NATURAL RESOURCES EVALUATION REPORT

McCulloch Road
Roadway Conceptual Analysis (RCA)
from N. Orion Boulevard to Tanner Road
Orange County

Orange County Project Number: Y21-832

Prepared for:

Orange County Board of County Commissioners
Orange County, Florida

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Executive Summary

Orange County Public Works proposes improvements to McCulloch Road between North Orion / Lockwood Boulevard and North Tanner Road, in Orange County, Florida. Orange County has conducted a Roadway Conceptual Analysis (RCA) study to identify a preferred improvement alternative to address current and future transportation needs within the study area. This Natural Resources Evaluation Report provides a summary of the existing natural resource conditions and potential impacts, permits required, and mitigation options. This assessment includes a review of the project study area, which includes potential alternatives and stormwater pond sites. Specific pond sites and floodplain analysis were evaluated in the Pond Siting Report provided with the RCA.

Natural and artificial wetlands and surface waters occur within the project study area which may be potentially impacted. These systems include mixed wetland hardwood forests and herbaceous non-forested wetlands. Orange County will adhere to the provisions of Chapter 373.4137, Florida Statutes "Mitigation requirements for specified transportation projects" in selection of appropriate mitigation for wetland or other jurisdictional waters impacts. Compensatory mitigation for impacts associated with the Least Environmentally Damaging Practicable Alternative (LEPDA) will be provided via the purchase of mitigation credits from a permitted bank.

Multiple wetlands and uplands bordering the existing McCulloch Road right-of-way (ROW) are protected under either conservation easement via the St. Johns River Water Management District (SJRWMD) or as state lands under the Trustees of the Internal Improvement Trust Fund (TIITF). A full or partial release of these encumbrances will be required prior to permit issuance by SJRWMD and/or the Florida Department of Environmental Protection (FDEP).

A modification of the existing Individual Permit from SJRWMD will be required for this project. Additionally, it is anticipated that a Standard Permit from the United States Army Corps of Engineers (USACE) will be required for impacts to federally jurisdictional waters. Pending the final design and results of pre-construction protected species survey results, this project may also require a Florida Fish and Wildlife Conservation Commission (FWC) Gopher Tortoise Relocation Permit.

1.0 Project Overview

1.1 Project Description

The project study area is located along McCulloch Road from North Orion / Lockwood Boulevard to North Tanner Road in Orange and Seminole Counties. Orange County proposes widening McCulloch Road from Orion / Lockwood Boulevard to Tanner Road from the existing two-lane facility to a divided four-lane facility with a raised median and sidewalks in each direction. The total project length is approximately 1.1 miles. McCulloch Road runs along the jurisdictional boundary of Orange and Seminole Counties with the eastbound portion of the public ROW within Orange County and the westbound public ROW within Seminole County. The Counties have an interlocal agreement for the maintenance of the ROW and coordination with Seminole County Public Works was conducted during the study. The study area is displayed on the **Regional Location Map** and **Aerial Location Map** in **Appendix A**. Proposed roadway additions include two 11-foot travel lanes in each direction with a 10-foot multi-use path on the south side of the road and 6-foot sidewalk on the north side. Additional safety improvements include turning lane and intersection improvements to aid in the flow of traffic and reduce vehicle crashes.

The objective of this analysis is to document the environmental considerations, including alternatives and potential occurrence of protected species and their habitat within the study area. This evaluation also includes a review of the natural communities within the project area and potential impacts to natural wetlands and surface waters within the project area. Anticipated wetland functional values were assessed for mitigation requirements. Additionally, this report summarizes the anticipated state and federal permits required for the proposed project.

1.2 Purpose and Need

The purpose of the proposed project is to provide increased traffic capacity and enhance safety within this segment of McCulloch Road. Additionally, the project is proposed to be consistent with Orange County long range transportation plans including the Orange County Capital Improvement Program (CIP), Orange County 2030 Long-Range Transportation Plan (LRTP), and the Orange County Ten-Year Roadway Plan. The area is experiencing exponential growth in residential and commercial development. This segment of McCulloch Road is classified as an Urban Collector and serves as a primary transportation corridor for the adjacent residential developments between Orion / Lockwood Boulevard and Tanner Road and serves as an east-west route for commuters to and from the University of Central Florida (UCF).

Based on the Design Traffic Technical Memorandum, which developed potential projected traffic assessments through 2048, this segment of McCulloch Road will operate at an unacceptable Level of Service (LOS) of F. Crash reports for this segment between 2016 and 2021 indicate a total of 166 crashes occurred within the study area. Capacity and intersection improvements are designed to enhance safety along this segment of McCulloch Road.

5-foot sidewalks exist on both sides of McCulloch Road at various points; however, only one on the south side, is continuous. There is no existing sidewalk on the north side of the roadway for approximately 1,200 feet, from Lockwood Boulevard to west of Keats Way. Additionally, there are no bike lanes or shoulders for bicyclists.

In addition to capacity and safety improvements, the proposed project would improve safety for pedestrians and cyclists through a continuous sidewalk and a 10-foot multi-use path.

2.0 Existing Conditions

2.1 Land Use

The surrounding land uses within the project study area are primarily comprised by the existing roadway and wetlands, with adjacent residential development. The U.S. Fish and Wildlife Service (USFWS), Natural Wetland Inventory (NWI), SJRWMD Land Use and Cover Forms (2020) ArcGIS shapefile, adjacent permitting information and supplemental site visit were used to describe general land uses present. This assessment identified natural wetlands and other jurisdictional waters within the project study area, including forested wetlands. General existing land uses identified in the review are described via the Florida Land Use, Cover and Forms Classification System (FLUCCS) (Florida Department of Transportation [FDOT], January 1999) categories, provided as an attachment (please refer to the **Land Use Map** in **Appendix A**). Medium and high-density residential development (FLUCCS 1200 and 1300 respectively), lakes and reservoirs (FLUCCS 5200 and 5300), and mixed forested wetlands (FLUCCS 6300) make up a significant portion of the study area.

Natural vegetative communities that have a higher potential to support protected species, including pine flatwoods, and wetland communities are further described below in the Protected Species and Wetlands, Surface Waters, and Non-Wetland Waters sections.

2.2 Soils

The project study area soil map was created using data from the National Resources Conservation Service (NRCS) Web Soil Survey. Due to the individual mapping of soils within Orange and Seminole County, discrepancies in soil number and name exist between soils mapped for each county. Details regarding soil number, soil name, and hydric classification are displayed for each county in the attached **Soils Map** in **Appendix A**.

3.0 Wetlands, Surface Waters, and Non-Wetland Waters

3.1 Data Collection

Prior to field surveys, environmental scientists reviewed the most current information regarding the location and extent of wetlands and surface waters in the project area. These wetland and surface water habitats were defined according to the corresponding FLUCCS categories. The information included, but was not limited to:

- United States Geological Survey (USGS) Topographic Maps
- USFWS NWI
- NRCS Soil Survey of Osceola County (Accessed 2026)
- SJRWMD Land Use and Cover Forms
- Florida Natural Areas Inventory (FNAI) Landcover Maps and Online Matrix (Accessed 2026)

3.2 Wetland Assessment Methodology

A preliminary wetland and surface water evaluation was performed within the project study area. The wetland evaluation relied on literature desktop reviews and limited field surveys to identify the approximate location and extent of natural and artificial wetlands and surface waters, while assessing their ecological value using the Unified Mitigation Assessment Methodology (UMAM).

Environmental scientists used information to evaluate potential direct and indirect effects to wetlands and surface waters, including the potential cumulative impacts to those jurisdictional features in the general regional area. Practicable measures to avoid and/or minimize impacts to those wetlands and surface waters are proposed in Section 4.1 - Avoidance and Minimization / Elimination and Reduction.

The approximate extent of natural wetlands and surface waters as well as artificial man-made (non-wetland waters) was identified using the methodology described in Rule 62-340, Florida Administrative Code (FAC), State of Florida *Delineation of the Landward Extent of Wetlands and Surface Waters,* the USACE *Wetland Delineation Manual* (USACE, 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region* (USACE, 2010).

3.3 Wetlands, Surface Waters, and Non-Wetland Waters Habitats

Based on the project study area of an approximately 500-foot radius from the centerline of the existing roadway, there are 6 wetland systems identified totaling approximately 35 acres within the study area. Wetlands 2 and 3 and Wetlands 4 and 5, respectively, are historically contiguous wetlands that have been separated by the existing McCulloch Road. These wetlands remain hydrologically connected via stormwater culverts, including a system of 5 72" RCP Culverts between Wetland 2 and 3, which serve as a north-south wildlife crossing under McCulloch Road. 2 additional wetlands, Wetland 1 and 6, are present within the project study area. Within the study area, one man-made surface water (SW), and 8 non-wetland waters (NWW) were identified, associated with the existing roadway and adjacent developments. These man-made features make up approximately 0.75 acres of SW and 4.1 acres of NNW within the study area.

The following general descriptions of these communities are provided below using the FLUCCS (FDOT 1999) and FNAI (FWC 2018) and locations of these features can be found on the **Land Use Map** and **Wetlands, Surface Waters, and Non-Wetland Waters Map** (with wetlands identified as WL-1 through WL-6), provided in **Appendix A**.

<u>FLUCCS 5200 – Lakes</u>
This land use best describes SW 1 located north of McCulloch Road, associated with the Carillon Development. This SW serves as a stormwater pond for the adjacent development and appears to be originally constructed from wetlands and may be subject to mitigation due to being wetland-cut and contiguous with natural wetlands.

<u>FLUCCS 5300 – Artificial Impoundment/Reservoirs (Upland-Cut) NWW</u>
Within the study area, man-made NWW features associated with the existing roadway and surrounding development are located throughout the project. These include roadside freshwater stormwater ditches/swales that were historically dredged from uplands during the original construction of the roadway, and stormwater ponds associated with the roadway or existing development. Please note, due to the map scale, the roadside stormwater features included in the overall roadway land use and not called out in the **Wetland, Surface Waters, and Non-Wetland Waters Map.** These features are primarily maintained with bahia grass (*Paspalum notatum*) and various sedges (*Carex* spp. and *Cyperus* spp.) as the dominant vegetation.

<u>FLUCCS 6170 – Mixed Wetland Hardwoods</u>
Within the study area, there are freshwater mixed wetland hardwood forested systems that extend beyond the study boundary. This land use makes up the central portions of Wetlands WL 2 and WL 3. These systems are of moderate ecological value and have some exotic/nuisance species encroachment along the existing ROW and residential developments.

Canopy species include red maple (*Acer rubrum*), slash and pond pine (*Pinus* spp.), bays (*Persea* spp. and *Magnolia virginiana*) and cypress (*Taxodium* spp.). Understory consists of juvenile bays, cabbage palm (*Sabal palmetto*), and Carolina willow (*Salix caroliniana*). Groundcover is comprised of Virginia chain fern (*Woodwardia virginica*), cinnamon fern (*Osmundastrum cinnamomeum*), and some encroaching nuisance species, such as Brazilian pepper (*Schinus terebinthifolia*), and opportunistic species such as dogfennel (*Eupatorium capillifolium*), and pennywort (*Hydrocotyle umbellata*).

An unnamed tributary of the Little Econlockhatchee River runs across McCulloch Road, east of Lockwood Boulevard, within the FLUCCS 6170 and 6250 wetlands north and south of McCulloch Road. This tributary is labelled on the Land Use Map but not differentiated within the FLUCCS due to the boundary of this tributary being undefined within the surrounding wetlands.

FLUCCS 6210 – Cypress

These areas best describe Wetlands WL 4 and WL 5 on the **Wetlands, Surface Waters, and Non-Wetland Waters Map**. Vegetative composition is primarily similar to the Mixed Wetland Hardwood communities with the exception of a dominant canopy of bald cypress (*Taxodium distichum*). These wetlands were inundated throughout the ROW edge during the November 2021 field review.

FLUCCS 6250 – Hydric Pine Flatwoods

Based on available data from the SJRWMD Land Use and Cover Forms (2020) shapefiles and limited field review in November 2021, the outer fringes of Wetlands WL 2 and WL 3 are comprised of hydric pine flatwoods communities. The canopy in these portions of the wetlands is made up of slash pine and pond pine (*Pinus serotina*) with an understory of gallberry (*Ilex glabra*), wax myrtle (*Morella cerifera*), juvenile pines and occasional bays and dahoon holly (*Ilex cassine*).

FLUCCS 6410 – Freshwater Marsh

The SJRWMD Land Use data classifies Wetlands WL 1 and WL 6 as non-forested wetlands, although direct confirmation of this was not observed during the November 2021 field review. These wetlands are located west of Orion / Lockwood Boulevard and north of the Hawthorne Glen Community. While within the project study area, these wetlands are not currently impacted by any proposed alternatives. Typical vegetation expected in this land use includes various emergent vegetation such as duck potato (*Sagittaria latifolia*) and pickerelweed (*Pontederia cordata*) as well as cattail (*Typha* spp.), wax myrtle, and spikerush (*Eleocharis* spp.). No impacts are anticipated to this wetland due to its location separated from McCulloch Road by the Hawthorne Glen Townhomes community.

FLUCCS 6460 – Mixed Scrub-Shrub Wetland

The SJRWMD Land Use data classifies this portion of Wetland WL 2 as a non-forested wetland, although direct confirmation of this was not observed during the November 2021 field review. Aerial interpretation appears to show a low or no canopy consistent with FLUCCS 6460. Portions of this area may have been previously modified as part of a mitigation area for the adjacent Carillon residential development and is included in areas designated as Conservation Easement by the SJRWMD. The typical vegetation expected here includes Carolina willow, wax myrtle, button bush (*Occidentalis* sp.), and gallberry.

4.0 Wetland and Non-Wetland Water Impacts

4.1 Avoidance and Minimization

Section 404 of the Clean Water Act requires an applicant to choose the LEDPA as the preferred alternative. Additionally, Statewide Environmental Resource Permit (ERP) regulations require an applicant to eliminate and reduce jurisdictional impacts to the greatest "practicable extent" unless those impacts are low in quality or mitigation for impacts is higher in ecological value and regionally significant.

Measures to avoid impacts associated with the final alignment and proposed pond design will be considered during the early design phase using the preliminary wetland, surface water, and NWW estimated limits from this assessment and future assessments. Impacts to the wetland systems will be minimized to the greatest practicable extent, and an Avoidance and Minimization Statement will be provided to the USACE during the permitting phase, explaining the LEDPA.

Orange County will furthermore ensure that an approved Stormwater Pollution Prevention Plan (SWPPP) is implemented during construction to prevent sediment and untreated stormwater runoff into adjacent off-site wetlands and surface waters and will comply with all National Pollutant Discharge Elimination System criteria during construction activities. The proposed treatment system for the expanded corridor will provide improved treatment and attenuation for offsite systems in the adjacent properties.

4.2 Estimated Jurisdictional Impacts and Ecological Value

Direct Impacts

Within the project study area, approximately 35.5 acres of natural wetlands, 0.75 acres of surface waters, and 4.1 acres of NNW (artificial water bodies created from uplands) were identified during this preliminary study. Direct impact acreage will depend upon the final design of the selected alignment and pond sites. Wetlands and NNW boundaries within the study area are displayed on the **Wetland, Surface Waters, and Non-Wetland Waters Map** in **Appendix A**. Of these systems, WL 2 and WL 3 are anticipated to be jurisdictional to USACE due to the surface connection between these systems and the Little Econlockhatchee River. All wetlands and SW 1 are anticipated to be jurisdictional with SJRWMD due to SW 1 being originally cut from wetlands and contiguous with existing wetlands. NWW are often not jurisdictional with USACE and are not anticipated to require mitigation from SJRWMD due to being man-made, upland cut features.

Indirect Impacts

Indirect (secondary) are those that affect jurisdictional systems but do not result from the actual dredge or filling material. Indirect impacts to natural wetlands resulting from the proposed project are anticipated to be minimal along the existing roadway, as these systems adjacent to the roadway have already been exposed to secondary impacts, such as noise, trash and road debris, and direct stormwater runoff from the roadway. Within and directly adjacent to the existing ROW, these systems display significant edge effects, with invasive and exotic plants such as Brazilian pepper, and Peruvian primrose willow. However, wetlands further from the existing roadway or other development may have less encroachment of these species and are of moderate value. Indirect impacts are anticipated to be assessed as 25-feet beyond direct impacts or limits of construction. However, during pre-application meetings with SJRWMD and USACE, discussions to confirm agreed upon indirect impact parameters to wetlands are advised.

SJRWMD Riparian Habitat Protection Zone (RHPZ)

SJRWMD requires mitigation for impacts to the Econlockhatchee River Riparian Habitat Protection Zones (RHPZ) associated with wetlands contiguous with tributaries of the Econlockhatchee and Little Econlockhatchee River system. RHPZ lands are identified as 550 feet from the stream's edge from the Econlockhatchee River and Little Econlockhatchee and listed tributaries, as identified in Chapter 40C-41.063(1)(a), FAC, or 50 feet from the landward edge of forested wetlands contiguous with the above system. For the purposes of this study, RHPZ was estimated as 50-feet landward of the wetland boundaries for wetlands abutting the tributary of the Little Econlockhatchee River, shown on the **Riparian Habitat Protection Zone Map** in **Appendix A**. Values for these areas are likely to be similar to that of the adjacent wetland due to the overall habitat conditions expected. Some areas shown as RHPZ appear to be maintained ROW or other land use not consistent with natural upland habitat expected within RHPZ. These areas are not likely to require mitigation for impacts due to the existing disturbed condition; however, mitigation requirements will be confirmed with SJRWMD during permitting.

Cumulative Impacts

Cumulative effects on the environment, based on current federal regulations, are considered those effects resulting from incremental impacts of the action, when added with other past, present, and reasonably foreseeable future actions, regardless of the agency or private entity that undertakes that action. Alternatives are not anticipated to significantly contribute to cumulative effects in the regional area, due to their location along the existing roadway corridor and in previously existing development. This project is proposed to accommodate surrounding residential, municipal, and commercial development that has already been constructed or permitted for construction by both state and federal agencies. The majority of wetlands and natural habitats remaining within the regional area surrounding the McCulloch Road project study area are either under conservation easement, state-owned, or County-owned lands. These areas will likely be excluded from further development. Due to the existing development surrounding this segment of McCulloch Road, the need for this project is a result of the surrounding development and therefore, significant cumulative impacts are not anticipated because of this project.

The project will include an associated stormwater management system where runoff is collected and conveyed to detention ponds which will provide treatment, attenuation, and floodplain compensation for the runoff.

State cumulative impact criteria require consideration of the location of proposed mitigation as it relates to proposed wetland impacts. These criteria are based on regulatory drainage basins. Mitigation banks with available in-basin credits exist within the Econlockhatchee Nested Basin that the project study area falls within. Therefore, cumulative impact criteria are achievable through purchase of credits from a state and federally permitted mitigation bank.

Estimated Functional Value Assessment

An estimated ecological value for the existing wetlands is provided below to assist in determining the functional loss for potential alternatives. Ecological values were assessed using the UMAM. Per the UMAM criteria, Landscape Support, Community Structure and Water Environment were primary factors in consideration of the system's ecological value. The UMAM is the primary method for mitigation assessment for most available mitigation bank credits in the regional area. However, other functional assessments (Ratio Method, Wetland Rapid Assessment Procedure [WRAP]) may be needed during design, depending on the chosen mitigation option.

Most, if not all wetland systems are likely jurisdictional with both the state and the USACE, due to their hydrologic connection to the Econlockhatchee River and Little Econlockhatchee River system. The table below provides a summary of the estimated UMAM values based on the limited preliminary assessment.

