FLORIDA SOUTHEAST CONNECTION PROJECT

RESOURCE REPORT 3

Fish, Wildlife, and Vegetation

FERC Docket No. PF14-2-000

Pre-Filing Draft

June 2014

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Filing Requirement	**Location in Environmental Report**
☒ Describe commercial and recreational warmwater, coldwater, and saltwater fisheries in the affected area and associated significant habitats (§380.12 (e) (1)).	Section 3.2 and Table 2.3-1 in Resource Report 2
☒ Describe terrestrial and wetland wildlife and habitats that might be affected by the Project; describe typical species that have commercial, recreational, or aesthetic value. (§ 380.12 (e) (2)).	Section 3.4 and Table 3.4-1
☒ Describe the major vegetative cover types that would be crossed and provide the acreage of each vegetative cover type that would be affected by construction. (§ 380.12 (e) (3)).	Section 3.3 and Table 3.3-1
☒ Describe the effects of construction, operation, maintenance, clearing, and treatment of the project area on aquatic and terrestrial species and their habitats. (§ 380.12 (e) (4)).	Section 3.4.2
☒ Evaluate the potential for short-term, long-term, and permanent impact on the wildlife resources and state-listed endangered or threatened species caused by construction and operation of the Project and proposed mitigation measures. (§ 380.12(e) (4)).	Sections 3.4.2, 3.4.4, and 3.5.4
☒ Identify all federally listed or proposed endangered or threatened species that potentially occur in the vicinity of the Project and discussion results of consultations with other agencies regarding those potential species. (§ 380.12 (e) (5)).	Section 3.5
☒ Identify all federally listed essential fish habitat (“EFH”) that potentially occur in the vicinity of the Project; identify the result of abbreviated consultations with the National Maritimes and Fisheries Service (“NMFS”); and identify any resulting EFH assessments (§§ 380.12(e)(4) & (7)).	N/A
☒ Describe any significant biological resources that would be affected. Describe any impacts and any associated mitigation proposed to avoid or minimize that impact (§§ 380.12(e)(4) & (7)).	Sections 3.2.3, 3.3.2, 3.4.3 and 3.5

ACRONYMS AND ABBREVIATIONS

°F	degrees Fahrenheit
BOs	Biological Opinions
Certificate	Certificates of Public Convenience and Necessity
CFR	Code of Federal Regulations
EFH	essential fish habitat
ESA	Endangered Species Act
FDACS	Florida Department of Agriculture and Consumer Services
FDEP	Florida Department of Environmental Protection
FERC	Federal Energy Regulatory Commission
FPL	Florida Power & Light Company
FLUCFCS	Florida Land Use, Cover and Forms Classification System
FNAI	Florida Natural Areas Inventory
FSC	Florida Southeast Connection, LLC
FWC	Florida Fish and Wildlife Conservation Commission
GPS	global positioning system
HDD	horizontal directional drill
MBTA	Migratory Bird Treaty Act
MMcf/d	million cubic feet per day
NMFS	National Marine Fisheries Service
Sabal Trail	Sabal Trail Transmission Pipeline Project
SFWMD	South Florida Water Management District
SPC Plan	Spill Prevention Control Plan
T&E	threatened or endangered
USACE	U.S Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

3.0 RESOURCE REPORT 3 – FISH, WILDLIFE, AND VEGETATION

3.1 INTRODUCTION

Florida Southeast Connection, LLC ("FSC"), a subsidiary of NextEra Energy, Inc., is seeking a certificate of public convenience and necessity ("Certificate") from the Federal Energy Regulatory Commission ("FERC") pursuant to Section 7(c) of the Natural Gas Act authorizing the construction and operation of an approximately 127 mile natural gas pipeline known as the Florida Southeast Connection Project ("FSC Project"). The FSC Project is designed to meet the growing demand for natural gas by the electric generation, distribution and end use markets in Florida. It will also provide additional source diversity through a connection to a new interconnection hub in central Florida ("Central Florida Hub") to be constructed as part of the Sabal Trail Transmission Pipeline Project ("Sabal Trail"). The Sabal Trail Project is the subject of a separate, but related, certificate filing to the FERC.

The FSC Project will increase natural gas transportation capacity and availability to southern Florida by adding a new, third pipeline in central and southern Florida. Upon the anticipated in-service date of May 2017, the FSC Project will be capable of providing up to 640 million cubic feet per day ("MMcf/d") of natural gas to an existing gas yard at Florida Power & Light Company's ("FPL") Martin Clean Energy Center.

The FSC Project involves the construction and operation of approximately 127 miles of up to 36-inch-diameter pipeline and the construction and operation of one meter station (known as the Martin Meter Station). The FSC Project pipeline will start in Osceola County, Florida at the interconnection with Sabal Trail within the Central Florida Hub and will traverse Polk, Osceola, Okeechobee, St. Lucie, and Martin Counties, terminating at the FPL Martin Clean Energy Center in Martin County, Florida. The Martin Meter Station will be located at the terminus of the FSC Project at the FPL Martin Clean Energy Center. In addition, FSC will install a pig launcher at the start of the FSC Project and a pig receiver at the end of the FSC Project. A complete summary of the FSC Project facilities is provided in Tables 1.2-1 and Table 1.2-2 and a location map of the FSC Project facilities is provided as Figure 1.2-1.

This Resource Report 3 describes the fishery resources associated with the waterbodies crossed by the FSC Project (Section 3.2), the existing vegetation resources along the FSC Project route (Section 3.3), the wildlife habitat along the FSC Project route (Section 3.4), and the federally and state-protected wildlife species that are known to occur or may potentially occur along the FSC Project route (Section 3.5). The following sections identify existing resources, FSC Project impacts on those resources, and measures to avoid, minimize or mitigate impacts. A checklist showing the status of the FERC filing requirements for this Resource Report is included in the table of contents.

3.2 FISHERY RESOURCES

Fishery resources are surface water areas that provide habitat for fish and are typically characterized according to water temperature (warmwater or coldwater), salinity (freshwater, marine, or estuarine), types of fishing uses (commercial or recreational), and utilization by open water marine fishes that require freshwater upstream areas to spawn (anadromous species) or freshwater species that migrate to marine waters for reproduction (catadromous species). Significant fisheries resources are defined by the FERC as waterbodies that either (1) provide important habitat for foraging, rearing, or spawning of fish species; (2) represent important commercial or recreational fishing areas; or (3) support large populations of commercially or recreationally valuable fish species or species listed for protection at the federal, state, or local level.

3.2.1 Fisheries Habitat Classification

All fisheries within the FSC Project study region are classified as warmwater fisheries, which are defined as capable of supporting fish able to tolerate water temperatures above 80 degrees Fahrenheit (°F). Warmwater fish include such species as crappies, largemouth bass, sunfish, and catfish. Table 2.3-1 in Resource Report 2 lists the waterbodies crossed by the FSC Project along with their fisheries habitat classifications.

3.2.2 Existing Fishery Resources

None of the waterbodies affected by the FSC Project contain or have the potential to contain species managed by the National Marine Fisheries Service ("NMFS"), nor do they support essential fish habitat ("EFH") as defined under the Magnuson-Stevens Fishery Conservation and Management Act (Public Law 94-265 as amended through January 12, 2007). As the FSC Project occurs well inland of saltwater or tidal waters, there are no saltwater marine or estuarine fisheries habitats, and no anadromous or diadromous fish runs that occur within waterbodies along the FSC Project route. Also there are no state or federally-listed threatened or endangered ("T&E"), or candidate species fish that occur within waterbodies along the FSC Project route. Fish known to occur within waterbodies along the FSC Project route are summarized in Table 3.2-1. Table 2.3-1 in Resource Report 2 lists the waterbodies crossed by the FSC Project and fishery type.

3.2.3 Fisheries of Special Concern

Waterbodies with fisheries of special concern include those that have fisheries with important recreational value, support coldwater fisheries, are included in special state fishery management regulations, or provide habitat for federally or state-listed T&E, or candidate species. Waterbodies that have significant economic value because of fish stocking programs, commercial fisheries, EFH, or tribal harvest, are also considered fisheries of special concern.

As previously discussed, no listed T&E fish species (federal or state), EFH, or coldwater fisheries are known to occur within any of the waters crossed by the FSC Project. No waters identified as significant fisheries habitat, included in special state fishery management regulations, having fish stocking programs, commercial fisheries, tribal harvest, or having important recreational value are present along the FSC Project route with the exception of the Kissimmee River. The Project will not impact the Kissimmee River as the crossing of this river will be accomplished with the use of horizontal direction drilling ("HDD").

3.2.4 Fisheries Impacts and Mitigation

This section describes potential impacts and measures that will be implemented to minimize impacts on fisheries resources along the FSC Project route. The FSC Project crosses no marine or estuarine environments, so fisheries and recreation associated with those habitats will not be affected. The FSC Project will be constructed across some freshwater habitats or near lakes (e.g., areas not designated as fisheries of special concern), but fishing or recreational activities near these resources will experience only minor and temporary nuisances due to the presence of construction equipment and workers.

Short-term impacts on fisheries associated with pipeline construction activities may be caused by temporary increases in sedimentation and turbidity, temperature changes due to removal of vegetation cover over streams, introduction of water pollutants, or entrainment of fish. However, no long-term effects on water temperature, dissolved oxygen, pH, benthic invertebrates, or fish communities are expected to occur due to the construction or operation of the FSC Project facilities. FSC will use both its Plan and Procedures to avoid increasing sedimentation of downstream habitats and to minimize impacts on fishery resources.

Construction impacts on fishery resources may include direct contact by construction equipment with food resources in the form of relatively immobile prey, increased sedimentation and water turbidity immediately downstream of the construction work area, alteration or removal of aquatic habitat cover and vegetation on adjacent banks, and introduction of contaminants. FSC will implement its Plan and Procedures to minimize potential impacts associated with loss of riparian shade and vegetation cover. Clearing of trees and other vegetation will be restricted to only what is necessary to safely construct and operate the FSC Project. Once construction is complete, streambeds and banks will be restored to preconstruction conditions to the fullest extent practicable. Restoration, bank stabilization, and revegetation efforts, which are defined in the FSC Plan and Procedures, will minimize the potential for erosion from the surrounding landscape. Adherence to the FSC Plan and Procedures will also maximize the potential for re-growth of riparian vegetation, thereby minimizing the potential for any long-term impacts associated with lack of shade and cover.

3.2.4.1 Waterbody Construction Methods

Construction across waterbodies will be conducted in accordance with all of the measures set forth in the FSC Procedures. Smaller water bodies will be crossed by dry crossing, fluming, or dam-and-pump, with the final determination made at the time of the crossing depending on the existing flow in the water body. Agricultural ditches will be crossed by dry-crossing methods. The Kissimmee River will be crossed by HDD to avoid fisheries impacts and navigational issues.

To minimize potential impacts, waterbodies, streams, and rivers will be crossed as quickly and as safely as possible. Adherence to FSC's Procedures will ensure stream flow will be maintained throughout construction. Most stream crossings will be completed using conventional trackhoe-type equipment and dry-crossing techniques.

3.2.4.2 Vegetation Clearing

Removal of trees and other streamside vegetation from the edges of waterbodies at the crossing may reduce shading of the waterbody, diminish escape cover, and can result in locally elevated water temperatures. Elevated water temperatures can, in turn, lead to reductions in levels of dissolved oxygen. This can negatively influence habitat quality and reduce availability of habitat for certain fish species. Impacts resulting from tree clearing will be minimized due to the use of existing cleared rights-of-way and previously developed corridors for the majority of the FSC Project route. In general, impacts to forested vegetation have been minimized to the extent practicable.

To further minimize potential impacts associated with loss of riparian shade and vegetation cover, clearing of trees and other vegetation will be restricted to only what is necessary to safely construct and operate the pipeline. Once construction is complete, streambeds and banks will be restored to preconstruction conditions to the fullest extent practicable. Restoration, bank stabilization, and revegetation efforts, which are defined in the FSC Plan and Procedures, will minimize the potential for erosion from the surrounding landscape. Adherence to the FSC Plan and Procedures will also maximize the potential for re-growth of riparian vegetation, thereby minimizing the potential for long-term impacts associated with lack of shade and cover.

Implementation of the FSC Plan and Procedures during construction will minimize the short-term impacts on fishery resources, and the aquatic habitats upon which these fishery resources depend. After construction, invertebrate populations will recolonize the crossing area and all temporary workspaces will revert to their original condition, including re-establishment of any riparian cover. Furthermore, operation and routine maintenance of the pipeline rights-of-way and aboveground facilities, which will be restricted to clearing and mowing vegetation on the

permanent rights-of-way, are not expected to have any noticeable impact on fishery resources along the FSC Project route.

3.2.4.3 Hydrostatic Test Water

Once installation and backfilling are completed, and before the proposed FSC Project begins operation, the pipeline will be hydrostatically pressure-tested in accordance with U.S. Department of Transportation minimum federal safety standards (49 Part 192 Transportation of Natural and other Gas by Pipeline) to verify its integrity and ensure its ability to withstand the maximum allowable operating pressure.

As allowed, hydrostatic test water typically will be discharged. The test water will be released adjacent to the construction right-of-way through an energy-dissipating device such as a splash plate and a straw bale structure and in accordance with any other requirements specified by the applicable agencies in the permit conditions. At the request of the applicable Water Management Districts, the hydrostatic test water may be returned to the source. If local sources of water are used, withdrawal intake hoses will be fitted with intake screen devices to prevent the entrainment of fingerlings and small fish during water withdrawal. Discharges will comply with regulatory permit conditions and will be controlled to prevent scour and sedimentation, flooding, or the introduction of foreign or toxic substances into the aquatic system. Sampling of discharge water will be conducted in accordance with the FSC Procedures to document water quality at the time of discharge.

Due to mitigation and regulatory requirements, hydrostatic test water withdrawals and discharges will not result in a significant entrainment of fish, loss of habitat, or an adverse effect to water quality. Hydrostatic test water will be obtained and discharged in accordance with applicable permit conditions.

3.2.4.4 Spill Prevention Control

Accidental spills of construction-related fluids (*e.g.,* oil, gasoline, or hydraulic fluids) on the landscape or directly into waterbodies could result in water quality impacts affecting fish and other organisms. Impacts to fisheries would depend on the type and quantity of the spill, and the dispersal and attenuation characteristics of the waterbody. Minimization and mitigation procedures related to water quality are discussed in detail in FSC's Spill Prevention Control Plan ("SPC Plan"). The implementation of the SPC Plan will minimize the potential for adverse effects on fish species from the accidental or unintended release of contaminants.

To minimize spill risk, refueling or other handling of hazardous materials will not occur within 100 feet of wetland and waterbody resources. If the 100-foot setback cannot be met, these activities will be performed under the supervision of an Environmental Inspector.

3.3 VEGETATION

This section describes the vegetation resources that could be affected by the construction and operation of the proposed FSC Project. Included are descriptions of the various plant communities found in the Project area, descriptions of any unique or protected vegetation, and the methods FSC will employ to minimize impacts on these vegetation resources.

3.3.1 Ecoregions

Ecoregions are areas with generally similar ecosystems and with similar types, qualities, and quantities of environmental resources (National Atlas of the United States, 2013). Ecoregion boundaries are determined by examining patterns of vegetation, animal life, geology, soils, water quality, climate, and human land use, as well as other living and non-living ecosystem components (National Atlas of the United States, 2013). The proposed FSC Project traverses

two ecoregions: the Central Florida Ridges and Uplands and the Eastern Florida Flatwoods. The following descriptions of these ecoregions are derived from the Florida Regionalization Project (Griffith et al., 1994).

The Central Florida Ridges and Uplands consists of the area from the Lake Wales Ridge/Intraridge Valley in the south, through the highland dune area of the Ocala National Forest, and into the Trail Ride area in the north. The sand hill karst area characterized by xeric hills and solution basins is the principle recharge area of the Floridan aquifer. The soils tend to be thick, acidic, sandy, and excessively to moderately drained. The natural vegetation consists of forests of longleaf pine, turkey oak, and wiregrass. The current land uses include citrus groves, herbaceous rangeland, cropland and pasture, and urban/built-up land.

The Eastern Florida Flatwoods is ribbed by sand ridges and some intervening swampy lowlands. Sand, silt, and clay soils are mostly of poor drainage, but it is a diverse area of coastal strips, valleys, ridges, and plains. The current land uses include cropland and pasture, pine plantations, non-forested wetlands, and urban/suburban.

3.3.2 Existing Vegetation

Plant community types along the FSC Project route were determined based on a review of aerial photography, existing land use classifications, and field surveys. Descriptions of existing typical vegetative cover types along the FSC Project route are based on the natural community classification systems described in the Florida Land Use, Cover and Forms Classification System (“FLUCFCS”) (FDOT, 1999).

FSC consulted with the U.S. Fish and Wildlife Service (“USFWS”) and the FWCC to identify rare, sensitive, or unique natural communities and/or plant species along the FSC Project route. Field surveys for identified natural communities and/or species were conducted by qualified scientists between July 22, 2013 and January 24, 2014, and March 31 and April 1, 2014 (ECT, 2014; Cardno Entrix, 2014). A table identifying agency correspondence and contacts is located in Appendix 1F of Resource Report 1.

