# APPENDIX K

BIOLOGICAL ASSESSMENT

**Federal Energy Regulatory Commission**
Office of Energy Projects
Washington, DC 20426

# Southeast Market Pipelines Project
## *Biological Assessment*

**August 2015**

**Docket Nos.:**
**CP14-554-000; CP15-16-000; CP15-17-000**

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## ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| ADCNR | Alabama Department of Conservation and Natural Resources |
| ALNHP | Alabama Natural Heritage Program |
| ATWS | additional temporary workspaces |
| BA | Biological Assessment |
| Bcf/d | billion cubic feet per day |
| CBMPP | Transco's Construction Best Management Practices Plan |
| CCL | Citrus County Line |
| Certificate | Certificate of Public Convenience and Necessity |
| CFR | Code of Federal Regulations |
| Commission | Federal Energy Regulatory Commission |
| Con. | construction impacts |
| diamondback | Eastern diamondback rattlesnake |
| DOT | U.S. Department of Transportation |
| E&SCPs | Sabal Trail's Erosion and Sediment Control Plan |
| EIS | environmental impact statement |
| ESA | Endangered Species Act |
| FERC | Federal Energy Regulatory Commission |
| FERC Plan | Upland Erosion Control, Revegetation and Maintenance Plan |
| FERC Procedures | Wetland and Waterbody Construction and Mitigation Procedures |
| FNAI | Florida Natural Areas Inventory |
| FSC | Florida Southeast Connection, LLC |
| FSC's Plan | FSC's Upland Erosion Control, Revegetation and Maintenance Plan |
| FSC's Procedures | FSC's Wetland and Waterbody Construction and Mitigation Procedures |
| FWC | Florida Fish and Wildlife Conservation Commission |
| FWS | U.S. Fish and Wildlife Service |
| HCL | Hunters Creek Lateral |
| HDD | horizontal directional drill |
| hp | horsepower |
| indigo | Eastern indigo snake |
| M&R | metering and regulating |
| Mainline | the mainline of the Sabal Trail pipeline |
| MLVs | mainline valves |
| MMcfd | million cubic feet per day |
| MPs | mileposts |
| NGA | Natural Gas Act |
| NMFS | National Marine Fisheries Service |

| | |
|---|---|
| NOI | Notice of Intent |
| OEP | Office of Energy Projects |
| Op. | operational impacts |
| Sabal Trail | Sabal Trail Transmission, LLC |
| scrub-jay | Florida scrub-jay |
| SMP Project | Southeast Market Pipelines Project |
| snail kite | Everglade snail kite |
| Transco | Transcontinental Gas Pipe Line Company, LLC |
| USGS | U.S. Geological Survey |

# 1.0 INTRODUCTION

The environmental staff of the Federal Energy Regulatory Commission (FERC or Commission) prepared this Biological Assessment (BA) to assess the environmental impacts on federally listed threatened or endangered species or designated critical habitat of a federally listed species associated with the construction and operation of three separate, but related, natural gas pipeline and associated facilities proposed by Transcontinental Gas Pipe Line Company, LLC (Transco); Sabal Trail Transmission, LLC (Sabal Trail); and Florida Southeast Connection, LLC (FSC). Transco would construct and operate the Hillabee Expansion Project; Sabal Trail would construct and operate the Sabal Trail Project; and FSC would construct and operate the Florida Southeast Connection (FSC) Project. The three companies are collectively referred to as the Applicants, and the three projects are collectively referred to as the Southeast Market Pipelines Project (SMP Project). A detailed description of the three projects is presented in section 2.0, and figure 1-1 provides an overview map of the SMP Project.

On November 18, 2014, Transco filed an application with the FERC in Docket No. CP15-16-000 under section 7 of the Natural Gas Act (NGA) and Part 157 of the Commission's regulations. Transco is seeking a Certificate of Public Convenience and Necessity (Certificate) from the FERC to construct, own, and operate natural gas pipeline and related facilities in Alabama, and approval to abandon by lease to Sabal Trail all of the capacity created by Transco's new facilities. The Hillabee Expansion Project would involve construction and operation of about 43.5 miles of pipeline loop[1] in eight segments; one new natural gas fired-compressor station; modifications at three existing compressor stations; and mainline valves (MLVs),[2] pig[3] launchers and receivers, and appurtenant facilities. Transco's facilities would be constructed in three phases between 2016 and 2021 and would provide Sabal Trial with up to 1.1 billion cubic feet per day (Bcf/d) of natural gas capacity upon completion.

On November 21, 2014, Sabal Trail filed an application with the FERC in Docket No. CP15-17-000 under section 7 of the NGA and Parts 157 and 284 of the Commission's regulations. Sabal Trail is seeking a Certificate from the FERC to construct, own, and operate a natural gas pipeline and related facilities, and to lease the natural gas capacity that would be created by the Hillabee Expansion Project. Sabal Trail also requests a Blanket Certificate for limited future activities and services on the new facilities. The Sabal Trail Project would involve construction and operation of about 480.4 miles of 36-inch-diameter Mainline pipeline in Alabama, Georgia, and Florida; 13.1 miles of 36-inch-diameter lateral pipeline (the Hunters Creek Line (HCL)) and 21.5 miles of 24-inch-diameter lateral pipeline (the Citrus County Line (CCL)) in Florida; five new natural gas-fired compressor stations; and MLVs, pig launchers and receivers, meter and regulating (M&R) stations,[4] and appurtenant facilities. Sabal Trail would also construct and operate the Central Florida Hub[5] at the termination of the Mainline pipeline in Osceola County, Florida. Sabal Trail's facilities would be constructed in three phases between 2016 and 2021, with the second and third phases involving only additional compression facilities. The Sabal Trail Project would have a design capacity of up to 1.1 Bcf/d upon completion.

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[1] A loop is a segment of pipe that is usually installed adjacent to an existing pipeline and connected to it at both ends. The loop allows more gas to move through the system.

[2] A mainline valve is an aboveground facility on a pipeline with valves for controlling the flow of gas in the pipeline. The valves act as gateways that can be open and closed.

[3] A pipeline "pig" is a device used to clean or inspect the pipeline. A pig launcher/receiver is an aboveground facility where pigs are inserted or retrieved from the pipeline.

[4] A meter and regulating station is an aboveground facility on a pipeline system that has equipment for measuring the volume of gas flowing in the pipeline.

[5] A hub is a location where two or more pipeline systems interconnect and which offers administrative services that facilitate the movement and/or transfer of gas. A hub creates a market where buyers can seek the least expensive natural gas from multiple sellers. The Central Florida Hub would be the first natural gas hub in Florida.

0 35 70 Miles

N W E S

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**Figure 1-1**
**Southeast Market Pipelines Project Overview**

- Proposed New/Modified Compressor Station
- Proposed Hillabee Expansion Project
- Proposed Sabal Trail Project
- Proposed Florida Southeast Connection Project

Source: Z:\Clients\Q_T\Spectra\SMP\Sabal_Trail\ArcGIS\20150104\Overview_Map\SMP_Overview_All_11_Few_Labels.mxd

Date: (8/12/2015)

On September 26, 2014, FSC filed an application with the FERC in Docket No. CP14-554-000 under section 7 of the NGA and Parts 157 and 284 of the Commission's regulations. FSC is seeking a Certificate from the FERC to construct, own, and operate a natural gas pipeline and related facilities, and a Blanket Certificate for limited future activities and services on the new facilities. The FSC Project would involve construction and operation of about 77.1 miles of 36-inch-diameter pipeline; 49.3 miles of 30-inch-diameter pipeline; and MLVs, pig launchers and receivers, meter stations, and appurtenant facilities in Florida. Construction would occur in one phase between 2016 and 2017. The FSC Project would connect with the Sabal Trail Project at the Central Florida Hub and would have an initial capacity of up to 640 million cubic feet per day (MMcfd).

Federal agencies, in consultation with the U.S. Fish and Wildlife Service (FWS) and/or the National Marine Fisheries Service (NMFS), are required by the Endangered Species Act (ESA) section 7(a)(2) to ensure that any action authorized, funded, or carried out by the agency would not jeopardize the continued existence of a federally listed threatened or endangered species or species proposed for listing, or result in the destruction or adverse modification of designated critical habitat. As the lead federal agency, the FERC is responsible for consulting with the FWS and/or NMFS to determine whether any federally listed endangered or threatened species or any of their designated critical habitats are near the proposed action, and to determine the proposed action's potential effects on those species or critical habitats. None of the waters in the SMP Project area are managed by the NMFS; therefore, consultation with NMFS is not required under the ESA.[6]

For actions involving major construction activities with the potential to affect listed species or critical habitats, the lead federal agency must prepare a BA for those species that may be affected. The lead federal agency must submit its BA to the FWS and, if it is determined that the action may adversely affect a federally listed species, the lead agency must submit a request for formal consultation to comply with section 7 of the ESA. In response, the FWS would issue a Biological Opinion as to whether or not the federal action would likely adversely affect or jeopardize the continued existence of a listed species, or result in the destruction or adverse modification of designated critical habitat. For the SMP Project, we[7] have determined that federally listed species may be affected, and are submitting this BA to the FWS to request concurrence on our determinations of effect and to initiate formal consultation for species that may be adversely affected by the SMP Project.

Although proposed, petitioned, and candidate species and proposed critical habitat do not receive federal protection through the ESA, we considered the potential effects on these species and habitats so section 7 consultation could be facilitated in the event one or more of these species become listed before or during SMP Project construction. Should a federally listed, proposed, petitioned, or candidate species be identified during construction that has not been previously identified during field surveys or assessed through consultation, and project activities could adversely affect the species, the Applicants would be required to suspend the construction activity and notify the Commission and FWS of the potential affect. The construction activity could not resume until the Commission completes its FWS consultation.

Three separate FWS Ecological Services Field Offices are reviewing the SMP Project: the Alabama Field Office is reviewing the Hillabee Expansion Project; the North Florida Field Office is reviewing the Sabal Trail Project; and the Panama City Field Office is reviewing the FSC Project. Our section 7 analysis in this BA is separated by the three SMP Project components to facilitate the FWS's review of the projects.

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[6] Correspondence from NMFS can be found in Appendix E of Sabal Trail's July 7, 2015 supplemental environmental information filing at: https://elibrary.ferc.gov/IDMWS/Doc_Family.asp?document_id=14355066

[7] "We," "us," and "our" refer to the environmental staff of the Federal Energy Regulatory Commission's Office of Energy Projects.

# 2.0 DESCRIPTION OF THE PROJECT FACILITIES

## 2.1 PROPOSED FACILITIES

The SMP Project would involve the construction and operation of underground natural gas transmission pipeline and associated aboveground facilities in Alabama, Georgia, and Florida. Detailed maps of the project facilities are not provided with this document due to the length of the proposed pipeline. However, maps showing the proposed pipeline route, aboveground facilities, access roads, and construction support yards are included in appendix B of the draft environmental impact statement (EIS), and aerial photograph-based alignment sheets depicting pipeline workspaces are available on our website at www.ferc.gov. Summaries of the proposed facilities for each project component are provided in the following sections.

### 2.1.1 Hillabee Expansion Project

In the Hillabee Expansion Project area, Transco's interstate transmission system consists of four or five pipelines in a generally contiguous right-of-way. Transco proposes to construct and operate about 43.5 miles of pipeline in eight loop segments adjacent to an existing natural gas transmission pipeline corridor at a typical offset of 25 feet from the nearest pipeline (see table 2.1.1-1). The locations and lengths of the proposed loops are relative to the existing mileposts (MPs) of Transco's system. The pipeline facilities would be installed underground using the methods described in section 3.1.

TABLE 2.1.1-1

**Pipeline Facilities Associated with the Hillabee Expansion Project**

| Loop | County | Milepost Range | Mainline Designation [a] | Length (miles) [b] | Pipe Diameter (inches) | Collocation (percent) [c] | Phase |
|---|---|---|---|---|---|---|---|
| Rock Springs | Choctaw | 784.7-791.4 | F | 6.7 | 42 | 85 | 2 |
| Butler | Choctaw | 791.4-796.7 | F | 5.3 | 42 | 92 | 3 |
| Billingsley | Autauga, Chilton | 886.0-890.6 | E | 4.7 | 48 | 87 | 1 |
| Autauga | Autauga, Chilton | 890.7-898.2 | F | 7.5 | 42 | 92 | 3 |
| Verbena | Chilton | 905.7-909.7 | E | 3.9 | 42 | 88 | 2 |
| Proctor Creek | Coosa | 911.1-916.5 | E | 5.3 | 42 | 96 | 1 |
| Hissop | Coosa | 924.3-926.9 | E | 2.6 | 42 | 100 | 1 |
| Alexander City | Tallapoosa | 941.8-949.4 | E | 7.5 | 42 | 97 | 1 |

[a] Mainline designations E and F represent the fifth and sixth pipelines within the right-of-way, respectively.
[b] The distance between the beginning and ending mileposts may not reflect the actual length of each loop.
[c] Collocation refers to the degree to which the new right-of-way would abut or share an existing right-of-way.

In addition to the pipeline facilities, the Hillabee Expansion Project would include the construction of one new compressor station, increased compression and other modifications at three existing compressor stations, and other aboveground facilities. All of the aboveground facilities would be within or generally adjacent to Transco's right-of-way or within Transco property boundaries. Table 2.1.1-2 summarizes the new and modified compressor stations proposed by Transco. Construction of the facilities would provide a total of 88,500 horsepower (hp) of compression during Phase 1 and 2 of the project; no additional compression would be installed during Phase 3.

TABLE 2.1.1-2

**Compressor Stations Associated with the Hillabee Expansion Project**

| Compressor Station | County | Milepost | Phase | Scope of Work |
|---|---|---|---|---|
| Compressor Station 84 | Choctaw | 782.8 | 1 | Construct new compressor station with two, 16,000 horsepower (hp) Solar Mars 100 gas turbine driven compressor units. |
| Compressor Station 95 | Dallas | 851.4 | 1 | Add one new 16,000 hp Solar Mars 100 unit; cool and re-wheel two existing Solar Mars 100 units. |
| | | | 2 | Add one new 16,000 hp Solar Mars 100 unit; re-wheel three existing Solar Mars 100 units. |
| Compressor Station 100 | Chilton | 890.6 | 2 | Uprate existing electric motor driven compressor unit by 4,000 hp. |
| | | | 3 | Re-wheel existing 15,000 hp Solar Mars 100 unit. |
| Compressor Station 105 | Coosa | 926.9 | 1 | Add one new 20,500 hp Titan 130 gas driven compressor unit to existing facility. |

Table 2.1.1-3 summarizes the other aboveground facilities associated with the Hillabee Expansion Project, including new and removed/relocated MLVs and pig launchers/receivers. All of the proposed MLVs would be within Transco's rights-of-way, and none would include remote blow-down facilities. Transco would also install minor facilities at the Transco Hillabee M&R Station to be constructed by Sabal Trail within Sabal Trail's Alexander City Compressor Station. These and other minor, appurtenant facilities such as valves and piping may be installed within the proposed right-of-way or Transco facility boundaries.