Table 4.2-1 Estimated UMAM Values

Land Use Code (FLUCCS)	Wetland Habitats	System ID	Location and Landscape	Water Environment	Community Structure	Estimated UMAM Delta (Sum/30)
5200	**Lakes**	**SW 1**	**5**	**5**	**5**	**0.50**
6170/6210/6250	**Forested Wetlands**	**WL 2-5**	**6**	**5**	**5**	**0.53**
6410/6460	**Non-Forested Wetlands**	**WL 1, WL 3, & WL 6**	**6**	**5**	**5**	**0.53**

Regulatory Conservation Easements and Protected Lands within the Study Area

Desktop review of existing protected lands withing the project study area revealed that the majority of wetlands within the study area are protected under either Conservation Easement or other protection afforded to State-owned and County-owned Lands. SJRWMD Conservation Easements extend from the existing northern ROW of Wetland 3 as mitigation for the Carillon development (SJRWMD Permit No. 4-117-0193); Wetland 4 under the University Estates development (SJRWMD Permit No. 4-095-0301); and Wetland 5 under the Hawthorne Glen community (SJRWMD Permit No. 40-117-91175-1). Wetland 2 and the associated upland pine flatwoods south of the existing ROW are State-owned lands within the UCF property. Additionally, at the northeast corner of the project study area is the Econ River Wilderness Area, owned by Seminole County. During preliminary discussions with SJRWMD in 2021, it was determined that some, but not all boundaries of recorded Conservation Easements are currently mapped in the SJRWMD system.

Further coordination with SJRWMD will need to be undertaken during permitting to determine the extent of all Conservation Easement boundaries within the final design project area. These potentially protected lands are displayed on the **Protected Lands Map** in **Appendix A**. Any impact to these conservation easements will require a release or partial release from SJRWMD.

4.3 Conceptual Permitting Requirements and Mitigation Options

The following summary includes anticipated permitting requirements for impacts to state and federally jurisdictional waters and other protected lands within the study area as well as the associated mitigation options. As outlined in Section 5.3 below regarding protected species, please note in addition to state ERP and federal permits for jurisdictional waters/protected lands, it is possible that the project will require permits for impacts to wildlife habitat through FWC and/or USFWS, depending on the final design for the preferred corridor alignment and selected pond sites.

Although Technical Assistance with FWC and USFWS is recommended prior to applications, protected species reviews will also be assessed during the state ERP and federal permitting application processes.

State Permitting Requirements

Widening and safety improvements to McCulloch Road will require an ERP through the SJRWMD, according to state regulations. There are two primary components of ERP review: stormwater design and regulatory science review. The stormwater criteria to meet rule primarily considers attenuation and treatment (stormwater system design) whereas regulatory science reviews will focus on practicable elimination and reduction of resource impacts, including wetland dependent species, direct and indirect (secondary) impacts to natural wetlands and surface waters, and mitigation analysis. As part of the ERP application, RHPZ impacts must be quantified and mitigation from an SJRWMD mitigation bank will be required. Once the ERP application is submitted, SJRWMD will correspond with other state agencies to solicit any comments. Typical agencies solicited include Division of Historic Resources (DHR) and FWC.

Prior to SJRWMD issuing a permit, partial releases of these easements will be required for any portions of these protected lands proposed for construction with the final design. Due to proprietary policies, as set forth by the SJRWMD Governing Board, the release of a regulatory Conservation Easement must be deemed necessary and applicants must demonstrate that there are no reasonable/feasible alternatives for avoidance to the regulatory Conservation Easement, prior to consideration for release. Therefore, it is recommended that early coordination occurs with SFWMD regulatory staff if a partial or full release of the Conservation Easements are anticipated.

Prior to construction, per Environmental Protection Agency (EPA) regulations, the County's selected contractor must apply for use of a Construction Generic Permit (CGP) and National Pollutant Discharge Elimination System Permit (NPDES), administered by the state FDEP, as aforementioned. The project will require the development of a sediment control plan for use of this permit

Federal Permitting Requirements

In addition to state ERP requirements, natural wetlands and surface waters are likely jurisdictional with the USACE, based on current USACE Waters of the United States (WOTUS) regulations. The project area contains wetlands contiguous with USACE Section 10 retained waters (Little Econlockhatchee River) and is therefore anticipated to be permitted with the USACE for federal jurisdictional WOTUS impacts.

USACE will require state ERP issuance (water quality certification, per EPA requirements) prior to the issuance of a Standard Permit. The USACE, in adherence with the Section 404 Clean Water Act and Natural Environmental Policy Act (NEPA), will require that the LEDPA be selected for both alignment and pond alternatives.

During the Project Development and Environment (PD&E) study, documentation of the LEDPA will be provided through analysis in other reporting, such as a Final Engineering Report, Pond Siting Memorandum/Report, and other documents for the County to ensure efficient state and federal permitting during the design phase.

The table below provides a summary of jurisdictional waters/land permitting requirements.

Table 4.3-1 Anticipated Permit Requirements

Permit Type	Regulatory Agency
Environmental Resource Permit (ERP)	SJRWMD
Standard Permit (SP)	USACE
Notice of Intent (NOI) to use the Construction General Permit (GCP)	EPA through FDEP
National Pollutant Discharge Elimination System (NPDES)	EPA through FDEP

Mitigation

State and federal agencies have different hierarchical mitigation preferences, examples include onsite wetland mitigation, off-site mitigation, and mitigation bank credits for in-kind (herbaceous and forested) freshwater impacts. If mitigation bank credits are available within the project's USACE Hydrologic Unit Code, the USACE will typically require the use of bank credits for mitigation, unless proposed Permittee Responsible Mitigation is regionally significant. There are multiple federally permitted mitigation banks with herbaceous and/or forested credits available to service the study area and within the project's USACE Upper St. Johns Hydrologic Unit Code (No. 03080101). State regulations require mitigation credits be obtained where possible within the project's impacted watershed or Cumulative Impact Basin.

The project is located within the state's Econlockhatchee River Nested watershed Basin 19 and state permitted mitigation banks are located within the watershed with availability; additionally, multiple mitigation banks also still service the area with credit availability outside the watershed, meeting the state's ERP Cumulative Impact criteria. Currently, there is at least one mitigation bank that provides both credits within the federal Hydrologic Unit Code and state Lake Gentry watershed.

Given the anticipated UMAM scores assigned, wetland mitigation costs are anticipated to range from $50,000-$90,000 per acre. This estimate assumes wetlands are not encumbered by regulatory Conservation Easements. If wetland impacts are proposed within a regulatory Conservation Easement, ecological replacement of the mitigation site will also be required prior to release of the Conservation Easement; therefore, costs per acre of Conservation Easement encumbered wetlands may range between $100,000-$170,000. Early coordination and pre-application meetings with both agencies will provide further insight into available mitigation options.

5.0 Threatened and Endangered Species

Protected species include listed species as well as species otherwise protected under other regulations, such as the Migratory Bird Treaty Act, the Bald and Golden Eagle Protection Act or the Bear Conservation Rule (68A-4.009, FAC). Federal listed species are afforded protections under the Endangered Species Act of 1973, as amended, under the jurisdiction of the USFWS and the National Marine Fisheries Service (NMFS).

Within the state of Florida, federal and state listed species are afforded protection under Chapter 68A-27, FAC, which also states that all species listed by the USFWS and the NMFS that occur within Florida are also included on the Florida Endangered and Threatened Species List as Federally-designated Endangered, Federally-designated Threatened, Federally-designated due to Similarity of Appearance, or Federally-designated Non-Essential Experimental Population Species.

In Florida, state protected animal species are under the jurisdiction of the FWC, while state protected plant species are under the jurisdiction of the Florida Department of Agriculture & Consumer Services (FDACS) by rule 5B-40 FAC. The following sections provide resource data collection and evaluation methodology as well as the anticipated species effect determinations.

5.1 Data Collection and Methodology

Literature reviews, agency database searches, and field reviews were conducted to document the potential presence of federal and state protected species, their habitat, and any critical habitat within the study area. General field reviews of overall habitat types, condition, and potential for species occurrence, were conducted on November 10, 2021.

No species-specific surveys were conducted at this time. During the early design phase, technical assistance should be requested from USFWS and FWC to determine if species-specific surveys will be required. Reviewed information sources and databases included, but were not limited to, the following:

- Environmental Systems Research Institute (ESRI) World Imagery (ESRI 2019)
- Florida Geographic Data Library ([FGDL], Accessed 2026)
- USFWS Datasets and Consultation Area Maps
    - Critical Habitat for Threatened and Endangered Species (USFWS 2018)
    - Information for Planning and Consultation (USFWS Environmental Conservation Online System, Accessed 2026)
    - Protected Species Consultation Areas (USFWS 2019)
    - Wood Stork Rookeries and Core Foraging Areas (USFWS 2019)
    - Caracara Documented Historic Nest Sites (USFWS 2017)
- FNAI Online Database Matrix (Accessed 2026)
- Regulated Plant Index (Florida Department of State Chapter 5B-40.0055, FAC
- National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service Ecological Fish Habitat Mapper (Accessed 2026)
- Audubon Center for Birds of Prey EagleWatch Program Database (Accessed 2026)
- FWC Databases
    - Eagle Nest Locator Website (Accessed 2026)
    - Water Bird Colony Locator Website (Accessed 2026)
    - Florida Black Bear Roadkill Occurrences (Accessed 2026)

Each potential species discussed was assigned a likelihood of occurrence within the project study area based on the data review, field observations, presence of suitable habitat, and the species' known ranges. Each assigned likelihood of occurrence within the study area (low, moderate, or high) is based on the following:

- Low – The project is within the species' range, and minimal or marginal quality habitat exists within or adjacent to the project study area; however, there are no documented occurrences of the species within the study area, and the species was not observed during the field reviews.

- Moderate – The project is within the species' range and suitable habitat exists within or adjacent to the project's study area; however, there are no documented occurrences of the species within the buffer, and the species was not observed during the field review.
- High – The project is within the species' range, suitable habitat exists within or adjacent to the project's study area, there is a documented occurrence of the species, or the species was observed during the field review, or the potential presence of the species is widely accepted.

5.2 Protected Species Occurrence

Table 5.2-1 below lists all protected species assessed, the species potential for occurrence, listing status, and preliminary project effect statements. Listed species assess were generated during desktop review from the sources listed in Section 5.1.

Table 5.2-1: Federal and/or State-Listed Wildlife Species with Potential for Occurrence

Scientific Name	Common Name	USFWS Status	FWC Status	Occurrence Potential	Preliminary Project Effects
Mammals					
Puma Concolor coryi	Florida Panther	E	E	Low	No adverse effect anticipated
Perimyotis subflavus	Tricolored Bat	Proposed	Proposed	Moderate	No adverse effect anticipated
Ursus americanus floridanus	Florida Black Bear	N	N	Moderate	No adverse effect anticipated
Reptiles					
Drymarchon couperi	Eastern Indigo Snake	T	T	Moderate	Not likely to adversely affect
Gopherus polyphemus	Gopher Tortoise	N	T	High	No adverse effect anticipated
Pituophis melanoleucus mugitus	Florida Pine Snake	N	SSC	Moderate	No adverse effect anticipated
Birds					
Haliaeetus leucocephalus	Bald Eagle	N	N	Moderate	May affect, not likely to adversely affect
Egretta caerulea	Little Blue Heron	N	T	Moderate	No adverse effect anticipated
Egretta tricolor	Tricolored Heron	N	T	Moderate	No adverse effect anticipated
Rostrhamus sociabilis plumbeus	Everglade Snail Kite	E	E	Low	May affect, not likely to adversely affect
Antigone canadensis pratensis	Florida Sandhill Crane	N	T	Moderate	No adverse effect anticipated
Mycteria americana	Wood Stork	T	T	Moderate	Not likely to adversely affect
Aphelocoma coerulescens	Florida Scrub Jay	T	T	Low	May affect, not likely to adversely affect
Polyborus plancus cheriway	Audubon's Crested Caracara	T	T	Low	May affect, not likely to adversely affect
Falco sparverius paulus	Southeastern American Kestrel	N	T	Low	May affect, not likely to adversely affect
Leuconotopicus borealis	Red-cockaded Woodpecker	T	N	Moderate	May affect, likely to adversely affect
Pandion haliaetus	Osprey	N	SSC	Moderate	No adverse effect anticipated
Athene cunicularia floridana	Florida Burrowing Owl	N	T	Low	No adverse effect anticipated
Laterallus jamaicensis jamaicensis	Eastern Black Rail	T	N	Low	May affect, not likely to adversely affect
Plants					
Deeringothamnus pulchellus	Beautiful Pawpaw	E	E	Low	May affect, not likely to adversely affect
Nolina atopocarpa	Florida Beargrass	N	T	Low	No adverse effect anticipated
Warea amplexifolia	Wide-leaf Warea	E	E	Low	May affect, not likely to adversely affect

Warea carteri	Carter's Warea	E	E	Low	May affect, not likely to adversely affect
Warea amplexifolia	Clasping Warea	E	E	Low	May affect, not likely to adversely affect
Paronychia chartacea	Papery Whitlow-wort	T	E	Low	May affect, not likely to adversely affect
Coleataenia abscissa	Cutthroatgrass	N	E	Low	No adverse effect anticipated
Centrosema arenicola	Sand Butterfly Pea	N	E	Low	No adverse effect anticipated
Clitoria fragrans	Pigeon Wings	T	E	Low	May affect, not likely to adversely affect
Carex chapmannii	Chapman's sedge	N	T	Low	No adverse effect anticipated
Calopogon multiflorus	Many-flowered Grass-pink	N	T	Low	No adverse effect anticipated
Chionanthus pygmaeus	Pygmy Fringe-tree	E	E	Low	May affect, not likely to adversely affect
Polygonella myriophylla	Sandlace	E	E	Low	May affect, not likely to adversely affect
Lechea cernua	Nodding Pinweed	N	T	Low	No adverse effect anticipated
Illicium parviflorum	Star Anise	N	E	Low	No adverse effect anticipated
Hartwrightia floridana	Florida Hartwrightia	N	T	Low	No adverse effect anticipated
Conradina grandiflora	Large-flowered Rosemary	N	T	Low	No adverse effect anticipated
Matelea floridana	Florida spiny-pod	N	E	Low	No adverse effect anticipated
Salix floridana	Florida Willow	N	E	Low	No adverse effect anticipated
Pteroglossaspis ecristata	Giant Orchid	N	T	Low	No adverse effect anticipated
Nemastylis floridana	Celestial Lily	N	E	Low	No adverse effect anticipated

*T = Threatened; E = Endangered; N = Not Listed; SSC = Species of Special Concern.

5.3.1 Protected Flora

Federal and/or state-listed flora that have the potential for occurrence within the study area are listed in **Table 5.2-1**. No federal and/or state-listed flora were observed within or adjacent to the McCulloch Road ROW within the study area; therefore, the potential for occurrence of protected plant species is low. The Econ River Wilderness Area, owned by Seminole County, is adjacent to the eastern limits of the existing roadway corridor, just east of North Tanner Road on the north side of McCulloch Road. No impacts are currently anticipated to this conservation area; however, any potential change in the project limits likely alters species occurrence potential and may require additional permitting not discussed within this report.

5.3.2 Protected Fauna

The study area is located within the USFWS Consultation Area (CA) for Audubon's crested caracara (*Caracara plancus cheriway*), red-cockaded woodpecker (*Leuconotopicus borealis*), Florida scrub-jay (*Aphelocoma coerulescens*), and Everglade snail kite (*Rostrhamus sociabilis plumbeus*), and within the core foraging areas (CFAs) of two wood stork (*Mycteria americana*) colonies.

The study area is also within the habitat range for the Eastern indigo snake (*Drymarchon couperi*), bald eagle (*Haliaeetus leucocephalus*), bats, including the tri-colored (*Perimyotis subflavus*), and other protected wading and wetland-dependent birds, including the eastern black rail (*Laterallus jamaicensis jamaicensis*). Additionally, the project study area is within the known range for state-only listed species including the Florida burrowing owl (*Athene cunicularia floridana*), gopher tortoise (*Gopherus polyphemus*), Florida pine snake (*Pituophis melanoleucus mugitus*), southeastern American kestrel (*Falco sparverius paulus*), and other wading and wetland-dependent birds. The project is also within the "Frequent" range of the Central Florida Bear Management Unit (BMU) for the Florida black bear (*Ursus americanus floridanus*).

Due to the existing development surrounding the project study area, minimal suitable habitat, and lack of onsite observations during general field surveys, most species are anticipated to have a low to moderate occurrence. No EFH is located within the project area. Of the species evaluated, only the Everglade snail kite has designated critical habitat, the closest of which is located greater than 100 miles south. Therefore, the project is not located within and will not result in the destruction or adverse modification of federally designated critical habitat or EFH.

For species with potential for occurrence other than none (low, moderate, or high), further assessment information is provided below.

5.3.3 Federally Protected Species

Audubon's Crested Caracara (*Caracara plancus cheriway*)

The project is within the USFWS CA for Audubon's crested caracara, which is listed as threatened by the USFWS. Marginal natural habitat for caracara exists within the project study area. The crested caracara inhabits large prairies and pastures in south-central Florida. It prefers nesting in cabbage palms; however, it has also been reported to nest in other tree species. Undeveloped areas within the project study area are primarily composed of wetlands and forested pine flatwoods that do not represent suitable nesting or foraging habitat for caracara. No crested caracara nests have been documented within or adjacent to the study area (FNAI 2019, FWC) and no crested caracaras were observed during the general protected species review in November 2021. Due to the lack of suitable habitat present within the study area, the project is anticipated to have an effect determination of "**may affect, not likely to adversely affect**" for the crested caracara. Concurrence of effect determinations with the USFWS should be obtained during the design phase. Additional species-specific surveys are not anticipated; however, if required by USFWS, species-specific surveys should be conducted bi-weekly in the spring breeding season, starting prior to January 10th, and running through April 30th, in accordance with the USFWS *2004 Species Conservation Guidelines and USFWS Crested Caracara Draft Survey Protocol – Additional Guidance (2016-2017 Breeding Season*).

Bald eagle (*Haliaeetus leucocephalus*)

The bald eagle was removed from the Endangered Species Act in 2007 and Florida's Endangered and Threatened Species list in 2008; however, the eagle remains protected under the Bald and Golden Eagle Protection Act, the Migratory Bird Treaty Act, and Florida's bald eagle rule, (68A-16.002, FAC).

The Audubon EagleWatch and FWC Historical Eagle Nesting databases were queried for active nests within 0.5-miles of the project study area.

One eagle nest, OR036, is documented by Audubon as active as of the 2025 nesting season; however, this nest is approximately 0.40-mile away from the project study area. Therefore, the project will not encroach on the 660-foot nest protection buffer for Nest OR036. Due to the presence of other large pine trees, suitable for eagle nesting, located within the study area, preliminary protected species surveys will be conducted during the design phase to verify that no new nest sites have been established within the project area for the preferred alternative. If surveys identify an eagle nest within the project area, coordination with USFWS will occur to ensure that proper monitoring and permits are in place prior to construction, if necessary. Should the project anticipate construction within a nest's regulated 660-foot nest protection buffer, an Incidental Take permit application with the USFWS may be required for the proposed project. Provided best management practices are followed in accordance with the permit, or if the project continues to have no known nest sites, it is anticipated the project "**may affect, not likely to adversely affect**" the bald eagle.

Eastern indigo snake (*Drymarchon couperi*)

The Eastern indigo snake is listed as threatened by the USFWS and occurs throughout Florida. The species prefers xeric upland and scrub habitats but will utilize a variety of habitats including margins of swamps, wet prairies, unimproved and improved pastures, and xeric pinelands. The project study area consists primarily of wetlands, urban residential and commercial developments. Based on available land use data and onsite observations in November 2021, there is minimal potentially suitable upland habitat within the project study area for the Eastern indigo snake. No Eastern indigo snakes were observed during the field review and there are no known documented occurrences within the vicinity of the project study area. However, three gopher tortoise burrows, which the snakes are known to reside in, were observed during the initial field review in 2021. Therefore, the potential for occurrence for this species within the study area is moderate.

As a protection measure for the species, the latest version of the USFWS ***Standard Protection Measures for the Eastern Indigo Snake*** will be utilized during construction (**Appendix B**). With the protection measures in place, based on the *North Florida USFWS Jacksonville Ecological Services Field Office Eastern Indigo Snake Programmatic Effect Determination Key* dated August 2013 (**Appendix B**), it is anticipated that the project "**not likely to adversely affect**" the Eastern indigo snake. Use of this key resulted in the following sequential determination: A – "project is not located in open water or salt marsh" > B – "permit will be conditioned for use of the Service's most current guidance for *Standard Protection Measures For The Eastern Indigo Snake* during site preparation and project construction." > C – "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" > D – "the project will impact less than 25 acres of eastern indigo snake habitat..." > 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..." = **not likely to adversely affect**. During design, updates to impacted Eastern indigo snake potential habitat will be provided for review during permitting.

