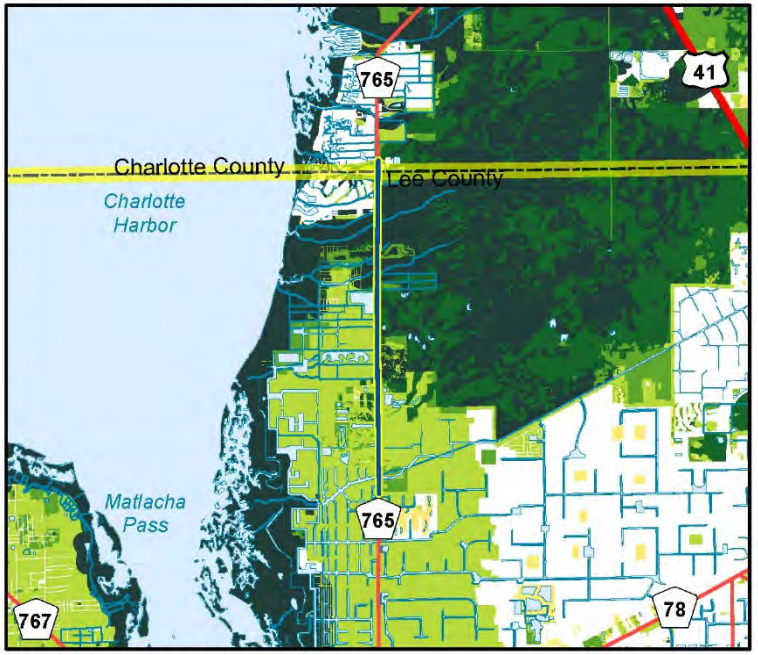
CLIP Biodiversity Resource Priorities



CLIP Landscape Resource Priorities



CLIP Surface Water Resource Priorities



CLIP Aggregated Resource Priorities

0 2.5 5 10 Miles

Map produced by KAB
12/9/2021

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FLORIDA Natural Areas INVENTORY

FNAI ELEMENT OCCURRENCE REPORT on or near

PD&E Study for Burnt Store Road

Map Label	Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Listing	Observation Date	Description	EO Comments
ALLIMISS*67	*Alligator mississippiensis*	American Alligator	G5	S4	SAT	FT(S/A)	1991	STREAM.	DATA UNAVAILABLE.
DEERPULC*31	*Deeringothamnus pulchellus*	beautiful pawpaw	G1	S1	E	E	2021-03-27	Summary: Disked fire breaks and mesic slash pine flatwoods with scrub dominated by saw palmetto and grassy patches dominated by herbs and graminoids. Area mapped as Immokalee fine sand in 1984 Soil Survey of Lee County.	Large extensive population observed over multiple years from 1989 to 2021; several hundred to >1000 plants over 40-50 acres; all vegetative except were recently burned; 2019: 25 total individuals mapped; tissue collected for DNA research.
DEERPULC*48	*Deeringothamnus pulchellus*	beautiful pawpaw	G1	S1	E	E	2017-05-16	Mesic flatwoods; light disturbance from fire exclusion.	Total of 93 plants obsevered in three clusters (F17FNA39FLUS).
DS*38741	*Data Sensitive Element*	Data Sensitive	G2	S2	N	N	2013-10-30	Data Sensitive	Data Sensitive
FALCPAUL*55	*Falco sparverius paulus*	Southeastern American Kestrel	G5T4	S3	N	ST	1991	1991: slash pine flatwoods (U91BEE01FLUS).	1991: individual(s) observed foraging (U91BEE01FLUS).
GOPHPOLY*655	*Gopherus polyphemus*	Gopher Tortoise	G3	S3	C	ST	2016-08-03	NO DATA.	Several burrows seen on disturbed flatwoods near Burnt Store Road
HALILEUC*235	*Haliaeetus leucocephalus*	Bald Eagle	G5	S3	N	N	2003	No general description given	Nest status 1995-2003: Continuously active. (U03FWC01FLUS). Previous data (note different format) ACTIVE NEST; 2 YOUNG IN 1981; UNKNOWN IN 1980.
NOLIATOP*164	*Nolina atopocarpa*	Florida beargrass	G3	S3	N	T	2017-05-15	Mesic flatwoods	Several plants observed in 1991 (U91PAL07FLUS). In 2017, 9 plants observed (F17FNA19FLUS)

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Florida Natural Areas Inventory

Biodiversity Matrix Report

Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Listing
Matrix Unit ID: 33306					
Likely					
Mesic flatwoods		G4	S4	N	N
Mycteria americana	Wood Stork	G4	S2	T	FT
Potential					
Acipenser oxyrinchus desotoi	Gulf Sturgeon	G3T2T3	S2?	T	FT
Ardea herodias occidentalis	Great White Heron	G5T2	S2	N	N
Athene cunicularia floridana	Florida Burrowing Owl	G4T3	S3	N	ST
Calopogon multiflorus	many-flowered grass-pink	G2G3	S2S3	N	T
Centrosema arenicola	sand butterfly pea	G2Q	S2	N	E
Deeringothamnus pulchellus	beautiful pawpaw	G1	S1	E	E
Drymarchon couperi	Eastern Indigo Snake	G3	S2?	T	FT
Elytraria caroliniensis var. angustifolia	narrow-leaved Carolina scalystem	G4T2	S2	N	N
Eumops floridanus	Florida bonneted bat	G1	S1	E	FE
Gopherus polyphemus	Gopher Tortoise	G3	S3	C	ST
Lechea cernua	nodding pinweed	G3	S3	N	T
Linum carteri var. smallii	Small's flax	G2T2	S2	N	E
Nemastylis floridana	celestial lily	G2	S2	N	E
Nolina atopocarpa	Florida beargrass	G3	S3	N	T
Rallus longirostris scottii	Florida Clapper Rail	G5T3?	S3?	N	N
Rivulus marmoratus	Mangrove Rivulus	G4G5	S3	SC	N
Rostrhamus sociabilis	Snail Kite	G4G5	S2	E	FE
Matrix Unit ID: 33307					
Likely					
Drymarchon couperi	Eastern Indigo Snake	G3	S2?	T	FT
Mesic flatwoods		G4	S4	N	N
Mycteria americana	Wood Stork	G4	S2	T	FT
Potential					
Antigone canadensis pratensis	Florida Sandhill Crane	G5T2	S2	N	ST
Athene cunicularia floridana	Florida Burrowing Owl	G4T3	S3	N	ST
Calopogon multiflorus	many-flowered grass-pink	G2G3	S2S3	N	T
Centrosema arenicola	sand butterfly pea	G2Q	S2	N	E
Deeringothamnus pulchellus	beautiful pawpaw	G1	S1	E	E
Dryobates borealis	Red-cockaded Woodpecker	G3	S2	E, PT	FE
Elytraria caroliniensis var. angustifolia	narrow-leaved Carolina scalystem	G4T2	S2	N	N
Eumops floridanus	Florida bonneted bat	G1	S1	E	FE
Gopherus polyphemus	Gopher Tortoise	G3	S3	C	ST
Lechea cernua	nodding pinweed	G3	S3	N	T
Linum carteri var. smallii	Small's flax	G2T2	S2	N	E
Mustela frenata peninsulae	Florida Long-tailed Weasel	G5T3?	S3?	N	N
Nemastylis floridana	celestial lily	G2	S2	N	E
Nolina atopocarpa	Florida beargrass	G3	S3	N	T
Rostrhamus sociabilis	Snail Kite	G4G5	S2	E	FE
Sciurus niger niger	Southeastern Fox Squirrel	G5T5	S3	N	N
Ursus americanus floridanus	Florida Black Bear	G5T4	S4	N	N

Definitions: *Documented - Rare species and natural communities documented on or near this site.*
Documented-Historic - Rare species and natural communities documented, but not observed/reported within the last twenty years.
Likely - Rare species and natural communities likely to occur on this site based on suitable habitat and/or known occurrences in the vicinity.
Potential - This site lies within the known or predicted range of the species listed.

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Florida Natural Areas Inventory

Biodiversity Matrix Report

Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Listing
Matrix Unit ID: 33308					
Likely					
Mesic flatwoods		G4	S4	N	N
Mycteria americana	Wood Stork	G4	S2	T	FT
Potential					
Antigone canadensis pratensis	Florida Sandhill Crane	G5T2	S2	N	ST
Athene cunicularia floridana	Florida Burrowing Owl	G4T3	S3	N	ST
Calopogon multiflorus	many-flowered grass-pink	G2G3	S2S3	N	T
Centrosema arenicola	sand butterfly pea	G2Q	S2	N	E
Deeringothamnus pulchellus	beautiful pawpaw	G1	S1	E	E
Drymarchon couperi	Eastern Indigo Snake	G3	S2?	T	FT
Dryobates borealis	Red-cockaded Woodpecker	G3	S2	E, PT	FE
Elytraria caroliniensis var. angustifolia	narrow-leaved Carolina scalystem	G4T2	S2	N	N
Eumops floridanus	Florida bonneted bat	G1	S1	E	FE
Gopherus polyphemus	Gopher Tortoise	G3	S3	C	ST
Lechea cernua	nodding pinweed	G3	S3	N	T
Linum carteri var. smallii	Small's flax	G2T2	S2	N	E
Mustela frenata peninsulae	Florida Long-tailed Weasel	G5T3?	S3?	N	N
Nemastylis floridana	celestial lily	G2	S2	N	E
Nolina atopocarpa	Florida beargrass	G3	S3	N	T
Platanthera integra	yellow fringeless orchid	G3G4	S3	N	E
Rostrhamus sociabilis	Snail Kite	G4G5	S2	E	FE
Sciurus niger niger	Southeastern Fox Squirrel	G5T5	S3	N	N
Trichechus manatus	West Indian Manatee	G2G3	S2	T	FT
Ursus americanus floridanus	Florida Black Bear	G5T4	S4	N	N
Matrix Unit ID: 33309					
Likely					
Drymarchon couperi	Eastern Indigo Snake	G3	S2?	T	FT
Dryobates borealis	Red-cockaded Woodpecker	G3	S2	E, PT	FE
Mesic flatwoods		G4	S4	N	N
Mycteria americana	Wood Stork	G4	S2	T	FT
Potential					
Athene cunicularia floridana	Florida Burrowing Owl	G4T3	S3	N	ST
Calopogon multiflorus	many-flowered grass-pink	G2G3	S2S3	N	T
Centrosema arenicola	sand butterfly pea	G2Q	S2	N	E
Deeringothamnus pulchellus	beautiful pawpaw	G1	S1	E	E
Elytraria caroliniensis var. angustifolia	narrow-leaved Carolina scalystem	G4T2	S2	N	N
Eumops floridanus	Florida bonneted bat	G1	S1	E	FE
Gopherus polyphemus	Gopher Tortoise	G3	S3	C	ST
Lechea cernua	nodding pinweed	G3	S3	N	T
Linum carteri var. smallii	Small's flax	G2T2	S2	N	E
Mustela frenata peninsulae	Florida Long-tailed Weasel	G5T3?	S3?	N	N
Nemastylis floridana	celestial lily	G2	S2	N	E
Nolina atopocarpa	Florida beargrass	G3	S3	N	T

Definitions: *Documented - Rare species and natural communities documented on or near this site.*
Documented-Historic - Rare species and natural communities documented, but not observed/reported within the last twenty years.
Likely - Rare species and natural communities likely to occur on this site based on suitable habitat and/or known occurrences in the vicinity.
Potential - This site lies within the known or predicted range of the species listed.

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Florida Natural Areas Inventory

Biodiversity Matrix Report

Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Listing
Platanthera integra	yellow fringeless orchid	G3G4	S3	N	E
Rostrhamus sociabilis	Snail Kite	G4G5	S2	E	FE
Sciurus niger niger	Southeastern Fox Squirrel	G5T5	S3	N	N
Trichechus manatus	West Indian Manatee	G2G3	S2	T	FT
Ursus americanus floridanus	Florida Black Bear	G5T4	S4	N	N

Matrix Unit ID: 33310

Documented

Deeringothamnus pulchellus	beautiful pawpaw	G1	S1	E	E
Nolina atopocarpa	Florida beargrass	G3	S3	N	T

Likely

Alligator mississippiensis	American Alligator	G5	S4	SAT	FT(S/A)
Aphelocoma coerulescens	Florida Scrub-Jay	G2?	S2	T	FT
Drymarchon couperi	Eastern Indigo Snake	G3	S2?	T	FT
Dryobates borealis	Red-cockaded Woodpecker	G3	S2	E, PT	FE
Mesic flatwoods		G4	S4	N	N
Mycteria americana	Wood Stork	G4	S2	T	FT
Scrub		G2	S2	N	N

Potential

Athene cunicularia floridana	Florida Burrowing Owl	G4T3	S3	N	ST
Calopogon multiflorus	many-flowered grass-pink	G2G3	S2S3	N	T
Centrosema arenicola	sand butterfly pea	G2Q	S2	N	E
Chamaesyce cumulicola	sand-dune spurge	G2	S2	N	E
Elytraria caroliniensis var. angustifolia	narrow-leaved Carolina scalystem	G4T2	S2	N	N
Eumops floridanus	Florida bonneted bat	G1	S1	E	FE
Gopherus polyphemus	Gopher Tortoise	G3	S3	C	ST
Lechea cernua	nodding pinweed	G3	S3	N	T
Lechea divaricata	pine pinweed	G2	S2	N	E
Linum carteri var. smallii	Small's flax	G2T2	S2	N	E
Mustela frenata peninsulae	Florida Long-tailed Weasel	G5T3?	S3?	N	N
Nemastylis floridana	celestial lily	G2	S2	N	E
Platanthera integra	yellow fringeless orchid	G3G4	S3	N	E
Rostrhamus sociabilis	Snail Kite	G4G5	S2	E	FE
Schizachyrium niveum	scrub bluestem	G1G2	S1S2	N	E
Sciurus niger niger	Southeastern Fox Squirrel	G5T5	S3	N	N
Ursus americanus floridanus	Florida Black Bear	G5T4	S4	N	N

Matrix Unit ID: 33311

Documented

Deeringothamnus pulchellus	beautiful pawpaw	G1	S1	E	E
Falco sparverius paulus	Southeastern American Kestrel	G5T4	S3	N	ST
Gopherus polyphemus	Gopher Tortoise	G3	S3	C	ST
Nolina atopocarpa	Florida beargrass	G3	S3	N	T

Likely

Alligator mississippiensis	American Alligator	G5	S4	SAT	FT(S/A)

Definitions: *Documented - Rare species and natural communities documented on or near this site.*
Documented-Historic - Rare species and natural communities documented, but not observed/reported within the last twenty years.
Likely - Rare species and natural communities likely to occur on this site based on suitable habitat and/or known occurrences in the vicinity.
Potential - This site lies within the known or predicted range of the species listed.

1018 Thomasville Road
Suite 200-C
Tallahassee, FL 32303
(850) 224-8207
(850) 681-9364 Fax
www.fnai.org

Florida Natural Areas Inventory

Biodiversity Matrix Report

Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Listing
Aphelocoma coerulescens	Florida Scrub-Jay	G2?	S2	T	FT
Drymarchon couperi	Eastern Indigo Snake	G3	S2?	T	FT
Dryobates borealis	Red-cockaded Woodpecker	G3	S2	E, PT	FE
Mesic flatwoods		G4	S4	N	N
Mycteria americana	Wood Stork	G4	S2	T	FT
Potential					
Antigone canadensis pratensis	Florida Sandhill Crane	G5T2	S2	N	ST
Ardea herodias occidentalis	Great White Heron	G5T2	S2	N	N
Athene cunicularia floridana	Florida Burrowing Owl	G4T3	S3	N	ST
Calopogon multiflorus	many-flowered grass-pink	G2G3	S2S3	N	T
Centrosema arenicola	sand butterfly pea	G2Q	S2	N	E
Chamaesyce cumulicola	sand-dune spurge	G2	S2	N	E
Elytraria caroliniensis var. angustifolia	narrow-leaved Carolina scalystem	G4T2	S2	N	N
Eumops floridanus	Florida bonneted bat	G1	S1	E	FE
Lechea cernua	nodding pinweed	G3	S3	N	T
Lechea divaricata	pine pinweed	G2	S2	N	E
Linum carteri var. smallii	Small's flax	G2T2	S2	N	E
Mustela frenata peninsulae	Florida Long-tailed Weasel	G5T3?	S3?	N	N
Nemastylis floridana	celestial lily	G2	S2	N	E
Platanthera integra	yellow fringeless orchid	G3G4	S3	N	E
Rallus longirostris scottii	Florida Clapper Rail	G5T3?	S3?	N	N
Rostrhamus sociabilis	Snail Kite	G4G5	S2	E	FE
Schizachyrium niveum	scrub bluestem	G1G2	S1S2	N	E
Sciurus niger niger	Southeastern Fox Squirrel	G5T5	S3	N	N
Setophaga discolor paludicola	Florida Prairie Warbler	G5T3	S3	N	N
Ursus americanus floridanus	Florida Black Bear	G5T4	S4	N	N
Matrix Unit ID: 33312					
Documented					
Gopherus polyphemus	Gopher Tortoise	G3	S3	C	ST
Likely					
Drymarchon couperi	Eastern Indigo Snake	G3	S2?	T	FT
Dryobates borealis	Red-cockaded Woodpecker	G3	S2	E, PT	FE
Mesic flatwoods		G4	S4	N	N
Mycteria americana	Wood Stork	G4	S2	T	FT
Potential					
Antigone canadensis pratensis	Florida Sandhill Crane	G5T2	S2	N	ST
Ardea herodias occidentalis	Great White Heron	G5T2	S2	N	N
Athene cunicularia floridana	Florida Burrowing Owl	G4T3	S3	N	ST
Calopogon multiflorus	many-flowered grass-pink	G2G3	S2S3	N	T
Centrosema arenicola	sand butterfly pea	G2Q	S2	N	E
Deeringothamnus pulchellus	beautiful pawpaw	G1	S1	E	E
Elytraria caroliniensis var. angustifolia	narrow-leaved Carolina scalystem	G4T2	S2	N	N
Eretmochelys imbricata	Hawksbill Sea Turtle	G3	S1	E	FE
Eumops floridanus	Florida bonneted bat	G1	S1	E	FE
Lechea cernua	nodding pinweed	G3	S3	N	T

Definitions: *Documented - Rare species and natural communities documented on or near this site.*
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Florida Natural Areas Inventory

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Linum carteri var. smallii	Small's flax	G2T2	S2	N	E
Mustela frenata peninsulae	Florida Long-tailed Weasel	G5T3?	S3?	N	N
Nemastylis floridana	celestial lily	G2	S2	N	E
Nolina atopocarpa	Florida beargrass	G3	S3	N	T
Platanthera integra	yellow fringeless orchid	G3G4	S3	N	E
Podomys floridanus	Florida Mouse	G3	S3	N	N
Rallus longirostris scottii	Florida Clapper Rail	G5T3?	S3?	N	N
Rostrhamus sociabilis	Snail Kite	G4G5	S2	E	FE
Sciurus niger niger	Southeastern Fox Squirrel	G5T5	S3	N	N
Setophaga discolor paludicola	Florida Prairie Warbler	G5T3	S3	N	N
Ursus americanus floridanus	Florida Black Bear	G5T4	S4	N	N

Definitions: *Documented - Rare species and natural communities documented on or near this site.*
Documented-Historic - Rare species and natural communities documented, but not observed/reported within the last twenty years.
Likely - Rare species and natural communities likely to occur on this site based on suitable habitat and/or known occurrences in the vicinity.
Potential - This site lies within the known or predicted range of the species listed.

Elements and Element Occurrences

An **element** is any exemplary or rare component of the natural environment, such as a species, natural community, bird rookery, spring, sinkhole, cave, or other ecological feature.

An **element occurrence (EO)** is an area of land and/or water in which a species or natural community is, or was, present. An EO should have practical conservation value for the Element as evidenced by potential continued (or historical) presence and/or regular recurrence at a given location.

Element Ranking and Legal Status

Using a ranking system developed by NatureServe and the Natural Heritage Program Network, the Florida Natural Areas Inventory assigns two ranks for each element. The global rank is based on an element's worldwide status; the state rank is based on the status of the element in Florida. Element ranks are based on many factors, the most important ones being estimated number of Element Occurrences (EOs), estimated abundance (number of individuals for species; area for natural communities), geographic range, estimated number of adequately protected EOs, relative threat of destruction, and ecological fragility.

FNAI GLOBAL ELEMENT RANK

G1 = Critically imperiled globally because of extreme rarity (5 or fewer occurrences or less than 1000 individuals) or because of extreme vulnerability to extinction due to some natural or man-made factor.
G2 = Imperiled globally because of rarity (6 to 20 occurrences or less than 3000 individuals) or because of vulnerability to extinction due to some natural or man-made factor.
G3 = Either very rare and local throughout its range (21-100 occurrences or less than 10,000 individuals) or found locally in a restricted range or vulnerable to extinction from other factors.
G4 = Apparently secure globally (may be rare in parts of range).
G5 = Demonstrably secure globally.
GH = Of historical occurrence throughout its range, may be rediscovered (e.g., ivory-billed woodpecker).
GX = Believed to be extinct throughout range.
GXC = Extirpated from the wild but still known from captivity or cultivation.
G#? = Tentative rank (e.g., G2?).
G#G# = Range of rank; insufficient data to assign specific global rank (e.g., G2G3).
G#T# = Rank of a taxonomic subgroup such as a subspecies or variety; the G portion of the rank refers to the entire species and the T portion refers to the specific subgroup; numbers have same definition as above (e.g., G3T1).
G#Q = Rank of questionable species - ranked as species but questionable whether it is species or subspecies; numbers have same definition as above (e.g., G2Q).
G#T#Q = Same as above, but validity as subspecies or variety is questioned.
GU = Unrankable; due to a lack of information no rank or range can be assigned (e.g., GUT2).
GNA = Ranking is not applicable because the element is not a suitable target for conservation (e.g. a hybrid species).
GNR = Element not yet ranked (temporary).
GNRTNR = Neither the element nor the taxonomic subgroup has yet been ranked.

FNAI STATE ELEMENT RANK

S1 = Critically imperiled in Florida because of extreme rarity (5 or fewer occurrences or less than 1000 individuals) or because of extreme vulnerability to extinction due to some natural or man-made factor.
S2 = Imperiled in Florida because of rarity (6 to 20 occurrences or less than 3000 individuals) or because of vulnerability to extinction due to some natural or man-made factor.
S3 = Either very rare and local in Florida (21-100 occurrences or less than 10,000 individuals) or found locally in a restricted range or vulnerable to extinction from other factors.
S4 = Apparently secure in Florida (may be rare in parts of range).
S5 = Demonstrably secure in Florida.
SH = Of historical occurrence in Florida, possibly extirpated, but may be rediscovered (e.g., ivory-billed woodpecker).
SX = Believed to be extirpated throughout Florida.
SU = Unrankable; due to a lack of information no rank or range can be assigned.
SNA = State ranking is not applicable because the element is not a suitable target for conservation (e.g. a hybrid species).
SNR = Element not yet ranked (temporary).

FEDERAL LEGAL STATUS

Legal status information provided by FNAI for information only. For official definitions and lists of protected species, consult the relevant federal agency.

Definitions derived from U.S. Endangered Species Act of 1973, Sec. 3. Note that the federal status given by FNAI refers only to Florida populations and that federal status may differ elsewhere.

C = Candidate species for which federal listing agencies have sufficient information on biological vulnerability and threats to support proposing to list the species as Endangered or Threatened.
E = Endangered: species in danger of extinction throughout all or a significant portion of its range.
E, T = Species currently listed endangered in a portion of its range but only listed as threatened in other areas
E, PDL = Species currently listed endangered but has been proposed for delisting.
E, PT = Species currently listed endangered but has been proposed for listing as threatened.
E, XN = Species currently listed endangered but tracked population is a non-essential experimental population.
T = Threatened: species likely to become Endangered within the foreseeable future throughout all or a significant portion of its range.
PE = Species proposed for listing as endangered
PS = Partial status: some but not all of the species' infraspecific taxa have federal
PT = Species proposed for listing as threatened
SAT = Treated as threatened due to similarity of appearance to a species which is federally listed such that enforcement personnel have difficulty in attempting to differentiate between the listed and unlisted species.
SC = Not currently listed, but considered a "species of concern" to USFWS.

STATE LEGAL STATUS

Provided by FNAI for information only. For official definitions and lists of protected species, consult the relevant state agency.

Animals: Definitions derived from "Florida's Endangered Species and Species of Special Concern, Official Lists" published by Florida Fish and Wildlife Conservation Commission, 1 August 1997, and subsequent updates.

C = Candidate for listing at the Federal level by the U. S. Fish and Wildlife Service
FE = Listed as Endangered Species at the Federal level by the U. S. Fish and Wildlife Service
FT = Listed as Threatened Species at the Federal level by the U. S. Fish and Wildlife Service
FXN = Federal listed as an experimental population in Florida
FT(S/A) = Federal Threatened due to similarity of appearance
ST = State population listed as Threatened by the FFWCC. Defined as a species, subspecies, or isolated population which is acutely vulnerable to environmental alteration, declining in number at a rapid rate, or whose range or habitat is decreasing in area at a rapid rate and as a consequence is destined or very likely to become an endangered species within the foreseeable future.
SSC = Listed as Species of Special Concern by the FFWCC. Defined as a population which warrants special protection, recognition, or consideration because it has an inherent significant vulnerability to habitat modification, environmental alteration, human disturbance, or substantial human exploitation which, in the foreseeable future, may result in its becoming a threatened species. (SSC* for Pandion haliaetus (Osprey) indicates that this status applies in Monroe county only.)
N = Not currently listed, nor currently being considered for listing.

Plants: Definitions derived from Sections 581.011 and 581.185(2), Florida Statutes, and the Preservation of Native Flora of Florida Act, 5B-40.001. FNAI does not track all state-regulated plant species; for a complete list of state-regulated plant species, call Florida Division of Plant Industry, 352-372-3505 or see: http://www.doacs.state.fl.us/pi/.

E = Endangered: species of plants native to Florida that are in imminent danger of extinction within the state, the survival of which is unlikely if the causes of a decline in the number of plants continue; includes all species determined to be endangered or threatened pursuant to the U.S. Endangered Species Act.
T = Threatened: species native to the state that are in rapid decline in the number of plants within the state, but which have not so decreased in number as to cause them to be Endangered.
N = Not currently listed, nor currently being considered for listing.

Element Occurrence Ranking

FNAI ranks of quality of the element occurrence in terms of its viability (EORANK). Viability is estimated using a combination of factors that contribute to continued survival of the element at the location. Among these are the size of the EO, general condition of the EO at the site, and the conditions of the landscape surrounding the EO (e.g. an immediate threat to an EO by local development pressure could lower an EO rank).

A = Excellent estimated viability
A? = Possibly excellent estimated viability
AB = Excellent or good estimated viability
AC = Excellent, good, or fair estimated viability
B = Good estimated viability
B? = Possibly good estimated viability
BC = Good or fair estimated viability
BD = Good, fair, or poor estimated viability
C = Fair estimated viability
C? = Possibly fair estimated viability
CD = Fair or poor estimated viability
D = Poor estimated viability
D? = Possibly poor estimated viability
E = Verified extant (viability not assessed)
F = Failed to find
H = Historical
NR = Not ranked, a placeholder when an EO is not (yet) ranked.
U = Unrankable
X = Extirpated

*For additional detail on the above ranks see: http://www.natureserve.org/explorer/eorankguide.htm

FNAI also uses the following EO ranks:

H? = Possibly historical
F? = Possibly failed to find
X? = Possibly extirpated

The following offers further explanation of the H and X ranks as they are used by FNAI:

The rank of H is used when there is a lack of recent field information verifying the continued existence of an EO, such as (a) when an EO is based only on historical collections data; or (b) when an EO was ranked A, B, C, D, or E at one time and is later, without field survey work, considered to be possibly extirpated due to general habitat loss or degradation of the environment in the area. This definition of the H rank is dependent on an interpretation of what constitutes "recent" field information. Generally, if there is no known survey of an EO within the last 20 to 40 years, it should be assigned an H rank. While these time frames represent suggested maximum limits, the actual time period for historical EOs may vary according to the biology of the element and the specific landscape context of each occurrence (including anthropogenic alteration of the environment). Thus, an H rank may be assigned to an EO before the maximum time frames have lapsed. Occurrences that have not been surveyed for periods exceeding these time frames should not be ranked A, B, C, or D. The higher maximum limit for plants and communities (i.e., ranging from 20 to 40 years) is based upon the assumption that occurrences of these elements generally have the potential to persist at a given location for longer periods of time. This greater potential is a reflection of plant biology and community dynamics. However, landscape factors must also be considered. Thus, areas with more anthropogenic impacts on the environment (e.g., development) will be at the lower end of the range, and less-impacted areas will be at the higher end.

The rank of X is assigned to EOs for which there is documented destruction of habitat or environment, or persuasive evidence of eradication based on adequate survey (i.e., thorough or repeated survey efforts by one or more experienced observers at times and under conditions appropriate for the Element at that location).

Appendix G

Sea Turtle and Smalltooth Sawfish Construction Conditions

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southeast Regional Office
263 13th Avenue South
St. Petersburg, FL 33701

SEA TURTLE AND SMALLTOOTH SAWFISH CONSTRUCTION CONDITIONS

The permittee shall comply with the following protected species construction conditions:

a. The permittee shall instruct all personnel associated with the project of the potential presence of these species and the need to avoid collisions with sea turtles and smalltooth sawfish. All construction personnel are responsible for observing water-related activities for the presence of these species.

b. The permittee shall advise all construction personnel that there are civil and criminal penalties for harming, harassing, or killing sea turtles or smalltooth sawfish, which are protected under the Endangered Species Act of 1973.

c. Siltation barriers shall be made of material in which a sea turtle or smalltooth sawfish cannot become entangled, be properly secured, and be regularly monitored to avoid protected species entrapment. Barriers may not block sea turtle or smalltooth sawfish entry to or exit from designated critical habitat without prior agreement from the National Marine Fisheries Service's Protected Resources Division, St. Petersburg, Florida.

d. All vessels associated with the construction project shall operate at "no wake/idle" speeds at all times while in the construction area and while in water depths where the draft of the vessel provides less than a four-foot clearance from the bottom. All vessels will preferentially follow deep-water routes (e.g., marked channels) whenever possible.

e. If a sea turtle or smalltooth sawfish is seen within 100 yards of the active daily construction/dredging operation or vessel movement, all appropriate precautions shall be implemented to ensure its protection. These precautions shall include cessation of operation of any moving equipment closer than 50 feet of a sea turtle or smalltooth sawfish. Operation of any mechanical construction equipment shall cease immediately if a sea turtle or smalltooth sawfish is seen within a 50-ft radius of the equipment. Activities may not resume until the protected species has departed the project area of its own volition.

f. Any collision with and/or injury to a sea turtle or smalltooth sawfish shall be reported immediately to the National Marine Fisheries Service's Protected Resources Division (727-824-5312) and the local authorized sea turtle stranding/rescue organization.

g. Any special construction conditions, required of your specific project, outside these general conditions, if applicable, will be addressed in the primary consultation.

Revised: March 23, 2006
O:\forms\Sea Turtle and Smalltooth Sawfish Construction Conditions.doc

Appendix H

Standard Protection Measures for the Eastern Indigo Snake

STANDARD PROTECTION MEASURES FOR THE EASTERN INDIGO SNAKE
U.S. Fish and Wildlife Service
August 12, 2013

The eastern indigo snake protection/education plan (Plan) below has been developed by the U.S. Fish and Wildlife Service (USFWS) in Florida for use by applicants and their construction personnel. At least **30 days prior** to any clearing/land alteration activities, the applicant shall notify the appropriate USFWS Field Office via e-mail that the Plan will be implemented as described below (North Florida Field Office: jaxregs@fws.gov; South Florida Field Office: verobeach@fws.gov; Panama City Field Office: panamacity@fws.gov). As long as the signatory of the e-mail certifies compliance with the below Plan (including use of the attached poster and brochure), no further written confirmation or "approval" from the USFWS is needed and the applicant may move forward with the project.

If the applicant decides to use an eastern indigo snake protection/education plan other than the approved Plan below, written confirmation or "approval" from the USFWS that the plan is adequate must be obtained. At least 30 days prior to any clearing/land alteration activities, the applicant shall submit their unique plan for review and approval. The USFWS will respond via e-mail, typically within 30 days of receiving the plan, either concurring that the plan is adequate or requesting additional information. A concurrence e-mail from the appropriate USFWS Field Office will fulfill approval requirements.

The Plan materials should consist of: 1) a combination of posters and pamphlets (see **Poster Information** section below); and 2) verbal educational instructions to construction personnel by supervisory or management personnel before any clearing/land alteration activities are initiated (see **Pre-Construction Activities** and **During Construction Activities** sections below).

POSTER INFORMATION

Posters with the following information shall be placed at strategic locations on the construction site and along any proposed access roads (a final poster for Plan compliance, to be printed on 11" x 17" or larger paper and laminated, is attached):

DESCRIPTION: The eastern indigo snake is one of the largest non-venomous snakes in North America, with individuals often reaching up to 8 feet in length. They derive their name from the glossy, blue-black color of their scales above and uniformly slate blue below. Frequently, they have orange to coral reddish coloration in the throat area, yet some specimens have been reported to only have cream coloration on the throat. These snakes are not typically aggressive and will attempt to crawl away when disturbed. Though indigo snakes rarely bite, they should NOT be handled.

SIMILAR SNAKES: The black racer is the only other solid black snake resembling the eastern indigo snake. However, black racers have a white or cream chin, thinner bodies, and WILL BITE if handled.

LIFE HISTORY: The eastern indigo snake occurs in a wide variety of terrestrial habitat types throughout Florida. Although they have a preference for uplands, they also utilize some wetlands

and agricultural areas. Eastern indigo snakes will often seek shelter inside gopher tortoise burrows and other below- and above-ground refugia, such as other animal burrows, stumps, roots, and debris piles. Females may lay from 4 - 12 white eggs as early as April through June, with young hatching in late July through October.

PROTECTION UNDER FEDERAL AND STATE LAW: The eastern indigo snake is classified as a Threatened species by both the USFWS and the Florida Fish and Wildlife Conservation Commission. "Taking" of eastern indigo snakes is prohibited by the Endangered Species Act without a permit. "Take" is defined by the USFWS as an attempt to kill, harm, harass, pursue, hunt, shoot, wound, trap, capture, collect, or engage in any such conduct. Penalties include a maximum fine of $25,000 for civil violations and up to $50,000 and/or imprisonment for criminal offenses, if convicted.

Only individuals currently authorized through an issued Incidental Take Statement in association with a USFWS Biological Opinion, or by a Section 10(a)(1)(A) permit issued by the USFWS, to handle an eastern indigo snake are allowed to do so.

IF YOU SEE A <u>LIVE</u> EASTERN INDIGO SNAKE ON THE SITE:

- Cease clearing activities and allow the live eastern indigo snake sufficient time to move away from the site without interference;
- Personnel must NOT attempt to touch or handle snake due to protected status.
- Take photographs of the snake, if possible, for identification and documentation purposes.
- Immediately notify supervisor or the applicant's designated agent, **and** the appropriate USFWS office, with the location information and condition of the snake.
- If the snake is located in a vicinity where continuation of the clearing or construction activities will cause harm to the snake, the activities must halt until such time that a representative of the USFWS returns the call (within one day) with further guidance as to when activities may resume.

IF YOU SEE A <u>DEAD</u> EASTERN INDIGO SNAKE ON THE SITE:

- Cease clearing activities and immediately notify supervisor or the applicant's designated agent, **and** the appropriate USFWS office, with the location information and condition of the snake.
- Take photographs of the snake, if possible, for identification and documentation purposes.
- Thoroughly soak the dead snake in water and then freeze the specimen. The appropriate wildlife agency will retrieve the dead snake.

Telephone numbers of USFWS Florida Field Offices to be contacted if a live or dead eastern indigo snake is encountered:

North Florida Field Office – (904) 731-3336
Panama City Field Office – (850) 769-0552
South Florida Field Office – (772) 562-3909

PRE-CONSTRUCTION ACTIVITIES

1. The applicant or designated agent will post educational posters in the construction office and throughout the construction site, including any access roads. The posters must be clearly visible to all construction staff. A sample poster is attached.

2. Prior to the onset of construction activities, the applicant/designated agent will conduct a meeting with all construction staff (annually for multi-year projects) to discuss identification of the snake, its protected status, what to do if a snake is observed within the project area, and applicable penalties that may be imposed if state and/or federal regulations are violated. An educational brochure including color photographs of the snake will be given to each staff member in attendance and additional copies will be provided to the construction superintendent to make available in the onsite construction office (a final brochure for Plan compliance, to be printed double-sided on 8.5" x 11" paper and then properly folded, is attached). Photos of eastern indigo snakes may be accessed on USFWS and/or FWC websites.

3. Construction staff will be informed that in the event that an eastern indigo snake (live or dead) is observed on the project site during construction activities, all such activities are to cease until the established procedures are implemented according to the Plan, which includes notification of the appropriate USFWS Field Office. The contact information for the USFWS is provided on the referenced posters and brochures.

DURING CONSTRUCTION ACTIVITIES

1. During initial site clearing activities, an onsite observer may be utilized to determine whether habitat conditions suggest a reasonable probability of an eastern indigo snake sighting (example: discovery of snake sheds, tracks, lots of refugia and cavities present in the area of clearing activities, and presence of gopher tortoises and burrows).

2. If an eastern indigo snake is discovered during gopher tortoise relocation activities (i.e. burrow excavation), the USFWS shall be contacted within one business day to obtain further guidance which may result in further project consultation.

3. Periodically during construction activities, the applicant's designated agent should visit the project area to observe the condition of the posters and Plan materials, and replace them as needed. Construction personnel should be reminded of the instructions (above) as to what is expected if any eastern indigo snakes are seen.

POST CONSTRUCTION ACTIVITIES

Whether or not eastern indigo snakes are observed during construction activities, a monitoring report should be submitted to the appropriate USFWS Field Office within 60 days of project completion. The report can be sent electronically to the appropriate USFWS e-mail address listed on page one of this Plan.

Appendix I

Eastern Indigo Snake Consultation Key

United States Department of the Interior

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

August 1, 2017

Donnie Kinard
U.S. Army Corps of Engineers
Post Office Box 4970
Jacksonville, Florida 32232-0019

Subject: Consultation Key for the Eastern Indigo Snake – Revised

Dear Mr. Kinard:

This letter revises and replaces the January 25, 2010, and August 13, 2013, letters to the U.S. Army Corps of Engineers (Corps) regarding the use of the eastern indigo snake programmatic effect determination key (Key) for projects occurring within the South Florida Ecological Service's Office (SFESO) jurisdiction. This revision supersedes all prior versions of the Key in the SFESO area. The purpose of this revision is to clarify portions of the previous keys based on questions we have been asked, specifically related to habitat and refugia used by eastern indigo snakes (*Drymarchon corais couperi*), in the southern portion of their range and within the jurisdiction of the SFESO. This Key is provided pursuant to the Service's authorities under the Endangered Species Act of 1973, as amended (Act) (87 Stat. 884; 16 U.S.C.1531 *et seq.*). This Key revision has been assigned Service Consultation Code: 41420-2009-I-0467-R001.

The purpose of this Key is to assist the Corps (or other Federal action agency) in making appropriate effects determinations for the eastern indigo snake under section 7 of the Act, and streamline informal consultation with the SFESO for the eastern indigo snake when the proposed action can be walked through the Key. The Key is a tool available to the Corps (or other Federal action agency) for the purposes of expediting section 7 consultations. There is no requirement to use the Key. There will be cases when the use of the Key is not appropriate. These include, but are not limited to: where project specific information is outside of the scope of the Key or instances where there is new biological information about the species. In these cases, we recommend the Corps (or other Federal action agency) initiates traditional consultation pursuant to section 7 of the Act, and identify that consultation is being requested outside of the Key.