TABLE 2.1.1-3

**Other Aboveground Facilities Associated with the Hillabee Expansion Project**

| Loop/Facility | County | Milepost | Scope of Work | Phase |
|---|---|---|---|---|
| Rock Springs Loop | | | | |
| Pig Launcher/Mainline Valve (MLV) | Choctaw | 784.7 | Install new MLV, pig launcher, blow-off valve, crossover valves, and other piping. | 2 |
| Pig Receiver/MLV | Choctaw | 791.4 | Install new MLV, crossover valves, pig receiver, blow-off valve and other piping. | 2 |
| Butler Loop | | | | |
| Pig Launcher/MLV Removal | Choctaw | 791.4 | Remove pig receiver and MLV. Isolate crossover valve piping. | 3 |
| Pig Receiver/MLV | Choctaw | 796.7 | Install relocated pig receiver and MLV (from Rock Springs Loop), crossover valves, blow-off valve, and other piping. | 3 |
| Billingsley Loop | | | | |
| Pig Receiver/MLV Removal | Chilton | 866.2 | Remove pig receiver and MLV. Isolate crossover valve piping. | 1 |
| Pig Receiver/MLV | Chilton | 890.6 | Install relocated pig receiver and MLV (from the beginning of this loop), new suction side gate valve, blow-off valve, and other associated station piping up to the existing station discharge valve. | 1 |
| Autauga Loop | | | | |
| Pig Launcher/MLV | Chilton | 890.7 | Install new pig launcher, MLV, station discharge valve, blow-off valve, and other associated station piping and valves. | 3 |
| Pig Receiver/MLV | Chilton | 898.2 | Install new MLV, pig receiver, crossover valves, blow-off valve, and other necessary piping. | 3 |
| Verbena Loop | | | | |
| Pig Receiver Removal | Chilton | 905.7 | Remove pig receiver and associated piping. | 2 |

TABLE 2.1.1-3

**Other Aboveground Facilities Associated with the Hillabee Expansion Project**

| Loop/Facility | County | Milepost | Scope of Work | Phase |
|---|---|---|---|---|
| Pig Receiver/MLV | Chilton | 909.7 | Install relocated pig receiver (from the end of this loop), new MLV, crossover valves, blow-off valve, and other necessary piping. | 2 |
| Proctor Creek Loop | | | | |
| Pig Launcher/MLV | Coosa | 911.1 | Install relocated pig launcher (from the end of this loop), new MLV, crossover valves, blow-off valve, and other necessary piping. | 1 |
| Pig Launcher/MLV Removal | Coosa | 916.5 | Remove pig receiver and MLV. Isolate crossover valve piping. | 1 |
| Hissop Loop | | | | |
| Pig Receiver Removal | Coosa | 924.3 | Remove pig receiver and associated piping. | 1 |
| Tie-in to Compressor Station 105 [a] | Coosa | 926.9 | Install suction side gate valve, blow-off valve and other necessary piping, and remove pig launcher and associated piping. | 1 |
| Alexander City Loop | | | | |
| Pig Receiver/MLV Removal | Tallapoosa | 941.8 | Remove pig receiver, MLV, crossover valves, and associated piping. | 1 |
| Pig Receiver/MLV | Tallapoosa | 949.4 | Install relocated pig receiver and MLV (from the beginning of this loop), new crossover valves, blow-off valve, and other necessary piping. | 1 |

[a] All aboveground facilities installed for the tie-in of the proposed Hissop Loop to Compressor Station 105 would be entirely within the existing compressor station footprint.

### 2.1.2 Sabal Trail Facilities

The Sabal Trail Project would be in Alabama, Georgia, and Florida and consist of pipeline facilities and aboveground facilities including compressor stations, M&R stations, MLVs, and pig launchers/receivers. Sabal Trail would also create the Central Florida Hub by interconnecting the Sabal Trail Project, FSC Project, and existing FGT and Gulfstream systems at the termination of the Sabal Trail Project. Sable Trail would construct its project in three phases to meet the phased natural gas delivery requirements of the SMP Project. Phase 1 would include construction of all of the pipeline facilities and three compressor stations, and would create up to 830 MMcfd of capacity for proposed in-service in May, 2017. Phase 2 would include construction of two compressor stations and would provide an additional 169 MMcfd commencing in 2020. Phase 3 would involve installing additional compression at two of the compressor stations to provide an additional 76 MMcfd beginning in 2021.

As summarized in table 2.1.2-1, Sabal Trail proposes to construct and operate 515.5 miles of interstate natural gas transmission pipeline consisting of 480.9 miles of mainline pipeline in Alabama, Georgia, and Florida (Mainline); a 21.5-mile-long pipeline lateral in Florida (the CCL); and a 13.1-mile-long pipeline lateral in Florida (the HCL). The pipeline facilities would be constructed of carbon steel and would be installed underground using the methods described in section 3.1.

TABLE 2.1.2-1

**Pipeline Facilities Associated with the Sabal Trail Project**

| State/Facility | County | Milepost Range | Length (miles)[a] | Pipe Diameter (inches) |
|---|---|---|---|---|
| Alabama | | | | |
| Mainline | Tallapoosa | 0.0-20.5 | 20.5 | 36 |
| | Chambers | 20.5-40.1 | 19.7 | 36 |
| | Lee | 40.1-60.8R [b] | 20.7 | 36 |
| | Russell | 60.8R-86.4 [b] | 25.6 | 36 |
| Alabama Pipeline Facilities Subtotal | | | 86.5 | |
| Georgia | | | | |
| Mainline | Stewart | 86.4-110.2 | 23.9 | 36 |
| | Webster | 110.2-120.5 | 10.2 | 36 |
| | Terrell | 120.5-141.1 | 20.6 | 36 |
| | Lee | 141.1-141.8 | 0.7 | 36 |
| | Terrell | 141.8-146.7 | 4.9 | 36 |
| | Dougherty | 146.7-169.8 | 23.1 | 36 |
| | Mitchell | 169.8-182.6 | 12.8 | 36 |
| | Colquitt | 182.6-208.6 | 26.0 | 36 |
| | Brooks | 208.6-231.3 | 22.8 | 36 |
| | Lowndes | 231.3-247.8 | 16.8 | 36 |
| Georgia Pipeline Facilities Subtotal | | | 161.7 | |
| Florida | | | | |
| Mainline | Hamilton | 247.8-267.4R [b] | 19.6 | 36 |
| | Suwannee | 267.4R-308.3 [b] | 43.0 | 36 |
| | Gilchrist | 308.3-337.5 | 29.1 | 36 |
| | Alachua | 337.5-341.2 | 3.7 | 36 |
| | Levy | 341.2-369.8 | 28.7 | 36 |
| | Marion | 369.8-399.5 | 32.6 | 36 |
| | Sumter | 399.5-430.1 | 30.6 | 36 |
| | Lake | 430.1-430.2 | 0.1 | 36 |
| | Sumter | 430.2-435.8R [b] | 5.6 | 36 |
| | Lake | 435.8R-457.6 [b] | 22.4 | 36 |
| | Polk | 457.6-465.8 | 8.2 | 36 |
| | Osceola | 465.8-474.4 | 9.1 | 36 |
| Florida Mainline Subtotal | | | 232.7 | |
| Citrus County Line | Marion | 0.0-1.3 | 1.3 | 24 |
| | Citrus | 1.3-21.5 | 20.2 | 24 |
| Citrus County Line Subtotal | | | 21.5 | |
| Hunters Creek Line | Osceola | 0.0-13.1 | 13.0 | 36 |
| | Orange | 13.1-13.1 | 0.1 | 36 |
| Hunters Creek Line Subtotal | | | 13.1 | |
| Florida Pipeline Facilities Subtotal | | | 267.3 | |
| Pipeline Facilities Total | | | 515.5 | |

[a] Actual linear length. Values may differ slightly from information provided by Sabal Trail due to rounding.

[b] R indicates milepost location within a re-route that was incorporated into the proposed route after Sabal Trail filed its application on November 18, 2014. Sabal Trail utilized actual linear length in mileposting the re-routes; therefore, the actual linear length of the mainline pipeline, 480.9 miles, exceeds the original milepost length of 474.4 miles.

The Sabal Trail Project would include the construction of five new compressor stations, subsequent increased compression at two of the compressor stations, and other aboveground facilities. All of the aboveground facilities would be within or generally adjacent to Sabal Trail's right-of-way or

within Sabal Trail property boundaries. Table 2.1.2-2 summarizes the new and modified compressor stations proposed by Sabal Trail. Construction of the facilities would provide a total of 127,900 hp of compression during Phase 1, 41,000 hp of compression during Phase 2, and 41,000 hp of compression during Phase 3. Of the total compression on a state-by-state basis, 71,000 hp (34 percent) would occur in Alabama, 41,000 hp (20 percent) would occur in Georgia, and 97,900 hp (46 percent) would occur in Florida. All of the compressor units would be fueled by natural gas obtained from the Sabal Trail Mainline.

TABLE 2.1.2-2

**Compressor Stations Associated with the Sabal Trail Project**

| State/Compressor Station | County | Milepost | Phase | Scope of Work |
|---|---|---|---|---|
| Alabama | | | | |
| Alexander City | Tallapoosa | 0.0 | 1 | Construct compressor station with two Solar Titan 130 gas turbines and one Solar Titan 250 gas turbine driven compressor units; total 71,000 horsepower (hp). |
| Georgia | | | | |
| Albany | Dougherty | 154.7 | 2 | Construct compressor station with one 20,500 hp Solar Titan 130 gas turbine driven compressor unit. |
| | | | 3 | Add one new 20,500 hp Titan 130 gas driven compressor unit. |
| Florida | | | | |
| Hildreth | Suwannee | 296.3 | 1 | Construct compressor station with one 20,500 hp Solar Titan 130 gas turbine driven compressor unit |
| | | | 3 | Add one new 20,500 hp Titan 130 gas driven compressor unit. |
| Dunnellon | Marion | 392.7R | 2 | Construct compressor station with one 20,500 hp Solar Titan 130 gas turbine driven compressor unit. |
| Reunion | Osceola | 474.4 | 1 | Construct compressor station with one 20,500 hp Solar Titan 130 gas turbine and one 15,900 hp Solar Mars 100 gas turbine driven compressor unit. |

[a] R indicates milepost location within a re-route that was incorporated into the proposed route after Sabal Trail filed its application on November 18, 2014. Sabal Trail utilized actual linear length in mileposting the re-routes; therefore, the actual linear length of the mainline pipeline, 480.9 miles, exceeds the original milepost length of 474.4 miles.

Table 2.1.2-3 summarizes the other aboveground facilities associated with the Sabal Trail Project including M&R stations, MLVs, and pig launchers/receivers. Additional information regarding the six M&R stations proposed by Sabal Trail is provided below. Sabal Trail would also install two side-tap valves on the mainline pipeline in Dougherty and Mitchell Counties, Georgia. All of the other aboveground facilities would be within Sabal Trail's rights-of-way or other Sabal Trail facility boundaries.

TABLE 2.1.1-3

**Aboveground Facilities Associated with the Sabal Trail Project**

| State/Facility | County | Milepost[a] | Scope of Work |
|---|---|---|---|
| Alabama | | | |
| Mainline Valve (MLV)-1; Transco Hillabee Meter and Regulating (M&R) Station; pig launcher | Tallapoosa | 0.0 | Install M&R station, MLV, and pig launcher within the Alexander City Compressor Station site. |
| MLV-2 | Tallapoosa | 19.3 | Install MLV with remote blowdown due to adjacent powerline. |
| MLV-3 | Chambers | 29.8 | Install MLV. |
| MLV-4 | Lee | 48.8 | Install MLV. |

TABLE 2.1.1-3

**Aboveground Facilities Associated with the Sabal Trail Project**

| State/Facility | County | Milepost[a] | Scope of Work |
|---|---|---|---|
| MLV-5 | Russell | 66.7R | Install MLV. |
| MLV-6 | Russell | 75.4 | Install MLV. |
| Georgia | | | |
| MLV-7 | Stewart | 90.6 | Install MLV. |
| MLV-8 | Stewart | 104.2 | Install MLV. |
| MLV-9 | Terrell | 122.8 | Install MLV. |
| MLV-10 | Terrell | 140.3 | Install MLV. |
| MLV-11; pig launcher/receiver | Dougherty | 154.7R | Install MLV and pig launcher/receiver within the Albany Compressor Station site. |
| Tap Valve TV-MGAG-001 | Dougherty | 165.4 | Install side-tap valve. |
| MLV-12 | Mitchell | 173.5 | Install MLV. |
| Tap Valve TV-MGAG-002 | Mitchell | 176.3 | Install side-tap valve. |
| MLV-13 | Colquitt | 185.3R | Install MLV. |
| MLV-14 | Colquitt | 198.1 | Install MLV. |
| MLV-15 | Brooks | 211.7 | Install MLV. |
| MLV-16 | Brooks | 224.6 | Install MLV. |
| MLV-17 | Lowndes | 240.2 | Install MLV. |
| Florida | | | |
| Mainline | | | |
| MLV-18 | Hamilton | 259.1 | Install MLV with remote blowdown due to adjacent powerline. |
| MLV-19 | Suwannee | 270.0R | Install MLV. |
| MLV-20 | Suwannee | 280.9 | Install MLV. |
| MLV-21; pig launcher/receiver | Suwannee | 296.3 | Install MLV and pig launcher/receiver within the Hildreth Compressor Station site. |
| FGT Suwanee M&R Station | Suwannee | 299.7 | Install M&R station. |
| MLV-22 | Suwannee | 306.9 | Install MLV. |
| MLV-23 | Gilchrist | 320.4 | Install MLV with remote blowdown due to adjacent powerline. |
| MLV-24 | Alachua | 340.1 | Install MLV with remote blowdown due to adjacent powerline. |
| MLV-25 | Levy | 359.4 | Install MLV. |
| MLV-26 | Marion | 374.9R | Install MLV. |
| MLV-27 | Marion | 392.7R | Install MLV within the Dunnellon Compressor Station site. |
| MLV-28 | Sumter | 409.8 | Install MLV. |
| MLV-29 | Sumter | 422.9 | Install MLV. |
| MLV-30 | Lake | 437.3R | Install MLV. |
| MLV-31 | Lake | 451.7 | Install MLV. |
| MLV-32 | Osceola | 466.7R | Install MLV. |
| MLV-33; pig receiver; FSC M&R Station; Gulfstream M&R Station | Osceola | 474.4 | Install MLV, pig receiver, and two M&R stations within the Reunion Compressor Station site. |
| Citrus County Line | | | |
| MLV-CCL-1; pig launcher | Marion | 0.0 | Install MLV and pig launcher within the Dunnellon Compressor Station site. |
| MLV-CCL-2 | Citrus | 7.3 | Install MLV. |
| MLV-CCL-3; pig receiver; Citrus County M&R Station | Citrus | 21.5 | Install MLV, pig receiver, and M&R station at termination of the Citrus County Line. |
| Hunters Creek Line | | | |
| MLV-HCL-1; pig launcher | Osceola | 0.0 | Install MLV and pig launcher within the Reunion Compressor Station site. |

TABLE 2.1.1-3

**Aboveground Facilities Associated with the Sabal Trail Project**

| State/Facility | County | Milepost[a] | Scope of Work |
|---|---|---|---|
| MLV-HCL-2 | Osceola | 7.1 | Install MLV. |
| MLV-HCL-3; pig receiver; FGT Hunters Creek M&R Station | Orange | 13.1 | Install MLV, pig receiver, and M&R station at interconnection with FGT system. |

[a] R indicates milepost location within a re-route that was incorporated into the proposed route after Sabal Trail filed its application on November 18, 2014. Sabal Trail utilized actual linear length in mileposting the re-routes; therefore, the actual linear length of the mainline pipeline, 480.9 miles, exceeds the original milepost length of 474.4 miles.

### 2.1.3 Florida Southeast Connection Facilities

The FSC Project would be in Florida and consist of pipeline facilities and aboveground facilities including one M&R station, MLVs, and pig launchers/receivers. The FSC Project would be constructed in one phase to provide 400 MMcfd of natural gas to Florida Power and Light's existing Martin Plant beginning in May 2017, increasing to 600 MMcfd in May, 2020.