Developed or managed land uses/land covers mapped along the FSC Project route consist of residential, commercial and services, industrial, mining, institutional, recreational, open land, agricultural, disturbed land, transportation, communication, and utilities. According to the FLUCFCS, these categories include low-density residential, medium-density residential, commercial and services, industrial, extractive, institutional, recreational, open land, cropland and pastureland, tree crops, nurseries and vineyards, specialty farms, other open lands, sands and other lands, disturbed land, transportation, communication, utilities, and solid waste disposal.

The vegetation cover classes present include 300, 400, and 600 FLUCFCS series classifications. Included in the 300 series are herbaceous/dry prairie, palmetto prairies, other shrub and brush, and mixed rangeland.

The 400 series includes pine flatwoods, sand pine, longleaf pine-xeric oak, sand pine, pine-mesic oak, mixed pine, xeric oak, Brazilian pepper, temperate hardwoods, tropical hardwoods, live oak, cabbage palm, sand live oak, hardwood-conifer mixed, upland scrub/pine/hardwoods, Australian pine, and coniferous plantations. The wetland (600) series consists of bay swamp, gum swamp, stream and lake, swamp/bottomland, mixed wetland hardwoods, willow and elderberry, exotic wetland hardwoods, cypress, cypress/pine/cabbage palm, wet pinelands/hydric pine, wetland forested mixed, shrub wetland, freshwater marshes, wet prairies, shoreline, and intermittent ponds.

Upland nonforested communities are the dominant community, followed by nonforested wetland communities, upland forests, forested wetland communities, and open waters. See Table 3.3-1 i for calculations of vegetation community impacts along the FSC Project route. The following paragraphs provide a description by ecosystem type of each vegetation type along the FSC Project route (i.e., upland, wetland, or aquatic).

3.3.3 Open Land

Open land includes utility rights-of-way, open fields, pasture, vacant land, herbaceous and scrub-shrub uplands, non-forested lands, emergent wetland, scrub-shrub wetland, golf courses, and municipal land.

3.3.3.1 Upland Open Land

Four types of naturally vegetated upland nonforested communities occur along the FSC Project route. The dominant community is herbaceous dry prairie, which is located primarily along roadsides and within transmission line corridors. This plant association is dominated by a variety of herbs and may include scattered clumps of shrubs. Typical herbs include broomsedges (*Andropogon spp*.), bluestems (*Schizachyrium spp*.), Bahia grass (*Paspalum notatum*), wiregrass (*Aristida stricta*), crabgrasses (*Digitaria spp*.), love grasses (*Eragrostis spp*.), dogfennel (*Eupatorium capillifolium*), sweet broom (*Cytisus spachianus*), slender goldenrod (*Solidago erecta)*, smutgrass (*Sporobolus indicus*), finger grass (*Eustachys petraea*), buttonweeds (*Spermacoce spp*.), paspalums (*Paspalum sp*., especially *Paspalum setaceum*), witchgrasses (*Dichanthelium spp*.), and blackberries (*Rubus spp*.). Shrubs are often present but not dominant. They include Brazilian pepper (*Schinus terebinthifolius*), saw palmetto (*Serenoa repens*), wax myrtle (*Myrica cerifa*), and groundsel tree (*Baccharis halimifolia*).

Palmetto prairie is dominated primarily by saw palmetto with wax myrtle, gallberry (*Ilex glabra*), muscadine grape (*Vitis rotundifolia*), fetterbush (*Lyonia lucida*), shiny blueberry (*Vaccinium myrsinites*), coastal plain staggerbush (*Lyonia fruticosa*), winged sumac (*Rhus copallinum*), tar flower (*Bejaria racemosa*), and four-petal St. John's wort (*Hypericum tetrapetalum*). Wiregrass and broomsedge are the most common ground-layer species. Other ground-layer components include narrowleaf silkgrass (*Pityopsis graminifolia*) and chaffheads (*Carphephorus paniculatus*, *C. corymbosus*). Widely scattered trees include slash pine (*Pinus elliottii*), longleaf pine (*Pinus palustris*), live oak (*Quercus virginiana*), laurel oak (*Quercus laurifolia*), and water oak (*Quercus nigra*).

Other shrubs and brushland and mixed rangeland are also present along the FSC Project route. There are a combination of herbaceous and shrub species mentioned previously, as well as a few scattered trees.

A total of 307.52 acres of upland open land will be affected for construction of the FSC Project and 118.34 acres will be affected for operation of the FSC Project, as shown in Table 3.3-1.

3.3.3.2 Herbaceous and Scrub-Shrub Wetlands

Nonforested wetlands are primarily comprised of freshwater marshes, with shrub wetland and wet prairie accounting for only a small fraction along the FSC Project route. There are two types of marshes within the FSC Project area: those that are natural and those associated with linear roadside and agricultural conveyances.

The vegetation cover of the natural marshes varies considerably. Undisturbed natural marshes tend to have a plant cover consisting of a mixture of plants where no single species is dominant. Common species noted in the natural marshes include little carpetgrass (*Axonopus fissifolius*), narrowfruited horned beakrush (*Rhynchospora inudata*), spadeleaf (*Centella asiatica*), southern cutgrass (*Leersia hexandra*), maidencane (*Panicum hemitomon*), lemon bacopa (*Bacopa*

caroliniana), dotted smartweed (*Polygonum punctatum*), bluejoint panicum (*Panicum tenerum*), road-grass (*Eleocharis baldwinii*), Virginia chain fern (*Woodwardia virginica*), and others. Natural marshes disturbed by human activity or cattle grazing tend to have few species and are dominated by weedy native and exotic species, including torpedo grass (*Panicum repens*), Cuban bulrush (*Oxycaryum cubense*), and limpograss (*Hemarthria altissima*).

Roadside and agricultural conveyances generally support a large number of species, but only a few species are dominant, including torpedo grass, paragrass (*Urochloa mutica*), Mexican seedbox (*Ludwigia octovalvis*), and bulltongue arrowhead (*Sagittaria lancifolia*). Soft rush (*Juncus effuses*) is a dominant only in the agricultural (pasture) conveyances. Many of the conveyences, especially the roadside conveyances, have scattered to locally dense shrubs, including Peruvian primrose-willow (*Ludwigia peruviana*) and Carolina willow (*Salix carolininana*).

Shrub wetlands are comprised of similar species as the marsh but also have a dominant shrub component of either buttonbush (*Cephalanthus occidentalis*) or coastal plain willow (*Salix caroliniana*).

Wet prairies are also comprised of similar vegetation species but tend to be shallower and have a shorter hydroperiod.

As shown in Table 3.3-1, a total of 133.66 acres of herbaceous wetlands will be temporarily affected for construction of the FSC Project and no herbaceous wetlands will be affected for operation of the FSC Project, as these wetlands will revert to their pre-construction state. Also shown in Table 3.3-1, a total of 24.08 acres of scrub-shrub wetlands will be temporarily affected for construction of the FSC Project and 15.60 acres will be affected for operation of the FSC Project, as shown in Table 3.3-1.

3.3.4 Agricultural

Within the agricultural land use types, improved pasture is the most prevalent followed by active or abandoned citrus/tree groves, unimproved pasture, and various specialty farms.

The cropland and pastureland classification is typically associated with cattle grazing on open fields of pasture grasses. These improved and unimproved pastures have a dominant cover of pasture grasses such as Bahia grass, limpograss, Bermuda grass (*Cynodon dactylon*), smutgrass, pangola grass (*Digitaria eriantha*), and carpetgrass (*Axonopus spp*.), among others. Depending on the degree of improvement, old field species such as dog fennel, sweet broom, common ragweed (*Ambrosia artemisiifolia*), slender goldenrod, slender flattop goldenrod (*Euthamia caroliniensis*), spadeleaf, tropical soda apple (*Solanum viarum*), cogongrass (*Imperata cylindrica*), pokeweed (*Phytolacca americana*), manyflower marshpennywort (*Hydrocotyle umbellata*), blackberry, and other weedy herbaceous species, as well as occasional shrubs of saw palmetto, wax myrtle, Brazilian pepper, or netted pawpaw (*Asimina reticulata*) often inhabit these communities.

A total of 948.62 acres of agricultural land will be temporarily affected for construction of the FSC Project and 383.30 acres of agricultural land will be affected for operation of the FSC Project, as shown in Table 3.3-1.

3.3.5 Forest and Woodlands

3.3.5.1 Pine Plantation

There are approximately six and one half million acres of pure natural and planted longleaf and slash pine stands in Florida (FDOT, 1999). These are almost exclusively artificially generated by

planting seedling stock or seeds (FDOT, 1999). These stands are characterized by high numbers of trees per acre and their uniform appearance (FDOT, 1999).

A total of 1.34 acres of pine plantation will be affected for construction of the FSC Project and 0.47 acres of pine plantation will be affected for operation of the FSC project, as shown in Table 3.3-1.

3.3.5.2 Upland Forest

A variety of forested upland vegetation communities are present along the FSC Project route. The dominant type is mixed hardwood-conifer mixed, followed by xeric oak and then pine flatwoods.

Mixed hardwood-conifer is dominated by a canopy consisting of a mixture of live oak, laurel oak, water oak, slash pine, and occasionally longleaf pine, cabbage palm (*Sabal palmetto*), sweetgum (*Liquidambar styraciflora*), common persimmon (*Diospyros virginiana*), and red maple (*Acer rubrum*). Usually the understory in this type of plant community, if it has not been cleared, is saw palmetto with scattered gallberry. Shrubs typically consist of saw palmetto, wax myrtle, groundsel tree, and/or American beautyberry (*Callicarpa americana*).

Xeric oak is prevalent in the northern portion of the FSC Project route. Dominant species include sand live oak (*Quercus geminata*), bluejack oak (*Quercus incana*), turkey oak (*Quercus laevis*), sand post oak (*Quercus margaretta*), live oak, and scattered longleaf or sand pine (*Pinus clausa*).

Pine flatwoods along the FSC Project route are dominated by scattered to locally dense slash pine, longleaf pine, or a combination of both. The understory is dominated by saw palmetto with scattered fetterbush, tarflower, wax myrtle, gallberry, American beautyberry, live oak, and sand live oak. Herbs are restricted to openings in the shrub cover and can include a large number of species such as wiregrass, roadgrass, broomsedges, pale meadowbeauty (*Rhexia mariana*), hemlock witchgrass (*Dichanthelium portoricensis*), pinebarren (*Solidago fistulosa*), and Carolina elephantsfoot (*Elephantopus carolinianus*).

A total of 198.37 acres of upland forest will be affected for construction of the FSC Project and 80.38 acres of upland forest will be affected for operation of the FSC Project, as shown in Table 3.3-1.

3.3.5.3 Wetland Forest

A variety of wetland forest communities are observed along the FSC Project route: bay swamp, gum swamp, stream and lake swamp (bottomland), mixed wetland hardwood, willow and elderberry, exotic hardwoods, cypress, cypress-pine-cabbage palm, hydric pine flatwoods, and mixed wetland forest. Mixed wetland hardwoods community is the most dominant type followed by wetland forested mixed. The remaining forested vegetation community types comprise a small percentage of the FSC Project route.

Mixed wetland hardwoods are dominated by laurel oak, often with water oak and live oak around the outer edges. Some of the mixed wetland hardwood areas have scattered saw palmetto, small sweetbay (*Magnolia virginiana*), red maple, and dahoon holly (*Ilex cassine*) in the understory. Other hardwoods areas are virtually devoid of shrubs and herbs, especially those areas where cattle were present. Cinnamon fern (*Osmunda cinnamomea*) is the only notable herb noted in most of the mixed wetland hardwood areas.

Wetland forested mixed community is dominated by a canopy composed of hardwoods and conifers including sweetbay, laurel oak, loblolly bay (*Gordonia lasianthus*), bald cypress (*Taxodium distichum*), pond cypress (*Taxodium asendens*), slash pine, and swamp tupelo

(*Nyssa sylvatica* var*. biflora*) with an understory of wax myrtle and root sprouts of sweetbay. The herbaceous layer is mostly ferns, including toothed midsorus fern (*Blechnum serrulatum*), Virginia chain fern, and royal fern (*Osmunda regalis*).

A total of 110.16 acres of wetland forest will be temporarily affected for construction of the FSC Project while 59.76 acres of wetland forest will be permanently affected for operation of the FSC Project, as shown in Table 3.3-1.

3.3.6 Industrial, Commercial, and Residential Uses

Industrial, commercial, and residential land uses are defined in Resource Report 8, which does not include "open water" land use (i.e. water crossings greater than 100 feet wide and streams visible on aerial photography but less than 100 feet in width). Identified as “Other” in Table 3.3-1, a total of 172.15 acres of industrial, commercial, and residential land will be affected for construction of the FSC Project and 30.38 acres of industrial, commercial, and residential land will be affected for operation of the FSC Project.

3.3.7 Non-Native/Invasive Species

The USFWS defines invasive species as organisms that are “not native to an ecosystem and which causes, or is likely to cause, economic or environmental harm or harm to human health” (USFWS, 2012). Most commonly they are exotic species that have been introduced from another part of the United States, another region, or another continent, although native species that exhibit rapid growth and spread are sometimes considered invasive. Invasive plant species can change or degrade natural vegetation communities, which can reduce the quality of habitat for wildlife and native plant species. Non-native/invasive plant species potentially occurring along the FSC Project route are listed in Table 3.3-2.

Subsequent to ground disturbance from construction, vegetation communities may be susceptible to infestations of exotic and invasive vegetative species. These species are usually most prevalent in areas of prior surface disturbance such as agricultural areas, roadsides, existing utility rights-of-way, and wildlife concentration areas. Despite efforts to prevent the spread of exotic and invasive vegetation, it is possible that pipeline construction, operation, and maintenance activities will increase the prevalence of such vegetation along the pipeline route right-of-way, or that exotic and invasive vegetation will be transported into areas that were relatively free of such vegetation prior to construction. Seed recommendation and control measures for nuisance species provided by the Natural Resources Conservation Service will be taken under consideration dependent on site specific conditions, seasonality, and land owner requests. When conducting restoration efforts only native or local seed sources based upon agency recommendations will be used.

3.3.8 Vegetation Impacts and Mitigation

This section summarizes the FSC Project construction and operation impacts on the vegetative cover types. The clearing for the project will consist of an approximately 100-foot wide area within the construction right-of-way except in wetlands where clearing is reduced to 75 feet. Once the pipeline is installed, a 50-foot wide permanent right-of-way will remain.

Construction of the FSC pipeline will include temporary and permanent impacts on the vegetation cover types previously described. A significant portion of the approximate 127 miles of the proposed pipeline facilities will be within or adjacent to existing rights-of-way and existing linear features. This includes public roadways, railways, and/or other utility rights-of-way. Construction of the pipeline facilities within or adjacent to existing rights-of-way will limit impacts on vegetation by reducing land use change, and tree clearing and stump removal activities.

The pipeline right-of-way and temporary workspaces in non-paved areas will be cleared of vegetation prior to construction to provide a safe working area. The limits of clearing will be identified and flagged in the field prior to the start of clearing operations. Where the right-of-way needs to be cleared for construction, any trees will be cut into lengths, chipped, or removed to an approved site. Except where they would interfere with trenching or pipeline construction, tree stumps and rootstock will be left in place wherever possible to stabilize soils and facilitate natural revegetation. As described in the FSC Plan and Procedures, FSC will install erosion control measures following initial disturbance of the soil.

Following construction, the entire right-of-way will be restored and a 50-foot wide permanent right-of-way will be maintained by FSC for the pipeline. Routine maintenance of the right-of-way is required to allow continued access for routine pipeline patrols, maintaining access in the event of emergency repairs, and visibility during aerial patrols.

In upland areas, maintenance of the right-of-way will involve clearing the entire 50-foot permanent right-of-way of woody vegetation. Trees or deep-rooted shrubs that could damage the pipeline's protective coating, obscure periodic surveillance, or interfere with potential repairs will not be permitted to grow within the permanent right-of-way. As such, the maintained permanent rights-of-way will be subjected to mowing as needed. This maintenance will result in permanent conversion of some areas of existing upland forested vegetation to herbaceous or scrub vegetation; however, FSC has routed the pipeline facilities to use or be adjacent to existing utility rights-of-way and road corridors to the extent possible, to minimize the effects on forested vegetation. Within wetlands and adjacent waterbodies, FSC will maintain vegetation in a 10-foot corridor centered over the pipeline in an herbaceous state, and will reserve the right to selectively cut and remove trees larger than 15 feet in height that are located within 15 feet of the pipeline. Vegetation maintenance will not normally be required in agricultural or grazing areas.

Clearing for construction of the pipeline will not result in any permanent impacts on wetland vegetation communities located outside of the permanent right-of-way. Forested wetlands within the permanent right-of-way will be converted to nonforested wetland but will still continue to perform wetland functions.

The frequency of the vegetation maintenance will depend on vegetation growth rate. Routine vegetation maintenance clearing will typically be performed on a sectionalized basis with higher regrowth areas receiving right-of-way maintenance necessary to adequately patrol the pipeline consistent with 49 CFR 192.705. However, to facilitate periodic corrosion and leak surveys, a corridor not exceeding 10 feet in width centered on the pipeline will typically be maintained annually in an herbaceous state.