This Key uses project size and home ranges of eastern indigo snakes as the basis for making determinations of "may affect, but is not likely to adversely affect" (NLAA) and "may affect. and is likely to adversely affect" (may affect). Suitable habitat for the eastern indigo snake consists of a mosaic of habitats types, most of which occur throughout South Florida. Information on home ranges for individuals is not available in specific habitats in South Florida. Therefore, the SFESO uses the information from a 26-year study conducted by Layne and Steiner (1996) at Archbold Biological Station, Lake Placid, Florida, as the best available

information. Layne and Steiner (1996) determined the average home range size for a female eastern indigo snake was 46 acres and 184 acres for a male.

Projects that would remove/destroy less than 25 acres of eastern indigo snake habitat are expected to result in the loss of a portion of an eastern indigo snakes home range that would not impair the ability of the individual to feed, breed, and shelter. Therefore, the Service finds that take would not be reasonably certain to occur due to habitat loss. However, these projects have the potential to injure or kill an eastern indigo snake if the individual is crushed by equipment during site preparation or other project aspects. The Service's *Standard Protection Measures for the Eastern Indigo Snake* (Service 2013 or most current version) and the excavation of underground refugia (where a snake could be buried, trapped and/or injured), when implemented, are designed to avoid these forms of take. Consequently, projects less than 25 acres that include the Service's *Standard Protection Measures for the Eastern Indigo Snake* (Service 2013 or most current version) and a commitment to excavate underground refugia as part of the proposed action would be expected to avoid take and thus, may affect, but are not likely to adversely affect the species.

If a proposed project would impact less than 25 acres of vegetated eastern indigo snake habitat (not urban/ human-altered) completely surrounded by urban development, and an eastern indigo snake has been observed on site, the Key should not be used. The Service recommends formal consultation for this situation because of the expected increased value of the vegetated habitat within the individual's home range.

Projects that would remove 25 acres or more of eastern indigo snake habitat could remove more than half of a female eastern indigo snakes home range. This loss of habitat within a home range would be expected to significantly impair the ability of that individual to feed, breed, and shelter. Therefore, the Service finds take through habitat loss would be reasonably certain to occur and formal consultation is appropriate. Furthermore, these projects have the potential to injure or kill an eastern indigo snake if the individual is crushed by equipment during site preparation or other project aspects. The Service's *Standard Protection Measures* for the *Eastern Indigo Snake* (Service 2013 or most current version) and the excavation of underground refugia (where a snake could be buried, trapped and/or injured), when implemented, are designed to avoid these forms of take.

Eastern indigo snakes use a variety of habitat and are difficult to detect. Therefore, site specific information on the land use, observations of eastern indigo snakes within the vicinity, as well as other factors, as appropriate, will all be considered by the Service when making a final recommendation on the appropriate effects determination and whether it is appropriate to conclude consultation with the Corps (or other Federal action agency) formally or informally for projects that will impact 25 acres or more of habitat. Accordingly, when the use of the Key results in a determination of "may affect," the Corps (or other Federal action agency) is advised that consultation may be concluded informally or formally, depending on the project specific effects to eastern indigo snakes. Technical assistance from the Service can assist you in making a determination prior to submitting a request for consultation. In circumstances where the Corps (or other Federal action agency) desires to proceed with a consultation request prior to receiving

additional technical assistance from the Service, we recommend the agency documents the biological rationale for their determination and proceed with a request accordingly.

If the use of the Key results in a determination of "no effect," no further consultation is necessary with the SFESO. If the use of the Key results in a determination of "NLAA," the SFESO concurs with this determination based on the rationale provide above, and no further consultation is necessary for the effects of the proposed action on the eastern indigo snake. For "no effect" or "NLAA" determinations, the Service recommends that the Corps (or other Federal action agency) documents the pathway used to reach your no effect or NLAA determination in the project record and proceed with other species analysis as warranted.

Eastern Indigo Snake Programmatic Effect Determination Key
Revised July 2017
South Florida Ecological Service Office

Scope of the Key

This Key should be used only in the review of permit applications for effects determinations for the eastern indigo snake (*Drymarchon corais couperi*) within the South Florida Ecological Service's Office (SFESO) area (Broward, Charlotte, Collier, De Soto, Glades, Hardee, Hendry, Highlands, Lee, Indian River, Martin, Miami-Dade, Monroe, Okeechobee, Osceola, Palm Beach, Polk, Sarasota, and St. Lucie Counties). There is no designated critical habitat for the eastern indigo snake.

This Key is subject to revision as the Corps (or other Federal action agency) and Service deem necessary and in particular whenever there is new information on eastern indigo snake biology and effects of proposed projects.

The Key is a tool available to the Corps (or other Federal action agency) for the purposes of expediting section 7 consultations. There is no requirement to use the Key. There will be cases when the use of the Key is not appropriate. These include, but are not limited to: where project specific information is outside of the scope of the Key or instances where there is new biological information about the species. In these cases, we recommend the Corps (or other Federal action agency) initiates traditional consultation pursuant to section 7 of the Act, and identify that consultation is being requested outside of the Key.

Habitat

Habitat use varies seasonally between upland and wetland areas, especially in the more northern parts of the species' range. In southern parts of their range eastern indigo snakes are habitat generalists which use most available habitat types. Movements between habitat types in northern areas of their range may relate to the need for thermal refugia (protection from cold and/or heat).

In northern areas of their range eastern indigo snakes prefer an interspersion of tortoise-inhabited sandhills and wetlands (Landers and Speake 1980). In these northern regions eastern indigo

snakes most often use forested areas rich with gopher tortoise burrows, hollowed root channels, hollow logs, or the burrows of rodents, armadillos, or land crabs as thermal refugia during cooler seasons (Lawler 1977; Moler 1985a; Layne and Steiner 1996). The eastern indigo snake in the northern region is typically classified as a longleaf pine savanna specialist because here, in the northern four-fifths of its range, the eastern indigo snake is typically only found in vicinity of xeric longleaf pine–turkey oak sandhills inhabited by the gopher tortoise (Means 2006).

In the milder climates of central and southern Florida, comprising the remaining one fifth of its range, thermal refugia such as those provided by gopher tortoise burrows may not be as critical to survival of indigo snakes. Consequently, eastern indigo snakes in these regions use a more diverse assemblage of habitats such as pine flatwoods, scrubby flatwoods, floodplain edges, sand ridges, dry glades, tropical hammocks, edges of freshwater marshes, muckland fields, coastal dunes, and xeric sandhill communities; with highest population concentrations of eastern indigo snakes occurring in the sandhill and pineland regions of northern and central Florida (Service 1999). Eastern indigo snakes have also been found on agricultural lands with close proximity to wetlands (Zeigler 2006).

In south Florida, agricultural sites (*e.g.*, sugar cane fields and citrus groves) are occupied by eastern indigo snakes. The use of sugarcane fields by eastern indigo snakes was first documented by Layne and Steiner in 1996. In these areas there is typically an abundance of wetland and upland ecotones (due to the presence of many ditches and canals), which support a diverse prey base for foraging. In fact, some speculate agricultural areas may actually have a higher density of eastern indigo snakes than natural communities due to the increased availability of prey. Gopher tortoise burrows are absent at these locations but there is an abundance of both natural and artificial refugia. Enge and Endries (2009) reporting on the status of the eastern indigo snake included sugarcane fields and citrus groves in a Global Information Systems (GIS)-base map of potential eastern indigo snake habitat. Numerous sightings of eastern indigo snakes within sugarcane fields have been reported within south Florida (Florida Fish and Wildlife Conservation Commission Indigo Snake Database [Enge 2017]). A recent study associated with the Comprehensive Everglades Restoration Plan (CERP) (A-1 FEB Project formerly A-1 Reservoir; Service code: 41420-2006-F-0477) documented eastern indigo snakes within sugarcane fields. The snakes used artificial habitats such as piles of limerock, construction debris, and pump stations. Recent studies also associated with the CERP at the C-44 Project (Service code: 41420-2009-FA-0314), and C-43 Project (Service code: 41420-2007-F-0589) documented eastern indigo snakes within citrus groves. The snakes used artificial habitats such as boards, sheets of tin, construction debris, pipes, drain pipes in abandoned buildings and septic tanks.

In extreme south Florida (*i.e.*, the Everglades and Florida Keys), eastern indigo snakes also utilize tropical hardwood hammocks, pine rocklands, freshwater marshes, abandoned agricultural land, coastal prairie, mangrove swamps, and human-altered habitats. Though eastern indigo snakes have been found in all available habitats of south Florida it is thought they prefer hammocks and pine forests since most observations occur there and use of these areas is disproportionate compared to the relatively small total area of these habitats (Steiner *et al.* 1983).

Even though thermal stress may not be a limiting factor throughout the year in south Florida, eastern indigo snakes still seek and use underground refugia. On the sandy central ridge of central Florida, eastern indigo snakes use gopher tortoise burrows more (62 percent) than other underground refugia (Layne and Steiner 1996). Other underground refugia used include armadillo (*Dasypus novemcinctus*) burrows near citrus groves, cotton rat (*Sigmodon hispidus*) burrows, and land crab (*Cardisoma guanhumi*) burrows in coastal areas (Layne and Steiner 1996; Wilson and Porras 1983). Natural ground holes, hollows at the base of trees or shrubs, ground litter, trash piles, and crevices of rock-lined ditch walls are also used (Layne and Steiner 1996). These refugia are used most frequently where tortoise burrows are not available, principally in low-lying areas off the central and coastal ridges.

Minimization Measures

The Service developed protection measures for the eastern indigo snake "Standard Protection Measures for the Eastern Indigo Snake" (Service 2013) located at: https://www.fws.gov/verobeach/ReptilesPDFs/20130812_EIS%20Standard%20Protection%20Measures_final.pdf. These protections measures (or the most updated version) are considered a minimization measure for projects proposed within eastern indigo snake habitat.

Determinations

If the use of this Key results in a determination of "**no effect**," no further consultation is necessary with the SFESO.

If the use of this Key results in a determination of "**NLAA**," the SFESO concurs with this determination and no further consultation is necessary for the effects of the proposed action on the eastern indigo snake.

For no effect or NLAA determinations, the Corps (or other Federal action agency) should make a note in the project file indicating the pathway used to reach your no effect or NLAA determination.

If a proposed project would impact less than 25 acres of vegetated eastern indigo snake habitat (not urban/ human-altered) completely surrounded by urban development, and an eastern indigo snake has been observed on site, the subsequent Key should not be used. The Service recommends formal consultation for this situation because of the expected increased value of the vegetated habitat within the individual's home range.

If the use of this Key results in a determination of "**may affect**," consultation may be concluded informally or formally depending on project effects to eastern indigo snakes. Technical assistance from the Service can assist you in making a determination prior to submitting a request for consultation. In circumstances where the Corps desires to proceed with a consultation request prior to receiving additional technical assistance from the Service, we recommend the Corps document the biological rationale for their determination and proceed with a request accordingly.

A. Project is not located in open water or salt marsh.....go to B

Project is located solely in open water or salt marsh.....**no effect**

B. Permit will be conditioned for use of the Service's most current guidance for Standard Protection Measures For The Eastern Indigo Snake (currently 2013) during site preparation and project construction.....go to C

Permit will not be conditioned as above for the eastern indigo snake, or it is not known whether an applicant intends to use these measures and consultation with the Service is requested.....**may affect**

C. The project will impact less than 25 acres of eastern indigo snake habitat (*e.g.*, sandhill, scrub, pine flatwoods, pine rocklands, scrubby flatwoods, high pine, dry prairie, coastal prairie, mangrove swamps, tropical hardwood hammocks, hydric hammocks, edges of freshwater marshes, agricultural fields [including sugar cane fields and active, inactive, or abandoned citrus groves], and coastal dunes).....go to D

The project will impact 25 acres or more of eastern indigo snake habitat (*e.g.*, sandhill, scrub, pine flatwoods, pine rocklands, scrubby flatwoods, high pine, dry prairie, coastal prairie, mangrove swamps, tropical hardwood hammocks, hydric hammocks, edges of freshwater marshes, agricultural fields [including sugar cane fields and active, inactive, or abandoned citrus groves], and coastal dunes).....**may affect**

D. The project has no known holes, cavities, active or inactive gopher tortoise burrows, or other underground refugia where a snake could be buried, trapped and/or injured during project activities.....**NLAA**

The project has known holes, cavities, active or inactive gopher tortoise burrows, or other underground refugia where a snake could be buried, trapped and /or injured.....go to E

E. Any permit will be conditioned such that all gopher tortoise burrows, active or inactive, will be excavated prior to site manipulation in the vicinity of the burrow[1]. If an eastern indigo snake is encountered, the snake must be allowed to vacate the area prior to additional site manipulation in the vicinity. Any permit will also be conditioned such that holes, cavities, and snake refugia other than gopher tortoise burrows will be inspected each morning before planned site manipulation of a particular area, and, if occupied by an eastern indigo snake, no work will commence until the snake has vacated the vicinity of proposed work.....**NLAA**[2]

Permit will not be conditioned as outlined above.....**may affect**

End Key

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[1] If excavating potentially occupied burrows, active or inactive, individuals must first obtain state authorization via a Florida Fish and Wildlife Conservation Commission Authorized Gopher Tortoise Agent permit. The excavation method selected should also minimize the potential for injury of an indigo snake. Applicants should follow the excavation guidance provided within the most current Gopher Tortoise Permitting Guidelines found at http://myfwc.com/gophertortoise.

[2] Please note, if the proposed project will impact less than 25 acres of vegetated eastern indigo snake habitat (not urban/ human-altered) completely surrounded by urban development, and an eastern indigo snake has been observed on site, NLAA is not the appropriate conclusion. The Service recommends formal consultation for this situation because of the expected increased value of the vegetated habitat within the individual's home range

Working with the Fish and Wildlife Foundation of Florida, the Service has established a fund to support conservation and recovery for the eastern indigo snake. Any project that has the potential to affect the eastern indigo snake and/or its habitat is encouraged to make a voluntary contribution to this fund. If you would like additional information about how to make a contribution and how these monies are used to support eastern indigo snake recovery please contact Ashleigh Blackford, Connie Cassler, or José Rivera at 772-562-3559.

This revised Key is effective immediately upon receipt by the Corps. Should circumstances change or new information become available regarding the eastern indigo snake and/or implementation of the Key, the determinations herein may be reconsidered and this Key further revised or amended.

Thank you for your continued cooperation in the effort to conserve fish and wildlife resources. If you have any questions or comments regarding this Key, please contact the SFESO at 772-562-3909.

Sincerely,

Roxanna Hinzman
Field Supervisor
South Florida Ecological Services

Cc:
Corps, Jacksonville, Florida (Dale Beter, Muriel Blaisdell, Ingrid Gilbert, Angela Ryan, Irene Sadowski, Victoria White, Alisa Zarbo)
Service, Athens, Georgia (Michelle Elmore)
Service, Jacksonville, Florida (Annie Dziergowski)
Service, Panama City, Florida (Sean Blomquist)

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Appendix J

Wood Stork Effect Determination Key

United States Department of the Interior

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

May 18, 2010

Donnie Kinard
Chief, Regulatory Division
Jacksonville District Corps of Engineers
Post Office Box 4970
Jacksonville, Florida 32232-0019

Service Federal Activity Code: 41420-2007-FA-1494
Service Consultation Code: 41420-2007-I-0964
Subject: South Florida Programmatic Concurrence
Species: Wood Stork

Dear Mr. Kinard:

This letter addresses minor errors identified in our January 25, 2010, wood stork key and as such, supplants the previous key. The key criteria and wood stork biomass foraging assessment methodology have not been affected by these minor revisions.

The Fish and Wildlife Service's (Service) South Florida Ecological Services Office (SFESO) and the U.S. Army Corps of Engineers Jacksonville District (Corps) have been working together to streamline the consultation process for federally listed species associated with the Corps' wetland permitting program. The Service provided letters to the Corps dated March 23, 2007, and October 18, 2007, in response to a request for a multi-county programmatic concurrence with a criteria-based determination of "may affect, not likely to adversely affect" (NLAA) for the threatened eastern indigo snake (*Drymarchon corais couperi*) and the endangered wood stork (*Mycteria americana*) for projects involving freshwater wetland impacts within specified Florida counties. In our letters, we provided effect determination keys for these two federally listed species, with specific criteria for the Service to concur with a determination of NLAA.

The Service has revisited these keys recently and believes new information provides cause to revise these keys. Specifically, the new information relates to foraging efficiencies and prey base assessments for the wood stork and permitting requirements for the eastern indigo snake. This letter addresses the wood stork key and is submitted in accordance with section 7 of the Endangered Species Act of 1973, as amended (Act) (87 Stat. 884; 16 U.S.C. 1531 *et seq.*). The eastern indigo snake key will be provided in a separate letter.

Wood stork

Habitat

The wood stork is primarily associated with freshwater and estuarine habitats that are used for nesting, roosting, and foraging. Wood storks typically construct their nests in medium to tall

trees that occur in stands located either in swamps or on islands surrounded by relatively broad expanses of open water (Ogden 1991, 1996; Rodgers et al. 1996). Successful colonies are those that have limited human disturbance and low exposure to land-based predators. Nesting colonies protected from land-based predators are characterized as those surrounded by large expanses of open water or where the nest trees are inundated at the onset of nesting and remain inundated throughout most of the breeding cycle. These colonies have water depths between 0.9 and 1.5 meters (3 and 5 feet) during the breeding season.

Successful nesting generally involves combinations of average or above-average rainfall during the summer rainy season and an absence of unusually rainy or cold weather during the winter-spring breeding season (Kahl 1964; Rodgers et al. 1987). This pattern produces widespread and prolonged flooding of summer marshes, which maximize production of freshwater fishes, followed by steady drying that concentrate fish during the season when storks nest (Kahl 1964). Successful nesting colonies are those that have a large number of foraging sites. To maintain a wide range of foraging sites, a variety of wetland types should be present, with both short and long hydroperiods. The Service (1999) describes a short hydroperiod as a 1 to 5-month wet/dry cycle, and a long hydroperiod as greater than 5 months. During the wet season, wood storks generally feed in the shallow water of the short-hydroperiod wetlands and in coastal habitats during low tide. During the dry season, foraging shifts to longer hydroperiod interior wetlands as they progressively dry-down (though usually retaining some surface water throughout the dry season).

Wood storks occur in a wide variety of wetland habitats. Typical foraging sites for the wood stork include freshwater marshes and stock ponds, shallow, seasonally flooded roadside and agricultural ditches, narrow tidal creeks and shallow tidal pools, managed impoundments, and depressions in cypress heads and swamp sloughs. Because of their specialized feeding behavior, wood storks forage most effectively in shallow-water areas with highly concentrated prey. Through tactolocation, or grope feeding, wood storks in south Florida feed almost exclusively on fish between 2 and 25 centimeters [cm] (1 and 10 inches) in length (Ogden et al. 1976). Good foraging conditions are characterized by water that is relatively calm, uncluttered by dense thickets of aquatic vegetation, and having a water depth between 5 and 38 cm (5 and 15 inches) deep, although wood storks may forage in other wetlands. Ideally, preferred foraging wetlands would include a mosaic of emergent and shallow open-water areas. The emergent component provides nursery habitat for small fish, frogs, and other aquatic prey and the shallow, open-water areas provide sites for concentration of the prey during seasonal dry-down of the wetland.

Conservation Measures

The Service routinely concurs with the Corps' "may affect, not likely to adversely affect" determination for individual project effects to the wood stork when project effects are insignificant due to scope or location, or if assurances are given that wetland impacts have been avoided, minimized, and adequately compensated such that there is no net loss in foraging potential. We utilize our *Habitat Management Guidelines for the Wood Stork in the Southeast Region* (Service 1990) (Enclosure 1) (HMG) in project evaluation. The HMG is currently under review and once final will replace the enclosed HMG. There is no designated critical habitat for the wood stork.

The SFESO recognizes a 29.9 kilometer [km] (18.6-mile) core foraging area (CFA) around all known wood stork colonies in south Florida. Enclosure 2 (to be updated as necessary) provides locations of colonies and their CFAs in south Florida that have been documented as active within the last 10 years. The Service believes loss of suitable wetlands within these CFAs may reduce foraging opportunities for the wood stork. To minimize adverse effects to the wood stork, we recommend compensation be provided for impacts to foraging habitat. The compensation should consider wetland type, location, function, and value (hydrology, vegetation, prey utilization) to ensure that wetland functions lost due to the project are adequately offset. Wetlands offered as compensation should be of the same hydroperiod and located within the CFAs of the affected wood stork colonies. The Service may accept, under special circumstances, wetland compensation located outside the CFAs of the affected wood stork nesting colonies. On occasion, wetland credits purchased from a "Service Approved" mitigation bank located outside the CFAs could be acceptable to the Service, depending on location of impacted wetlands relative to the permitted service area of the bank, and whether or not the bank has wetlands having the same hydroperiod as the impacted wetland.

In an effort to reduce correspondence in effect determinations and responses, the Service is providing the Wood Stork Effect Determination Key below. If the use of this key results in a Corps determination of "no effect" for a particular project, the Service supports this determination. If the use of this Key results in a determination of NLAA, the Service concurs with this determination[1]. This Key is subject to revisitation as the Corps and Service deem necessary.

The Key is as follows:

A. Project within 0.76 km (0.47 mile)[2] of an active colony site[3] ..... "*may affect*[4]"

Project impacts Suitable Foraging Habitat (SFH)[5] at a location greater than 0.76 km (0.47 mile) from a colony site..... ....."*go to* B"

[1] With an outcome of "no effect" or "NLAA" as outlined in this key, and the project has less than 20.2 hectares (50 acres) of wetland impacts, the requirements of section 7 of the Act are fulfilled for the wood stork and no further action is required. For projects with greater than 20.2 hectares (50 acres) of wetland impacts, written concurrence of NLAA from the Service is necessary.

[2] Within the secondary zone (the average distance from the border of a colony to the limits of the secondary zone is 0.76 km (2,500 feet, or 0.47 mi).

[3] An active colony is defined as a colony that is currently being used for nesting by wood storks or has historically over the last 10 years been used for nesting by wood storks.

[4] Consultation may be concluded informally or formally depending on project impacts.

[5] Suitable foraging habitat (SFH) includes wetlands that typically have shallow-open water areas that are relatively calm and have a permanent or seasonal water depth between 5 to 38 cm (2 to 15 inches) deep. Other shallow non-wetland water bodies are also SFH. SFH supports and concentrates, or is capable of supporting and concentrating small fish, frogs, and other aquatic prey. Examples of SFH include, but are not limited to freshwater marshes, small ponds, shallow, seasonally flooded roadside or agricultural ditches, seasonally flooded pastures, narrow tidal creeks or shallow tidal pools, managed impoundments, and depressions in cypress heads and swamp sloughs.

Project does not affect SFH……..…..*"no effect[1]".*

B. Project impact to SFH is less than 0.20 hectare (one-half acre)[6]……..……*NLAA[1]"*

Project impact to SFH is greater in scope than 0.20 hectare (one-half acre)....……*go to* C

C. Project impacts to SFH not within the CFA (29.9 km, 18.6 miles) of a colony site ……..…….…….…..……*go to* D

Project impacts to SFH within the CFA of a colony site …….…..…...…….*go to* E

D. Project impacts to SFH have been avoided and minimized to the extent practicable; compensation (Service approved mitigation bank or as provided in accordance with Mitigation Rule 33 CFR Part 332) for unavoidable impacts is proposed in accordance with the CWA section 404(b)(1) guidelines; and habitat compensation replaces the foraging value matching the hydroperiod[7] of the wetlands affected and provides foraging value similar to, or higher than, that of impacted wetlands. See Enclosure 3 for a detailed discussion of the hydroperiod foraging values, an example, and further guidance[8]…….. *NLAA[1]"*

Project not as above.……... *"may affect[4]"*

E. Project provides SFH compensation in accordance with the CWA section 404(b)(1) guidelines and is not contrary to the HMG; habitat compensation is within the appropriate CFA or within the service area of a Service-approved mitigation bank; and habitat compensation replaces foraging value, consisting of wetland enhancement or restoration matching the hydroperiod[7] of the wetlands affected, and provides foraging value similar

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[6] On an individual basis, SFH impacts to wetlands less than 0.20 hectare (one-half acre) generally will not have a measurable effect on wood storks, although we request that the Corps require mitigation for these losses when appropriate. Wood storks are a wide ranging species, and individually, habitat change from impacts to SFH less than one-half acre are not likely to adversely affect wood storks. However, collectively they may have an effect and therefore regular monitoring and reporting of these effects are important.

[7] Several researchers (Flemming et al. 1994; Ceilley and Bortone 2000) believe that the short hydroperiod wetlands provide a more important pre-nesting foraging food source and a greater early nestling survivor value for wood storks than the foraging base (grams of fish per square meter) than long hydroperiod wetlands provide. Although the short hydroperiod wetlands may provide less fish, these prey bases historically were more extensive and met the foraging needs of the pre-nesting storks and the early-age nestlings. Nest productivity may suffer as a result of the loss of short hydroperiod wetlands. We believe that most wetland fill and excavation impacts permitted in south Florida are in short hydroperiod wetlands. Therefore, we believe that it is especially important that impacts to these short hydroperiod wetlands within CFAs are avoided, minimized, and compensated for by enhancement/restoration of short hydroperiod wetlands.

[8] For this Key, the Service requires an analysis of foraging prey base losses and enhancements from the proposed action as shown in the examples in Enclosure 3 for projects with greater than 2.02 hectares (5 acres) of wetland impacts. For projects with less than 2.02 hectares (5 acres) of wetland impacts, an individual foraging prey base analysis is not necessary although type for type wetland compensation is still a requirement of the Key.

to, or higher than, that of impacted wetlands. See Enclosure 3 for a detailed discussion of the hydroperiod foraging values, an example, and further guidance[8]……..... *"NLAA[1]"*

Project does not satisfy these elements ……..……..…….....*"may affect[4]"*

This Key does not apply to Comprehensive Everglades Restoration Plan projects, as they will require project-specific consultations with the Service.

Monitoring and Reporting Effects

For the Service to monitor cumulative effects, it is important for the Corps to monitor the number of permits and provide information to the Service regarding the number of permits issued where the effect determination was: "may affect, not likely to adversely affect." We request that the Corps send us an annual summary consisting of: project dates, Corps identification numbers, project acreages, project wetland acreages, and project locations in latitude and longitude in decimal degrees.

Thank you for your cooperation and effort in protecting federally listed species. If you have any questions, please contact Allen Webb at extension 246.

Sincerely yours,

Paul Souza
Field Supervisor
South Florida Ecological Services Office

Enclosures

cc: w/enclosures (electronic only)
Corps, Jacksonville, Florida (Stu Santos)
EPA, West Palm Beach, Florida (Richard Harvey)
FWC, Vero Beach, Florida (Joe Walsh)
Service, Jacksonville, Florida (Billy Brooks)

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Appendix K

Florida Bonneted Bat Consultation Key

United States Department of the Interior

FISH AND WILDLIFE SERVICE
South Florida Ecological Services Office
1339 20th Street
Vero Beach, Florida 32960
October 22, 2019

Shawn Zinszer
U.S. Army Corps of Engineers
Post Office Box 4970
Jacksonville, Florida 32232-0019

Subject: Consultation Key for the Florida bonneted bat; 04EF2000-2014-I-0320-R001

Dear Mr. Zinszer:

This letter replaces the December 2013, Florida bonneted bat guidelines provided to the U.S. Army Corps of Engineers (Corps) to assist your agency with effect determinations within the range of the Florida bonneted bat (*Eumops floridanus*). This October 2019 revision supersedes all prior versions. The enclosed *Florida Bonneted Bat Consultation Guidelines* and incorporated *Florida Bonneted Bat Consultation Key* (Key) are provided pursuant to the U.S. Fish and Wildlife Service's (Service) authorities under the Endangered Species Act of 1973, as amended (Act) (87 Stat. 884; 16 U.S.C.1531 *et seq.*). This letter, guidelines, and Key have been assigned Service Consultation Code: 41420- 04EF2000-2014-I-0320-R001.

The purpose of the guidelines and Key is to aid the Corps (or other Federal action agency) in making appropriate effect determinations for the Florida bonneted bat under section 7 of the Act, and streamline informal consultation with the Service for the Florida bonneted bat when the proposed action is consistent with the Key. There is no requirement to use the Key. There will be cases when the use of the Key is not appropriate. These include, but are not limited to: where project specific information is outside of the scope of the Key, applicants do not wish to implement the identified survey or best management practices, or if there is new biological information about the species. In these cases, we recommend the Corps (or other Federal action agency) initiate traditional consultation pursuant to section 7 of the Act, and identify that consultation is being requested outside of the Key.

This Key uses type of habitat (*i.e*, roosting or foraging), survey results, and project size as the basis for making determinations of "may affect, but is not likely to adversely affect" (MANLAA) and "may affect, and is likely to adversely affect" (LAA). The Key is structured to focus on the type(s) of habitat that will be affected by a project. When proposed project areas provide features that could support roosting of Florida bonneted bats, it is considered roosting habitat. If evaluation of roosting habitat determines that roosting is not likely, then the area is subsequently evaluated for its value to the species as foraging habitat.

Roosting habitat

The guidelines describe the features of roosting habitat. When a project is proposed in roosting habitat, the likelihood that roosting is occurring is evaluated through surveys (*i.e.*, full acoustic or limited roost). When a roost is expected and the proposed activity will affect that roost, formal consultation is required. This is because the proposed activity is expected to take individuals through the destruction of the roost and the appropriate determination is that the project may affect, and is likely to adversely affect (LAA) the species. When roosting is expected, but all impacts to the roost can be avoided, and only foraging habitat (without roost structure) will be affected, the Service finds that it is reasonable to conclude that the proposed action is not likely to impair feeding, breeding, or sheltering. Thus, the proposed project may affect, but is not likely to affect the Florida bonneted bat (MANLAA).

The exception to this logic path is if the proposed action will affect more than 50 acres of foraging habitat in proximity to the roost. Under this scenario, we anticipate that the loss of the larger amount of foraging habitat near the roost could significantly impair feeding of young and overall breeding (*i.e.*, LAA). Consequently, these projects would require formal consultation to analyze the effect of the incidental take.

If the roost surveys demonstrate that roosting is not likely, the project is then evaluated for its effects to foraging habitat. Our evaluation of these actions is described below. The exception is for projects less than or equal to 5 acres if a limited roost survey is conducted. Limited roost surveys rely on peeping and visual surveys to determine whether roosting is likely. On these small projects, this survey strategy is believed to be more economical and is considered a reasonable effort to evaluate the potential for roosting. The Service acknowledges that this approach is less reliable in evaluating the likelihood of roosting when it is not combined with acoustic surveys. Therefore, when limited roost surveys are conducted for projects that are less than or equal to 5 acres in size and the determination is that roosting is not likely, we conclude that the proposed project may affect, but is not likely to adversely affect the species (MANLAA).

Foraging habitat

The guidelines describe the features of foraging habitat. Data informing the home range size of the Florida bonneted bats is limited. Global Positioning System (GPS) and radio-telemetry data for Florida bonneted bats documents that they move large distances and likely have large home ranges. Data from recovered GPS satellite tags on Florida bonneted bats tagged at Babcock-Webb Wildlife Management Area (BWWMA) found the maximum distance detected from a capture site was 24.2 mi (38.9 km); the greatest path length travelled in a single night was 56.3 mi (90.6 km) (Ober 2016; Webb 2018a-b). At BWWMA, researchers found that most individual locations were within one mile of the roost (point of capture) (Ober 2015). Additional data collected during the month of December documented the mean maximum distance Florida bonneted bats (n=8) with tags traveled from the roost was 9.5 mi (Webb 2018b).

The Service recognizes that the movement information comes from only one site (BWWMA and vicinity), and data are from small numbers (n=20) of tagged individuals for only short periods of time (Webb 2018a-b). We expect that across the Florida bonneted bat's range differences in

habitat quality, prey availability, and other factors will result in variable habitat use and home range sizes between locations. Foraging distances and home range sizes in high quality habitats are expected to be smaller while foraging distances and home range sizes in low quality habitat would be expected to be larger. Regardless, we use these studies as our best available information to evaluate when changes to foraging habitat may have an effect on the species ability to feed, breed, and shelter and subsequently result in incidental take. When considering where most of the nightly activity was observed, we calculate a foraging area centered on a roost with a 1 mile radius would include approximately 2,000 acres, and a foraging area centered on a 9.5 mile radius would encompass approximately 181,000 acres, on any given night.

Given the Service's limited understanding of how the Florida bonneted bat moves throughout its home range and selects foraging areas, we choose to use 50 acres of habitat as a conservative estimate to when loss of foraging habitat may affect the fitness of an individual to the extent that it would impair feeding and breeding. Projects that would remove, destroy or convert less than 50 acres of Florida bonneted bat foraging habitat are expected to result in a loss of foraging opportunities; however, this decrease is not expected to significantly impair the ability of the individual to feed and breed. Consequently, projects impacting less than 50 acres of foraging habitat that implement the identified best management practices in the Key would be expected to avoid take, and the appropriate determination is that the project may affect, but is not likely to adversely affect the species (MANLAA).

Next, the Service incorporated the level of bat activity into our Key to evaluate when a foraging area may have greater value to the species. When surveys document high bat activity, we deduce that this area has increased value and importance to the species. Thus, when high bat activity is detected in parcels with greater than 50 acres of foraging habitat, we anticipate that the loss, destruction, or conversion of this habitat could significantly impair the ability of an individual to feed and breed (*i.e.*, LAA); thus formal consultation is warranted.

If surveys do not indicate high bat activity, we anticipate that loss of this additional foraging habitat may affect, but is not likely to adversely affect the species (MANLAA). This is because although the acreage is large, the area does not appear to be important at the landscape scale of nightly foraging. Therefore, its loss is not anticipated to significantly impair the ability of an individual to feed or breed.

The exception to this approach is for projects greater than 50 acres when they occur in potential roosting habitat that is not found to support roosting or high bat activity. Under this scenario, the Service concludes that the loss of the large acreage of suitable roosting habitat has the potential to significantly impair the ability of an individual to breed or shelter (*i.e.*, LAA) because the species is cavities for roosting are expected to be limited range wide and the project will impair these limited opportunities for roosting.

Determinations

The Corps (or other Federal action agency) may reach one of several determinations when using this Key. Regardless of the determination, when acoustic bat surveys have been conducted, the Service requests that these survey results are provided to our office to increase our knowledge of

the species and improve our consultation process. Surveys results and reports should be transmitted to the Service at FBBsurveyreport@fws.gov or mail electronic file to U.S. Fish and Wildlife Service, Attention Florida bonneted bat surveys, 1339 20th Street, Vero Beach, Florida 32960. When formal consultation is requested, survey results and reports should be submitted with the consultation request to verobeach@fws.gov.

No effect: If the use of the Key results in a determination of "no effect," no further consultation is necessary with the Service. The Service recommends that the Corps (or other Federal action agency) documents the pathway used to reach the determination in the project record and proceeds with other species analyses as warranted.

May Affect, Not Likely to Adversely Affect (MANLAA): In this Key we have identified two ways that consultation can conclude informally, MANLAA-P and MANLAA-C.

> **MANLAA-P**: If the use of the Key results in a determination of "MANLAA- P," the Service concurs with this determination based on the rationale provide above, and no further consultation is necessary for the effects of the proposed action on the Florida bonneted bat. The Service recommends that the Corps (or other Federal action agency) documents the pathway used to reach the determination in the project record and proceeds with other species analyses as warranted.
>
> **MANLAA-C**: If the use of the Key results in a determination of MANLAA-C, further consultation with the Service is required to confirm that the Key has been used properly, and the Service concurs with the evaluation of the survey results. Survey results should be submitted with the consultation request.

May Affect, Likely to Adversely Affect (LAA) - When the determination in the Key is "LAA" technical assistance with the Service and modifications to the proposed action may enable the project to be reevaluated and conclude with a MANLAA-C determination. Under other circumstance, "LAA" determinations will require formal consultation.

Working with the Fish and Wildlife Foundation of Florida, the Service has established a fund to support conservation and recovery for the Florida bonneted bat. Any project that has the potential to affect the Florida bonneted bat and/or its habitat is encouraged to make a voluntary contribution to this fund. If you would like additional information about how to make a contribution and how these monies are used to support Florida bonneted bat recovery please contact Ashleigh Blackford, Connie Cassler, or José Rivera at 772-562-3909.

This revised Key is effective immediately upon receipt by the Corps. Should circumstances change or new information become available regarding the Florida bonneted bat and/or implementation of the Key, the determinations herein may be reconsidered and this Key further revised or amended. We have established an email address to collect comments on the Key and the survey protocols at: FBBguidelines@fws.gov.

Thank you for your continued cooperation in the effort to conserve fish and wildlife resources. If you have any questions regarding this Key, please contact the South Florida Ecological Services Office at 772-562-3909.

Sincerely,

Roxanna Hinzman
Field Supervisor
South Florida Ecological Services

Enclosure

Cc: electronic only
Corps, Jacksonville, Florida (Dale Beter, Muriel Blaisdell, Ingrid Gilbert, Alisa Zarbo, Melinda Charles-Hogan, Susan Kaynor, Krista Sabin, John Fellows)

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U.S. Fish and Wildlife Service
South Florida Ecological Services Office

FLORIDA BONNETED BAT CONSULTATION GUIDELINES

October - 2019

The U.S. Fish and Wildlife Service's South Florida Ecological Services Field Office (Service) developed the Florida Bonneted Bat Consultation Guidelines (Guidelines) to assist in avoiding and minimizing potential negative effects to roosting and foraging habitat, and assessing effects to the Florida bonneted bat (*Eumops floridanus*) from proposed projects. The Consultation Key within the Guidelines assists applicants in evaluating their proposed projects and identifying the appropriate consultation paths under sections 7 and 10 of the Endangered Species Act of 1973 (Act), as amended (87 Stat. 884; 16 U.S.C. 1531 *et seq.*). These Guidelines are primarily for use in evaluating regulatory projects where development and land conversions are anticipated. These Guidelines focus on conserving roosting structures in natural and semi-natural environments. The following Consultation Area map (Figure 1 and Figure 2, Appendix A), Consultation Flowchart (Figure 3), Consultation Key, Survey Framework (Appendices B-C), and **Best Management Practices (BMPs)** (Appendix D) are based upon the best available scientific information. As more information is obtained, these Guidelines will be revised as appropriate. If you have comments, or suggestions on these Guidelines or the Survey Protocols (Appendix B and C), please email your comments to FBBguidelines@fws.gov. These comments will be reviewed and incorporated in an annual review.

Terms in **bold** are further defined in the Glossary.

Wherever possible, proposed development projects within the Consultation Area should be designed to avoid and minimize take of Florida bonneted bats and to retain their habitat. Applicants are encouraged to enter into early technical assistance/consultation with the Service so we may provide recommendations for avoiding and minimizing adverse effects. Although these Guidelines focus on the effects of a proposed action (*e.g.*, development) on natural habitat, (*i.e.*, non-urban), Appendix E also provides Best Management Practices for Land Management Projects.

If you are renovating an existing artificial structure (*e.g.*, building) within the urban environment with or without additional ground disturbing activities, these Guidelines do not apply. The Service is developing separate guidelines for consultation in these situations. Until the urban guidelines are complete, please contact the Service for additional guidance.

The final listing rule for the Florida bonneted bat (Service 2013) describes threats identified for the species. Habitat loss and degradation, as well as habitat modification, have historically affected the species. Florida bonneted bats are different from most other Florida bat species because they are reproductively active through most of the year, and their large size makes them capable of foraging long distances from their roost (Ober *et al.* 2016). Consequently, this species is vulnerable to disturbances around the roost during a greater portion of the year and considerations about foraging habitat extend further than the localized roost.