Everglade snail kite (*Rostrhamus sociabilis plumbeus*)

This species is listed as endangered by USFWS. Suitable habitat for the Everglade snail kite consists of lake perimeters and freshwater marshes due to the species diet consisting largely of apple snails.

Although the project study area is located within the CA for the Everglade snail kite, it is not within designated critical habitat for this species.

Based on the preliminary assessment, limited suitable habitat for the species is present within the study area in the form of freshwater lakes and pond perimeters and marshes. Based on the existing road alignment, the widening is not anticipated to impact suitable habitat; however, the final design will be evaluated for potential Everglade snail kite habitat impacts. Additionally, a protected species survey should be conducted within 90 days prior to construction. If preconstruction protected species surveys identify suitable habitat or Everglade snail kites are observed within the project area, then technical assistance with USFWS is recommended. Therefore, based on the current study area, no species-specific surveys are anticipated, and following these measures, the project is currently expected to have an effect determination of "**may affect, not likely to adversely affect**" the Everglade snail kite.

Florida scrub-jay (*Aphelocoma coerulescens*)

The project is within the CA for the Florida scrub jay, listed as federally threatened by USFWS and FWC. The Florida scrub-jay prefers xeric oak habitats with well-drained sandy soils that are adapted to periodic drought and frequent fires. Three classes of scrub jay habitat are defined by the USFWS *Species Conservation Guidelines, South Florida, Florida Scrub Jay* (USFWS 2004):

- Type I – any upland plant community in which the percent cover of the substrate by scrub oak species is 15 percent or more.
- Type II – any plant community, not meeting the definition of Type I habitat, in which one or more scrub oak species is represented.
- Type III – any upland or seasonally dry wetland within 400 meters (0.25 mile) of any area designated as Type I or Type II habitats.

The project study area consists of existing maintained ROW, residential properties, wetlands, and commercial development. The November 2021 field review determined there is no suitable habitat within the project study area and no scrub-jays were observed in the area. Although the FWC 1992-1993 Florida Scrub-Jay Documented Habitat identifies habitat located within and adjacent to the project study area, these areas are now developed with no natural habitat remaining. Based on these observations, a determination of "**may affect, not likely to adversely affect**" is anticipated for the Florida scrub-jay.

Red-cockaded woodpecker (*Leuconotopicus borealis*)

The project study area is within the Consultation Area for the red-cockaded woodpecker. Pine trees more than 6" diameter at breast height (DBH) exist in the project study area with some areas of limited understory; however, no documented observations were noted within or near the study area based on the available FWC 2005 observations data. Pending the final project area, should potential red-cockaded woodpecker pine habitat be impacted, additional survey efforts are anticipated to be required in accordance with the latest USFWS *Species Conservation Guidelines*. Due to the existing potential habitat, the project is anticipated to have a "**may affect, likely to adversely affect**" determination for the red-cockaded woodpecker until the preferred alignment is selected and USFWS is consulted for final effect determination.

Bats, including the Tricolored Bat (*Perimyotis subflavus*)

The project study area is within the habitat range of bats protected via Chapter 68A-4.001 FAC, including the tricolored bat, which are proposed to be listed by the USFWS under the Endangered Species Act. Tricolored bats roost in trees and structures, such as bridges and large culverts.

The project area contains suitable foraging habitat and potential roosting habitat via large trees in the forested wetlands and uplands within the project study area. Additionally, there are five 72" culverts under the existing McCulloch Road which could serve as potential roosting habitat. The species proposed listing is a result of a population decline and disease prominent in other states. Due to its' potential listing, I t is likely USFWS will request Orange County to incorporate tricolored bat best management practices (BMPs) during construction. Some BMPs that are currently encouraged are:

- Timber harvesting between the months of August-March to avoid mat maternity season and pup season.
- Prescribed fires: conduct burns when temperatures are above 50 degrees Fahrenheit, as bats are slow to arouse when temperatures are below 50 degrees.

No evidence of tree cavities, which bats are known to roost in, or evidence of bat roosting (e.g., guano, staining or acoustic detections) was observed during the November 2021 field review. Additionally, no known occupied roosts or maternity sites occur within the project study area. However, due to the time since the preliminary survey, additional protected species surveys during the design phase are recommended to determine the potential presence of the species within the final project footprint. Dependent on the final design project area avoiding the substantial removal of potential roosting habitat and adherence to seasonal BMPs for tree removal, the project has an effect determination of "may affect, not likely to adversely affect" bats; however, although the USFWS may impose additional requirements in the future pending the listing of the tricolored bat, it is anticipated such requirements will not be required for the subject project.

Wood Stork (*Mycteria americana*) and other wading and wetland-dependent birds

The wood stork is federally designated as a threatened species by USFWS. Wood storks are primarily associated with freshwater and estuarine habitats and typically construct nests in stands of medium to tall trees in swamps or islands surrounded by open water. The study area is located within CFA for two (2) documented wood stork colonies. The closest of these is the Orlando Wetlands Park Colony, approximately 11.2 miles east of the project study area. The project area contains suitable foraging habitat in the form of wetlands and stormwater ponds (NWW); therefore, the species has a "moderate" occurrence potential.

The Corps of Engineers, Jacksonville District, U.S. Fish and Wildlife Service, Jacksonville Ecological Services Field Office and State of Florida Effect Determination Key for the Wood Stork in Central and North Peninsular Florida dated September 2008 (attached in **Appendix C**) was reviewed during the species assessment. The determination assumes that the project will impact less than ½-acre of suitable foraging habitat and proposed impacts will be compensated within the service area at an USFWS approved mitigation bank or provided within the proposed stormwater system. A foraging prey analysis has not been conducted since the project is anticipated to impact less than 5 acres of wetlands classified as suitable foraging habitat (SFH). In the event the project impacts greater than 5 acres of SFH, a foraging analysis in accordance with USFWS guidance will be completed, as necessary.

The current determination is based on the following species determination key sequence: A – "Project more than 2,500 feet from a colony site > B – Project Impacts SFH > C – Project impacts to SFH are less than or equal to 0.5 acre = **"not likely to adversely affect."** If greater than 0.5 acre SFH are impacted then the same effect determination is reached via continuation of the key: D – Project impacts to SFH are within the CFA of a colony site…> E – "Project provides SFH compensation within the Service Area of the Service-approved wetland mitigation bank or wood stork conservation bank preferably within the CFA…" Therefore, it is anticipated that the project will not adversely affect the woodstork or other wading and wetland dependent birds.

Other Species protected under MBTA

The study area contains nesting and foraging habitat for other avian species protected under the MBTA (i.e., Osprey), no active nest sites occurred within the project study limits at this time; however, there are several lakes and stormwater ponds in the vicinity and potential nesting habitat within the project study area. Updated surveys to confirm presence or absence of nest sites will be conducted during design phase, and 90 days prior to construction. If an active nest is discovered, consultation with USFWS and FWC will be required to determine the appropriate actions and potential permit required based on the scope of work directly affecting the nest.

5.3.4 State Protected Species

Gopher Tortoise (*Gopherus polyphemus*)

The gopher tortoise is listed as threatened by the FWC. The gopher tortoise inhabits a wide variety of upland habitats and is known to serve as refuge for many species, some of which are protected. While the project study area is primarily residential developments and wetlands, the uplands within the existing ROW and undeveloped upland pine flatwoods provide potential habitat for the gopher tortoise within the project study area. According to FWC, "*Gopher tortoises and their burrows are protected by state law, and a gopher tortoise relocation permit must be obtained from FWC before disturbing burrows and conducting construction activities (Chapter 68A-27.003, FL Administrative Code). A disturbance includes any type of work within 25 feet of a gopher tortoise burrow*." FWC requires adherence to the most current version of the *Gopher Tortoise Permitting Guidelines* when performing any earth disturbing activities within 25 feet of any gopher tortoise burrows. Three gopher tortoise burrows were observed during the field review in November 2021, see attached **Protected Species Location Map (November 2021)** in **Appendix A**. Each of these burrows was located outside of the proposed project limits between Orion / Lockwood Boulevard and North Tanner Road; however, the gopher tortoise is a highly mobile species and with potential habitat within the study area, the likelihood of occurrence for the species remains high. A 100% survey will be conducted in accordance with the guidelines prior to construction. If work is proposed within 25 feet of a burrow, a gopher tortoise relocation permit prior to construction is typically required by FWC. If these guidelines are followed, including the excavation and/or other relocation of any potentially affected tortoises, "**no adverse effect"** is anticipated for the gopher tortoise for the proposed project.

Florida Pine Snake (*Pituophis melanoleucus mugitus*)

The Florida pine snake is a state threatened species. According to the FWC, the pine snake inhabits xeric habitats such as sandhill, scrub, and pine with well drained sandy soils and moderate to open canopy coverage.

Particularly, habitats with densities of pocket gophers and gopher tortoises are suitable for sustaining the species. Florida pine snakes may use other burrows as refugia or construct burrows where nest clutches are laid inside side burrows.

The project study area consists primarily of residential land uses where typical natural habitat is limited. However, three gopher tortoise burrows were observed within the study area during the preliminary field review. These burrows were observed primarily within the adjacent Econ River Wilderness area, which is not proposed for impact with the current preferred alternative. Despite gopher tortoise burrows observed in the study area, overall, potentially suitable habitat is limited. Therefore, the species is determined to have a low likelihood of occurrence within the study boundary. According to the ***FWC Florida Pine Snake Species Conservation Measures and Permitting Guidelines*** (**Appendix D**), species-specific surveys for most activities is not recommended and surveys are not required; however, "*surveys for pocket gopher mounds or gopher tortoise burrows will provide an indication of potential Florida pine snake habitat and essential breeding locations. These surveys will help meet the guidelines for minimization of impacts and can help to identify conservation or scientific benefit.*" A 100% gopher tortoise survey will be conducted in the final project area prior to construction and relocation activities will be conducted if potentially occupied gopher tortoise burrows are identified that cannot be avoided by the required 25-foot buffer required by FWC. If Florida pine snakes are detected on site, coordination with FWC will occur as needed and mitigative measures will be placed during relocation efforts. Therefore, the project will likely have **"no adverse effect"** on the Florida pine snake**.**

Florida Burrowing Owl (*Athene cunicularia floridana*)

The Florida burrowing owl is listed as threatened by the FWC. This species inhabits sparsely vegetated, sandy habitats throughout Florida. The burrowing owl has been documented occurring at golf courses, airports, pastures, and agricultural fields. The project study area includes minimal habitat for the species via the existing ROW and adjacent protected lands such as the Econ River Wilderness Area. The species was not observed during the November 2021 site visit and no documented species occurrences are located within the project vicinity (FNAI 2019, FWC).

For these reasons, there is a low likelihood of Florida burrowing owl occurrence within the study area. Although not anticipated, if burrowing owls are observed during the design phase, appropriate conservation and mitigative measures will be implemented in coordination with the FWC. A Florida burrowing owl survey will be conducted prior to construction in conjunction with gopher tortoise surveys. Therefore, assuming no Florida burrowing owls or their burrows are observed, or additional measures are coordinated with FWC is so, the project is anticipated to have "**no adverse effect**" on the Florida burrowing owl.

Southeastern American Kestrel (*Falco sparverius paulus*)

The southeastern American kestrel is listed as threatened by the FWC. This species inhabits open woodlands, pastures, agricultural areas, and low-density residential areas. The project study area is comprised primarily of wetlands and medium to high-density residential development. Therefore, there is minimal suitable habitat within the study area with the exception of the adjacent Econ River Wilderness Area. The current preferred alternative does not propose impacts to this property and the species was not observed during the November 2021 field review. If the final design avoids impacts to the adjacent Econ River Wilderness Area, no additional species-specific surveys are anticipated to be required.

Should southeastern American kestrels be observed during pre-construction general protected species surveys, additional coordination with FWC will be implemented. If no potential habitat is proposed to be impacted, an effect determination of "**may affect, not likely to adversely affect"** is anticipated for the southeastern American kestrel until surveys confirm absence.

Florida Sandhill Crane (*Antigone canadensis pratensis*) and Other State Listed Wading Birds

The Florida sandhill crane, little blue heron, and tricolored heron are each listed as threatened by the FWC occurring in Osceola County; these species, along with others are protected as well under the MBTA. No wading bird rookeries or nesting activities were observed during the November 2021 field review. Assuming mitigation is provided for all natural wetland impacts, no additional consultation or permitting is anticipated to be required. Additionally, an updated nesting/communal roost survey for wading birds should be performed during the final design phase to confirm absence prior to construction. If nests are identified during updated field reviews, appropriate consultation measures will be taken with FWC. Following these measures, there is "**no adverse effect**" anticipated for these species, based on the current study limits.

Florida Black Bear (*Ursus americanus floridanus*)

The Florida black bear is state protected under the Bear Conservation Rule (68A-4.009, FAC). According to FWC, the project study area is located within the "frequent" range of the Central Florida BMU.

The project study area is primarily developed; however suitable habitat exists within the general study area by way of the Econ River Wilderness area and protected lands to the east. Black bear road mortality data available via FWC (2020) was reviewed to assess the level of occurrence within the study area. The data indicates that no roadkill is documented within the project's study area. The nearest black bear roadkill is documented over 10 miles northwest of the study area, occurring in 2008. While no sightings are documented within the study boundary, according to the FWC Interactive Public Bear Map, multiple calls regarding bear sightings in neighborhoods east and south of the project area were recorded in 2024 and 2025. Therefore, with adjacent habitat and sightings within the general study area, there is a moderate probability of occurrence for the black bear within the project study area.

The FWC will provide comments during state ERP permitting "in order to minimize and avoid potential negative impacts of land modifications on the conservation and management of black bears," in accordance with the Bear Conservation Rule. FWC may require BMPs for construction to minimize the potential for bear interactions throughout construction. Due to the lack of documented road-kills or FWC-documented sightings within the study boundary and assuming any FWC-required BMPs are followed throughout construction, "**no adverse effect**" for the Florida black bear is anticipated.

5.4 Wildlife Corridor Analysis

Senate Bill 976 (SB 976), approved in 2021, and filed in Section 1055, Chapter 259, Florida Statutes, is known as the "The Florida Wildlife Corridor Act". The Act states that the Department of Environmental Protection shall encourage and promote various measures of investing in and protecting the Florida Wildlife Corridor. In response to this legislation, Orange County assessed the McCulloch Road corridor, to determine feasibility of maintaining and possibly improving wildlife habitat connectivity, during the design of roadway capacity improvements.

During field review conducted on November 10, 2021, three potentially occupied gopher tortoise burrows were observed within the study area's 500-foot radius of the project limits. No other federal and/or state-listed wildlife species were observed during field surveys and there is no documented significant movement of listed wildlife species across the study area.

General wildlife species (e.g., raccoons, opossums, armadillo, and deer) likely utilize existing vegetative communities along the residential corridor; however, no wildlife species were observed. Existing conditions (residential and commercial development and existing roadways) within the study area have fragmented natural vegetative communities, which restricts wildlife movement across McCulloch Road.

While there are existing conservation easements (primarily regulatory easements granted to the SJRWMD) immediately adjacent to the existing project corridor, as well as state-owned lands associated with UCF, the lack of upland corridor connectivity limits the immediate population of wildlife from ingress and egress to primarily wetland habitat, as the adjacent upland and ecotonal areas have been developed into stormwater ponds, upland "buffers" for residential communities, and single family/multi-family neighborhoods. Additionally, much of the wetland habitat immediately surrounding the study area is inundated with water for at least half of the calendar year.

During site visits, an existing culvert system consisting of five 72" RCP culvert pipes was observed adjacent to the UCF campus (owned by the state of Florida), approximately 500 feet east of North Orion Boulevard. "Wildlife Crossing" signs at the culvert are posted and wildlife cameras are installed on site, adjacent to the culvert, on the state-owned property. It is anticipated that UCF staff track movement at this location. Further analysis is recommended, during early design phase, to determine if any improvement to the existing structure (such as shelves) might benefit existing wildlife movement. Consideration of impacts to natural wetland systems should be analyzed, to determine cost-benefit analysis and impact to the natural floodplain. Analysis of wildlife fencing should also be further assessed during early design phase, as more recent studies demonstrate that wildlife underpasses without proper fencing are significantly less effective.

Given the extent of inundation in existing wetland systems adjacent to the project's existing corridor, residential/commercial development beyond the remaining wetlands that have eliminated the majority of upland habitat within a mile radius, and no priority lands proposed for future conservation purchases by state or local municipalities, no additional crossings are recommended during design phase.

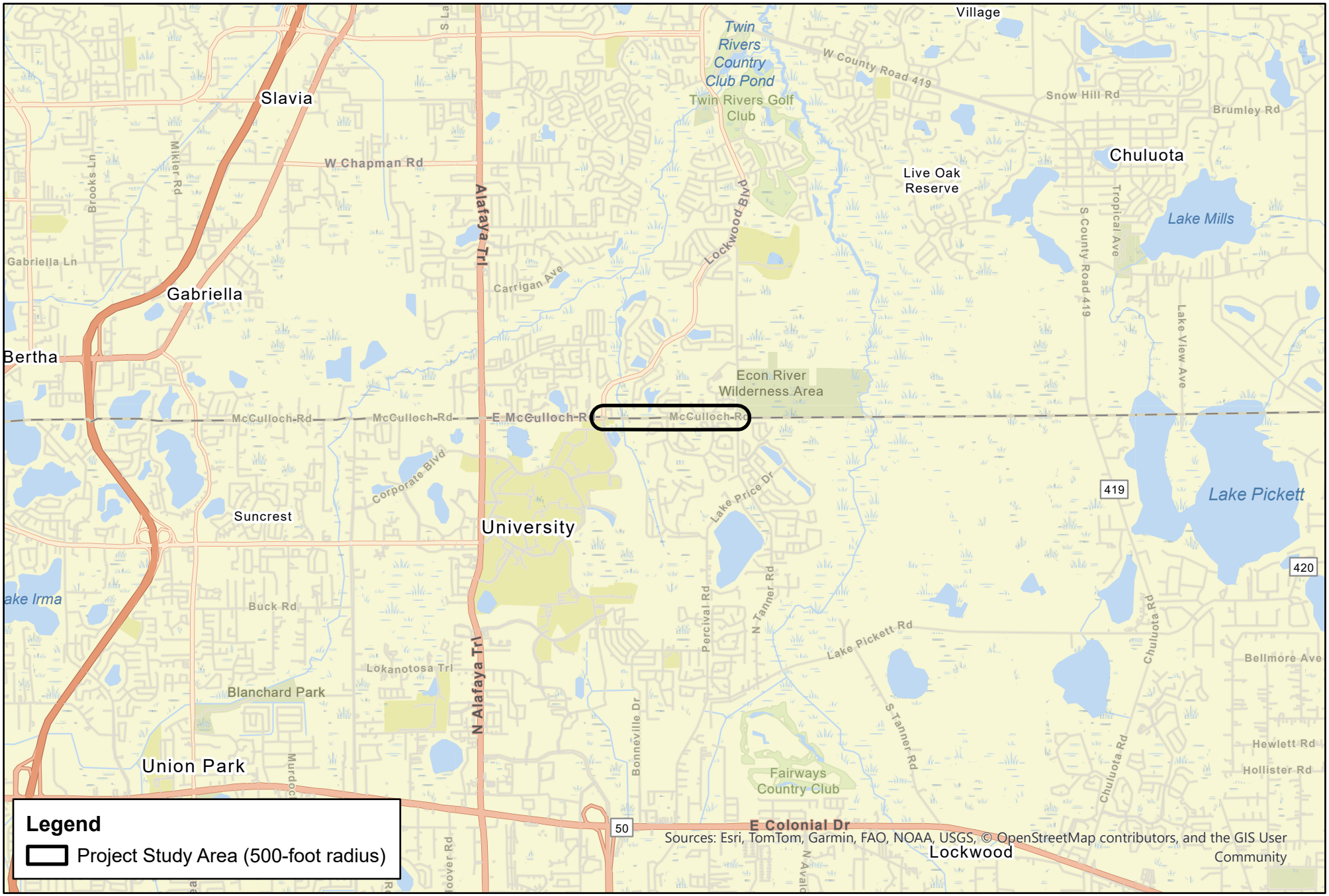
Summary of Commitments

The McCulloch Road project study area includes wetlands, NWWs, CEs and State-owned Lands, and possible occurrence of multiple protected species. The following commitments are recommended to avoid and minimize impacts to natural protected resources, where practicable:

- Avoidance and minimization (elimination and reduction) of wetland and listed or otherwise protected species impacts will continue to be evaluated during the final design, permitting and construction phases of this project and all possible and practicable measures to avoid or minimize these impacts during design, construction and operation will be incorporated.