FSC would install 126.4 miles of natural gas transmission pipeline, consisting of 36-inch-diameter pipeline between MPs 0.0 and 77.1, and 30-inch-diameter pipeline between MPs 77.1 to 126.4 (see table 2.1.3-1). FSC's pipeline would originate at the interconnection between the FSC Project and the Sabal Trail Project within Sabal Trail's Reunion Compressor Station and extend generally south and southeast across six counties. The pipeline facilities would installed underground using the methods described in section 3.1.

TABLE 2.1.3-1

**Pipeline Facilities Associated with the Florida Southeast Connection Project**

| County | Milepost Range | Length (miles) | Pipe Diameter (inches) |
|---|---|---|---|
| Osceola | 0.0-5.2 | 5.2 | 36 |
| Polk | 5.2-52.9 | 47.7 | 36 |
| Osceola | 52.9-77.1 | 24.2 | 36 |
| Okeechobee | 77.1-102.1 | 25.0 | 30 |
| St. Lucie | 102.1-114.8 | 12.7 | 30 |
| Martin | 114.8-126.4 | 11.6 | 30 |
| Pipeline Facilities Total | | 126.4 | |

The FSC Project would include the construction of one M&R station and the installation of MLVs along the pipeline route (see table 2.1.3-2). All of the aboveground facilities would be within or generally adjacent to FSC's right-of-way or within other aboveground facility boundaries.

TABLE 2.1.3-2

**Aboveground Facilities Associated with the Florida Southeast Connection Project**

| Facility | County | Milepost | Scope of Work |
|---|---|---|---|
| MLV, pig launcher | Osceola | 0.0 | Install MLV at interconnection with the Sabal Trail Project within Sabal Trail's Reunion Compressor Station. |
| MLV1 | Polk | 4.3 | Install MLV. |
| MLV2 | Polk | 14.8 | Install MLV. |
| MLV3 | Polk | 27.2 | Install MLV. |
| MLV4 | Polk | 34.0 | Install MLV. |

TABLE 2.1.3-2

**Aboveground Facilities Associated with the Florida Southeast Connection Project**

| Facility | County | Milepost | Scope of Work |
|---|---|---|---|
| MLV5 | Polk | 44.0 | Install MLV. |
| MLV6 | Osceola | 53.7 | Install MLV. |
| MLV7 | Osceola | 70.3 | Install MLV. |
| Pig launcher/receiver | Okeechobee | 77.1 | Install pig launcher/receiver where the pipe diameter changes from 36 to 30 inches. |
| MLV8 | Okeechobee | 87.2 | Install MLV. |
| MLV9 | Okeechobee | 94.6 | Install MLV. |
| MLV10 | St. Lucie | 110.0 | Install MLV. |
| MLV11 | Martin | 118.7 | Install MLV. |
| MLV, pig receiver, Martin Meter Station | Martin | 126.4 | Install MLV, pig receiver, and M&R station within the Martin Clean Energy Center property. |

## 2.2 LAND REQUIREMENTS

Construction of the SMP Project would disturb about 11,436.2 acres of land, including the pipeline construction right-of-way, additional temporary workspaces (ATWS), aboveground facilities, contractor pipe storage yards and staging areas, and new and improved access roads for each project component. Operation of the SMP Project would require about 4,143.3 acres, including the pipeline permanent right-of-way, aboveground facility sites, and permanent access roads. Table 2.2-1 summarizes the land requirements for the SMP Project. A more detailed description of land requirements and land use is presented in section 3.9 of the draft EIS.

The FERC regulations (Section 18 of the Code of Federal Regulations (CFR) 380.15[d][1]) give consideration to the use, enlargement, or extension of existing rights-of-way over developing a new right-of-way in order to reduce potential impacts on sensitive resources. In general, the collocation of new pipeline along existing rights-of-way or other linear corridors that have been previously cleared or used (such as pipelines, power lines, roads, or railroads) may be environmentally preferable to the development of new rights-of-way. Construction-related effects and cumulative impacts can normally be reduced by use of previously cleared or disturbed rights-of-way; however, in congested or environmentally sensitive areas, it may be advantageous to deviate from an existing right-of-way. Additionally, collocation may be infeasible in some areas due to a lack of or unsuitably oriented existing corridors, engineering and design considerations, or constructability or permitting issues.

TABLE 2.2-1

**Land Requirements of the Southeast Market Pipelines Project**

| | Total | |
|---|---|---|
| Project/Component | Con. | Op. |
| Hillabee Project Pipeline | | |
| Pipeline Right-of-Way | 560.3 | 264.4 |
| Additional Temporary Workspace | 176.7 | 0.0 |
| Aboveground Facilities | 110.3 | 26.6 |
| Access Roads | 62.1 | 5.8 |
| Pipe/Contractor Yards | 90.4 | 0.0 |
| Hillabee Expansion Project Subtotal | 999.8 | 296.8 |
| Sabal Trail Project | | |
| Pipeline Right-of-Way | 5,976.1 | 2,824.5 |
| Additional Temporary Workspace | 1,621.7 | 0.0 |
| Aboveground Facilities | 224.3 | 166.1 |

TABLE 2.2-1

**Land Requirements of the Southeast Market Pipelines Project**

| Project/Component | Total Con. | Total Op. |
|---|---|---|
| Access Roads | 337.8 | 105.2 |
| Pipe/Contractor Yards | 388.8 | 0.0 |
| Sabal Trail Project subtotal | 8,548.8 | 3,095.8 |
| Florida Southeast Connection Project | | |
| Pipeline Right-of-Way | 1,385.5 | 743.6 |
| Additional Temporary Workspace | 167.6 | 0.0 |
| Aboveground Facilities | 1.7 | 1.7 |
| Access Roads | 128.5 | 5.3 |
| Pipe/Contractor Yards | 204.3 | 0.0 |
| Florida Southeast Connection Project Subtotal | 1,887.6 | 750.7 |
| Southeast Market Pipelines Projects Total | 11,436.2 | 4,143.3 |

Note: The totals shown in this table may not equal the sum of addends due to rounding.

### 2.2.1 Hillabee Expansion Project

#### 2.2.1.1 Pipeline Right-of-Way

Transco would use a 110- to 120-foot-wide temporary right-of-way to construct the proposed pipeline loops. This right-of-way would be reduced as necessary through sensitive areas such as wetlands, waterbodies, and residential lands. Constructing the Hillabee Expansion Project pipeline loops would require the temporary use of about 560.3 acres of land. Appendix C of the draft EIS includes typical construction right-of-way diagrams for the project.

Transco has proposed a pipeline route that is generally parallel to and overlapping its existing pipeline right-of-way for approximately 38.9 miles (89 percent) of the total pipeline loop lengths. The remaining approximately 4.6 miles (11 percent) of the pipeline route would deviate from this rights-of-way. Where collocated, Transco's construction workspace would generally overlap with the existing easement by 30 to 60 feet. Of the area affected by pipeline construction, approximately 307.4 acres would overlap with existing easements. Additional information on the locations of the proposed pipeline in relation to existing rights-of-way is presented in section 3.8 of the draft EIS.

Following construction, Transco would retain a 50-foot-wide permanent right-of-way to operate the pipeline. Transco's permanent right-of-way would generally overlap with the existing collocated facility's easement by 25 to 50 feet. The permanent right-of-way would require about 264.4 acres of land. Of this area, about 155.5 acres would be within previously disturbed, maintained, operational easements. The majority of the permanent right-of-way would be allowed to revert to former use; however, certain activities, such as the construction of aboveground structures or the planting and cultivating of trees, would be prohibited within the permanent right-of-way. The remaining area not permanently maintained would be restored in accordance with Transco's Construction Best Management Practices Plan (CBMPP, see section 3.1).

In addition to the construction right-of-way, ATWS would be required in areas such as the following:

- adjacent to crossings of roadways, railroads, waterbodies, wetlands, or other utilities;

- construction constraints that require special construction techniques, such as horizontal directional drill (HDD) entry and exit locations;
- HDD pullbacks;
- areas requiring extra trench depth;
- certain pipe bends;
- areas for spoil storage;
- areas for temporary storage of segregated topsoil;
- locations with soil stability concerns;
- truck turnarounds;
- equipment passing lanes;
- hydrostatic test water withdrawal and discharge locations; and
- staging and fabrication areas.

Most ATWSs would add 25 feet onto the construction right-of-way, effectively creating a 135- to 145-foot-wide work area at the ATWS location. In total, ATWSs would temporarily require about 176.7 acres of land. Transco would restore the ATWSs to preconstruction conditions in accordance with Transco's CBMPP.

#### 2.2.1.2 Aboveground Facilities

Constructing and operating the aboveground facilities would require the temporary and permanent use of about 110.3 acres of land and 26.6 acres of land, respectively. Table 2.2.1-2 lists the land required for each aboveground facility site. Appendix B of the draft EIS shows the locations of aboveground facilities proposed as part of the Hillabee Expansion Project.

TABLE 2.2.1-2

**Aboveground Facility Land Requirements for the Hillabee Expansion Project**

| Facility [a, b] | Milepost | Construction Area (acres) | Operation Area (acres) |
|---|---|---|---|
| Compressor Station 84 | 782.8 | 79.5 | 14.0 |
| Rock Springs Launcher and Mainline Block Valve | 784.7 | 0.0 | 0.2 |
| Rock Springs Receiver and Mainline Block Valve | 791.4 | 0.0 | 0.4 |
| Butler Receiver and Mainline Block Valve | 796.7 | 0.0 | 0.3 |
| Compressor Station 95 | 851.4 | 18.3 | 0.8 |
| Compressor Station 100[c] | 890.6 | 0.0 | 0.0 |
| Billingsley Receiver and Mainline Block Valve | 890.6 | 0.0 | 5.0 |
| Autauga Launcher and Mainline Block Valve | 890.7 | 0.0 | 3.2 |
| Autauga Receiver and Mainline Block Valve | 898.2 | 0.0 | 0.4 |
| Verbena Receiver and Mainline Block Valve | 909.7 | 0.0 | 0.4 |
| Proctor Creek Launcher and Mainline Block Valve | 911.1 | 0.0 | 0.4 |
| Compressor Station 105 | 926.9 | 12.5 | 0.9 |
| Hissop Tie-in to Compressor Station 105 [c] | 926.9 | 0.0 | 0.0 |

TABLE 2.2.1-2

**Aboveground Facility Land Requirements for the Hillabee Expansion Project**

| Facility [a, b] | Milepost | Construction Area (acres) | Operation Area (acres) |
|---|---|---|---|
| Sabal Trail Hillabee Meter Station [d] | 944.3 | 0.0 | 0.2 |
| Alexander City Receiver and Mainline Block Valve | 949.4 | 0.0 | 0.5 |
| Total | | 110.3 | 26.6 |

[a] Aboveground facilities would be entirely within the permanent, maintained right-of-way for the pipeline loops.
[b] Does not include removed facilities, which would be allowed to revert to pre-construction conditions.
[c] Proposed upgrades would not result in new land impacts.
[d] Transco would install aboveground appurtenances within the footprint of the Sabal Trail Hillabee M&R Station, which is associated with the Sabal Trail Project.
Note: The totals shown in this table may not equal the sum of addends due to rounding.

### 2.2.1.3 Contractor Pipe Storage Yards and Staging Areas

Transco would use nine contractor pipe storage yards and staging areas in Alabama and one contractor yard and staging area in Mississippi to house contractor management offices and to stage and store vehicles, equipment, pipe, and other materials (see table 2.2.1-3). The yards would temporarily occupy about 90.4 acres and would be restored to preconstruction conditions in accordance with Transco's CBMPP. Appendix B of the draft EIS depicts the locations of the contractor pipe storage yards and staging areas.

TABLE 2.2.1-3

**Contractor Pipe Storage Yards and Staging Areas for the Hillabee Expansion Project**

| State/County - Yard Name | Construction Area (acres) | Operation Area (acres) |
|---|---|---|
| Alabama Yards | | |
| Choctaw County - Butler #3 | 5.0 | 0.0 |
| Choctaw County - Butler #4 | 10.3 | 0.0 |
| Chilton County - Billingsley #1 | 17.3[a] | 0.0 |
| Chilton County - Verbena #1 | 11.2 | 0.0 |
| Chilton County - Verbena #2 | 6.9 | 0.0 |
| Chilton County - Clanton #1 | 4.8[a] | 0.0 |
| Chilton County - Clanton #2 | 9.2[a] | 0.0 |
| Chilton County - Clanton #3 | 8.3 | 0.0 |
| Coosa County - Kellyton #1 | 9.2[a] | 0.0 |
| Mississippi Yards | | |
| Lauderdale County - Meridian #1 | 8.2 | 0.0 |
| Total | 90.4 | 0.0 |

[a] Construction area impacts do not include the acreages of wetlands within the yards. Transco would avoid impacts on wetlands areas during use of the yards.
Note: The totals shown in this table may not equal the sum of addends due to rounding.

### 2.2.1.4 Access Roads

Transco has identified 58 existing roads that would need to be improved or modified. Additionally, Transco would build and permanently maintain five new roads for operations and permanently maintain six existing roads for operations. Of the proposed access roads, 59 are associated

with yard and pipeline right-of-way access and 10 are associated with aboveground facility access. Access road use would temporarily impact about 62.1 acres of land and permanently impact about 5.8 acres. Table 2.2.1-4 in appendix D of the draft EIS identifies each road improvement proposed on the Hillabee Expansion Project.

After construction and at roads used temporarily for construction, Transco would remove access road improvements and restore improved roads to their preconstruction condition unless the landowner or land-managing agency requests that the improvements be left in place. At this time we are not aware of any landowners or land-managing agencies that have requested Transco leave road improvements in place.

### 2.2.2 Sabal Trail Project

#### 2.2.2.1 Pipeline Right-of-Way

Sabal Trail would use a 100-foot-wide construction right-of-way for a majority of the proposed Mainline route and HCL, and a 90-foot-wide construction right-of-way for the majority of the CCL. This right-of-way would be reduced as necessary through sensitive areas such as wetlands, waterbodies, and residential lands. Constructing the Sabal Trail Project would require the temporary use of about 5,976.1 acres of land. Appendix C of the draft EIS includes typical construction right-of-way diagrams for the project.

Sabal Trail has proposed pipeline routes that are collocated with existing rights-of-way or previously disturbed corridors for approximately 308.1 miles (60 percent) of the total pipeline lengths. The remaining approximately 207.5 miles (40 percent) of the pipeline route would deviate from these rights-of-way and corridors. Of the area affected by pipeline construction, approximately 487.3 acres (8 percent) would overlap with existing easements. Additional information on the locations of the proposed pipeline in relation to existing rights-of-way is presented in section 3.8 of the draft EIS.

Following construction, Sabal Trail would retain a 50-foot-wide permanent right-of-way to operate the pipeline facilities. The permanent right-of-way would require about 2,824.5 acres of land. Of this area, about 94.7 acres would be within previously disturbed, maintained, operational easements. The majority of the permanent right-of-way would be allowed to revert to former use; however, certain activities, such as the construction of aboveground structures or the planting and cultivating of trees, would be prohibited within the permanent right-of-way. The remaining area not permanently maintained would be restored in accordance with Sabal Trail's Erosion and Sediment Control Plan (E&SCP, see section 3.1).

In addition to the construction right-of-way, ATWS would be required in areas such as those identified in section 2.2.2.1. Most ATWSs would add 25 feet onto the construction right-of-way, effectively creating a 115- to 125-foot-wide work area at the ATWS location. In total, ATWSs would temporarily require about 1,621.7 acres of land. Table 2.2.1-1 in appendix D of the draft EIS lists each ATWS proposed on the Sabal Trail Project. Following construction, ATWSs would be restored to preconstruction conditions in accordance with Sabal Trail's E&SCP.

#### 2.2.2.2 Aboveground Facilities

Constructing and operating the aboveground facilities would require the temporary and permanent use of about 232.3 acres and 175.4 acres, respectively. Table 2.2.2-1 lists the land required for each aboveground facility site. Appendix B of the draft EIS depicts the locations of aboveground facilities proposed as part of the Sabal Trail Project.