Impacts to vegetation within additional temporary work spaces and at aboveground facilities will be similar to those described above for the pipeline facilities. The temporary workspace areas used during construction (other than areas already existing as gravel or pavement), will be seeded and allowed to revegetate with no further maintenance or disturbance associated with operation of the pipeline. Disturbed upland areas may be seeded as required by the FSC Plan, and written recommendations for seed mixes, rates, and dates may be obtained from the local soil conservation authority or as requested by the landowner or land management agency, consistent with permit conditions.

FSC has selected several locations for contractor yards and staging/storage areas. These areas consist of open land, industrial, or commercial land, and no forest clearing will be required to use these sites. Additional maintenance may be required to remove brush, prune trees, and remove other herbaceous vegetation for safe passage of equipment and to prepare a work

surface for the storage of pipe and other construction materials. Vegetative impacts will be minimal due to the existing conditions at these locations.

To the extent practicable, existing public and private road crossings along the FSC Project route will be used as the primary means of accessing the right-of-way. In addition, the proposed pipeline facilities have been sited adjacent to or within existing utility rights-of-way. These established rights-of-way typically have existing access roads that can be used during construction of the pipeline facilities. FSC will use the existing access roads during construction to the maximum extent practicable, minimizing major impacts on vegetation communities. The majority of the roads identified by FSC has existing gravel, asphalt or concrete surfaces and can be used with little or no improvement. In a few locations, upgrades may be required, such as brush removal and tree trimming, to allow safe access along the existing access roads.

3.4 WILDLIFE

The FSC Project will cross a variety of terrestrial and wetland habitats that support a diversity of wildlife species. The composition, structure, and distribution of the plant community in an area constitute a large part of the cover and food components of wildlife habitat. As a result, areas with similar vegetative characteristics tend to have similar assemblages of wildlife species. Some wildlife species have specific habitat requirements and are found in only a few habitats, while other species have broader habitat requirements and occur more commonly. Habitat types were identified on the basis of FLUCFCS mapping combined with interpretation of aerial photography. Subsequent field reconnaissance confirmed seven major habitat types: upland open land, herbaceous wetlands, scrub-shrub wetlands, agricultural, pine plantation, upland forest, and wetland forest. Table 3.4-1 lists the common wildlife species potentially occurring along the FSC Project route.

3.4.1 Existing Resources

The FSC Project will be located in several types of upland habitats, including agricultural lands, pastures, scrub, and upland coniferous and hardwood forests.

Agricultural lands dominate much of the route and as described in Section 3.3.4, consist of pasturelands (both improved and unimproved), citrus groves, and specialty agricultural uses. Wildlife species found in agricultural areas represent openland breeding and nesting species such as ground dove, mourning dove, mockingbird, tree swallow, kestrel, black vulture, eastern bluebird, common crow, gopher tortoise, nine-banded armadillo, eastern cottontail, white-tailed deer, and eastern mole. The endangered Florida grasshopper sparrow may also be found in certain pasturelands along the route.

Scrub habitats, characterized by dry, well-drained sandy soils, contain vegetation and wildlife that are well adapted to xeric conditions where runoff and percolation rates are extremely high. Typical species include the gopher tortoise, gopher frog, fence lizard, mole skink, eastern coachwhip, pine snake, and eastern diamondback rattlesnake. Bird and mammal species include the bobwhite, ground dove, red-headed woodpecker, rufous-sided towhee, fox squirrel, and southeastern pocket gopher.

Forest communities are habitat for such mammal species as the white-tailed deer, gray fox, gray squirrel, nine-banded armadillo, striped skunk, southeastern pocket gopher, cotton rat, and least shrew. Typical bird species include the red-headed woodpecker, loggerhead shrike, eastern kingbird, hairy woodpecker, eastern bluebird, brown-headed nuthatch, pine warbler, bobwhite, and the wild turkey. The box turtle, six-lined racerunner, black racer, eastern diamondback rattlesnake, and oak toad are typical reptiles and amphibians.

The FSC Project would cross three major freshwater wetland types: forest swamps, scrub-shrub swamps, and marshes. Typical aquatic and wetland wildlife in forest and scrub-shrub swamps include the white-tailed deer, raccoon, river otter, cotton mouse, white ibis and glossy ibis, wood duck, prothonotary warbler, wild turkey, lesser siren, mud snake, and cottonmouth. Freshwater marshes provide habitat for many aquatic wildlife species, including those found in forest and scrub-shrub swamps, as well as the rice rat, least bittern, green heron, common yellowthroat, red-winged blackbird, leopard frog, pinewoods tree frog, bullfrog, green water snake, mud turtle, cooter, chicken turtle, and pygmy rattlesnake.

Certain of these wildlife species, as well as other wildlife furbearers and migratory birds, are important game animals hunted along the FSC Project route. They include the white-tailed deer, bobcat, gray squirrel, raccoon, cottontail rabbit, opossum, wild turkey, bobwhite, mourning dove, and various waterfowl (ducks and geese).

3.4.2 Wildlife Impacts and Mitigation

Temporary wildlife impacts are those associated with disturbance to habitats during construction, while permanent impacts are those associated with conversion of forested wetland habitats to scrub-shrub and herbaceous habitats, resulting from periodic maintenance of the permanent right-of-way. Indirect wildlife impacts associated with construction noise and increased activity should be temporary, and could include abandoned reproductive efforts, displacement, and avoidance of work areas. Direct mortality to small mammals, reptiles and amphibians that are less mobile could occur during clearing and grading operations.

The majority of the pipeline route is located within or adjacent to existing roadway, railway, and/or utility rights-of-way. These existing rights-of-way are routinely maintained as part of regular facility operations to control vegetative growth, thus establishing open habitat types. Many species of resident and migratory wildlife along the FSC Project route use these existing utility corridors as preferred habitat.

Construction and operation of the FSC Project may result in short- and long-term impacts on wildlife. Although some wildlife species will be affected, the FSC Project will not likely have a significant impact on local populations or habitats of any species. The extent and duration of impacts will vary depending on the species present in each affected habitat type and their individual life history. Because the FSC Project will not permanently alter the characteristic of a majority of the available habitats, most FSC Project-related impacts are anticipated to be temporary. Because the FSC Project route is located primarily along or adjacent to existing rights-of-way and roads, and in a previously developed highly fragmented urban landscape, little forested habitat will be affected by the Project. The majority of the forested areas that are present along the FSC Project route already exist as edge habitat, not interior forested habitat.

Construction activities, especially clearing of the right-of-way, will reduce feeding, nesting, and cover habitat components until vegetation has become re-established. Mobile species may be temporarily disturbed or displaced from portions of their habitats, and mortality of individuals of less mobile species, such as some small mammals, reptiles, or amphibians may occur. However, direct impacts on wildlife along the FSC Project route and associated work spaces will generally be of short duration and limited to the period of construction activities. Indirect wildlife impacts associated with construction noise and increased activity will be short term but could result in the temporary displacement of wildlife species from the construction areas.

Effects on non-forested upland habitat disturbed by construction will be temporary, and these areas are expected to recover quickly once construction is completed. Similarly, FSC Project-related impacts on scrub-shrub and emergent wetland habitats will be relatively short term. The temporary effects on these habitats will have little or no impact on individual wildlife species or

wildlife populations. Forested communities, both upland and wetland, will be affected to a greater extent because of the long-term conversion of these wooded habitats to earlier successional stages in the temporary right-of-way and the permanent conversion to scrub-shrub and/or non-woody herbaceous species in the permanent, maintained right-of-way.

The permanent, maintained right-of-way may function as a travel corridor for some wildlife species and may provide food, cover, and breeding habitat for those species that use open and emergent habitats. In addition, maintained utility right-of-way can provide important early successional habitats for several important game species and migratory birds.

Implementing FSC's Plan and Procedures will minimize permanent impacts on wildlife and promote the rapid stabilization and revegetation of disturbed areas. Re-vegetation will be completed in accordance with permit requirements and in consultation with agency and non-agency stakeholders affected by the FSC Project. Construction and operation of the FSC Project facilities is not expected to adversely affect the distribution or regional abundance of wildlife species given the amount and distribution of similar habitat types available in the immediate vicinity of the FSC Project route.

3.4.3 Significant or Sensitive Wildlife Habitat

FSC has identified a number of wildlife resources that may be affected by the FSC Project, including conservation lands.

Based on database searches and agency consultation, none of the FSC Project facilities would be located within a National Wildlife Refuge; however, the Lake Wales Ridge National Wildlife Refuge abuts the east side of the FSC Project limits in Polk County. The FSC Project does cross some private and state-managed conservation lands, including the North Walk-In-Water Creek, Lake Wales Ridge State Forest, and Tiger Lake Ranch Conservation Easement. The FSC Project will also cross the Kissimmee River, which is considered a valuable fishery and wildlife resource; however, the FSC Project will use HDD to cross the river, so no permanent impacts will occur to wildlife resources using the river and surrounding habitats.

3.4.4 Migratory Birds

The Migratory Bird Treaty Act ("MBTA") implements the United States' commitment to four bilateral treaties, or conventions, for the protection of a shared migratory bird resource. The MBTA protects more than 1,000 species of birds by implementing the provisions of four treaties within the United States. The list of migratory bird species protected by the MBTA appears in 50 CFR 10.13.

The MBTA provides that it is unlawful to pursue, hunt, take, capture, kill, possess, sell, purchase, barter, import, export, or transport any migratory bird, or any part, nest, or egg of any such bird, unless authorized under a permit issued by the Secretary of the Interior. Executive Order 13186 (January 2001) directs federal agencies to consider the effects of agency actions on migratory birds, with emphasis on bird species of concern.

The vegetation communities traversed by the FSC Project are utilized by a variety of migratory bird species in Florida at various times of the year. These bird species include raptors and songbirds. Suitable nesting habitat occurs throughout the FSC Project route.

FSC Project activities could cause some migratory birds to avoid the construction areas. This impact will be limited to the relatively short period of active construction and is not expected to result in a significant or long-term change in migratory bird populations.

3.5 ENDANGERED, THREATENED AND SPECIAL CONCERN SPECIES

The Endangered Species Act of 1973 ("ESA") (16 USCA 1535-1543, P.L. 93-205) protects federally listed T&E species. The ESA states that T&E plant and animal species are of aesthetic, ecological, educational, historic, and scientific value to the United States and protection of these species and their habitats is required. The ESA protects fish, wildlife, plants, and invertebrates that are federally listed as T&E. A federally listed endangered species is one that is in danger of extinction throughout all or a significant portion of its range. A federally listed threatened species is a species that is likely to become endangered in the foreseeable future throughout all or a significant portion of its range. The USFWS, which is responsible for terrestrial and freshwater species, and NMFS, which is responsible for marine species, jointly administer the law. Protection is also afforded under the ESA to "critical habitat," which the USFWS defines as specific areas both within and outside the geographic area occupied by a species on which are found those physical and biological features essential to its conservation.

In addition to federal law, Florida also has a state Endangered and Threatened Species Act (Section 372.072, Florida Statutes), which affords protection to fish and wildlife designated as state T&E. Under the Florida statute, endangered species means any species of fish and wildlife naturally occurring in Florida, whose prospects of survival are in jeopardy due to modification or loss of habitat; overutilization for commercial, sporting, scientific, or educational purposes; disease; predation; inadequacy of regulatory mechanisms; or other natural or manmade factors affecting its continued existence. Threatened species means any species of fish and wildlife naturally occurring in Florida which may not be in immediate danger of extinction, but which exists in such small populations as to become endangered if it is subjected to increased stress as a result of further modification of its environment. The overall goal of the state T&E statute is to provide for research and management to conserve and protect these species as a natural resource.

FSC consulted with the USFWS and FWC to identify wildlife species listed as endangered, threatened, or of special concern along the FSC Project route. Field surveys for identified species were conducted by qualified scientists between July 22, 2013 and January 24, 2014, and between March 31 and May 30, 2014 (ECT, 2014; Cardno Entrix, 2014). A table identifying agency correspondence and contacts is located in Appendix 1F of Resource Report 1.

Field surveys were conducted along the FSC Project route, which encompassed up to a 300-foot-wide area ("corridor area"). Surveys were conducted by teams consisting of a qualified biologist/botanist and global positioning system ("GPS") technician. Listed species or signs thereof, such as tracks, scats, dens, burrows, nests, etc., were recorded. GPS coordinates were taken when the species or sign was stationary, and photographs of representative habitats were also taken.

3.5.1 Protected Aquatic and Marine Species

No protected aquatic or marine species were identified during review of USFWS, NMFS, and Florida Natural Areas Inventory ("FNAI") records. As such, protected aquatic and marine species are not discussed further.

3.5.2 Protected Plant Species

Although the five counties crossed by the proposed corridor are home to dozens of listed plant species, many of these are associated with the endemic scrub region of the Lake Wales Ridge, which predominantly lies west of the proposed pipeline route. Table 3.5-1 summarizes the status and likelihood of occurrence for these plant species. A total of 34 plant species from Table 3.5-1 are listed by the Florida Department of Agriculture and Consumer Services ("FDACS"). Most of these are listed to prevent over-collection. A total of 25 plant species was

identified as USFWS-listed species potentially occurring in the proposed corridor area. Those federally-listed species are discussed in detail in Appendix A.

3.5.3 Protected Wildlife Species

A total of 40 terrestrial or wetland dependent vertebrate species, including 1 amphibian, 12 reptiles, 21 birds, and 6 mammals, was identified as listed species occurring or possibly occurring in the proposed corridor area based on FNAI occurrences or listings by county on the USFWS Website. The status and likelihood of occurrence for these vertebrate species are summarized in Table 3.5-2 and discussed in detail in Appendix B. Several species on Table 3.5-2 are included at the suggestion of the USFWS as species recorded in their county lists. Those species are highlighted, but are considered to be unlikely to occur along the FSC Project route due to rarity, known range, and /or habitat requirements.

3.5.4 Impacts and Mitigation

To the extent practicable, the FSC Project avoids known sensitive habitats and listed species locations. The FSC Project has been located along and through existing disturbances such as roads and highways, electric transmission lines, other utility pipelines, and through agriculturally-dominated land uses. The FSC Project has been located to minimize impacts on forested wetlands and will only produce temporary impacts in herbaceous wetlands. Permanent wetland impacts will be mitigated as required.

Prior to clearing, FSC has agreed to perform listed species surveys along the route in appropriate habitats, according to currently accepted USFWS and FWC survey protocols. Species found will be reported to those agencies, and additional avoidance or mitigation measures may be employed. These may include such measures as relocation (gopher tortoises and certain listed plants), seasonal avoidance (construction timed to nonbreeding season), spatial avoidance (buffers applied near nesting areas), or mitigation in the form of habitat mitigation or purchase of certain listed species credits from approved mitigation banks.

3.5.4.1 Protected Plant Species

As previously discussed, a total of 25 plant species was identified as USFWS-listed species potentially occurring along the FSC Project right-of-way. Those federally-listed species are discussed in detail in Appendix A, including potential impacts and mitigation.

3.5.4.2 Federally Listed Wildlife Species

Based on review of the literature and USFWS websites, a total of nine federally-listed wildlife species could be potentially affected by the project if they were found to be present in the proposed right-of-way area (100 feet for temporary construction, reduced to 50 feet for permanent right-of-way):

- Eastern indigo snake
- Sand skink
- Blue-tailed mole skink
- Florida grasshopper sparrow
- Florida scrub jay
- Wood stork
- Crested caracara
- Snail kite

- Florida bonneted bat

Descriptions of these species are included in Appendix B, and additional discussion of impacts and mitigation for these nine wildlife species is provided in Appendix C. FSC has committed to preclearing surveys for these species using USFWS or other approved survey protocols. Results of those surveys will be provided to USFWS and FWC, and additional avoidance or mitigation measures will be addressed at that time, if necessary.

3.5.4.3 Federally Listed Candidate Species

There are several species identified as candidate species for listing in Florida (Federal Register, 2013), but only three that potentially could occur within the along the FSC Project route:

- Striped newt
- Gopher tortoise
- Florida bristle fern

Striped newt (*Notophthalmus perstriatus*)

The striped newt is a small salamander that inhabits xeric upland communities, primarily sandhill, scrub, and pine flatwoods that contain ephemeral wetlands for breeding (FNAI, 2001). The range of this animal is generally considered to be Southern Georgia and Northern and Central Florida. It is not currently listed in Florida by FWC. It may possibly occur in Osceola and Polk Counties. If it does occur, the habitats in which it breeds (ephemeral wetlands) would only be temporarily affected during construction, and would recover and remain after construction. Tree canopy associated with the sandhill, scrub, or flatwoods areas it occupies will be lost if located within the right-of-way.

Gopher tortoise (*Gopherus polyphemus*)

The gopher tortoise is a state-listed threatened species in Florida. It does occur along the FSC Project route, and, as required by FWC, FSC will conduct 100-percent visual surveys for burrows in the potential gopher tortoise habitat immediately prior to clearing. A FWC permit will be required to temporarily exclude or permanently relocate the affected animals. Habitat used by the tortoises will be restored after construction, such that the animals may recolonize the right-of-way.