Use of Consultation Area, Flowchart, and Key

Figure 1 shows the Consultation Area for the Florida bonneted bat where this consultation guidance applies. For information on how the Consultation Area was delineated see Appendix A. The Consultation Flowchart (Figure 3) and Consultation Key direct project proponents through a series of couplets that will provide a conclusion or determination for potential effects to the Florida bonneted bat. *Please Note: If additional listed species, or candidate or proposed species, or designated or proposed critical habitat may be affected, a separate evaluation will be needed for these species/critical habitats.*

Currently, the Consultation Flowchart (Figure 3) and Consultation Key cannot be used for actions proposed within the urban development boundary in Miami-Dade and Broward County. The urban development boundary is part of the Consultation Area, but it is excluded from these Guidelines because Florida bonneted bats use this area differently (roosting largely in artificial structures), and small natural foraging areas are expected to be important. Applicants with projects in this area should contact the Service for further guidance and individual consultation.

Determinations may be either "no effect," "may affect, but is not likely to adversely affect" (**MANLAA**), or "may affect, and is likely to adversely affect" (**LAA**). An applicant's willingness and ability to alter project designs could sufficiently minimize effects to Florida bonneted bats and allow for a **MANLAA** determination for this species (informal consultation). The Service is available for early technical assistance/consultation to offer recommendations to assist in project design that will minimize effects. When take cannot be avoided, applicants and action agencies are encouraged to incorporate compensation to offset adverse effects. The Service can assist with identifying compensation options (*e.g.,* conservation on site, conservation off-site, contributions to the Service's Florida bonneted bat conservation fund, *etc*.).

Using the Key and Consultation Flowchart

- "No effect" determinations do not need Service concurrence.
- "May affect, but is not likely to adversely affect" **MANLAA**. Applicants will be expected to incorporate the appropriate BMPs to reach a **MANLAA** determination.
    - **MANLAA-P** (in blue in Consultation Flowchart) have programmatic concurrence through the transmittal letter of these Guidelines, and therefore no further consultation with the Service is necessary unless assistance is needed in interpreting survey results.
    - **MANLAA-C** (in black in Consultation Flowchart) determinations require further consultation with the Service.
- "May affect, and is likely to adversely affect" (**LAA**) determinations require consultation with the Service. Project modifications could change the **LAA** determinations in numbers 5, 8, 9, 11, 12, and 17 to **MANLAA**. When take cannot be avoided, **LAA** determinations will require a biological opinion.
- The Service requests copies of surveys used to support all determinations. If a survey is required by the Consultation Key and the final determination is "no effect" or "MANLAA-P", send the survey to FBBsurveyreport@fws.gov , or mail electronic file to U.S. Fish and Wildlife Service, Attention Florida bonneted bat surveys, 1339 20th Street, Vero Beach, Florida 32960. If a survey is required by the Consultation Key and the determination is "MANLAA-C" or "LAA", submit the survey in the consultation request.

For the purpose of making a decision at Couplet 2: If any potential roosting structure is present, then the habitat is classified as **potential roosting habitat**, and the left half of the flowchart should be followed (see Figure 3). We recognize that roosting habitat may also be used by Florida bonneted bats for foraging. If the project site only consists of **foraging habitat** (*i.e.*, no suitable roosting structures), then the right side of the flowchart should be followed beginning at step 13.

For couplets 11 and 12: **Potential roosting habitat** is considered **Florida bonneted bat foraging habitat** when a determination is made that roosting is not likely.

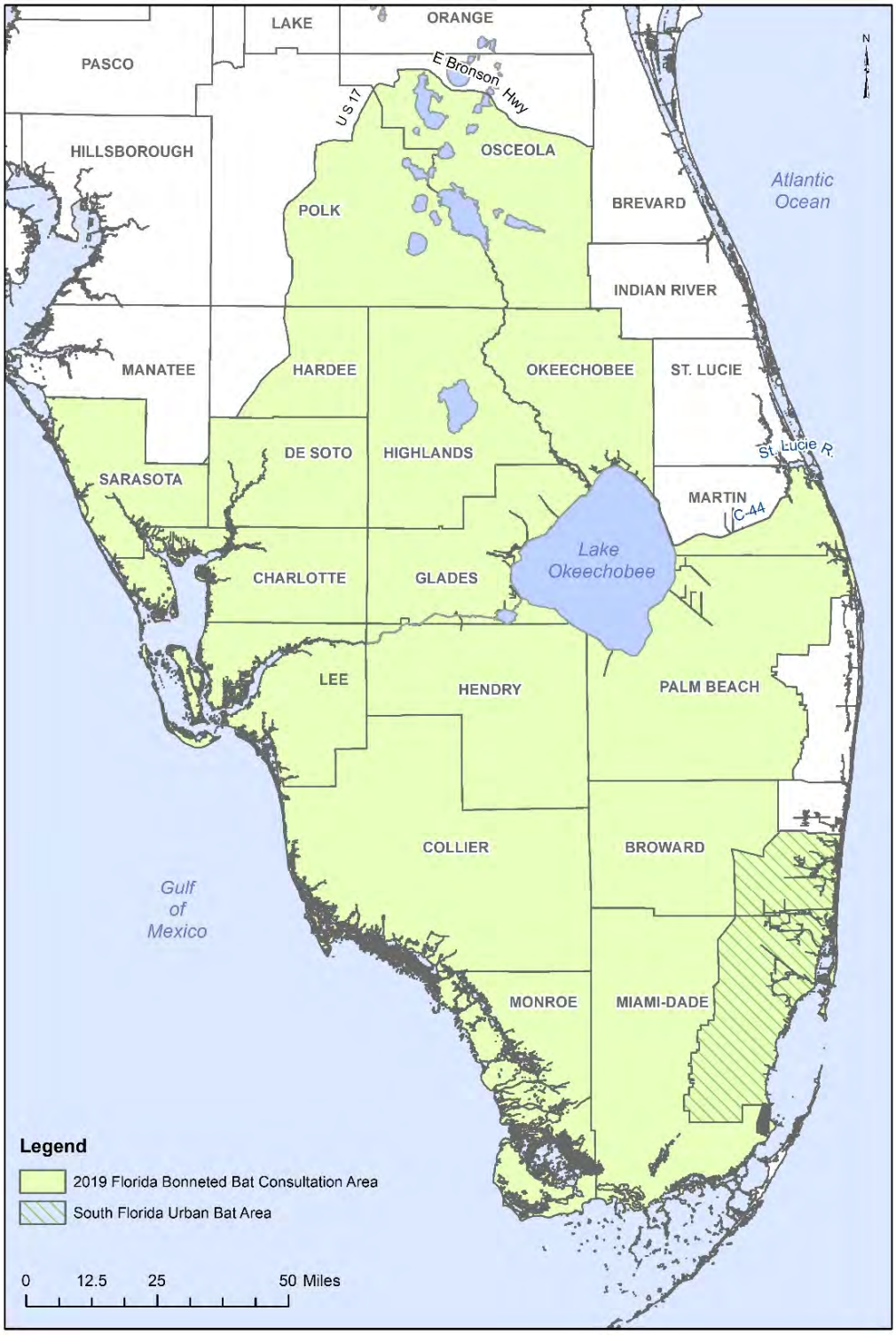

Figure 1. Florida Bonneted Bat Consultation Area. Hatched area (Figure 2) identifies the urban development boundary in Miami-Dade and Broward County. Applicants with projects in this area should contact the Service for specific guidance addressing this area and individual consultation. The Consultation Key should not be used for projects in this area.

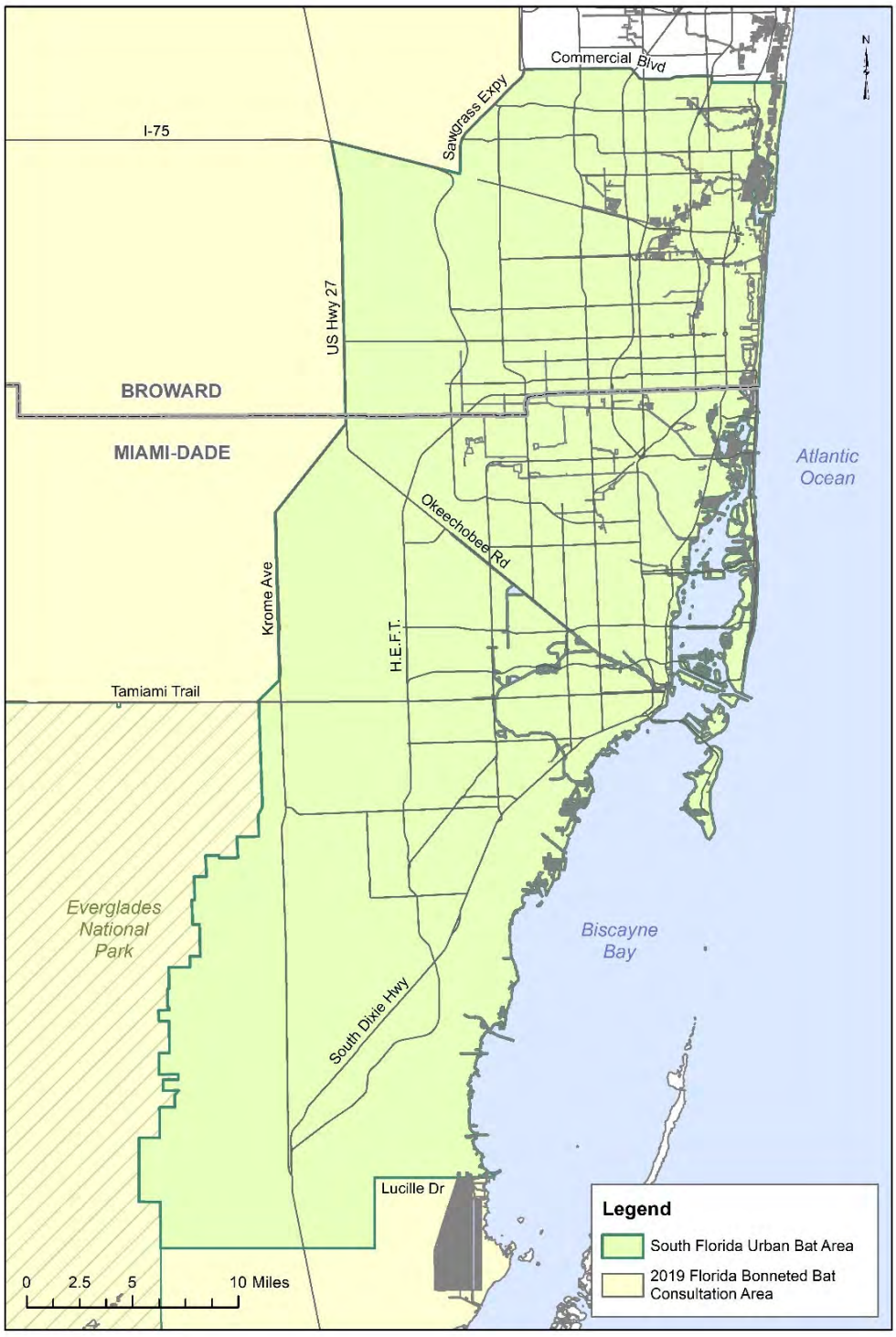

Figure 2. Urban development boundary in Miami-Dade and Broward County. The Consultation Key should not be used for projects in this area. Applicants with projects in this South Florida Urban Bat Area should contact the Service for specific guidance addressing this area and individual consultation.

Florida Bonneted Bat Consultation Key[#]

Use the following key to evaluate potential effects to the Florida bonneted bat (FBB) from the proposed project. Refer to the Glossary as needed.

1a. Proposed project or land use change is partially or wholly within the Consultation Area (Figure 1).....**Go to 2**
1b. Proposed project or land use change is wholly outside of the Consultation Area (Figure 1).....**No Effect**

2a. Potential FBB roosting habitat exists within the project area.....**Go to 3**
2b. No potential FBB roosting habitat exists within the project area.....**Go to 13**

3a. Project size/footprint* ≤ 5 acres (2 hectares)..... **Conduct Limited Roost Survey (Appendix C)** then **Go to 4**
3b. Project size/footprint* > 5 acres (2 hectares).....**Conduct Full Acoustic/Roost Surveys (Appendix B)** then **Go to 6**

4a. Results show FBB roosting is likely .....**Go to 5**
4b. Results do not show FBB roosting is likely.....**MANLAA-P if BMPs (Appendix D) used and survey reports are submitted. Programmatic concurrence.**

5a. Project will affect roosting habitat.....**LAA[+] Further consultation with the Service required.**
5b. Project will not affect roosting habitat..... **MANLAA-C with required BMPs (Appendix D). Further consultation with the Service required.**

6a. Results show some FBB activity.....**Go to 7**
6b. Results show no FBB activity.....**No Effect**

7a. Results show FBB roosting is likely.....**Go to 8**
7b. Results do not show FBB roosting is likely.....**Go to 10**

8a. Project will not affect roosting habitat.....**Go to 9**
8b. Project will affect roosting habitat.....**LAA[+] Further consultation with the Service required.**

9a. Project will affect* > 50 acres (20 hectares) (wetlands and uplands) of foraging habitat.....**LAA[+] Further consultation with the Service required.**
9b. Project will affect* ≤ 50 acres (20 hectares) (wetlands and uplands) of foraging habitat..... **MANLAA-C with required BMPs (Appendix D). Further consultation with the Service required.**

10a. Results show high FBB activity/use.....**Go to 11**
10b. Results do not show high FBB activity/use.....**Go to 12**

11a. Project will affect* > 50 acres (20 hectares) (wetlands and uplands) of FBB habitat (roosting and/or foraging)..... **LAA[+] Further consultation with the Service required.**
11b. Project will affect* ≤ 50 acres (20 hectares) (wetlands and uplands) of FBB habitat (roosting and/or foraging)..... **MANLAA-C with required BMPs (Appendix D). Further consultation with the Service required.**

12a. Project will affect* > 50 acres (20 hectares) (wetlands and uplands) of FBB habitat..... **LAA[+] Further consultation with the Service required.**
12b. Project will affect* ≤ 50 acres (20 hectares) (wetlands and uplands) of FBB habitat..... **MANLAA-P if BMPs (Appendix D) used and survey reports are submitted. Programmatic concurrence.**

13a. FBB foraging habitat exists within the project area and foraging habitat will be affected…..……..**Go to 14**

13b. FBB foraging habitat exists within the project area and foraging habitat will not be affected **OR** no FBB foraging habitat exists within the project area…..……..**No Effect**

14a. Project size* > 50 acres (20 hectares) (wetlands and uplands) ……..…….....**Go to 15**

14b. Project size* ≤ 50 acres (20 hectares) (wetlands and uplands) ……...….. **MANLAA-P if BMPs (Appendix D) used. Programmatic concurrence.**

15a. Project is within 8 miles (12.9 kilometers) of high quality potential roosting areas^……..……**Conduct Full Acoustic Survey (Appendix B) and Go to 16**

15b. Project is not within 8 miles (12.9 kilometers) of high quality potential roosting area^…….....….**MANLAA-P if BMPs (Appendix D) used. Programmatic concurrence.**

16a. Results show some FBB activity……...…….....**Go to 17**

16b. Results show no FBB activity……..…….…....**No Effect**

17a. Results show high FBB activity/use……...…...…....**LAA[+] Further consultation with the Service required.**

17b. Results do not show high FBB activity/use……..……... **MANLAA-P if BMPs (Appendix D) used and survey reports submitted. Programmatic concurrence.**

[#] If you are within the urban environment and you are renovating an existing artificial structure (with or without additional ground disturbing activities), these Guidelines do not apply. The Service is developing separate guidelines for consultation in these situations. Until the urban guidelines are complete, please contact the Service for additional guidance

*****Includes wetlands and uplands that are going to be altered along with a 250- foot (76.2- meter) buffer around these areas if the parcel is larger than the altered area.

[+]Project modifications could change the **LAA** determinations in numbers 5, 8, 9, 11, 12, and 17 to **MANLAA** determinations.

^Determining if **high quality potential roosting areas** are within 8 mi (12.9 km) of a project is intended to be a desk-top exercise looking at most recent aerial imagery, not a field exercise.

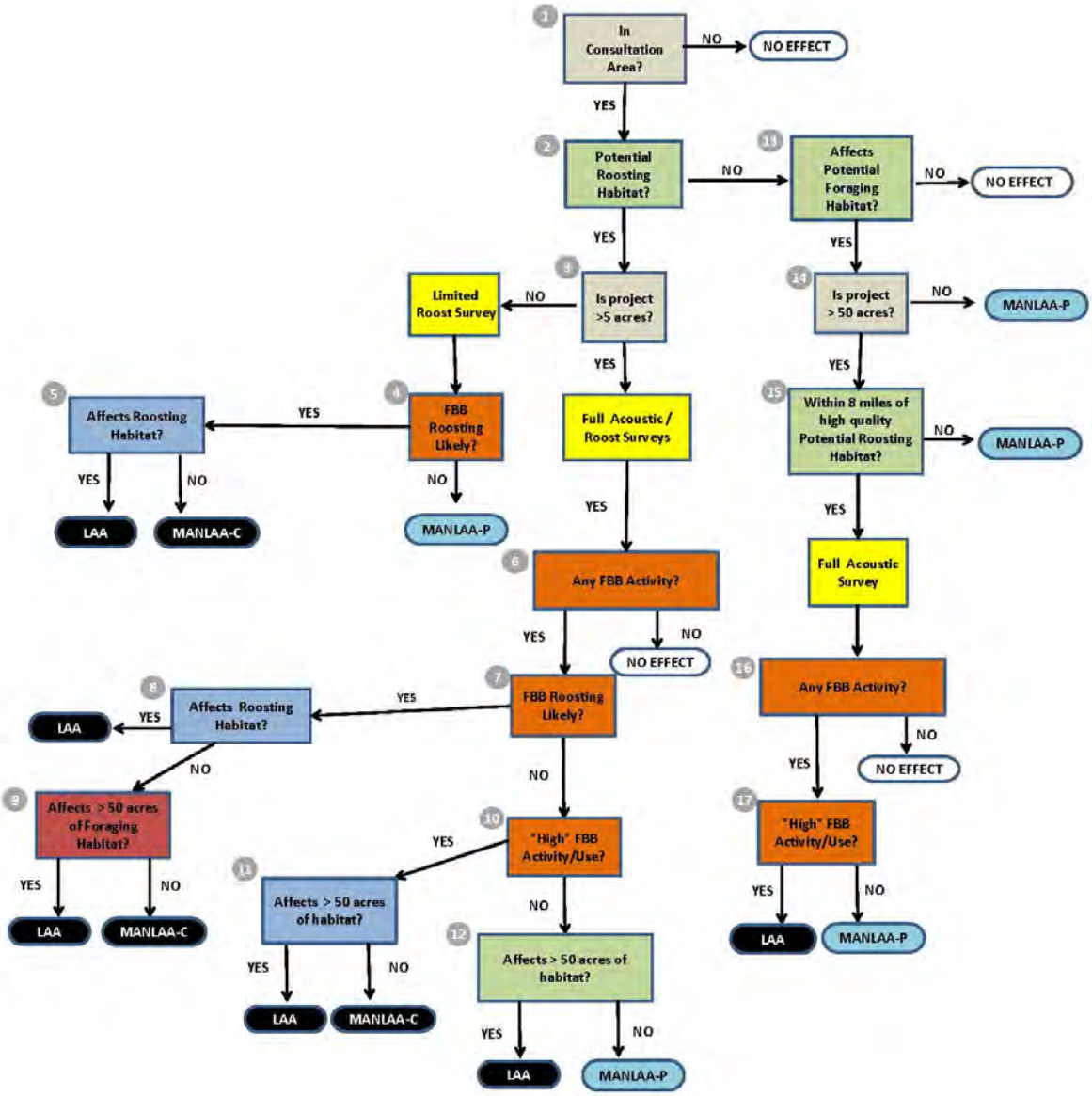

Figure 3. Florida bonneted bat Consultation Flowchart. "**No effect**" determinations do not need Service concurrence. "May affect, but not likely to adversely affect", **MANLAA-P,** in blue have programmatic concurrence through the transmittal letter of these Guidelines, and therefore no further consultation with the Service is necessary unless assistance is needed in interpreting survey results. **MANLAA-C** determinations in black require further consultation with the Service. Applicants are expected to incorporate the appropriate **BMPs** to reach a **MANLAA** determination. "May affect, and is likely to adversely affect", **LAA, (**also in black) determinations require consultation with the Service. Further consultation with the Service may identify project modifications that could change the **LAA** determinations in numbers 5, 8, 9, 11, 12, and 17 to **MANLAA** determinations. The Service requests Florida bonneted bat survey reports for all determinations.

GLOSSARY

BMPs – Best Management Practices. Recommendations for actions to conserve roosting and foraging habitat to be implemented before, during, and after proposed development, land use changes, and land management activities.

FBB Activity – Florida bonneted bat (FBB) activity is when any Florida bonneted bat calls are recorded during an acoustic survey or human observers see or hear Florida bonneted bats on a site.

FORAGING HABITAT - Comprised of relatively open (*i.e.,* uncluttered or reduced numbers of obstacles, such as fewer tree branches and leaves, in the flight environment) areas to find and catch prey, and sources of drinking water. In order to find and catch prey, Florida bonneted bats forage in areas with a reduced number of obstacles. This includes: open fresh water, permanent or seasonal freshwater wetlands, within and above wetland and upland forests, wetland and upland shrub, and agricultural lands (Bailey *et al.* 2017). In urban and residential areas drinking water, prey base, and suitable foraging can be found at golf courses, parking lots, and parks in addition to relatively small patches of natural habitat.

FULL ACOUSTIC/ROOST SURVEY - This is a comprehensive survey that will involve systematic acoustic surveys (*i.e.,* surveys conducted 30 minutes prior to sunset to 30 minutes after sunrise, over multiple consecutive nights). Depending upon acoustic results and habitat type, targeted roost searches through thorough visual inspection using a tree-top camera system or observations at emergence (*e.g.,* looking and listening for bats to come out of tree cavities around sunset) or more acoustic surveys may be necessary. See Appendix B for a full description.

HIGH FBB ACTIVITY/USE - High Florida bonneted bat (FBB) activity/use or importance of an area can be defined using several parameters (*e.g*., types of calls, numbers of calls). An area will be considered to have high FBB activity/use if **ANY** of the following are found: (a) multiple FBB feeding buzzes are detected; (b) FBB social calls are recorded; (c) large numbers of Florida bonneted bat calls (9 or more) are recorded throughout one night. Each of these parameters is considered to indicate that an area is actively used and important to FBBs, however, the Service will further evaluate the activity/use of the area within the context of the site (*i.e.,* spatial distribution of calls, site acreage, habitat on site, as well as adjacent habitat) and provide additional guidance.

HIGH QUALITY POTENTIAL ROOSTING AREAS - Sizable areas (>50 acres) [20 hectares] that contain large amounts of high-quality, natural roosting structure – (*e.g.,* predominantly native, mature trees; especially pine flatwoods or other areas with a large number of cavity trees, tree hollows, or high woodpecker activity).

LAA - May Affect, and is Likely to Adversely Affect. The appropriate conclusion if any adverse effect to listed species may occur as a direct or indirect result of the proposed action or its interrelated or interdependent actions, and the effect is not: discountable, insignificant, or

beneficial [see definition of "may affect, but is not likely to adversely affect" (**MANLAA**)]. In the event the overall effect of the proposed action is beneficial to the listed species, but also is likely to cause some adverse effects, then the proposed action is "likely to adversely affect" the listed species. If incidental take is anticipated to occur as a result of the proposed action, an "is likely to adversely affect" (**LAA**) determination should be made. An "is likely to adversely affect" determination requires the initiation of formal section 7 consultation.

LIMITED ROOST SURVEY - This is a reduced survey that may include the following methods: acoustics, observations at emergence (*e.g.,* looking and listening for bats to come out of tree cavities around sunset), and visual inspection of trees with cavities or loose bark using tree-top cameras (or combination of these methods). Methods are fairly flexible and dependent upon composition and configuration of project site and willingness and ability of applicant and partners to conserve roosting structures on site. See also Appendix C for a full description.

MANLAA - May Affect, but is Not Likely to Adversely Affect. The appropriate conclusion when effects on listed species are expected to be discountable, insignificant, or completely beneficial. Beneficial effects are contemporaneous positive effects without any adverse effects to the species. Insignificant effects relate to the size of the impact and should never reach the scale where take occurs. Discountable effects are those extremely unlikely to occur. Based on best judgment, a person would not: (1) be able to meaningfully measure, detect, or evaluate insignificant effects; or (2) expect discountable effects to occur. To use these Guidelines and Consultation Key applicants must incorporate the appropriate **BMPs** (Appendix D) to reach a **MANLAA** determination.

In this Consultation Key we have identified two ways that consultation can conclude informally, **MANLAA-P and MANLAA-C**:

> **MANLAA-P**: programmatic concurrence is provided through the transmittal letter of these Guidelines, no additional consultation is required with the Service for Florida bonneted bats. All survey results must be submitted to Service.
>
> **MANLAA-C**: further consultation with the Service is required to confirm that the Consultation Key has been used properly, and the Service concurs with the evaluation of the survey results. Request for consultation must include survey results.

NO EFFECT - The appropriate conclusion when the action agency determines its proposed action will not affect listed species or designated critical habitat.

POTENTIAL ROOSTING HABITAT - Includes forest and other areas with tall, mature trees or other areas with suitable roost structures (*e.g.,* utility poles, artificial structures). Forest is defined as all types including: pine flatwoods, scrubby flatwoods, pine rocklands, royal palm hammocks, mixed or hardwood hammocks, cypress, sand pine scrub, or other forest types. (Forrest types currently include exotic forests such as melaleuca, please contact the Service for additional guidance as needed). More specifically, this includes habitat in which suitable structural features for breeding and sheltering are present. In general, roosting habitat contains one or more of the following structures: tree snags, and trees with cavities, hollows, deformities, decay, crevices, or loose bark. Structural characteristics are of primary importance.

Florida bonneted bats have been found roosting in habitat with the following structural features, but may also occur outside of these parameters:

- trees greater than 33 feet (10 meters) in height, greater than 8 inches (20 centimeters) in diameter at breast height (DBH), with cavity elevations higher than 16 feet (5 meters) above ground level (Braun de Torrez 2019);
- areas with a high incidence of large or mature live trees with various deformities (*e.g.,* large cavities, hollows, broken tops, loose bark, and other evidence of decay) (*e.g.,* pine flatwoods);
- rock crevices (*e.g.,* limestone in Miami-Dade County); and/or
- artificial structures, mimicking natural roosting conditions (*e.g.,* bat houses, utility poles, buildings), situated in natural or semi-natural habitats.

In order for a building to be considered a roosting structure, it should be a minimum of 15 feet high and contain one or more of the following features: chimneys, gaps in soffits, gaps along gutters, or other structural gaps or crevices (outward entrance approximately 1 inch (2.5 centimeters) in size or greater. Structures similar to the above (*e.g.,* bridges, culverts, minimum of 15 feet high) are expected to also provide roosting habitat, based upon the species' morphology and behavior (Keeley and Tuttle 1999). Florida bonneted bat roosts will be situated in areas with sufficient open space for these bats to fly (*e.g.,* open or semi-open canopy, canopy gaps, above the canopy, and edges which provide relatively uncluttered conditions [*i.e.,* reduced numbers of obstacles, such as fewer tree branches and leaves, in the flight environment]).

For the purpose of this Consultation Key*: Roosting habitat refers to habitat with structures that can be used for daytime and maternity roosting. Roosting at night between periods of foraging can occur in a broader range of structure types. For the purposes of this guidance we are focusing on day roosting habitat.*

ROOSTING IS LIKELY– Determining likelihood of roosting is challenging. The Service has provided the following definition for the express purpose of these Guidelines. Researchers use additional cues to assist in locating roosts. As additional indicators are identified and described we expect our Guidelines will be improved.

In this Consultation Key the Service will consider the following evidence indicative that roosting is likely nearby (*i.e.,* reasonably certain to occur) if **ANY** of the following are documented: (a) Florida bonneted bat calls are recorded within 30 minutes before sunset to 1½ hours following sunset or within 1½ hours before sunrise; (b) emergence calls are recorded; (c) human observers see (or hear) Florida bonneted bats flying from or to potential roosts; (d) human observers see and identify Florida bonneted bats within a natural roost or artificial roost; and/or (e) other bat sign (*e.g*., guano, staining, etc.) is found that is identified to be Florida bonneted bat through additional follow-up.

In addition to the aforementioned events, researchers consider roosting likely in an area when (1) large numbers of Florida bonneted bat calls are recorded throughout the night (*e.g.,* ≥ 25 files per night at a single acoustic station when 5 second file lengths are recorded); (2) large numbers of FBB calls are recorded over multiple nights (*e.g.,* an average of ≥ 20 files per night from a single detector when 5 second file lengths are recorded); or (3) social calls are recorded. Because social calls and large numbers of calls recorded over one or more nights can be indicative of high

FBB activity/use or when roosting is likely, the Service is choosing not to use these as indicators to make the determination that roosting is likely. Instead we are relying on the indicators that are only expected to occur at or very close to a roost location [(a)-(e) above].

TAKE - to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct. [ESA §3(19)] Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering. Harass is defined by the Service as actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. [50 CFR §17.3].

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Appendix A. **Delineation and Justification for Consultation Area**

The Consultation Area (Figure 1) represents the general range of the species. The Consultation Area represents the area within which consideration should be given to potential effects to Florida bonneted bats from proposed projects or actions. Coordination and consultation with the Service helps to determine whether proposed actions and activities may affect listed species. This Consultation Area defines the area where proposed actions and activities may affect the Florida bonneted bat.

This area was delineated using confirmed presence data, key habitat features, reasonable flight distances and home range sizes. Where data were lacking, we used available occupancy models that predict probability of occurrence (Bailey *et al.* 2017). Below we describe how each one of these data sources was used to determine the overall Consultation Area.

Presence data: Presence data included locations for: (1) confirmed Florida bonneted bat acoustic detections; (2) known roost sites (occupied or formerly occupied; includes natural roosts, bat houses, and utility poles); (3) live Florida bonneted bats observed or found injured; (4) live Florida bonneted bats captured during research activities; and (5) Florida bonneted bats reported as dead. The Geographic Information Systems (GIS) dataset incorporates information from January 2003 to May 2019.

The vast majority of the presence data came from acoustic surveys. The species' audible, low frequency, distinct, echolocation calls are conducive for acoustic surveys. However, there are limitations in the range of detection from ultrasonic devices, and the fast, high-flying habits of this species can confound this. Overall, detection probabilities for Florida bonneted bats are generally considered to be low. For example, in one study designed to investigate the distribution and environmental associations of Florida bonneted bat, Bailey *et al.* 2017 found overall nightly detection probability was 0.29. Based on the estimated detection probabilities in that study, it would take 9 survey nights (1 detector per night) to determine with 95% certainty whether Florida bonneted bat are present at a sampling point. Positive acoustic detection data are extremely valuable. However, it is important to recognize that there are issues with false negatives due to limitations of equipment, low detection probabilities, difference in detection due to prey availability and seasonal movement over the landscape, and in some circumstances improperly conducted surveys (*i.e.,* short duration or in unsuitable weather conditions).

Key habitat features: We considered important physical and biological features with a focus on potential roosting habitat and applied key concepts of bat conservation (*i.e*., need to conserve roosting habitat, foraging habitat, and prey base). To date, all known natural Florida bonneted bat roosts (n=19 have been found in live trees and snags of the following types: slash pine, longleaf pine, royal palm, and cypress (Braun de Torrez 2018). Several of the recent roost discoveries are located in fire-maintained vegetation communities, and it appears that Florida bonneted bats are fire-adapted and can benefit from prescribed burn regimes that closely mimic historical fire patterns (Ober *et al.* 2018).

From a landscape and roosting perspective, we consider key habitat features to include forested areas and other areas with mature trees, wetlands, areas used by red-cockaded woodpeckers

(*Picoides borealis*; RCW), and fire-managed and other conservation areas. However, recent work suggests that Florida bonneted bats do not use pinelands more than other land cover types (Bailey *et al.* 2017). In fact, Bailey *et al.* 2017 detected Florida bonneted bats in all land cover types investigated in their study (e.g., agricultural, developed, upland, and wetland). For the purposes of these consultation guidelines, we are focusing on the conservation of potential roosting habitats across the species' range. However, we also recognize the need for comprehensive consideration of foraging habitats, habitat connectivity, and long-term suitability.

Flight distances and home range sizes: Like most bats, Florida bonneted bats are colonial central-place foragers that exploit distant and scattered resources (Rainho and Palmeirim 2011). Morphological characteristics (narrow wings, high wing-aspect ratio) make *Eumops* spp. well-adapted for efficient, low-cost, swift, and prolonged flight in open areas (Findley *et al*. 1972, Norberg and Rayner 1987). Other Eumops including Underwood's mastiff bat (*Eumops underwoodi*), and Greater mastiff bat or Western mastiff bat (*Eumops perotis*) are known to forage and/or travel distances ranging from 6.2 miles to 62 miles from the roost with multiple studies documenting flight distances approximately 15- 18 miles from the roost (Tibbitts *et al* 2002, Vaugh 1959 as cited in Best *et al*. 1996, Siders *et al.* 1999, Siders 2005, Vaughan 1959 as cited in Siders 2005.)

Like other *Eumops,* Florida bonneted bats are strong fliers, capable of travelling long distances (Belwood 1992). Recent Global Positioning System (GPS) and radio-telemetry data for Florida bonneted bats documents that they also move large distances and likely have large home ranges. Data from recovered GPS satellite tags on Florida bonneted bats tagged at Babcock-Webb Wildlife Management Area (WMA), found the maximum distance detected from a capture site was 24.2 mi (38.9 km); the greatest path length travelled in a single night was 56.3 mi (90.6 km) (Ober 2016; Webb 2018a-b). Additional data collected during the month of December documented the mean maximum distance of Florida bonneted bats (n=8) with tags traveled from the roost was 9.5 mi (Webb 2018b). The Service recognizes that the movement information comes from only one site (Babcock-Webb WMA and vicinity), and data are from small numbers (n=20) of tagged individuals for only short periods of time (Webb 2018a-b). We expect that across the Florida bonneted bat's range differences in habitat quality, prey availability, and other factors will result in variable habitat use and home range sizes between locations. Foraging distances and home range sizes in high quality habitats are expected to be smaller while foraging distances and home range sizes in low quality habitat would be expected to be larger. Consequently, because Babcock-Webb WMA provides high quality roosting habitat, this movement data could represent the low end of individual flight distances from a roost.

Given the species' morphology and habits (*e.g*., central-place forager) and considering available movement data from other *Eumops* and Florida bonneted bats discussed above, we opted to use 15 miles (24 km) as a reasonable estimate of the distance Florida bonneted bats would be expected to travel from a roost on any given night. For the purposes of delineating a majority of the Consultation Area, we used available confirmed presence point location data and extended out 15 miles (24 km), with modifications for habitat features (as described above). As more movement data are obtained and made available, this distance estimate may change in the future.

Occupancy model – Research by Bailey *et al.* (2017) indicates the species' range is larger than previously known. Their model performed well across a large portion of the previously known

range when considering confirmed Florid bonneted bat locations; thus it is anticipated to be useful where limited information is available for the species.

We used the model output from Bailey *et al.* (2017) to more closely examine areas where we are data-deficient (*i.e.,* areas where survey information is particularly lacking). We considered 0.27 probability of occurrence a filter for high likelihood of occurrence because 0.27 was the model output for Babcock-Webb WMA, an area where Florida bonneted bats are known to occupy and heavily use. Large portions of Sarasota, Martin, and Palm Beach counties were identified as having probability of occurrence of 0.27. The consultation area should include areas where the species has a high likelihood of occurring. Based on this reasoned approach, all of Sarasota County, portions of Martin County, and greater parts of Palm Beach County were included in the Consultation Area.

We recognize that there are areas in the northern portion of the range where the model is less successful predicting occurrence based on the known Florida bonneted bat locations (*i.e*., the model predicts low likelihood of occurrence on Avon Park Air Force range, where the species is known to roost). Consequently, the Service is proactively working with partners to conduct surveys in the areas added based on the model to confirm that inclusion of these portions of the aforementioned counties is appropriate. The Consultation Area may be adjusted based on changes in this information.

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Appendix B: Full Acoustic / Roost Survey Framework

Purpose: The purpose of this survey is to: (1) determine if Florida bonneted bats are likely to be actively roosting or using the site; (2) locate active roost(s) and avoid the loss of the structure, if possible; and, (3) avoid or minimize the take of individuals. In some cases, changes in project designs or activities can help avoid and minimize take. For example, project proponents may be able to retain suspected roosts or conserve roosting and foraging habitats. Changing the timing or nature of activities can also help reduce the losses of non-volant young or effects to pregnant or lactating females. If properly conducted, acoustic surveys are the most effective way to determine presence and assess habitat use. If the applicant is unable to follow or does not want to follow the Full Acoustic/Roost Survey framework when recommended according to the Key, the Corps (or other Action Agency) will not be able to use these Guidelines and will need to provide a biologically supported rational using the best available information for their determination in their request for consultation.

General Description: This is a *comprehensive survey effort*, and robust acoustic surveys (*i.e.,* surveys conducted 30 minutes prior to sunset to 30 minutes after sunrise, over multiple nights) are a fundamental component of the approach. Depending upon acoustic results and habitat type, it may also include: observations at emergence (*e.g.,* emergence surveys during which observers look and listen for bats to come out of roost structures around sunset), visual inspection of trees/snags (*i.e.,* those with cavities, hollows, and loose bark) and other roost structures with tree-top cameras, or follow-up targeted acoustic surveys. Methods are dependent upon composition and configuration of project site and willingness and ability of applicant and partners to conserve roosting and foraging habitats on site.

General Survey Protocol:

[Note: The Service will provide more information in separate detailed survey protocols in the near future. This will include specific information on: detector types, placement, orientation, verification of proper functioning, analysis, reporting requirements, etc.]

- Approach is intended for project sites > 5 acres (2 hectares).
- For sites containing roosting habitat, acoustic surveys should primarily focus on assessing roosting habitat within the project site that will be lost or modified (*i.e.,* areas that will not be conserved), and locations on the property within 250 feet (76.2 meters) of areas that will not be conserved. This will help avoid or minimize the loss of an active roost and individuals. Secondarily, since part of the purpose is to determine if Florida bonneted bats are using the site, acoustic devices should also be placed near open water and wetlands to maximize chances of detection and aid in assessing foraging habitat that may be lost.
- For sites that do not contain ANY roosting habitat, but do contain foraging habitat (see Figure 3 - Consultation Flowchart and Key, Step 2 [no], Step 13 [yes]), efforts should focus on assessing foraging habitat within the project site that will be lost or modified (*i.e.,* areas that will not be conserved).
- Acoustic surveys should be performed by those who are trained and experienced in setting up, operating, and maintaining acoustic equipment; and retrieving, saving,

analyzing, and interpreting data. Surveyors should have completed one or more of the available bat acoustic courses/workshops, or be able to show similar on-the-job or academic experience (Service 2018).