TABLE 2.2.2-1

**Aboveground Facility Land Requirements for the Sabal Trail Project**

| State/Facility | Milepost | Construction Area (acres) | Operation Area (acres) |
|---|---|---|---|
| Alabama | | | |
| Alexander City Compressor Station | 0.0 | 66.8 | 29.7 |
| Transco Hillabee Meter Station | 0.0 | 1.3 | 1.3 |
| Additional Aboveground Facilities (MLVs, etc.) [a] | See table 2.1.1-3 | 0.5 | 0.5 |
| Georgia | | | |
| Albany Compressor Station | 154.7 | 33.4 | 26.3 |
| Additional Aboveground Facilities (MLVs, etc.) [a] | See table 2.1.1-3 | 1.0 | 1.0 |
| Florida | | | |
| Hildreth Compressor Station | 296.3 | 34.6 | 27.9 |
| Dunnellon Compressor Station | 392.7R[b] | 37.3 | 37.3 |
| Reunion Compressor Station | 474.4 | 18.4 | 17.7 |
| FGT Suwannee Meter Station | 299.7 | 10.4 | 7.4 |
| FSC Meter Station | 474.4 | 1.5 | 1.5 |
| Gulfstream Meter Station | 474.4 | 1.4 | 1.4 |
| FGT Hunters Creek Meter Station | 13.1 | 6.4 | 3.6 |
| Duke Energy Citrus Meter Station | 21.5 | 9.8 | 4.1 |
| Additional Aboveground Facilities (MLVs, etc.) [a] | See table 2.1.1-3 | 1.4 | 1.4 |
| Total | | 224.3 | 161.1 |

[a] Includes MLVs, pig receivers, pig launchers, and tap valves that would be located entirely within the permanent, maintained right-of-way for the pipeline or are associated with the construction and operation of another proposed aboveground facility site.

[b] R indicates milepost location within a re-route that was incorporated into the proposed route after Sabal Trail filed its application on November 18, 2014. Sabal Trail utilized actual linear length in mileposting the re-routes; therefore, the actual linear length of the mainline pipeline, 480.9 miles, exceeds the original milepost length of 474.4 miles.

Note: The totals shown in this table may not equal the sum of addends due to rounding.

### 2.2.2.3 Contractor Pipe Storage Yards and Staging Areas

Sabal Trail would use two contractor yards in Alabama, five pipe/contractor yards in Georgia, and seven pipe/contractor yards in Florida to house contractor management offices and to stage and store vehicles, equipment, pipe, and other materials (see table 2.2.2-2). The yards would temporarily occupy about 388.8 acres and would be restored to preconstruction conditions in accordance with Sabal Trail's E&SCP. Appendix B of the draft EIS depicts the locations of the contractor pipe storage yards and staging areas.

TABLE 2.2.2-2

**Contractor Pipe Storage Yards and Staging Areas for the Sabal Trail Project**

| State/County - Yard Name | Construction Area (acres) | Operation Area (acres) |
|---|---|---|
| Alabama | | |
| Chambers County, Yard 1-1 | 22.9 | 0.0 |
| Lee County, Yard 1-2 | 24.7 | 0.0 |
| Georgia | | |
| Lee County, Yard 2-1 | 21.3 | 0.0 |
| Dougherty County, Yard 2-2 | 24.1 | 0.0 |
| Dougherty County, Yard 2-3 | 77.0 | 0.0 |
| Lowndes County, Yard 3-2 | 25.0 | 0.0 |

TABLE 2.2.2-2

**Contractor Pipe Storage Yards and Staging Areas for the Sabal Trail Project**

| State/County - Yard Name | Construction Area (acres) | Operation Area (acres) |
|---|---|---|
| Lowndes, Yard 3-3 | 23.9 | 0.0 |
| Florida | | |
| Suwannee County, Yard 4-1 | 24.8 | 0.0 |
| Marion County, Yard 5-5 | 38.3 | 0.0 |
| Marion County, Yard 5-6 | 29.7 | 0.0 |
| Marion County, Yard 5-7 | 18.1 | 0.0 |
| Lake County, Yard 6-1 | 12.2 | 0.0 |
| Osceola County, Yard 6-3 | 17.7 | 0.0 |
| Sumter County Yard 6-5 | 29.1 | 0.0 |
| **Total** | **388.8** | **0.0** |

Note: The totals shown in this table may not equal the sum of addends due to rounding.

#### 2.2.2.4 Access Roads

Sabal Trail has identified 158 existing roads that would need to be improved or modified. Additionally, Sabal Trail would build and permanently maintain 36 new roads for operations; permanently maintain 49 existing roads for operations; and build 21 new roads for temporary use during construction. Of the proposed access roads, 251 are associated with contractor pipe storage yards and pipeline right-of-way access and 8 are associated with aboveground facility access. Access road use would temporarily impact about 337.7 acres of land and permanently impact about 105.2 acres. Table 2.2.1-4 in appendix D of the draft EIS identifies each road improvement proposed on the Sabal Trail Project.

After construction and at roads used temporarily for construction, Sabal Trail would remove access road improvements and restore improved roads to their preconstruction condition unless the landowner or land-managing agency requests that the improvements be left in place. At this time we are not aware of any landowners or land-managing agencies that have requested Sabal Trail leave road improvements in place.

### 2.2.3 Florida Southeast Connection Project

#### 2.2.3.1 Pipeline Right-of-Way

FSC would use a 100-foot-wide construction right-of-way for a majority of the proposed route in upland non-agricultural areas and a 125-foot-wide construction right-of-way in agricultural areas. This right-of-way would be reduced as necessary through sensitive areas such as wetlands, waterbodies, and residential lands. Constructing the FSC Project would require the temporary use of about 1,385.5 acres of land. Appendix C of the draft EIS includes typical construction right-of-way diagrams for the project.

FSC proposes a pipeline route that is collocated with existing roads and utilities for approximately 101.9 miles (81 percent) of the total pipeline length. The remaining 24.5 miles (19 percent) of the pipeline route would deviate from these rights-of-way or corridors.

Following construction, FSC would retain a 50-foot-wide permanent right-of-way to operate the pipeline. The permanent right-of-way would require about 743.6 acres of land.

In addition to the construction right-of-way, ATWS would be required in areas such as those identified in section 2.2.1.1. Most ATWSs would add 25 feet onto the construction right-of-way, effectively creating a 125- to 155-foot-wide work area at the ATWS location. In total, ATWSs would temporarily require about 167.6 acres of land. Table 2.2.1-1 in appendix D of the draft EIS lists each ATWS proposed on the FSC Project. Following construction, ATWSs would be restored to preconstruction conditions in accordance with FSC's Plan and Procedures (see section 3.1).

### 2.2.3.2 Aboveground Facilities

Constructing and operating the aboveground facilities would require the temporary and permanent use of about 1.7 acres of land each, respectively. Table 2.2.3-1 lists the land required for each aboveground facility site. Appendix B of the draft EIS depicts the locations of aboveground facilities proposed as part of the FSC Project.

TABLE 2.2.3-1

**Aboveground Facility Land Requirements for the Florida Southeast Connection Project**

| Facility | Milepost | Construction Area (acres) | Operation Area (acres) |
|---|---|---|---|
| Meter Station | | | |
| Martin Meter Station | 126.4 | 0.9 | 0.9 |
| Other Aboveground Facilities (MLVs, pig launchers/receivers) [a] | | | |
| MLV Launcher and Receiver Sites | See table 2.1.3-2 | 0.3 | 0.3 |
| MLVs #1-11 | See table 2.1.3-2 | 0.5 | 0.5 |
| **Total** | | **1.7** | **1.7** |

[a] Includes MLVs, pig receivers, and pig launchers that would be located entirely within the permanent, maintained right-of-way for the pipeline or are associated with the construction and operation of another proposed aboveground facility site.

Note: The totals shown in this table may not equal the sum of addends due to rounding.

### 2.2.3.3 Contractor Pipe Storage Yards and Staging Areas

FSC would use six contractor yards and one staging area to house contractor management offices and to stage and store vehicles, equipment, pipe, and other materials. The yards would temporarily occupy about 204.2 acres (see table 2.2.3-2) and would be restored to preconstruction conditions in accordance with FSC's Plans and Procedures. Appendix B of the draft EIS shows the locations of the contractor pipe storage yards and staging areas.

TABLE 2.2.3-2

**Contractor Pipe Storage Yards and Staging Areas for the Florida Southeast Connection Project**

| Yard Name | Construction Area (acres) | Operation Area (acres) |
|---|---|---|
| Contractor Yards | | |
| Polk Contractor Yard | 12.8 | 0.0 |
| Lake Wales Contractor Yard | 7.5 | 0.0 |
| Osceola Contractor Yard | 92.5 | 0.0 |
| Okeechobee Pipe Storage Yard | 21.5 | 0.0 |
| Martin Contractor Yard | 41.3 | 0.0 |
| Martin Pipe Storage Yard | 24.4 | 0.0 |
| Staging Areas | | |
| Yeehaw Junction Staging Area | 4.3 | 0.0 |
| **Total** | **204.2** | **0.0** |

Note: The totals shown in this table may not equal the sum of addends due to rounding.

#### 2.2.3.4 Access Roads

FSC has identified 254 existing roads that would need to be improved or modified. Additionally, FSC would permanently maintain 14 existing roads for operations and build 1 new road for temporary use during construction. Of the proposed access roads, 256 are associated with yard and pipeline right-of-way access and 13 are associated with aboveground facility access. Access road use would temporarily impact about 125.8 acres of land and permanently impact about 5.3 acres. Table 2.2.1-4 in appendix D of the draft EIS identifies each road improvement proposed on the FSC Project.

After construction and at roads used temporarily for construction, FSC would remove access road improvements and restore improved roads to their preconstruction condition unless the landowner or land-managing agency requests that the improvements be left in place. At this time we are not aware of any landowners or land-managing agencies that have requested FSC leave road improvements in place.

## 2.3 VEGETATION IMPACTS

The SMP Project would cross six primary vegetative cover types including upland forest, pine plantation, open upland, agriculture, forested wetlands, scrub-shrub wetlands, and developed land. Descriptions of each upland vegetation cover type crossed by the SMP Project are provided in table 2.3-1.

TABLE 2.3-1

**Upland Vegetation Cover Types Crossed by the Southeast Market Pipelines Project**

| Vegetation Cover Types | Project | Typical and Observed Vegetation Species in each Project Area |
|---|---|---|
| Upland Forest | Hillabee Expansion Project | Common trees include southern red oak, white oak, turkey oak, American beech, sweetgum, flowering dogwood, tulip poplar, pignut hickory, black cherry, eastern redbud, hornbeam/muscle wood, and loblolly pine. Common shrubs include buckeye, blueberry, mountain laurel, American elderberry, sumac, witch hazel, Chinese privet, and flowering dogwood. Common herbs and vines include blackberry, Japanese honeysuckle, Virginia creeper, Christmas fern, and greenbrier. |
| | Sabal Trial Project | Common trees include loblolly pine, shortleaf pine, oak, hickory, sweetgum, blackgum, red maple, and winged elm. Common understory species include dogwoods, viburnums, blueberry, farkleberry, Christmas fern, American beautyberry, yaupon, and numerous woody vines including muscadine grape and greenbrier. |
| | Florida Southeast Connection Project | Mixed hardwood-conifer forests include live oak, laurel oak, water oak, slash pine, and occasionally longleaf pine, cabbage palm, sweetgum, common persimmon, and red maple. Understory includes palmetto with scattered gallberry. Shrubs typically include saw palmetto, wax myrtle, groundsel tree, and American beautyberry.<br><br>Xeric oak forests include sand live oak, bluejack oak, turkey oak, sand post oak, live oak, and scattered longleaf or sand pine.<br><br>Pine flatwoods include slash pine and/or longleaf pine. The understory includes saw palmetto with scattered fetterbush, tarflower, wax myrtle, gallberry, American beautyberry, live oak, sand live oak, wiregrass, roadgrass, broomsedges, pale meadowbeauty, hemlock witchgrass, pinebarren, and Carolina elephantsfoot. |
| Pine Plantation | Southeast Market Pipelines Project | Consists of land managed primarily for loblolly pine and longleaf pine timber harvest. These areas may be maintained by prescribed fire, herbicide applications, or selective thinning. Mixed hardwood species may encroach into pine plantations if these areas are not maintained. |

TABLE 2.3-1

**Upland Vegetation Cover Types Crossed by the Southeast Market Pipelines Project**

| Vegetation Cover Types | Project | Typical and Observed Vegetation Species in each Project Area |
|---|---|---|
| Open Upland | Hillabee Expansion Project and Sabal Trail Project | Open upland includes pastures, utility rights-of-way, and fallow crop fields. Common herbaceous species include tall fescue, bermudagrass, bahiagrass, broomsedge bluestem, ragweed, and goldenrod. Thickets of blackberry and Japanese honeysuckle, as well as scattered pine and hardwood seedlings and saplings, may also occur. |
| | Florida Southeast Connection Project | Includes dry prairie, palmetto prairie, and pasture/rangeland. Common herbaceous species of dry prairie include broomsedges, bluestems, Bahiagrass, wiregrass, crabgrasses, love grasses, dogfennel, sweet broom, slender goldenrod, smutgrass, finger grass, buttonweeds, paspalums, witchgrasses, and blackberries. Palmetto prairie species include saw palmetto with wax myrtle, gallberry, muscadine grape, fetterbush, shiny blueberry, coastal plain staggerbush, winged sumac, tar flower, and four-petal St. John's wort. Rangeland species include bahiagrass, limpograss, Bermuda grass, smutgrass, pangola grass, and carpetgrass, with old field species such as dog fennel, sweet broom, common ragweed, slender goldenrod, slender flattop goldenrod, spadeleaf, tropical soda apple, cogongrass, pokeweed, manyflower marshpennywort, and blackberry. |
| Agriculture Land | Southeast Market Pipelines Project | Agricultural land includes actively cultivated cropland and hay fields, orchards, citrus groves, and pecan farms. |
| Developed Land | Southeast Market Pipelines Project | Developed land include residential lands, industrial and commercial lands, utility stations, manufacturing or industrial plants, landfills, mines, quarries, and commercial or retail facilities. Residential land generally include tall fescue, bermudagrass, or bahiagrass. |

The location and abundance of wildlife is dependent on habitat, which is generally associated with existing vegetation cover types. The vegetation characteristics of each cover type are the most important factors for determining a species presence or absence at a particular site. Table 2.3-2 identifies the amount of the vegetation that would be affected by constructing and operating the SMP Project. The degree of vegetation removal impact would depend on the type and amount of vegetation affected, the rate at which vegetation would regenerate after construction, and the frequency of vegetation maintenance conducted on the right-of-way during pipeline operation. Site-specific conditions such as grazing, rainfall amounts, elevation, weeds, and soil type would also influence the length of time required to achieve successful revegetation.