Florida bristle fern (*Trichomanes punctatum floridanum*)

The Florida bristle fern (filmy fern) is a small endemic fern found in a few Central Florida counties and Miami-Dade County. The plant is currently listed in Florida by the FDACS as endangered. The fern inhabits tree trunks in hammocks or edges of limesinks. Limestone mining, logging, and draining of wetlands are the principal reasons for its rarity. No specimens were observed during wetland surveys of the project area. The closest documented location to the FSC Project route is Sumter County to the northwest. It is unlikely it occurs along the proposed right-of-way.

3.5.4.4 State-Listed Wildlife Species

To the extent practicable, the FSC Project has avoided known sensitive habitats and listed species locations. The project has been located along and through existing disturbances such as roads and highways, electric transmission lines, other utility pipelines, and through agriculturally-dominated land uses. The pipeline has been located to minimize impacts on forested wetlands and will only produce temporary impacts in herbaceous wetlands. Permanent wetland impacts will be mitigated as required.

Prior to clearing, FSC has agreed to perform listed species surveys along the route in appropriate habitats, according to currently accepted USFWS and FWC survey protocols. Species found will be reported to those agencies, and additional avoidance or mitigation measures may be employed. These may include such measures as relocation (gopher tortoises and certain listed plants), seasonal avoidance (construction timed to nonbreeding season), spatial avoidance (buffers applied near nesting areas), or mitigation in the form of habitat mitigation or purchase of certain listed species credits from approved mitigation banks.

3.6 REFERENCES

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TABLES

Table 3.2-1

Fish Species with the Potential to Occur along the FSC Project Route

Common Name	Scientific Name
White bullhead	*Ameiurus catus*
Yellow bullhead	*Ameiurus natalis*
Brown bullhead	*Ameiurus nebulosus*
Bowfin	*Amia calva*
Pirate perch	*Aphredoderus sayanus*
Oscar	*Astronotus ocellatus*
Silver perch	*Bairdiella chrysoura*
Walking catfish	*Clarias batrachus*
Blackfin pacu	*Colossoma macropomum*
Grass carp	*Ctenopharyngodon idella*
Common carp	*Cyprinus carpio*
Eastern gizzard shad	*Dorosoma cepedianum*
Threadfin shad	*Dorosoma petenense*
Everglades pygmy sunfish	*Elassoma evergladei*
Okefenokee pygmy sunfish	*Elassoma okefenokee*
Lake chubsucker	*Erimyzon sucetta sucetta*
Grass pickerel	*Esox americanus*
Chain pickerel	*Esox niger*
Swamp darter	*Etheostoma fusiforme*
Golden topminnow	*Fundulus chrysotus*
Seminole killifish	*Fundulus seminolis*
Western mosquitofish	*Gambusia holbrooki*
Least killifish	*Heterandria formosa*
Brown hoplo	*Hoplosternum littorale*
Suckermouth catfish	*Hypostomus plecostomus*
Channel catfish	*Ictalurus punctatus*
Flagfish	*Jordanella floridae*
Longnose gar	*Lepisosteus osseus*
Florida gar	*Lepisosteus platyrhincus*
Redbreast sunfish	*Lepomis auritus*
Warmouth	*Lepomis gulosus*
Bluegill	*Lepomis macrochirus*

Table 3.2-1

Fish Species with the Potential to Occur along the FSC Project Route

Common Name	Scientific Name
Dollar sunfish	*Lepomis marginatus*
Redear sunfish	*Lepomis microlophus*
Spotted sunfish	*Lepomis punctatus*
Bluefin killifish	*Lucania goodei*
Largemouth bass	*Micropterus salmoides*
Japanese weatherfish	*Misgurnus anguillicaudatus*
White bass	*Morone chrysops*
Rockfish	*Morone saxatilis*
Golden shiner	*Notemigonus crysoleucas*
Taillight shiner	*Notropis maculatus*
Pugnose minnow	*Opsopoeodus emiliae*
Blue tilapia	*Oreochromis aureus*
Nile tilapia	*Oreochromis niloticus*
Pirapatinga	*Piaractus brachypomus*
Sailfin molly	*Poecilia latipinna*
Southern sailfin catfish	*Pterygoplichthys anisitsi*
Vermiculated sailfin catfish	*Pterygoplichthys disjunctivus*
Spotted tilapia	*Tilapia mariae*
Redbelly tilapia	*Tilapia zillii*
Hogchoker	*Trinectes maculatus*
Green swordtail	*Xiphophorus hellerii*

Sources:
FNAI, 2014. http://www.fnai.org/biodiversitymatrix/index.html
NatureServe.org, 2014. http://explorer.natureserve.org/servlet/NatureServe?init=Ecol
USGS Biodiversity Information Serving Our Nation, 2014. http://bison.usgs.ornl.gov/

Table 3.3-1

Acres of Vegetation Affected by the FSC Project

Facility	Open Land a/						Agricultural b/		Forest/Woodland c/						Other d/		Total	
	Upland Open Land		Herbaceous Wetlands		Scrub-Shrub Wetlands				Pine Plantation		Upland Forest		Wetland Forest					
	Construction	Operation e/	Construction	Operation	Construction	Operation	Construction	Operation	Construction	Operation	Construction	Operation	Construction	Operation	Construction	Operation	Construction	Operation
Pipeline Right-of-Way	117.42	117.42	71.70	0.00	15.60	15.60	382.85	382.85	0.47	0.47	80.38	80.38	59.76	59.76	30.38	30.38	**758.56**	**686.86**
Temporary Easement	97.45	0.00	33.10	0.00	7.08	0.00	362.70	0.00	0.64	0.00	95.42	0.00	33.06	0.00	28.74	0.00	**658.19**	**0.00**
Additional Temporary Workspace	20.14	0.00	11.83	0.00	1.08	0.00	74.83	0.00	0.23	0.00	15.15	0.00	7.83	0.00	9.35	0.00	**140.44**	**0.00**
Launcher Site	0.00	0.00	0.00	0.00	0.00	0.00	0.45	0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.45**	**0.45**
Martin Meter Station	2.63	0.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**2.63**	**0.92**
Contractor Yards	63.77	0.00	14.57	0.00	0.00	0.00	100.22	0.00	0.00	0.00	4.58	0.00	9.28	0.00	30.57	0.00	**222.99**	**0.00**
Staging Area	0.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.62	0.00	0.00	0.00	1.79	0.00	**4.31**	**0.00**
Access Roads	5.21	0.00	2.46	0.00	0.32	0.00	27.57	0.00	0.00	0.00	1.22	0.00	0.23	0.00	71.32	0.00	**108.33**	**0.00**
PROJECT TOTALS	**307.52**	**118.34**	**133.66**	**0.00**	**24.08**	**15.60**	**948.62**	**383.30**	**1.34**	**0.47**	**198.37**	**80.38**	**110.16**	**59.76**	**172.15**	**30.38**	**1895.90**	**688.23**

a/ Utility rights-of-way, open fields, vacant land, herbaceous and scrub uplands, non-forested lands, emergent wetland, scrub-shrub wetland, golf courses, and municipal land.
b/ Cultivated land and citrus groves.
c/ Upland and wetland forest, and pine plantation.
d/ Industrial, commercial, and residential land uses as defined in Resource Report 8. Does not include "open water" land use, i.e. water crossings greater than 100 feet wide and streams visible on aerial photography but less than 100 feet in width.
e/ Land affected during operation of the pipeline includes only the new 50-foot permanent right-of-way, except for the permanent right-of-way in wetlands as detailed in Resource Report 2.

Table 3.4-1

Wildlife Species with the Potential to Occur Along the FSC Project Route

Common Name	Scientific Name
Amphibians	
Barking treefrog	*Hyla gratiosa*
Bullfrog	*Rana catesbeiana*
Chorus frog	*Pseudacris nigrita*
Cricket frog	*Acris gryllus*
Cuban treefrog	*Osteopilus septentrionalis*
Eastern narrow-mouthed toad	*Gastrophyrne carolinensis*
Gopher frog	*Lithobates capito*
Green treefrog	*Hyla cinerea*
Greenhouse frog	*Eleutherodactylus planirostris*
Little grass frog	*Pseudacris ocularis*
Oak toad	*Bufo quercicus*
Pig frog	*Rana grylio*
Pinewoods treefrog	*Hyla femoralis*
Southern leopard frog	*Rana sphenocephala*
Southern toad	*Bufo terrestris*
Squirrel treefrog	*Hyla squirella*
Reptiles	
American alligator	*Alligator mississippiensis*
Black racer	*Coluber constrictor*
Brown anole	*Anolis sagrei*
Chicken turtle	*Deirochelys reticularia*
Dusky pygmy rattlesnake	*Sistrurus miliarius barbouri*
Eastern diamondback rattlesnake	*Crotalus adamanteus*
Eastern garter snake	*Thamnophis sirtalis*
Eastern indigo snake	*Drymarchon corais couperi*
Five-lined skink	*Eumeces fascatus*
Florida box turtle	*Terrapene carolina bauri*
Florida cooter	*Chrysemys floridana*
Florida cottonmouth	*Agkistrodon piscivorous*
Florida soft-shell turtle	*Trionyx ferox*

Table 3.4-1

Wildlife Species with the Potential to Occur Along the FSC Project Route

Common Name	Scientific Name
Florida water snake	*Natrix fasciata pictiventris*
Gopher tortoise	*Gopherus polyphemus*
Green anole	*Anolis carolinensis*
Ground skink	*Scinella lateralis*
Six-lined racerunner	*Cnemidophorus sexlineatus*
Southeastern five lined skink	*Eumeces inexpectatus*
Yellow rat snake	*Elaphe obsolete*
Birds	
American anhinga	*Anhinga anhinga*
American bittern	*Botaurus lentiginosus*
American coot	*Fulica americana*
American goldfinch	*Carduelis tristis*
American kestrel	*Falco sparverius*
American redstart	*Setophaga ruticilla*
American robin	*Turdus migratorius*
American white pelican	*Pelecanus erythrorhynchos*
Bachman's sparrow	*Aimophila aestivalis*
Bald eagle	*Haliaeetus leucocephalus*
Barn swallow	*Hirundo rustica*
Barred owl	*Strix varia*
Belted kingfisher	*Ceryle alcyon*
Black and white warbler	*Mniotilta varia*
Black vulture	*Coragyps atratus*
Black-bellied whistling duck	*Dendrocygna autumnalis*
Black-crowned night heron	*Nycticorax nycticorax*
Black-necked stilt	*Himantopus mexicanus*
Blue jay	*Cyanocitta cristata*
Blue-gray gnatcatcher	*Polioptila caerulea*
Boat-tailed grackle	*Quiscalus major*
Brown thrasher	*Toxostoma rufum*
Bobwhite	*Colinus virginianus*
Brown-headed cowbird	*Molothrus ater*

Table 3.4-1

Wildlife Species with the Potential to Occur Along the FSC Project Route

Common Name	Scientific Name
Burrowing owl	*Athene cunicularia floridana*
Carolina chickadee	*Parus carolinensis*
Carolina wren	*Thryothorus ludovicianus*
Cattle egret	*Bubulcus ibis*
Cedar waxwing	*Bombycilla cedrorum*
Chimney swift	*Chaetura pelagica*
Chuck-will's-widow	*Caprimulgus carolinensis*
Common crow	*Corvus brachyrhynchos*
Common gallinule	*Gallinula chloropus*
Common grackle	*Quiscalus quiscula*
Common nighthawk	*Chordeiles minor*
Common snipe	*Capella gallinago*
Common yellowthroat	*Geothlypis trichas*
Cooper's hawk	*Accipiter cooperii*
Crested caracara	*Polyborus plancus*
Double-crested cormorant	*Phalacrocorax auritus*
Downy woodpecker	*Picoides pubescens*
Eastern bluebird	*Sialia sialis*
Eastern kingbird	*Tyrannus tyrannus*
Eastern meadowlark	*Sturnella magna*
Eastern phoebe	*Sayornis phoebe*
Eastern wood pewee	*Contopus virens*
Eurasian collared dove	*Streptopelia decaocto*
Field sparrow	*Spizella pusilla*
Fish crow	*Corvus ossifragus*
Florida duck	*Anas fulvigula*
Florida sandhill crane	*Grus canadensis pratensis*
Glossy ibis	*Plegadis falcinellus*
Gray catbird	*Dumetella carolinensis*
Great blue heron	*Ardea herodias*
Great egret	*Casmerodius albus*
Great horned owl	*Bubo virginianus*

Table 3.4-1

Wildlife Species with the Potential to Occur Along the FSC Project Route

Common Name	Scientific Name
Great-crested flycatcher	*Myiarchus crinitus*
Greater yellowlegs	*Tringa melanoleuca*
Green heron	*Butorides striatus*
Ground dove	*Columbina passerina*
Hairy woodpecker	*Picoides villosus*
House wren	*Troglodytes aedon*
Killdeer	*Charadrius vociferous*
Little blue heron	*Egretta caerulea*
Loggerhead shrike	*Lanius ludovicianus*
Merlin	*Falco columbarius*
Mourning dove	*Zenaida macroura*
Northern bobwhite	*Colinus viginiana*
Northern cardinal	*Cardinalis cardinalis*
Northern flicker	*Colaptes auratus*
Northern harrier	*Circus cyaneus*
Northern mockingbird	*Mimus polyglottos*
Northern parula	*Parula americana*
Osprey	*Pandion haliaetus*
Palm warbler	*Dendroica palmarum*
Pied-billed grebe	*Podilymbus podiceps*
Pigeon (Rock dove)	*Columba livia*
Pileated woodpecker	*Dryocopus pileatus*
Pine warbler	*Dendroica pinus*
Prairie warbler	*Dendroica discolor*
Red-bellied woodpecker	*Melanerpes carolinus*
Red-cockaded woodpecker	*Picoides borealis*
Red-headed woodpecker	*Melanerpes erythrocephalus*
Red-shouldered hawk	*Buteo lineatus*
Red-tailed hawk	*Buteo jamaicensis*
Red-winged blackbird	*Agelaius phoeniceus*
Roseate spoonbill	*Ajaia ajaja*
Ruby-crowned kinglet	*Regulus calendula*

Table 3.4-1

Wildlife Species with the Potential to Occur Along the FSC Project Route

Common Name	Scientific Name
Rufous-sided towhee	*Pipilo erythrophthalmus*
Savannah sparrow	*Passerculus sandwichensis*
Sharp-shinned hawk	*Accipiter striatus*
Short-tailed hawk	*Buteo brachyurus*
Snowy egret	*Egretta thula*
Song sparrow	*Melospiza melodia*
Southeastern American kestrel	*Falco sparverius paulus*
Starling	*Sturnus vulgaris*
Summer tanager	*Piranga rubra*
Swallow-tailed kite	*Elanoides forficatus*
Tree swallow	*Iridoprocne bicolor*
Tricolored heron	*Egretta tricolor*
Tufted titmouse	*Parus bicolor*
Turkey vulture	*Cathartes aura*
White ibis	*Eudocimus albus*
White-eyed vireo	*Vireo griseus*
Wild turkey	*Meleagris gallopavo*
Wood duck	*Aix sponsa*
Wood stork	*Mycteria americana*
Wood thrush	*Hylocichla mustelina*
Yellow-bellied sapsucker	*Sphyrapicus varius*
Yellow-billed cuckoo	*Coccyzus americanus*
Yellow-crowned night heron	*Nyctanassa violacea*
Yellow–rumped warbler	*Dendroica coronata*
Yellow-shafted flicker	*Colaptes auratus*
Yellow-throated warbler	*Dendroica dominica*
Mammals	
Bobcat	*Felis rufus*
Cotton mouse	*Peromyscus gossypinus*
Coyote	*Canis latrans*
Eastern cottontail	*Sylvilagus floridanus*
Eastern gray squirrel	*Sciurus carolinensis*

Table 3.4-1

Wildlife Species with the Potential to Occur Along the FSC Project Route

Common Name	Scientific Name
Eastern mole	*Scalopus aquaticus*
Feral hog	*Sus scrofa*
Florida mouse	*Podomys floridanus*
Gray fox	*Urocyon cinereoargenteus*
Hispid cotton rat	*Sigmodon hispidus*
Marsh rabbit	*Sylvilagus palustris*
Nine-banded armadillo	*Dasypus novemcinctus*
Old field mouse	*Peromyscus polionotus*
Opossum	*Didelphis virginiana*
Raccoon	*Procyon lotor*
River otter	*Lutra canadensis*
Round-tailed muskrat	*Neofiber alleni*
Sherman's fox squirrel	*Sciurus niger shermani*
Southeastern pocket gopher	*Geomys pinetus*
Striped skunk	*Mephitis mephitis*
White-tailed deer	*Odocoileus virginianus*

Sources:

Environmental Consulting & Technology (ECT), Inc., 2014.
FNAI, 2014. http://www.fnai.org/biodiversitymatrix/index.html

Table 3.5-1

Federally and State-Listed Plant Species Potentially Occurring in Osceola, Okeechobee, Polk, Martin, and St. Lucie Counties, Florida with the Potential to Occur Along the FSC Project Route