- Due to the variation in the quality of recordings, the influence of clutter, the changing performances of software packages over time, and other factors, manual verification is recommended (Loeb *et al.* 2015). Files that are identified to species from auto-ID programs must be visually reviewed and manually verified by experienced personnel.
- Acoustic devices should be set up to record from 30 minutes prior to sunset to 30 minutes after sunrise for multiple nights, under suitable weather conditions.
- Acoustic surveys can be conducted any time of year as long as weather conditions meet the criteria. If any of the following weather conditions exist at a survey site during acoustic sampling, note the time and duration of such conditions, and repeat the acoustic sampling effort for that night: (a) temperatures fall below 65°F (18.3°C) during the first 5 hours of survey period; (b) precipitation, including rain and/or fog, that exceeds 30 minutes or continues intermittently during the first 5 hours of the survey period; and (c) sustained wind speeds greater than 9 miles/hour (4 meters/second; 3 on Beaufort scale) for 30 minutes or more during the first 5 hours of the survey period (Service 2018). At a minimum, nightly weather conditions for survey sites should be checked using the nearest NOAA National Weather Service station and summarized in the survey reports. Although not required at this time, it has been demonstrated that conducting surveys on warm nights late in the spring can help maximize detection probabilities (Ober *et al.* 2016; Bailey *et al.* 2017).
- Acoustic devices should be calibrated and properly placed. Microphones should be directed away from surrounding vegetation, not beneath tree canopy, away from electrical wires and transmission lines, away from echo-producing surfaces, and away from external noises. Directional microphones should be aimed to sample the majority of the flight path/zone. Omnidirectional microphones should be deployed on a pole in the center of the flight path/zone and oriented horizontally. For monitoring possible roost sites, microphones should be directed to maximize likelihood of detection.
- To standardize recordings, acoustic device recordings should have a 2-second trigger window and a maximum file length of 15 seconds.
- The number of acoustic survey sites and nights needed for the assessment is dependent upon the overall acreage of suitable habitat proposed to be impacted by the action.
    - For non-linear projects, a minimum of 16 detector nights per 20 acres of suitable habitat expected to be impacted is recommended.
    - For linear projects (*e.g.,* roadways, transmission lines), a minimum of five detector nights per 0.6 mi (0.97 km) is recommended. Detectors can be moved to multiple locations within each kilometer surveyed, but must remain in a single location throughout any given night.
    - For any site, and in particular for sites > 250 acres, please contact the Service to assist in designing an appropriate approach.
- If results of acoustic surveys show **high Florida bonneted bat activity** or **Florida bonneted bat roosting likely** (*e.g.,* high activity early in the evening) (see definitions in Glossary), follow-up methods such as emergence surveys, visual inspection of the roosting structures, or follow-up acoustic surveys are recommended to locate potential roosts. Using a combination of methods may be helpful.

- For bat emergence surveys, multiple observers should be stationed at potential roosts if weather conditions (as above) are suitable. Surveyors should be quietly stationed 30 minutes before sunset so they are ready to look and listen for emerging FBBs from sunset to 1½ hours after sunset. When conducting emergence surveys it is best to orient observers so that the roost is silhouetted in the remaining daylight; facing west can help maximize the ability to notice movement of animals out of a roost structure.
- Visual inspection of trees with cavities and loose bark during the day may be helpful. Active RCW trees should not be visually inspected during the RCW breeding season (April 15 through June 15).
- Visual inspection alone is not recommended due to the potential for roosts to be too high for cameras to reach, too small for cameras to fit, or shaped in a way that contents are out of view (Braun de Torrez *et al.* 2016).
- If roosting is suspected on site, use tree-top cameras during the day to search those trees/snags or other structures that have potential roost features (*i.e.,* cavities, hollows, crevices, or other structure for permanent shelter). If unsuccessful (*e.g.,* cannot see entire contents within a given cavity, cannot reach cavity, cannot see full extent of cavity) OR occupied roosts are found with the tree-top camera within the area in which high Florida bonneted bat activity/likely Florida bonneted bats roosting were identified, we recommend emergence surveys and/or acoustics to verify occupancy and/or identify bat species.
- Provide report showing effort, methods, weather conditions, findings, and summary of acoustic data relating to Florida bonneted bats (*e.g.,* # of calls, time of calls, and station number) organized by the date on which the data were collected. Sonograms of all calls with signatures at or below 20kHz shall be included in the report. The report shall be provided to the Corps project manager assigned to the project for which the survey was conducted and to the Service via the email address **verobeach@fws.gov. Raw acoustic data should be provided to the Service for all surveys. Raw acoustic data should be provided as "all raw data" and "all raw data with signatures at or below 20kHz". Data can be submitted to the Service via flash drive, memory stick, or hard drive. Data can be submitted digitally to verobeach@fws.gov or via mail to U.S. Fish and Wildlife Service, Attn: Florida bonneted bat data manager, 1339 20th Street, Vero Beach, Florida 32960.**
- Negative surveys are valid for 1 year after completion of the survey.

If you have comments, or suggestions on this survey protocols, please email your comments to FBBguidelines@fws.gov. These comments will be reviewed and incorporated in an annual review.

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Appendix C: Limited Roost Survey Framework

Purpose: The purpose of this survey is to: (1) determine if Florida bonneted bats are likely to be actively roosting within suitable structures on-site; (2) locate active roost(s) and avoid the loss of the structure, if possible; and, (3) avoid or minimize the take of individuals. In some cases, changes in project designs or activities can help avoid and minimize take. For example, applicants and partners may be able to retain the suspected roosts or conserve roosting and foraging habitats. Changing the timing of activities can also help reduce the losses of non-volant young or effects to pregnant or lactating females.

General Description: This is a *reduced survey effort* that may include the following methods: visual inspection of trees/snags (*i.e.,* those with cavities, hollows, and loose bark) and other roost structures with tree-top cameras, observations at emergence (*e.g.,* emergence surveys during which observers look and listen for bats to come out of roost structures around sunset), acoustic surveys, or a combination of these methods. Methods are fairly flexible and dependent upon composition and configuration of project site and willingness and ability of applicant and partners to conserve roosting habitat on site.

General Survey Protocol:

[Note: The Service will provide more information in separate, detailed survey protocols in the near future. This will include specific information on: detector types, placement, orientation, verification of proper functioning, analysis, reporting requirements, etc.]

- Approach is **intended only for small project sites** (*i.e.,* sites ≤ 5 acres [2 hectares]).
- Efforts should focus on assessing potential roosting structures within the project site that will be lost or modified (*i.e.,* areas that will not be conserved), or are located on the property within 250 feet (76.2 meters) of areas that will not be conserved.

Identification of potential roost structures

- This step is necessary prior to any of the methods that follow.
- Run line transects through roosting habitat close enough that all trees and snags are easily inspected. Transect spacing will vary with habitat structure and season from a maximum of 91 m (300 ft) between transects in very open pine stands to 46 m (150 ft) or less in areas with dense mid-story. Transects should be oriented north to south, to optimize cavity detectability because many RCW cavity entrances are oriented in a westerly direction (Service 2004).
- Visually inspect all trees and snags or other structures for evidence of cavities, hollows, crevices that can be used for permanent shelter. Using binoculars, examine structures for cavities, loose bark, hollows, or other crevices that are large enough for Florida bonneted bats (diameter of opening > or = to 1 inch (2.5 cm) (Braun de Torrez *et al*. 2016).
- When potential roosting structures are found, record their location in the field using a Global Positioning System (GPS) unit.

Visual Inspection of trees and snags with tree-top cameras

- Visually inspect all cavities using a video probe (peeper) and assess the cavity contents.

Active RCW trees should not be visually inspected during the RCW breeding season (April 15 through June 15).

- Visual inspection alone is valid only when the entire cavity is observed and the contents can be identified. Typically, acoustics at emergence will also be needed to definitively identify bat species, if bats are present or suspected.
- If bats are suspected, or if contents cannot be determined, or if the entire cavity cannot be observed with the video probe; follow methods for an Acoustic Survey or an Emergence Survey (below). If the Corps (or other action agency) or applicant does not wish to conduct acoustic or emergence surveys, the Corps (or other action agency) cannot use the key and must request formal consultation with the Service.
- Record tree species or type of cavity structure, tree diameter and height, cavity height, cavity orientation and cavity contents.

Emergence Surveys

- For bat emergence surveys, multiple observers should be stationed at potential roosts if weather conditions (as described below in Acoustic Surveys) are suitable.
- Surveyors should be quietly stationed 30 minutes prior to sunset so they are ready to look and listen for emerging Florida bonneted bats from sunset to 1½ hours after sunset.
- When conducting emergence surveys it is best to orient observers so that the roost is silhouetted in the remaining daylight; facing west can help maximize the ability to notice movement of animals out of a roost structure.
- Record number of bats that emerged, the time of emergence, and if bat calls were heard.

Acoustic surveys

- Acoustic surveys should be performed by those who are trained and experienced in setting up, operating, and maintaining acoustic equipment; and retrieving, saving, analyzing, and interpreting data. Surveyors should have completed one or more of the available bat acoustic courses/workshops, or be able to show similar on-the-job or academic experience (Service 2018).
- Due to the variation in the quality of recordings, the influence of clutter, and the changing performances of software packages over time, and other factors, manual verification is recommended (Loeb *et al.* 2015). Files that are identified to species from auto-ID programs must be visually reviewed and manually verified by experienced personnel.
- Acoustic devices should be set up to record from 30 minutes prior to sunset to 30 minutes after sunrise for multiple nights, under suitable weather conditions.
- Acoustic surveys can be conducted any time of year as long as weather conditions meet the criteria. If any of the following weather conditions exist at a survey site during acoustic sampling, note the time and duration of such conditions, and repeat the acoustic sampling effort for that night: (a) temperatures fall below 65°F (18.3°C) during the first 5 hours of survey period; (b) precipitation, including rain and/or fog, that exceeds 30 minutes or continues intermittently during the first 5 hours of the survey period; and (c) sustained wind speeds greater than 9 miles/hour (4 meters/second; 3 on Beaufort scale) for 30 minutes or more during the first 5 hours of the survey period (Service 2018). At a minimum, nightly weather conditions for survey sites should be checked using the nearest NOAA National Weather Service station and summarized in the survey reports. Although not required at this time, it has been demonstrated that conducting surveys on

warm nights late in the spring can help maximize detection probabilities (Ober *et al.* 2016; Bailey *et al.* 2017).

- Acoustic devices should be calibrated and properly placed. Microphones should be directed away from surrounding vegetation, not beneath tree canopy, away from electrical wires and transmission lines, away from echo-producing surfaces, and away from external noises. Directional microphones should be aimed to sample the majority of the flight path/zone. Omnidirectional microphones should be deployed on a pole in the center of the flight path/zone and oriented horizontally. For monitoring possible roost sites, microphones should be directed to maximize likelihood of detection.
- To standardize recordings, acoustic device recordings should have a 2-second trigger window and a maximum file length of 15 seconds.
- Acoustic surveys should be conducted over a minimum of four nights.
- If acoustic devices cannot be left in place for the entire night for multiple nights as above, then a combination of short acoustic surveys (from sunset and extending for 1½ hours), stationed observers for emergence surveys or visual inspection of trees/snags with tree-top cameras may be acceptable. Contact the Service for guidance under this circumstance.

Reporting

- Provide report showing effort, methods, weather conditions, findings, and summary of acoustic data relating to Florida bonneted bat by date (*e.g.*, # of calls, time of calls). Sonograms of all calls with signatures at or below 20kHz shall be included in the report. The report shall be provided to the Corps project manager assigned to the project for which the survey was conducted and to the Service via the email address **verobeach@fws.gov. Raw acoustic data should be provided to the Service for all surveys. Raw acoustic data should be provided as "all raw data" and "all raw data with signatures at or below 20kHz". Data can be submitted to the Service via flash drive, memory stick, or hard drive. Data can be submitted digitally to verobeach@fws.gov or via mail to U.S. Fish and Wildlife Service, Attn: Florida bonneted bat data manager, 1339 20th Street, Vero Beach, Florida 32960.**
- Negative surveys are valid for 1 year after completion of the survey

If you have comments, or suggestions on this survey protocols, please email your comments to FBBguidelines@fws.gov. These comments will be reviewed and incorporated in an annual review.

Literature Cited – Appendix C

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U.S. Fish and Wildlife Service. 2018. Range-wide Indiana bat survey guidelines. https://www.fws.gov/midwest/endangered/mammals/inba/surveys/pdf/2018RangewideIBatSurveyGuidelines.pdf

Appendix D: Best Management Practices (BMPs) for Development Projects

Ongoing research and monitoring will continue to increase the understanding of the Florida bonneted bat and its habitat needs and will continue to inform habitat and species management recommendations. These BMPs incorporate what is known about the species and also include recommendations that are beneficial to all bat species in Florida. These BMPs are intended to provide recommendations for improving conditions for use by Florida bonneted bats, and to help conserve Florida bonneted bats that may be foraging or roosting in an area.

The BMPs required to reach a "may affect, but is not likely to adversely affect" (MANLAA) determination vary depending on the couplet from the Consultation Key used to reach that particular MANLAA. The requirements for each couplet are provided below followed by the list of BMPs. If the applicant is unable or does not want to do the required BMPs, then the Corps (or other Action Agency) will not be able to use this Guidance and formal consultation with the Service is required.

Couplet Number for MANLAA from Consultation Key	Required BMPs
4b	BMP number 1 if more than 3 months has occurred between the survey and start of the project, and any 3 BMPs out of BMPs 4 through 13
5b	BMP number 2, and any 3 BMPs out of BMPs 3 through 13
9b	BMPs number 2 and 3, and any 4 BMPs out of BMPs 5 through 13
11b	BMPs number 1 and 4, and any 4 BMPs out of BMPs 5 through 13
12b	BMP number 1, and any 3 BMPs out of BMPs 3 through 13
14b	Any 2 BMPs out of BMPs 3 through 13
15b	Any 3 BMPs out of BMPs 3 through 13
17b	Any 4 BMPs out of BMPs 3 through 13

BMPs for development, construction, and other general activities:

1. If potential roost trees or structures need to be removed, check cavities for bats within 30 days prior to removal of trees, snags, or structures. When possible, remove structure outside of breeding season (*e.g.*, January 1 – April 15). If evidence of use by any bat species is observed, discontinue removal efforts in that area and coordinate with the Service on how to proceed.
2. When using heavy equipment, establish a 250 foot (76 m) buffer around known or suspected roosts to limit disturbance to roosting bats.
3. For every 5 acres of impact, retain a minimum of 1.0 acre of native vegetation. If upland habitat is impacted, then upland habitat with native vegetation should be retained.
4. For every 5 acres of impact, retain a minimum of 0.25 acre of native vegetation. If upland habitat is impacted, then upland habitat with native vegetation should be retained..
5. Conserve open freshwater and wetland habitats to promote foraging opportunities and avoid impacting water quality. Created/restored habitat should be designed to replace the function of native habitat.

6. Conserve and/or enhance riparian habitat. A 50-ft (15.2 m) buffer is recommended around water bodies and stream edges. In cases where artificial water bodies (*i.e.,* stormwater ponds) are created, enhance edges with native plantings especially in cases in which wetland habitat was affected.
7. Avoid or limit widespread application of insecticides (*e.g.,* mosquito control, agricultural pest control) in areas where Florida bonneted bats are known or expected to forage or roost.
8. Conserve natural vegetation to promote insect diversity, availability, and abundance. For example, retain or restore 25% of the parcel in native contiguous vegetation.
9. Retain mature trees and snags that could provide roosting habitat. These may include live trees of various sizes and dead or dying trees with cavities, hollows, crevices, and loose bark. See "Roosting Habitat" in "Background" above.
10. Protect known Florida bonneted bat roost trees, snags or structures and trees or snags that have been historically used by Florida bonneted bats for roosting, even if not currently occupied, by retaining a 250 foot (76 m) disturbance buffer around the roost tree, snag, or structure to ensure that roost sites remain suitable for use in the future.
11. Avoid and minimize the use of artificial lighting, retain natural light conditions, and install wildlife friendly lighting (*i.e*., downward facing and lowest lumens possible). Avoid permanent night-time lighting to the greatest extent practicable.
12. Incorporate engineering designs that discourage bats from using buildings or structures. If Florida bonneted bats take residence within a structure, contact the Service and Florida Fish and Wildlife Conservation Commission prior to attempting removal or when conducting maintenance activities on the structure.
13. Use or allow prescribed fire to promote foraging habitat.

Appendix E: Additional Best Management Practices (BMPs) for Land Management Projects

Ecological Land Management

The Service reviews and develops Ecological Land Management projects that use land management activities to restore and maintain native, natural communities that are beneficial to bats. These activities include prescribed fire, mechanical treatments to reduce vegetation densities, timber thinning to promote forest health, trail maintenance, and the treatment of exotic vegetation. The following BMPs provide recommendations for conserving Florida bonneted bat roosting and foraging habitat during ecological land management activities. The Service recommends incorporating these BMP into ecological land management plans.

If potential roost trees need to be removed, check cavities for bats prior to removal of trees or snags. If evidence of use by any bat species is observed, discontinue removal efforts in that area and coordinate with the Service on how to proceed.

Ecological Land Management BMPs:

- Protect potential roosting habitat during ecological land management activities, if feasible. Avoid removing trees or snags with cavities.
- Rake and/or manually clear vegetation around the base of known or suspected roost trees to remove fuel prior to prescribed burning.
- If possible, use ignition techniques such as spot fires or backing fire to limit the intensity of fire around the base of the tree or snag containing the roost. The purpose of this action is to prevent the known or suspected roost tree or snag from catching fire and also to attempt to limit the exposure of the roosting bats to heat and smoke. A 250-ft (76 m) buffer is recommended.
- If prescribed fire is being implemented to benefit Florida bonneted bats, Braun de Torrez et al. (2018) noted that fire in the dry/spring season could be most beneficial.
- When creating firebreaks or conducting fire-related mechanical treatment, mark and avoid any known or suspected bat roosts.
- When using heavy equipment, establish a buffer of 250 feet (76 m) around known roosts to limit disturbance to roosting bats.
- Establish forest management efforts to maintain tree species and size class diversity to ensure long-term supply of potential roost sites.
- For every 5 acres (2 hectares) of timber that is harvested, retain a clump of trees 1-2 acres (0.4 - 0.8 hectare) in size containing potential roost trees, especially pines and royal palms (live or dead). Additionally, large snags in open canopy should be preserved.

Literature Cited – Appendix E

Braun de Torrez, E.C., H.K. Ober, and R.A. McCleery. 2018. Activity of an Endangered Bat Increases Immediately Following Prescribed Fire. The Journal of Wildlife Management.

Appendix L

Florida Bonneted Bat Survey Memorandum

FLORIDA BONNETED BAT ACOUSTIC SURVEY TECHNICAL REPORT

Florida Department of Transportation

District One

Burnt Store Road PD&E Study

Limits of Project: From Van Buren Parkway to Charlotte County Line

Lee County, Florida

Financial Management Number: 436928-1-22-01

ETDM Number: 14380

Date: 12/7/2022

The environmental review, consultation, and other actions required by applicable federal environmental laws for this project are being, or have been, carried out by the Florida Department of Transportation (FDOT) pursuant to 23 U.S.C. § 327 and a Memorandum of Understanding dated May 26, 2022 and executed by the Federal Highway Administration and FDOT.

BURNT STORE ROAD PD&E STUDY FROM VAN BUREN PARKWAY TO CHARLOTTE COUNTY LINE FPID 436928-1

Florida Bonneted Bat Acoustic Survey Technical Report

Prepared for
Scalar Consulting Group, Inc.
and
FDOT, District One

December 2022

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BURNT STORE ROAD PD&E STUDY FROM VAN BUREN PARKWAY TO CHARLOTTE COUNTY LINE

Florida Bonneted Bat Acoustic Survey Technical Report

Introduction

The Florida Department of Transportation (FDOT), District One, is conducting a Project Development and Environment (PD&E) Study to evaluate the proposed widening of Burnt Store Road (CR 765) from Van Buren Parkway to Charlotte County Line in Lee County. The study also extends a quarter mile north into Charlotte County to tie into the existing four-lane segment. The total project length is approximately 5.7 miles, and the project limits are shown in **Figure 1**. Alternatives to be evaluated include the widening of the existing two-lane undivided roadway to four lanes, and to four lanes expandable to six lanes. The proposed project may also include the addition of paved shoulders/marked bicycle lanes, sidewalks, and/or a shared-use path. The purpose of the PD&E Study is to document and evaluate engineering and environmental data that will aid Lee County, Lee Metropolitan Planning Organization (MPO), FDOT District One, and the FDOT Office of Environmental Management (OEM) in reaching a decision on the type, preliminary design, and location of the proposed improvements. The study was conducted to meet the requirements of the National Environmental Policy Act (NEPA) and other related federal and state laws, rules, and regulations.

This report summarizes the methods and results of a species-specific survey for the Florida bonneted bat (*Eumops floridanus*). The project limits overlap the U.S. Fish and Wildlife Service (USFWS) Florida bonneted bat consultation area (CA). This survey was conducted in accordance with the 2019 USFWS Florida Bonneted Bat Consultation Guidelines.

Species Information

Species and Habitat Description

The Florida bonneted bat has a body length of between 84 to 108 millimeters (mm) (approximately 3.75 inches) with a wingspan of 490 to 530 mm (approximately 20 inches), making it the largest species of bat in Florida. Its fur color can range from a dark grey to reddish brown and a distinguishing characteristic of the Florida bonneted bat is its large, rounded ears which are joined at the midline of the forehead. There is no significant difference in size or appearance between

males and females. Florida bonneted bat echolocations have a minimum frequency of 10-18 kilohertz (kHz) and a maximum frequency of 16-22 kHz.

Very little is known about the life history and ecology of the Florida bonneted bat. Natural roosting habitat for this species includes forested areas containing tall mature trees such as pine flatwoods, mixed or hardwood hammocks, wetland forested systems, and sand pine scrub. In these natural habitats, Florida bonneted bats may roost in tree snags, tree cavities, under loose bark, tree crevices, or other deformities within mature trees. Documented roosts have occurred in trees greater than 6 meters (20 feet) tall, with a diameter at breast height of 20.3 centimeters (cm) (8 inches), and having cavities higher than 4.6 meters (15 feet) above ground. Florida bonneted bats have also been documented roosting in urban/suburban areas. Roosting habitat in these areas includes the shafts of royal palm (*Roystonea regia*) leaves, underneath tiles in Spanish tile roofs, attics, rock or brick chimneys of buildings, utility poles, and manmade bat houses.

This species can cover large areas when foraging. Studies at the Babcock-Webb Wildlife Management Area (WMA) conducted with Florida bonneted bats fitted with Global Positioning System (GPS) satellite tags documented the maximum distance detected from a capture site was 24.2 miles and the longest path traveled in a single night was 56.3 miles. Florida bonneted bats were documented traveling a mean maximum distance of 9.5 miles from the roost from a sample size of eight individuals.

Status

The Florida bonneted bat is listed as a federally designated Endangered species by the USFWS and is protected by the Endangered Species Act (ESA), as amended (16 U.S. Code (U.S.C.) 1531-1544, 87 Stat. 884). No critical habitat (CH) has been designated for this species; however, the USFWS proposed draft language for designation of CH in June 2020, which was revised recently in November 2022. The project mainline is adjacent to, but does not fall within, the proposed CH. However, there are two preferred pond sites that are within the proposed CH (**Figure 1**). A South Florida Urban Bat Area located in in Miami-Dade and Broward County was designated in the guidelines by USFWS. If a project is located in this area the consultation key does not apply and specific guidance from USFWS addressing this area and individual consultation is required.

Florida bonneted bats are unique from other bat species in Florida due to their ability to forage far from their roosts and to reproduce throughout most of the year. As a result, disturbances to their roosts can have an adverse effect on the species throughout a greater portion of the year. Furthermore, impacts to their foraging habitat can also have adverse effects, even if the impacts are located a significant distance from their roosts.

Methodology

Desktop Data Collection

A comprehensive literature and geospatial database search were conducted for the project area to determine if the Florida bonneted bat has been previously documented within the project limits and

if suitable roosting or foraging habitat is available. The literature and geospatial database search included standard references such as the Rare and Endangered Biota of Florida Series, Florida Geographic Data Library (FGDL) Geographic Information System (GIS) databases, as well as resources from the Florida Fish and Wildlife Conservation Commission (FWC) and USFWS databases such as National Wetlands Inventory (NWI) mapping, CA limits, proposed CH limits, and the 2019 USFWS Consultation Key for the Florida Bonneted Bat. Additional reviewed sources included the South Florida Water Management District (SFWMD) Florida Land Use, Cover and Forms Classification System (FLUCFCS), current information from the Federal Register for Endangered and Threatened Wildlife and Plants, and current aerial imagery.

Based on this preliminary data collection effort, findings related to the Florida bonneted bat and this project include the following:

- The project falls entirely within the USFWS Florida bonneted bat CA;
- The project does not fall within the USFWS designated South Florida Urban Bat Area located in Miami-Dade and Broward County;
- The project mainline is adjacent to the proposed CH and two preferred pond sites are within the proposed CH;
- Potentially suitable foraging and roosting habitat was identified within the project boundary; and
- The project is adjacent to conservation lands associated with Babcock Webb Wildlife Management Area and known Florida bonneted bat houses are approximately 7 miles northeast of the project on the east side of I-75.

Field Surveys

The Florida bonneted bat acoustic surveys followed the protocol documented in the October 2019 USFWS South Florida Ecological Services Office's *Florida Bonneted Bat Consultation Guidelines* (USFWS 2019) for linear projects that contain potential bonneted bat roosting and foraging habitat and that are also greater than five acres in size. Per the guidelines, the following weather conditions must be met for the first five hours of each survey night:

- Temperature at or above 65 degrees Fahrenheit;
- Precipitation events, including rain and/or fog cannot exceed 30 minutes in length; and
- Sustained wind speeds cannot be greater than nine miles per hour.

For the Burnt Store Road project, eleven (11) acoustic survey stations were developed based on the minimum requirements of five (5) detector nights per 0.60 miles for linear projects. The acoustic survey station locations are depicted in **Figure 2**. Representative photos of the acoustic survey stations are provided in **Appendix A** and the survey locations and dates for each survey station are provided in **Table 1** below.

TABLE 1
EQUIPMENT DEPLOYMENT DETAILS

Station	Latitude	Longitude	Deployment Dates (2022)	Notes
1	26.695047	-82.038715	10/25/22 through 10/31/22	October 26 and 29 were excluded due to inclement weather
2	26.704313	-82.038859	10/25/22 through 10/31/22	October 26 and 29 were excluded due to inclement weather
3	26.71206	-82.037625	10/25/22 through 10/31/22	October 26 and 29 were excluded due to inclement weather
4	26.719386	-82.038304	10/25/22 through 10/31/22	October 26 and 29 were excluded due to inclement weather
5	26.729412	-82.039932	10/25/22 through 10/31/22	October 26 and 29 were excluded due to inclement weather
6	26.738055	-82.038196	10/31/22 through 11/15/22	November 2, 3, 6-9, and 13 were excluded due to inclement weather
7	26.748414	-82.038384	10/25/22 through 10/31/22	October 26 and 29 were excluded due to inclement weather
8	26.757095	-82.038173	10/25/22 through 10/31/22	October 26 and 29 were excluded due to inclement weather
9	26.760642	-82.040879	10/25/22 through 10/31/22	October 26 and 29 were excluded due to inclement weather
10	26.767064	-82.037913	10/31/22 through 11/15/22	November 2, 3, 6-9, and 13 were excluded due to inclement weather
11	26.772345	-82.037273	10/31/22 through 11/15/22	November 2, 3, 6-9, and 13 were excluded due to inclement weather

Each acoustic survey station was placed in an area deemed to be a potentially suitable flight path for the Florida bonneted bat and where nearby habitat contained mature forested areas and an open water source to maximize chances of detecting foraging bats and potential roosting areas. At each survey station, a Wildlife Acoustics Song Meter SM4BAT Full Spectrum (FS) detector, set to automatically begin collecting data continuously from 30 minutes before sunset to 30 minutes after sunrise, was deployed and programmed to record 15-second file lengths with a two-second trigger window. Each detector was fitted with an omnidirectional Wildlife Acoustic SMM-U2 External Ultrasonic Microphone placed atop an adjustable pole. The microphones were not placed beneath tree canopies and were situated away from echo-producing surfaces including open water.

Data Analysis

The Wildlife Acoustics Song Meter SM4BAT Full Spectrum detector records bat echolocations as Waveform Audio (WAV) files. A single WAV file is made up of a series of pulses that are considered a single bat pass. The WAV files recorded at each survey station were analyzed using Wildlife Acoustics Kaleidoscope Pro version 5.4.8. The auto-identification parameters used by Kaleidoscope Pro were from Bats of North America (Version 5.4.0), region Florida, and the sensitivity setting was set to zero balanced (neutral). The species to be selected in the auto identification classifier included: big brown bat (*Eptesicus fuscus*), Florida bonneted bat, eastern red bat (*Lasiurus borealis*), hoary bat (*Lasiurus cinereus*), northern yellow bat (*Lasiurus intermedius*), Seminole bat (*Lasiurus seminolus*), southeastern myotis (*Myotis austroriparius*), northern long-eared bat (*Myotis septentrionalis*), evening bat (*Nycticeius humeralis*), tri-colored bat (*Perimyotis subflavus*), and Brazilian free-tailed bat (*Tadarida brasiliensis*).

The bat acoustic data was retrieved, saved, analyzed, and interpreted by experienced biologists who have taken one or more bat acoustic courses/workshops and who have also previously reviewed

Florida bonneted bat echolocations using Kaleidoscope Pro. All echolocations auto identified by Kaleidoscope Pro as being created by a Florida bonneted bat were visually reviewed and manually verified by experienced biologists. The following parameters were considered in manual verification of Florida bonneted bat echolocations:

- Whether the characteristic frequency of echolocations fall within the documented range for the Florida bonneted bat;
- Whether there are three or more echolocations where the time between echolocations remained consistent across the sequence of echolocations;
- Whether the minimum frequency remained consistent across the sequence of echolocations;
- Whether the slope and bandwidth remained consistent from echolocation to echolocation; and
- Whether there was good signal to noise ratio as evidenced by a crisp, clean oscillogram.

Additionally, all WAV files with characteristic frequencies below 25 kHz that were not assigned an auto identification, and therefore classified by Kaleidoscope Pro as "No ID", were manually reviewed to determine if they could contain Florida bonneted bat echolocations i.e., pulses.

Results

Weather data was collected from the National Oceanic and Atmospheric Administration (NOAA) National Weather Service (NWS) from 30 minutes prior to sunset to 30 minutes after sunrise and is provided in **Appendix B**. The closest NOAA station, Punta Gorda Airport (KPGD) (approximately 12 miles northeast), was used through November 3, 2022 until it malfunctioned and Page Field Airport (KFMY) (approximately 15 miles southeast) was used for the rest of the survey.

A summary of the acoustic data collected at each survey station is listed in **Appendix C** and is detailed in the following sections. This summary includes the total number of nights the detectors were deployed and the nights during which the weather conditions met the requirements in the guidelines.

Acoustic Survey Station 1

Station 1 was surveyed from October 25 through 31, 2022. The nights with acceptable weather conditions were October 25, 27, 28, 30, and 31, 2022. A total of 1,402 WAV files were recorded and, of these, 951 WAV files were auto-identified to the species level, 210 WAV files were not assigned an auto-identification, and 241 WAV files were classified as noise. Thirty-four (34) WAV files were auto-identified as containing Florida bonneted bat echolocations. These WAV files were manually inspected and 20 were confirmed as Florida bonneted bat echolocations. None of the calls were recorded within 30 minutes before sunset to 1½ hours following sunset or within 1½ hours before sunrise and no emergence calls were recorded. Twelve (12) of the calls were in one night and one call was classified as a social call. Therefore, per the Florida Bonneted Bat Consultation Guidelines this area is considered to have High Florida Bonneted Bat Activity. The following is a summary of the auto-identification data:

- Big brown bat (35 WAV files)

- Eastern red bat (3 WAV files)
- Hoary bat (90 WAV files)
- Northern yellow bat (34 WAV files)
- Seminole bat (5 WAV files)
- Evening bat (5 WAV files)
- Tricolored bat (8 WAV files)
- Brazilian free-tailed bat (737 WAV files)
- **Florida bonneted bat (34 WAV files with 20 confirmed WAV files)**

Acoustic Survey Station 2

Station 2 was surveyed from October 25 through 31, 2022. The nights with acceptable weather conditions were October 25, 27, 28, 30, and 31, 2022. A total of 1,899 WAV files were recorded and, of these, 722 WAV files were auto-identified to the species level, 197 WAV files were not assigned an auto-identification, and 980 WAV files were classified as noise. Fourteen (14) WAV files were auto-identified as containing Florida bonneted bat echolocations. These WAV files were manually inspected and 10 were confirmed as Florida bonneted bat echolocations. None of the calls were recorded within 30 minutes before sunset to 1½ hours following sunset or within 1½ hours before sunrise and no emergence calls were recorded. No single night contained more than five of these echolocations but two feeding buzzes were detected in one WAV file. Therefore, per the Florida Bonneted Bat Consultation Guidelines this area is considered to have High Florida Bonneted Bat Activity. The following is a summary of the auto-identification data:

- Big brown bat (20 WAV files)
- Eastern red bat (6 WAV files)
- Hoary bat (68 WAV files)
- Northern yellow bat (23 WAV files)
- Seminole bat (6 WAV files)
- Southeastern myotis (1 WAV file)
- Evening bat (6 WAV files)
- Tricolored bat (19 WAV files)
- Brazilian free-tailed bat (559 WAV files)
- **Florida bonneted bat (14 WAV files with 10 confirmed WAV files)**

Acoustic Survey Station 3

Station 3 was surveyed from October 25 through 31, 2022. The nights with acceptable weather conditions were October 25, 27, 28, 30, and 31, 2022. A total of 1,817 WAV files were recorded and, of these, 1,306 WAV files were auto-identified to the species level, 206 WAV files were not assigned an auto-identification, and 305 WAV files were classified as noise. Nineteen (19) WAV files were auto-identified as containing Florida bonneted bat echolocations. These WAV files were manually inspected and 5 were confirmed as Florida bonneted bat echolocations. None of the calls were recorded within 30 minutes before sunset to 1½ hours following sunset or within 1½ hours

before sunrise and no emergence calls were recorded. The following is a summary of the auto-identification data:

- Big brown bat (11 WAV files)
- Eastern red bat (1 WAV file)
- Hoary bat (133 WAV files)
- Northern yellow bat (22 WAV files)
- Evening bat (1 WAV file)
- Tricolored bat (5 WAV file)
- Brazilian free-tailed bat (1,114 WAV files)
- **Florida bonneted bat (19 WAV files with 5 confirmed WAV files)**

Acoustic Survey Station 4

Station 4 was surveyed from October 25 through 31, 2022. The nights with acceptable weather conditions were October 25, 27, 28, 30, and 31, 2022. A total of 14,089 WAV files were recorded and, of these, 6,617 WAV files were auto-identified to the species level, 2,307 WAV files were not assigned an auto-identification, and 5,885 WAV files were classified as noise. Thirty-five (35) WAV files were auto-identified as containing Florida bonneted bat echolocations. These WAV files were manually inspected and were determined not to contain Florida bonneted bat echolocations. Several appeared to be artificial noise or insects. The following is a summary of the auto-identification data:

- Big brown bat (110 WAV files)
- Eastern red bat (7 WAV files)
- Hoary bat (1,823 WAV files)
- Northern yellow bat (105 WAV files)
- Seminole bat (14 WAV files)
- Evening bat (19 WAV files)
- Tricolored bat (1 WAV file)
- Brazilian free-tailed bat (4,503 WAV files)
- **Florida bonneted bat (35 WAV files with 0 confirmed WAVfiles)**

Acoustic Survey Station 5

Station 5 was surveyed from October 25 through 31, 2022. The nights with acceptable weather conditions were October 25, 27, 28, 30, and 31, 2022. A total of 6,938 WAV files were recorded and, of these, 3,299 WAV files were auto-identified to the species level, 1,255 WAV files were not assigned an auto-identification, and 2,384 WAV files were classified as noise. Twenty-four (24) WAV files were auto-identified as containing Florida bonneted bat echolocations. These WAV files were manually inspected and 4 were confirmed as Florida bonneted bat echolocations. None of the calls were recorded within 30 minutes before sunset to 1½ hours following sunset or within 1½ hours before sunrise and no emergence calls were recorded. The following is a summary of the auto-identification data:

- Big brown bat (301 WAV files)
- Eastern red bat (8 WAV files)
- Hoary bat (333 WAV files)
- Northern yellow bat (277 WAV files)
- Seminole bat (28 WAV files)
- Evening bat (191 WAV files)
- Tricolored bat (41 WAV files)
- Brazilian free-tailed bat (2,096 WAV files)
- **Florida bonneted bat (24 WAV files with 4 confirmed WAV file)**

Acoustic Survey Station 6

Station 6 was surveyed from October 31 through November 15, 2022. The nights with acceptable weather conditions were October 31, November 1, 4, 5, 10-12, 14 and 15, 2022. A total of 12,631 WAV files were recorded and, of these, 8,559 WAV files were auto-identified to the species level, 2,837 WAV files were not assigned an auto-identification, and 1,235 WAV files were classified as noise. Forty (40) WAV files were auto-identified as containing Florida bonneted bat echolocations. These WAV files were manually inspected and 3 were confirmed as Florida bonneted bat echolocations. None of the calls were recorded within 30 minutes before sunset to 1½ hours following sunset or within 1½ hours before sunrise and no emergence calls were recorded. The following is a summary of the auto-identification data:

- Big brown bat (402 WAV files)
- Eastern red bat (13 WAV files)
- Hoary bat (1,805 WAV files)
- Northern yellow bat (785 WAV files)
- Seminole bat (9 WAV files)
- Evening bat (28 WAV files)
- Tricolored bat (22 WAV files)
- Brazilian free-tailed bat (5,455 WAV files)
- **Florida bonneted bat (40 WAV files with 3 confirmed WAV files)**

Acoustic Survey Station 7

Station 7 was surveyed from October 25 through 31, 2022. The nights with acceptable weather conditions were October 25, 27, 28, 30, and 31, 2022. A total of 5,358 WAV files were recorded and, of these, 3,260 WAV files were auto-identified to the species level, 430 WAV files were not assigned an auto-identification, and 1,668 WAV files were classified as noise. Nine (9) WAV files were auto-identified as containing Florida bonneted bat echolocations. These WAV files were manually inspected and one (1) was confirmed as a Florida bonneted bat echolocation. The call was not recorded within 30 minutes before sunset to 1½ hours following sunset or within 1½ hours before sunrise and was not an emergence call. The following is a summary of the auto-identification data:

- Big brown bat (20 WAV files)
- Eastern red bat (8 WAV files)
- Hoary bat (126 WAV files)
- Northern yellow bat (73 WAV files)
- Seminole bat (15 WAV files)
- Evening bat (46 WAV files)
- Tricolored bat (3 WAV files)
- Brazilian free-tailed bat (2,960 WAV files)
- **Florida bonneted bat (9 WAV files with 1 confirmed WAV file)**

Acoustic Survey Station 8

Station 8 was surveyed from October 25 through 31, 2022. The nights with acceptable weather conditions were October 25, 27, 28, 30, and 31, 2022. A total of 12,083 WAV files were recorded and, of these, 8,103 WAV files were auto-identified to the species level, 1,715 WAV files were not assigned an auto-identification, and 2,265 WAV files were classified as noise. One hundred thirteen (113) WAV files were auto-identified as containing Florida bonneted bat echolocations. These WAV files were manually inspected and one (1) was confirmed as a Florida bonneted bat echolocation. The call was not recorded within 30 minutes before sunset to 1½ hours following sunset or within 1½ hours before sunrise and was not an emergence call. The following is a summary of the auto-identification data:

- Big brown bat (37 WAV files)
- Eastern red bat (8 WAV files)
- Hoary bat (4,393 WAV files)
- Northern yellow bat (467 WAV files)
- Seminole bat (30 WAV files)
- Evening bat (326 WAV files)
- Tricolored bat (7 WAV files)
- Brazilian free-tailed bat (2,722 WAV files)
- **Florida bonneted bat (113 WAV files with 1 confirmed WAV file)**

Acoustic Survey Station 9

Station 9 was surveyed from October 25 through 31, 2022. The nights with acceptable weather conditions were October 25, 27, 28, 30, and 31, 2022. A total of 2,934 WAV files were recorded and, of these, 1,708 WAV files were auto-identified to the species level, 619 WAV files were not assigned an auto-identification, and 607 WAV files were classified as noise. Nineteen (19) WAV files were auto-identified as containing Florida bonneted bat echolocations. These WAV files were manually inspected and 14 were confirmed as Florida bonneted bat echolocations but no single night contained more than eight of these echolocations. Additionally, none of the calls were recorded within 30 minutes before sunset to 1½ hours following sunset or within 1½ hours before

sunrise and no emergence calls were recorded. The following is a summary of the auto-identification data:

- Big brown bat (115 WAV files)
- Eastern red bat (8 WAV files)
- Hoary bat (111 WAV files)
- Northern yellow bat (102 WAV files)
- Seminole bat (101 WAV files)
- Evening bat (271 WAV files)
- Tricolored bat (24 WAV files)
- Brazilian free-tailed bat (957 WAV files)
- **Florida bonneted bat (19 WAV files with 14 confirmed WAV files)**

Acoustic Survey Station 10

Station 10 was surveyed from October 31 through November 15, 2022. The nights with acceptable weather conditions were October 31, November 1, 4, 5, 10-12, 14 and 15, 2022. A total of 3,721 WAV files were recorded and, of these, 2,366 WAV files were auto-identified to the species level, 1,004 WAV files were not assigned an auto-identification, and 351 WAV files were classified as noise. Eight (8) WAV files were auto-identified as containing Florida bonneted bat echolocations. These WAV files were manually inspected and one (1) was confirmed as a Florida bonneted bat echolocation. The call was not recorded within 30 minutes before sunset to 1½ hours following sunset or within 1½ hours before sunrise and was not an emergence call. The following is a summary of the auto-identification data:

- Big brown bat (121 WAV files)
- Eastern red bat (39 WAV files)
- Hoary bat (300 WAV files)
- Northern yellow bat (257 WAV files)
- Seminole bat (54 WAV files)
- Northern long-eared bat (1 WAV file)
- Evening bat (154 WAV files)
- Tricolored bat (85 WAV files)
- Brazilian free-tailed bat (1,347 WAV files)
- **Florida bonneted bat (8 WAV files with 1 confirmed WAV file)**

Acoustic Survey Station 11

Station 11 was surveyed from October 31 through November 15, 2022. The nights with acceptable weather conditions were October 31, November 1, 4, 5, 10-12, 14 and 15, 2022. A total of 4,418 WAV files were recorded and, of these, 3,225 WAV files were auto-identified to the species level, 1,127 WAV files were not assigned an auto-identification, and 66 WAV files were classified as noise. Eight (8) WAV files were auto-identified as containing Florida bonneted bat echolocations.