- Coordination with SJRWMD and the State Board of Trustees for State-owned Lands to determine the boundaries of adjacent protected lands and assessment of potential impacts and mitigation should be undertaken during the early design phase.
- Conduct general protected species surveys during the early design phase, pending the preferred alignment, pond sites, and project area, to determine additional permitting or other requirements for the bald eagle, tricolored bat, red-cockaded woodpecker, osprey, wading and wetland-dependent birds, gopher tortoise, Florida burrowing owl, southeastern American kestrel, and nesting birds.
- The latest *Standard Protection Measures for the Eastern Indigo Snake* will be implemented during project construction.
- The *FWC Florida Pine Snake Species Conservation Measures and Permitting Guidelines* will be implemented during project construction.
- BMPs to control erosion and sedimentation in accordance with Standard Specifications for Road and Bridge Construction will be implemented, such as via a Stormwater Pollution Prevention Plan

Appendix A



Regional Location Map

McCulloch Road RCA Study

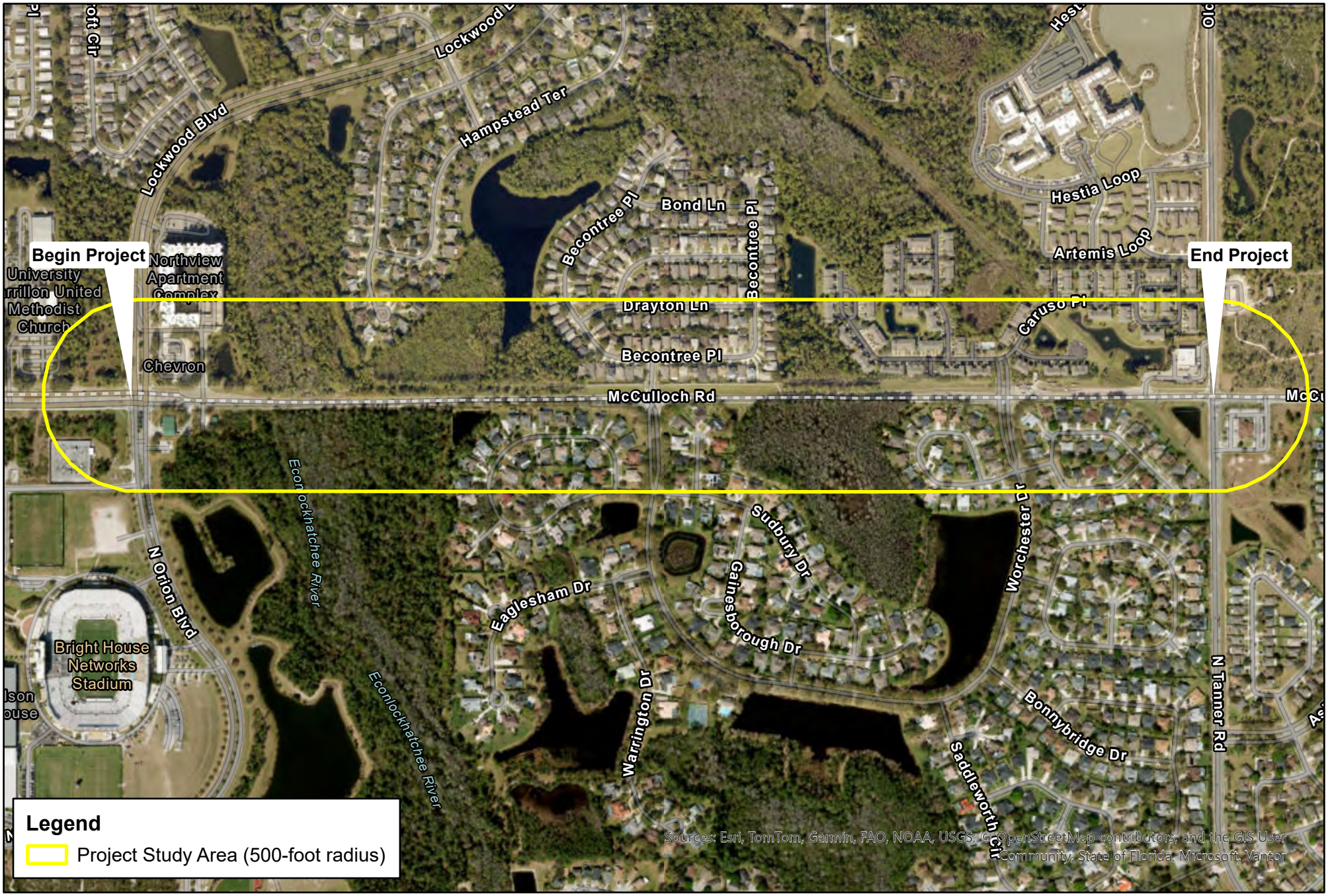
Orange and Seminole County, Florida

N

Miles
0 0.5 1

Data Source: Dewberry
Image Source: ESRI

Dewberry



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Aerial Location Map

McCulloch Road RCA Study

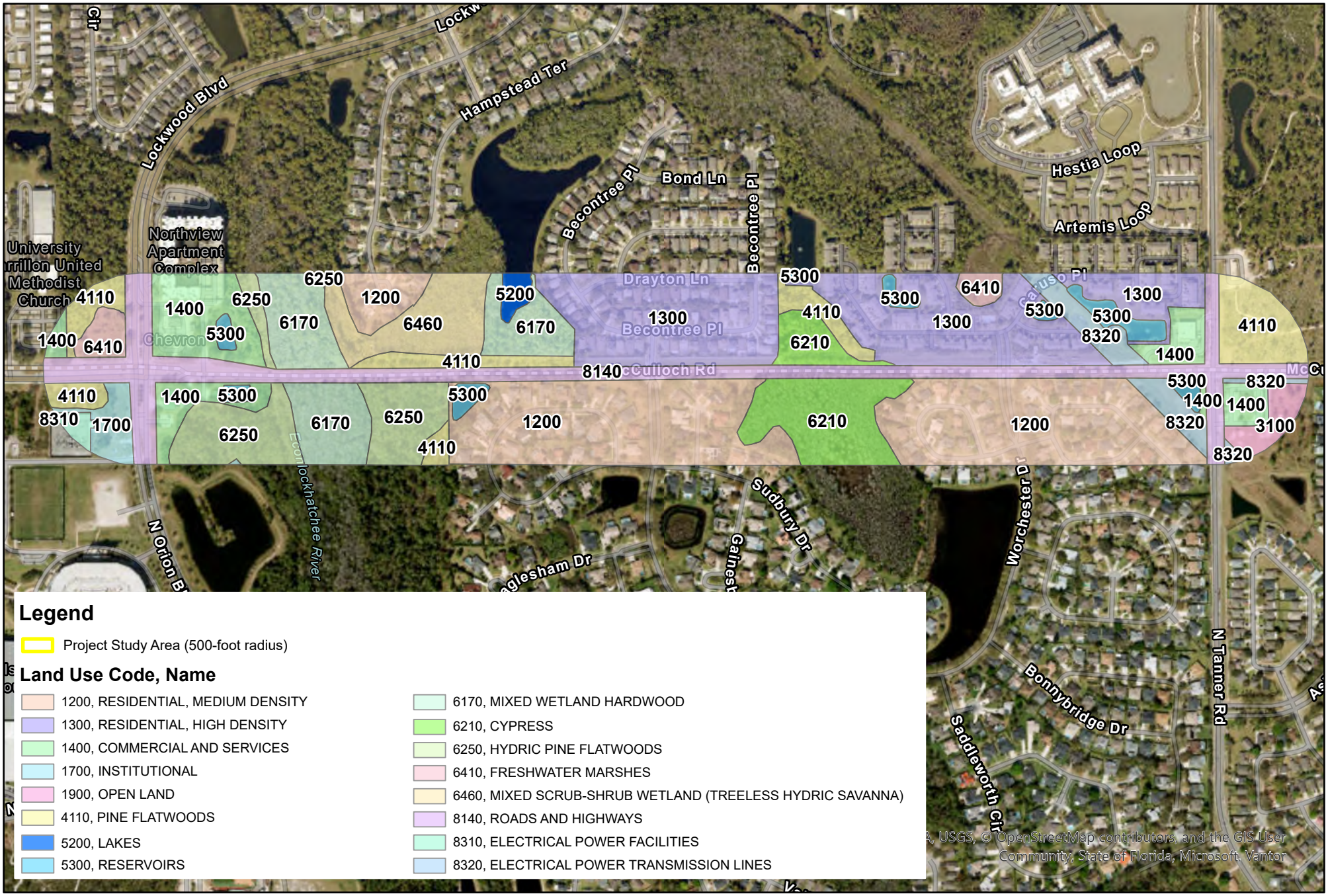
Orange and Seminole County, Florida

N

Data Source: Dewberry
Image Source: ESRI

0 330 660 Feet

Dewberry



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Land Use Map

McCulloch Road RCA Study

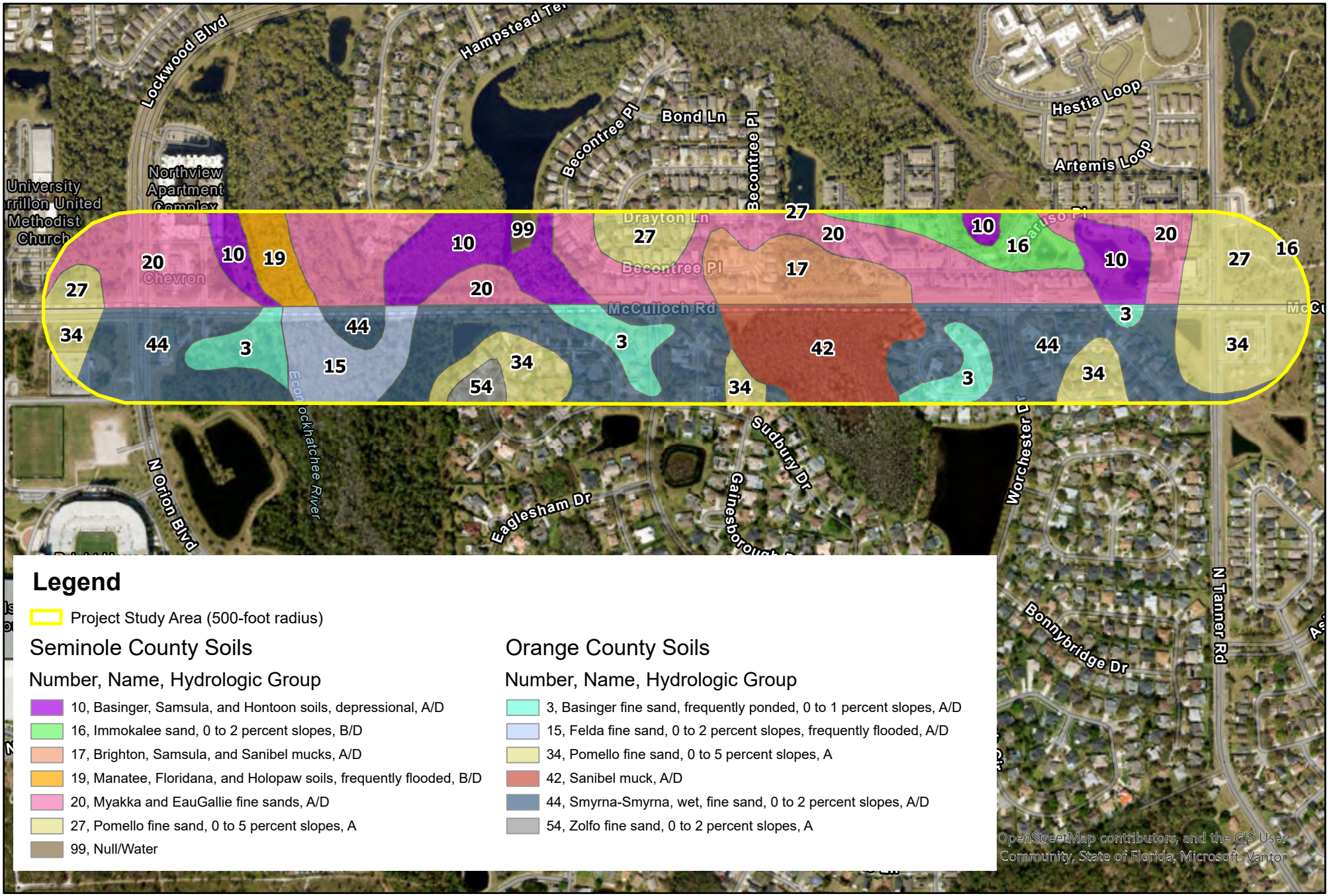
Orange and Seminole County, Florida

N

0 330 660 Feet

Data Source: Dewberry, SJRWMD
Land Use (2020)
Image Source: ESRI

Dewberry



Legend

Project Study Area (500-foot radius)

Seminole County Soils

Number, Name, Hydrologic Group

- 10, Basinger, Samsula, and Hontoon soils, depressional, A/D
- 16, Immokalee sand, 0 to 2 percent slopes, B/D
- 17, Brighton, Samsula, and Sanibel mucks, A/D
- 19, Manatee, Floridana, and Holopaw soils, frequently flooded, B/D
- 20, Myakka and EauGallie fine sands, A/D
- 27, Pomello fine sand, 0 to 5 percent slopes, A
- 99, Null/Water

Orange County Soils

Number, Name, Hydrologic Group

- 3, Basinger fine sand, frequently ponded, 0 to 1 percent slopes, A/D
- 15, Felda fine sand, 0 to 2 percent slopes, frequently flooded, A/D
- 34, Pomello fine sand, 0 to 5 percent slopes, A
- 42, Sanibel muck, A/D
- 44, Smyrna-Smyrna, wet, fine sand, 0 to 2 percent slopes, A/D
- 54, Zolfo fine sand, 0 to 2 percent slopes, A

Path: \\dewberry.dewberryroot.local\Offices\Orlando\Projects\50145232_McCulloch_Road\Tech\Environmental\GIS\McCulloch_Rd_NRE\McCulloch_Rd_NRE.aprx

Soils Map

McCulloch Road RCA Study

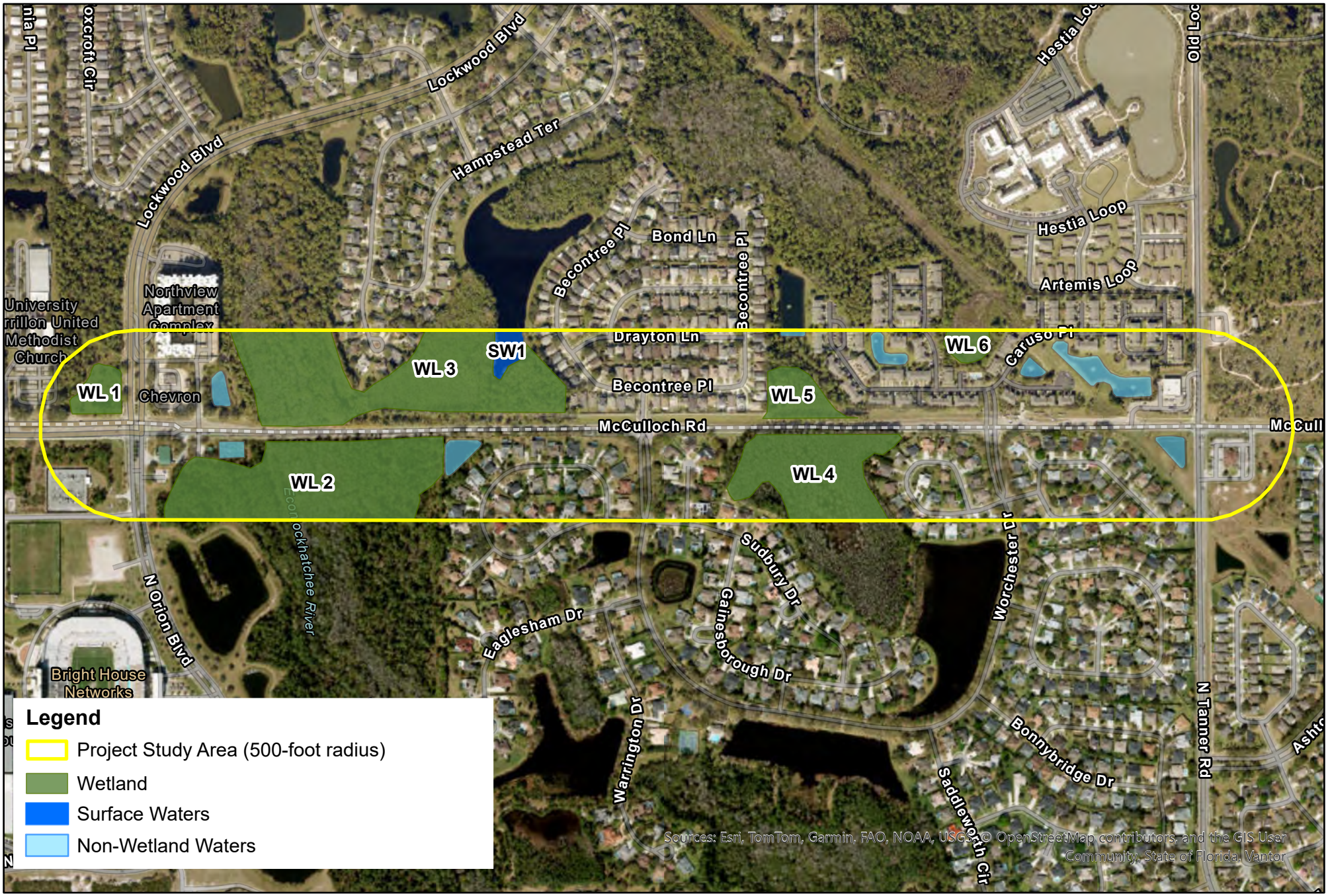
Orange and Seminole County, Florida

N

0 330 660 Feet

Data Source: Dewberry, USDA NRCS
Image Source: ESRI

Dewberry



Path: \\dewberry.dewberryroot.local\Offices\Orlando\Projects\50145232_McCulloch_Road\Tech\Environmental\GIS\McCulloch_Rd_NRE\McCulloch_Rd_NRE.aprx