TABLE 2.3-2

**Vegetation Communities Affected by Construction and Operation of the Southeast Market Pipelines Project (in acres)[a]**

| | Pine Plantation | | Upland Forest | | Forested Wetland | | Upland Open Land | | Herbaceous Wetland | | Scrub-Shrub Wetland | | Agriculture | | Project Totals[b] | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vegetation Component | Con. | Op. | Con. | Op. | Con. | Op. | Con. | Op. | Con. | Op. | Con. | Op. | Con. | Op. | Con. | Op. |
| Hillabee Expansion Project | | | | | | | | | | | | | | | | |
| Alabama | | | | | | | | | | | | | | | | |
| Pipeline Right-of-Way[c, d] | 70.4 | 26.0 | 166.8 | 48.6 | 32.8 | 18.3 | 234.0 | 141.9 | 27.2 | 18.6 | 3.0 | 1.6 | 9.1 | 2.9 | 543.3 | 257.9 |
| Additional Workspaces | 21.6 | 0.0 | 53.2 | 0.0 | 7.8 | 0.0 | 79.8 | 0.0 | 2.6 | 0.0 | 1.4 | 0.0 | 4.4 | 0.0 | 170.8 | 0.0 |
| Aboveground Facilities | 19.0 | 2.8 | 7.3 | 1.6 | 3.9 | 0.6 | 77.4 | 10.6 | 2.7 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 110.3 | 15.7 |
| Access Roads | 2.4 | 0.6 | 1.8 | 0.7 | 0.2 | 0.2 | 2.4 | 1.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 6.8 | 3.1 |
| Pipe/Contractor Yards | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 55.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 26.4 | 0.0 | 82.2 | 0.0 |
| Alabama Subtotal | 113.3 | 29.5 | 229.1 | 50.9 | 44.7 | 19.2 | 449.5 | 154.1 | 32.5 | 18.7 | 4.4 | 1.6 | 40.0 | 2.9 | 913.5 | 276.9 |
| Mississippi | | | | | | | | | | | | | | | | |
| Pipe/Contractor Yards | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 8.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 8.2 | 0.0 |
| Project Total | 113.3 | 29.5 | 229.1 | 50.9 | 44.7 | 19.2 | 457.7 | 154.1 | 32.5 | 18.7 | 4.4 | 1.6 | 40.0 | 2.9 | 921.7 | 276.9 |
| Sabal Trail Project | | | | | | | | | | | | | | | | |
| Alabama | | | | | | | | | | | | | | | | |
| Pipeline Right-of-Way[c, d] | 200.6 | 95.8 | 529.2 | 254.4 | 15.4 | 6.3 | 230.8 | 120.5 | 1.6 | 0.0 | 4.0 | 0.4 | 16.7 | 8.5 | 998.3 | 485.9 |
| Additional Workspaces | 66.1 | 0.0 | 180.2 | 0.0 | 0.6 | 0.0 | 146.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 7.9 | 0.0 | 400.9 | 0.0 |
| Aboveground Facilities | 17.4 | 2.3 | 11.9 | 4.4 | 0.8 | 0.2 | 37.0 | 24.6 | 0.0 | 0.0 | 1.4 | 0.0 | 0.0 | 0.0 | 68.6 | 31.5 |
| Access Roads | 2.5 | 2.5 | 7.0 | 6.7 | 0.2 | 0.0 | 54.6 | 46.2 | <0.1 | 0.0 | 0.7 | 0.0 | 0.9 | 0.0 | 65.9 | 55.4 |
| Pipe/Contractor Yards | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 47.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 47.7 | 0.0 |
| Alabama Subtotal | 286.6 | 100.7 | 728.4 | 265.5 | 17.0 | 6.5 | 516.1 | 191.3 | 1.6 | 0.0 | 6.2 | 0.4 | 25.5 | 8.5 | 1,581.4 | 572.9 |
| Georgia | | | | | | | | | | | | | | | | |
| Pipeline Right-of-Way[c, d] | 517.8 | 249.7 | 409.7 | 197.8 | 107.0 | 41.3 | 276.9 | 146.6 | 14.4 | 0.0 | 6.7 | 0.9 | 532.8 | 258.5 | 1,865.3 | 894.8 |
| Additional Workspaces | 136.6 | 0.0 | 102.7 | 0.0 | 4.2 | 0.0 | 95.0 | 0.0 | 0.4 | 0.0 | 0.0 | 0.0 | 187.7 | 0.0 | 526.6 | 0.0 |
| Aboveground Facilities | 8.4 | 7.7 | 0.2 | 0.2 | 0.0 | 0.0 | 0.3 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 | 33.6 | 33.6 | 42.4 | 41.7 |
| Access Roads | 4.7 | 2.2 | 6.4 | 2.7 | 0.4 | 0.0 | 88.9 | 31.6 | 0.0 | 0.0 | 0.0 | 0.0 | 10.1 | 2.0 | 110.5 | 38.5 |
| Pipe/Contractor Yards | 11.6 | 0.0 | 2.2 | 0.0 | 0.0 | 0.0 | 71.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 62.1 | 0.0 | 147.2 | 0.0 |
| Georgia Subtotal | 679.2 | 259.6 | 521.0 | 200.7 | 111.5 | 41.3 | 532.3 | 178.4 | 14.8 | 0.0 | 6.7 | 0.9 | 826.3 | 294.1 | 2,691.8 | 975.0 |
| Florida[e] | | | | | | | | | | | | | | | | |
| Pipeline Right-of-Way[c, d, e] | 459.8 | 219.2 | 758.5 | 377.8 | 260.0 | 103.7 | 204.2 | 101.5 | 98.7 | 0.0 | 5.9 | 0.8 | 1,134.1 | 547.2 | 2,921.2 | 1,350.2 |
| Additional Workspaces | 75.3 | 0.0 | 135.4 | 0.0 | 24.9 | 0.0 | 68.3 | 0.0 | 6.2 | 0.0 | 0.5 | 0.0 | 329.6 | 0.0 | 640.2 | 0.0 |
| Aboveground Facilities | 36.6 | 29.9 | 53.5 | 48.9 | 2.3 | 1.4 | 3.8 | 0.9 | 1.7 | 0.9 | 2.0 | 0.0 | 19.8 | 19.2 | 119.7 | 102.2 |
| Access Roads | 17.3 | 0.3 | 23.0 | 1.6 | 7.1 | 0.1 | 7.0 | 0.3 | 0.9 | 0.0 | 0.2 | 0.2 | 51.7 | 0.4 | 107.2 | 2.9 |
| Pipe/Contractor Yards | 0.7 | 0.0 | 1.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 133.4 | 0.0 | 135.2 | 0.0 |

TABLE 2.3-2

**Vegetation Communities Affected by Construction and Operation of the Southeast Market Pipelines Project (in acres)[a]**

| | Pine Plantation | | Upland Forest | | Forested Wetland | | Upland Open Land | | Herbaceous Wetland | | Scrub-Shrub Wetland | | Agriculture | | Project Totals[b] | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vegetation Component | Con. | Op. | Con. | Op. | Con. | Op. | Con. | Op. | Con. | Op. | Con. | Op. | Con. | Op. | Con. | Op. |
| Florida Subtotal | 589.7 | 249.4 | 971.4 | 428.3 | 294.3 | 105.2 | 283.3 | 102.7 | 107.5 | 0.9 | 8.6 | 1.0 | 1,668.6 | 566.9 | 3,923.4 | 1,454.4 |
| Project Total | 1,555.5 | 609.7 | 2,220.8 | 894.4 | 422.9 | 153.0 | 1,331.7 | 472.3 | 123.9 | 0.9 | 21.5 | 2.2 | 2,520.3 | 869.4 | 8,196.6 | 3,001.9 |
| Florida Southeast Connection Project | | | | | | | | | | | | | | | | |
| Florida | | | | | | | | | | | | | | | | |
| Pipeline Right-of-Way[c,d] | 1.1 | 0.5 | 182.3 | 83.1 | 86.7 | 56.1 | 700.4 | 369.1 | 102.1 | 71.0 | 18.0 | 12.7 | 238.6 | 120.8 | 1,329.2 | 713.3 |
| Additional Workspaces | 0.3 | 0.0 | 19.8 | 0.0 | 7.8 | 0.0 | 69.2 | 0.0 | 12.2 | 0.0 | 0.9 | 0.0 | 46.8 | 0.0 | 157.0 | 0.0 |
| Aboveground Facilities | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.4 | 0.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.1 | 0.5 | 0.5 |
| Access Roads | <0.1 | 0.0 | 1.6 | 0.2 | 0.3 | 0.0 | 31.8 | 1.2 | 3.9 | 0.0 | 0.3 | 0.0 | 6.5 | 0.2 | 44.4 | 1.6 |
| Pipe/Contractor Yards | 0.0 | 0.0 | 33.0 | 0.0 | 9.3 | 0.0 | 142.3 | 0.0 | 14.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 199.2 | 0.0 |
| Project Total | 1.4 | 0.5 | 236.6 | 83.3 | 104.1 | 56.1 | 944.1 | 370.6 | 132.8 | 71.0 | 19.3 | 12.7 | 292.0 | 121.1 | 1,730.3 | 715.3 |
| Overall Projects Total | 1,670.2 | 639.7 | 2,686.5 | 1,028.6 | 571.7 | 228.3 | 2,733.5 | 997.0 | 289.2 | 90.6 | 45.2 | 16.5 | 2,852.3 | 993.4 | 10,848.6 | 3,994.1 |
| Mississippi Impacts | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 8.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 8.2 | 0.0 |
| Alabama Impacts | 399.9 | 130.2 | 957.5 | 316.4 | 61.7 | 25.7 | 965.6 | 345.4 | 34.1 | 18.7 | 10.6 | 2.0 | 65.5 | 11.4 | 2,494.9 | 849.8 |
| Georgia Impacts | 679.2 | 259.6 | 521.0 | 200.7 | 111.5 | 41.3 | 532.3 | 178.4 | 14.8 | 0.0 | 6.7 | 0.9 | 826.3 | 294.1 | 2,691.8 | 975.0 |
| Florida Impacts | 591.1 | 249.9 | 1,208.0 | 511.6 | 398.4 | 161.3 | 1,227.4 | 473.3 | 240.3 | 71.9 | 27.9 | 13.7 | 1,960.6 | 688 | 5,653.7 | 2,169.7 |

[a] Approximately 588 and 141.1 acres or developed land would be impacted by construction and operation of SMP Project, respectively, which is not included in the impacts above. Con. = Construction impacts; Op. = operational impacts.

[b] Does not include open water impacts. See section 3.3.2 of the draft EIS for waterbody impacts associated with the projects.

[c] Project-specific construction right-of-way widths are discussed in the project-specific sections above. Note that impacts presented are based on typical construction right-of-way widths (100, 110, 120, etc.) for the entire length of the pipeline discussed by project below. However, the construction right-of-way would be reduced at certain locations (e.g., wetlands), some portions of the right-of-way would overlap with existing rights-of-way that have been previously disturbed, and/or the HDD method would be used to avoid direct impacts on vegetation.

[e] Project-specific operational right-of-way widths are discussed in the project-specific sections above. Note that impacts presented are based on a typical operational right-of-way width of 50 feet for the entire length of the pipeline discussed by project below. However, most vegetation types would be allowed to revert to pre-construction conditions, limited vegetation maintenance would be allowed in wetlands, some portions of the right-of-way would overlap with existing rights-of-way that are maintained, and/or the HDD method would be used to avoid direct impacts on vegetation.

[d] Impacts in Florida include the Sabal Trail Mainline Pipeline, the Citrus County Line, and the Hunter's Creek Line.

# 3.0 DESCRIPTION OF THE PROPOSED ACTION

The following section provides a general overview of the construction procedures the Applicants propose to implement during construction of the SMP Project. Not all of the construction procedures presented in this section would impact listed species. Construction-related impacts that would affect listed species are discussed in detail in section 5.

## 3.1 GENERAL PIPELINE CONSTRUCTION PROCEDURES

The Applicants would design, construct, operate, and maintain their respective pipelines and facilities in accordance with U.S. Department of Transportation (DOT) regulations under 49 CFR 192 (Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards) and other applicable federal and state regulations. DOT regulations specify pipeline material selection; minimum design requirements; protection from internal, external, and atmospheric corrosion; and qualification procedures for welders and operations personnel, in addition to other design standards. The Applicants would also comply with the siting and maintenance requirements under 18 CFR 380.15 (Siting and Maintenance Requirements) and other applicable federal and state regulations, including the requirements of the U.S. Department of Labor, Occupational Safety and Health Administration. These safety regulations are intended to ensure adequate protection of the public, pipeline workers, contractors, and employees, and to prevent natural gas pipeline accidents and failures.

In their respective applications, the Applicants provided plans describing how they would construct and maintain their respective projects. These plans also include measures to avoid and minimize potential impacts on the environment. The environmental avoidance and impact minimization measures identified in the Applicants' plans are based on our *Upland Erosion Control, Revegetation and Maintenance Plan* (FERC Plan) and *Wetland and Waterbody Construction and Mitigation Procedures* (FERC Procedures) available on the FERC Internet website at http://www.ferc.gov/industries/gas/enviro/guidelines.asp. As noted in section 2.2, Transco's baseline environmental construction, restoration, and mitigation plans are contained in its CBMPP; Sabal Trail's baseline environmental plans are contained in its E&SCP; and FSC's baseline environmental plans are contained in its Plan and Procedures. These plans are collectively referred to in this EIS as the Applicants' construction plans and generally include measures that:

- minimize workspace and the duration of construction in uplands and wetlands;
- minimize the impacts of construction on soils and vegetation;
- minimize erosion in uplands and sedimentation in wetlands and waterbodies;
- minimize impacts on terrestrial and aquatic species;
- maintain and control the flow of water in waterbodies;
- enhance restoration of affected lands; and
- minimize impacts on residential areas.

The Applicants' construction plans each include certain proposed modifications to the FERC Plan and Procedures. These modifications are identified in each construction plan and described in table 2.3-1 in appendix D of the draft EIS. We have reviewed these requested modification and find them acceptable.

In addition to the Applicants' baseline plans, the Applicants prepared additional plans or developed and described other measures identified in table 3.1-1 that would be implemented to further reduce SMP Project impacts. The baseline plans and additional plans and procedures are collectively referred to in this BA and the draft EIS as the Applicants' construction and restoration plans. We have reviewed these plans and procedures and find them acceptable.