These WAV files were manually inspected and one (1) was confirmed as a Florida bonneted bat echolocation. The call was not recorded within 30 minutes before sunset to 1½ hours following sunset or within 1½ hours before sunrise and was not an emergence call. The following is a summary of the auto-identification data:

- Big brown bat (154 WAV files)
- Eastern red bat (49 WAV files)
- Hoary bat (174 WAV files)
- Northern yellow bat (322 WAV files)
- Seminole bat (23 WAV files)
- Southeastern myotis (1 WAV file)
- Evening bat (512 WAV files)
- Tricolored bat (89 WAV files)
- Brazilian free-tailed bat (1,893 WAV files)
- **Florida bonneted bat (8 WAV files with 1 confirmed WAV file)**

Conclusion

A total of 67,290 WAV files were recorded at the eleven (11) survey stations during Florida bonneted bat acoustic surveys for this proposed Burnt Store Road widening project. Of these, 323 WAV files were auto identified by Kaleidoscope Pro as containing Florida bonneted bat echolocations. Biologists manually verified each of the auto identified Florida bonneted bat WAV files and all files with frequencies between 8 kHz and 25 kHz classified by Kaleidoscope Pro as "No ID". As a result, it was found that 60 of the files contain echolocations from the Florida bonneted bat. As described above, Station 1 had over 9 calls in one night and one social call and Station 2 had multiple feeding buzzes. Therefore, both stations met the USFWS criteria to be considered as having High Florida Bonneted Bat Activity. Station 1 is adjacent to Gator Slough Canal, which is connected to estuarine wetlands to the west and therefore is likely high quality foraging habitat. Station 2 was also in close proximity to Gator Slough Canal and adjacent to a canal and two existing stormwater ponds both of which provide high quality foraging. Finally, many of the files that were not manually verified as Florida bonneted bat were identified as noise (potentially from vehicular traffic), insects, or birds. **Figure 3** contains examples of calls that were misclassified/auto-identified as Florida bonneted bat.

The USFWS Florida Bonneted Bat Consultation Key within the guidelines was used to identify the effect determination for the proposed Burnt Store Road project. The following sections of the key were applicable (1a, 2a, 3b, 6a, 7b, 10a, and 11b), resulting in May Affect, Not Likely to Adversely - C with required BMPs (MANLAA-C). Further consultation with the Service is required for the Florida bonneted bat.

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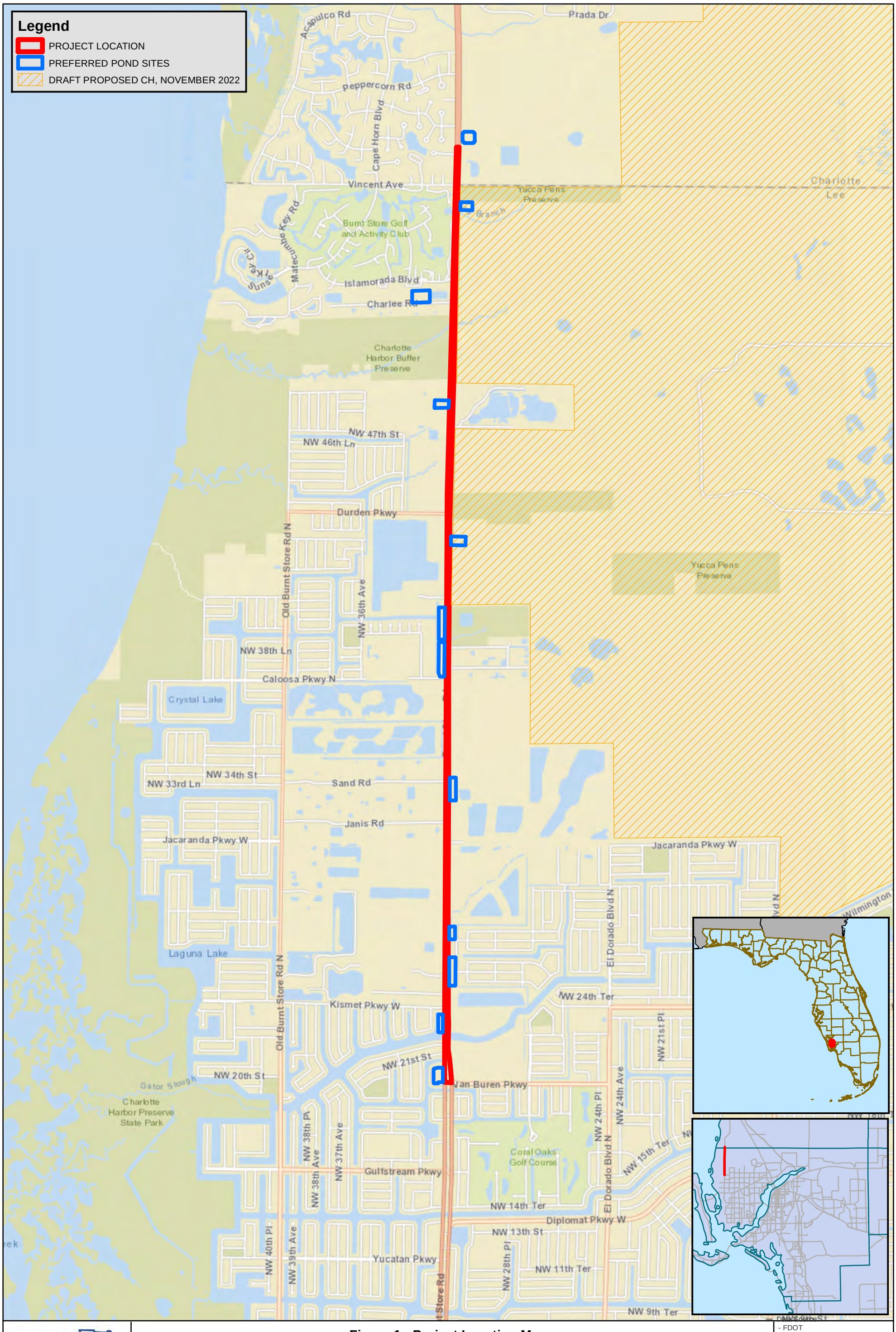
FIGURES



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

Figure 1 - Project Location Map

FPID #: 436928-1-22-01
Burnt Store Rd PD&E Study from Van Buren Pkwy to Charlotte County Line
Lee County, Florida

U:\GIS\GIS\Projects\19-xxx\D2019010780.0, Burnt Store Rd. PD&E from Van Buren Pkwy to Charlotte\03_MXDs_Projects\D20191010078_Fig1Loc_BJQ_20221129.mxd

Legend

- PROJECT LOCATION
- FBB SURVEY POINTS
- PREFERRED POND SITES
- DRAFT PROPOSED CH, NOVEMBER 2022

Station 11
Station 10
Station 9
Station 8
Station 7
Station 6
Station 5
Station 4
Station 3
Station 2
Station 1

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Figure 2 - Acoustic Survey Station Location Map

FPID #: 436928-1-22-01
Burnt Store Rd PD&E Study from Van Buren Pkwy to Charlotte County Line
Lee County, Florida

0 1,500 3,000 4,500 Feet

Data Source:
- FDOT
- Scalar
- ESA

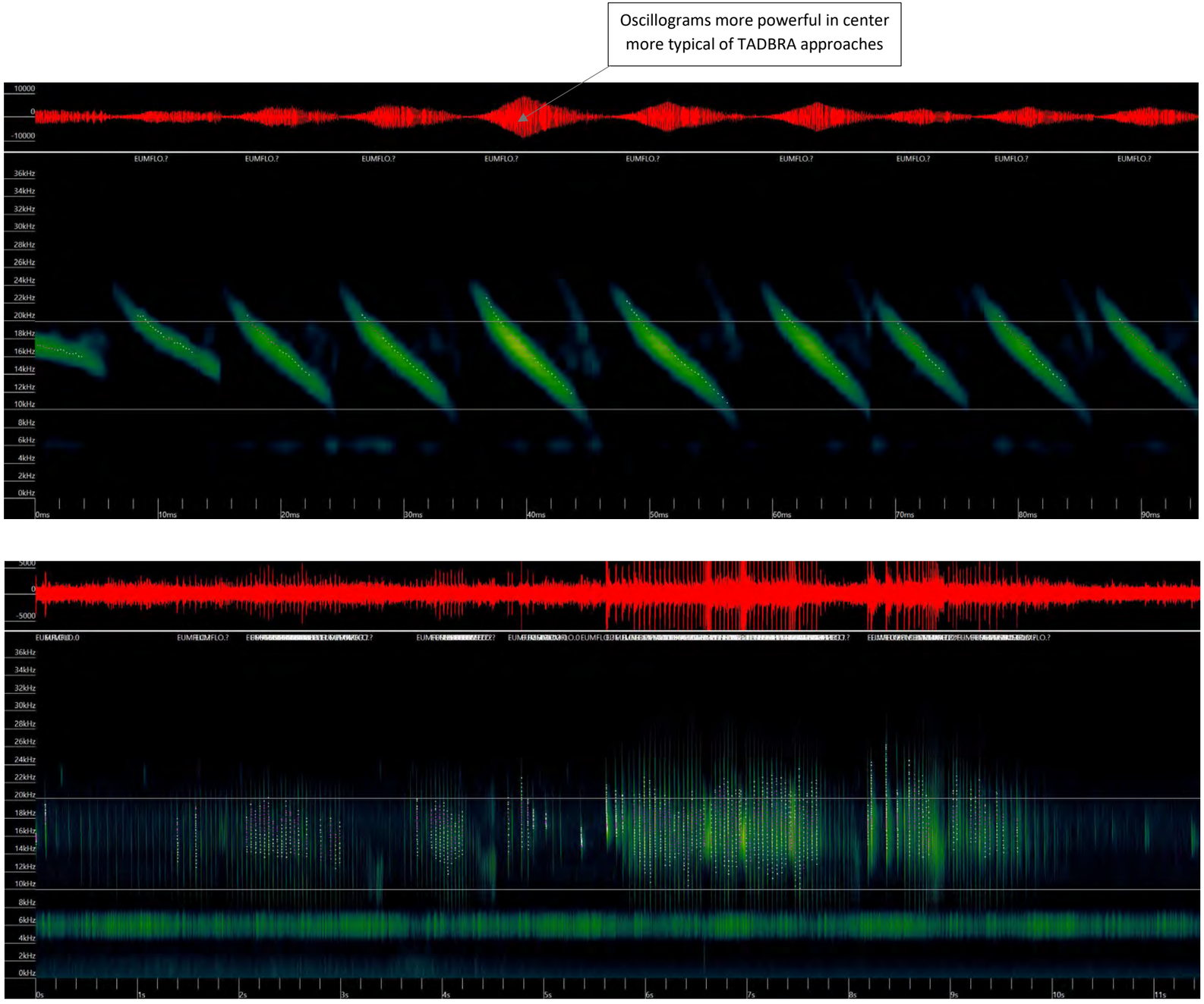
Imagery Source:
- ESRI Streets

Coordinate System:
NAD 1983 Florida State Plane West

N

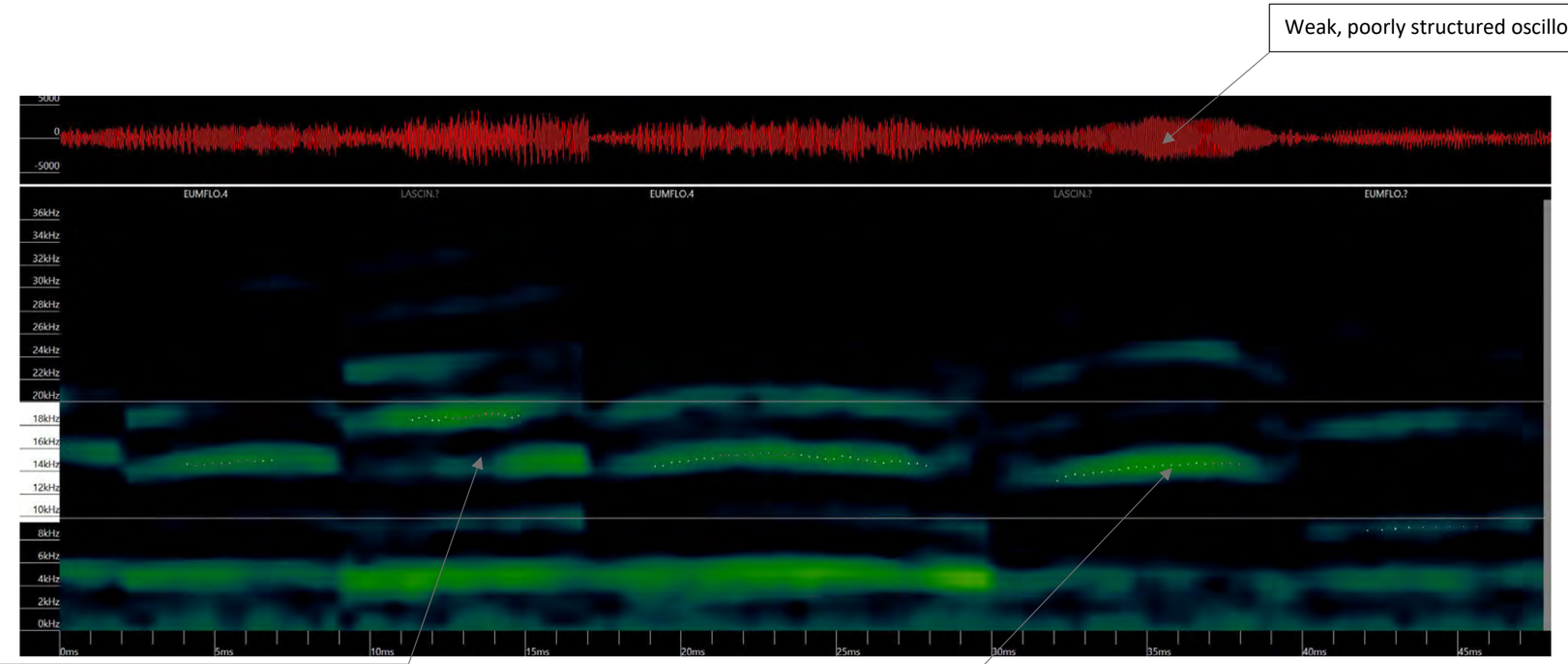
Figure 3 - Examples of Calls Misclassified as Florida Bonneted Bat

Misclassification: Different Species

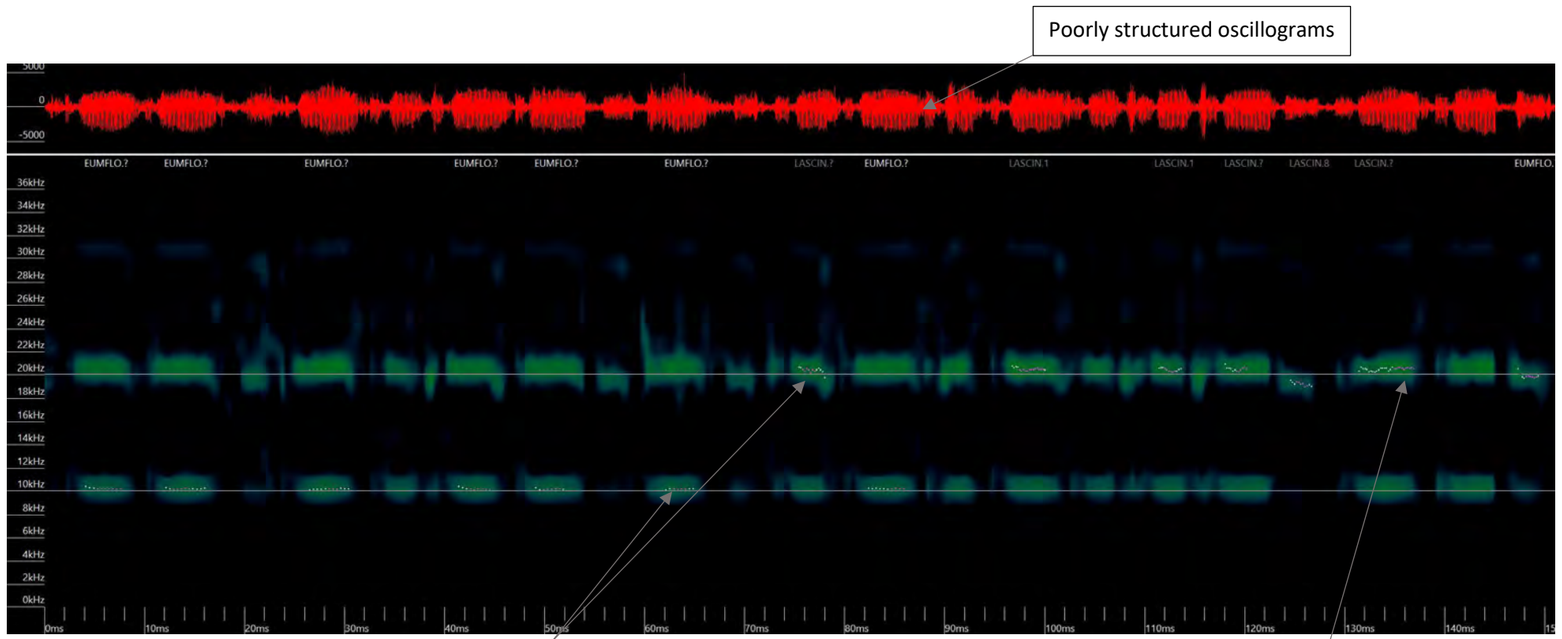


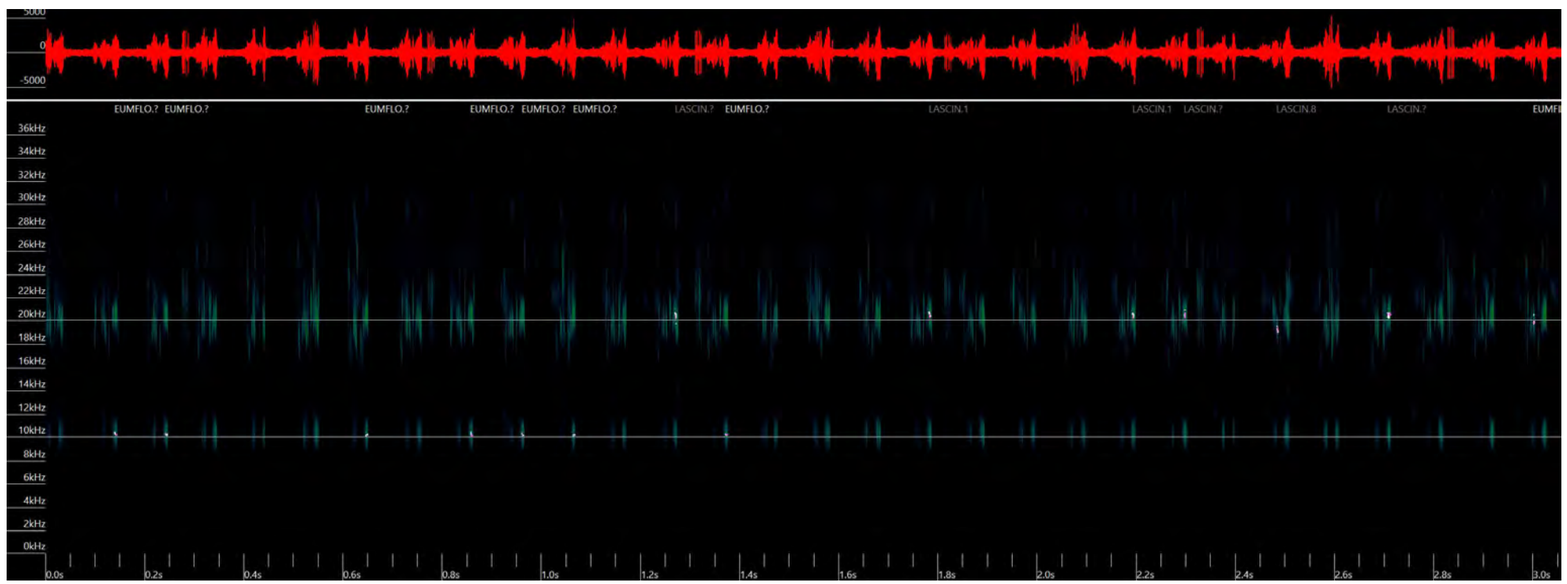
Cannot confirm EUMFLO with lack of search phase calls

Misclassification: Different Class



Misclassification: Different Phylum





Expanded view shows “pulses” are samples from larger sounds (insects)

Appendix A

PHOTOGRAPHS OF SURVEY STATIONS

Survey Station No. 1

Survey Station No. 2

Burnt Store Rd from Van Buren Pkwy to Charlotte County Line FPID No. 436928-1	**Appendix A** Representative Photographs of Acoustic Survey Stations

Survey Station No. 3

Survey Station No. 4

Burnt Store Rd from Van Buren Pkwy to Charlotte County Line FPID No. 436928-1	**Appendix A** Representative Photographs of Acoustic Survey Stations

Survey Station No. 5

Survey Station No. 6

Burnt Store Rd from Van Buren Pkwy to Charlotte County Line FPID No. 436928-1	**Appendix A** Representative Photographs of Acoustic Survey Stations

Survey Station No. 7

Survey Station No. 8

Burnt Store Rd from Van Buren Pkwy to Charlotte County Line FPID No. 436928-1	**Appendix A** Representative Photographs of Acoustic Survey Stations

Survey Station No. 9

Survey Station No. 10

Burnt Store Rd from Van Buren Pkwy to Charlotte County Line FPID No. 436928-1	**Appendix A** Representative Photographs of Acoustic Survey Stations

Survey Station No. 11

Burnt Store Rd from Van Buren Pkwy to Charlotte County Line FPID No. 436928-1	**Appendix A** Representative Photographs of Acoustic Survey Stations

Appendix B

NOAA National Weather Service Data

Appendix B. NOAA National Weather Service Data

Date	Time	Temperature	Dew Point	Humidity	Direction	Wind Speed	Wind Gust	Pressure	Precipitation	Conditions
10/25/2022	5:53 PM	85 °F	60 °F	43 %	NNE	3 mph	0 mph	29.90 in	0.0 in	Fair
	6:53 PM	80 °F	64 °F	58 %	SW	5 mph	0 mph	29.90 in	0.0 in	Fair
	7:53 PM	78 °F	65 °F	64 %	WSW	3 mph	0 mph	29.92 in	0.0 in	Fair
	8:53 PM	75 °F	66 °F	73 %	WNW	6 mph	0 mph	29.94 in	0.0 in	Fair
	9:53 PM	72 °F	66 °F	81 %	CALM	0 mph	0 mph	29.94 in	0.0 in	Fair
	10:53 PM	69 °F	66 °F	90 %	CALM	0 mph	0 mph	29.95 in	0.0 in	Fair
	11:53 PM	67 °F	65 °F	93 %	ENE	5 mph	0 mph	29.95 in	0.0 in	Fair
	12:53 AM	69 °F	66 °F	90 %	CALM	0 mph	0 mph	29.95 in	0.0 in	Mostly Cloudy
	1:53 AM	68 °F	66 °F	93 %	SSE	6 mph	0 mph	29.93 in	0.0 in	Mostly Cloudy
	2:53 AM	68 °F	65 °F	90 %	SSE	6 mph	0 mph	29.92 in	0.0 in	Fair
	3:53 AM	69 °F	65 °F	87 %	SE	3 mph	0 mph	29.91 in	0.0 in	Fair
	4:53 AM	67 °F	63 °F	87 %	SSE	5 mph	0 mph	29.90 in	0.0 in	Fair
	5:53 AM	66 °F	63 °F	90 %	CALM	0 mph	0 mph	29.90 in	0.0 in	Fair
	6:53 AM	65 °F	62 °F	90 %	SSE	6 mph	0 mph	29.90 in	0.0 in	Fair
	7:53 AM	67 °F	63 °F	87 %	SE	3 mph	0 mph	29.91 in	0.0 in	Fair
	8:53 AM	72 °F	67 °F	84 %	SE	3 mph	0 mph	29.92 in	0.0 in	Fair
10/26/2022	5:53 PM	80 °F	69 °F	69 %	WSW	10 mph	0 mph	29.86 in	0.0 in	Fair
	6:53 PM	77 °F	69 °F	76 %	SW	7 mph	0 mph	29.88 in	0.0 in	Fair
	7:53 PM	77 °F	70 °F	79 %	SW	6 mph	0 mph	29.89 in	0.0 in	Fair
	8:53 PM	75 °F	70 °F	84 %	SW	6 mph	0 mph	29.90 in	0.0 in	Fair
	9:53 PM	74 °F	70 °F	87 %	SSW	5 mph	0 mph	29.90 in	0.0 in	Fair
	10:53 PM	71 °F	69 °F	93 %	S	3 mph	0 mph	29.90 in	0.0 in	Fair
	11:53 PM	72 °F	69 °F	91 %	CALM	0 mph	0 mph	29.90 in	0.0 in	Fair
	12:53 AM	71 °F	69 °F	93 %	CALM	0 mph	0 mph	29.89 in	0.0 in	Fair
	1:53 AM	70 °F	69 °F	97 %	CALM	0 mph	0 mph	29.88 in	0.0 in	Fair
	2:53 AM	70 °F	69 °F	97 %	CALM	0 mph	0 mph	29.88 in	0.0 in	Fair
	3:53 AM	70 °F	69 °F	97 %	CALM	0 mph	0 mph	29.87 in	0.0 in	Fair
	4:53 AM	69 °F	68 °F	96 %	CALM	0 mph	0 mph	29.87 in	0.0 in	Fair
	5:53 AM	68 °F	68 °F	100 %	SE	3 mph	0 mph	29.88 in	0.0 in	Fair
	6:53 AM	69 °F	69 °F	100 %	SE	3 mph	0 mph	29.90 in	0.0 in	Fair
	7:53 AM	69 °F	69 °F	100 %	SE	5 mph	0 mph	29.91 in	0.0 in	Fair
	8:53 AM	73 °F	72 °F	96 %	SSE	5 mph	0 mph	29.93 in	0.0 in	Fair
10/27/2022	5:53 PM	82 °F	70 °F	67 %	WSW	9 mph	0 mph	29.93 in	0.0 in	Fair
	6:53 PM	80 °F	69 °F	69 %		0 mph	0 mph	29.94 in	0.0 in	Fair
	7:53 PM	78 °F	69 °F	74 %	W	6 mph	0 mph	29.95 in	0.0 in	Fair
	8:53 PM	77 °F	71 °F	82 %	W	3 mph	0 mph	29.97 in	0.0 in	Fair
	9:53 PM	74 °F	71 °F	91 %	CALM	0 mph	0 mph	30.00 in	0.0 in	Mostly Cloudy
	10:53 PM	73 °F	71 °F	93 %	CALM	0 mph	0 mph	30.01 in	0.0 in	Cloudy
	11:53 PM	73 °F	72 °F	96 %	ESE	3 mph	0 mph	30.02 in	0.0 in	Mostly Cloudy
	12:53 AM	73 °F	71 °F	93 %	E	5 mph	0 mph	30.02 in	0.0 in	Mostly Cloudy
	1:53 AM	72 °F	70 °F	93 %	ENE	5 mph	0 mph	30.01 in	0.0 in	Mostly Cloudy
	2:53 AM	71 °F	69 °F	93 %	ENE	3 mph	0 mph	30.01 in	0.0 in	Fair
	3:53 AM	70 °F	68 °F	93 %	ENE	5 mph	0 mph	30.00 in	0.0 in	Fair
	4:53 AM	69 °F	68 °F	96 %	E	5 mph	0 mph	30.00 in	0.0 in	Fair
	5:53 AM	68 °F	67 °F	96 %	E	5 mph	0 mph	30.00 in	0.0 in	Fair
	6:53 AM	66 °F	66 °F	100 %		0 mph	0 mph	30.01 in	0.0 in	Fair
	7:53 AM	68 °F	67 °F	96 %	NE	3 mph	0 mph	30.04 in	0.0 in	Fair
	8:53 AM	74 °F	70 °F	87 %	CALM	0 mph	0 mph	30.06 in	0.0 in	Fair
10/28/2022	5:53 PM	87 °F	66 °F	49 %	E	9 mph	0 mph	30.02 in	0.0 in	Fair
	6:53 PM	82 °F	68 °F	62 %	E	7 mph	0 mph	30.03 in	0.0 in	Mostly Cloudy
	7:53 PM	79 °F	68 °F	69 %	E	7 mph	0 mph	30.05 in	0.0 in	Fair
	8:53 PM	78 °F	67 °F	68 %	E	9 mph	0 mph	30.07 in	0.0 in	Fair
	9:53 PM	75 °F	67 °F	76 %	E	9 mph	0 mph	30.10 in	0.0 in	Fair
	10:53 PM	74 °F	68 °F	82 %	ENE	8 mph	0 mph	30.11 in	0.0 in	Fair
	11:53 PM	71 °F	68 °F	90 %	ENE	7 mph	0 mph	30.10 in	0.0 in	Fair
	12:53 AM	69 °F	67 °F	93 %	NE	7 mph	0 mph	30.09 in	0.0 in	Fair
	1:53 AM	70 °F	69 °F	97 %	ENE	7 mph	0 mph	30.08 in	0.0 in	Fair
	2:53 AM	69 °F	69 °F	100 %	ENE	6 mph	0 mph	30.06 in	0.0 in	Fair
	3:53 AM	68 °F	67 °F	96 %	NE	6 mph	0 mph	30.05 in	0.0 in	Fair
	4:05 AM	70 °F	69 °F	97 %	NE	5 mph	0 mph	30.05 in	0.0 in	Mostly Cloudy
	4:20 AM	70 °F	69 °F	97 %	NE	6 mph	0 mph	30.05 in	0.0 in	Fog
	4:53 AM	70 °F	69 °F	97 %	ENE	7 mph	0 mph	30.05 in	0.0 in	Fog
	5:12 AM	69 °F	69 °F	100 %	NE	7 mph	0 mph	30.05 in	0.0 in	Fog
	5:50 AM	70 °F	68 °F	94 %	NE	6 mph	0 mph	30.06 in	0.0 in	Fog
	5:53 AM	69 °F	68 °F	96 %	NE	5 mph	0 mph	30.06 in	0.0 in	Fog
	6:03 AM	68 °F	68 °F	100 %	NE	5 mph	0 mph	30.06 in	0.0 in	Cloudy

NOTE: Survey nights shaded in grey did not meet the weather criteria specified in the Guidelines. Red indicates specific parameters.

Appendix B. NOAA National Weather Service Data

Date	Time	Temperature	Dew Point	Humidity	Direction	Wind Speed	Wind Gust	Pressure	Precipitation	Conditions
10/28/2022	6:13 AM	68 °F	68 °F	100 %	NE	6 mph	0 mph	30.06 in	0.0 in	Fog
	6:53 AM	69 °F	69 °F	100 %	NNE	9 mph	0 mph	30.08 in	0.0 in	Partly Cloudy
	7:53 AM	69 °F	68 °F	96 %	NE	8 mph	0 mph	30.10 in	0.0 in	Mostly Cloudy
	8:22 AM	70 °F	69 °F	97 %	NE	8 mph	0 mph	30.11 in	0.0 in	Fog
	8:34 AM	70 °F	69 °F	97 %	NE	8 mph	0 mph	30.11 in	0.0 in	Fog
	8:53 AM	70 °F	70 °F	100 %	NNE	10 mph	0 mph	30.12 in	0.0 in	Fog
10/29/2022	5:53 PM	82 °F	67 °F	60 %	ENE	13 mph	0 mph	30.02 in	0.0 in	Mostly Cloudy
	6:53 PM	79 °F	68 °F	69 %	NE	8 mph	0 mph	30.02 in	0.0 in	Fair
	7:53 PM	76 °F	69 °F	79 %	E	8 mph	0 mph	30.04 in	0.0 in	Fair
	8:53 PM	75 °F	69 °F	82 %	ENE	7 mph	0 mph	30.04 in	0.0 in	Fair
	9:53 PM	72 °F	69 °F	91 %	ENE	6 mph	0 mph	30.05 in	0.0 in	Fair
	10:53 PM	71 °F	69 °F	93 %	ENE	6 mph	0 mph	30.05 in	0.0 in	Fair
	11:53 PM	70 °F	69 °F	97 %	NE	6 mph	0 mph	30.05 in	0.0 in	Partly Cloudy
	12:53 AM	70 °F	69 °F	97 %	ENE	6 mph	0 mph	30.03 in	0.0 in	Fair
	1:53 AM	69 °F	68 °F	96 %	ENE	6 mph	0 mph	30.02 in	0.0 in	Fair
	2:53 AM	68 °F	67 °F	96 %	NE	6 mph	0 mph	30.00 in	0.0 in	Fair
	3:53 AM	68 °F	67 °F	96 %	NE	6 mph	0 mph	29.99 in	0.0 in	Fair
	4:53 AM	68 °F	68 °F	100 %	NNE	8 mph	0 mph	29.99 in	0.0 in	Fair
	5:53 AM	67 °F	67 °F	100 %	NE	5 mph	0 mph	29.99 in	0.0 in	Fair
	6:53 AM	67 °F	66 °F	97 %	NE	6 mph	0 mph	30.00 in	0.0 in	Fair
	7:53 AM	67 °F	66 °F	97 %	NE	6 mph	0 mph	30.01 in	0.0 in	Fair
	8:53 AM	73 °F	70 °F	90 %	NE	7 mph	0 mph	30.02 in	0.0 in	Fair
10/30/2022	5:53 PM	86 °F	64 °F	48 %	ENE	8 mph	0 mph	29.91 in	0.0 in	Fair
	6:53 PM	79 °F	67 °F	66 %	E	5 mph	0 mph	29.92 in	0.0 in	Fair
	7:53 PM	77 °F	68 °F	74 %	E	3 mph	0 mph	29.93 in	0.0 in	Fair
	8:53 PM	72 °F	67 °F	84 %	ENE	7 mph	0 mph	29.95 in	0.0 in	Fair
	9:53 PM	73 °F	67 °F	81 %	E	6 mph	0 mph	29.96 in	0.0 in	Fair
	10:53 PM	70 °F	67 °F	90 %	ENE	6 mph	0 mph	29.96 in	0.0 in	Fair
	11:53 PM	70 °F	67 °F	90 %	ENE	6 mph	0 mph	29.96 in	0.0 in	Fair
	12:53 AM	69 °F	67 °F	93 %	ENE	5 mph	0 mph	29.96 in	0.0 in	Fair
	1:53 AM	69 °F	67 °F	93 %	E	3 mph	0 mph	29.95 in	0.0 in	Fair
	2:53 AM	68 °F	67 °F	96 %	ENE	5 mph	0 mph	29.94 in	0.0 in	Fair
	3:53 AM	68 °F	67 °F	96 %	ENE	5 mph	0 mph	29.93 in	0.0 in	Fair
	4:53 AM	68 °F	67 °F	96 %	ENE	5 mph	0 mph	29.93 in	0.0 in	Fair
	5:53 AM	68 °F	67 °F	96 %	ENE	5 mph	0 mph	29.94 in	0.0 in	Fair
	6:53 AM	68 °F	67 °F	96 %	NE	6 mph	0 mph	29.95 in	0.0 in	Fair
	7:53 AM	68 °F	67 °F	96 %	ENE	6 mph	0 mph	29.96 in	0.0 in	Fair
	8:53 AM	73 °F	71 °F	93 %	ENE	6 mph	0 mph	29.97 in	0.0 in	Fair
10/31/2022	5:53 PM	87 °F	71 °F	59 %	WNW	7 mph	0 mph	29.91 in	0.0 in	Partly Cloudy
	6:53 PM	83 °F	71 °F	67 %	WNW	6 mph	0 mph	29.92 in	0.0 in	Mostly Cloudy
	7:53 PM	81 °F	71 °F	72 %	NNW	7 mph	0 mph	29.94 in	0.0 in	Mostly Cloudy
	8:53 PM	81 °F	71 °F	72 %	NNW	9 mph	0 mph	29.96 in	0.0 in	Cloudy
	9:53 PM	80 °F	72 °F	76 %	E	6 mph	0 mph	29.99 in	0.0 in	Cloudy
	10:53 PM	76 °F	74 °F	94 %	ESE	3 mph	0 mph	30.00 in	0.0 in	Mostly Cloudy
	11:53 PM	76 °F	74 °F	94 %	CALM	0 mph	0 mph	30.01 in	0.0 in	Cloudy
	12:53 AM	76 °F	74 °F	94 %	NE	5 mph	0 mph	30.01 in	0.0 in	Cloudy
	1:53 AM	74 °F	73 °F	97 %	NE	5 mph	0 mph	30.00 in	0.0 in	Fair
	2:17 AM	74 °F	73 °F	97 %	NE	5 mph	0 mph	30.00 in	0.0 in	Mostly Cloudy
	2:53 AM	74 °F	73 °F	97 %	NE	3 mph	0 mph	30.00 in	0.0 in	Cloudy
	3:23 AM	73 °F	72 °F	96 %	ENE	5 mph	0 mph	30.00 in	0.0 in	Partly Cloudy
	3:53 AM	73 °F	72 °F	96 %	ENE	3 mph	0 mph	30.00 in	0.0 in	Fair
	4:15 AM	73 °F	72 °F	96 %	NNE	5 mph	0 mph	30.00 in	0.0 in	Mostly Cloudy
	4:53 AM	74 °F	73 °F	97 %	ENE	3 mph	0 mph	30.00 in	0.0 in	Cloudy
	5:53 AM	75 °F	74 °F	96 %	E	3 mph	0 mph	30.01 in	0.0 in	Cloudy
	6:53 AM	75 °F	73 °F	94 %	SE	5 mph	0 mph	30.03 in	0.0 in	Cloudy
	7:34 AM	74 °F	73 °F	97 %	CALM	0 mph	0 mph	30.03 in	0.0 in	Cloudy
	7:50 AM	73 °F	73 °F	100 %	CALM	0 mph	0 mph	30.04 in	0.0 in	Fog
	7:53 AM	73 °F	73 °F	100 %	CALM	0 mph	0 mph	30.04 in	0.0 in	Fog
	8:00 AM	73 °F	72 °F	96 %	CALM	0 mph	0 mph	30.04 in	0.0 in	Mostly Cloudy
	8:22 AM	74 °F	73 °F	97 %	CALM	0 mph	0 mph	30.05 in	0.0 in	Mostly Cloudy
	8:53 AM	77 °F	73 °F	88 %	ENE	3 mph	0 mph	30.06 in	0.0 in	Fair
11/1/2022	5:53 PM	86 °F	72 °F	63 %	NE	6 mph	0 mph	30.02 in	0.0 in	Fair
	6:53 PM	83 °F	72 °F	69 %	NE	5 mph	0 mph	30.04 in	0.0 in	Fair
	7:53 PM	80 °F	72 °F	76 %	NE	5 mph	0 mph	30.06 in	0.0 in	Fair
	8:53 PM	80 °F	72 °F	76 %	NNW	5 mph	0 mph	30.08 in	0.0 in	Cloudy

NOTE: Survey nights shaded in grey did not meet the weather criteria specified in the Guidelines. Red indicates specific parameters.