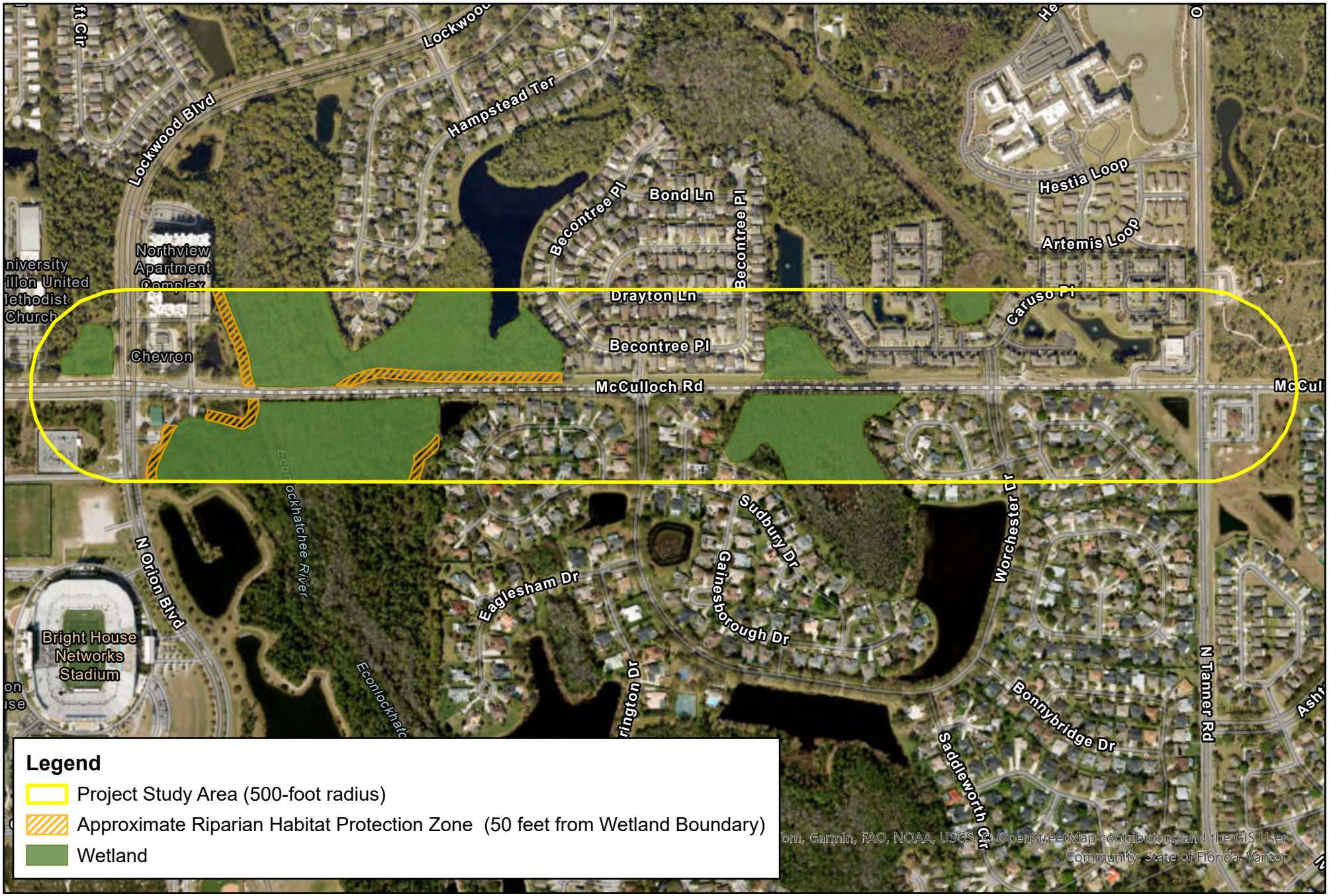
Wetlands, Surface Waters and Non-Wetland Waters Map

McCulloch Road RCA Study

Orange and Seminole County, Florida

Data Source: Dewberry, NWI, SJRWMD
Image Source: ESRI

Dewberry



Path: \\dewberry.dewberryroot.local\Offices\Orlando\Projects\50145232_McCulloch_Road\Tech\Environmental\GIS\McCulloch_Rd_NRE\McCulloch_Rd_NRE.aprx

Riparian Habitat Protection Zone Map

McCulloch Road RCA Study

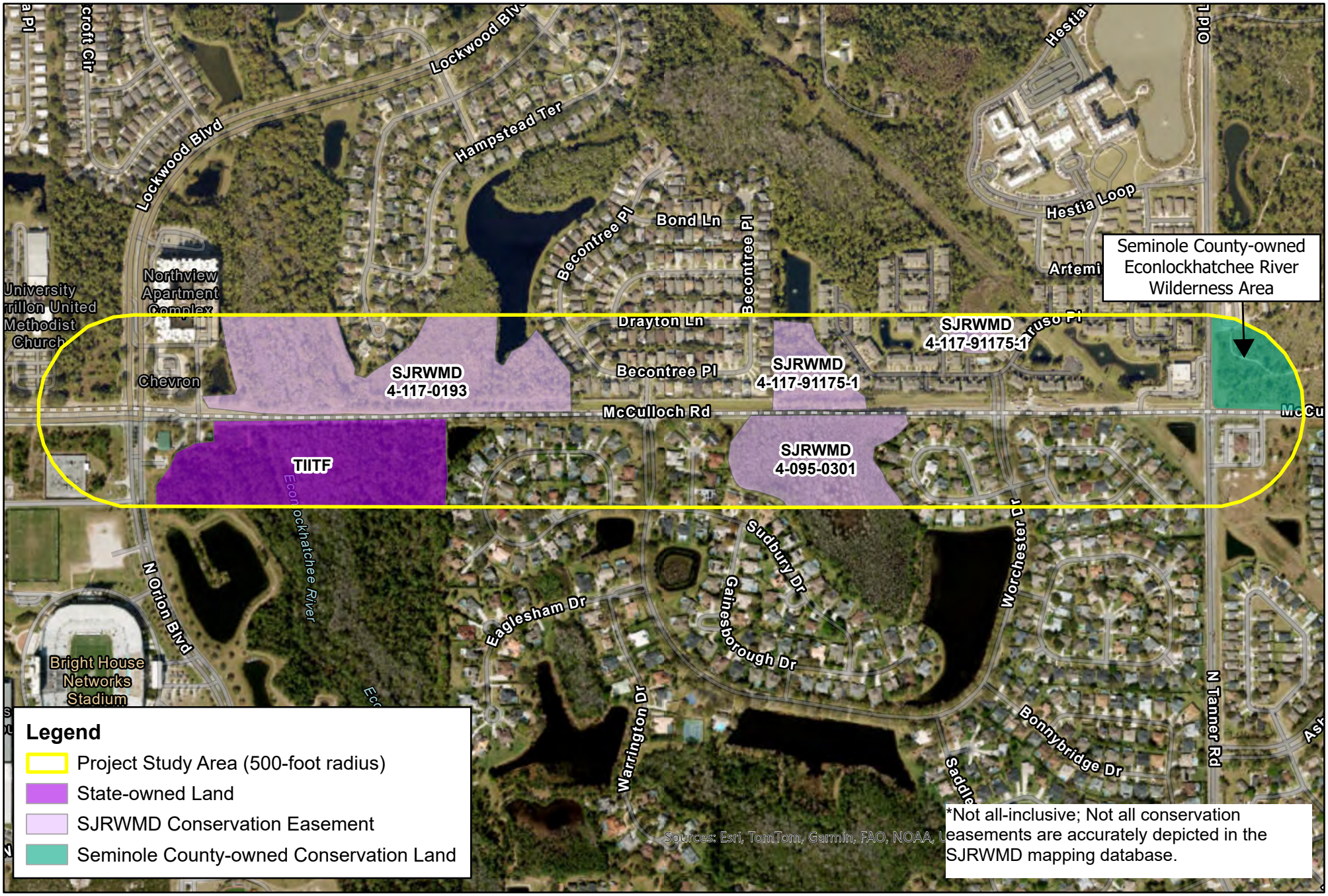
Orange and Seminole County, Florida

N

Data Source: Dewberry
Image Source: ESRI

0 330 660 Feet

Dewberry



Path: \\dewberry.dewberryroot.local\Offices\Orlando\Projects\50145232_McCulloch_Road\Tech\Environmental\GIS\McCulloch_Rd_NRE\McCulloch_Rd_NRE.aprx

Protected and Significant Lands Map

McCulloch Road RCA Study

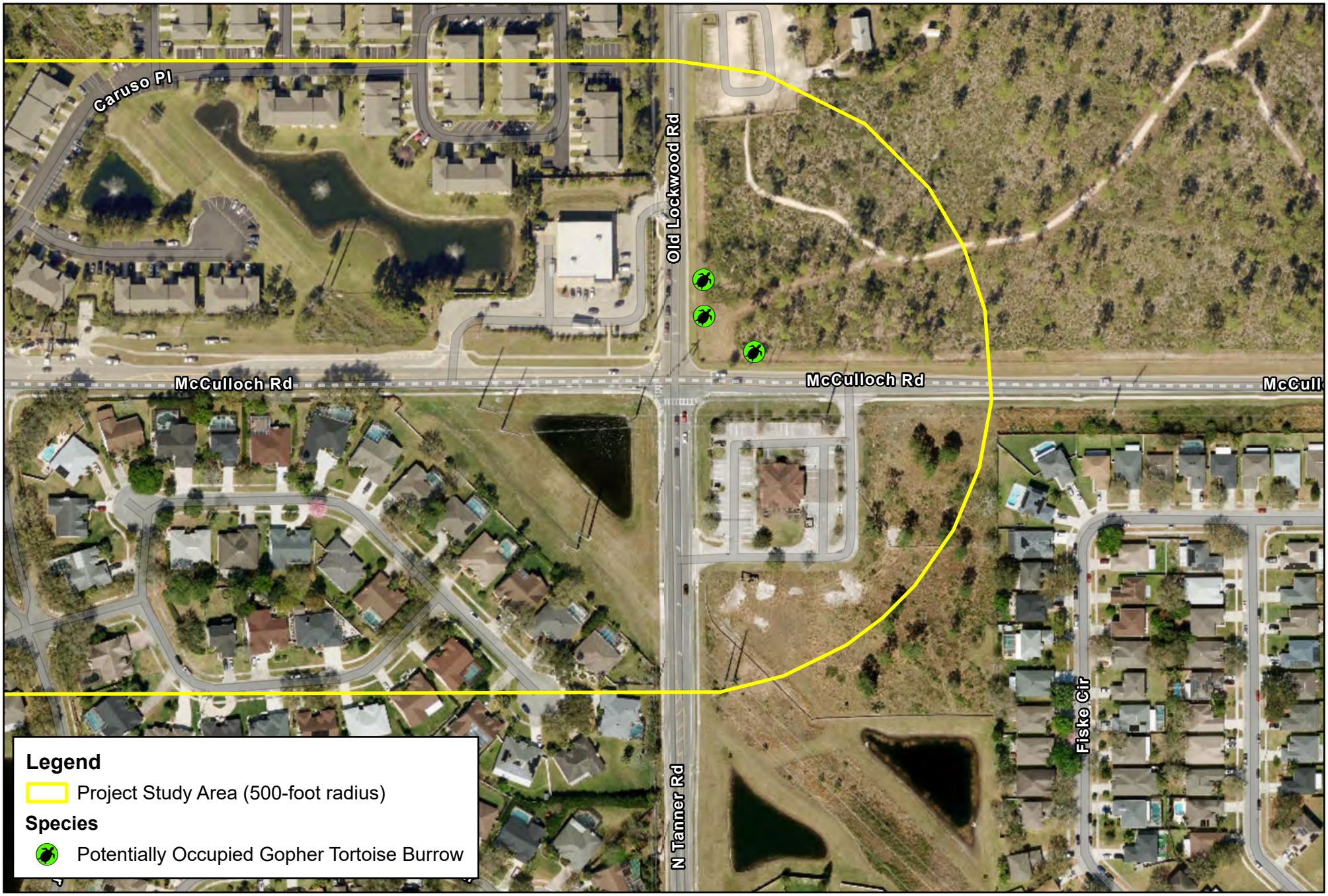
Orange and Seminole County, Florida

N

0 330 660 Feet

Data Source: Dewberry, SJRWMD, BTLDS
Image Source: ESRI

Dewberry



Protected Species Location Map (November 2021)

McCulloch Road RCA Study

Orange and Seminole County, Florida

N

Data Source: Dewberry
Image Source: ESRI

0 100 200 Feet

Dewberry

Path: \\dewberry.dewberryroot.local\Offices\Orlando\Projects\50145232_McCulloch_Road\Tech\Environmental\GIS\McCulloch_Rd_NRE\McCulloch_Rd_NRE.aprx

Appendix B

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

IN REPLY REFER TO:
August 13, 2013

Colonel Alan M. Dodd, District Engineer
Department of the Army
Jacksonville District Corps of Engineers
P.O Box 4970
Jacksonville, Florida 32232-0019
(Attn: Mr. David S. Hobbie)

RE: Update Addendum to USFWS Concurrence Letter to U.S. Army Corps of Engineers Regarding Use of the Attached Eastern Indigo Snake Programmatic Effect Determination Key

Dear Colonel Dodd:

This letter is to amend the January 25, 2010, letter to the U.S. Army Corps of Engineers regarding the use of the attached eastern indigo snake programmatic effect determination key (key). It supersedes the update addendum issued January 5, 2012.

We have evaluated the original programmatic concurrence and find it suitable and appropriate to extend its use to the remainder of Florida covered by the Panama City Ecological Services Office.

On Page 2

The following replaces the last paragraph above the signatures:

"Thank you for your continued cooperation in the effort to conserve fish and wildlife resources. Any questions or comments should be directed to Annie Dziergowski (North Florida ESO) at 904-731-3089, Harold Mitchell (Panama City ESO) at 850-769-0552, or Victoria Foster (South Florida ESO) at 772-469-4269."

On Page 3

The following replaces both paragraphs under "Scope of the key":

"This key should be used only in the review of permit applications for effects determinations for the eastern indigo snake within the State of Florida, and not for other listed species or for aquatic resources such as Essential Fish Habitat (EFH)."

On Page 4

The following replaces the first paragraph under Conservation Measures:

"The Service routinely concurs with the Corps' "not likely to adversely affect" (NLAA) determination for individual project effects to the eastern indigo snake when assurances are given that

our *Standard Protection Measures for the Eastern Indigo Snake* (Service 2013) located at: http://www.fws.gov/northflorida/IndigoSnakes/indigo-snakes.htm will be used during project site preparation and project construction. There is no designated critical habitat for the eastern indigo snake."

On Page 4 and Page 5 (Couplet D)

The following replaces D. under Conservation Measures:

D. The project will impact less than 25 acres of xeric habitat (scrub, sandhill, or scrubby flatwoods) or less than 25 active and inactive gopher tortoise burrows.....*go to* E

The project will impact more than 25 acres of xeric habitat (scrub, sandhill, or scrubby flatwoods) or more than 25 active and inactive gopher tortoise burrows and consultation with the Service is requested[2].....*"may affect"*

On Page 5

The following replaces footnote #3:

"[3]If excavating potentially occupied burrows, active or inactive, individuals must first obtain state authorization via a FWC 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 ."

Thank you for making these amendments concerning the Eastern Indigo Snake Key. If you have any questions, please contact Jodie Smithem of my staff at the address on the letterhead, by email at jodie_smithem@fws.gov, or by calling (904)731-3134.

Sincerely,

Dawn Jennings
Acting Field Supervisor

cc:
Panama City Ecological Services Field Office, Panama City, FL
South Florida Ecological Services Field Office, Vero Beach, FL

United States Department of the Interior

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

January 25, 2010

David S. Hobbie
Chief, Regulatory Division
U.S. Army Corps of Engineers
Post Office Box 4970
Jacksonville, Florida 32232-0019

Service Federal Activity Code: 41420-2009-FA-0642
Service Consultation Code: 41420-2009-I-0467
41910-2010-I-0045
Subject: North and South Florida Ecological Services Field Offices Programmatic Concurrence for Use of Original Eastern Indigo Snake Key(s) Until Further Notice

Dear Mr. Hobbie:

The U.S. Fish and Wildlife Service's (Service) South and North Florida Ecological Services Field Offices (FO), through consultation with the U.S. Army Corps of Engineers Jacksonville District (Corps), propose revision to both Programmatic concurrence letters/keys for the federally threatened Eastern Indigo Snake (*Drymarchon corais couperi*), (indigo snake), and now provide one key for both FO's. The original programmatic key was issued by the South Florida FO on November 9, 2007. The North Florida FO issued a revised version of the original key on September 18, 2008. Both keys were similar in content, but reflected differences in geographic work areas between the two Field Offices. The enclosed key satisfies each office's responsibilities under the Endangered Species Act of 1973, as amended (Act) (87 Stat. 884; 16 U.S.C.1531 *et seq.*).

Footnote number 3 in the original keys indicated "A member of the excavation team should be authorized for Incidental Take during excavation through either a section 10(a)(1)(A) permit issued by the Service or an incidental take permit issued by the Florida Fish and Wildlife Conservation Commission (FWC)." We have removed this reference to a Service issued Section 10(a)(1)(A) permit, as one is not necessary for this activity. We also referenced the FWC's revised April 2009 Gopher Tortoise Permitting Guidelines with a link to their website for updated excavation guidance, and have provided a website link to our Standard Protection Measures. All other conditions and criteria apply.

We believe the implementation of the attached key achieves our mutual goal for all users to make consistent effect determinations regarding this species. The use of this key for review of projects

located in all referenced counties in our respective geographic work areas leads the Service to concur with the Corps' determination of "may affect, not likely to adversely affect" (MANLAA) for the Eastern indigo snake. The biological rationale for the determinations is contained within the referenced documents and is submitted in accordance with section 7 of the Act.

Should circumstances change or new information become available regarding the eastern indigo snake or implementation of the key, the determinations may be reconsidered as deemed necessary.

Thank you for your continued cooperation in the effort to conserve fish and wildlife resources. Any questions or comments should be directed to either Allen Webb (Vero Beach) at 772-562-3909, extension 246, or Jay Herrington (Jacksonville) at 904-731-3326.

Sincerely,

Paul Souza
Field Supervisor
South Florida Ecological Services Office

David L. Hankla
Field Supervisor
North Florida Ecological Services Office

Enclosure

cc: electronic only
FWC, Tallahassee, Florida (Dr. Elsa Haubold)
Service, Jacksonville, Florida (Jay Herrington)
Service, Vero Beach, Florida (Sandra Sneckenberger)

Eastern Indigo Snake Programmatic Effect Determination Key

Scope of the key

This key should be used only in the review of permit applications for effects determinations within the North and South Florida Ecological Services Field Offices Geographic Areas of Responsibility (GAR), and not for other listed species or for aquatic resources such as Essential Fish Habitat (EFH). Counties within the **North** Florida GAR include Alachua, Baker, Bradford, Brevard, Citrus, Clay, Columbia, Dixie, Duval, Flagler, Gilchrist, Hamilton, Hernando, Hillsborough, Lafayette, Lake, Levy, Madison, Manatee, Marion, Nassau, Orange, Pasco, Pinellas, Putnam, St. Johns, Seminole, Sumter, Suwannee, Taylor, Union, and Volusia.

Counties in the **South** Florida GAR include Broward, Charlotte, Collier, De Soto, Glades, Hardee, Hendry, Highlands, Lee, Indian River, Martin, Miami-Dade, Monroe, Okeechobee, Osceola, Palm Beach, Polk, Sarasota, St. Lucie.

Habitat

Over most of its range, the eastern indigo snake frequents several habitat types, including pine flatwoods, scrubby flatwoods, high pine, dry prairie, tropical hardwood hammocks, edges of freshwater marshes, agricultural fields, coastal dunes, and human-altered habitats (Service 1999). Eastern indigo snakes appear to need a mosaic of habitats to complete their life cycle. Wherever the eastern indigo snake occurs in xeric habitats, it is closely associated with the gopher tortoise *(Gopherus polyphemus),* the burrows of which provide shelter from winter cold and summer desiccation (Speake et al. 1978; Layne and Steiner 1996). Interspersion of tortoise-inhabited uplands and wetlands improves habitat quality for this species (Landers and Speake 1980; Auffenberg and Franz 1982).

In south Florida, agricultural sites, such as sugar cane fields, created in former wetland areas are occupied by eastern indigo snakes (Enge pers. comm. 2007). Formerly, indigo snakes would have only occupied higher elevation sites within the wetlands. The introduction of agriculture and its associated canal systems has resulted in an increase in rodents and other species of snakes that are prey for eastern indigo snakes. The result is that indigos occur at higher densities in these areas than they did historically.

Even though thermal stress may not be a limiting factor throughout the year in south Florida, indigo snakes still seek and use underground refugia. On the sandy central ridge of central Florida, eastern indigos 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 (Service 2006). 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. In extreme south Florida (the Everglades and Florida Keys), indigo snakes are found in tropical

hardwood hammocks, pine rocklands, freshwater marshes, abandoned agricultural land, coastal prairie, mangrove swamps, and human-altered habitats (Steiner et al. 1983). It is suspected that they prefer hammocks and pine forests, because most observations occur in these habitats disproportionately to their presence in the landscape (Steiner et al. 1983). Hammocks may be important breeding areas as juveniles are typically found there. The eastern indigo snake is a snake-eater so the presence of other snake species may be a good indicator of habitat quality.