TABLE 3.1-1

**Construction and Restoration Plans for the Southeast Market Pipelines Project**

| General Plan Name | Transco | Sabal Trail | Florida Southeast Connection |
|---|---|---|---|
| Upland Erosion Control, Revegetation, and Maintenance Plan | Transco's *Upland Erosion Control, Revegetation, and Maintenance Plan* (Resource Report (RR) 7, appendix 7.B; Accession No. 20141118-5156)<br>Draft *Construction Best Management Practices Plan* (CBMPP) (Accession No. 20150410-5147) | *Erosion and Sediment Control Plan* (E&SCP): (Accession No. 20150515-5216) | FSC *Upland Erosion Control, Revegetation, and Maintenance Plan* (RR1, appendix 1F; Accession No. 20140926-5191) |
| Wetland and Waterbody Construction and Mitigation Procedures | Transco's *Wetland and Waterbody Construction and Mitigation Procedures* (RR2, appendix 2.A; Accession No. 20141118-5156) | Included with E&SCP | FSC *Wetland and Waterbody Construction and Mitigation Procedures* (RR1, appendix 1G; Accession No. 20140926-5191) |
| HDD Construction and Contingency Plans | NA | *Best Drilling Practices Plan for the Sabal Trail Project* (EIS Appendix E) | *HDD Contingency Plan* (EIS Appendix E) |
| Karst Plan | NA | *Karst Mitigation Plan* (EIS Appendix F) | *Karst Plan* (EIS Appendix F) |
| Residential Construction Plans | EIS Appendix G | EIS Appendix G | EIS Appendix G |
| Karst Characterization Studies | NA | *Characterization of Karst Sensitive Areas Relative to the Proposed Route of the Sabal Trail Natural Gas Transmission Pipeline in Georgia* and *Characterization of Karst Sensitive Areas Relative to the Proposed Route of the Sabal Trail Natural Gas Transmission Pipeline in Florida* (Appendix H) | NA |
| Spill Plans | *Construction Spill Plan for Oil and Hazardous Materials* (EIS Appendix I) | *Spill Prevention, Control and Countermeasure Plan* (EIS Appendix I) | *Spill Prevention and Control Plan* (EIS Appendix I) |
| Blasting Plan | *Blasting Plan* (RR6, appendix 6.A; Accession No. 20141118-5156) | *Blasting Plan* (RR6, appendix 6A; Accession No. 20141121-5111) | RR6 discussion (Accession No. 20140926-5191) |
| Paleontological Resource Plan | *Unanticipated Paleontological Resources Discovery Plan* (RR6, appendix 6.B; Accession No. 20141118-5156) | RR6 discussion (Accession No. 20141121-5111) | *Paleontological Resource Plan* (RR6, appendix 6C; Accession No. 20140926-5191) |
| Groundwater Monitoring and Mitigation Plan | *Groundwater Monitoring and Mitigation Plan* (RR2, appendix 2.D; Accession No. 20141118-5156) | RR2 discussion (Accession No. 20141121-5179) | RR2 discussion (Accession No. 20140926-5191) |
| Hazardous Materials Discovery Plan | *Unanticipated Discovery of Contamination Plan* (RR7, appendix 7.C; Accession No. 20141118-5156) | RR1 discussion (Accession No. 20141121-5110) | *Unexpected Contamination Response Plan* (Accession No. 20150310-5132) |
| Invasive Species Management Plan | *Noxious and Invasive Weed Control Plan* (RR3, appendix 3.A; Accession No. 20141118-5156) | *Noxious Weed Management Plan* (RR3, appendix 3A; Accession No. 20141121-5128) | *Invasive Species Management Plan for the FSC Project* (RR1, appendix 1E; Accession No. 20140926-5191) |

TABLE 3.1-1

**Construction and Restoration Plans for the Southeast Market Pipelines Project**

| General Plan Name | Transco | Sabal Trail | Florida Southeast Connection |
|---|---|---|---|
| Residential Access/Traffic Mitigation Plan | RR8 discussion (Accession No. 20141118-5156) | RR8 discussion (Accession No. 20141121-5111) | *Residential Access and Traffic Mitigation Plan* (RR8, appendix 8C; Accession No. 20140926-5191) |
| Landowner Complaint Resolution Procedure | *Landowner Complaint Resolution Procedure* (RR1, appendix 1.E; Accession No. 20141118-5156) | RR1 discussion (Accession No. 20141121-5110) | RR1 discussion (Accession No. 20140926-5191) |
| Fire Suppression Plan | *Burning and Fire Suppression Plan* (Accession No. 20150410-5147) | RR1 discussion (Accession No. 20141121-5110) | RR1 discussion (Accession No. 20140926-5191) |
| Unanticipated Discovery Plan | *Protocols for Inadvertent Discovery of Cultural Resources, Burials and/or Human Remains Hillabee Expansion Project* (RR4, appendix 4.A; Accession No. 20141118-5156) | *Procedures Guiding the Discovery of Unanticipated Cultural Resources and Human Remains* (RR4, appendix 4C; Accession No. 20141121-5110) | *Procedures Guiding the Discovery of Unanticipated Cultural Resources and Human Remains* (RR4, appendix 4C; Accession No. 20140926-5191) |
| Dust Control Plans/Procedures | *Fugitive Dust Control Plan* (Accession No. 20150410-5147) | *Fugitive Dust Plan*; Accession No. 20150327-5260 | RR9 discussion Accession No. 20140926-5191 |
| HDD Noise Complaint Resolution Plan | NA | RR9 discussion (Accession No. 20141121-5111) | *HDD Noise Complaint Resolution Plan* (RR9, appendix 9B; Accession No. 20140926-5191) |

Construction of the SMP Project pipeline facilities would follow several sequential pipeline construction techniques, which include survey and staking; clearing and grading; trenching; pipe stringing, bending, and welding; lowering-in and backfilling; hydrostatic testing; commissioning; and cleanup and restoration. These construction techniques would proceed in an assembly line fashion and construction crews would move down the construction right-of-way as work progresses. Construction at any single point along the pipelines, from surveying and staking to cleanup and restoration, would typically last about 6 to 10 weeks. The construction process would be coordinated to limit the time the trench is open in any single area. Figure 3.1-1 illustrates the typical pipeline construction sequence. Following construction, the Applicants would monitor areas disturbed by the SMP Project to ensure successful restoration and revegetation.

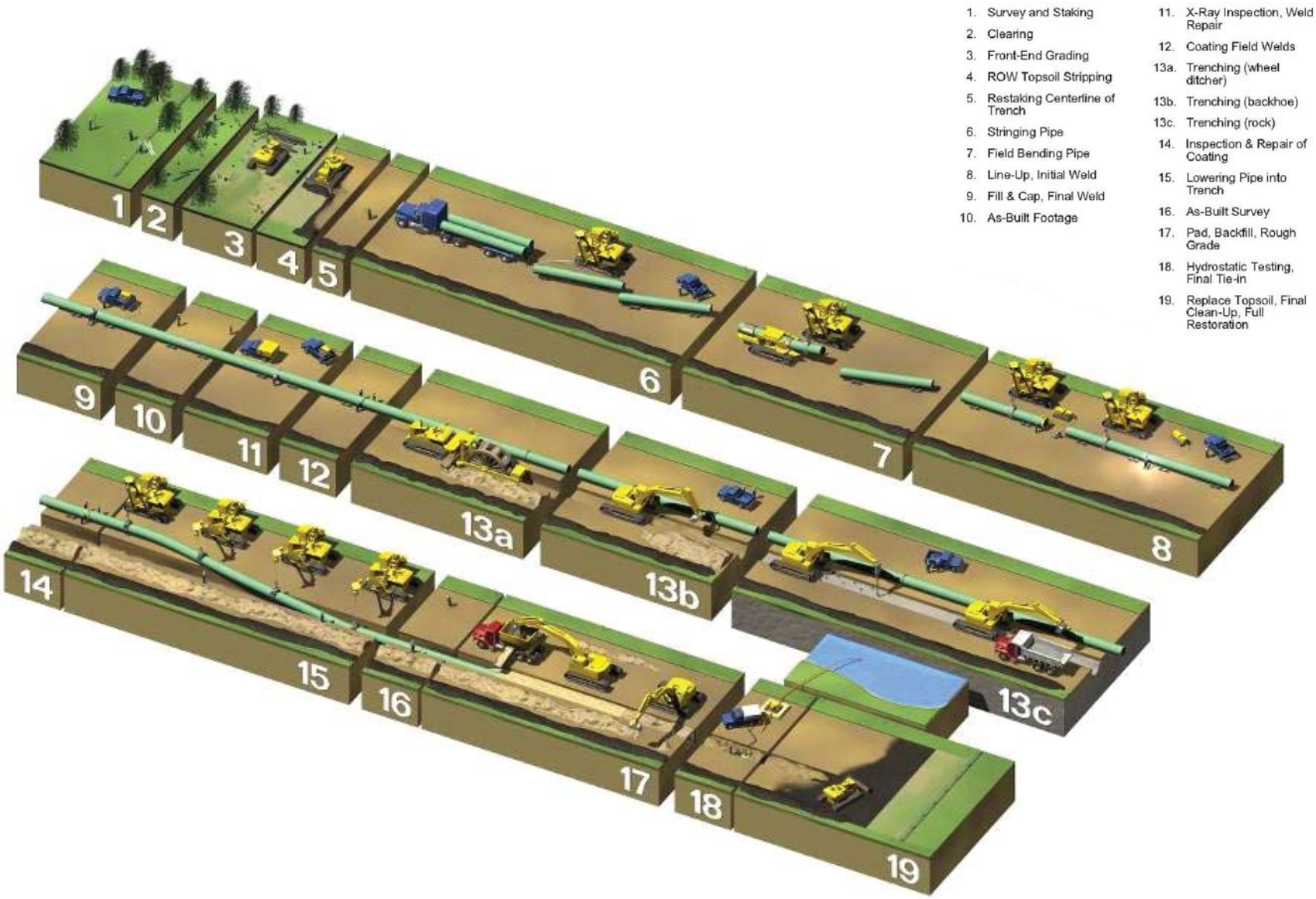


**Figure 3.1-1**
**Southeast Market Pipelines Project**
Construction Sequence Overview

### 3.1.1 Survey and Staking

The first step of construction involves survey crews staking the limits of the construction right-of-way, the centerline of the proposed trench, ATWS, and other approved work areas. The Applicants would mark approved access roads using temporary signs or flagging, and the limits of approved disturbance on any access roads requiring widening. The Applicants would mark other environmentally sensitive areas (e.g., waterbodies, cultural resources, sensitive species) where appropriate. The Applicants would contact the One-Call system for each state to locate, identify, and flag existing underground utilities to prevent accidental damage during pipeline construction.

### 3.1.2 Clearing and Grading

Clearing and grading would remove trees, shrubs, brush, roots, and large rocks from the construction work area and would level the right-of-way surface to allow operation of construction equipment. Vegetation would generally be cut or scraped flush with the surface of the ground, leaving rootstock in place where possible. Brush and other materials cleared from the construction corridor would be open burned, chipped/mulched within the construction right-of-way, or hauled offsite to an appropriate disposal location. Any open burning would be conducted in accordance with applicable state and local regulations and project plans. In the event of an uncontrolled fire, the construction personnel would notify the appropriate fire control authority, and the contractor would initiate and implement fire control activities until relieved by professional fire suppression crews.

Grading would be conducted where necessary to provide a reasonably level work surface. More extensive grading would be required in uneven terrain and where the right-of-way traverses steep slopes and side slopes. The Applicants have indicated that they would separate topsoil from subsoil in residential and agricultural areas. The Applicants would segregate at least the top 12 inches of topsoil where 12 or more inches of topsoil is present. In soils with less than 12 inches of topsoil, the Applicants would segregate the entire topsoil layer. During backfilling, subsoil would be returned to the trench first. Topsoil would follow such that spoil would be returned to its original horizon.

Temporary erosion controls would be installed along the construction right-of-way immediately after initial disturbance of the soil and would be maintained throughout construction. Temporary erosion control measures would remain in place until permanent erosion controls are installed or restoration is completed. Each Applicant has committed to employing Environmental Inspectors during construction to help determine the need for erosion controls and ensure that they are properly installed and maintained.

### 3.1.3 Trenching

Soil and bedrock would be removed to create a trench into which the pipeline would be placed. A rotary trenching machine, track-mounted excavator, or similar equipment would be used to dig the pipeline trench. When rock is encountered, tractor-mounted mechanical rippers or rock trenchers would be used to fracture the rock prior to excavation. Excavated materials would be stockpiled along the right-of-way on the side of the trench away from the construction traffic.

The trench would be excavated to a depth that would provide sufficient cover over the pipeline in accordance with DOT standards in 49 CFR 192.327. Typically, the trench would range from 6 to 8 feet deep, depending on the substrate and resource being crossed. Excavations could be deeper in certain locations, such as at road and stream crossings. Less cover would be provided in rocky areas and additional cover would be provided at road and waterbody crossings. Additional cover (above DOT standards) could also be negotiated at a landowner's request to accommodate land use practices.

Additional depth of cover generally requires a wider construction right-of-way in order to store the additional spoil.

Blasting would be required in areas where mechanical equipment cannot break up or loosen the bedrock. Sabal Trail and Transco have stated that blasting for rock removal may be required during construction, primarily in Alabama and Georgia. Transco and Sabal Trail would each implement a project-specific Blast Plan in accordance with industry accepted standards, applicable regulations, and permit requirements. Each Applicant would adhere to strict safety precautions during blasting and would exercise care to prevent damage to nearby structures, utilities, wells, springs, and other important resources. Blasting would only be conducted during daylight hours and would not begin until landowners and tenants have been provided sufficient advanced notice to protect property or livestock. Blasting mats or padding would be used where necessary to prevent fly rock from scattering. All blasting activities would be performed in compliance with federal, state, and local codes, ordinances, and permits; manufacturers' prescribed safety procedures; and industry practices. FSC does not anticipate that blasting would be required for installation of the FSC Project; however, it stated it would conduct any potential blasting activities in accordance with the measures described above.

### 3.1.4 Pipe Stringing, Bending, Welding, and Coating

After trenching, sections of pipe typically between 40 and 80 feet long (also referred to as "joints") would be transported to the right-of-way by truck and strung beside the trench in a continuous line. The pipe would be delivered to the job site with a protective coating of fusion-bonded epoxy or other approved coating that would inhibit corrosion by preventing moisture from coming into direct contact with the steel. The Applicants would implement measures to prevent wildlife and livestock from falling into open trenches, and install ramps in the trench to provide an exit for wildlife that may fall into the trench. In addition, the draft EIS would inspect open trenches daily prior to construction for wildlife and livestock.

Individual sections of pipe would be bent to conform to the contours of the ground after the joints of pipe sections are strung alongside the trench. Workers would use a track-mounted, hydraulic pipe-bending machine to bend the pipe. Where multiple or complex bends are required, bending would be conducted at the pipe fabrication factory, and the pipe would be shipped to the SMP Project area pre-bent.

After the pipe joints are bent, they would be aligned, welded together into a long segment, and placed on temporary supports at the edge of the trench. The Applicants would use welders who are qualified according to applicable standards in 49 CFR 192 Subpart E, American Petroleum Standard 1104, and other requirements.

Once the welds are made, a coating crew would coat the area around the weld before the pipeline is lowered into the trench. Prior to application, the coating crew would thoroughly clean the bare pipe with a power wire brush or sandblast machine to remove dirt, mill scale, and debris. The crew would then apply the coating and allow the coating to dry. The pipeline would be inspected electronically (also referred to as "jeeped" because of the sound of the alarm on the testing equipment) for faults or voids in the coating and would be visually inspected for scratches, and other defects. The Applicants would repair damage to the coating before the pipeline is lowered into the trench.

### 3.1.5 Lowering-In and Backfilling

The trench would be inspected to be sure it is free of rocks and other debris that could damage the pipe or protective coating before the pipe would be lowered into the trench. Trench dewatering may be necessary to inspect the bottom of the trench in areas where water has accumulated. Trench water

discharges would be directed to well-vegetated areas and away from waterbodies and dry washes to minimize the potential for runoff and sedimentation. The pipeline would then be lowered into the trench by a series of side-boom tractors (tracked vehicles with hoists on one side and counterweights on the other), which would carefully lift the pipeline and place it on the bottom of the trench.

Trench breakers (stacked sand bags or polyurethane foam) would then be installed in the trench on slopes at specified intervals to prevent subsurface water movement along the pipeline. The trench would then be backfilled using the excavated material. At locations where topsoil had been separated from subsoil during the clearing process, subsoil would be returned to the trench first, followed by topsoil. A crown of soil about the width of the trench and up to 1 foot high may be left over the trench to compensate for settling. Appropriately spaced breaks may be left in the crown to prevent interference with stormwater runoff.

In rocky areas or where the trench contains bedrock, padding material such as sand, approved foam, or other protective materials would be placed in the bottom of the trench to protect the pipeline. Topsoil would not be used for padding. Once the pipe is sufficiently covered with suitable material, the excavated rocky soil would be used for backfill within the original rocky soil horizon.

### 3.1.6 Hydrostatic Testing

The Applicants would hydrostatically test the pipeline after backfilling to ensure the system is capable of withstanding the operating pressure for which it was designed. Hydrostatic testing involves filling the pipeline with water to a designated test pressure and maintaining that pressure for about 8 hours. Actual test pressures and durations would be consistent with the requirements of 49 CFR 192. Any leaks would be repaired and the section of pipe retested until the required specifications were met. The new installed pipeline would consist of new steel pipe that would be free of chemicals or lubricant and no water additives would be used during hydrostatic testing.