Scientific Name	Common Name	Status a/		FNAI Observation Within 1 Mile	MP	Likelihood of Occurrence
		Federal	State			
Andropogon arctatus	Pinewoods bluestem	NL	LT	Not Observed	N/A	Low
Asimina tetramera	Four-petal pawpaw	LE	NL	Not Observed	N/A	Unlikely
Bonamia grandiflora	Florida bonamia	LT	LE	10/21/1998	35	Low
Calamintha ashei	Ashe's savory	NL	LT	Not Observed	N/A	Low
Calopogon multiforus	Many-flowered grass-pink	NL	LE	Not Observed	N/A	Low
Carex chapmanii	Chapman's sedge	NL	LT	Not Observed	N/A	Low
Centrosema arenicola	Sand butterfly pea	NL	LE	09/04/1960	30	Low
Chamaesyce cumulicola	Sand-dune spurge	NL	LE	Not Observed	N/A	Low
Chionanthus pygmaeus	Pygmy fringe tree	LE	LE	04/11/2012	9	Low
Cladonia perforata	Perforate reindeer lichen	LE	LE	Not Observed	N/A	Low
Clitoria fragrans	Scrub pigeon-wing	LT	LE	05/29/1983	4	Moderate
Coelorachis tuberculosa	Piedmont jointgrass	NL	LT	Not Observed	N/A	Low
Conradina brevifolia	Short-leaved rosemary	LE	LE	Not Observed	N/A	Low
Conradina grandiflora	Large-flowered rosemary	NL	LT	05/11/1963	73	Low
Crotalarioa avonensis	Avon park hare-bells	LE	LE	Not Observed	N/A	Low
Dicerandra frutescens	Scrub mint	LE	LE	07/30/2010	9	Moderate
Dicerandra immaculate	Lakela's mint	LE	LE	Not Observed	N/A	Low
Drosera intermedia	Spoon-leaved sundew	NL	LT	Not Observed	N/A	Low
Eriogonum longifolium var.gnaphalifolium	Scrub buckwheat	LT	LE	02/12/1998	35	Moderate
Harrisia fragrans/Cereus eriophorus var. fragrans	Fragrant prickly apple	LE	LE	Not Observed	N/A	Unlikely
Hartwrightia floridana	Hartwrightia	NL	LT	Not Observed	N/A	Observed MP 37, 42, 49
Hypericum cumulicola	Highlands scrub hypericum	LE	LE	Not Observed	N/A	Low
Hypericum edisonianum	Edison's ascyrum	NL	LE	Not Observed	N/A	Low

Table 3.5-1

Federally and State-Listed Plant Species Potentially Occurring in Osceola, Okeechobee, Polk, Martin, and St. Lucie Counties, Florida with the Potential to Occur Along the FSC Project Route

Scientific Name	Common Name	Status a/		FNAI Observation Within 1 Mile	MP	Likelihood of Occurrence
		Federal	State			
Illicium parviflorum	Star anise	NL	LE	08/21/1996	12	Observed MP 9, 12
Lechea cernua	Nodding pinweed	NL	LT	11/17/1987	1	Moderate
Lechea divaricata	Pine pinweed	NL	LE	Not Observed	N/A	Low
Liatris ohlingerae	Florida blazing star	LE	LE	Not Observed	N/A	Low
Lupinus aridorum	Scrub lupine	LE	LE	Not Observed	N/A	Low
Matelea floridana	Florida spiny-pod	NL	LE	Not Observed	N/A	Low
Najas filifolia	Narrowleaf naid	NL	LT	Not Observed	N/A	Low
Nemastylis floridana	Celestial lily	NL	LE	09/04/1977	1	Low
Nolina atopocarpa	Florida beargrass	NL	LT	Not Observed	N/A	Low
Nolina brittoniana	Britton's beargrass	LE	LE	08/21/1998	9	Moderate
Ophioglossum palmatum	Hand fern	NL	LE	09/18/2001	80	Moderate
Panicum abscissum	Cutthroat grass	NL	LE	Not Observed	N/A	Low
Paronychia chartacea ssp.chartacea	Paper-like nailwort/Papery whitlow-wort	LT	LE	11/24/1987	35	High
Pecluma plumula	Plume polypody	NL	LE	Not Observed	N/A	Low
Pecluma ptilodon	Swamp plume polypody	NL	LE	Not Observed	N/A	Low
Peperomia humilis	Terrestrial peperomia	NL	LE	08/21/1996	12	Moderate
Peperomia obtusifolia	Blunt-leaved peperomia	NL	LE	05/12/1997	108	Low
Platanthera integra	Yellow fringeless orchid	NL	LE	Not Observed	N/A	Low
Polygala lewtonii	Lewton's polygala	LE	LE	04/11/2012	9	Moderate
Polygala smallii	Tiny polygala	LE	LE	Not Observed	N/A	Unlikely
Polygonella basiramia	Florida jointweed/wireweed	LE	LE	09/26/2012	35	Low
Polygonella myriophylla	Small's jointweed/ Sandlace	LE	LE	11/17/1987	1	Moderate
Prunus geniculata	Scrub plum	LE	LE	08/19/1989	35	Moderate
Pteroglossaspis ecristata	Giant orchid	NL	LT	Not Observed	N/A	Low

Table 3.5-1

Federally and State-Listed Plant Species Potentially Occurring in Osceola, Okeechobee, Polk, Martin, and St. Lucie Counties, Florida with the Potential to Occur Along the FSC Project Route

Scientific Name	Common Name	Status a/		FNAI Observation Within 1 Mile	MP	Likelihood of Occurrence
		Federal	State			
Rhynchospora megaplumosa	Large-plumed beaksedge	NL	LE	Not Observed	N/A	Low
Salix floridana	Florida willow	NL	LE	03/28/1989	9	Moderate
Sarracenia minor	Hooded pitcher plant	NL	LT	Not Observed	N/A	Observed MP 77
Schizachyrium niveum	Scrub bluestem	NL	LE	10/10/1986	35	Moderate
Stylisma abdita	Scrub stylisma	NL	LE	10/21/1998	35	Moderate
Tephrosia angustissima var.curtissii	Coastal hoary-pea	NL	LE	Not Observed	N/A	Low
Thelypteris serrata	Toothed maiden fern	NL	LE	Not Observed	N/A	Low
Tillandsia utriculata	Giant air plant	NL	LE	Not Observed	N/A	Observed MP 36, 103, 126
Warea amplixifolia	Clasping warea/Wide-leaf warea	LE	LE	Not Observed	N/A	Low
Warea carteri	Carter's warea	LE	LE	09/22/1967	15	Moderate
Zephyranthes simpsonii	Redmargin zephyrlily	NL	LT	Not Observed	N/A	Low
Ziziphus celata	Scrub ziziphus, Florida ziziphus	LE	LE	Not Observed	N/A	Low

a/ LE = Listed Endangered
LT = Listed Threatened
NL = Not Listed

Sources:

USFWS, 2014. http://ecos.fws.gov/tess_public/pub/stateListingAndOccurrenceIndividual.jsp?state=FL&s8fid=112761032792&s8fid=112762573902
FDACS, 2013, 2014. http://www.freshfromflorida.com/Divisions-Offices/Florida-Forest-Service/Our-Forests/Forest-Health/Florida-Statewide-Endangered-and-Threatened-Plant-Conservation-Program/Florida-s-Federally-Listed-Plant-Species
FNAI, 2014. http://www.fnai.org/biodiversitymatrix/index.html
ECT, 2014.

Table 3.5-2

Federally and State-Listed Wildlife Species Known to Occur in Osceola, Okeechobee, Polk, Martin, and St. Lucie Counties, Florida with the Potential to Occur along the FSC Project Route

Scientific Name	Common Name	Status		FNAI Observation Within 1 Mile	Likelihood of Occurrence
		Federal a/	State b/		
Amphibians					
Rana capito	Gopher frog	NL	SSC	08/21/1998	Moderate
Reptiles					
Alligator mississippiensis	American alligator	FT(S/A)	NL	02/1992	Observed, multiple
Caretta caretta	Loggerhead sea turtle	LT	NL	Not Observed	Unlikely
Chelonia mydas	Green sea turtle	LE	NL	Not Observed	Unlikely
Crocodylus acutus	American crocodile	LT	NL	Not Observed	Unlikely
Dermochelys coriacea	Leatherback sea turtle	LE	NL	Not Observed	Unlikely
Drymarchon couperi	Eastern indigo snake	LT	FT	11/24/1998	Moderate
Eretmochelys imbricata	Hawksbill sea turtle	LE	NL	Not Observed	Unlikely
Eumeces egregius lividus	Blue-tailed mole skink	LT	FT	11/17/1987	Low
Gopherus polyphemus	Gopher tortoise	C	ST	09/09/2003	Observed, multiple
Neoseps reynoldsi	Sand skink	LT	FT	11/17/1987	Moderate
Pituophis melanoleucus mugitus	Florida pine snake	NL	SSC	Not Observed	Low
Stilosoma extenuatum	Short-tailed snake	NL	ST	Not Observed	Low
Birds					
Ammodramus savannarum floridanus	Florida grasshopper sparrow	LE	FE	1984	Low
Aphelocoma coerulescens	Florida scrub-jay	LT	FT	06/08/1982	Moderate
Aramus guarauna	Limpkin	NL	SSC	Not Observed	Moderate

Table 3.5-2

Federally and State-Listed Wildlife Species Known to Occur in Osceola, Okeechobee, Polk, Martin, and St. Lucie Counties, Florida with the Potential to Occur along the FSC Project Route

Scientific Name	Common Name	Status		FNAI Observation Within 1 Mile	Likelihood of Occurrence
		Federal a/	State b/		
Athene cunicularia floridana	Florida burrowing owl	NL	SSC	06/21/1989	Observed MP 45, 46
Calidris canutus rufa	Red knot	PT	NL	Not Observed	Unlikely
Campephilus principalis	Ivory-billed woodpecker	LE	NL	Not Observed	Unlikely, presumed extinct
Charadrius melodus	Piping plover	LT	NL	Not Observed	Unlikely
Dendroica kirtlandii	Kirtland's warbler	LE	NL	Not Observed	Unlikely
Egretta caerulea	Little blue heron	NL	SSC	04/21/1988	Observed
Egretta thula	Snowy egret	NL	SSC	Not Observed	Observed
Egretta tricolor	Tricolored heron	NL	SSC	Not Observed	Observed MP 66
Eudocimus albus	White ibis	NL	SSC	Not Observed	Observed
Falco sparverius paulus	Southeastern American kestrel	NL	ST	Not Observed	High
Grus americana	Whooping crane	Experimental population	NL	Not Observed	Unlikely
Grus canadensis pratensis	Florida sandhill crane	NL	ST	02/1992	Observed MP 6, 36, 68, 72, 123; Nest at MP 62
Haliaeetus leucocephalus	Bald eagle	NL	NL	2003	Observed nest east of MP 99
Mycteria americana	Wood stork	LE	FE	Not Observed	Observed MP 66
Picoides borealis	Red-cockaded woodpecker	LE	FE	Not Observed	Low
Platalea ajaja	Roseate spoonbill	NL	SSC	Not Observed	Low
Polyborus plancus audubonii	Crested caracara	LT	FT	1978	Observed MP 58, 63, 66, 67, 78, 97,112
Rostrhamus sociabilis plumbeus	Snail kite	LE	FE	Not Observed	Low

Table 3.5-2

Federally and State-Listed Wildlife Species Known to Occur in Osceola, Okeechobee, Polk, Martin, and St. Lucie Counties, Florida with the Potential to Occur along the FSC Project Route

Scientific Name	Common Name	Status		FNAI Observation Within 1 Mile	Likelihood of Occurrence
		Federal a/	State b/		
Mammals					
Eumops floridanus	Florida bonneted bat	LE	NL	Not Observed	Unlikely
Peromyscus polionotus niveiventris	Southeastern beach mouse	LT	NL	Not Observed	Unlikely
Podomys floridanus	Florida mouse	NL	SSC	Not Observed	Moderate
Puma concolor coryi	Florida panther	LE	FE	Not Observed	Low
Sciurus niger shermanii	Sherman's fox squirrel	NL	SSC	Not Observed	Observed MP 111, 121
Trichechus mantaus	West Indian manatee	LE	NL	Not Observed	Unlikely

a/ LE = Listed Endangered
LT = Listed Threatened
PT = Proposed Threatened
C = Candidate for Listing
FT(S/A) = Federally-designated Threatened Due to Similarity of Appearance
NL = Not Listed

b/ FE = Federally Endangered
FT = Federally Threatened
ST = State Threatened
SSC = State Species of Special Concern
NL = Not Listed

Sources:
USFWS, 2014. http://ecos.fws.gov/tess_public/pub/stateListingAndOccurrenceIndividual.jsp?state=FL&s8fid=112761032792&s8fid=112762573902
FWC, 2014. http://myfwc.com/wildlifehabitats/imperiled/profiles/
FNAI, 2014. http://www.fnai.org/biodiversitymatrix/index.html
ECT, 2014.
Cardno-Entrix, 2014. Latt Maxcy Property-Florida Southeast Connection Listed Species Survey Report, prepared for Florida Southeast Connection.

APPENDIX A

DESCRIPTIONS, IMPACTS, AND MITIGATION OF FEDERALLY-LISTED PLANT SPECIES KNOWN TO OCCUR IN OSCEOLA, OKEECHOBEE, POLK, MARTIN, AND ST. LUCIE COUNTIES, FLORIDA WITH THE POTENTIAL TO OCCUR ALONG THE FSC PROJECT ROUTE

FLORIDA SOUTHEAST CONNECTION

Appendix A

Descriptions, Impacts, and Mitigation of Federally-Listed Plant Species Known to Occur in Osceola, Okeechobee, Polk, Martin, and St. Lucie Counties, Florida with the Potential to Occur along the FSC Project Route

Avon Park Hare-Bells (*Crotalaria avonensis*)

Avon Park hare-bells is a scrub-dependent species occurring in Polk County (USFWS, 1999). This plant species inhabits scrub communities and prefers full sun, bare sandy soils, and may also grow along trails and previously disturbed roadbeds (USFWS, 1999). Although none were observed during the field survey, potential habitat to support this species exists along the FSC Project route. It is noteworthy that scrub habitat along the FSC Project route in Polk County is limited; within those scrub areas, FSC would be following existing linear disturbances, such as highways. Construction and operation associated with the project may affect, but are not likely to adversely affect, Avon Park harebells, should it occur along the FSC Project route. According to Delaney and Wunderlin (1989) this plant species has been successfully propagated and should be a good candidate for population reestablishment, especially with proper post-construction practices, such as avoiding placement of sod as it may preclude establishment of the species.

Britton's Beargrass (*Nolina brittoniana*)

Britton's beargrass occurs in a wide range of habitat types, from relatively open scrub to hammocks with closed canopies, and was recorded in Polk and Osceola Counties (efloras.org, nd; CPC, 2010). This plant species prefers upland sites, where soil is droughty and infertile, and fire-dependent and fire-maintained ecosystems (CPC, 2010). The largest remaining populations and largest tracts of occupied habitat for this species are in Polk and Highlands Counties, on conservation lands, in both scrub and sandhill vegetation. It is locally abundant and apparently secure, so much so that only minimal monitoring is done at the Tiger Creek Preserve, where sandhill is being restored by frequent prescribed fires. Populations of this plant are believed to be relatively stable, in large part because the individual plants are long-lived (USFWS, 2013b).

None were observed during the field surveys, and marginal habitat to support this species exists along the FSC Project route. Scrub habitat within the study corridor in Polk County is limited, and within those scrub areas, FSC would be following existing linear disturbances, such as roads. Construction and operation associated with the FSC Project may affect, but is not likely to adversely affect, Britton's beargrass. Because the species can grow in open scrub, post-construction practices and maintenance of the FSC Project facilities should not change existing habitat management practices and prevent the species from further recruitment along the FSC Project route.

Carter's Warea (*Warea carteri*)

Carter's warea is an annual herb that grows in pinelands, scrubby flatwoods, scrub, and sandhill habitats along the Lake Wales Ridge and was recorded in Polk County (FNAI, 2000; Hill, 2006). Although none were observed during the field survey, some potential habitat to support this species exists along the FSC Project route. Scrub habitat along the FSC Project route in Polk County is limited. Within those scrub areas, FSC would be following existing linear disturbances, such as roads. Construction and operation associated with the FSC Project may affect, but is not likely to adversely affect, Carter's warea. Fire management is a critical concern for this species, and prolonged intervals between fires are likely to result in the real loss of viable seeds from the seed bank and declines in population sizes (FNAI, 2000; Hill, 2006). Scrub habitat along the FSC Project route mainly occurs in association with roads and is likely not currently

being fire-managed; post-construction practices and maintenance of the corridor should not change existing habitat management practices, and prescribed burning will be allowed.

Wide-Leaf Warea (*Warea amplexifolia*)

The habitat for this summer annual herb includes long-leaf pine or scrubby oak forests along the Lake Wales Ridge (CPC, 2010a). Wide-leaf warea was recorded in Polk and Osceola Counties (CPC, 2010a). Like many plant species found in these communities, it is believed that wide-leaf warea is fire-dependent (CPC, 2010a). Because the fire regime of these communities along the FSC Project route has been suppressed for a long time, the likelihood of occurrence for this plant species is low, and none were recorded during the field surveys. Should Wide-leaf warea occur along the FSC Project route, construction and operation associated with FSC Project may adversely affect those individuals occurring within the right-of-way, because construction and maintenance associated with the FSC Project would preclude the formation of forested communities. It would be unlikely however that the FSC Project would adversely affect the species.