Conservation Measures

The Service routinely concurs with the Corps' "not likely to adversely affect" (NLAA) determination for individual project effects to the eastern indigo snake when assurances are given that our *Standard Protection Measures for the Eastern Indigo Snake* (Service 2004) located at: http://www.fws.gov/northflorida/IndigoSnakes/indigo-snakes will be used during project site preparation and project construction. There is no designated critical habitat for the eastern indigo snake.

In an effort to reduce correspondence in effect determinations and responses, the Service is providing an Eastern Indigo Snake Effect Determination Key, similar in utility to the West Indian Manatee Effect Determination Key and the Wood Stork Effect Determination Keys presently being utilized by the Corps. 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 and no additional correspondence will be necessary[1]. This key is subject to revisitation as the Corps and Service deem necessary.

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 *Standard Protection Measures For The Eastern Indigo Snake* 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[2] .....*"may affect"*

C. There are gopher tortoise burrows, holes, cavities, or other refugia where a snake could be buried or trapped and injured during project activities .....*go to* D

   There are no gopher tortoise burrows, holes, cavities, or other refugia where a snake could be buried or trapped and injured during project activities .....*"NLAA"*

D. The project will impact less than 25 acres of xeric habitat supporting less than 25 active and inactive gopher tortoise burrows.....*go to* E

The project will impact more than 25 acres of xeric habitat or more than 25 active and inactive gopher tortoise burrows and consultation with the Service is requested[2]..... *"may affect"*

E. Any permit will be conditioned such that all gopher tortoise burrows, active or inactive, will be evacuated prior to site manipulation in the vicinity of the burrow[3]. If an 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 indigo snake, no work will commence until the snake has vacated the vicinity of proposed work..... *"NLAA"*

Permit will not be conditioned as outlined above and consultation with the Service is requested[2] ..... *"may affect"*

---

[1]With an outcome of "no effect" or "NLAA" as outlined in this key, the requirements of section 7 of the Act are fulfilled for the eastern indigo snake and no further action is required.

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

[3] If burrow excavation is utilized, it should be performed by experienced personnel. The method used should minimize the potential for injury of an indigo snake. Applicants should follow the excavation guidance provided within the Florida Fish and Wildlife Conservation Commission's revised April 2009 Gopher Tortoise Permitting Guidelines located at **http://myfwc.com/License/Permits_ProtectedWildlife.htm#gophertortoise**. A member of the excavation team should be authorized for Incidental Take during excavation through an incidental take permit issued by the Florida Fish and Wildlife Conservation Commission.

STANDARD PROTECTION MEASURES FOR THE EASTERN INDIGO SNAKE

U.S. Fish and Wildlife Service

May 2024

The Standard Protection Measures for the Eastern Indigo Snake (Plan) below has been developed by the U.S. Fish and Wildlife Service (USFWS) in Florida and Georgia for use by project proponents and their construction personnel help minimize adverse impacts to eastern indigo snakes. However, implementation of this Plan does not replace any state of federal consultation or regulatory requirements. At least 30 days prior to any land disturbance activities, the project proponent shall notify the appropriate USFWS Field Office (see Field Office contact information) via e-mail that the Plan will be implemented as described below.

As long as the signatory of the e-mail certifies compliance with the below Plan (including use of the approved poster and pamphlet (USFWS Eastern Indigo Snake Conservation webpage), no further written confirmation or approval from the USFWS is needed regarding use of this Plan as a component of the project.

If the project proponent 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. The project proponent 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.

STANDARD PROTECTION MEASURES

BEFORE AND DURING CONSTRUCTION ACTIVITIES:

- All Project personnel shall be notified about the potential presence and appearance of the federally protected eastern indigo snake (*Drymarchon couperi*).
- All personnel shall be advised that there are civil and criminal penalties for harassing, harming, pursuing, hunting, shooting, wounding, killing, capturing, or collecting the species, in knowing violation of the Endangered Species Act of 1973.
- The project proponent or designated agent will post educational posters in the construction office and throughout the construction site. The posters must be clearly visible to all construction staff and shall be posted in a conspicuous location in the

Project field office until such time that Project construction has been completed and time charges have stopped.

- Prior to the onset of construction activities, the project proponent or 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 pamphlet 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. Photos of eastern indigo snakes may be accessed on USFWS, Florida Fish and Wildlife Conservation Commission and/or Georgia Department of Natural Resources websites.
- Each day, prior to the commencement of maintenance or construction activities, the Contractor shall perform a thorough inspection for the species of all worksite equipment.
- If an eastern indigo snake (alive, dead or skin shed) 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 Office. The contact information for the USFWS is provided below and on the referenced posters and pamphlets.
- During initial site clearing activities, an onsite observer is recommended 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).
- Periodically during construction activities, the project area should be visited 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.
- For erosion control use biodegradable, 100% natural fiber, net-free rolled erosion control blankets to avoid wildlife entanglement.

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 (See USFWS Field Office Contact Information).

USFWS FIELD OFFICE CONTACT INFORMATION

Georgia Field Office: Phone: (706) 613-9493, email: gaes_assistance@fws.gov
Florida Field Office: Phone: (352) 448-9151, email: fw4flesregs@fws.gov

POSTER & PAMPHLET INFORMATION

Posters with the following information shall be placed at strategic locations on the construction site and along any proposed access roads (final posters for Plan compliance are available on our website in English and Spanish and should be printed on 11 x 17in or larger paper and laminated (USFWS Eastern Indigo Snake Conservation webpage). Pamphlets are also available on our webpage and should be printed on 8.5 x 11in paper and folded, and available and distributed to staff working on the site.

POSTER CONTENT (ENGLISH):

ATTENTION

Federally-Threatened Eastern Indigo Snakes may be present on this site!

Killing, harming, or harassing eastern indigo snakes is strictly prohibited and punishable under State and Federal Law.

IF YOU SEE A LIVE EASTERN INDIGO SNAKE ON THE SITE:

• Stop land disturbing activities and allow the snake time to move away from the site without interference. Do NOT attempt to touch or handle the snake.

• Take photographs of the snake, if possible, for identification and documentation purposes.

• Immediately notify supervisor/agent, and a U.S. Fish and Wildlife Service (USFWS) Ecological Services Field Office, with the location information and condition of the snake.

• If the snake is located near clearing or construction activities that will cause harm to the snake, the activities must pause until a representative of the USFWS returns the call (within one day) with further guidance.

IF YOU SEE A DEAD EASTERN INDIGO SNAKE ON THE SITE:

• Stop land disturbing activities and immediately notify supervisor/applicant, and a USFWS Ecological Services Field 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.

DESCRIPTION: The eastern indigo snake is one of the largest non-venomous snakes in North America, reaching up to 8 ft long. Named for the glossy, blue-black scales above and slate blue below, they often have orange to reddish color (cream color in some cases)

in the throat area. They are not typically aggressive.

SIMILAR SPECIES: The black racer resembles the eastern indigo snake. However, black racers have a white or cream chin, and thinner bodies.

LIFE HISTORY: Eastern indigo snakes live in a variety of terrestrial habitat types. Although they prefer uplands, they also use wetlands and agricultural areas. They will shelter inside gopher tortoise burrows, other animal burrows, stumps, roots, and debris piles. Females may lay from 4 to 12 white eggs as early as April through June, with young hatching in late July through October.

PROTECTED STATUS: The eastern indigo snake is protected by the USFWS, Florida Fish and Wildlife Conservation Commission, and Georgia Department of Natural Resources. Any attempt to kill, harm, harass, pursue, hunt, shoot, wound, trap, capture, collect, or engage eastern indigo snakes is prohibited by the U.S. Endangered Species Act. Penalties include a maximum fine of $25,000 for civil violations and up to $50,000 and/or imprisonment for criminal offenses. Only authorized individuals with a permit (or an Incidental Take Statement associated with a USFWS Biological Opinion) may handle an eastern indigo snake.

Please contact your nearest USFWS Ecological Services Field Office if a live or dead eastern indigo snake is encountered:

Florida Office: (352) 448-9151

Georgia Office: (706) 613-9493

POSTER CONTENT (SPANISH):

ATENCIÓN

¡Especie amenazada, la culebra Índigo del Este, puede ocupar el área!

Matar, herir o hostigar culebras Índigo del Este es estrictamente prohibido bajo la Ley Federal.

SI VES UNA CULEBRA ÍNDIGO DEL ESTE O UNA CULEBRA NEGRA VIVA EN EL ÁREA:

• Pare excavación y permite el movimiento de la culebra fuera del área sin interferir. NO atentes tocar o recoger la culebra.

• Fotografié la culebra si es posible para identificación y documentación.

• Notifique supervisor/agente, y la Oficina de Campo de Servicios Ecológicos del Servicio Federal de Pesca y Vida Silvestre (USFWS) apropiada con información acerca del sitio y condición de la culebra.

• Si la culebra está cerca de un área de construcción que le pueda causar daño, las actividades deben parar hasta un representante del USFWS regrese la llamada (dentro de un día) con más orientación.

SI VES UNA CULEBRA ÍNDIGO DEL ESTE MUERTA EN EL ÁREA:

• Pare excavación. Notifique supervisor/aplicante, y la Oficina de Campo de Servicios Ecológicos apropiada con información acerca del sitio y condición de la culebra.

• Fotografié la culebra si es posible para identificación y documentación.

• Emerge completamente la culebra en agua y congele la especie hasta que personal apropiado de la agencia de vida silvestre la recoja.

DESCRIPCIÓN. La culebra Índigo del Este es una de las serpientes sin veneno más grande en Norte América, alcanzando hasta 8 pies de largo. Su nombre proviene del color azul-negro brilloso de sus escamas, pero pueden tener un color anaranjado-rojizo (color crema en algunos casos) en su mandíbula inferior. No tienden a ser agresivas.

SERPIENTES PARECIDAS. La corredora negra, que es de color negro sólido, es la única otra serpiente que se asemeja a la Índigo del Este. La corredora negra se diferencia por una mandíbula inferior color blanca o crema y un cuerpo más delgado.

HÁBITATS Y ECOLOGÍA. La culebra Índigo del Este vive en una variedad de hábitats, incluyendo tierras secas, humedales, y áreas de agricultura. Ellas buscan refugio en agujeros o huecos de tierra, en especial madrigueras de tortugas de tierra. Las hembras ponen 4 hasta 12 huevos blancos entre abril y junio, y la cría emergen entre julio y octubre.

PROTECCIÓN LEGAL. La culebra Índigo del Este es clasificada como especie amenazada por el USFWS, la Comisión de Conservación de Pesca y Vida Silvestre de Florida y el Departamento de Recursos Naturales de Georgia. Intento de matar, hostigar, herir, lastimar, perseguir, cazar, disparar, capturar, colectar o conducta parecida hacia las culebras Índigo del Este es prohibido por la Ley Federal de Especies en Peligro de Extinción. Penalidades incluyen un máximo de $25,000 por violaciones civiles y $50,000 y/o encarcelamiento por actos criminales. Solos individuales autorizados con un permiso o Determinación de toma incidental (Incidental Take Statement) asociado con una Opinión Biológico del USFWS pueden recoger una Índigo del Este.

Por favor de contactar tu Oficina de Campo de Servicios Ecológicos más cercana si encuentras una culebra Índigo del Este viva o muerta:

Oficina de Florida: (352) 448-9151

Oficina de Georgia: (706) 613-9493

Appendix C

THE CORPS OF ENGINEERS, JACKSONVILLE DISTRICT, U. S. FISH AND WILDLIFE SERVICE, JACKSONVILLE ECOLOGICAL SERVICES FIELD OFFICE AND STATE OF FLORIDA EFFECT DETERMINATION KEY FOR THE WOOD STORK IN CENTRAL AND NORTH PENINSULAR FLORIDA
September 2008

Purpose and Background

The purpose of this document is to provide a tool to improve the timing and consistency of review of Federal and State permit applications and Federal civil works projects, for potential effects of these projects on the endangered wood stork (*Mycteria americana*) within the Jacksonville Ecological Services Field Office (JAFL) geographic area of responsibility (GAR see below). The key is designed primarily for Corps Project Managers in the Regulatory and Planning Divisions and the Florida Department of Environmental Protection or its authorized designee, or Water Management Districts. The tool consists of the following dichotomous key and reference material. The key is intended to be used to evaluate permit applications and Corps' civil works projects for impacts potentially affecting wood storks or their wetland habitats. At certain steps in the key, the user is referred to graphics depicting known wood stork nesting colonies and their core foraging areas (CFA), footnotes, and other support documents. The graphics and supporting documents may be downloaded from the Corps' web page at http://www.saj.usace.army.mil/permit or at the JAFL web site at http://www.fws.gov/northflorida/WoodStorks. We intend to utilize the most recent information for both the graphics and supporting information; so should this information be updated, we will modify it accordingly. **Note: This information is provided as an aid to project review and analysis, and is not intended to substitute for a comprehensive biological assessment of potential project impacts. Such assessments are site-specific and usually generated by the project applicant or, in the case of civil works projects, by the Corps or project co-sponsor.**

Explanatory footnotes provided in the key must be closely followed whenever encountered.

Scope of the key

This key should only be used in the review of permit applications for effects determinations on wood storks within the JAFL GAR, and not for other listed species. Counties within the JAFL GAR include Alachua, Baker, Bradford, Brevard, Citrus, Clay, Columbia, Dixie, Duval, Flagler, Gilchrist, Hamilton, Hernando, Hillsborough, Lafayette, Lake, Levy, Madison, Manatee, Marion, Nassau, Orange, Pasco, Pinellas, Putnam, St. Johns, Seminole, Sumter, Suwannee, Taylor, Union, and Volusia.

The final effect determination will be based on project location and description, the potential effects to wood storks, and any measures (for example project components, special permit conditions) that avoid or minimize direct, indirect, and/or cumulative

impacts to wood storks and/or suitable wood stork foraging habitat. Projects that key to a "no effect" determination do not require additional consultation or coordination with the JAFL. Projects that key to "NLAA" also do not need further consultation; however, the JAFL staff will assist the Corps if requested, to answer questions regarding the appropriateness of mitigation options. 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 should request the JAFL to initiate formal consultation on the Wood stork.

Summary of General Wood Stork Nesting and Foraging Habitat Information

The wood stork is primarily associated with freshwater and estuarine habitats that are used for nesting, roosting, and foraging. Wood storks typically nest colonially 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; Rodgers et al. 1996). Successful breeding sites are those that have limited human disturbance and low exposure to land based predators. Nesting sites 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.

In addition to limited human disturbance and land-based predation, successful nesting depends on the availability of suitable foraging habitat. Such habitat generally results from a combination 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 that tends to 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 opportunities, a variety of wetland habitats exhibiting short and long hydroperiods should be present. In terms of wood stork foraging, the Service (1999) describes a short hydroperiod as one where a wetland fluctuates between wet and dry in 1 to 5-month cycles, and a long hydroperiod where the wet period is greater than five consecutive months. Wood storks during the wet season generally feed in the shallow water of 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).

Because of their specialized feeding behavior, wood storks forage most effectively in shallow-water areas with highly concentrated prey. Typical foraging sites for the wood stork include freshwater marshes, depressions in cypress heads, swamp sloughs, managed impoundments, stock ponds, shallow-seasonally flooded roadside or agricultural ditches, and narrow tidal creeks or shallow tidal pools. Good foraging conditions are characterized by water that is relatively calm, open, and having water depths between 5 and 15 inches (5 and 38 cm). Preferred foraging habitat includes wetlands exhibiting a mosaic of submerged and/or emergent aquatic vegetation, and shallow, open-water areas subject to hydrologic

regimes ranging from dry to wet. The vegetative 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 daily or seasonal low water periods.

WOOD STORK KEY

Although designed primarily for use by Corps Project Managers in the Regulatory and Planning Divisions, and State Regulatory agencies or their designees, project permit applicants and co-sponsors of civil works projects may find this key and its supporting documents useful in identifying potential project impacts to wood storks, and planning how best to avoid, minimize, or compensate for any identified adverse effects.

A. Project within 2,500 feet of an active colony site[1]……*May affect*

Project more than 2,500 feet from a colony site……go to B

B. Project does not affect suitable foraging habitat[2] (SFH)…….*no effect*

Project impacts SFH[2]……go to C

C. Project impacts to SFH are less than or equal to 0.5 acre[3]…….....*NLAA*[4]

Project impacts to SFH are greater than or equal to 0.5 acre..……..go to D

D. Project impacts to SFH not within a Core Foraging Area[5] (see attached map) of a colony site, and no wood storks have been documented foraging on site…….....NLAA[4]

Project impacts to SFH are within the CFA of a colony site, or wood storks have been documented foraging on a project site outside the CFA ……..….go to E

E. Project provides SFH compensation within the Service Area of a Service-approved wetland mitigation bank or wood stork conservation bank preferably within the CFA, or consists of SFH compensation within the CFA consisting of enhancement, restoration or creation in a project phased approach that provides an amount of habitat and foraging function equivalent to that of impacted SFH (see *Wood Stork Foraging Habitat Assessment Procedure*[6] for guidance), is not contrary to the Service's *Habitat Management Guidelines For The Wood Stork In The Southeast Region* and in accordance with the CWA section 404(b)(1) guidelines……*NLAA*[4]

Project does not satisfy these elements.…….....……...*May affect*

[1] An active nesting site is defined as a site currently supporting breeding pairs of wood storks, or has supported breeding wood storks at least once during the preceding 10-year period.

[2] Suitable foraging habitat (SFH) is described as any area containing patches of relatively open (< 25% aquatic vegetation), calm water, and having a permanent or seasonal water depth between 2 and 15 inches (5 to 38 cm). 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 and stock ponds, shallow, seasonally flooded roadside or agricultural ditches, narrow tidal creeks or shallow tidal pools, managed impoundments, and depressions in cypress heads and swamp sloughs. See above *Summary of General Wood Stork Nesting and Foraging Habitat Information*.

[3] On an individual basis, projects that impact less than 0.5 acre of SFH generally will not have a measurable effect on wood storks, although we request the Corps to require mitigation for these losses when appropriate. Wood Storks are a wide ranging species, and individually, habitat change from impacts to less than 0.5 acre of SFH is 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.

[4] Upon Corps receipt of a general concurrence issued by the JAFL through the Programmatic Concurrence on this key, "NLAA" determinations for projects made pursuant to this key require no further consultation with the JAFL.

[5] The U.S. Fish and Wildlife Service (Service) has identified core foraging area (CFA) around all known wood stork nesting colonies that is important for reproductive success. In Central Florida, CFAs include suitable foraging habitat (SFH) within a 15-mile radius of the nest colony; CFAs in North Florida include SFH within a 13-mile radius of a colony. The referenced map provides locations of known colonies and their CFAs throughout Florida documented as active within the last 10 years. The Service believes loss of suitable foraging wetlands within these CFAs may reduce foraging opportunities for the wood stork.

[6]This draft document, *Wood Stork Foraging Habitat Assessment Procedure*, by Passarella and Associates, Incorporated, may serve as further guidance in ascertaining wetland foraging value to wood storks and compensating for impacts to wood stork foraging habitat.

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 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, and latitude and longitude in decimal degrees be sent to the Service quarterly.

Literature Cited

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

Ogden, J.C. 1991. Nesting by wood storks in natural, altered, and artificial wetlands in central and northern Florida. Colonial Waterbirds 14:39-45.

Rodgers, J.A. Jr., A.S. Wenner, and S.T. Schwikert. 1987. Population dynamics of wood storks in northern and central Florida, USA. Colonial Waterbirds 10:151-156.

Rodgers, J.A., Jr., S.T. Schwikert, and A. Shapiro-Wenner. 1996. Nesting habitat of wood storks in north and central Florida, USA. Colonial Waterbirds 19:1-21.

U.S. Fish and Wildlife Service. 1999. South Florida multi-species recovery plan. Fish and Wildlife Service; Atlanta, Georgia. Available from: http://verobeach.fws.gov/Programs/Recovery/vbms5.html.