Appendix B. NOAA National Weather Service Data

Date	Time	Temperature	Dew Point	Humidity	Direction	Wind Speed	Wind Gust	Pressure	Precipitation	Conditions
	9:53 PM	79 °F	71 °F	77 %	NE	6 mph	0 mph	30.09 in	0.0 in	Fair
11/1/2022	10:53 PM	78 °F	72 °F	81 %	CALM	0 mph	0 mph	30.11 in	0.0 in	Mostly Cloudy
	11:53 PM	78 °F	73 °F	84 %	SE	7 mph	0 mph	30.12 in	0.0 in	Mostly Cloudy
	12:08 AM	78 °F	74 °F	87 %	E	6 mph	0 mph	30.12 in	0.0 in	Cloudy
	12:30 AM	78 °F	75 °F	90 %	E	9 mph	0 mph	30.11 in	0.0 in	Mostly Cloudy
	12:53 AM	77 °F	75 °F	94 %	E	6 mph	0 mph	30.10 in	0.0 in	Partly Cloudy
	1:53 AM	77 °F	75 °F	94 %	E	5 mph	0 mph	30.09 in	0.0 in	Fair
	2:53 AM	75 °F	74 °F	96 %	ENE	5 mph	0 mph	30.09 in	0.0 in	Fair
	3:21 AM	75 °F	74 °F	96 %	E	5 mph	0 mph	30.09 in	0.0 in	Partly Cloudy
	3:30 AM	75 °F	74 °F	96 %	E	6 mph	0 mph	30.09 in	0.0 in	Mostly Cloudy
	3:37 AM	75 °F	74 °F	96 %	E	5 mph	0 mph	30.09 in	0.0 in	Mostly Cloudy
	3:49 AM	75 °F	73 °F	94 %	E	5 mph	0 mph	30.09 in	0.0 in	Fog
	3:53 AM	75 °F	74 °F	96 %	E	5 mph	0 mph	30.08 in	0.0 in	Fog
	4:03 AM	75 °F	75 °F	100 %	E	5 mph	0 mph	30.09 in	0.0 in	Fog
	4:16 AM	76 °F	75 °F	97 %	ESE	5 mph	0 mph	30.09 in	0.0 in	Fog
	4:26 AM	76 °F	75 °F	97 %	ESE	6 mph	0 mph	30.09 in	0.0 in	Fog
	4:42 AM	76 °F	75 °F	97 %	E	6 mph	0 mph	30.09 in	0.0 in	Fog
	4:53 AM	76 °F	75 °F	97 %	E	5 mph	0 mph	30.09 in	0.0 in	Fog
	5:29 AM	76 °F	75 °F	97 %	E	6 mph	0 mph	30.09 in	0.0 in	Cloudy
	5:45 AM	76 °F	75 °F	97 %	E	7 mph	0 mph	30.09 in	0.0 in	Fog
	5:53 AM	76 °F	75 °F	97 %	E	7 mph	0 mph	30.10 in	0.0 in	Fog
	6:53 AM	76 °F	75 °F	97 %	E	6 mph	0 mph	30.11 in	0.0 in	Fog
	7:49 AM	75 °F	73 °F	94 %	E	7 mph	0 mph	30.12 in	0.0 in	Fog
	7:53 AM	75 °F	74 °F	96 %	ENE	6 mph	0 mph	30.12 in	0.0 in	Fog
	8:53 AM	75 °F	75 °F	100 %	E	3 mph	0 mph	30.14 in	0.0 in	Fog
11/2/2022	5:53 PM	89 °F	70 °F	53 %	E	5 mph	0 mph	30.05 in	0.0 in	Fair
	6:53 PM	85 °F	70 °F	61 %	CALM	0 mph	0 mph	30.07 in	0.0 in	Fair
	7:53 PM	82 °F	73 °F	74 %	E	8 mph	0 mph	30.08 in	0.0 in	Mostly Cloudy
	8:53 PM	80 °F	73 °F	79 %	CALM	0 mph	0 mph	30.10 in	0.0 in	Cloudy
	9:53 PM	79 °F	72 °F	79 %	SSW	3 mph	0 mph	30.11 in	0.0 in	Thunder in the Vicinity
	10:13 PM	79 °F	73 °F	82 %	N	13 mph	25 mph	30.12 in	0.0 in	Thunder
	10:23 PM	73 °F	71 °F	93 %	N	18 mph	35 mph	30.13 in	0.1 in	T-Storm
	10:27 PM	72 °F	71 °F	97 %	NE	28 mph	45 mph	30.12 in	0.2 in	Heavy T-Storm / Windy
	10:34 PM	73 °F	72 °F	96 %	NE	41 mph	56 mph	30.11 in	0.9 in	Heavy T-Storm / Windy
	10:53 PM	72 °F	71 °F	97 %	ENE	30 mph	58 mph	30.13 in	2.8 in	Heavy T-Storm / Windy
	11:04 PM	71 °F	70 °F	96 %	ENE	13 mph	36 mph	30.15 in	0.6 in	Heavy T-Storm
	11:09 PM	73 °F	72 °F	96 %	E	15 mph	26 mph	30.14 in	0.6 in	Heavy T-Storm
	11:14 PM	74 °F	73 °F	97 %	S	12 mph	0 mph	30.14 in	0.7 in	Heavy T-Storm
	11:23 PM	72 °F	71 °F	97 %	SW	5 mph	0 mph	30.14 in	0.7 in	T-Storm
	11:30 PM	72 °F	70 °F	93 %	SSE	6 mph	0 mph	30.14 in	0.7 in	T-Storm
	11:48 PM	72 °F	72 °F	100 %	NNE	8 mph	0 mph	30.13 in	0.7 in	Partly Cloudy
	11:53 PM	72 °F	71 °F	97 %	NE	3 mph	0 mph	30.13 in	0.7 in	Partly Cloudy
	12:53 AM	74 °F	73 °F	97 %	E	5 mph	0 mph	30.11 in	0.0 in	Fair
	1:53 AM	74 °F	73 °F	97 %	ENE	7 mph	0 mph	30.10 in	0.0 in	Fair
	2:53 AM	74 °F	73 °F	97 %	CALM	0 mph	0 mph	30.09 in	0.0 in	Fair
	3:53 AM	73 °F	72 °F	96 %	NE	5 mph	0 mph	30.07 in	0.0 in	Fair
	4:30 AM	74 °F	73 °F	97 %	ENE	6 mph	0 mph	30.07 in	0.0 in	Partly Cloudy
	4:53 AM	74 °F	73 °F	97 %	ENE	7 mph	0 mph	30.07 in	0.0 in	Fair
	5:53 AM	73 °F	72 °F	96 %	ENE	5 mph	0 mph	30.07 in	0.0 in	Fair
	6:53 AM	73 °F	72 °F	96 %	ENE	5 mph	0 mph	30.08 in	0.0 in	Fair
	7:53 AM	72 °F	71 °F	97 %	E	5 mph	0 mph	30.10 in	0.0 in	Fair
	8:53 AM	75 °F	73 °F	94 %	E	6 mph	0 mph	30.12 in	0.0 in	Fair
11/3/2022	5:53 PM	82 °F	73 °F	74 %	NW	13 mph	0 mph	30.02 in	0.0 in	Cloudy
	6:03 PM	79 °F	73 °F	82 %	VAR	6 mph	0 mph	30.03 in	0.1 in	Heavy Rain
	6:12 PM	77 °F	73 °F	88 %	W	13 mph	21 mph	30.03 in	0.3 in	Heavy Rain
	6:19 PM	76 °F	72 °F	87 %	N	15 mph	21 mph	30.05 in	0.3 in	Light Rain
	6:22 PM	75 °F	72 °F	90 %	N	16 mph	23 mph	30.06 in	0.5 in	Heavy Rain
	6:31 PM	75 °F	72 °F	90 %	WNW	14 mph	23 mph	30.05 in	0.8 in	Heavy Rain
	6:39 PM	74 °F	71 °F	91 %	WSW	14 mph	0 mph	30.04 in	0.9 in	Rain
	6:43 PM	74 °F	71 °F	91 %	WSW	9 mph	0 mph	30.04 in	0.9 in	Light Rain
	6:53 PM	75 °F	71 °F	87 %	VAR	5 mph	0 mph	30.04 in	0.9 in	Rain
	7:31 PM	73 °F	70 °F	90 %	NW	8 mph	0 mph	30.06 in	0.1 in	Heavy Rain
	7:38 PM	73 °F	71 °F	93 %	NW	7 mph	0 mph	30.07 in	0.1 in	Light Rain
	7:53 PM	73 °F	71 °F	93 %	WNW	3 mph	0 mph	30.07 in	0.1 in	Light Rain
	8:53 PM	75 °F	72 °F	90 %	SE	6 mph	0 mph	30.09 in	0.0 in	Cloudy
	9:53 PM	75 °F	69 °F	82 %	ENE	8 mph	0 mph	30.11 in	0.0 in	Cloudy
	10:53 PM	73 °F	66 °F	79 %	ENE	9 mph	0 mph	30.11 in	0.0 in	Fair

NOTE: Survey nights shaded in grey did not meet the weather criteria specified in the Guidelines. Red indicates specific parameters.

Appendix B. NOAA National Weather Service Data

Date	Time	Temperature	Dew Point	Humidity	Direction	Wind Speed	Wind Gust	Pressure	Precipitation	Conditions
	11:53 PM	71 °F	66 °F	84 %	E	3 mph	0 mph	30.10 in	0.0 in	Fair
	12:53 AM	70 °F	66 °F	87 %	NE	6 mph	0 mph	30.08 in	0.0 in	Fair
11/3/2022	1:53 AM	69 °F	66 °F	90 %	NE	5 mph	0 mph	30.08 in	0.0 in	Fair
	2:53 AM	69 °F	65 °F	87 %	NNE	3 mph	0 mph	30.06 in	0.0 in	Fair
	3:53 AM	68 °F	66 °F	93 %	NNE	5 mph	0 mph	30.05 in	0.0 in	Fair
	4:53 AM	68 °F	66 °F	93 %	NNE	7 mph	0 mph	30.05 in	0.0 in	Fair
	5:53 AM	67 °F	66 °F	97 %	NNE	6 mph	0 mph	30.04 in	0.0 in	Fair
	6:53 AM	67 °F	66 °F	97 %	NE	7 mph	0 mph	30.04 in	0.0 in	Fair
	7:53 AM	67 °F	65 °F	93 %	NE	7 mph	0 mph	30.06 in	0.0 in	Fair
	8:53 AM	70 °F	67 °F	90 %	NNE	7 mph	0 mph	30.08 in	0.0 in	Fair
Due to failure of KPGD weather station, switched to KFMY for the remainder of the survey.										
11/4/2022	5:53 PM	81 °F	61 °F	50 %	ENE	7 mph	0 mph	29.98 in	0.0 in	Fair
	6:53 PM	79 °F	65 °F	62 %	ENE	8 mph	0 mph	30.00 in	0.0 in	Fair
	7:53 PM	77 °F	64 °F	64 %	ENE	6 mph	0 mph	30.01 in	0.0 in	Fair
	8:53 PM	75 °F	63 °F	66 %	ENE	9 mph	0 mph	30.02 in	0.0 in	Fair
	9:53 PM	74 °F	63 °F	68 %	ENE	8 mph	0 mph	30.02 in	0.0 in	Fair
	10:53 PM	73 °F	64 °F	73 %	NE	7 mph	0 mph	30.01 in	0.0 in	Fair
	11:53 PM	72 °F	65 °F	78 %	NE	7 mph	0 mph	29.99 in	0.0 in	Fair
	12:53 AM	72 °F	66 °F	81 %	ENE	5 mph	0 mph	29.97 in	0.0 in	Fair
	1:53 AM	70 °F	66 °F	87 %	NE	6 mph	0 mph	29.96 in	0.0 in	Fair
	2:53 AM	70 °F	66 °F	87 %	NE	6 mph	0 mph	29.94 in	0.0 in	Fair
	3:53 AM	71 °F	66 °F	84 %	NE	7 mph	0 mph	29.93 in	0.0 in	Fair
	4:53 AM	70 °F	67 °F	90 %	ENE	8 mph	0 mph	29.93 in	0.0 in	Fair
	5:53 AM	70 °F	66 °F	87 %	NE	6 mph	0 mph	29.93 in	0.0 in	Fair
	6:53 AM	70 °F	67 °F	90 %	NE	6 mph	0 mph	29.94 in	0.0 in	Fair
	7:53 AM	73 °F	68 °F	84 %	NE	8 mph	0 mph	29.96 in	0.0 in	Fair
	8:53 AM	79 °F	70 °F	74 %	NE	7 mph	0 mph	29.96 in	0.0 in	Fair
11/5/2022	5:53 PM	81 °F	68 °F	65 %	E	3 mph	0 mph	29.89 in	0.0 in	Fair
	6:53 PM	82 °F	69 °F	65 %	ENE	7 mph	0 mph	29.91 in	0.0 in	Cloudy
	7:53 PM	80 °F	69 °F	69 %	E	6 mph	0 mph	29.93 in	0.0 in	Mostly Cloudy
	8:53 PM	78 °F	68 °F	71 %	E	6 mph	0 mph	29.95 in	0.0 in	Fair
	9:53 PM	77 °F	68 °F	74 %	E	3 mph	0 mph	29.96 in	0.0 in	Fair
	10:53 PM	76 °F	69 °F	79 %	ENE	5 mph	0 mph	29.95 in	0.0 in	Fair
	1:53 AM	73 °F	70 °F	90 %	ENE	5 mph	0 mph	29.92 in	0.0 in	Fair
	2:53 AM	73 °F	70 °F	90 %	NNE	5 mph	0 mph	29.92 in	0.0 in	Fair
	3:53 AM	73 °F	71 °F	93 %	NNE	6 mph	0 mph	29.91 in	0.0 in	Fair
	4:53 AM	73 °F	70 °F	90 %	NE	3 mph	0 mph	29.91 in	0.0 in	Fair
	5:53 AM	72 °F	70 °F	93 %	NE	6 mph	0 mph	29.93 in	0.0 in	Fair
	6:53 AM	73 °F	70 °F	90 %	ENE	6 mph	0 mph	29.94 in	0.0 in	Partly Cloudy
	7:53 AM	75 °F	71 °F	87 %	NE	6 mph	0 mph	29.97 in	0.0 in	Fair
	8:53 AM	79 °F	72 °F	79 %	E	9 mph	0 mph	29.98 in	0.0 in	Fair
11/6/2022	5:53 PM	83 °F	69 °F	63 %	E	9 mph	20 mph	29.94 in	0.0 in	Fair
	6:53 PM	81 °F	71 °F	72 %	ENE	10 mph	20 mph	29.97 in	0.0 in	Fair
	7:53 PM	80 °F	71 °F	74 %	E	8 mph	0 mph	29.99 in	0.0 in	Fair
	8:53 PM	79 °F	71 °F	77 %	ENE	8 mph	0 mph	30.00 in	0.0 in	Fair
	9:53 PM	77 °F	71 °F	82 %	NE	8 mph	0 mph	30.01 in	0.0 in	Fair
	10:53 PM	76 °F	71 °F	85 %	ENE	9 mph	0 mph	30.02 in	0.0 in	Fair
	11:53 PM	75 °F	70 °F	84 %	ENE	8 mph	0 mph	30.01 in	0.0 in	Fair
	12:53 AM	73 °F	69 °F	87 %	NE	7 mph	0 mph	30.02 in	0.0 in	Fair
	1:53 AM	73 °F	68 °F	84 %	ENE	8 mph	0 mph	30.01 in	0.0 in	Fair
	2:53 AM	72 °F	67 °F	84 %	ENE	5 mph	0 mph	30.00 in	0.0 in	Fair
	3:53 AM	71 °F	66 °F	84 %	NE	8 mph	0 mph	30.00 in	0.0 in	Fair
	4:53 AM	72 °F	67 °F	84 %	NE	7 mph	0 mph	30.00 in	0.0 in	Fair
	5:53 AM	71 °F	67 °F	87 %	NE	6 mph	0 mph	30.01 in	0.0 in	Fair
	6:53 AM	71 °F	67 °F	87 %	NE	7 mph	0 mph	30.02 in	0.0 in	Fair
	7:53 AM	74 °F	68 °F	82 %	NE	9 mph	0 mph	30.04 in	0.0 in	Fair
	8:53 AM	79 °F	68 °F	69 %	NE	14 mph	0 mph	30.05 in	0.0 in	Fair
11/7/2022	5:53 PM	81 °F	64 °F	56 %	ENE	9 mph	0 mph	29.99 in	0.0 in	Fair
	6:53 PM	78 °F	65 °F	64 %	NE	12 mph	23 mph	30.01 in	0.0 in	Fair
	7:53 PM	77 °F	64 °F	64 %	NE	10 mph	0 mph	30.03 in	0.0 in	Fair
	8:53 PM	75 °F	64 °F	69 %	NE	10 mph	0 mph	30.04 in	0.0 in	Fair
	9:53 PM	75 °F	64 °F	69 %	NE	12 mph	0 mph	30.04 in	0.0 in	Mostly Cloudy
	10:53 PM	74 °F	65 °F	73 %	NE	9 mph	0 mph	30.04 in	0.0 in	Fair
	11:53 PM	73 °F	64 °F	73 %	NNE	12 mph	0 mph	30.03 in	0.0 in	Fair
	12:53 AM	72 °F	64 °F	76 %	NNE	9 mph	0 mph	30.02 in	0.0 in	Fair
	1:53 AM	71 °F	64 °F	78 %	N	8 mph	0 mph	30.02 in	0.0 in	Fair

NOTE: Survey nights shaded in grey did not meet the weather criteria specified in the Guidelines. Red indicates specific parameters.

Appendix B. NOAA National Weather Service Data

Date	Time	Temperature	Dew Point	Humidity	Direction	Wind Speed	Wind Gust	Pressure	Precipitation	Conditions
	2:53 AM	71 °F	66 °F	84 %	N	9 mph	0 mph	30.01 in	0.0 in	Fair
	3:53 AM	71 °F	67 °F	87 %	N	9 mph	0 mph	30.00 in	0.0 in	Partly Cloudy
	4:53 AM	71 °F	66 °F	84 %	N	10 mph	0 mph	30.00 in	0.0 in	Cloudy
	5:53 AM	71 °F	66 °F	84 %	N	9 mph	0 mph	30.01 in	0.0 in	Mostly Cloudy
	6:53 AM	71 °F	67 °F	87 %	NNE	12 mph	0 mph	30.02 in	0.0 in	Fair
11/7/2022	7:53 AM	72 °F	67 °F	84 %	N	12 mph	0 mph	30.04 in	0.0 in	Partly Cloudy
	8:53 AM	76 °F	67 °F	74 %	N	14 mph	0 mph	30.04 in	0.0 in	Fair
	5:53 PM	81 °F	62 °F	52 %	NE	16 mph	26 mph	29.96 in	0.0 in	Partly Cloudy
	6:53 PM	79 °F	62 °F	56 %	NNE	12 mph	0 mph	29.97 in	0.0 in	Fair
	7:53 PM	78 °F	63 °F	60 %	NNE	12 mph	0 mph	29.97 in	0.0 in	Cloudy
	8:53 PM	75 °F	68 °F	79 %	N	12 mph	21 mph	29.98 in	0.0 in	Cloudy
	9:53 PM	74 °F	69 °F	85 %	N	13 mph	0 mph	29.98 in	0.0 in	Cloudy
	10:06 PM	74 °F	69 °F	85 %	NNE	12 mph	0 mph	29.98 in	0.0 in	Cloudy
	10:42 PM	74 °F	69 °F	85 %	N	13 mph	0 mph	29.98 in	0.0 in	Cloudy
	10:53 PM	74 °F	69 °F	85 %	N	15 mph	0 mph	29.98 in	0.0 in	Cloudy
	11:30 PM	74 °F	68 °F	82 %	N	10 mph	0 mph	29.97 in	0.0 in	Cloudy
	11:53 PM	74 °F	68 °F	82 %	NNE	12 mph	0 mph	29.97 in	0.0 in	Mostly Cloudy
	11:59 PM	74 °F	69 °F	85 %	N	12 mph	0 mph	29.97 in	0.0 in	Mostly Cloudy
	12:06 AM	74 °F	69 °F	85 %	N	13 mph	0 mph	29.96 in	0.0 in	Mostly Cloudy
11/8/2022	12:32 AM	73 °F	69 °F	87 %	N	10 mph	0 mph	29.97 in	0.0 in	Light Rain
	12:53 AM	73 °F	69 °F	87 %	N	12 mph	0 mph	29.96 in	0.0 in	Mostly Cloudy
	1:08 AM	73 °F	69 °F	87 %	N	12 mph	0 mph	29.95 in	0.0 in	Mostly Cloudy
	1:37 AM	73 °F	69 °F	87 %	N	12 mph	0 mph	29.95 in	0.0 in	Mostly Cloudy
	1:53 AM	73 °F	69 °F	87 %	N	10 mph	0 mph	29.94 in	0.0 in	Cloudy
	2:05 AM	73 °F	69 °F	87 %	N	10 mph	0 mph	29.94 in	0.0 in	Light Rain
	2:53 AM	73 °F	69 °F	87 %	N	12 mph	0 mph	29.93 in	0.0 in	Mostly Cloudy
	3:53 AM	73 °F	69 °F	87 %	N	14 mph	0 mph	29.92 in	0.0 in	Mostly Cloudy
	4:53 AM	74 °F	68 °F	82 %	N	16 mph	24 mph	29.91 in	0.0 in	Mostly Cloudy
	5:53 AM	74 °F	68 °F	82 %	N	12 mph	0 mph	29.91 in	0.0 in	Fair
	6:53 AM	74 °F	67 °F	79 %	N	13 mph	21 mph	29.92 in	0.0 in	Fair
	7:53 AM	74 °F	67 °F	79 %	NNE	17 mph	0 mph	29.94 in	0.0 in	Fair
	8:53 AM	75 °F	67 °F	76 %	NNE	15 mph	0 mph	29.94 in	0.0 in	Partly Cloudy
	5:53 PM	73 °F	66 °F	79 %	N	18 mph	29 mph	29.80 in	0.0 in	Light Rain
	6:53 PM	72 °F	66 °F	81 %	N	16 mph	32 mph	29.79 in	0.0 in	Cloudy
	7:53 PM	72 °F	65 °F	78 %	N	16 mph	26 mph	29.79 in	0.0 in	Cloudy
	8:53 PM	70 °F	66 °F	87 %	NNW	16 mph	30 mph	29.76 in	0.0 in	Light Rain
	9:08 PM	69 °F	66 °F	90 %	NNW	17 mph	26 mph	29.76 in	0.0 in	Rain
	9:53 PM	69 °F	66 °F	90 %	NNW	18 mph	26 mph	29.74 in	0.0 in	Light Rain
	10:53 PM	70 °F	66 °F	87 %	NNW	17 mph	0 mph	29.70 in	0.0 in	Light Rain
	11:53 PM	70 °F	67 °F	90 %	NNW	17 mph	25 mph	29.66 in	0.0 in	Cloudy
	12:53 AM	71 °F	67 °F	87 %	NNW	18 mph	28 mph	29.62 in	0.0 in	Mostly Cloudy
	1:53 AM	70 °F	67 °F	90 %	NW	18 mph	33 mph	29.58 in	0.0 in	Rain
	2:53 AM	70 °F	67 °F	90 %	WNW	23 mph	33 mph	29.54 in	0.1 in	Light Rain / Windy
	3:48 AM	70 °F	66 °F	88 %	WNW	17 mph	28 mph	29.52 in	0.1 in	Heavy Rain
11/9/2022	3:53 AM	69 °F	67 °F	93 %	WNW	17 mph	28 mph	29.51 in	0.2 in	Heavy Rain
	4:06 AM	69 °F	67 °F	93 %	WNW	18 mph	30 mph	29.51 in	0.3 in	Heavy Rain
	4:17 AM	70 °F	67 °F	90 %	WNW	18 mph	30 mph	29.51 in	0.4 in	Heavy Rain
	4:26 AM	70 °F	67 °F	90 %	WNW	18 mph	35 mph	29.51 in	0.5 in	Heavy Rain
	4:37 AM	70 °F	68 °F	93 %	WNW	21 mph	30 mph	29.51 in	0.5 in	Heavy Rain / Windy
	4:46 AM	70 °F	68 °F	93 %	WNW	15 mph	26 mph	29.50 in	0.6 in	Heavy Rain
	4:53 AM	71 °F	68 °F	90 %	WNW	16 mph	28 mph	29.50 in	0.6 in	Heavy Rain
	5:00 AM	71 °F	68 °F	90 %	WNW	18 mph	28 mph	29.50 in	0.0 in	Heavy Rain
	5:53 AM	72 °F	69 °F	91 %	W	17 mph	30 mph	29.51 in	0.1 in	Rain
	6:53 AM	73 °F	70 °F	90 %	W	21 mph	31 mph	29.53 in	0.1 in	Light Rain / Windy
	7:53 AM	73 °F	70 °F	90 %	W	21 mph	32 mph	29.56 in	0.0 in	Light Rain / Windy
	8:16 AM	74 °F	70 °F	87 %	W	16 mph	26 mph	29.57 in	0.0 in	Cloudy
	8:53 AM	74 °F	71 °F	91 %	W	16 mph	32 mph	29.60 in	0.0 in	Light Rain
	5:53 PM	76 °F	71 °F	85 %	WSW	8 mph	0 mph	29.71 in	0.0 in	Cloudy
	6:05 PM	76 °F	71 °F	85 %	SW	7 mph	0 mph	29.71 in	0.0 in	Mostly Cloudy
	6:15 PM	76 °F	71 °F	85 %	SW	8 mph	0 mph	29.72 in	0.0 in	Partly Cloudy
	6:53 PM	76 °F	71 °F	85 %	SW	6 mph	0 mph	29.73 in	0.0 in	Fair
	7:53 PM	76 °F	71 °F	85 %	SSW	6 mph	0 mph	29.75 in	0.0 in	Fair
	8:53 PM	75 °F	71 °F	87 %	S	6 mph	0 mph	29.78 in	0.0 in	Fair
	9:53 PM	75 °F	71 °F	87 %	S	6 mph	0 mph	29.79 in	0.0 in	Fair
11/10/2011	10:53 PM	75 °F	72 °F	90 %	S	6 mph	0 mph	29.80 in	0.0 in	Fair
	11:53 PM	74 °F	72 °F	93 %	S	3 mph	0 mph	29.80 in	0.0 in	Fair

NOTE: Survey nights shaded in grey did not meet the weather criteria specified in the Guidelines. Red indicates specific parameters.

Appendix B. NOAA National Weather Service Data

Date	Time	Temperature	Dew Point	Humidity	Direction	Wind Speed	Wind Gust	Pressure	Precipitation	Conditions
	12:53 AM	73 °F	71 °F	93 %	S	3 mph	0 mph	29.80 in	0.0 in	Fair
	1:53 AM	73 °F	71 °F	93 %	SSE	6 mph	0 mph	29.80 in	0.0 in	Fair
	2:53 AM	73 °F	71 °F	93 %	SSE	5 mph	0 mph	29.80 in	0.0 in	Fair
	3:53 AM	73 °F	71 °F	93 %	SSE	5 mph	0 mph	29.81 in	0.0 in	Fair
	4:53 AM	73 °F	71 °F	93 %	SSE	6 mph	0 mph	29.81 in	0.0 in	Fair
	5:53 AM	74 °F	72 °F	93 %	S	5 mph	0 mph	29.83 in	0.0 in	Fair
	6:53 AM	73 °F	71 °F	93 %	ESE	3 mph	0 mph	29.85 in	0.0 in	Fair
11/10/2022	7:53 AM	76 °F	73 °F	91 %	CALM	0 mph	0 mph	29.87 in	0.0 in	Partly Cloudy
	8:53 AM	79 °F	75 °F	88 %	S	7 mph	0 mph	29.88 in	0.0 in	Fair
	5:53 PM	80 °F	72 °F	76 %	SSW	7 mph	0 mph	29.88 in	0.0 in	Fair
	6:53 PM	79 °F	73 °F	82 %	SW	5 mph	0 mph	29.90 in	0.0 in	Fair
	7:53 PM	78 °F	73 °F	84 %	SW	3 mph	0 mph	29.91 in	0.0 in	Fair
	8:53 PM	78 °F	73 °F	84 %	CALM	0 mph	0 mph	29.92 in	0.0 in	Fair
	9:53 PM	76 °F	73 °F	91 %	SSE	3 mph	0 mph	29.93 in	0.0 in	Fair
	10:53 PM	76 °F	73 °F	91 %	S	3 mph	0 mph	29.93 in	0.0 in	Fair
	11:53 PM	75 °F	73 °F	94 %	CALM	0 mph	0 mph	29.93 in	0.0 in	Fair
	12:53 AM	74 °F	72 °F	93 %	CALM	0 mph	0 mph	29.93 in	0.0 in	Fair
	1:53 AM	74 °F	72 °F	93 %	CALM	0 mph	0 mph	29.93 in	0.0 in	Fair
	2:53 AM	73 °F	72 °F	96 %	CALM	0 mph	0 mph	29.93 in	0.0 in	Fair
	3:28 AM	72 °F	71 °F	97 %	CALM	0 mph	0 mph	29.93 in	0.0 in	Mostly Cloudy
	3:37 AM	73 °F	71 °F	93 %	CALM	0 mph	0 mph	29.93 in	0.0 in	Mostly Cloudy
	3:53 AM	72 °F	71 °F	97 %	CALM	0 mph	0 mph	29.93 in	0.0 in	Cloudy
11/11/2022	4:05 AM	72 °F	70 °F	93 %	CALM	0 mph	0 mph	29.93 in	0.0 in	Cloudy
	4:11 AM	72 °F	70 °F	93 %	CALM	0 mph	0 mph	29.93 in	0.0 in	Fog
	4:24 AM	72 °F	70 °F	93 %	CALM	0 mph	0 mph	29.93 in	0.0 in	Fog
	4:49 AM	72 °F	72 °F	100 %	CALM	0 mph	0 mph	29.93 in	0.0 in	Fog
	4:53 AM	72 °F	71 °F	97 %	CALM	0 mph	0 mph	29.93 in	0.0 in	Fog
	5:12 AM	72 °F	71 °F	97 %	CALM	0 mph	0 mph	29.94 in	0.0 in	Fog
	5:35 AM	72 °F	71 °F	97 %	SE	3 mph	0 mph	29.94 in	0.0 in	Fog
	5:51 AM	72 °F	72 °F	100 %	SSE	5 mph	0 mph	29.94 in	0.0 in	Fog
	5:53 AM	72 °F	71 °F	97 %	SE	3 mph	0 mph	29.94 in	0.0 in	Fog
	6:12 AM	72 °F	71 °F	97 %	CALM	0 mph	0 mph	29.95 in	0.0 in	Fog
	6:42 AM	72 °F	71 °F	97 %	CALM	0 mph	0 mph	29.95 in	0.0 in	Fog
	6:53 AM	72 °F	71 °F	97 %	SE	3 mph	0 mph	29.95 in	0.0 in	Fog
	7:51 AM	73 °F	72 °F	94 %	SSE	3 mph	0 mph	29.97 in	0.0 in	Fog
	7:53 AM	73 °F	73 °F	100 %	S	3 mph	0 mph	29.97 in	0.0 in	Fog
	5:53 PM	80 °F	71 °F	74 %	W	7 mph	0 mph	29.96 in	0.0 in	Cloudy
	6:53 PM	79 °F	71 °F	77 %	WNW	7 mph	0 mph	29.98 in	0.0 in	Cloudy
	7:53 PM	77 °F	72 °F	84 %	WNW	5 mph	0 mph	29.99 in	0.0 in	Partly Cloudy
	8:53 PM	78 °F	72 °F	81 %	WNW	5 mph	0 mph	29.99 in	0.0 in	Mostly Cloudy
	9:53 PM	78 °F	72 °F	81 %	NW	3 mph	0 mph	29.99 in	0.0 in	Cloudy
	10:53 PM	76 °F	72 °F	87 %	CALM	0 mph	0 mph	29.98 in	0.0 in	Fair
	11:53 PM	75 °F	71 °F	87 %	CALM	0 mph	0 mph	29.98 in	0.0 in	Fair
	12:53 AM	74 °F	71 °F	91 %	CALM	0 mph	0 mph	29.98 in	0.0 in	Fair
	1:53 AM	73 °F	71 °F	93 %	CALM	0 mph	0 mph	29.97 in	0.0 in	Fair
	2:53 AM	72 °F	70 °F	93 %	CALM	0 mph	0 mph	29.97 in	0.0 in	Fair
11/12/2022	3:53 AM	73 °F	71 °F	93 %	SSE	3 mph	0 mph	29.96 in	0.0 in	Fair
	4:53 AM	73 °F	71 °F	93 %	SSE	5 mph	0 mph	29.95 in	0.0 in	Fair
	5:53 AM	72 °F	71 °F	97 %	CALM	0 mph	0 mph	29.96 in	0.0 in	Fair
	6:45 AM	71 °F	70 °F	96 %	CALM	0 mph	0 mph	29.98 in	0.0 in	Partly Cloudy
	6:47 AM	72 °F	70 °F	94 %	CALM	0 mph	0 mph	29.98 in	0.0 in	Fog
	6:50 AM	72 °F	70 °F	94 %	CALM	0 mph	0 mph	29.98 in	0.0 in	Fog
	6:53 AM	71 °F	70 °F	96 %	SE	3 mph	0 mph	29.98 in	0.0 in	Fog
	6:57 AM	71 °F	70 °F	96 %	SSE	3 mph	0 mph	29.98 in	0.0 in	Fog
	6:59 AM	71 °F	70 °F	96 %	SSE	3 mph	0 mph	29.98 in	0.0 in	Partly Cloudy
	7:53 AM	74 °F	72 °F	93 %	CALM	0 mph	0 mph	30.00 in	0.0 in	Fair
	8:53 AM	78 °F	72 °F	81 %	CALM	0 mph	0 mph	30.01 in	0.0 in	Fair
	5:53 PM	77 °F	69 °F	76 %	WNW	8 mph	0 mph	29.95 in	0.0 in	Fair
	6:53 PM	74 °F	68 °F	82 %	NNW	12 mph	0 mph	29.97 in	0.0 in	Fair
	7:53 PM	73 °F	66 °F	79 %	NNW	9 mph	0 mph	29.99 in	0.0 in	Fair
	8:53 PM	72 °F	65 °F	78 %	N	8 mph	0 mph	30.01 in	0.0 in	Fair
	9:53 PM	71 °F	64 °F	78 %	N	9 mph	0 mph	30.02 in	0.0 in	Fair
	10:53 PM	69 °F	64 °F	84 %	N	8 mph	0 mph	30.01 in	0.0 in	Fair
	11:53 PM	68 °F	64 °F	87 %	NNW	6 mph	0 mph	30.01 in	0.0 in	Partly Cloudy
	12:02 AM	69 °F	64 °F	84 %	N	5 mph	0 mph	30.01 in	0.0 in	Mostly Cloudy
11/13/2022	12:53 AM	69 °F	63 °F	81 %	NNW	6 mph	0 mph	30.01 in	0.0 in	Cloudy

NOTE: Survey nights shaded in grey did not meet the weather criteria specified in the Guidelines. Red indicates specific parameters.

Appendix B. NOAA National Weather Service Data

Date	Time	Temperature	Dew Point	Humidity	Direction	Wind Speed	Wind Gust	Pressure	Precipitation	Conditions
	1:13 AM	69 °F	63 °F	81 %	NNW	6 mph	0 mph	30.00 in	0.0 in	Cloudy
	1:53 AM	69 °F	64 °F	84 %	N	6 mph	0 mph	29.99 in	0.0 in	Cloudy
	2:53 AM	69 °F	65 °F	87 %	N	5 mph	0 mph	29.99 in	0.0 in	Cloudy
	3:53 AM	70 °F	66 °F	87 %	NE	5 mph	0 mph	29.99 in	0.0 in	Cloudy
	4:53 AM	69 °F	67 °F	93 %	NNE	7 mph	0 mph	30.00 in	0.0 in	Cloudy
	5:07 AM	69 °F	67 °F	93 %	NE	9 mph	0 mph	30.00 in	0.0 in	Fog
	5:14 AM	69 °F	67 °F	93 %	ENE	8 mph	0 mph	30.00 in	0.0 in	Cloudy
	5:24 AM	69 °F	67 °F	93 %	ENE	7 mph	0 mph	30.00 in	0.0 in	Cloudy
	5:53 AM	70 °F	66 °F	87 %	NE	8 mph	0 mph	30.01 in	0.0 in	Cloudy
	6:04 AM	70 °F	66 °F	87 %	NE	7 mph	0 mph	30.01 in	0.0 in	Cloudy
11/13/2022	6:53 AM	69 °F	64 °F	84 %	ENE	8 mph	0 mph	30.02 in	0.0 in	Cloudy
	7:09 AM	69 °F	64 °F	84 %	ENE	7 mph	0 mph	30.03 in	0.0 in	Cloudy
	7:45 AM	70 °F	63 °F	78 %	NE	9 mph	0 mph	30.04 in	0.0 in	Cloudy
	7:53 AM	69 °F	62 °F	78 %	ENE	8 mph	0 mph	30.05 in	0.0 in	Cloudy
	5:53 PM	78 °F	69 °F	74 %	NW	7 mph	0 mph	30.01 in	0.0 in	Fair
	6:53 PM	77 °F	69 °F	76 %	NNW	5 mph	0 mph	30.02 in	0.0 in	Fair
	7:53 PM	75 °F	69 °F	82 %	NNW	5 mph	0 mph	30.03 in	0.0 in	Fair
	8:53 PM	75 °F	69 °F	82 %	N	3 mph	0 mph	30.04 in	0.0 in	Fair
	9:53 PM	74 °F	69 °F	85 %	CALM	0 mph	0 mph	30.05 in	0.0 in	Fair
	10:53 PM	74 °F	69 °F	85 %	CALM	0 mph	0 mph	30.05 in	0.0 in	Mostly Cloudy
	11:53 PM	74 °F	69 °F	85 %	ENE	3 mph	0 mph	30.04 in	0.0 in	Mostly Cloudy
11/14/2022	12:53 AM	73 °F	69 °F	87 %	SE	3 mph	0 mph	30.02 in	0.0 in	Fair
	1:53 AM	71 °F	69 °F	93 %	SE	3 mph	0 mph	30.01 in	0.0 in	Fair
	2:53 AM	71 °F	69 °F	93 %	E	3 mph	0 mph	30.02 in	0.0 in	Fair
	3:53 AM	71 °F	69 °F	93 %	NE	3 mph	0 mph	30.04 in	0.0 in	Fair
	4:53 AM	70 °F	68 °F	93 %	CALM	0 mph	0 mph	30.04 in	0.0 in	Fair
	5:53 AM	70 °F	68 °F	93 %	CALM	0 mph	0 mph	30.06 in	0.0 in	Fair
	6:53 AM	70 °F	68 °F	93 %	CALM	0 mph	0 mph	30.07 in	0.0 in	Fair
	7:53 AM	73 °F	70 °F	90 %	ESE	5 mph	0 mph	30.08 in	0.0 in	Fair

NOTE: Survey nights shaded in grey did not meet the weather criteria specified in the Guidelines. Red indicates specific parameters.