Water for hydrostatic testing would be obtained from surface waterbodies and municipal water sources. In order to minimize impacts associated from water uses, low stream flow conditions would be avoided. Surface waterbody withdrawals would be conducted by using pumps placed adjacent to the waterbody with hoses placed into the waterbody. Intakes would be screened to prevent the uptake of aquatic organisms and fish. Approximately 189 million gallons of water would be required for the SMP Project, to be used for hydrostatic testing pipeline facilities and aboveground facilities, and HDD pullback. Anticipated withdrawal sites, amounts, and rates are detailed in table 3.1.6-1.

Following depressurization, water would be discharged to well-vegetated upland areas after being run through a dewatering structure designed to dissipate energy, retain suspended solids, and encourage infiltration. Potential impacts resulting from the discharge of water to upland areas would generally be limited to erosion of soils, which would be minimized by adhering to the measures contained in the Applicant's construction and restoration plans. The discharge rate would be regulated to decrease the potential for erosion. Efforts would be made to reuse water between test segments to decrease water withdrawal volumes.

TABLE 3.1.6-1

**Water Use Associated with the Southeast Market Pipelines Project**

| Project/State/Facility | Water Source | Withdrawal Location (MP)[a] | Approximate Volume (gallons) | Discharge Location (MP) |
|---|---|---|---|---|
| Hillabee Expansion Project | | | | |
| Alabama | | | | |
| Rock Springs Loop | Wahalak Creek | 791.1 | 2,458,819 | 791.1 |
| Butler Loop | Tributary to Spear Creek | 792.4 | 1,983,275 | 792.5 |
| Billingsley Loop | Little Mulberry Creek | 889.9 | 2,213,796 | 889.9 |
| Autauga Loop | Swift Creek | 892.9 | 2,750,043 | 892.7 |
| Verbena Loop | Pond at beginning of loop | 905.7 | 1,445,063 | 906.0 |
| Proctor Creek Loop | Proctor Creek | 914.4 | 1,968,530 | 914.5 |
| Hissop Loop | Dunlaps Lake | 927.2 | 954,774 | 927.2 |
| Alexander City Loop | Hillabee Creek | 945.0 | 2,812,712 | 944.9 |
| Hillabee Expansion Project/ Alabama Subtotal | | | 13,774,300 | |
| Sabal Trail Project | | | | |
| Alabama | | | | |
| Mainline | Oaktassasi Creek | 0.1 | 1,075,000 | 4.1 |
| | Tallapoosa River | 7.4 | 6,100,000 | 28.2 |
| | Private Water Source | 37.2 | 5,120,000 | 37.2 |
| | N/A | N/A | N/A | 50.3 |
| | Uchee Creek | 71.0 | 6,290,000 | 55.0 |
| | N/A | N/A | N/A | 67.6 |
| | Chattahoochee River | 86.4 | 3,290,000 | 77.8 |
| Mainline HDD | Hillabee Creek | 1.4 | 2,295,000 | N/A |
| | Tallapoosa River | 7.4 | 1,595,000 | N/A |
| | Uchee Creek | 70.9 | 845,000 | N/A |
| | Chattahoochee River | 86.4 | 750,000 | N/A |
| Compressor Stations | | | | |
| Alexander City | City Water | N/A | 31,794,000 | 0.0 |
| Meter and Regulating Stations | | | | |
| Transco Hillabee | City Water | N/A | 46,400 | 0.0 |
| Sabal Trail Project Alabama Subtotal | | | 62,490,400 | |
| Alabama Total | | | 76,264,700 | |
| Georgia | | | | |
| Mainline | Chattahoochee River | 86.4 | 8,025,000 | 146.8 |
| | N/A | N/A | N/A | 176.1 |
| | Private pond NE of ROW | 204.7R | 4,120,000 | 189.1 |
| | Withlacoochee River (Georgia) | 231.3 | 8,390,000 | 231.2 |
| | N/A | N/A | N/A | 248.9 |
| | Water Well at CS5 | 296.3 | 15,500,000 | 296.3 |
| | N/A | N/A | N/A | 326.1 |
| | N/A | N/A | N/A | 353.1 |
| Mainline HDD | Private Source | 91.23 | 704,840 | N/A |
| | Municipal Fire Hydrant | 163.18 | 2,565,119 | N/A |
| | City of Moultrie, GA | 199.1 | 967,000 | N/A |
| | Withlacoochee River | 231.3 | 2,121,000 | N/A |
| Compressor Stations | | | | |
| Albany | City Water | NA | 16,200 | 159.4R |
| Sabal Trail Project Georgia Total | | | 42,409,159 | |

TABLE 3.1.6-1

**Water Use Associated with the Southeast Market Pipelines Project**

| Project/State/Facility | Water Source | Withdrawal Location (MP)[a] | Approximate Volume (gallons) | Discharge Location (MP) |
|---|---|---|---|---|
| Florida | | | | |
| Mainline | Water Well at CS5 | 392.7R | 15,625,000 | 372.4 |
| | N/A | N/A | N/A | 392.7R |
| | Water Well at CS6 (end MLV 30) | 409.5 | 7,311,000 | 409.5 |
| | N/A | N/A | N/A | 437.3R |
| | MLV 32 / Private Pond (FL-OS-002.005) | 466.7 | 2,887,000 | 466.7 |
| Mainline HDD | Municipal Water Source | 91.23 | 2,198,000 | N/A |
| | Santa Fe River | 308.4 | 1,325,000 | N/A |
| | Private Pond at FL-OS-002.005 | 466.7 | 3,055,000 | N/A |
| Compressor Stations | | | | |
| Hildreth | Well | N/A | 78,300 | 196.4 |
| Dunnellon | City Water | N/A | 140,600 | 392.7R |
| Reunion Compressor Station | Private Pond | 0.3 | 148,300 | 474.4 |
| Meter and Regulating Stations | | | | |
| FGT Suwannee | City Water | N/A | 60,000 | 299.7 |
| FSC | City Water | N/A | 17,900 | 474.4 |
| Gulfstream | City Water | N/A | 15,500 | 474.4 |
| FGT Hunters Creek | City Water | N/A | 38,600 | 13.1 |
| Duke Energy Citrus | City Water | N/A | 8,400 | 21.4 |
| Citrus County Line | Withlacoochee River or Water Well at CS6 | 0.0 | 2,511,000 | 0.0 |
| Citrus County Line HDD | Withlacoochee River | 1.3 | 591,367 | N/A |
| Hunters Creek Line | Private pond S of ROW | 6.3 | 3,460,000 | 6.3 |
| Hunters Creek Line HDD | Private Pond at HCL-FL-OS-031.001 | 9.6 | 1,475,000 | N.A |
| | Municipal Water Source | 12.8 | 280,000 | N/A |
| Sabal Trail Project Florida Subtotal | | | 40,718,367 | |
| Sabal Trail Project Total | | | 145,617,926 | |
| Florida Southeast Connection Project | | | | |
| Florida | | | | |
| Mainline | N/A | N/A | 29,036,000 | N/A |
| Johnson Avenue HDD | N/A | 12 | 74,300 | N/A |
| Weohyakapka Creek HDD | N/A | 38 | 77,866 | N/A |
| Lake Kissimmee HDD | Kissimmee River | 54 | 290,265 | N/A |
| Blanket Bay Slough HDD | N/A | 59 | 80,244 | N/A |
| Boggy Branch/Indian Hammock Trail HDD | N/A | 84 | 44,767 | N/A |
| Forested Wetland HDD | N/A | 99 | 51,655 | N/A |
| Forested Wetland HDD | N/A | 106 | 43,046 | N/A |
| C-23 Canal HDD | C-23 Canal | 115 | 78,515 | N/A |
| SW Warfield Boulevard (SR 710) HDD | Pond adjacent to Warfield Boulevard | 124 | 125,349 | N/A |
| Florida Southeast Connection Project Total | | | 29,776,658 | |
| Florida Total | | | 70,495,025 | |
| Southeast Market Pipelines Project Total | | | 189,168,884 | |

[a] R indicates milepost location within a re-route that was incorporated into the proposed route after Sabal Trail filed its application on November 18, 2014. Sabal Trail utilized actual linear length in mileposting the re-routes; therefore, the actual linear length of the mainline pipeline, 480.9 miles, exceeds the original milepost length of 474.4 miles.

### 3.1.7 Commissioning

Test manifolds would be removed and final pipeline tie-ins would be completed after hydrostatic testing. The pipeline then would be cleaned and dried using mechanical tools (pigs) that are moved through the pipeline with pressurized dry air. Pigs also would be used to internally inspect the pipeline to detect whether any abnormalities or damage exists. Any problems or concerns would be addressed as appropriate. Pipeline commissioning would then commence. Commissioning involves verifying that equipment has been properly installed and is working, verifying that controls and communications systems are functioning, and confirming that the pipeline is ready for service. In the final step, the pipeline would be prepared for service by purging the pipeline of air and loading it with natural gas. The Applicants would not be authorized to place the pipeline facilities into service until it has received written permission from the Director of the FERC's Office of Energy Projects (OEP).

### 3.1.8 Cleanup and Restoration

Within 20 days of backfilling the trench (10 days in residential areas) all work areas would be graded and restored to preconstruction contours and natural drainage patterns as closely as possible. If seasonal or other weather conditions prevent compliance with these timeframes, temporary erosion controls would be maintained until conditions allow completion of final cleanup. Topsoil and subsoil would be tested for compaction at regular intervals in agricultural areas disturbed by construction activities, and severely compacted agricultural areas would be plowed. Cut and scraped vegetation in the storage area would be spread back across the right-of-way. Some large shrubs and trees cut during clearing may be spread back across the right-of-way to impede vehicular traffic and other unauthorized access, or hauled away for disposal in accordance with applicable laws. Surplus construction material and debris would be removed from the right-of-way unless that landowner or land-managing agency approves otherwise. Excess rock/stone would be removed from at least the top 12 inches of soils in agricultural and residential areas and, at the landowner's request, in other areas. The Applicants would remove excess rock/stone such that the size, density, and distribution of rock on the construction right-of-way would be similar to adjacent non-right-of-way areas. Landowners are also at liberty to negotiate certain specific construction requirements and restoration measures directly with the Applicants.

The Applicants would conduct restoration activities in accordance with landowner agreements, permit requirements, and written recommendations on seeding mixes, rates, and dates obtained from the local conservation authority or other duly authorized agency and in accordance with the Applicants construction and restoration plans. The right-of-way would be seeded within 6 working days following final grading, weather and soil conditions permitting. Alternative seed mixes specifically requested by the landowner or required by agencies may be used. Any soil disturbance that occurs outside the permanent seeding season or any bare soil left unstabilized by vegetation would be mulched in accordance with the Applicants construction and restoration plans.

Markers showing the location of the pipeline would be installed at fence and road crossings in order to identify the owner of the pipeline and convey emergency information in accordance with applicable governmental regulations, including DOT safety requirements. Special markers providing information and guidance for aerial patrol pilots would also be installed.

Any property damaged during construction, such as fences and gates, would be restored to its original or better condition in accordance with individual landowner agreements. Access road improvements would be removed after construction and affected roads would be restored to their

preconstruction condition unless the landowner or land-managing agency requests that the improvements be left in place.

### 3.1.9 Post Construction Monitoring

The Applicants would conduct follow-up inspections and monitor disturbed areas at a minimum after the first and second growing seasons, including until revegetation thresholds are met and temporary erosion control devices are removed. The Applicants would submit quarterly monitoring reports for at least 2 years following construction. Restoration is deemed complete when the density and cover of non-nuisance vegetation are similar in density and cover to adjacent, undisturbed areas. We would also monitor for issues such as vegetation cover, invasive species, soil settling, soil compaction, excessively rocky soils, and drainage problems.

We would continue oversight of the SMP Project area after construction by reviewing the Applicants' monitoring reports and conducting compliance inspections. We would require the Applicants to continue revegetation efforts until we determines that restoration is successful.

We recognize that during and after construction, issues or complaints may develop that were not addressed during the environmental proceedings at the Commission, and it is important that landowners have an avenue to contact the Applicants' representatives. Should the SMP Project be approved, we are interested in ensuring that landowner issues and complaints received during and after construction are resolved in a timely and efficient manner.

## 3.2 SPECIAL PIPELINE CONSTRUCTION PROCEDURES

Special construction techniques are typically required when constructing across waterbodies, riparian areas, roads, foreign utilities, steep slopes, geologic faults, and international borders. ATWSs adjacent to the construction right-of-way would be utilized at most of these areas for staging construction, stockpiling spoil, storing materials, maneuvering equipment, and fabricating pipe.

### 3.2.1 Waterbody Crossings

The SMP Project would cross 699 waterbodies, including 258 perennial waterbodies, 407 intermittent or ephemeral streams or ditches, and 34 ponds. The waterbodies that would be crossed and the Applicants' proposed crossing methods for each are listed in table 3.3.2-1 in appendix D of the draft EIS.

The waterbody crossings would be constructed in accordance with federal, state, and local permits and, for those waterbodies that have perceptible flow at the time of construction, in accordance with the Applicant's construction and restoration plans, which are based on our Procedures, except where alternative measures to our Procedures are requested and approved by the FERC and other jurisdictional agencies. Standard waterbody construction measures related to typical ATWS, temporary bridging, clearing of vegetation, sediment control, and timing are described below. The Applicants have identified specific construction methods they would use at each waterbody, including overland, flume, dam and pump, wet open-cut, conventional bore, and HDD construction methods. These construction methods are described below.

ATWS would be required at waterbodies to stage construction, fabricate the pipeline, and store materials. The amount of pipe required to cross a waterbody would be stockpiled in ATWS on one or both sides of the waterbody. These ATWS would be located a minimum of 50 feet from the waterbody edge, except where adjacent upland consists of actively cultivated or rotated cropland or other disturbed

land. The 50-foot setback would be maintained unless site-specific approval for a reduced setback is granted by the FERC and other jurisdictional agencies.

To prevent sedimentation caused by construction and vehicular traffic crossing perennial waterbodies for access to the right-of-way, the Applicants would install temporary equipment bridges to allow construction equipment to cross. Bridges may include clean rock fill over culverts, equipment pads, wooden mats, free-spanning bridges, and other types of spans. Equipment bridges would be maintained throughout construction. Each bridge would be designed to accommodate normal to high streamflow and would be maintained to prevent soil from entering the waterbody and to prevent restriction of flow during the period of time the bridge is in use.

The Applicants would implement the measures in their construction plans to minimize impacts from erosion and sedimentation. Sediment barriers would be installed immediately after initial disturbance of the waterbody or adjacent upland. Sediment barriers would be properly maintained throughout construction and reinstalled as necessary until replaced by permanent erosion controls or restoration of adjacent upland areas is complete and revegetation has stabilized the disturbed areas.

#### 3.2.1.1 Overland Construction Method

For waterbodies without flow at the time of construction, the Applicants would utilize the standard overland construction methods described in section 3.1. After backfilling, the streambanks would be re-established to approximate preconstruction contours and stabilized, and erosion and sediment control measures would be installed across the construction right-of-way to reduce streambank and upland erosion and sediment transport into the waterbody.

#### 3.2.1.2 Flume Construction Method

The flume method is a standard dry, open-cut waterbody crossing method that involves diverting the flow of water across the construction work area through one or more flume pipes placed in the waterbody. The first step in the flume crossing method would involve placing a sufficient number of adequately sized flume pipes in the waterbody to accommodate the highest anticipated flow during construction. After placing the pipe in the waterbody, sand bags or equivalent dam diversion structures would be placed in the waterbody upstream and downstream of the trench area. These devices would serve to dam the stream and divert the water flow through the flume pipes, thereby isolating the water flow from the construction area between the dams. Flume pipes would be left in place during pipeline installation and until final cleanup of the streambed and bank was completed.