Florida Beargrass (*Nolina atopocarpa*)

According to the Atlas of Florida Vascular Plants (2014), Florida beargrass is not found in the counties where the FSC Project is located. Therefore this species is unlikely to be affected.

Florida Blazing Star (*Liatris ohlingerae*)

This plant is a perennial herb, which grows on rosemary balds, especially edges transitional to oak scrub, scrubby flatwoods, and disturbed scrub with records in Polk County (FNAI, 2000a). Although none were observed during the field surveys, potential habitat to support this species exists along the FSC Project route. Should the species occur within the right-of-way, construction and operation associated with the FSC Project is not likely to adversely affect Florida blazing star, especially with proper post-construction practices, such as avoiding placement of sod as it may preclude establishment of the species.

Florida Bonamia (*Bonamia grandiflora*)

Florida bonamia is a perennial trailing vine that prefers to colonize habitats of open or disturbed scrub, sand pine, and scrub oak with records in Polk County (USFWS, 2013). Only marginal habitat to support this species exists along the FSC Project route. Scrub habitat along the FSC Project route in Polk County is limited. Within those scrub areas, FSC would be following existing linear disturbances, such as roads. Florida bonamia was not observed during the field survey, and the likelihood of its occurrence along the FSC Project route is low, because of it being a fire-dependent species, and because only marginal habitat to support its existence is found within corridor boundaries (USFWS, 2013). The fire regime of communities located along the FSC Project route has been suppressed for a long time. Construction and operation associated with the FSC Project is not likely to adversely affect Florida bonamia.

Florida Jointweed (*Polygonella basiramia*)

This species is a perennial herb and a member of the Florida scrub plant community (Hawkes and Menges, 1995). It occurs in openings in the scrubs dominated by rosemary, sand pine, other pines, and oaks, and was recorded in Polk County (Hawkes and Menges, 1995). Although none were observed during the field survey, potential habitat to support this species exists along the FSC Project route. Construction and operation associated with the FSC Project may affect, but is not likely to adversely affect, Florida jointweed, should it occur along the FSC Project route. According to Hawkes and Menges (1995), the plant species' primary need for successful reproduction and propagation is open sand habitat. With proper post-construction practices,

such as avoiding placement of sod and restricted or targeted use of herbicides, the FSC Project should have no negative effects on the species.

Four-Petal Pawpaw (*Asimina tetramera*)

This pawpaw is found only in sand pine scrub vegetation on old, coastal dunes (USFWS, 1999(a); Austin and Tatje, 1979). The likelihood of occurrence along the FSC Project route is unlikely.

Fragrant Prickly Apple (*Harrisia fragrans*)

The fragrant prickly apple is a rare species of cactus, with records in St. Lucie County (USFWS, 1999(b)). The plant's favored natural habitat is mostly coastal hammocks with some shade, as the cactus can become desiccated in full sun (UFSWS, 1999(b)). Coastal hammocks do not occur along the FSC Project route; therefore, it is highly unlikely for this species to occur along the FSC Project route.

Highlands Scrub Hypericum (*Hypericum cumulicola*)

This plant is a perennial herb found in sunny areas within oak and rosemary scrub (CPC, 2010(b); Quintana-Ascencio, 1995). It is endemic to the Lake Wales Ridge of Polk County (CPC, 2010(b); Quintana-Ascencio, 1995). Scrub habitat within the study corridor in Polk County is limited. Within those scrub areas, FSC would be following existing linear disturbances, such as roads. Highlands scrub hypericum was not observed during the field surveys, and the likelihood of its occurrence along the FSC Project route is low, because it is a fire-dependent species, and because only marginal habitat to support its existence is found within the FSC Project boundaries (CPC, 2010(b); Quintana-Ascencio, 1995). The fire regime of communities located along the FSC Project route has been suppressed for a long time. Construction and operation associated with FSC Project may affect, but is not likely to adversely affect, highlands scrub hypericum.

Lakela's Balm (*Dicerandra immaculata*)

This plant is endemic to the Atlantic Coastal Ridge of Florida (Hill, 2006(a)). It was first described in 1963 (Lakela, 1963), and known to occur naturally only in coastal scrub and pine scrub areas in Indian River and St. Lucie Counties, with most known plants in an area of old dune with an elevation of 45 feet (Hill, 2006(a)). This area is approximately 0.5 mile wide and 3 miles long, lying between Vero Beach and Fort Pierce. The FSC Project route is located in the western half of St. Lucie County; therefore, it is not expected that this species would occur along the FSC Project route.

Lewton's Polygala (*Polygala lewtonii*)

Lewton's polygala is a perennial herb found in sunny openings and often colonizes disturbed sites, such as roadsides, fire lanes, and power line clearings, as well as scrub habitat ranging from high pine to turkey oak barrens (USFWS, 1999(c); CPC, 2010(c)). Lewton's polygala was recorded in Polk and Osceola Counties (USFWS, 1999(c); CPC, 2010(c)). Although none were observed during the field survey, habitat to support this species exists along the FSC Project route. Should the species occur along the FSC Project route, construction and operation associated with FSC Project may affect, but is not likely to adversely affect, this species, especially with proper post-construction practices, such as avoiding placement of sod and restricted or targeted use of herbicides, since these may preclude establishment of the species. In fact, construction of the FSC Project may even create more habitat for this species.

Paper Nailwort (*Paronychia chartacea* ssp. *chartacea*)

This plant is a short-lived dioecious herb, forming small mats (USFWS, 1999(d)). Paper nailwort was recorded in Polk and Osceola Counties, associated with Lake Wales Ridge (USFWS, 1999(d)). The natural habitat for the paper nailwort is rosemary scrub, also known as the rosemary phase of sand pine (USFWS, 1999(d)). Within this scrub community, paper nailwort is more abundant in disturbed, sandy habitats, such as road rights-of-way and recently cleared or disturbed sites, such as along fire lanes or trails (USFWS, 1999(d)). The density of this plant species increases in relation to available open space (Hawkes and Menges, 1996). Because it thrives in fire lanes and along sand roads and trails, construction and operation associated with the FSC Project may affect, but is not likely to adversely affect, this species, especially with proper post-construction practices, such as avoiding placement of sod and restricted or targeted use of herbicides, since these may preclude establishment of the species.

Pygmy Fringe Tree (*Chionanthus pygmaeus*)

This plant is a shrub or small tree, usually less than 10 feet tall, and is recorded in Polk and Osceola Counties (FNAI, 2000(b); USFWS, 1999(e)). It prefers scrub, sandhill, high pineland, xeric hammock, and transitional habitats, primarily associated with Lake Wales Ridge (FNAI, 2000(b); USFWS, 1999(e)). Scrub habitat within the study corridor in Polk and Osceola Counties is limited. Within those scrub areas, FSC would be following existing linear disturbances, such as roads or railroads. Should pygmy fringe tree occur along the FSC Project route, construction and operation associated with the FSC Project may affect or may adversely affect these individuals, because construction and maintenance associated with the FSC Project would preclude the formation of forested communities and would not allow the tree to reach maturity. It would however be unlikely that the FSC Project would adversely affect the species or local populations of the species.

Scrub Buckwheat (*Eriogonum longifolium* var. *gnaphalifolium*)

This plant is a perennial herb, recorded in Polk and Osceola Counties (USFWS, 2013(a); FNAI, 2000(c); ABS, 2013). It occurs in habitats intermediate between scrub and sandhills (high pine) and in turkey oak barrens (USFWS, 2013(a); FNAI, 2000(c); ABS, 2013). Over the long term, a population viability analysis shows that scrub buckwheat populations require fire at intervals of 5 to 20 years to remain viable (Satterthwaite et al., 2002). Only marginal habitat to support this species exists along the FSC Project route. Scrub habitat along the FSC Project route in Polk and Osceola Counties is limited. Within those scrub areas, FSC would be following existing linear disturbances, such as roads. The fire regime of communities located along the FSC Project route has been suppressed for a long time. Scrub buckwheat was not observed during the field survey, and the likelihood of its occurrence along the FSC Project route is low, because of it being a fire dependent species, and because only marginal habitat to support its existence is found along the FSC Project route. Construction and operation associated with the FSC Project may affect, but is not likely to adversely affect, highlands scrub hypericum.

Scrub Lupine (*Lupinus aridorum*)

This plant is a biennial or perennial herb, recorded in Polk and Osceola Counties (FNAI, 2000(d); USFWS, 2009; CPC, 2010(d)). This plant prefers open patches in sand pine and rosemary scrub and grows primarily in well-drained sandy white or occasionally yellow soils where the turkey oak woods have invaded the sand pine scrub (FNAI, 2000(d); USFWS, 2009; CPC, 2010(d)). According to J. Stout, University of Central Florida, this species is not dependent on fire management compared to other scrub-dependent plant species. Although none were observed during the field surveys, potential habitat to support this species exists along the FSC Project route. Scrub habitat along the FSC Project route in Polk and Osceola

Counties is limited. Within those scrub areas, FSC would be following existing linear disturbances, such as roads. Because the likelihood of occurrence for this species is low, construction and operation associated with the FSC Project may affect, but is not likely to adversely affect, the species.

Scrub Mint (*Dicerandra frutescens*)

Scrub mint is a low growing shrub approximately one foot in height, is endemic to Florida, and grows in sand pine, scrub, and sandhill habitats of the Lake Wales Ridge, with records in Polk County (USFWS, 1999(f)). Because scrub habitat along the FSC Project route in Polk County is limited, and, within those scrub areas, FSC would be following existing linear disturbances, such as roads, there is low potential for the plant to occur in other suitable habitats along the FSC Project route. Should scrub mint occur within the project boundaries, construction and operation associated with the FSC Project may adversely affect those individuals, because construction and maintenance associated with the FSC Project would preclude the formation of forested and shrub communities and would not allow scrub mint to reach maturity. It would however be unlikely that the FSC Project would adversely affect the species or local populations of the species.

Scrub Pigeon-Wing (*Clitoria fragrans*)

Scrub pigeon-wing is a perennial herb belonging to the pea family (FNAI, 2000(e); USFWS, 1999(g)). Its preferred habitat includes turkey oak barrens with wire grass, bluejack and turkey oak, scrub hickory, and scrub and scrubby high pine (FNAI, 2000(e); USFWS, 1999(g)). Studies at Archbold Biological Station have documented positive post-fire responses in flowering and vegetative growth of scrub pigeon-wing. Scrub habitat along the FSC Project route in Polk County is limited. Within those scrub areas, FSC would be following existing linear disturbances, such as roads. Scrub pigeon-wing was not observed during the field surveys, and the likelihood of its occurrence along the FSC Project route is low, because it is a fire dependent species, and because only limited habitat to support its existence is found along the FSC Project route. The fire regime of communities located along the FSC Project route has been suppressed for a long time. Construction and operation associated with the FSC Project may affect, but is not likely to adversely affect, scrub pigeon-wing.

Scrub Plum (*Prunus geniculata*)

Scrub plum is a scraggly, heavily branched shrub growing up to 6 feet tall, recorded in Polk County (USFWS, 2009(a); FNAI, 2000(f); CPC, 2010(e)). This plant prefers sandhill and sand pine-oak scrub xeric upland habitats on the Lake Wales Ridge of Central Florida (USFWS, 2009(a); FNAI, 2000(f); CPC, 2010(e)). Because scrub habitat along the FSC Project route in Polk County is limited, and, within those scrub areas, FSC would be following existing linear disturbances, such as roads, there is low potential for the plant to occur along the FSC Project route. Should scrub plum occur along the FSC Project route, construction and operation associated with the FSC Project may adversely affect the individuals found there, because construction and maintenance associated with the FSC Project would preclude the formation of forested and shrub communities and would not allow these plants to reach maturity. It would however be unlikely that the FSC Project would adversely affect the species.

Florida Ziziphus (*Ziziphus celata*)

This plant is a spiny shrub growing up to 6.5 feet tall (USFWS, 1999(h); ABS, 2013(a)). Florida ziziphus is a shrub that is endemic to the Lake Wales Ridge in Central Florida and occurs in Polk County (USFWS, 1999(h); ABS, 2013(a)). This plant, which was believed extinct until 1987, occurs on the periphery of turkey oak sandhills or yellow sand oak-hickory scrub communities (USFWS, 1999(h); ABS, 2013(a)). Because scrub habitat along the FSC Project

route in Polk County is limited, and, within those scrub areas, FSC would be following existing linear disturbances, such as roads, the likelihood of this plant occurring along the FSC Project route is extremely low. Also, recorded populations in the wild do not appear to reproduce (USFWS, 1999(h); ABS, 2013(a)). Ellis et al. (2007) concluded that the long-term persistence of Florida ziziphus populations requires the translocation of cross compatible genotypes to establish sexually reproducing populations. Should Florida ziziphus occur along the FSC Project route, construction and operation associated with the FSC Project may affect, but is not likely to adversely affect, this species.

Short-Leaved Rosemary (*Conradina brevifolia*)

This plant is a perennial shrub reaching up to 3.5 feet in height, which grows on the Lake Wales Ridge in Polk County (USFWS, 1999(i); CPC, 2010(f)). It inhabits white sand scrub with scattered overstory of sand pine and scrub oak in clearings with other endemic shrubs and herb scrub vegetation (USFWS, 1999(i); CPC, 2010(f)). Existing information on the natural fire regimes of various scrub communities suggest that the white sand, scrub oak-dominated vegetative complex, within which short-leaved rosemary is commonly found, generally requires periodic, patchy, high-intensity fires (USFWS, 1999(i); CPC, 2010(f)). Scrub habitat along the FSC Project route in Polk County is limited. Within those scrub areas, FSC would be following existing linear disturbances, such as roads. Short-leaved rosemary was not observed during the field survey, and the likelihood of its occurrence along the FSC Project route is low, because it is a fire dependent species, and because only marginal habitat to support its existence is found along the FSC Project route. The fire regime of communities located within the project corridor has been suppressed for a long time. Should short-leaved rosemary occur along the FSC Project route, construction and operation associated with the FSC Project may adversely affect those individuals, because construction and maintenance associated with the FSC Project would preclude the formation of forested and shrub communities and would not allow short-leaved rosemary to reach maturity. It would however be unlikely that the FSC Project would adversely affect the species.

Small's Jointweed (*Polygonella myriophylla*)

This plant is a mat-forming sub-shrub that spreads along the ground and forms low mats (FNAI, 2000(g)). It occurs in association within the Lake Wales Ridge and is recorded in Polk and Osceola Counties (FNAI, 2000(g)). Small's jointweed is a member of the Florida scrub plant community and prefers dry white-sand scrub dominated by Florida rosemary, as well as oak scrub, flatwoods, roadsides, and occasionally sandhills (FNAI, 2000(g)). Potential habitat for its occurrence does exist along the FSC Project Route. Because this plant can grow along roadsides, and because, in scrub habitat, FSC would be following existing linear disturbances, such as roads, construction and operation associated with the FSC Project may affect, but is not likely to adversely affect, this species. Proper post-construction practices, such as avoiding placement of sod and restricted or targeted use of herbicides, may allow this species to reestablish.

Tiny Polygala (*Polygala smallii*)

The only known populations of tiny polygala occur in sand pockets of pine rocklands, open sand pine scrub, slash pine, high pine, and well-drained coastal spoil (USFWS, 1999(j); FNAI, 2000(h)). All 11 known populations are found within 6 miles of the Atlantic Coast (USFWS, 1999(j); FNAI, 2000(h)). It is highly unlikely for this species to occur along the FSC Project route.

Perforate Reindeer Lichen (*Cladonia perforata*)

This lichen is known from the high rosemary scrub habitats of Central Florida (USFWS, 1999(k)). It has been reported in Polk, Osceola, and coastal scrubs of Martin County (USFWS, 1999(k)). This lichen is usually conspicuous on white sand patches within scrub areas, dominated by scrub oaks and sand pines (Evans, nd). Loss of scrub habitat and trampling by man and machines/vehicles are the primary reasons for its rarity (Evans, nd). Many of the site locations where it has been found are currently protected, however (Evans, nd). It does not survive in fire, even though the habitats it occurs in are fire-maintained (Evans, nd). It is believed the open sand patches are refugia from the fires (Evans, nd). While there is a possibility this species could occur in scrub areas along the FSC Project route, its likelihood of occurrence would be considered low. The FSC pipeline restoration would result in sandy topsoil replacement after construction, which could serve as recruitment habitat for the plant, if found in the vicinity.

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APPENDIX B

DESCRIPTIONS OF FEDERALLY AND STATE-LISTED WILDLIFE SPECIES KNOWN TO OCCUR IN OSCEOLA, OKEECHOBEE, POLK, MARTIN, AND ST. LUCIE COUNTIES, FLORIDA WITH THE POTENTIAL TO OCCUR ALONG THE FSC PROJECT ROUTE

Appendix B

Descriptions of Federally- and State-Listed Wildlife Species Known to Occur in Osceola, Okeechobee, Polk, Martin, and St. Lucie Counties, Florida with the Potential to Occur along the FSC Project Route

The following species descriptions were derived from the following sources: (http://myfwc.com/wildlifehabitats/profiles/; http://www.fnai.org/biodiversitymatrix/index.html; http://ecos.fws.gov/tess_public/pub/stateListingAndOccurrenceIndividual.jsp?state=FL; Florida Fish and Wildlife Conservation Commission (FWC). 2013; Florida Natural Areas Inventory (FNAI). 2014. Field Guide to the Rare Animals of Florida (Online); Cardno Entrix. Field surveys. 2014; ECT. Field surveys. 2013, 2014)

Amphibians

Gopher Frog (*Rana capito*)

This amphibian is listed as a species of special concern by the FWC. It is typically considered a commensal species to the gopher tortoise. Therefore, habitat requirements tend to be xeric upland habitats that support gopher tortoise populations. FNAI records exist for this animal for all five counties crossed by the route, and two records occur within the environmental survey area in Polk County. Wherever xeric habitats and gopher tortoise burrows are found, there is a moderate likelihood for this species to be present.