Appendix D

Florida Pine Snake

Pituophis melanoleucus mugitus

Photograph by Kevin Enge, FWC.

Species Overview

Status: Listed as state Threatened on Florida's Endangered and Threatened Species List.

Current Protections

- 68A-27.003(a), F.A.C. No person shall take, possess, or sell any of the endangered or threatened species included in this subsection, or parts thereof or their nests or eggs except as allowed by specific federal or state permit or authorization.
- 68A-25.002(10), F.A.C. No person shall buy, sell or possess for sale any Florida pine snake (Pituophis melanoleucus mugitus), nor shall any person possess more than one Florida pine snake, except that said restrictions shall not apply to amelanistic (albino) specimens.
- 68A-27.001(4), F.A.C. Take – to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in such conduct. The term "harm" in the definition of take means an act which actually kills or injures fish or wildlife. Such act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering. The term "harass" in the definition of take means an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding or sheltering.

Cryptic Species

Cryptic species are those that may be difficult to detect due to behavior, habitat, or physical features, even when using standardized survey techniques in occupied habitat. Interpretation of when harm or harassment may occur is difficult without a clear understanding of essential behavioral patterns of the species or habitat features that may support those behavioral patterns. The documented difficulties in detecting cryptic species and the lack of a reliable detection methodology leads to different considerations for take due to harm.

- The policy on permitting standards for incidental take of cryptic species in Florida's Imperiled Species Management Plan identifies the Florida pine snake as a cryptic species. Due to low detectability, little is known about the full range wide distribution or life history of Florida pine snakes.
- Permitting standards for the Florida pine snake focus on cooperation and acquiring information, with the understanding that as information is gained, permitting standards may change.
- For Florida pine snakes, information on distribution and habitat use may constitute a scientific benefit. Even if surveys are conducted, detection is difficult because of the fossorial (adapted to dig and spend time underground) nature of this animal, therefore, surveys for Florida pine snakes are not recommended. Thorough and intensive surveys would be needed to determine Florida pine snake presence, and should be performed in coordination with FWC.

Biological Background

This section describes the biological background for this species and provides context for the following sections. It focuses on the habitats that support essential behaviors for the Florida pine snake, threats faced by the species, and what constitutes significant disruption of essential behaviors.

Florida pine snakes are 1 of 3 subspecies of pine snake (*P. melanoleucus*) found in the United States and occur from southern South Carolina, through peninsular Florida, and westward through the Florida panhandle to the Escambia River (see map). West of the Escambia River, Florida pine snakes may intergrade with black pine snakes (Pituophis m. lodingi) and will appear darker overall (Franz 1992). Black pine snakes occur from the extreme western Florida panhandle, through southern Alabama and Mississippi, and into eastern Louisiana. Florida pine snakes are large, non-venomous, heavy bodied snakes that can attain lengths nearing 228 cm (7.5 feet), although most average 122- to 168 cm (4-5.5 feet). These snakes occupy a variety of upland habitats (see Habitat Features that Support Essential Behavioral Patterns below), but prefer dry habitats with moderate to open canopy cover and well-drained sandy soils. Florida pine snakes are most active from March through October (Franz 1992), although they are a highly cryptic and fossorial (adapted to dig and spend time underground) species (Enge 1997, Franz 1992, Franz 2005, Miller et al. 2012). Here, cryptic is defined as those species not easily observed, tracked or surveyed due to camouflage or behavior rather than rarity. These adaptions include a modified rostral (nose) scale and a cone shaped head, which facilitate digging and excavating loose soil. When encountered, Florida pine snakes may vigorously vibrate their tail, inflate the body, hiss loudly, and exhibit bluff striking (Tuberville and Mason 2008).

Preferred landscapes have a moderate to mostly open canopy cover of primarily pine trees (*Pinus* spp.) and scrubby oaks (*Quercus* spp.; Franz 1992, Hipes et al. 2000, Bartlett and Bartlett 2003). Florida pine snakes spend a majority of their time in underground refugia and when available use southeastern pocket gopher (*Geomys pinetis*) burrows (Franz 1992, Miller et al. 2012). Females are believed to lay eggs inside the burrows of pocket gophers and other animals (Lee 1967, Franz 2005) in May and June (Franz 1992). Hatching occurs in September and October (Franz 1992). Florida pine snake prey generally consists of pocket gophers, small mammals including mice and rats, and ground dwelling birds and their eggs. Their estimated home range size is 70.1 ha (173 ac) for males and 37.5 ha (93 ac) for females (Franz 2005, Miller 2012).

Further background information pertaining to the Florida pine snake may be found in the Biological Status Review Report for the Florida Pine Snake (FWC 2011) and a Species Action Plan for the Florida Pine Snake (FWC 2013).

Habitat Features that Support Essential Behavioral Patterns

Florida pine snakes are typically found on large tracts of land comprised of sandhill, scrub or xeric pine savanna habitat that contain high densities of pocket gophers and gopher tortoises (Allen and Neill 1952, Franz 1992, Franz 2005, Miller et al. 2012). Uncompact xeric sandy soils are important landscape features for Florida pine snakes, although pine snakes will use wetlands during times of drought (Franz 1992). Florida pine snakes are sometimes also encountered in xeric hammock, scrubby flatwoods, mesic pine flatwoods, dry prairie with dry soils, and old fields and pastures (Allen and Neill 1952, Enge 1997, Ernst and Ernst 2003, Franz 1992, Hipes et al. 2000, Franz 2005).

Southeastern pocket gopher colonies are important to sustaining populations of Florida pine snakes. Florida pine snakes often prey on pocket gophers (Franz 1992, FWC 2011), primarily use pocket gopher burrows as refugia (Miller et al. 2012) and, where available, may use pocket gopher burrows as egg deposition sites (Franz 2005). Areas without pocket gophers also support pine snakes. In these areas, pine snakes may use gopher tortoise burrows, nine-banded armadillo (*Dasypus novemcinctus*) burrows, and stump holes as refugia (Means 2005, Smith 2011, Miller et al. 2012).

Figure 1. Pine upland habitat used by pine snakes. Photograph by FWC.

Florida pine snakes may spend over 75% of their time in underground refugia (Franz 1992, Miller et al. 2012).

Figure 2: Pocket gopher mounds in pine snake habitat. Photograph by Bradley O'Hanlon.

Threats

Population declines of Florida pine snakes have been suspected since the 1970s (Franz 1992). As habitat specialists, Florida pine snakes are dependent on habitat structure associated with the longleaf pine forest, such as an open forest canopy, a reduced midstory and understory, and robust groundcover. However, the current distribution of longleaf pine forest has been reduced to about 3% of its historic range (Ware et al. 1993), including significant losses of sandhill and scrub habitat within Florida (Kautz et al. 1993, Enge et al 2003). Because the Florida pine snake has specific habitat requirements, continued habitat loss due to land development and conversion may further imperil this species.

Because large tracts of intact uplands are important for pine snake conservation, proper fire management is essential. Although pine snakes may be tolerant to varying degrees of habitat degradation (Franz 2005, Miller 2008), insufficient fire management may render areas unsuitable. In addition to fire suppression, stump removal and soil compaction may negatively affect populations of Florida pine snakes.

Habitat fragmentation may also have negative effects on pine snake behavior. Miller et al. (2012) found that Florida pine snakes were sensitive to improved roads (i.e., paved and graded dirt), and no Florida pine snakes were detected on improved roads during surveys in appropriate habitat in southern Georgia (Stevenson et al. 2016). Habitat fragmentation may lead to isolation of pine snake populations and in turn, reduce range wide gene flow.

Florida pine snakes are dependent on underground refugia, and therefore are vulnerable to the decline and loss of southeastern pocket gophers and gopher tortoises. In Florida, gopher tortoise populations have declined by over 50% from the 1920's to 2005 (Enge et al. 2006), and populations of pocket gophers are suspected to be in decline as well (Georgia Department of Natural Resources 2008). These declines could be problematic as pocket gopher burrows are preferred refugia to pine snakes (Franz 1992, Franz 2005, Miller et al. 2012).

Figure 3. Using heavy machinery to excavate gopher tortoise burrows is an example of an activity that will compact soils and may take pine snakes. Photograph by Bradley O'Hanlon.

Snake fungal disease is an emergent threat to wild snakes, and has been documented in at least 10 states, including Florida (Sleeman 2013, Glorioso 2016). In New Hampshire, snake fungal disease may have been a factor in the 50% decline of an imperiled population of timber rattlesnakes (*Crotalus horridus*; Clark et al. 2010, Sleeman 2013). Because little is known about snake fungal disease, and pine snakes are difficult to monitor, any effects of snake fungal disease may be difficult to quantify. Providing any dead specimens to FWC will help monitor for this disease.

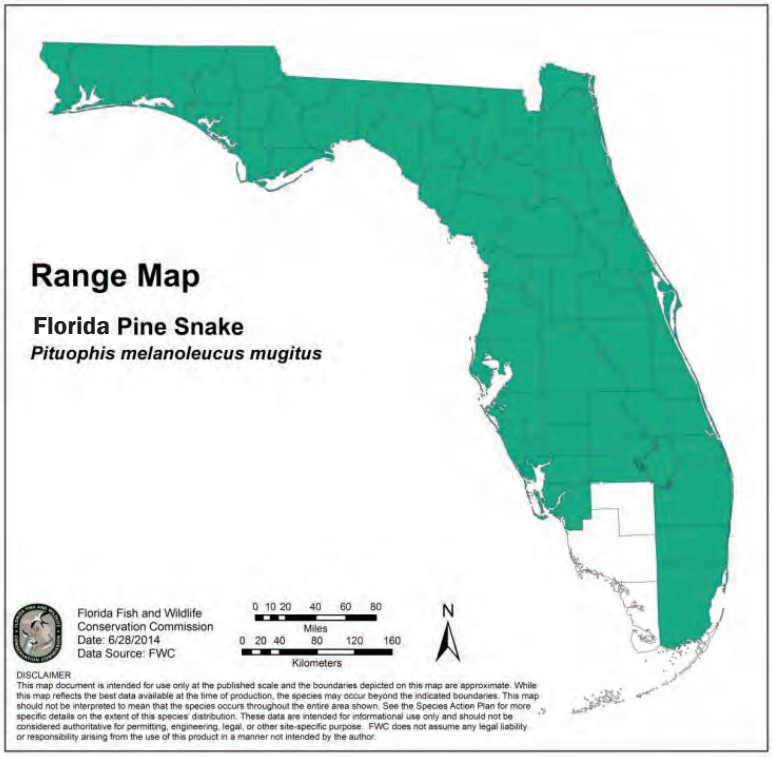
Potential to Significantly Impair Essential Behavioral Patterns

Florida pine snakes rely on intact tracts of properly managed uplands, thus actions that result in the loss,

degradation or fragmentation of those lands may impair or disrupt the essential behavioral patterns of Florida pine snakes (Hipes et al. 2000, FWC 2011). Activities that may degrade or fragment pine snake habitat include land clearing, development, and road widening or improvement. Additionally, because burrows and underground refugia are essential for Florida pine snake nesting and sheltering, activities that would eliminate or impact habitat features such as stump removal, tortoise burrow excavation, subsurface root raking and soil compaction from heavy equipment have the potential to cause incidental take of pine snakes (Diemer and Moler 1982, Means 2005, Smith et al. 2015, Andelt and Case 2016).

Distribution and Survey Methodology

The range map (right) represents the principle geographic range of the Florida pine snake, including intervening areas of unoccupied habitat. This map is for informational purposes only and not for regulatory use.



Counties: All counties except for Monroe, Collier, and Hendry.

Recommended Survey Methodology

FWC does not recommend Florida pine snake surveys for most activities unless as a component of scientific benefit (see Scientific Benefit). Any surveys performed during the project planning phase should be coordinated with FWC. Because this is a cryptic species, surveys conducted in accordance with the methodology described below may not detect this species. Surveys are not required. Any activity that requires handling a Florida pine snake in any capacity requires a permit. Opportunistic encounters that require identification of an animal without handling it may prove difficult as the Florida pine snake may be confused with other species (e.g., gray rat snake (*Pantherophis spiloides*; Figure 4 below). Surveys that may disturb any gopher tortoise burrow (active or inactive) will require a permit.

- Florida pine snakes are cryptic and fossorial, thus traditional methods such as road-cruising surveys and opportunistic visual encounter surveys are not effective for this animal (e.g., Stevenson et al. [2016] drove over 6,000 km (3,728 miles) in suitable Florida pine snake habitat and did not observe a single animal).
- The most effective survey methodology is long term site monitoring using appropriate drift fence arrays for large snakes. Brief surveys using temporary drift fence arrays may not be effective at documenting Florida pine snakes (Stevenson et al. 2016). All trapping operations will require a scientific collecting permit. Burgdorf et al. (2005) contains methodology for long term monitoring and appropriate trap design.
- Long term monitoring using Burgdorf-style traps is the recommended survey protocol for Florida pine snakes, however, this methodology is labor intensive. Because surveys may be suspended after

the first snake is observed, FWC does not recommend Florida pine snake surveys for most activities unless as a component of scientific benefit (see Scientific Benefit).

- If long term trapping is used, traps should be checked minimally every 2-3 days. Here, long term trapping is defined as a minimum commitment of 6 months. Trapping should encompass the main Florida pine snake active season (May–October). For best results, multiple traps should be deployed within a site.
- There will be considerable bi-catch when using drift fence traps that target large snakes. Other potential snake species that may be captured include federally-threatened eastern indigo snakes (*Drymarchon couperi*) and numerous species of venomous snakes, including eastern diamondback (*Crotalus adamanteus*) and timber rattlesnakes. Therefore, drift fence operators should be trained and permitted to handle these species.
- Surveys for pocket gopher mounds and gopher tortoise burrows will provide an indication of potential Florida pine snake habitat and essential breeding locations. These surveys will help meet the guidelines for minimization of impacts and can help to identify conservation or scientific benefit (see Information Options under Mitigation). Surveys that will impact gopher tortoise burrows will require a Scientific Collecting permit or certification as an Authorized Agent (see gopher tortoise permitting guidelines; FWC 2008).
- Florida pine snakes may be opportunistically detected within gopher tortoise burrows when using a burrow scoping system. If this methodology is used, the applicant must have either a Scientific Collecting permit or certification as an Authorized Agent to scope burrows.
- If Florida pine snakes are detected on site, the applicant should coordinate with FWC.

Figure 4: Gray rat snakes (top), typically found in the Florida panhandle, are similar in size and appearance to Florida pine snakes (bottom). Photographs by Michelina Dziadzio and Bradley O'Hanlon.

A geographic information system (GIS) review of recent (post-2000) Florida pine snake sightings may aid in determining the presence of Florida pine snakes. Because the Florida pine snake is a cryptic species, GIS and/or crowdsourced databases may not have complete occurrence data and should not be solely relied on if there are no documented occurrences near a project. As Florida pine snakes have large home ranges and may persist in degraded habitat, care should be taken to not misinterpret GIS data. This GIS data may be available upon request from the FWC.

Recommended Conservation Practices

Recommendations are general measures that could benefit the species but are not required. No FWC permit is required to conduct these activities.

- Refrain from fragmenting upland habitats, such as sandhills, scrub, xeric hammock, scrubby

flatwoods, mesic pine flatwoods, pinewoods, and dry prairie with dry soils.

- Design projects to minimize loss of upland habitats containing well drained soils by minimizing the size of the project footprint where possible.
- Establish conservation easements that maximize the conservation of upland habitat.
- If road construction is necessary, use unimproved dirt roads to the maximum extent possible. Guidelines for minimizing erosion and runoff from roadways can be found in the State of Florida Best Management Practices (BMP's) for stormwater runoff and within the Florida Department of Agriculture Consumer Services (FDACS) silviculture BMP's.
- Develop a prescribed fire regime that promotes forests with an open canopy layer and diverse ground cover. Encourage regimes that maintain ecologically natural fire frequency, intensity, and seasonality.
- Avoid habitat management procedures that will compact or disturb soil, such as using roller choppers or roller drums in suitable habitat, except as needed for habitat restoration.
- Avoid or minimize soil compaction, especially in areas where southeastern pocket gophers or gopher tortoises are present.
- Avoid disruptive activities such as road construction and lot clearing during peak movement times and the breeding season (May–October).
- The FDACS BMP's for state imperiled species as they relate to the gopher tortoise would benefit the Florida pine snake. When using herbicides to control herbaceous ground cover (herbaceous weed control) for newly established pines, a banded application is preferable over broadcast applications.

Measures to Avoid Take

Avoidance Measures that Eliminate the Need for FWC Take Permitting

This section describes all measures that would avoid the need for an applicant to apply for an FWC take permit.

- Avoid conversion of upland habitats used by Florida pine snakes. Specifically, avoid fragmenting large tracts of land.

Examples of Activities Not Expected to Cause Take

This list is not an exhaustive list of exempt actions. Please contact the FWC if you are concerned that you could potentially cause take.

- Activities that occur in areas not consistent with Florida pine snake habitat.
- Activities that avoid compacting soils, and that do not crush or harm pocket gopher mounds, gopher tortoise burrows, and that allow tree stumps to remain in the ground.
- Routine maintenance of vegetation in existing linear utility and highway right of ways.

Florida Forestry Wildlife BMP's and Florida Agricultural Wildlife BMP's

- The FDACS BMP's for State Imperiled Species does not include the Florida Pine Snake, however, the BMP's as they relate to the gopher tortoise would benefit the Florida pine snake.

Other authorizations for Take

- As described in Rule 68A-27.007(2)(c), F.A.C., land management activities (e.g., prescribed fire, mechanical removal of invasive species, and herbicide application) that benefit wildlife and are not inconsistent with FWC Management Plans are authorized and do not require a permit authorizing incidental take.
- When activities associated with normal and customary forestry and silvicultural practices are conducted in a manner where direct year-round contact with known and visibly apparent pocket

gopher villages are avoided and and tree stumps are left, take is avoided. Normal and customary practices are generally accepted agricultural (silvicultural) activities for the type of operation and the region, 5M-15.001 (2) F.A.C.

- In cases where there is an immediate danger to the public's health and/or safety, including imminent or existing power outages that threaten public safety, or in direct response to an official declaration of a state of emergency by the Governor of Florida or a local governmental entity, power restoration activities and non-routine removal or trimming of vegetation within linear right of way in accordance with a vegetation management plan that meets applicable federal and state standards does not require an incidental take permit from the state.

The Florida pine snake is listed as a priority commensal species of gopher tortoises within the Interim FWC Policy on the Relocation of Priority Commensals (FWC 2015). Take via harassment (i.e., non-lethal relocation) may occur when gopher tortoises are relocated and their burrows are collapsed. If applicants follow the guidance in Table 1, this take is authorized.

Table 1. Interim guidance for limited relocation of Florida pine snake based on post-development site characteristics.

Post Development Site Characteristics	If a gopher tortoise burrow will be impacted from development and some **habitat will remain on-site**	If a gopher tortoise burrow will be impacted from development activities and **adjacent habitat is available**	If a gopher tortoise burrow will be impacted/destroyed from development and **no habitat will remain**
Florida Pine Snake	Any incidentally captured pine snake should be released on-site or allowed to escape unharmed if some habitat will remain post-development activities.	Any incidentally captured pine snake should be released on-site or allowed to escape unharmed if some habitat will remain post-development activities.	Any incidentally captured pine snake should be allowed to escape unharmed or donated to a facility for educational or research purposes (permit required for receiving facility).

Coordination with Other State and Federal Agencies

The FWC participates in other state and federal regulatory programs as a review agency. During review, FWC identifies and recommends measures to address fish and wildlife resources to be incorporated into other agencies' regulatory processes. For example, the FWC commented on the Candidate Conservation Agreement with Assurances for Multiple At Risk Species in North Florida (CCAA) for the Camp Blanding Joint Training Center. This CCAA directly addresses the Florida pine snake and highlights the importance of conserving flatwoods, sandhill, and scrub habitat, as well as removing or reducing threats to other candidate and at-risk species.