Appendix C

ACOUSTIC DATA SUMMARY

Appendix C. Acoustic Data Summary

Station	Number of Kaleidoscope Pro Auto ID'd WAV files															Number of manually verified WAV files
	Total recorded files	Classifed as noise	Not assigned auto ID	Total auto ID'd to species level	Big brown bat (*Eptesicus fuscus*)	Eastern red bat (*Lasiurus borealis*)	Hoary bat (*Lasiurus cinereus*)	Northern yellow bat (*Lasiurus intermedius*)	Seminole bat (*Lasiurus seminolus*)	Southeastern myotis (*Myotis austroriparius*)	Northern Long-Eared Bat (*Myotis septentrionalis*)	Evening bat (*Nycticeius humeralis*)	Tricolored bat (*Perimyotis subflavus*)	Brazilian free-tailed bat (*Tadarida brasiliensis*)	Florida bonneted bat (*Eumops floridanus*)	Florida bonneted bat
1	1,402	241	210	951	35	3	90	34	5	0	0	5	8	737	34	20
2	1,899	980	197	722	20	6	68	23	6	1	0	6	19	559	14	10
3	1,817	305	206	1,306	11	1	133	22	0	0	0	1	5	1,114	19	5
4	14,089	5,885	2,307	6,617	110	7	1,823	105	14	0	0	19	1	4,503	35	0
5	6,938	2,384	1,255	3,299	301	8	333	277	28	0	0	191	41	2,096	24	4*
6	12,631	1,235	2,837	8,559	402	13	1,805	785	9	0	0	28	22	5,455	40	3*
7	5,358	1,668	430	3,260	20	8	126	73	15	0	0	46	3	2,960	9	1
8	12,083	2,265	1,715	8,103	37	8	4,393	467	30	0	0	326	7	2,722	113	1
9	2,934	607	619	1,708	115	8	111	102	101	0	0	271	24	957	19	14
10	3,721	351	1,004	2,366	121	39	300	257	54	0	1	154	85	1,347	8	1
11	4,418	66	1,127	3,225	154	49	174	322	23	1	0	512	89	1,893	8	1

NOTES:

The following species were not included in Kaleidoscope Pro analysis due to rarity in Florida: silver haired bat, fringed myotis, Palla's mastiff bat, gray myotis, and little brown myotis.

*Includes one WAV file not assigned an AutoID which contained EUMFLO pulses

Appendix M

Standard Manatee Conditions for In-Water Work

STANDARD MANATEE CONDITIONS FOR IN-WATER WORK

2011

The permittee shall comply with the following conditions intended to protect manatees from direct project effects:

a. All personnel associated with the project shall be instructed about the presence of manatees and manatee speed zones, and the need to avoid collisions with and injury to manatees. The permittee shall advise all construction personnel that there are civil and criminal penalties for harming, harassing, or killing manatees which are protected under the Marine Mammal Protection Act, the Endangered Species Act, and the Florida Manatee Sanctuary Act.

b. All vessels associated with the construction project shall operate at "Idle Speed/No Wake" at all times while in the immediate area and while in water where the draft of the vessel provides less than a four-foot clearance from the bottom. All vessels will follow routes of deep water whenever possible.

c. Siltation or turbidity barriers shall be made of material in which manatees cannot become entangled, shall be properly secured, and shall be regularly monitored to avoid manatee entanglement or entrapment. Barriers must not impede manatee movement.

d. All on-site project personnel are responsible for observing water-related activities for the presence of manatee(s). All in-water operations, including vessels, must be shutdown if a manatee(s) comes within 50 feet of the operation. Activities will not resume until the manatee(s) has moved beyond the 50-foot radius of the project operation, or until 30 minutes elapses if the manatee(s) has not reappeared within 50 feet of the operation. Animals must not be herded away or harassed into leaving.

e. Any collision with or injury to a manatee shall be reported immediately to the Florida Fish and Wildlife Conservation Commission (FWC) Hotline at 1-888-404-3922. Collision and/or injury should also be reported to the U.S. Fish and Wildlife Service in Jacksonville (1-904-731-3336) for north Florida or in Vero Beach (1-772-562-3909) for south Florida, and emailed to FWC at ImperiledSpecies@myFWC.com.

f. Temporary signs concerning manatees shall be posted prior to and during all in-water project activities. All signs are to be removed by the permittee upon completion of the project. Temporary signs that have already been approved for this use by the FWC must be used. One sign which reads *Caution: Boaters* must be posted. A second sign measuring at least 8½ " by 11" explaining the requirements for "Idle Speed/No Wake" and the shut down of in-water operations must be posted in a location prominently visible to all personnel engaged in water-related activities. These signs can be viewed at http://www.myfwc.com/WILDLIFEHABITATS/manatee_sign_vendors.htm. Questions concerning these signs can be forwarded to the email address listed above.

CAUTION: MANATEE HABITAT

All project vessels

IDLE SPEED / NO WAKE

When a manatee is within 50 feet of work
all in-water activities must

SHUT DOWN

Report any collision with or injury to a manatee:

Wildlife Alert:

1-888-404-FWCC(3922)

cell *FWC or #FWC

Appendix N

West Indian Manatee Effect Determination Key

United States Department of the Interior

FISH AND WILDLIFE SERVICE
1339 20th Street
Vero Beach, Florida 32960

May 13, 2019

Andrew D. Kelly, Jr., Colonel
District Commander
U.S. Army Corps of Engineers
P.O. Box 4970
Jacksonville, Florida 32232-0019

Dear Colonel Kelly:

The U.S. Fish and Wildlife Service (Service) and the U.S. Army Corps of Engineers (Corps) currently use a dichotomous key (Key) to assist in making effect determinations pursuant to the Endangered Species Act for in-water activities that may affect manatees. Recently, Corps and Service staff identified the need to make several revisions to the 2013 Key to address new issues and changed circumstances. Although a more complete revision is needed in the future, three issues need to be addressed as soon as possible: 1) requirements associated with clamshell dredge head operation; 2) locations and conditions related to impact hammer driven metal piles and/or sheet piles; and 3) incorporation of the current list of counties that have approved Manatee Protection Plans (MPPs).

For the purpose of continuing to use the Key on projects that involve clamshell dredging or impact driving of metal piles or sheet piles, the Service is issuing this letter as an addendum to the Key. The Service finds work that keys out as "not likely to adversely affect" the manatee or its critical habitat using the 2013 Key is still the appropriate determination provided there is adherence to the following additional conditions:

1) During clamshell dredging operations, the dredge operator shall gravity-release the clamshell bucket only at the water's surface, and only after confirmation that there are no manatees within the safety distance identified in the standard construction conditions (or a 75-foot buffer if dredging is authorized at night);

2) Installation of metal pilings or metal sheet piles by impact hammer – if not within Important Manatee Areas, Warm Water Aggregation Areas, or Federal manatee sanctuaries or state-designated No Entry Areas - may occur under the following conditions: a) Use of at least one dedicated manatee observer, with all work being stopped if a manatee is observed within 1000 feet; b) no work shall occur outside of daylight hours (defined as one-half hour after sunrise to one-half hour before sunset); and, c) no more than 5 piles/day may be installed. If within any of the above-described areas, an informal or formal project-specific consultation with the Service is required.

In addition, the following change will allow projects in Charlotte County and Flagler County to be properly handled using the Key:

3) Charlotte County and Flagler County shall be added to the list of counties that have an approved Manatee Protection Plan (couplet J of the 2013 Key) and removed from the list of counties included in couplet L and the second category of couplet P of the 2013 Key.

With the above-described changes, the Service affirms that such work would not likely adversely affect the West Indian manatee and no further consultation is required provided all other conditions of the 2013 Key are met. The above changes, and possibly others, will ultimately be reflected in an updated version of the Key. We hope this letter provides the Corps with the ability to continue to work with the 2013 Key and in-water construction conditions until a revised and updated Key is approved.

Thank you for your continued support to facilitate recovery of the West Indian manatee and other species protected under the Endangered Species Act. If you have any questions, please contact Mr. Scott Calleson by e-mail at charles_calleson@fws.gov or by phone at (904) 731-3326.

Sincerely,

Larry Williams

Larry Williams
State Supervisor

cc:
Service, Jacksonville, Florida (Jay Herrington)
Service, Vero Beach, Florida (Bob Progulske, Roxanna Hinzman)

THE CORPS OF ENGINEERS, JACKSONVILLE DISTRICT, AND THE STATE OF FLORIDA EFFECT DETERMINATION KEY FOR THE MANATEE IN FLORIDA
April 2013

Purpose and background of the key

The purpose of this document is to provide guidance to improve the review of permit applications by U.S. Army Corps of Engineers' (Corps) Project Managers in the Regulatory Division regarding the potential effects of proposed projects on the endangered West Indian manatee (*Trichechus manatus*) in Florida, and by the Florida Department of Environmental Protection or its authorized designee or Water Management District, for evaluating projects under the State Programmatic General Permit (SPGP) or any other Programmatic General Permits that the Corps may issue for administration by the above agencies. Such guidance is contained in the following dichotomous key. The key applies to permit applications for in-water activities such as, but not limited to: (1) dredging [new or maintenance dredging of not more than 50,000 cubic yards], placement of fill material for shoreline stabilization, and construction/placement of other in-water structures as well as (2) construction of docks, marinas, boat ramps and associated trailer parking spaces, boat slips, dry storage or any other watercraft access structures or facilities.

At a certain step in the key, the user is referred to graphics depicting important manatee areas or areas with inadequate protection. The maps can be downloaded from the Corps' web page at http://www.saj.usace.army.mil/Missions/Regulatory/SourceBook.aspx. We intend to utilize the most recent depiction of these areas, so should these areas be modified by statute, rule, ordinance and/or other legal mandate or authorization, we will modify the graphical depictions accordingly. These areas may be shaded or otherwise differentiated for identification on the maps.

Explanatory footnotes are provided in the key and must be closely followed whenever encountered.

Scope of the key

This key should only be used in the review of permit applications for effect determinations on manatees and should not be used for other listed species or for other aquatic resources such as Essential Fish Habitat (EFH). Corps Project Managers should ensure that consideration of the project's effects on any other listed species and/or on EFH is performed independently. This key may be used to evaluate applications for all types of State of Florida (State Programmatic General Permits, noticed general permits, standard general permits, submerged lands leases, conceptual and individual permits) and Department of the Army (standard permits, letters of permission, nationwide permits, and regional general permits) permits and authorizations. The final effect determination will be based on the project location and description; the potential effects to manatees, manatee habitat, and/or manatee critical habitat; and any measures (such as project components, standard construction precautions, or special conditions included in the authorization) to avoid or minimize effects to manatees or manatee critical habitat. Projects that key to a "may affect" determination equate to "likely to adversely affect" situations, and those projects should not be processed under the SPGP or any other programmatic general permit. For

all “may affect” determinations, Corps Project Managers shall refer to the Manatee Programmatic Biological Opinion, dated March 21, 2011, for guidance on eliminating or minimizing potential adverse effects resulting from the proposed project. If unable to resolve the adverse effects, the Corps may refer the applicant to the U.S. Fish and Wildlife Service (Service) for further assistance in attempting to revise the proposed project to a “may affect, not likely to adversely affect” level. The Service will coordinate with the Florida Fish and Wildlife Conservation Commission (FWC) and the counties, as appropriate. Projects that provide new access for watercraft and key to “may affect, not likely to adversely affect” may or may not need to be reviewed individually by the Service.

MANATEE KEY
Florida[1]
April 2013

The key is not designed to be used by the Corps' Regulatory Division for making their effect determinations for dredging projects greater than 50,000 cubic yards, the Corps' Planning Division in making their effect determinations for civil works projects or by the Corps' Regulatory Division for making their effect determinations for projects of the same relative scope as civil works projects. These types of activities must be evaluated by the Corps independently of the key.

A. Project is not located in waters accessible to manatees and does not directly or indirectly affect manatees (see Glossary).....*No effect*

Project is located in waters accessible to manatees **or** directly or indirectly affects manatees ..... B

B. Project consists of one or more of the following activities, all of which are *May affect*:

1. blasting or other detonation activity for channel deepening and/or widening, geotechnical surveys or exploration, bridge removal, movies, military shows, special events, etc.;

2. installation of structures which could restrict or act as a barrier to manatees;

3. new or changes to existing warm or fresh water discharges from industrial sites, power plants, or natural springs or artesian wells (but only if the new or proposed change in discharge requires a Corps permit to accomplish the work);

4. installation of new culverts and/or maintenance or modification of existing culverts (where the culverts are 8 inches to 8 feet in diameter, ungrated and in waters accessible, or potentially accessible, to manatees)[2];

5. mechanical dredging from a floating platform, barge or structure[3] that restricts manatee access to less than half the width of the waterway;

6. creation of new slips or change in use of existing slips, even those located in a county with a State-approved Manatee Protection Plan (MPP) in place and the number of slips is less than the MPP threshold, to accommodate docking for repeat use vessels, (*e.g.*, water taxis, tour boats, gambling boats, etc; or slips or structures that are not civil works projects, but are frequently used to moor large vessels (>100') for shipping and/or freight purposes; does not include slips used for docking at boat sales or repair facilities or loading/unloading at dry stack storage facilities and boat ramps); [Note: For projects within Bay, Dixie, Escambia, Franklin, Gilchrist, Gulf, Hernando, Jefferson, Lafayette, Monroe (south of Craig Key), Nassau, Okaloosa, Okeechobee, Santa Rosa, Suwannee, Taylor, Wakulla or Walton County, the reviewer should proceed to Couplet C.]

7. any type of in-water activity in a Warm Water Aggregation Area (WWAA) or No Entry Area (see Glossary and accompanying Maps[4]); [Note: For residential docking facilities in a Warm Water Aggregation Area that is not a Federal manatee sanctuary or No Entry Area, the reviewer should proceed to couplet C.]

8. creation or expansion of canals, basins or other artificial shoreline and/or the connection of such features to navigable waters of the U.S.; [Note: For projects proposing a single residential dock, the reviewer should proceed to couplet C; otherwise, project is a *May Affect*.]

9. installation of temporary structures (docks, buoys, etc.) utilized for special events such as boat races, boat shows, military shows, etc., but only when consultation with the U.S. Coast Guard and FWS has not occurred; [Note: See programmatic consultation with the U.S. Coast Guard on manatees dated May 10, 2010.].

Project is other than the activities listed above C

C. Project is located in an Important Manatee Area (IMA) (see Glossary and accompanying Maps[4]) ..... D

Project is not located in an Important Manatee Area (IMA) (see Glossary and accompanying Maps[4]) ..... G

D. Project includes dredging of less than 50,000 cubic yards ..... E

Project does not include dredging ..... G

E. Project is for dredging a residential dock facility or is a land-based dredging operation ..... N

Project not as above ..... F

F. Project proponent **does not elect** to follow all dredging protocols described on the maps for the respective IMA in which the project is proposed ..... *May affect*

Project proponent **elects** to follow all dredging protocols described on the maps for the respective IMA in which the project is proposed ..... G

G. Project provides new[5] access for watercraft, *e.g.*, docks or piers, marinas, boat ramps and associated trailer parking spaces, new dredging, boat lifts, pilings, floats, floating docks, floating vessel platforms, boat slips, dry storage, mooring buoys, or other watercraft access (residential boat lifts, pilings, floating docks, and floating vessel platforms installed in existing slips are not considered new access) or improvements allowing increased watercraft usage ..... H

Project does not provide new[5] access for watercraft, *e.g.*, bulkheads, seawalls, riprap, maintenance dredging, boardwalks and/or the maintenance (repair or rehabilitation) of currently serviceable watercraft access structures provided all of the following are met: (1) the number of slips is not increased; (2) the number of existing slips is not in question; and (3) the improvements do not allow increased watercraft usage ..... N

H. Project is located in the Braden River Area of Inadequate Protection (Manatee County) (see Glossary and accompanying AIP Map[4])
..... *May affect*

Project is not located in the Braden River Area of Inadequate Protection (Manatee County) (see Glossary and accompanying AIP Map[4]) I

I. Project is for a multi-slip facility (see Glossary) ..... J

Project is for a residential dock facility or is for dredging (see Glossary) ..... N

J. Project is located in a county that currently has a State-approved MPP in place (BREVARD, BROWARD, CITRUS, CLAY, COLLIER, DUVAL, INDIAN RIVER, LEE, MARTIN, MIAMI-DADE, PALM BEACH, ST. LUCIE, SARASOTA, VOLUSIA) or shares contiguous waters with a county having a State-approved MPP in place (LAKE, MARION, SEMINOLE)[6] ..... K

Project is located in a county not required to have a State-approved MPP L

K. Project has been developed or modified to be consistent with the county's State-approved MPP **and** has been verified by a FWC review (or FWS review if project is exempt from State permitting) **or** the number of slips is below the MPP threshold ..... N

Project has not been reviewed by the FWC or FWS **or** has been reviewed by the FWC or FWS **and** determined that the project is not consistent with the county's State-approved MPP ..... *May affect*

L. Project is located in one of the following counties: CHARLOTTE, DESOTO[7], FLAGLER, GLADES, HENDRY, HILLSBOROUGH, LEVY, MANATEE, MONROE[7], PASCO[7], PINELLAS ..... M

Project is located in one of the following counties: BAY, DIXIE, ESCAMBIA, FRANKLIN, GILCHRIST, GULF, HERNANDO, JEFFERSON, LAFAYETTE, MONROE (south of Craig Key), NASSAU, OKALOOSA, OKEECHOBEE, PUTNAM, SANTA ROSA, ST. JOHNS, SUWANNEE, TAYLOR, WAKULLA, WALTON ..... N

M. The number of slips does not exceed the residential dock density threshold (see Glossary) ..... N

The number of slips exceeds the residential dock density threshold (see Glossary) ..... *May affect*

N. Project impacts to submerged aquatic vegetation[8], emergent vegetation or mangrove will have beneficial, insignificant, discountable[9] or no effects on the manatee[10] ..... O

Project impacts to submerged aquatic vegetation[8], emergent vegetation or mangrove may adversely affect the manatee[10] ..... *May affect*

O. Project proponent **elects** to follow standard manatee conditions for in-water work[11] and requirements, as appropriate for the proposed activity, prescribed on the maps[4] ..... P

Project proponent **does not elect** to follow standard manatee conditions for in-water work[11] and appropriate requirements prescribed on the maps[4] ..... *May affect*

P. If project is for a new or expanding[5] multi-slip facility and is located in a county with a State-approved MPP in place **or** in Bay, Dixie, Escambia, Franklin, Gilchrist, Gulf, Hernando, Jefferson, Lafayette, Monroe (south of Craig Key), Nassau, Okaloosa, Okeechobee, Putnam, St. Johns, Santa Rosa, Suwannee, Taylor, Wakulla or Walton County, the determination of "*May affect, not likely to adversely affect*" is appropriate[12] and no further consultation with the Service is necessary.

If project is for a new or expanding[5] multi-slip facility and is located in Charlotte, Desoto, Flagler, Glades, Hendry, Hillsborough, Levy, Manatee, Monroe (north of Craig Key), Pasco, or Pinellas County, further consultation with the Service is necessary for "*May affect, not likely to adversely affect*" determinations.

If project is for repair or rehabilitation of a multi-slip facility and is located in an Important Manatee Area, further consultation with the Service is necessary for "*May affect, not likely to adversely affect*" determinations. If project is for repair or rehabilitation of a multi-slip facility and: (1) is not located in an Important Manatee Area; (2) the number of slips is not increased; (3) the number of existing slips is not in question; and (4) the improvements to the existing watercraft access structures do not allow increased watercraft usage, the determination of "*May affect, not likely to adversely affect*" is appropriate[12] and no further consultation with the Service is necessary.

If project is a residential dock facility, shoreline stabilization, or dredging, the determination of "*May affect, not likely to adversely affect*" is appropriate[12] and no further consultation with the Service is necessary. Note: For residential dock facilities located in a Warm Water Aggregation Area or in a No Entry area, seasonal restrictions may apply. See footnote 4 below for maps showing restrictions.

If project is other than repair or rehabilitation of a multi-slip facility, a new[5] multi-slip facility, residential dock facility, shoreline stabilization, or dredging, and does not provide new[5] access for watercraft or

improve an existing access to allow increased watercraft usage, the determination of "*May affect, not likely to adversely affect*" is appropriate[12] and no further consultation with the Service is necessary.

[1] On the St. Mary's River, this key is only applicable to those areas that are within the geographical limits of the State of Florida.

[2] All culverts 8 inches to 8 feet in diameter must be grated to prevent manatee entrapment. To effectively prevent manatee access, grates must be permanently fixed, spaced a maximum of 8 inches apart (may be less for culverts smaller than 16 inches in diameter) and may be installed diagonally, horizontally or vertically. For new culverts, grates must be attached prior to installation of the culverts. Culverts less than 8 inches or greater than 8 feet in diameter are exempt from this requirement. If new culverts and/or the maintenance or modification of existing culverts are grated as described above, the determination of "*May affect, not likely to adversely affect*" is appropriate[11] and no further consultation with the Service is necessary.

[3] If the project proponent agrees to follow the standard manatee conditions for in-water work as well as any special conditions appropriate for the proposed activity, further consultation with the Service is necessary for "*May affect, not likely to adversely affect*" determinations. These special conditions may include, but are not limited to, the use of dedicated observers (see Glossary for definition of dedicated observers), dredging during specific months (warm weather months vs cold weather months), dredging during daylight hours only, adjusting the number of dredging days, does not preclude or discourage manatee egress/ingress with turbidity curtains or other barriers that span the width of the waterway, etc.

[4] Areas of Inadequate Protection (AIPs), Important Manatee Areas (IMAs), Warm Water Aggregation Areas (WWAAs) and No Entry Areas are identified on these maps and defined in the Glossary for the purposes of this key. These maps can be viewed on the Corps' web page. If projects are located in a No Entry Area, special permits may be required from FWC in order to access these areas (please refer to Chapter 68C-22 F.A.C. for boundaries; maps are also available at FWC's web page).

[5] New access for watercraft is the addition or improvement of structures such as, but not limited to, docks or piers, marinas, boat ramps and associated trailer parking spaces, boat lifts, pilings, floats, floating docks, floating vessel platforms, (maintenance dredging, residential boat lifts, pilings, floating docks, and floating vessel platforms installed in existing slips are not considered new access), boat slips, dry storage, mooring buoys, new dredging, etc., that facilitates the addition of watercraft to, and/or increases watercraft usage in, waters accessible to manatees. The repair or rehabilitation of any type of currently serviceable watercraft access structure is not considered new access provided all of the following are met: (1) the number of slips is not increased; (2) the number of existing slips is not in question; and (3) the improvements to the existing watercraft access structures do not result in increased watercraft usage.

[6] Projects proposed within the St. Johns River portion of Lake, Marion, and Seminole counties and contiguous with Volusia County shall be evaluated using the Volusia County MPP.

[7] For projects proposed within the following areas: the Peace River in DeSoto County; all areas north of Craig Key in Monroe County, and the Anclote and Pithlachascotee Rivers in Pasco County, proceed to Couplet M. For all other locations in DeSoto, Monroe (south of Craig Key) and Pasco Counties, proceed to couplet N.

[8] Where the presence of the referenced vegetation is confirmed within the area affected by docks and other piling-supported minor structures and the reviewer has concluded that the impacts to SAV, marsh or mangroves would not adversely affect the manatee or its critical habitat, proceed to couplet O.

Where the presence of the referenced vegetation is confirmed within the area affected by docks and other piling-supported minor structures and the reviewer has concluded that the impacts to SAV, marsh or mangroves would adversely affect the manatee or its critical habitat, the applicant can elect to avoid/minimize impacts to that vegetation. In that instance, where impacts are unavoidable and the applicant elects to abide by or employ construction techniques that exceed the criteria in the following documents, the reviewer should conclude that the impacts to SAV, marsh or mangroves would not adversely affect the manatee or its critical habitat and proceed to couplet O.

- "Construction Guidelines in Florida for Minor Piling-Supported Structures Constructed in or over Submerged Aquatic Vegetation (SAV), Marsh or Mangrove Habitat," prepared jointly by the U.S. Army Corps of Engineers and the National Marine Fisheries Service (August 2001) [refer to the Corps' web page], and

- "Key for Construction Conditions for Docks or Other Minor Structures Constructed in or over Johnson's seagrass (*Halophila johnsonii*)," prepared jointly by the National Marine Fisheries Service and U.S. Army Corps of Engineers (October 2002), for those projects within the known range of Johnson's seagrass occurrence (Sebastian Inlet to central Biscayne Bay in the lagoon systems on the east coast of Florida) [refer to the Corps' web page],

Where the presence of the referenced vegetation is confirmed within the area affected by docks and other piling-supported minor structures and the reviewer has concluded that the impacts to SAV, marsh or mangroves would adversely affect the manatee or its critical habitat, and the applicant does not elect to follow the above Guidelines, the Corps will need to request formal consultation on the manatee with the Service as *May affect*.

For activities other than docks and other piling-supported minor structures proposed in SAV, marsh, or mangroves (*e.g.*, new dredging, placement of riprap, bulkheads, etc.), if the reviewer determines the impacts to the SAV, marsh or mangroves will not adversely affect the manatee or its critical habitat, proceed to couplet O, otherwise the Corps will need to request formal consultation on the manatee with the Service as *May affect*.

[9] See Glossary, under "is not likely to adversely affect."

[10] Federal reviewers, when making your effects determination, consider effects to manatee designated critical habitat pursuant to section 7(a)(2) of the Endangered Species Act. State reviewers, when making your effects determination, consider effects to manatee habitat within the entire State of Florida, pursuant to Chapter 370.12(2)(b) Florida Statutes.

[11] See the Corps' web page for manatee construction conditions. At this time, manatee construction precautions c and f are not required in the following Florida counties: Bay, Escambia, Franklin, Gilchrist, Gulf, Jefferson, Lafayette, Okaloosa, Santa Rosa, Suwannee, and Walton.

[12] By letter dated April 25, 2013, the Corps received the Service's concurrence with "*May affect, not likely to adversely affect*" determinations made pursuant to this key for the following activities: (1) selected non-watercraft access projects; (2) watercraft-access projects that are residential dock facilities, excluding those located in the Braden River AIP; (3) launching facilities solely for kayaks and canoes, and (4) new or expanding multi-slip facilities located in Bay, Dixie, Escambia, Franklin, Gilchrist, Gulf, Hernando, Jefferson, Lafayette, Monroe (south of Craig Key), Nassau, Okaloosa, Okeechobee, Santa Rosa, Suwannee, Taylor, Wakulla or Walton County.

Additionally, in the same letter dated April 25, 2013, the Corps received the Service's concurrence for "*May affect, not likely to adversely affect*" determinations specifically made pursuant to Couplet G of the key for the repair or rehabilitation of currently serviceable multi-slip watercraft access structures provided all of the following are met: (1) the project is not located in an IMA, (2) the number of slips is not increased; (3) the number of existing slips is not in question; and (4) the improvements to the existing watercraft access structures do not allow increased watercraft usage. Upon receipt of such a programmatic concurrence, no further consultation with the Service for these projects is required.

GLOSSARY

Areas of inadequate protection (AIP) – Areas within counties as shown on the maps where the Service has determined that measures intended to protect manatees from the reasonable certainty of watercraft-related take are inadequate. Inadequate protection may be the result of the absence of manatee or other watercraft speed zones, insufficiency of existing speed zones, deficient speed zone signage, or the absence or insufficiency of speed zone enforcement.

Boat slip – A space on land or in or over the water, other than on residential land, that is intended and/or actively used to hold a stationary watercraft or its trailer, and for which intention and/or use is confirmed by legal authorization or other documentary evidence. Examples of boat slips include, but are not limited to, docks or piers, marinas, boat ramps and associated trailer parking spaces, boat lifts, floats, floating docks, pilings, boat davits, dry storage, etc.

Critical habitat – For listed species, this consists of: (1) the specific areas within the geographical area occupied by the species, at the time it is listed in accordance with the provisions of section 4 of the Endangered Species Act (ESA), on which are found those physical or biological features (constituent elements) (a) essential to the conservation of the species and (b) which may require special management considerations or protection; and (2) specific areas outside the geographical area occupied by the species at the time it is listed in accordance with the provisions of section 4 of the ESA, upon a determination by the Secretary that such areas are essential for the conservation of the species. Designated critical habitats are described in 50 CFR 17 and 50 CFR 226.

Currently serviceable – Currently, serviceable means usable as is or with some maintenance, but not so degraded as to essentially require reconstruction.

Direct effects – The direct or immediate effects of the project on the species or its habitat.

Dredging – For the purposes of this key, the term dredging refers to all in-water work associated with dredging operations, including mobilization and demobilization activities that occur in water or require vessels.

Emergent vegetation – Rooted emergent vascular macrophytes such as, but not limited to, cordgrass (*Spartina alterniflora and S. patens*), needle rush (J*uncus roemerianus*), swamp sawgrass (*Cladium mariscoides*), saltwort (*Batis maritima*), saltgrass (*Distichlis spicata*), and glasswort (*Salicornia virginica*) found in coastal salt marsh-related habitats (tidal marsh, salt marsh, brackish marsh, coastal marsh, coastal wetlands, tidal wetlands).

Formal consultation – A process between the Services and a Federal agency or applicant that: (1) determines whether a proposed Federal action is likely to jeopardize the continued existence of listed species or destroy or adversely modify designated critical habitat; (2) begins with a Federal agency's written request and submittal of a complete initiation package; and (3) concludes with the issuance of a biological opinion and incidental take statement by either of the Services. If a proposed Federal action may affect a listed species or designated critical habitat, formal consultation is required (except when the Services concur, in writing, that a proposed

action “is not likely to adversely affect” listed species or designated critical habitat). [50 CFR 402.02, 50 CFR 402.14]

Important manatee areas (IMA) – Areas within certain counties where increased densities of manatees occur due to the proximity of warm water discharges, freshwater discharges, natural springs and other habitat features that are attractive to manatees. These areas are heavily utilized for feeding, transiting, mating, calving, nursing or resting as indicated by aerial survey data, mortality data and telemetry data. Some of these areas may be federally-designated sanctuaries or state-designated “seasonal no entry” zones. Maps depicting important manatee areas and any accompanying text may contain a reference to these areas and their special requirements. Projects proposed within these areas must address their special requirements.

Indirect effects – Those effects that are caused by or will result from the proposed action and are later in time, but are still reasonably certain to occur. Examples of indirect effects include, but are not limited to, changes in water flow, water temperature, water quality (*e.g.*, salinity, pH, turbidity, nutrients, chemistry), prop dredging of seagrasses, and manatee watercraft injury and mortality. Indirect effects also include watercraft access developments in waters not currently accessible to manatees, but watercraft access can, is, or may be planned to waters accessible to manatees by the addition of a boat lift or the removal of a dike or plug.

Informal consultation – A process that includes all discussions and correspondence between the Services and a Federal agency or designated non-Federal representative, prior to formal consultation, to determine whether a proposed Federal action may affect listed species or critical habitat. This process allows the Federal agency to utilize the Services’ expertise to evaluate the agency’s assessment of potential effects or to suggest possible modifications to the proposed action which could avoid potentially adverse effects. If a proposed Federal action may affect a listed species or designated critical habitat, formal consultation is required (except when the Services concur, in writing, that a proposed action “is not likely to adversely affect” listed species or designated critical habitat). [50 CFR 402.02, 50 CFR 402.13]

In-water activity – Any type of activity used to construct/repair/replace any type of in-water structure or fill; the act of dredging.

In-water structures – watercraft access structures – Docks or piers, marinas, boat ramps, boat slips, boat lifts, floats, floating docks, pilings (depending on use), boat davits, etc.

In-water structures – other than watercraft access structures – Bulkheads, seawalls, riprap, groins, boardwalks, pilings (depending on use), etc.

Is likely to adversely affect – The appropriate finding in a biological assessment (or conclusion during informal consultation) if any adverse effect to listed species may occur as a direct or indirect result of the proposed action or its interrelated or interdependent actions and the effect is not: discountable, insignificant, or beneficial (see definition of “is not likely to adversely affect”). An “is likely to adversely affect” determination requires the initiation of formal consultation under section 7 of the ESA.

Is not likely to adversely affect – The appropriate conclusion when effects on listed species are expected to be discountable, insignificant, or completely beneficial. **Discountable effects** are those extremely unlikely to occur. **Insignificant effects** relate to the size of the impact and should never reach the scale where take occurs. **Beneficial effects** are contemporaneous positive effects without any adverse effects to the species. Based on best judgment, a person would not (1) be able to meaningfully measure, detect, or evaluate insignificant effects or (2) expect discountable effects to occur.

Manatee Protection Plan (MPP) – A manatee protection plan (MPP) is a comprehensive planning document that addresses the long-term protection of the Florida manatee through law enforcement, education, boat facility siting, and habitat protection initiatives. Although MPPs are primarily developed by the counties, the plans are the product of extensive coordination and cooperation between the local governments, the FWC, the Service, and other interested parties.

Manatee Protection Plan thresholds – The smallest size of a multi-slip facility addressed under the purview of a Manatee Protection Plan (MPP). For most MPPs, this threshold is five slips or more. For Brevard, Clay, Citrus, and Volusia County MPPs, this threshold is three slips or more.

Mangroves – Rooted emergent trees along a shoreline that, for the purposes of this key, include red mangrove (*Rhizophora mangle*), black mangrove (*Avicennia germinans*) and white mangrove (*Laguncularia racemosa*).

May affect – The appropriate conclusion when a proposed action may pose <u>any</u> effects on listed species or designated critical habitat. When the Federal agency proposing the action determines that a "may affect" situation exists, then they must either request the Services to initiate formal consultation or seek written concurrence from the Services that the action "is not likely to adversely affect" listed species. For the purpose of this key, all "may affect" determinations equate to "likely to adversely affect" and Corps Project Managers should request the Service to initiate formal consultation on the manatee or designated critical habitat. **No effect** – the appropriate conclusion when the action agency determines its proposed action will not affect a listed species or designated critical habitat.

Multi-slip facility – Multi-slip facilities include commercial marinas, private multi-family docks, boat ramps and associated trailer parking spaces, dry storage facilities and any other similar structures or activities that provide access to the water for multiple (five slips or more, except in Brevard, Clay, Citrus, and Volusia counties where it is three slips or more) watercraft. In some instances, the Corps and the Service may elect to review multiple residential dock facilities as a multi-slip facility.

New access for watercraft – New dredging and the addition, expansion or improvement of structures such as, but not limited to, docks or piers, marinas, boat ramps and associated trailer parking spaces, boat lifts, pilings, floats, floating docks, floating vessel platforms, (residential boat lifts, pilings, floats, and floating vessel platforms installed in existing slips are not considered new access), boat slips, dry storage, mooring buoys, etc., that facilitates the addition of watercraft to, and/or increases watercraft usage in, waters accessible to manatees.

Observers – During dredging and other in-water operations within manatee accessible waters, the standard manatee construction conditions require all on-site project personnel to watch for manatees to ensure that those standard manatee construction conditions are met. Within important manatee areas (IMA) and under special circumstances, heightened observation is needed. **Dedicated Observers** are those having some prior experience in manatee observation, are dedicated only for this task, and must be someone other than the dredge and equipment operators/mechanics. **Approved Observers** are dedicated observers who also must be approved by the Service (if Federal permits are involved) and the FWC (if state permits are involved), prior to work commencement. Approved observers typically have significant and often project-specific observational experience. Documentation on prior experience must be submitted to these agencies for approval and must be submitted a minimum of 30 days prior to work commencement. When dedicated or approved observers are required, observers must be on site during all in-water activities, and be equipped with polarized sunglasses to aid in manatee observation. For prolonged in-water operations, multiple observers may be needed to perform observation in shifts to reduce fatigue (recommended shift length is no longer than six hours). Additional information concerning observer approval can be found at FWC's web page.

Residential boat lift – A boat lift installed on a residential dock facility.

Residential dock density ratio threshold – The residential dock density ratio threshold is used in the evaluation of multi-slip projects in some counties without a State-approved Manatee Protection Plan and is consistent with 1 boat slip per 100 linear feet of shoreline (1:100) owned by the applicant.

Residential dock facility – A residential dock facility means a private residential dock which is used for private, recreational or leisure purposes for single-family or multi-family residences designed to moor no more than four vessels (except in Brevard, Clay, Citrus, and Volusia counties which allow only two vessels). This also includes normal appurtenances such as residential boat lifts, boat shelters with open sides, stairways, walkways, mooring pilings, dolphins, etc. In some instances, the Corps and the Service may elect to review multiple residential dock facilities as a multi-slip facility.

Submerged aquatic vegetation (SAV) – Rooted, submerged, aquatic plants such as, but not limited to, shoal grass (*Halodule wrightii*), paddle grass (*Halophila decipiens*), star grass (*Halophila engelmanni*), Johnson's seagrass (*Halophila johnsonii*), sago pondweed (*Potamogeton pectinatus*), clasping-leaved pondweed (*Potamogeton perfoliatus*), widgeon grass (*Ruppia maritima*), manatee grass (*Syringodium filiforme*), turtle grass (*Thalassia testudinum*), tapegrass (*Vallisneria americana*), and horned pondweed (*Zannichellia palustris*).

Warm Water Aggregation Areas (WWAAs) and **No Entry Areas** – Areas within certain counties where increased densities of manatees occur due to the proximity of artificial or natural warm water discharges or springs and are considered necessary for survival. Some of these areas may be federally-designated manatee sanctuaries or state-designated seasonal "no entry" manatee protection zones. Projects proposed within these areas may require consultation in order to offset expected adverse impacts. In addition, special permits may be required from the FWC in order to access these areas.

Watercraft access structures – Docks or piers, marinas, boat ramps and associated trailer parking spaces, boat slips, boat lifts, floats, floating docks, pilings, boat davits, dry storage, etc.

Waters accessible to manatees – Although most waters of the State of Florida are accessible to the manatee, there are some areas such as landlocked lakes that are not. There are also some weirs, salinity control structures and locks that may preclude manatees from accessing water bodies. If there is any question about accessibility, contact the Service or the FWC.

Appendix O

Florida Panther Effect Determination Key

United States Department of the Interior

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

February 19, 2007

David S. Hobbie
Chief, Regulatory Division
U.S. Army Corps of Engineers
P.O. Box 4970
Jacksonville, Florida 32232-0019

Dear Mr. Hobbie:

The Fish and Wildlife Service (Service) has reviewed your letter dated December 20, 2006, referencing the development of a revised Panther Key, which will assist the Corps project managers in their effect determinations as prescribed under Section 7(a) (2) of the Endangered Species Act of 1973 as amended (Act) (87 Stat 884 16 U S C 1531 *et seq*) and its implementing regulations at 50 CFR Section 402. The original Panther Key has been used since August 8, 2003, by the Corps to evaluate all applications for a Department of Army permit under Section 404 of the Clean Water Act for projects in the consultation area. The Florida panther consultation area was depicted in the Service's interim Standard Local Operating Procedures for Endangered Species (SLOPES) for the Florida Panther (Service 2000).

In our original 2000 evaluation we provided a consultation area map (MAP) to assist the Corps in determining which projects may have an effect of the Florida panther. The MAP was generated by the Service by overlaying existing and historical panther telemetry data on a profile of Florida and providing a connecting boundary surrounding most of these points. Since the development of the MAP, we have received more accurate and up-to-date information on Florida panther habitat usage. Specifically we have received two documents that the Service believes reflect the common panther habitat usage profiles. These documents are the publications by Kautz et al. (2006) and Thatcher et al. (2006). Based on the information in these documents, we changed the boundaries of the MAP to better reflect areas where we believe project may have an effect on the Florida panther and provided this map to you in correspondence dated December 8, 2006. Upon receipt of this information, you provided a revised Panther Key and Rationale, dated December 20, 2006, and labeled as Panther Key and Rationale-January 2007. You also requested concurrence from the Service that the utilization of the Panther Key-January 2007 may affect but is not likely to adversely affect the Florida panther.