Reptiles

American Alligator (*Alligator mississippiensis*)

The alligator is listed as threatened due to similarity of appearance to the American crocodile by the USFWS and FWC. This reptile was observed along the FSC Project route and would commonly be present in wetlands and water bodies.

Eastern Indigo Snake (*Drymarchon corais couperi*)

This distinctive large, black snake can occur in suitable habitats throughout Florida. It has a wide range of habitat preferences and prey species and requires large tracts of land for survival. Often considered as a gopher tortoise commensal, it can be found in xeric habitats but also uses more mesic or wetland habitats for foraging. Both USFWS and FWC list the indigo snake as a threatened species. There is a moderate likelihood that the indigo snake would be found along the FSC Project Route. The FNAI has one record of this animal along the FSC Project route in Polk County.

Bluetail Mole Skink (*Eumeces egregius lividus*)

This skink is listed as threatened by the USFWS. It occurs in well-drained sandy uplands above 100 feet usually with an abundance of scattered shrubs and lichens. It favors rosemary, oak, and sand pine scrubs and is found occasionally in turkey oak barrens, sandhill, and xeric hammock. It requires loose sand (for burrowing) with patches of sparse to no groundcover or canopy and is often found in leaf litter. It is restricted to the Lake Wales Ridge in Polk, Highlands, and western Osceola Counties. FNAI records exist for this skink in Polk and Osceola Counties, and there is one FNAI record of this species along the FSC Project route. Its likelihood of occurrence is still considered low throughout much of the FSC Project route.

Gopher Tortoise (*Gopherus polyphemus*)

Gopher tortoises are listed as threatened species by the FWC and a candidate species for listing by the USFWS. They are typically found in xeric habitats, which are prevalent along the proposed corridor. As anticipated, there are a number of FNAI gopher tortoise records along the

FSC Project route. Additionally field crews recorded 152 gopher tortoise observations within all five counties during routine wildlife surveys. Gopher tortoise burrows are used by a number of other listed and non-listed wildlife species. As such, they are considered a keystone species and are obviously present along the FSC Project route.

Sand Skink (*Neoseps reynoldsi*)

This species is listed as threatened by the USFWS. It is a small, fossorial skink that is endemic to the sandy ridges of Central Florida, occurring in Highlands, Lake, Marion, Orange, Osceola, Polk, and Putnam Counties. Preferred habitats include xeric uplands with sandy soils, including rosemary scrub, scrubby flatwoods, and oak scrub. There are four FNAI records of this species in Polk and Osceola Counties along the FSC Project route, and it has a moderate likelihood to occur in xeric habitats elsewhere along the FSC Project route.

Florida Pine Snake (*Pituophis melanoleucus mugitus*)

The Florida pine snake is listed as a species of special concern by the FWC. It prefers longleaf pine/xeric oak woodlands and may use gopher tortoise burrows, similar to a number of other listed wildlife species. Although records exist in Polk County, there are no FNAI records for this species along the FSC Project route, and there is a low potential for it to occur due to lack of suitable habitat.

Short-Tailed Snake (*Stilosoma extenuatum*)

The short-tailed snake is listed as threatened by the FWC. It is generally restricted to xeric sandhill communities, which are found along the FSC Project route, especially in Polk and Osceola Counties. It is a secretive burrower, rarely seen above ground. Although the animal has been recorded in Polk County, the FNAI does not have records for this species along the FSC Project route, so there is a low likelihood of occurrence for this species.

Birds

Based on current FNAI records, there are no known wading bird colonies along the FSC Project route.

Florida Grasshopper Sparrow (*Ammodramus savannarum floridanus*)

This bird species is listed as endangered by the USFWS. This is a subspecies of grasshopper sparrow that is endemic to the dry prairies of Central and South Florida. FNAI has records of this bird for Polk, Osceola, and Okeechobee Counties. Their habitat consists of large, treeless, relatively poorly drained grasslands that have a history of frequent fires. The Florida grasshopper sparrow occurs in prairies dominated by saw palmetto and dwarf oaks. Bluestem grasses, St. John's wort, and wiregrasses are also typically found within Florida grasshopper sparrow habitat. There are two FNAI records of this species along the FSC Project route in Osceola County. Given its rarity but the prevalence of some suitable habitat along a large part of the FSC Project route, it has a low potential to occur.

Florida Scrub Jay (*Aphelocoma coerulescens*)

The Florida scrub jay prefers xeric scrub habitats generally found along the Lake Wales Ridge of Florida, which is located close to the FSC Project route. It has been found in all five counties crossed by the FSC Project. The FNAI revealed six recorded observations along the FSC Project route; two in Osceola County and four in Polk County. The scrub jay is listed as threatened by the USFWS and has a moderate likelihood to occur in suitable habitats along the FSC Project route.

Limpkin (*Aramus guarauna*)

The FWC lists the limpkin as a species of special concern. It is generally common in Central and South Florida, where it inhabits freshwater marshes, swamps, lake and river margins, swales, strand swamps, sloughs, and impoundments. It has been found in all five counties crossed by the FSC Project. The likelihood of occurrence along the FSC Project route is considered moderate due to the prevalence of these habitats, although there are no FNAI records of this species along the FSC Project route.

Burrowing Owl (*Athene cunicularia floridana*)

The burrowing owl prefers xeric pastures with low vegetation. The FSC Project crosses some dry pastures and croplands. Two records exist along the FSC Project route (one each in Polk and Osceola Counties) according to the FNAI; however, the animal has been observed in Lake Wales State Forest by FSC representatives during field reconnaissance. It was also observed during field surveys in Polk County. It is state listed as a species of special concern.

Little Blue Heron (*Egretta caerula*)

This wading bird is listed as a species of special concern by the FWC and is found in suitable wetlands throughout Florida. The little blue heron prefers freshwater habitats for foraging. This heron is likely to be found foraging in suitable habitats along the FSC Project route. The FNAI has one record of a known location along the FSC Project route in Okeechobee County. Field surveys found three locations of this bird, all in Okeechobee County.

Snowy Egret (*Egretta thula*)

The FWC lists snowy egrets as a species of special concern. This wading bird is widely distributed in Florida in both fresh and saltwater systems. The snowy egret is likely to occur in wetlands along the FSC Project route and was documented along the FSC Project route by the current survey efforts.

Tricolored Heron (*Egretta tricolor*)

The tricolored heron is a species of special concern as listed by the FWC. This wading bird species prefers estuarine habitats but can be found foraging in almost any wetland system. This species may occur within wetlands along the FSC Project route but has not been documented in the area by the FNAI. One field observation was made in Osceola County by FSC wildlife survey crews.

White Ibis (*Eudocimus albus*)

Although the white ibis is one of the most common wading birds in Florida, the FWC lists it as a species of special concern. Large flocks of this bird are often seen foraging in shallow marshes or wet pastures. The white ibis is likely to occur in suitable wetlands along the FSC Project route and was observed during field surveys.

Southeastern American Kestrel (*Falco sparverius paulus*)

This small falcon is the resident subspecies that breeds in Florida. The more common northern migrant is seen commonly in the winter months perching on snags and power lines along road sides in Central Florida. This species is listed as threatened by the FWC. The open habitats found along the FSC Project route provide good foraging habitat for this bird, so there is a high likelihood it could be found. It is recorded in all five counties crossed by the FSC Project, although no records have been documented by the FNAI to date along the FSC Project route.

Florida Sandhill Crane (*Grus canadensis pratensis*)

The sandhill crane is listed as threatened by the FWC. The sandhill crane prefers marshes for nesting and pastures, wet prairies, or farm fields for foraging. Given the potential habitats along the FSC Project route, the likelihood of occurrence of this species is considered high. There is one known FNAI record for this species in Okeechobee County along the FSC Project route. Two observations were also made by field crews in Polk County.

Bald Eagle (*Haliaeetus leucocephalus*)

The USFWS delisted the bald eagle in 2007, and the FWC delisted it in 2008, but it is still protected by state and federal management guidelines. The eagle is making a comeback in population numbers in the United States, and in Florida eagle nests are becoming more common. The FNAI has records for 13 eagle nests near the FSC Project route. One of these is in Okeechobee County, and the other 12 are in Polk County. Although no nests were observed within the FSC Project area, an active nest was observed several hundred feet to the east near MP 99. This bird's likelihood of occurrence along the FSC Project route is considered high.

Wood Stork (*Mycteria americana*)

The wood stork is an endangered species as listed by the USFWS. This large bird is primarily associated with freshwater and estuarine habitats for nesting, roosting, and foraging. Wood storks typically construct their nests in medium to tall trees that occur in stands located either in swamps or on islands surrounded by relatively broad expanses of open water. They are found across much of peninsular Florida. Wood storks tend to use the same colony sites over many years, as long as the sites remain undisturbed and sufficient feeding habitat remains in the surrounding wetlands. There are no known nesting colonies along the FSC Project route or within one mile, though individuals of the species almost certainly would be found foraging in marshes and ditches. Field surveys resulted in two observations in the FSC Project area. The wood stork core foraging area ("CFA") is an 18.6-mile radius around active nesting colonies where storks may likely forage. The proposed corridor intersects eight CFAs.

Red-Cockaded Woodpecker (*Picoides borealis*)

This species is listed as endangered by the USFWS. Pine-dominated pine/hardwood stands, with a low or sparse understory and ample old-growth pines, constitute primary red-cockaded woodpecker nesting and roosting habitat. Nest and roost cavities are almost always excavated in old age living pines, particularly longleaf and slash pines. This species is still widely distributed in the state, but substantial populations now occur only in the Panhandle (accounting for approximately 75 percent of the total population in Florida); elsewhere, populations are relatively small and disjunct. This species has a low likelihood to occur along the FSC Project route, as no records are found within the FNAI database, and suitable old growth pine stands are lacking.

Roseate Spoonbill (*Platalea ajaja*)

Roseate spoonbills are conspicuous birds that nest and forage primarily along the coast. These birds do occasionally forage inland and therefore have a low likelihood to occur along the FSC Project route, although there are no FNAI records of such. This spoonbill is listed as a species of special concern by the FWC.

Crested Caracara (*Polyborus plancus audubinii*)

This raptor is listed as a threatened species by the USFWS. It is present in Central and South Florida, including all five counties crossed by the FSC Project. Caracaras commonly occur in dry or wet prairie areas with scattered cabbage palms or in lightly wooded areas of scattered saw palmetto, scrub oaks, and cypress. Caracaras are highly opportunistic in their feeding

habits, eating carrion and capturing live prey. There are seven FNAI records for caracaras along the FSC Project route in Okeechobee, Polk, and Osceola Counties. Field surveys also recorded seven observations along the FSC Project route in Osceola, Okeechobee, and St. Lucie Counties. Therefore, the caracara does occur along the FSC Project route, although no indication of nests was observed.

Everglade Snail Kite (*Rostrhamus sociabilis plumbeus*)

This federally endangered bird prefers habitats consisting of slow-moving water with emergent vegetation such as maidencane or sawgrass. This species is typically found in the Lake Okeechobee area southward through the Everglades. The southern portion of the FSC Project route is within the normal range of this species; however, there are no known FNAI occurrences along the FSC Project route. The chances of it nesting along the FSC Project route are relatively low.

Mammals

Florida Mouse (*Podomys floridanus*)

The Florida mouse resides in xeric upland communities with sandy soils, including scrub and longleaf pine-xeric oak. They are recognized as a commensal to the gopher tortoise, commonly found residing in tortoise burrows. In the absence of gopher tortoises, Florida mice will dig their own burrows. Gopher tortoises occur along the FSC Project route, and the potential for the Florida mouse to occur there is moderate, although FNAI reports no records of it along the FSC Project route. The Florida mouse is considered a species of special concern by the FWC.

Florida Bonneted Bat (*Eumops floridanus*)

The Florida bonneted bat is known to roost in trees, and loss of forest habitat is a likely threat to this species. The bats also roosts in buildings, but little is known about the relative importance of trees versus buildings as roost sites or about the relative availability of different roost types. Availability of suitable roosts may be a limiting factor for populations of bonneted bats. Small population size and restricted extent of occurrence makes the species highly vulnerable to a number of potential impacts including inbreeding depression, genetic drift, disease, hurricanes, and other chance events.

Typically this bat is known from only extreme south Florida, but in 2008, biologists conducting surveys in the Kissimmee River area recorded Florida bonneted bat calls at two locations. This is the first time the species has been found north of Lake Okeechobee except in fossil records. This bat is listed as endangered by USFWS, but no critical habitat has been designated.

Florida Panther (*Puma concolor coryi*)

This large cat is listed as endangered by the USFWS. Florida panthers are secretive and require extensive blocks of mostly forested land for survival. Large wetlands, inaccessible to humans, provide important refuge. The remaining number of this species is low. Their breeding population is restricted to southwest Florida, but dispersing individuals may range well north into the peninsula in search for new territories. There are no known records of the panther along the FSC Project route, but there have been observations of them in Polk and Osceola Counties. The likelihood of occurrence is therefore considered low.

Sherman's Fox Squirrel (*Sciurus niger shermani*)

The FWC lists this squirrel as a species of special concern. It inhabits dry pine flatwoods, xeric oak, or sandhill communities, which are common within the proposed corridor. There are no FNAI records of this species along the FSC Project route, but it was observed by wildlife survey crews on this project.

APPENDIX C

IMPACTS AND MITIGATION OF FEDERALLY-LISTED WILDLIFE SPECIES THAT COULD BE POTENTIALLY AFFECTED BY THE FSC PROJECT

Appendix C

Impacts and Mitigation of Federally-Listed Wildlife Species That Could Be Potentially Affected by the FSC Project

Eastern Indigo Snake (*Drymarchon couperi*)

The eastern indigo snake's life history has been well documented in recent biological opinions ("BOs") issued by the USFWS in Florida (USFWS, 2007; USFWS, 2012), referenced herein. Often associated with gopher tortoise burrows for thermal refugia, this snake is diverse in habitat types it uses. Wildlife surveys conducted along the majority of the pipeline study corridor found a total of 152 gopher tortoise burrows, and that was without the 100-percent visual survey efforts that will be required preconstruction. Therefore, it is assumed there is the possibility the indigo snake occurs within the proposed right-of-way, although the 100-foot-wide right-of-way would not likely serve all the snakes' habitat requirements. Critical habitat has not been designated for this species.

The proposed action will result in the disturbance of approximately 100-foot-wide right-of-way along a 127-mile route through five counties where the snake could occur. This 100-foot disturbance is temporary for pipe construction. Once installed, the project will require only a 50-foot permanent easement for operation and maintenance of the pipeline. This 50-foot area will be allowed to revegetate with grasses, herbs, and low-growing, shallow-rooted vegetation. The FWC requires avoidance and relocation of gopher tortoises when present. Since they are confirmed present, prior to clearing and construction, FSC will be required to perform 100-percent visual surveys of all burrows within the 100-foot construction area. A permit will have to be obtained to verify avoidance of burrows (25-foot buffer from all construction) or temporary and permanent relocation. Any snakes discovered inhabiting burrows will be allowed to leave the area on their own during relocation of tortoises.

Direct effects of the proposed action could possibly include injury or death to individual animals, loss of gopher tortoise burrows for refuge, and some minimal loss of linear habitat. Indirect effects could be loss of prey species; harassment due to noise, vibration, and human presence; or exposure to additional vehicular traffic from maintenance and operation.

Because of the frequent association between eastern indigo snakes and gopher tortoises, the proposed plan calls for gopher tortoise burrow surveys to be conducted prior to construction to determine if tortoises occur at the project site. In addition, USFWS's Standard Protection Measures for the Eastern Indigo Snake would also be implemented during project construction. These preconstruction surveys and standard protection measures will avoid or minimize additional adverse impacts this project could have on the eastern indigo snake within the project footprint. Specific surveys for the indigo snake are not planned.

Additional protection measures beyond those listed as standard precautions (USFWS, 2004) would possibly include surveillance, management, and control of construction activities to avoid or minimize negative impacts; signs posted on construction sites; and personnel briefings on indigo snakes. Fatality of an indigo snake will be cause to cease work in the project action area, and the USFWS will be immediately notified of the occurrence.

Cumulative effects are expected to be minimal, due to the fact that vegetative cover and habitat types/current land uses would remain the same after installation of the pipe. Gopher tortoises will potentially reoccupy the right-of-way and serve to provide refugia for the snake. Minimal additional vehicular traffic will be necessary for pipeline maintenance.

Sand Skink/Blue-Tailed Mole Skink (*Neoseps reynoldsi*/*Eumeces egregius lividus*)

The mole and sand skink's life history has been well described in recent BOs issued by USFWS (USFWS, 2012; USFWS, 2013), referenced herein. Since their habitat requirements are similar, they will be discussed together here.