FWC provides recommendations for addressing potential impacts to state listed species in permits issued by other agencies. If permits issued by other agencies adequately address all of the requirements for issuing a state-Threatened species take permit, FWC will consider those regulatory processes to fulfill the requirements of Chapter 68A-27, F.A.C., with no additional application process. This may be accomplished by issuing a concurrent take permit from FWC, by a memorandum of understanding with the cooperating agency, or by a programmatic permit issued by another agency. These permits would be issued based on the understanding that the implementation of project commitments will satisfy the requirements of 68A-27.003 and 68A-27.007, F.A.C.

Review of Land and Water Conversion projects with State-Listed Species Conditions for Avoidance, Minimization and Mitigation of Take

- FWC staff, in coordination with other state agencies, provides comments to federal agencies (e.g., the Army Corps of Engineers) on federal actions, such as projects initiated by a federal agency or permits being approved by a federal agency.
- FWC staff works with landowners, local jurisdictions, and state agencies such as the Department of Economic Opportunity on large-scale land use decisions, including long-term planning projects like sector plans, projects in Areas of Critical State Concern, and large-scale comprehensive plan amendments.
- FWC staff coordinates with state agencies such as the Department of Environmental Protection (DEP) and the five Water Management Districts on the Environmental Resource Permitting (ERP) program, which regulates activities such as dredging and filling in wetlands, flood protection, stormwater management, site grading, building dams and reservoirs, waste facilities, power plant development, power and natural gas transmission projects, mining, oil and natural gas drilling projects, port facility expansion projects, some navigational dredging projects, some docking facilities, and single-family developments such as for homes, boat ramps, and artificial reefs.
- FWC staff provides technical assistance for early review of proposed projects.

FWC Permitting: Incidental Take

As defined in Rule 68A-27.001, F.A.C., incidental take is take that is incidental to, and not the purpose of, carrying out an otherwise lawful activity. Activities that result in impacts to Florida pine snakes can require an Incidental Take Permit from the FWC (see above for actions that do not require a permit). Permits may be issued when there is a scientific or conservation benefit to the species and only upon showing by the applicant that that the permitted activity will not have a negative impact on the survival potential of the species. Scientific benefit, conservation benefit, and negative impacts are evaluated by considering the factors listed in Rule 68A-27.007(2)(b), F.A.C. These conditions are usually accomplished through a combination of avoiding take when practicable, minimizing take that will occur, and mitigating for the permitted take. This section describes the minimization measures and mitigation options available as part of the Incidental Take Permit process for take of this species. This list is not an exhaustive list of options.

Minimization Measure Options

The suite of options below can help to reduce or minimize take of the species, and lessen the mitigation necessary to counterbalance take. All of the options below assume that adhering to avoidance measures that eliminate the need for FWC permitting described above is not possible, and that some level of take may occur. These options can lessen the impact of activities, and ultimately may reduce what is needed to achieve a conservation or scientific benefit (see below). FWC does not recommend Florida pine snake surveys unless as a component of scientific benefit. Surveys for pocket gopher and gopher tortoise burrows will provide an indication of potential Florida pine snake habitat and essential breeding locations. These surveys will help identify actions to minimize impacts (see Scientific Benefit).

Seasonal, Temporal, and Buffer Measures

- Florida pine snakes nest and hatch from eggs from June-October. Destruction or disturbance of pocket gopher mounds or other underground refugia (such as gopher tortoise burrows) should be avoided during this period to prevent disturbance to potential nests and eggs. Activities such as land clearing and conversion during the peak movement season, May, June, July and October should be avoided.
- A 7.6 m (25-foot ft) buffer in all directions around the mouth of a gopher tortoise burrow (as described the Gopher Tortoise Permitting Guidelines; FWC 2008) can minimize impacts to

Florida pine snakes.

- There are no recommendations for buffer zones around other refugia, including clusters of pocket gopher mounds, although a similar buffer to gopher tortoise burrows would be beneficial.

Design Modification

- Minimize loss and disturbance of suitable large tracts of uplands, including sandhill, scrub, xeric hammock, scrubby flatwoods, mesic pine flatwoods and dry prairie with dry soils.
- Minimize fragmentation of habitat within suitable large tracts of land (i.e., maintain connectivity among upland habitats). Avoid sensitive areas with high densities of pocket gopher mounds and/or gopher tortoise burrows.
- Design projects that minimize soil compaction within pine snake habitat and for projects that occur near pocket gopher villages.
- Design projects that will not affect prescribed fire regimes, or the ability to use prescribed fire in adjacent habitat.
- Minimize the number of primary and upgraded roadways within suitable Florida pine snake habitat.

Method Modification

- When activities must occur within habitat occupied by the Florida pine snake, refer to the Seasonal and Temporal Restrictions above to minimize take.
- Allow animals observed during construction activities to move safely away from an area by ceasing activity until the animal has moved away. All sightings should be immediately reported to the FWC and accompanied by GPS coordinates and photographs for species verification.
- Provide identification information to project personnel and avoiding directly crushing the Florida Pine snake and other cryptic species found in similar habitats.
- Flagging of pocket gopher mounds and gopher tortoise burrows when feasible, and where possible avoid impacting those mounds and burrows to the maximum extent possible.

Mitigation Options

Mitigation is scalable depending on the impact, with mitigation options for significant impairment or disruption of essential behavioral patterns constituting take. The Florida pine snake is a cryptic species. Therefore, the permittee can satisfy mitigation requirements selecting options under scientific benefit. Potential options for mitigation are described below. References to specific actions within the Species Action Plan (Actions) are provided.

Scientific Benefit

This section describes research and monitoring activities that provide scientific benefit, per Rule 68A-27.007, F.A.C. Conducting or funding these activities can be the sole form of mitigation for a project. Since this species is cryptic and there is limited information available, the options provided below are subject to change as new information becomes available. Projects that help to improve existing survey methodology for the Florida pine snake would need to be conducted with FWC cooperation (Action 3).

- Sharing sightings data (live and dead observations) with FWC, including latitude and longitude and photographs (Action 5) by email to Imperiled@MyFWC.com.
- Scientific studies following established survey methods, projects to fill data gaps related to information on species reproduction including nest behavior and location, habitat requirements in different natural communities, diet and refuge use in areas without pocket gophers, relationships between Florida pine snake densities and gopher tortoise and pocket gopher

abundance, impact of habitat fragmentation and patch size on population, and population demographic parameters (i.e., productivity, survivorship, and mortality rates; Actions 4, 5, 6). All scientific studies should be coordinated with input from FWC. It is possible that, through funding options, the FWC may provide support to scientific studies.

- Scientific studies (e.g., radio-telemetry studies) can help address life history questions. Collecting movement data and habitat use will help re-evaluate the Florida pine snake habitat suitability model (Action 7), or evaluate the effects of translocation on Florida pine snakes (Action 9). These projects should be designed and conducted with input from FWC to ensure that they provide scientific benefit.
- Identifying causes and underlying issues of southeastern pocket gopher declines (Action 8).

Habitat

Habitat acquisition or management may be a mitigation option.

- Maintaining connectivity of contiguous upland habitats is preferred. Easements and/or land use agreements that would help to establish connectivity for upland habitats is a desired outcome (Action 1).
- Upland habitat restoration options could include application of prescribed fire, hardwood reduction in overgrown habitats, pine thinning and decreasing habitat fragmentation by eliminating or decreasing roads within Florida pine snake habitat (Action 2).
- Removal and treatment of non-native invasive plant species and replacement with native plant species may be a mitigation option (Action 3).

Funding

- No funding option has been identified at this time. However, funding options as part of mitigation will be considered on a case by case basis.

Information

- Sharing sightings data (live and dead observations) with FWC, including latitude and longitude and photographs (required for verification purposes; Action 5) by email to Imperiled@MyFWC.com.
- Providing dead specimens to FWC for location vouchers, snake fungal disease screening, and future genetics work (Action 6). Arrangements for the transport or shipping of vouchers may be arranged by contacting Imperiled@MyFWC.com.
- The information option for this cryptic species may rise to the level of scientific benefit for the Florida pine snake, and is based on the most current knowledge of the species distribution.

Programmatic Options

- FWC's landowner Assistance Program is a voluntary program that can offer financial assistance to landowners who implement conservation plans. This program would allow the FWC opportunities to gather information on private lands slated for development, and the FWC would provide assistance in evaluating development practices and create suitable avoidance, minimization and mitigation options for specific properties.

Multispecies Options

- Florida pine snake range overlaps that of several other sandhill and upland habitats. Measures that will benefit the Florida pine snake, particularly those focused on maintaining connectivity across the landscape, will also benefit other species. Multi-species sandhill habitat measures are being drafted (Actions 2 and 3).
- State and federally listed species, as well as species included in Florida's ISMP, that have overlapping ranges and habitat preferences with the Florida pine snake include but are not

limited to: red-cockaded woodpecker (*Picoides borealis*), eastern indigo, Florida scrub jay, Southeastern American kestrel (*Falco sparverius paulus*), gopher tortoise, Florida mouse (*Podomys floridanus*), and gopher frog (*Lithobates capito*). Actions that benefit these species may have direct benefit to pine snakes.

- Other land management activities, for example safe harbor agreements for the red-cockaded woodpecker may benefit the Florida pine snake (Actions 2 and 3).

FWC Permitting: Intentional Take

Intentional take is not incidental to otherwise lawful activities. Per Rule 68A-27, F.A.C., intentional take is prohibited and requires a permit. For state-Threatened species, intentional take permits may only be considered for scientific or conservation purposes (defined as activities that further the conservation or survival of the species taken). Permits are issued for state-Threatened species following guidance in Rule 68A-27.007(2)(a), F.A.C.

Intentional take for human safety

- Permits will be issued only under limited and specific circumstances, in cases where there is an immediate danger to the public's health and/or safety, including imminent or existing power outages that threaten public safety, or in direct response to an official declaration of a state of emergency by the Governor of Florida or a local governmental entity. Applications submitted for this permit must include all information that is required from any other applicant seeking a permit, along with a copy of the official declaration of a state of emergency, if any. This permit process may be handled after the fact or at least after construction activities have already started. An intentional take permit may be issued for such purposes.

Aversive Conditioning

- Not applicable for the Florida pine snake.

Permits Issued for Harassment

- Not applicable for the Florida pine snake.

Scientific Collecting and Conservation Permits

- Scientific Collecting permits may be issued for the Florida pine snake using guidance found in Rule 68A-27.007(2)(a), F.A.C. Activities requiring a permit include any research that involves capturing, handling, or marking wildlife; conducting biological sampling; or other research that may cause take.
- A Scientific Collecting permit will not be issued for the sole purpose of removing a snake from the wild to use for education or outreach. Animals used for outreach may occasionally be available from wildlife rehabilitation facilities, or in scenarios where relocation is not an option. Florida pine snakes originating from the wild with a Scientific Collecting Permit used for educational and outreach purposes should be used for a minimum of 12 educational engagements equating to a minimum of 48 hours of contact time per year. Owners of pine snakes used for education and outreach must have a Class III Exhibition License and follow all caging requirements (68A-6.004, F.A.C.).

Considerations for Issuing a Scientific Collecting Permit

1) Is the purpose adequate to justify removing the species (if the project requires this)?
    - Permits will be issued if the identified project is consistent with the goal of the Species Action Plan for the Florida Pine Snake (i.e., improvement in status that leads to removal

from Florida's Endangered and Threatened Species List), or addresses an identified data gap important for the conservation of the species.

2) Is there be a direct or indirect effect of issuing the permit on the wild population?
3) Will the permit conflict with program intended to enhance survival of species?
4) Will purpose of permit reduce likelihood of extinction?
    - Projects consistent with the goal of the Species Action Plan for the Florida Pine Snake or that fill identified data gaps in species life history or management may reduce the likelihood of extinction. Applications should clearly explain how the proposed research will provide a scientific or conservation purpose for the species.
5) Have the opinions or views of other scientists or other persons or organizations having expertise concerning the species been sought?
6) Is applicant expertise sufficient?
    - Applicants must have prior documented experience with this or similar species; applicants should have met all conditions of previously issued permits; and applicants should have a letter of reference that supports their ability to handle the species.

Relevant to all Scientific Collecting Permits for Florida pine snakes

- Walking, visual encounter surveys, and opportunistic encounters that do not involve touching the animals, altering the microhabitat, or disturbing gopher tortoise burrows do not require a permit.
- Any activity that requires trapping or handling a Florida pine snake requires a permit. For example, these activities include taking a scale or tail clip for taxonomic analyses.
- Applications must include a proposal that clearly states the objectives and scope of work of the project, including a justification of how the project will result in a conservation benefit to the species. The proposal also must include a thorough description of the project's methods, time frame and final disposition of all individuals. Permit amendment and renewal applications must be "stand alone" (i.e., include all relevant information on objectives and methods).
- Permits may be issued to display a specimen if the specimen was obtained via rehabilitation facility or was encountered dead.
- Permits may be issued for captive possession (removal from the wild) if the individual is deemed non-releasable.
- Capturing and handling protocols, and a justification of methods, must be included in the permit application and should identify measures to lessen stress for captured snakes.
- Methodologies for any surgical procedures, including radio transmitter implantation, should be clearly spelled out, including measures taken to reduce stress and injury to the snakes. Surgical procedures should be performed by a qualified veterinarian.
- Methodologies for any collection of tissues such as blood and scale clips should be clearly spelled out, including measures taken to reduce stress and injury to the snakes.
- Disposition involving captive possession for any period of time must include a full explanation of whether the facility has appropriate resources for accomplishing the project objectives and for maintaining the animals in a safe and humane manner.
- Any mortality should be reported immediately to the FWC at the contact information below. The FWC will provide guidance on proper disposition of specimens.
- Geographical or visual data gathered must be provided to FWC in the specified format.
- A final report should be provided to the FWC in the format specified in the permit conditions.

Additional information

Information on Economic Assessment of this guideline can be found at http://myfwc.com/wildlifehabitats/imperiled/management-plans/

Contact

For more species-specific information or related permitting questions, contact the FWC at (850) 921-5990 or WildlifePermits@myfwc.com. For regional information, visit http://myfwc.com/contact/fwc-staff/regional-offices.

Literature Cited

Allen, E. R., and W. T. Neill. 1952. The southern pine snake. Florida Wildlife 5:18-19.

Andelt, W. F. and R. M. Case. 2016. Managing pocket gophers. Colorado State University Fact Sheet no. 6.515.

Bartlett, R. D., and P. Bartlett. 2003. Florida's snakes a guide to their identification and habits. University Press of Florida, Gainesville, Florida.

Clark, R. W., M. N. Marchand, B. J. Clifford, R. Stechert. S. Stephens. Decline of an isolated timber rattlesnake (*Crotalus horridus*) population: interactions between climate change, disease, and loss of genetic diversity. Biological Conservation 144:886-891.

Diemer, J. E. and P. E. Moler. 1982. Gopher tortoise response to site preparation in Northern Florida. Proceedings from the Annual Conference of the Southeast Association of Fish and Wildlife Agencies 36:634-637.

Enge, K. M. 1997. A standardized protocol for drift-fence surveys, Florida Game and Fresh Water Fish Commission Technical Report No. 14, Tallahassee.

Enge K. M., B. A. Millsap, T. J. Doonan, J. A. Gore, N. J. Douglass, and G. L. Sprandel. 2003. Conservation plans for biotic regions in Florida containing multiple rare or declining wildlife taxa. Florida Fish and Wildlife Conservation Commission, Bureau of Wildlife Diversity Conservation Final Report, Tallahassee.

Enge, K. M., J. E. Berish. R. Bolt. A Dziergowski, and H. R. Mushinsky. 2006. Biological status report: gopher tortoise. Florida Fish and Wildlife Conservation Commission, Tallahassee.

Ernst, C. H., and E. M. Ernst. 2003. Snakes of the United States and Canada. The Smithsonian Institution. Washington, D.C.

Florida Fish and Wildlife Conservation Commission. 2008. Gopher tortoise permitting guidelines (revised January 2017). Florida Fish and Wildlife Conservation Commission, Tallahassee, Florida.

Florida Fish and Wildlife Conservation Commission. 2011. Biological status review for the Florida pine snake (*Pituophis melanoleucus mugitus*). Florida Fish and Wildlife Conservation Commission, Tallahassee, Florida.

Florida Fish and Wildlife Conservation Commission. 2013. A species action plan for the Florida pine snake. Florida Fish and Wildlife Conservation Commission, Tallahassee, Florida.

Franz, R. 1986. The Florida gopher frog and the Florida pine snake as burrow associates of the gopher tortoise in Northern Florida. Pages 16-20 *in* D. R. Jackson and R. J. Bryant, editors. The gopher tortoise and its

community. Proceedings of the 5th Annual Meeting of the Gopher Tortoise Council, Florida State Museum, Gainesville.

Franz, R. 1992. Florida pine snake. Pages 255-258 *in* P. E. Moler, editor. Rare and endangered biota of Florida. Volume III. Amphibians and reptiles. University Press of Florida, Gainesville.

Franz, R. 2005.Up close and personal: a glimpse into the life of the Florida pine snake in a North Florida sand hill. Pages 120-131 *in* W. E. Meshaka, Jr. and K. J. Babbitt, editors. Amphibians and reptiles: status and conservation in Florida. Krieger, Malabar, Florida.

Glorioso, B. M., J. H. Waddle, D. E. Green, and J. M. Lorch. 2016. First documented case of snake fungal disease in a free-ranging wild snake in Louisiana. Copeia 15:N4-N6.

Hipes, D., D. R., Jackson, K. NeSmith, D. Printess, and K. Brandt. 2000. Florida pine snake *Pituophis melanoleucus mugitus*. Florida Natural Areas Inventory: Field guide to the rare animals of Florida. Walsworth Publishing Company, Brooksfield, Missouri.

Kautz, R. S., D. T. Gilbert, and G. M. Mauldin. 1993. Vegetative cover in Florida based on 1985-1989 Landsat Thematic Mapper Imagery. Florida Scientist 56:135-154.

Lee, D. S. 1967. Eggs and hatchlings of the Florida pine snake, *Pituophis melanoleucus mugitus*. Herpetologica 23:241-242.

Means, D. B. 2005. The value of dead tree bases and stumpholes as habitat for wildlife. Pages 74-78 *in* Meshaka W. E. Jr. and K. J. Babbitt, editors. Amphibians and reptiles: status and conservation in Florida. Krieger, Malabar, Florida.

Miller, G. J. 2008. Home range size, habitat associations and refuge use of the Florida pine snake, *Pituophis melanoleucus mugitus*, in Southwest Georgia, U.S.A. Thesis, University of Florida, Gainesville.

Miller, G. J., L. L. Smith, S. A. Johnson, and R. Franz. 2012. Home range size and habitat selection in the Florida pine snake (*Pituophis melanoleucus mugitus*). Copeia 4:706-713.

Sleeman, J. 2013. Snake fungal disease in the United States. National Wildlife Health Center Wildlife Health Bulletin 2013-02.

Smith, C. 2011. Biological community evaluations of potential black pine snake (*Pituophis melanoleucus lodingi*) habitat in Mississippi. Thesis. Mississippi State University. etd-10302011194853.

Smith, L. L., M. Hinderliter, R. S. Taylor, and J. M. Howze. 2015. Recommendation for gopher tortoise burrow buffer to avoid collapse from heavy equipment. Journal of Fish and Wildlife Management 6:456-436.

Stevenson, D. J., E. M. Schlimm, K. E. Stohlgren, and J. Heppinstall-Cymerman. 2016. 2013-2014 Georgia status surveys for the Florida pine snake (*Pituophis melanoleucus mugitus*) and the southern hognose snake (*Heterodon simus*).

Tuberville, T. D. and P. A. Mason. 2008. Pine snake *Pituophis melanoleucus*. Pages 388-390 *in* Jensen, J. B., C. D. Camp, W. Gibbons, and M. J. Elliott, editors. Amphibians and Reptiles of Georgia. The University of Georgia Press, Athens, Georgia.

Ware, S., C. Frost, P. D. Doerr. 1993. Southern mixed hardwood forest: the former longleaf pine forest. Pages 447-493 *in* W. H. Martin, S. G. Boyce, A. C. Echternacht, editors. Biodiversity of the Southeastern United States: lowland terrestrial communities. John Wiley and Sons, New York.