To assist the Corps in developing a Panther Key that fully reflects the Service's desire to identify those projects that may have an effect on the Florida panther and the need for consultation with the Service, we are providing a revised Panther Key and Rationale – February 19, 2007, that we believe meets this objective (enclosed).

We have used Kautz et al. (2006) and Thatcher et al. (2006) to outline a Panther Focus Area, where we believe sufficient data are present that, in most cases, warrants consultation with the Service. In addition, panther research data, including scientific publications, telemetry, photographs, tracks, prey kills, and other verifiable evidence, provide direct evidence of the presence of, and use of areas by panthers, in locations that may or may not be within the Panther Focus Area or original MAP. For example, panther mortality by vehicle interactions is a significant threat; although a proposed project may not be within the Panther Focus Area, traffic generated by the project in or adjacent to the Panther Focus Area may increase risk of panther-vehicle mortality, warranting consultation with the Service.

The key and rationale provide guidelines to help us identify when proposals may affect the panther. As always, information obtained in the future will help us refine these guidelines further, or possibly identify additional issues for consideration. As an important partner in our program to conserve and the Florida panther, your cooperation and assistance are greatly appreciated. Again, thank you for your cooperation and effort in protecting federally listed species. If you have any questions, please do not hesitate to contact either myself or Allen Webb at 772-562-3909.

Sincerely yours,

Paul Souza
Field Supervisor
South Florida Ecological Services Office

Enclosure

cc: Noreen Walsh, ARD-Ecological Services, U.S. FWS

Kautz, R., R. Kawula, T. Hoctor, J. Comiskey, D. Jansen, D. Jennings, J. Kasbohm, F. Mazzotti, R. McBride, L. Richardson, and K. Root. 2006. How Much Is Enough? Landscape-scale Conservation for the Florida Panther. Biological Conservation.

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U.S. Fish and Wildlife Service (Service). 2000. Florida panther final interim standard local operating procedures (SLOPES) for endangered species. Fish and Wildlife Service; Vero Beach, Florida.

Enclosure

Florida Panther Effect Determination Key
February 19, 2007

A. Project is not within Panther Focus Area ……. B

Project is within Panther Focus Area…… C

B. Project will have no increase and/or change in vehicle traffic patterns or other identifiable effects to panthers or their habitat…….. *No effect*

Project is greater than 1 acre in size and will have a net increase and/or change in vehicle traffic patterns or other identifiable effects to panthers or their habitat …… *May affect*
Consultation with the Service is requested[1]

C. Project is less than 1 acre…….……*May affect, not likely to adversely affect*

Project is greater than 1 acre…….*May affect*
Consultation with the Service is requested[1]

1 Consultation may be concluded informally or formally depending on project effects.

Rationale for the
Florida Panther Effect Determination Key
February 19, 2007

The following discussion provides background for terms used in the key and areas delineated on the accompanying map.

Panther Focus Area (see accompanying map)

The Panther Focus Area was based on results from recent panther habitat models south of the Caloosahatchee River and north of the Caloosahatchee River (Kautz et al. 2006 and Thatcher et al. 2006). In addition, marked panthers have been found throughout the delineated area.

The Kautz et al. (2006) model of landscape components important to Florida panther habitat conservation was based on an analysis of panther habitat use and forest patch size south of the Caloosahatchee River. This model was used in combination with radio-telemetry records, home range overlaps, land use/land cover data, and satellite imagery to delineate primary and secondary areas that would comprise a landscape mosaic of cover types that are especially important to support the current panther breeding population south of the Caloosahatchee River.

Thatcher et al. (2006) developed a habitat model using Florida panther home ranges in south Florida to identified landscape conditions (land-cover types, habitat patch size and configuration, road density and other human development activities, and other similar metrics) north of the Caloosahatchee River that were similar to those associated with the current panther breeding population south of the Caloosahatchee River.

The Panther Focus Area south of the Caloosahatchee River is divided into Primary, Secondary, and Dispersal Zones. North of the Caloosahatchee River it is named the Primary Dispersal/Expansion Area.

Primary Zone is currently occupied and supports the only known breeding population of Florida panthers in the world. These lands are important to the long-term viability and persistence of the panther in the wild.

Secondary Zone lands are contiguous with the Primary Zone and although these lands are used to a lesser extent by panthers, they are important to the long-term viability and persistence of the panther in the wild. Panthers use these lands in a much lower density than in the Primary Zone.

Dispersal Zone is a known corridor between the Panther Focus Area south of the

Caloosahatchee River to the Panther Focus Area north of the Caloosahatchee River. This zone is necessary to facilitate the dispersal of panthers and future panther population expansion to areas north of the Caloosahatchee River. Marked panthers have been known to use this zone.

Primary Dispersal/Expansion Area is the Fisheating Creek/Babcock-Webb Wildlife Management Area region. These are lands identified by Thatcher et al. (2006) as potential panther habitat with the shortest habitat connection to the Panther Focus Area in south Florida. Several collared and uncollared male panthers have been documented in this area since 1973, and the last female documented north of the Caloosahatchee River was found in this area.

In addition, the Thatcher Model Dispersal Pathways delineate model locations that show some areas where panthers have historically moved to areas further north.

Thatcher Model Dispersal Pathways are the most likely dispersal routes, based on Thatcher's (2006) least-cost pathways model, to potential habitats to the north. Panthers have historically been documented in this area.

Project Analysis

Projects within the Panther Focus Area can negatively affect panthers in different ways, such as loss and fragmentation of habitat, loss of available prey, increase potential for traffic related mortalities, and increase potential for human/panther interactions.

In addition, projects outside the Panther Focus Area, depending on type and size, can affect panthers and habitat used by panthers in different ways such as increasing traffic within or adjacent to the Panther Focus Area, changing hydrological conditions that affect the habitats that support panther or panther prey in the Panther Focus Area, increasing potential for human/panther interactions, and modifying habitat that provides some functional value for panthers.

Net Increase in Traffic

A net increase in traffic in or adjacent to the Panther Focus Area such as an increase in the number of trips per day averaged over a week is considered a traffic increase that may lead to adverse effects for purposes of this key.

Other Identifiable Effects

Dispersing panthers are known to occur outside of the Panther Focus Area. South of the Caloosahatchee River, where the only breeding population of panthers is known to exist, a project is considered to potentially have an effect on panthers if it occurs in

non-urbanized lands in areas adjacent to the Panther Focus Area (e.g., agricultural lands) where panthers have been documented.

Although non-urban lands outside of the Panther Focus Area do not provide the same habitat value as natural lands within the Panther Focus Area, they do provide important buffers between urban developments and the Panther Focus Area, dispersal and travel routes between higher quality habitats, refugia areas for sub-adult males, and foraging habitat for panther prey species. Generally, areas adjacent to the Panther Focus Area are defined as areas within the Service's 2000 consultation boundary (Service 2000) where urbanization has not replaced lower intensity land uses. Areas that have become urbanized no longer have habitat that can sustain panthers, although additional traffic generated in or adjacent to the Panther Focus Area from development in these locations may affect panthers.

Two-Mile Radius Buffer

A project is also considered to potentially have an effect on panthers if there has been documented physical evidence of panther occurrence within a two-mile radius of a project within the past two years. Documented physical evidence of panther occurrence includes telemetry locations, as well as photographs, tracks, prey kills, and other verifiable evidence that may be available.

Comiskey et al (2000) in the article "Panthers and Forests in South Florida: an Ecological Perspective" referenced that the mean movement distance between sequential telemetry locations was 6.6 km (4.1 miles) for males and 3.2 km (1.99 miles) for females. If flights to monitor panther telemetry are normally three times a week, generally every other day, the travel distance between two points per day would be roughly half the distance between the two points, roughly 2 miles for the male panther. In their habitat analysis, Comiskey et al (2000) considered lands within a circle where the radius is equal to the mean movement distance between sequential telemetry locations, as panther habitat. Following this approach, we believe land alterations within a two-mile radius of a verified panther occurrence, both north and south of the Caloosahatchee River, may potentially have an effect on the panther.

Projects Less than One Acre

On an individual basis, single-family residential developments on lots no larger than one acre will not have a measurable effect on panthers. Panthers are a wide ranging species, and individually, a one acre habitat change is not likely to adversely affect panthers. However, collectively they may have an effect and therefore regular monitoring and reporting of these effects are important.

<u>Monitoring and Reporting Effects</u>

For the Service to monitor effects, it is important for the Corps to monitor the number of permits and provide information to the Service regarding the number of permits issued that were determined "may affect, not likely to adversely affect." It is requested that information on date, Corps identification number, project acreage, project wetland acreage, latitude and longitude in decimal degrees, and county parcel identification number of these projects be sent to the Service quarterly.

Determination

With a determination of "no effect" or "may affect, not likely to adversely affect" ("NLAA") as outlined in this key, the requirements of section 7 of the Endangered Species Act are fulfilled and no further action is required.

A determination of "may affect" in the key may be concluded in either a "may affect, not likely to adversely affect" and written concurrence or "may adversely affect" and formal consultation with the Service is requested.

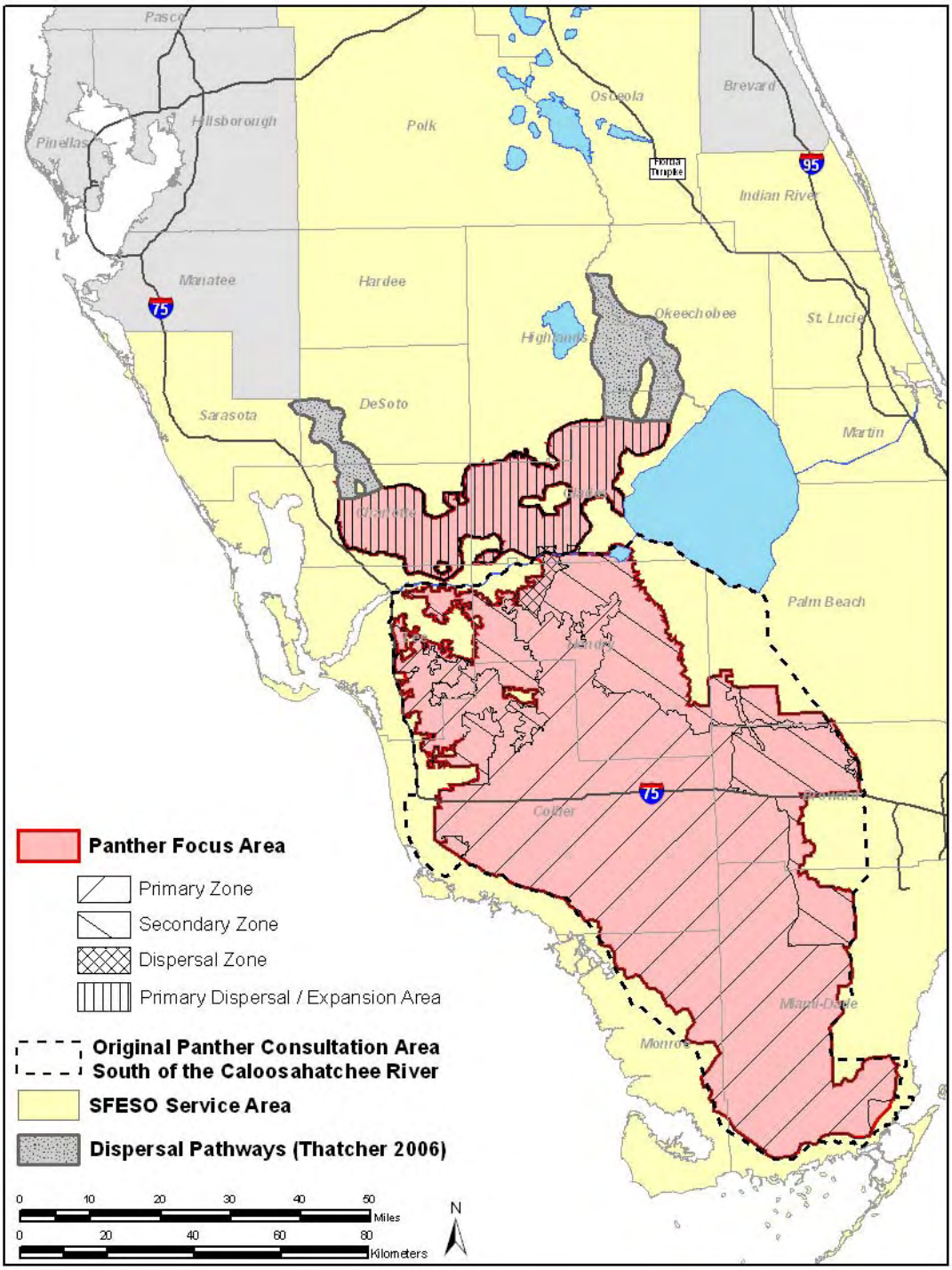
Literature Cited

Comiskey, E. J., O. L. Bass, Jr., L. J. Gross, R. T. McBride, and R. Salinas. 2002. Panthers and forests in south Florida: an ecological perspective. Conservation Ecology 6:18.

Kautz, R., R. Kawula, T. Hoctor, J. Comiskey, D. Jansen, D. Jennings, J. Kasbohm, F. Mazzotti, R. McBride, L. Richardson, and K. Root. 2006. How much is enough? Landscape-scale conservation for the Florida panther. Biological Conservation 130:118-133.

Thatcher, C. A., F. T. van Manen, and J. D. Clark. 2006. An assessment of habitat north of the Caloosahatchee River for Florida panthers. Leetown Science Center, Southern Appalachian Research Branch, U.S. Geological survey, Knoxville, Tennessee, USA.

U.S. Fish and Wildlife Service (Service). 2000. Florida panther final interim standard local operating procedures (SLOPES) for endangered species. Fish and Wildlife Service; Vero Beach, Florida.


Pasco
Hillsborough
Pinellas
Polk
Osceola
Brevard
Indian River
Florida Turnpike
95
75
Manatee
Hardee
Okeechobee
St. Lucie
Highlands
Sarasota
DeSoto
Martin
Palm Beach
Collier
Miami-Dade
Monroe
Panther Focus Area
Primary Zone
Secondary Zone
Dispersal Zone
Primary Dispersal / Expansion Area
Original Panther Consultation Area South of the Caloosahatchee River
SFESO Service Area
Dispersal Pathways (Thatcher 2006)
0 10 20 30 40 50
Miles
0 20 40 60 80
Kilometers
N

Appendix P

Proposed Wetland, Surface Water and Other Surface Water Impacts by Preferred Alternative and Ponds

Proposed Wetland and Other Surface Water Impacts by Preferred Alternative Map
Sheet 1 of 6

Burnt Store Road PD&E Study
From Van Buren Parkway to Charlotte County Line
FPID No. 436928-1-22-01
Lee County

Image Source: ESRI
Image Date: 2022

0 315 630 Feet

N

Sand Rd
Pond 4B
WL-8 F
WL-6 F
OSW-17
OSW-18
765
Janis Rd
OSW-16
Burnt Store Rd
WL-4
OSW-15
OSW-13
765
WL-3 F
WL-3 H
OSW-11
OSW-9
WL-2 H
Pond 3C
765
NW 26th Ter
OSW-7

Legend

- Preferred Alternative
- Preferred Pond Alternatives

Wetland Type

- Forested
- Herbaceous
- OSW

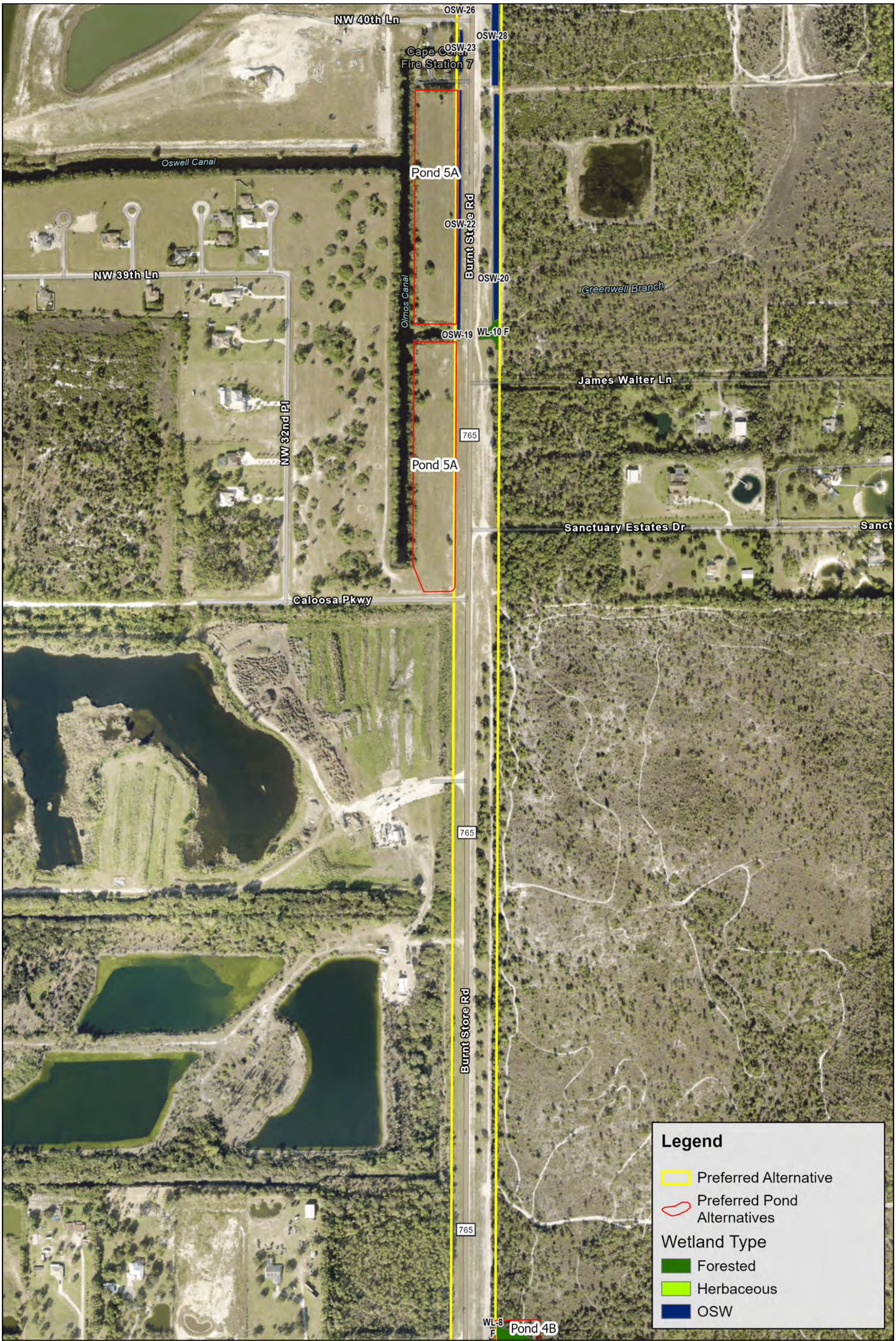
FDOT

Proposed Wetland and Other Surface Water Impacts by Preferred Alternative Map
Sheet 2 of 6
Burnt Store Road PD&E Study
From Van Buren Parkway to Charlotte County Line
FPID No. 436928-1-22-01
Lee County

Image Source: ESRI
Image Date: 2022

0 315 630 Feet

N



Proposed Wetland and Other Surface Water Impacts by Preferred Alternative Map
Sheet 3 of 6

Burnt Store Road PD&E Study
From Van Buren Parkway to Charlotte County Line
FPID No. 436928-1-22-01
Lee County

Image Source: ESRI
Image Date: 2022

0 315 630 Feet

N

Proposed Wetland and Other Surface Water Impacts by Preferred Alternative Map
Sheet 4 of 6

Burnt Store Road PD&E Study
From Van Buren Parkway to Charlotte County Line
FPID No. 436928-1-22-01
Lee County

Image Source: ESRI
Image Date: 2022

0 315 630 Feet

N

Proposed Wetland and Other Surface Water Impacts by Preferred Alternative Map
Sheet 5 of 6

Burnt Store Road PD&E Study
From Van Buren Parkway to Charlotte County Line
FPID No. 436928-1-22-01
Lee County

Image Source: ESRI
Image Date: 2022

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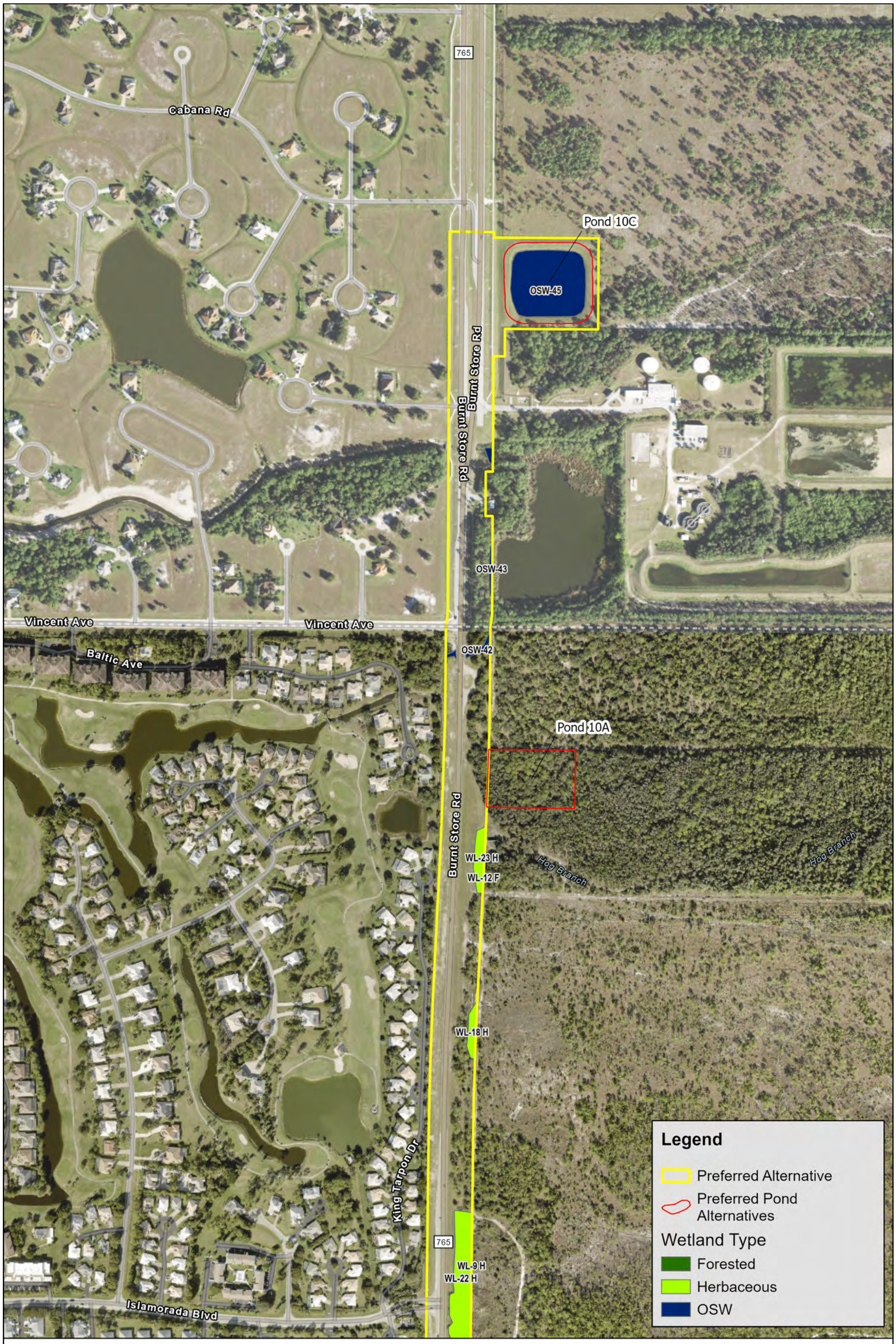

Proposed Wetland and Other Surface Water Impacts by Preferred Alternative Map
Sheet 5 of 6
Burnt Store Road PD&E Study
From Van Buren Parkway to Charlotte County Line
FPID No. 436928-1-22-01
Lee County

Image Source: ESRI
Image Date: 2022
0 315 630 Feet

N

Appendix Q

EFH List

Gulf Of Mexico Essential Fish Habitat (EFH) – Managed Species Potential of Occurrence within Project Area Table – 103 species

Fishery Management Plan	Species	Potential Occurrence in Project Area	Comments
Coastal Migratory Pelagic[1]	Cobia (Rachycentron canadum)	Medium	A near and off-shore species. EFH for the Coastal Migratory Pelagics FMP is found in project area.
	King mackerel (Scomberomorus cavalla)	Medium	A near and off-shore species. EFH for the Coastal Migratory Pelagics FMP is found in project area.
	Spanish mackerel (Scomberomorus maculatus)	Medium	A near shore species. EFH for the Coastal Migratory Pelagics FMP is found in project area.
Highly Migratory Species[2] - Billfish	Sailfish (Istiophorus platypterus)	None	A near shore species. No suitable habitat found in project area.
	Blue marlin (Makaira nigricans)	None	An off-shore species. No suitable habitat found in project area.
	White marlin (Tetrapturus albidus)	None	An off-shore species. No suitable habitat found in project area.
	Longbill spearfish (Tetrapturus pfluegeri)	None	An off-shore species. No suitable habitat found in project area.
Highly Migratory Species[2] - Large Coastal Sharks	Bignose shark (Carcharhinus altimus)	None	An off-shore species. No suitable habitat found in project area.
	Narrowtooth shark (Carcharhinus brachyurus)	None	An off-shore species. No suitable habitat found in project area.
	Spinner shark (Carcharhinus brevipinna)	Low	A near-shore species including beaches, bays, estuaries, and river mouths. Suitable habitat in project area but out of the range of the species.
	Silky shark (Carcharhinus falciformis)	None	An off-shore species. No suitable habitat found in project area.
	Galapagos shark (Carcharhinus galapagensis)	None	An off-shore species that will utilize strong, inshore currents that head offshore. Prefer rugged, rocky terrain. No suitable habitat in project area.
	Bull shark (Carcharhinus leucas)	Medium	A near shore species, including bays, estuaries, and even freshwater rivers that connect to the ocean. EFH found in project area.
	Blacktip shark (Carcharhinus limbatus)	Medium	A near shore species, including bays and estuaries. EFH found in project area.
	Dusky shark (Carcharhinus obscurus)	Low	A coastal species that is not commonly found in low salinity, such as estuaries. Range occurs from Texas to Alabama coastlines and Georgia to Northeastern coastal lines, avoids much of Florida. Suitable habitat present but project area is outside of range.
	Caribbean reef shark (Carcharhinus perezi)	None	A tropical, inshore species. Often found near outer edges and drop-offs of reefs. No suitable habitat in project area.
	Sandbar shark (Carcharhinus plumbeus)	Medium	A coastal species found in shallow waters associated with sandy or muddy bottoms including bays, estuaries, and harbors. EFH near project area.
	Night shark (Carcharhinus signatus)	None	An off-shore species. No suitable habitat found in project area.
	White shark (Carcharodon carcharias)	None	An off-shore species primarily found on the east coast of Florida. No suitable habitat found in project area.
	Tiger shark (Galeocerdo cuvieri)	Medium	A near and off-shore species, often found in shallow coastal waters including bays and estuaries. EFH in project area.

Fishery Management Plan	Species	Potential Occurrence in Project Area	Comments
	Nurse shark (Ginglymostoma cirratum)	Medium	Found in shallow coastal waters, including bays and estuaries. EFH near project area.
	Lemon shark (Negaprion brevirostris)	Medium	Found in shallow coastal waters and estuaries. EFH in project area.
	Bigeye sand tiger shark (Odontaspis noronhai)	None	An off-shore species. No suitable habitat found in project area.
	Sand tiger shark (Odontaspis taurus)	Medium	An inshore species including surf zones, bays, reefs, and estuaries. Range in project area.
	Whale shark (Rhinocodon typus)	None	An off-shore species. No suitable habitat found in project area.
	Scalloped hammerhead shark (Sphyrna lewini)	Medium	A near and off-shore species. Pups are found in high concentrations in bays and estuaries during the summer. EFH near project area.
	Great hammerhead shark (Sphyrna mokarran)	Medium	Found in shallow coastal waters and estuaries. EFH near project area.
	Bonnethead shark (Sphyrna tiburo)	Medium	Found in shallow coastal waters including bays, estuaries, seagrass beds, and sandy bottoms. EFH in project area.
	Smooth hammerhead shark (Sphyrna zygaena)	None	An off-shore species. No suitable habitat found in project area.
	Atlantic angel shark (Squatina dumeril)	Medium	An inshore, coastal species inhabiting shallow water seasonally (spring and summer). Range occurs in project area.
Highly Migratory Species[2] - Pelagic Sharks	Bigeye thresher shark (Alopias superciliosus)	None	An off-shore species. No suitable habitat found in project area.
	Common thresher shark (Alopias vulpinus)	None	An off-shore species, particularly tolerant of cold waters. Preferred range in the northeastern US. No suitable habitat found in project area.
	Oceanic whitetip shark (Carcharhinus longimanus)	None	An off-shore species. No suitable habitat found in project area.
	Sevengill shark (Heptranchias perlo)	None	An off-shore species. No suitable habitat found in project area.
	Sixgill shark (Hexanchus griseus)	None	An off-shore species. No suitable habitat found in project area.
	Bigeye sixgill shark (Hexanchus vitulus)	None	An off-shore species. No suitable habitat found in project area.
	Shortfin mako shark (Isurus oxyrinchus)	None	An off-shore species. No suitable habitat found in project area.
	Longfin mako shark (Isurus paucus)	None	An off-shore species. No suitable habitat found in project area.
	Porbeagle shark (Lamna nasus)	None	An off-shore species, particularly tolerant of cold waters. Preferred range in the northeastern US. No suitable habitat found in project area.
	Blue shark (Prionace glauca)	None	An off-shore species. No suitable habitat found in project area.
Highly Migratory Species[2] - Small Coastal Sharks	Blacknose shark (Carcharhinus acronotus)	Medium	Found in shallow coastal waters. Juveniles occur in shallow coastal bays and estuaries. EFH near project area.
	Finetooth shark (Carcharhinus isodon)	Low	Found in shallow coastal waters including beaches, bays, estuaries, and river mouths. Suitable habitat in project area but project area is outside the species' range.
	Smalltail shark (Carcharhinus porosus)	Low	A near and off-shore species. Prefers muddy bottoms in estuarine habitats. Suitable habitat in project area but project area is outside the species' range.

Fishery Management Plan	Species	Potential Occurrence in Project Area	Comments
	Caribbean sharpnose shark (Rhizoprionodon porosus)	Low	An inshore species including bays, estuaries, and occasionally freshwater rivers. Suitable habitat in project area but project area is outside species' range.
	Atlantic sharpnose shark (Rhizoprionodon terraenovae)	Medium	A near and off-shore species. Juveniles will inhabit shallow coastal bays and estuaries. Range is in project area.
Highly Migratory Species[2] - Swordfish	Swordfish (Xiphias gladius)	None	An off-shore species. No suitable habitat found in project area.
Highly Migratory Species[2] - Tuna	Skipjack tuna (Katsuwonus pelamis)	None	An off-shore species. No suitable habitat found in project area.
	Albacore tuna (Thunnus alalunga)	None	An off-shore species. No suitable habitat found in project area.
	Atlantic yellowfin tuna (Thunnas albacares)	None	An off-shore species. No suitable habitat found in project area.
	Atlantic bigeye tuna (Thunnas obesus)	None	An off-shore species. No suitable habitat found in project area.
	Atlantic bluefin tuna (Thunnas thynnus)	None	An off-shore species. No suitable habitat found in project area.
Red Drum[1]	Red drum (Sciaenops ocellatus)	Medium	Occurs throughout Charlotte Harbor. EFH for the Red Drum is found in the project area.
Reef Fish[1] Balistidae - Triggerfishes	Gray triggerfish (Balistes capriscus)	None	Found in near and off-shore waters. Prefers hard bottoms - no suitable habitat in project area.
Reef Fish[1] Carangidae - Jacks	Greater amberjack (Seriola dumerili)	None	Found in off-shore waters. No suitable habitat in project area.
	Lesser amberjack (Seriola fasciata)	None	Found in off-shore waters. No suitable habitat in project area.
	Almaco jack (Seriola rivoliana)	None	Found in off-shore waters. No suitable habitat in project area.
	Banded rudderfish (Seriola zonata)	None	Found in near and off-shore waters over hard bottoms and reefs and deep inshore channels. No suitable habitat in project area.
Reef Fish[1] Labridae - Wrasses	Hogfish (Lachnolaimus maximus)	Medium	Found just inshore and offshore from reef structures; juveniles may be found in shallow seagrass beds in Florida Bays. Suitable habitat for juveniles found in project area.
Reef Fish[1] Lutjanidae - Snappers	Queen snapper (Etelis oculatus)	Low	Found in deep, off-shore waters; occasionally travel into more shallow waters with hard bottoms off small islands. Minimal suitable habitat in project area.
	Mutton snapper (Lutjanus analis)	Medium	Found in near and off-shore waters; may inhabit estuarine areas but are not estuarine-dependent. EFH found in the project area.
	Schoolmaster (Lutjanus apodus)	Medium	Adults found in shallow waters over coral reefs - no suitable habitat. Juveniles found in shallow waters over sand, in mangroves, or even in brackish waters. EFH found in the project area.
	Backfin snapper (Lutjanus buccanella)	Low	Adults found in deep waters over reefs - no suitable habitat. Juveniles found in shallow waters occasionally immediately off the coast - minimal suitable habitat found in project area.
	Red snapper (Lutjanus campechanus)	Medium	Adults found in off-shore waters - no suitable habitat. Juveniles found in shallow waters near shore and in estuaries - EFH found in the project area.

Fishery Management Plan	Species	Potential Occurrence in Project Area	Comments
	Cubera snapper (Lutjanus cyanopterus)	Low	Adults found in deep off-shore waters - no suitable habitat. Juveniles found in shallow, vegetated near shore waters - suitable habitat in project area.
	Gray (mangrove) snapper (Lutjanus griseus)	Medium	A near and off-shore species, juveniles and adults may inhabit estuarine areas. EFH found in project area.
	Dog snapper (Lutjanus jocu)	Medium	A near and off-shore species, juveniles and adults may inhabit estuarine areas. EFH found in project area.
	Mahogany snapper (Lutjanus mahogoni)	Low	A near and off-shore species generally occurring over reefs, may occur over sandy, shallow bottoms. Minimal suitable habitat in project area.
	Lane snapper (Lutjanus synagris)	Medium	Found in near and off-shore waters; may inhabit estuarine areas but are not estuarine-dependent. EFH found in the project area.
	Silk snapper (Lutjanus vivanus)	Low	An off-shore, deep water species; juveniles have been found near shore. Minimal suitable habitat in project area.
	Yellowtail snapper (Ocyurus chrysurus)	None	A near shore species found over deep and shallow hard-bottoms. No suitable habitat found in project area.
	Wenchman (Pristipomoides aquilonairs)	None	An off-shore species. No suitable habitat found in project area.
	Vermilion snapper (Rhomboplites aurorubens)	None	An off-shore species. No suitable habitat found in project area.
Reef Fish[1] Malacanthidae - Tilefishes	Goldface tilefish (Caulolatilus chrysops)	None	A near-shore species living over rubble bottoms. No suitable habitat found in project area.
	Blackline tilefish (Caulolatilus cyanops)	None	An off-shore species. No suitable habitat found in project area.
	Anchor tilefish (Caulolatilus intermedius)	None	An off-shore species. No suitable habitat found in project area.
	Blueline tilefish (Caulolatilus microps)	None	An off-shore species. No suitable habitat found in project area.
	(Golden) tilefish (Lopholatilus chamaeleonticeps)	None	An off-shore species. No suitable habitat found in project area.
Reef Fish[1] Serranidae - Groupers	Dwarf sand perch (Diplectrum bivittatum)	Medium	A near and off-shore species. EFH near project area.
	Sand perch (Diplectrum formosum)	Medium	Found in sandy near shore waters. Suitable habitat and EFH in project area.
	Rock hind (Epinephelus adscensionis)	Medium	A near and off-shore species, over rocky bottoms. EFH near project area.
	Speckled hind (Epinephelus drummondhayi)	None	An off-shore species. No suitable habitat found in project area.
	Yellowedge grouper (Epinephelus flavolimbatus)	None	An off-shore species. No suitable habitat found in project area.
	Red hind (Epinephelus guttatus)	None	Found in shallow reefs and rocky bottoms. No suitable habitat found in project area.
	Marbled grouper (Epinephelus inermis)	None	An off-shore species. No suitable habitat found in project area.
	Goliath grouper (Epinephelus itajara)	Medium	A near and off-shore species. Juveniles can be found in mangroves, seagrass, and estuarine habitats. EFH in project area.
	Red grouper (Epinephelus morio)	Medium	A near and off-shore species. Juveniles can be found in shallow seagrass beds. EFH in project area.
	Misty grouper (Epinephelus mystacinus)	None	An off-shore species. No suitable habitat found in project area.

Fishery Management Plan	Species	Potential Occurrence in Project Area	Comments
	Warsaw grouper (Epinephelus nigritus)	None	An off-shore species. No suitable habitat found in project area.
	Snowy grouper (Epinephelus niveatus)	None	An off-shore species. No suitable habitat found in project area.
	Nassau grouper (Epinephelus striatus)	None	An off-shore species. No suitable habitat found in project area.
	Black grouper (Mycteroperca bonaci)	Medium	A near and off-shore species; juveniles sometimes occur in seagrass beds, estuaries, and oyster rubble. EFH in project area.
	Yellowmouth grouper (Mycteroperca interstitialis)	Medium	A near shore species. May occur in estuarine areas. EFH near project area.
	Gag (Mycteroperca microlepis)	Medium	A near and off-shore species. May be found in rocky or grassy bottoms in shallow areas. EFH in project area.
	Scamp (Mycteroperca phenax)	Medium	An off-shore species. Juveniles can be found in mangrove areas. EFH in project area.
	Yellowfin grouper (Mycteroperca venenosa)	Medium	A near shore species. Juveniles may occur in shallow seagrass beds. EFH in project area.
Shrimp[1]	Brown shrimp (Penaeus aztecus)	Medium	A near shore species. EFH found near project area.
	Pink shrimp (Penaeus duorarum)	Medium	A near shore species. May occur in estuarine areas. EFH in project area.
	White shrimp (Penaeus setiferus)	Medium	A near shore species. EFH found near project area.
	Royal red shrimp (Pleoticus robustus)	None	An off-shore species. No suitable habitat found in project area.
Spiny Lobster[1]	Spiny lobster (Panulirus argus)	Medium	A near shore species. May be found in shallow seagrass beds. EFH near project area.
	Slipper lobster (Scyllarides nodifer)	Medium	A near shore species. EFH near project area.
Stone Crab[1]	Gulf stone crab (Menippe adina)	Medium	A near shore species, including sub-tidal and estuarine areas. EFH in project area.
	Florida stone crab (Menippe mercenaria)	Medium	A near shore species, including sub-tidal areas such as seagrass beds and oyster reefs. EFH in project area.

Notes:

[1]Generic Amendment Number 3 for Addressing Essential Fish Habitat Requirements, Habitat Areas of Particular Concern, and Adverse Effects of Fishing in Fishery Management Plans of the Gulf of Mexico. Gulf of Mexico Fishery Management Council & National Oceanic and Atmospheric Administration. March 2005

[2]Final environmental Impact Statement for the Generic Essential Fish Habitat Amendment to the Fishery Management Plans of the Gulf of Mexico (GOM). Appendix c: Information on Species Distribution and Habitat Associations. Gulf of Mexico Fishery Management Council. March 2004.

[3]Ratings are low, medium, and high. Ratings based on presence of suitable habitat as follows:
None - suitable habitat does not occur within project area
Low - suitable habitat present in project area
Medium - suitable habitat present in project area and project area and EFH is present near the project area
High - suitable habitat present in project area and the project area is within the species range