Skink habitat is primarily associated with the Lake Wales Ridge scrub areas located west of the project corridor. Some scrub habitats do exist along the route, however, and FNAI has historical records of both skinks within one mile of the route. Skink habitat is being depleted due to residential and agricultural development of upland, xeric habitats. No skink surveys were conducted for the FSC Project other than incidental inspections of the sand skinks' tell-tale burrowing pattern in open sandy patches along the study corridor. No observations were made.

Since these species are presumed to have a likelihood of occurrence along scrub habitats within the right-of-way, FSC will propose conducting pre-clearing surveys in those specific areas of the right-of-way, using pedestrian surveys in appropriate habitat to look for the tell-tale tracks left by the animal, or conceding occurrence in those areas and proposing avoidance/mitigation measures. Much of the proposed right-of-way that traverses potential skink habitat is following existing highway rights-of-way (U.S. Highway [US] 17/92 or State Road [SR] 60). Bare sandy patches crossed by construction activities and pipe placement will be replaced with the preexisting sand that was removed. Low-growing, shallow-rooted vegetation will be allowed to recolonize the right-of-way.

Direct effects of the project on skinks could be incidental mortality of individuals or eggs, loss of habitat (at least temporary), and harassment due to vibration of equipment. Indirect effects of the proposed action would be a minor increase in vehicular traffic along the right-of-way due to maintenance vehicles. Since much of the potential skink habitat crossed is along major roadways, the project will not further fragment any habitats.

No additional cumulative impacts of project development are anticipated, since the pipeline right-of-way will continue to be of a similar habitat and land use to preconstruction conditions. The pipeline will not increase the need for additional development along its route.

FSC will also employ an environmental monitor during construction, and that person will be trained in identifying the burrow tracks left by sand skinks. If, after completion of the surveys, skinks are identified, FSC will consult with the USFWS for any additional mitigation measures that may be required.

Florida Grasshopper Sparrow (*Ammodramus savannarum floridanus*)

Florida grasshopper sparrows are endemic to dry prairie habitats within Central and Southern Florida and are strongly habitat-specific, occupying only the native, fire-maintained dry prairie vegetation community and a few unimproved or overgrown pasture sites that resemble the dry prairie community and were presumably dry prairie prior to conversion to pasture. Barriers to movement include forested edges and even sparsely stocked pine flatwoods. Habitat characteristics that are important for Florida grasshopper sparrows include a high percentage of bare ground cover and low vegetation height (30 to 70 centimeters) (Delany *et al.*, 1985). Both of these characteristics are maintained by frequent fire. Large areas of prairie habitat, possibly greater than 4,000 hectares (9,884 acres), are needed to maintain self-sustaining populations of Florida grasshopper sparrows (Perkins, 1999; Perkins and Vickery, 2001).

Within the study corridor, the FNAI has two historical records within one mile of the route. These locations are MP 66 and near MP 59. No observations were made during wildlife surveys. According to the FWC (Personal Communication, 2014), Florida grasshopper sparrows reportedly do occur on property along a large stretch of SR 60 just east of the Kissimmee River

crossing. However recent surveys along the pipeline route did not find presence of the bird and wetland permits obtained previously for that property did not address the presence of the bird (Cardno-Entrix, 2014). Much of the area where suitable pasture exists along the route is adjacent to major highways, thereby minimizing the fire maintenance necessary to sustain ideal habitat for the bird. Additional information about the Florida grasshopper sparrow life history has been well described in recent BOs issued by USFWS (USFWS, 2013(a); USFWS, 2013(b)), referenced herein.

The proposed action may temporarily alter suitable habitat until the pipe is installed and the pipeline has restored to its previous state. Removal of tall woody vegetation may, in some cases, increase potential suitable habitat. Pasture land uses along the right-of-way will be allowed to continue even with the use of prescribed burning. The 50-foot right-of-way will be maintained in an herbaceous or low-growing shrub state. Prior to clearing, FSC has agreed to perform protocol based wildlife surveys for listed species. Presence of grasshopper sparrows can be confirmed in springtime using call surveys. If birds are confirmed in a given locale, FSC will consult with the USFWS for any additional mitigation measures that may be necessary, such as no clearing in the area until after nesting season.

Direct effects of the project include mortality of individuals, loss of nests and eggs, and temporary loss of some habitat. Indirect effects may include increased predation due to flushing of birds near the construction area and harassment in the form of human presence, machinery and vehicles, and noise/vibrations may occur in a given area for short periods of time.

Additional protection measures include avoidance of confirmed bird habitats, temporal avoidance during the nesting season, and possibly mitigation of any documented habitat loss. No cumulative effects from pipeline construction are expected, as the completed project will not cause further development along the right-of-way, nor will management of potential habitat crossed be affected (grazing and fire maintenance can continue).

Florida Scrub Jay (*Aphelocoma coerulescens*)

Florida scrub jays have been documented within one mile of the proposed project in at least one location in the 1980s. Scrub jay life histories are provided in several recent BOs (USFWS, 2013(a); USFWS, 2013(b); USFWS, 2013(c)).

Potential scrub jay habitat is found in a few areas along the right-of-way, primarily along US 17/92 in Polk County and along SR 60 and US 441 in Osceola County. According to the FNAI (2013), scrub jay colonies historically were recorded just north of MP 3 and around MP 75.4. However, no scrub jays were seen or heard during general wildlife surveys conducted along the right-of-way. Generally scrub jays are conspicuous and can be found if present. Scrub jay habitat with brushy corridors connecting habitats are preferred, so areas along highways that the pipeline will use could potentially be used by the birds. Primary scrub jay habitat within the project area centers along the Lake Wales Ridge generally west of the right-of-way. Optimal habitat is oak scrub (less than 15-percent canopy cover) with 10 to 50 percent of the area made up of bare sand patches. Oaks that become too tall (taller than 10 feet) generally diminish habitat value.

The proposed action may remove some scrub jay habitat, given the fact that the 50-foot permanent right-of-way will be kept free of trees. However, if in scrub habitat, the right-of-way will provide open sand patches that could be used by the birds. The pipeline right-of-way will be kept free of trees, but fire maintenance can be conducted along the pipeline. Pre-clearing recorded call surveys, in accordance with USFWS protocol, will be conducted in potential habitats along the right-of-way. If birds are found inhabiting the right-of-way, the USFWS will be consulted for potential additional mitigation.

Direct effects of the project could be individual mortality to adults, young, and eggs, loss of nests, and some permanent loss of scrub oak species. Indirect effects could potentially be harassment from nearby noise, human presence, and machinery, during nesting season that could affect nesting. Current land uses and prescribed burning would be allowed to continue after construction.

Additional protection measures may include avoidance of documented scrub jay habitat, temporal avoidance of nearby scrub jays during nesting season, and the use of environmental monitoring staff during construction.

Cumulative effects should be minimal, since the project will not cause other development that would further impact the species. However, any loss of suitable habitat from construction of this project could be mitigated elsewhere or through enhancement of adjoining habitats.

Wood Stork (*Mycteria americana*)

The American wood stork is a large conspicuous white bird with a black head. The bird is found throughout Florida and much of the Southeast. It forages in shallow wetlands and is noted for a tactile foraging method. More complete life history information is presented in several BOs written over the past few years (USFWS, 2010; USFWS, 2013(a); USFWS, 2013(b)), referenced herein.

The wood stork would be considered likely to be found foraging in most shallow wetlands along the proposed project, including roadside ditches and swales, which are numerous. They nest in colonies, often with other wading birds, and generally prefer larger-diameter trees in the colony. Many of the wood stork colonies in Florida are already known due to previous aerial surveys.

The birds typically use the same colony year after year, depending on hydrology and availability of foraging wetlands. No colonies are known to occur within 1 mile of the right-of-way, but there are nine colonies within 16 miles.

USFWS has established Core Foraging Areas (“CFAs”) around these colonies. A CFA is an 18.6-mile radius (South Florida) circle from a colony site that is generally considered to be potential foraging habitat. There are nine CFAs intersected for the total of nine colonies referenced herein.

The proposed action is not expected to affect any colony site. The proposed action will traverse portions of nine CFAs and obviously cross several wetlands within the right-of-way as documented in this permit application. However, many of the types of wetlands preferred for foraging by the birds are herbaceous wetlands, swales, and ditches, which will remain as herbaceous wetlands after temporary construction impacts are completed. Prior to clearing, FSC will conduct aerial/ground surveys for any new colony sites that might occur along the route.

Direct effects of the proposed action would include temporary loss of foraging habitats and noise and human presence, which may preclude birds from foraging in nearby wetlands. Since herbaceous wetland type and hydrology will be restored after construction, no net loss of these types of wetlands is expected. There will be a loss of forested wetlands, since trees will be removed and kept free of the 50-foot permanent right-of-way. However, this will be a change from forested to herbaceous wetland and a resulting similar hydrology. Foraging habitat, therefore, may actually increase; however, loss of forested wetlands represents a potential loss of future colony sites.

Additional protection measures will include pre-clearing surveys for active colonies in the project vicinity, monitoring of the USFWS’s Website for colony locations, use of environmental

monitoring staff during construction, and post-construction review and inspection by wetland agencies for any water quality or quantity changes.

Cumulative project effects will not involve any additional development along the pipeline and the corresponding loss of habitat that such development may affect. Herbaceous wetlands will remain herbaceous wetlands, and forested wetlands will be converted to herbaceous wetlands, potentially resulting in a net increase in foraging habitat within the CFAs.

Crested Caracara (*Polyborus plancus audubonii*)

The crested caracara is a conspicuous bird of prey that uses a variety of habitats found along the proposed project pastures (both improved and unimproved, agricultural fields, citrus groves, open woodlots, and wetlands). They cover large territories in foraging and typically nest in cabbage palms, although they have been observed nesting in live oaks, cypress, and even old citrus trees. The key feature is that their preferred habitats are open lands with scattered trees or tree clumps. More details on life history can be found in recent BOs (USFWS, 2007; USFWS, 2013(a); USFWS, 2013(b)), referenced herein.

The proposed action traverses caracara habitat, especially in Polk, Osceola, and St. Lucie Counties. The FNAI has historical records within one mile of the route, and wildlife surveys yielded several observations of birds, generally east of the Kissimmee River. No nests were found however. Many of the bird observations were made along roadways, which serve as a food source (carrion road-kill) for the birds. The proposed action will result in a temporary disturbance to caracara foraging habitat, but that habitat type will remain over the pipeline right-of-way after construction is completed. The project may remove tree species that could be suitable nesting or roosting habitat. Pre-clearing surveys in the nesting season prior to construction will be performed using standard USFWS survey protocol. If nests are found within or near the right-of-way, FSC will consult with the USFWS for further avoidance or mitigation measures.

Direct effects of the action will be temporary loss of foraging habitat and permanent loss of potential nest trees. Indirect effects of the proposed action will be potential loss of some prey species and potential harassment of nearby birds due to noise, human presence, and machinery. Construction traffic may also serve to provide more road-kill to the birds, but at the same time increase the risk of foraging birds being hit by vehicles. The pipeline right-of-way will be kept free of trees and shrubs, which presents a minor positive benefit to caracara foraging habitat.

In addition to the pre-clearing nest surveys, other protection measures include preservation of as many cabbage palms as possible within or adjacent to the right-of-way, temporal avoidance of known nest sites during construction, and use of environmental monitoring staff during construction. If nesting is observed during construction, the USFWS will be consulted for further mitigation/avoidance measures. Any dead or sick birds found within the construction area will be reported to the USFWS.

Cumulative effects are expected to be minimal due to the fact that this project will not create other development that would increase potential habitat loss or disruption. Much of the right-of-way already exists in pasture and agricultural areas, and those land uses are not expected to change as a result of this project. Traffic on nearby roadways will only see a temporary increase during construction; otherwise, there will be no permanent increase in vehicular traffic on adjacent roadways due to the project.

Everglade Snail Kite (*Rostrhamus sociabilis plumbeus*)

The Everglade snail kite is a raptor inhabiting wetland systems with a specific prey requirement: the Florida apple snail. Therefore, key to the kite's habitat requirements are shallow wetlands and littoral zones around lakes where the apple snail lives and reproduces. Foraging is highly dependent on water levels and snail breeding success. Hydrology is also a key to nesting by the birds. They prefer to nest over water presumably to reduce predation. Nest sites are usually tree islands or clumps of trees surrounded by water. The birds typically build nests in trees or shrubs less than 30 feet in height. Critical habitat has been designated by the USFWS for the Everglade snail kite, but that occurs south and west of the project area (west shore of Lake Okeechobee and further south into the Everglades). However, all the counties crossed by the project do fall within the USFWS-designated consultation area for the kite. More detailed life history information is available in recent BOs (USFWS, 2013(d); USFWS, 2010(a); USFWS, 2013(b)), referenced herein.

The proposed action will result in temporary disturbance to herbaceous wetlands crossed by the construction right-of-way. A conversion of forested wetlands to herbaceous wetlands will occur where forested wetlands are crossed by the proposed right-of-way. No net loss of wetlands will occur due to the project. All permanent wetland impacts will be mitigated. No snail kites were observed during general wildlife surveys conducted for the project. The FNAI indicates the closest record of snail kites as being eight miles away. FSC will conduct pre-clearing surveys for the bird in suitable habitat along the right-of-way using USFWS protocol. Any nesting within or adjacent to the right-of-way will be documented, and if nesting is documented within 500 feet of the right-of-way, the USFWS will be consulted.

Direct effects of the proposed action would be the possible loss/mortality of nests, eggs, or young or loss of suitable nesting substrate. Indirect effects would be possible elimination of prey species or temporary loss of prey habitat. Harassment of the birds may occur from construction if too close to nesting areas. This could result in abandonment of the nest site.

In addition to the pre-clearing surveys for nesting birds, other protection measures that may be employed include environmental monitoring staff assigned to construction areas near snail kite habitat, snail kite education briefings to construction crews, and maintenance of hydrological regime during and after construction to preconstruction levels. If nest sites are documented near the right-of-way, temporal avoidance will be considered for construction in that area, depending on proximity to the nest areas.

Cumulative effects of the project are expected to be minimal. No development will occur as a result of this project that could further impact snail kite nesting or foraging habitat. Hydrology of wetlands crossed will be restored to preconstruction levels, such that foraging and nesting habitat will remain and long-term effects on snail reproduction will not be impacted. No increased human presence will result after construction of the project except for occasional routine maintenance along the right-of-way.

Florida Bonneted Bat (*Eumops floridanus*)

Once considered to be a subspecies (*Eumops glaucinus floridanus*), recent scientific research indicates that the Florida bonneted bat is distinct from other *Eumops* outside Florida and should be classified as a full species (McDonough, et al., 2008). Alternative common names include mastiff bat, Florida mastiff bat, and Wagner's mastiff bat.

The Florida bonneted bat is of medium size compared to other species in the genus *Eumops (*Timm and Genoways, 2004) however, it is the largest of Florida bats.

The Florida bonneted bat inhabits semitropical forests, particularly pineland, tropical hardwood, and mangrove habitat. Suitable roosting areas may include a variety of natural and man-made structures including chimneys, limestone outcroppings, tree cavities, bat houses, and under tiles of Spanish-style roofs (USFWS, 2008). The Florida bonneted bat roosts singly or in harem-like colonies composed of a male and several females (Best, et al., 1997). It has low fecundity, gives birth to only one offspring, and is thought to be polyestrous with an extensive summer breeding season and perhaps additional offspring born in January/February. The Florida bonneted bat is not migratory, but there may be seasonal shifts in roosting sites *(*Timm and Genoways, 2004).

The Florida bonneted bat forages for flying insects in open, uncluttered areas and often flies >10 m above the ground. Humans can hear the loud, low-frequency echolocation calls of bonneted bats and can recognize the bats as they fly nearby (Belwood, 1992).

The Florida bonneted bat is known to roost in trees, and loss of forest habitat is a likely threat to this species. The bats also roost in buildings, but little is known about the relative importance of trees versus buildings as roost sites or about the relative availability of different roost types. Availability of suitable roosts may be a limiting factor for populations of bonneted bats. Small population size and restricted extent of occurrence makes the species highly vulnerable to a number of potential impacts including inbreeding depression, genetic drift, disease, hurricanes, and other chance events (USFWS, 2008).

In 2008, biologists conducting surveys in the Kissimmee River area, recorded Florida bonneted bat calls at two locations. This is the first time the species has been found north of Lake Okeechobee except in fossil records (FWC, 2011).

The proposed action will not affect any man-made structures or buildings that could be used as roost or nest sites by the bat. Since numbers of bats found in the project area are likely to be low, there is a small potential that removal of any hollow trees could directly impact the bat. Direct effects therefore could be death or injury to roosting bats, loss of potential roost/nest sites, and temporary disturbance due to noise, vibration, and human presence. Indirect effects could be exposure of the bats to predators, temporary loss of foraging habitat, and disruption to breeding. Once constructed, the pipeline right-of-way will continue to serve as potential foraging areas for bats.

Cumulative effects to the bat are not expected since this project will not lead to additional development and further habitat impacts. Maintenance activities along the route will not further eliminate any foraging habitat.

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