#### 3.2.1.3 Dam and Pump Construction Method

The dam and pump method is a standard dry, open-cut waterbody crossing method that may be used as an alternative to the flume method. This method is similar to the flume crossing method except that pumps and hoses would be used instead of flumes to move water across the construction work area. The technique involves damming of the waterbody with sandbags and/or clean gravel with a plastic liner upstream and downstream of the trench area. Pumps would be set up at the upstream dam with the discharge line routed through the construction area to discharge water immediately downstream of the downstream dam. An energy dissipation device would be used to prevent scouring of the streambed at the discharge location. Water flow would be maintained through all but a short reach of the waterbody at the actual crossing. The pipeline would be installed and backfilled. After backfilling, the dams would be removed and the banks restored and stabilized.

### 3.2.1.4 Wet Open-cut Construction Method

The wet open-cut construction method involves trench excavation, pipeline installation, and backfilling in a waterbody without controlling or diverting streamflow (i.e., the stream would flow through the work area throughout the construction period). With the wet open-cut method, the trench would be excavated across the stream using trackhoes or draglines working within the waterbody, on equipment bridges, and/or from the streambanks. Once trench excavation across the entire waterbody is complete, a prefabricated section of pipe would be promptly lowered into the trench. The trench would then be backfilled with the previously excavated material, and the pipe section tied-in to the pipeline. Following pipe installation and backfilling, the streambanks would be re-established to approximate preconstruction contours and stabilized. Erosion and sediment control measures would be installed across the right-of-way to reduce streambank and upland erosion and sediment transport into the waterbody.

### 3.2.1.5 Conventional Bore Method

The conventional bore method involves excavating large bell holes on each side of a waterbody that are deep enough for the bore equipment to auger a hole horizontally from one bell hole to the other a minimum of 5 feet below the bed of a waterbody. Once the bore hole has been created, the pipeline would be pushed or pulled through the hole. Due to the depth of the bell holes and proximity to water resources, this method may require use of sheet pile to maintain the integrity of the bell holes, and use of well point dewatering systems to avoid flooding of the bell holes.

### 3.2.1.6 HDD Construction Method

An HDD involves drilling a hole under the waterbody (or other sensitive feature) and installing a pre-fabricated pipe segment through the hole. Sabal Trail proposes to use the HDD method at 17 locations, and FSC proposed to use the HDD method at 9 locations (see table 3.2.1-1).

TABLE 3.2.1-1

**Horizontal Direction Drill Crossings Associated with the Southeast Market Pipelines Project**

| Project/State/Facility | Feature Crossed | Pipeline Diameter (inches) | Entry Milepost[a] | Exit Milepost[a] | Length (miles) |
|---|---|---|---|---|---|
| Hillabee Expansion Project | None | | | | |
| Sabal Trail Project | | | | | |
| Alabama | | | | | |
| Mainline | Hillabee Creek | 36 | 1.2 | 1.8 | 0.5 |
| | State Highway 22 | 36 | 2.6 | 2.2 | 0.5 |
| | Tallapoosa River | 36 | 7.7 | 7.0 | 0.7 |
| | Uchee Creek | 36 | 70.9 | 70.6 | 0.4 |
| | Chattahoochee River | 36 | 86.5 | 86.2 | 0.4 |
| Alabama Subtotal | | | | | 2.4 |
| Georgia | | | | | |
| Mainline | Hannahatchee Creek | 36 | 91.5 | 91.2 | 0.3 |
| | Flint River | 36 | 163.3 | 162.6 | 0.7 |
| | Ochlockonee River | 36 | 199.4 | 199.1 | 0.3 |
| | State Highway 38 and Withlacoochee River | 36 | 231.9 | 231.2 | 0.7 |
| | | | | | 2.1 |
| Florida | | | | | |
| Mainline | Suwannee River | 36 | 267.4R | 266.7R | 0.7 |
| | Santa Fe River | 36 | 308.6 | 308.2 | 0.5 |
| | US Highway 27 | 36 | 464.5 | 464.9 | 0.4 |

TABLE 3.2.1-1

**Horizontal Direction Drill Crossings Associated with the Southeast Market Pipelines Project**

| Project/State/Facility | Feature Crossed | Pipeline Diameter (inches) | Entry Milepost[a] | Exit Milepost[a] | Length (miles) |
|---|---|---|---|---|---|
| | Toll Road 429 | 36 | 469.7 | 470.5 | 0.8 |
| | Interstate 4 | 36 | 471.7 | 471.1 | 0.5 |
| Citrus County Line | Withlacoochee River | 24 | 1.5 | 1.1 | 0.4 |
| Hunters Creek Line | Shingle Creek | 36 | 9.6 | 8.9 | 0.6 |
| | Deerfield | 36 | 12.5 | 12.8 | 0.4 |
| Florida Subtotal | | | | | 4.4 |
| Sabal Trail Project Subtotal | | | | | 9.0 |
| Florida Southeast Expansion Project | | | | | |
| | Johnson Avenue | 36 | 12.1 | 11.8 | 0.3 |
| | Weohyakapka Creek | 36 | 38.5 | 38.8 | 0.3 |
| | Lake Kissimmee | 36 | 53.7 | 52.6 | 1.0 |
| | Blanket Bay Slough | 36 | 58.3 | 58.5 | 0.3 |
| | Boggy Branch/Indian Hammock Trail | 30 | 84.6 | 84.4 | 0.2 |
| | Forested Wetland | 30 | 98.9 | 98.6 | 0.3 |
| | Forested Wetland | 30 | 105.7 | 105.5 | 0.2 |
| | C-23 Canal | 30 | 114.9 | 114.4 | 0.4 |
| | SW Warfield Boulevard (SR 710) | 30 | 124.3 | 123.6 | 0.7 |
| Florida Southeast Connection Project Subtotal | | | | | 3.7 |
| Southeast Market Pipelines Project Total | | | | | 12.7 |

[a] R indicates milepost location within a re-route that was incorporated into the proposed route after Sabal Trail filed its application on November 18, 2014. Sabal Trail utilized actual linear length in mileposting the re-routes; therefore, the actual linear length of the mainline pipeline, 480.9 miles, exceeds the original milepost length of 474.4 miles.

The HDD method utilizes a slurry referred to as drilling mud, which is composed of 95 percent water and bentonite, a naturally occurring clay mineral that can absorb up to 10 times its weight in water. Bentonite-based drilling mud is a non-toxic, non-hazardous material that is also used to construct potable water wells throughout the United States. The drilling mud is pumped under pressure through the inside of the drill pipe, and flows back (returns) to the drill entry point along the outside of the drill pipe. The purpose of the drilling mud is to lubricate the drill bit and convey the drill cuttings back to the drill entry point where the mud is reconditioned and re-used in a closed, circulating process. Because the drilling mud is pressurized, it also forms a cake on the rock surface of the borehole, which helps to keep the drill hole open and maintain circulation of the drilling mud system. Drilling mud can be lost if the drill path encounters cracks or fissures, resulting in a “frac-out” where the drilling mud is released to the surface. In the event of lost drilling mud, Sabal Trail may introduce additives into the drilling mud to stop or reduce the amount of drilling mud loss. These additives could include walnut shells, paper, other biodegradable solids, or polymers that would increase the viscosity and gel strength of the drilling mud. FSC would not use any additives.

The first step in an HDD is to drill a small diameter pilot hole from one side of the crossing to the other using a drill rig. As the pilot hole progresses, segments of drill pipe are inserted into the hole to extend the length of the drill. The drill bit is steered and monitored throughout the process until the desired pilot hole had been completed. The pilot hole is then enlarged using several passes of

successively larger reaming tools. Once reamed to a sufficient size, a pre-fabricated segment of pipe is attached to the drill string on the exit side of the hole and pulled back through the drill hole toward the drill rig. Depending on the substrate, drilling and pull back can last anywhere from a few days to a few weeks.

### 3.2.2 Wetland Crossings

The proposed pipeline routes would cross 1,574 wetlands, including 208 along the Hillabee Expansion Project, 900 along the Sabal Trail Project, and 466 along the FSC Project (see table 3.4.1-2 in appendix D of the draft EIS). Wetland crossings would be completed in accordance with federal and state permits and follow the measures described in the Applicants' construction plans.

The Applicants would typically use a 75-foot-wide construction right-of-way through wetlands unless site-specific approval for an increased right-of-way width is granted by the FERC and other jurisdictional agencies (see section 3.4.2.1 of the draft EIS). ATWS may be required on both sides of wetlands to stage construction equipment, fabricate the pipeline, and store materials. ATWS for wetland crossings would be located in upland areas a minimum of 50 feet from the wetland edge unless site-specific approval for a reduced setback is granted by the FERC and other jurisdictional agencies (see section 3.4.2.2 of the draft EIS).

Clearing of vegetation in wetlands would be limited to trees and shrubs, which would be cut flush with the surface of the ground and removed from the wetland. Stump removal, grading, topsoil segregation, and excavation would be limited to the area immediately over the trenchline. A limited amount of stump removal and grading may be conducted in other areas to ensure a safe working environment.

During clearing, sediment barriers, such as silt fence and staked straw bales, would be installed and maintained adjacent to wetlands and within temporary extra workspaces as necessary to minimize the potential for sediment runoff. Sediment barriers would be installed across the full width of the construction right-of-way at the base of slopes adjacent to wetland boundaries. Silt fence or straw bales installed across the working side of the right-of-way would be removed during the day when vehicle traffic is present and would be replaced each night. Sediment barriers would also be installed within wetlands along the edge of the right-of-way, where necessary, to minimize the potential for sediment to run off the construction right-of-way and into wetland areas outside the construction work area. If trench dewatering is necessary in wetlands, the trench water would be discharged in stable, vegetated, upland areas and/or filtered through a filter bag or siltation barrier. No heavily silt-laden water would be allowed to flow into a wetland.

Construction equipment working in wetlands would be limited to that essential for right-of-way clearing, excavating the trench, fabricating and installing the pipeline, backfilling the trench, and restoring the right-of-way. The method of pipeline construction used in wetlands would depend largely on the stability of the soils at the time of construction. In areas of saturated soils or standing water, low-ground-weight construction equipment and/or timber riprap, prefabricated equipment mats, or terra mats would be used to reduce rutting and the mixing of topsoil and subsoil. In unsaturated wetlands, the top 12 inches of topsoil from the trenchline would be stripped and stored separately from the subsoil. Topsoil segregation generally would not be possible in saturated soils.

Where wetland soils are saturated and/or inundated, the pipeline may be installed using the push-pull technique. The push-pull technique would involve stringing and welding the pipeline outside of the wetland and excavating the trench through the wetland using a backhoe supported by equipment mats. The water that seeps into the trench would be used as the vehicle to "float" the pipeline into place

together with a winch and flotation devices that would be attached to the pipe. After the pipeline is floated into place, the floats would be removed and the pipeline would sink into place. Pipe installed in saturated wetlands is typically coated with concrete or equipped with set-on weights to provide negative buoyancy. After the pipeline sinks to the bottom of the trench, a trackhoe working on equipment mats would backfill the trench and complete cleanup.

Prior to backfilling, trench breakers would be installed where necessary to prevent the subsurface drainage of water from wetlands. Where topsoil has been segregated from subsoil, the subsoil would be backfilled first followed by the topsoil. Equipment mats, terra mats, and timber riprap would be removed from wetlands following backfilling.

Where wetlands are located at the base of slopes, permanent interceptor dikes and trench plugs would be installed in upland areas adjacent to the wetland boundary. Temporary sediment barriers would be installed where necessary until revegetation of adjacent upland areas is successful. Once revegetation is successful, sediment barriers would be removed from the right-of-way and disposed of properly.

### 3.2.3 Steep Slopes

Segments of the Hillabee Expansion Project and Sabal Trail Project pipeline facilities would cross areas with steep slopes primarily in eastern Alabama and southwestern Georgia. In these areas, Transco and Sabal Trail would install and maintain specific temporary and permanent controls to minimize erosion and sedimentation, which can increase due to clearing, grading, and trenching on steep slopes. During construction, temporary slope and trench breakers consisting of compacted earth, sandbags, or other materials would be coordinated to reduce runoff velocity and divert water off of the construction right-of-way. Temporary trench plugs consisting of compacted earth or similar low-permeability material would be installed at the entry and exit points of wetlands and waterbodies to minimize channeling along the ditch and maintain subsurface hydrology patterns. Additional types of temporary erosion control such as super silt fence, erosion control matting, and hydro-mulching may be used. Upon installation of the pipeline, permanent trench breakers and plugs consisting of sandbags, gravel, foam, cement, or cement-filled sacks would be installed over and around the pipeline and permanent slope breakers generally consisting of compacted earth and rock would be installed across the right-of-way during grade restoration. Surface contours and topsoil would be returned to pre-construction conditions and revegetation of the right-of-way would commence. Sabal Trail and Transco would monitor the right-of-way during operation and take measures as necessary to ensure the effectiveness of erosion control and revegetation.

Sabal Trail may also implement the two-tone construction method in areas of steep side slopes. During grading, the upslope side of the right-of-way would be cut and the material placed on the downslope side to create a safe, level work area. This method could require additional ATWS to accommodate the downslope spoil. After installation of the pipeline, the spoil would be returned to the upslope cut and the overall grade restored. Any springs or seeps found in the upslope cut would be carried downslope through PVC pipe and/or gravel French drains during restoration.

## 3.3 ABOVEGROUND FACILITY CONSTRUCTION

Construction activities at the proposed compressor station sites would include access road construction; site clearing; grading; installing concrete foundations; erecting metal buildings; and installing compressors, metering facilities, and appurtenances. Initial work at the compressor stations would focus on preparing foundations for the buildings and equipment. Building foundations and pipe trenches would be excavated with standard construction earthmoving equipment. The Applicants do not anticipate that blasting would be required at the sites. Following foundation work, station equipment and

buildings would be brought to the site and installed, using any necessary trailers or cranes for delivery and installation. Following installation of the buildings and primary facilities, associated equipment, piping, and electrical systems would be installed. Necessary equipment testing and start-up activities would occur on a concurrent basis.

Construction of the other proposed aboveground facilities, including the M&R stations, MLVs, and pig launchers/receivers, would involve site clearing and grading as needed to establish appropriate contours for the facilities. Following installation of the equipment, the sites would be graveled, as necessary, and fenced. The valves would be installed at intervals specified by the DOT or as needed for customer deliveries.

## 3.4 CONSTRUCTION SCHEDULE AND WORKFORCE

The Applicants would seek approval to begin construction as soon as possible after receiving all necessary federal authorizations and has proposed an in-service date of May 2017 for the majority of the proposed facilities. In addition, certain facilities proposed by Transco and Sabal Trail would be constructed in subsequent phases and placed in-service in May 2020 and May 2021. Section 2.1 describes the construction schedules for each of the projects in detail.

The total construction workforce of 5,807 workers would occur during Phase 1 for all three projects and in all three states affected by the SMP Project. The total construction workforce would vary on any given day depending on the phase of construction. As the pipeline spread moves along, construction at any single point would last approximately 6 to 10 weeks. However, the duration of construction may be longer at aboveground facility sites and at hydrostatic test tie-in locations. Construction crews typically would work 10 hours per day, 6 days per week. Work would be conducted during daylight hours, except where the pipe would be installed using the HDD and bore methods, which require around-the-clock operations and typically last a few days to a few weeks.

## 3.5 OPERATIONS AND MAINTENANCE

The SMP Project pipeline and aboveground facilities would be operated and maintained in accordance with DOT regulations in 49 CFR 192, the Commission's guidance at 18 CFR 380.15, and the Applicants construction and restoration plans.

### 3.5.1 Pipeline Surveys and Inspections

As required by 49 CFR 192.615, the Applicants would establish an operation and maintenance plan and an emergency plan for each project that includes procedures to minimize the hazards in a natural gas pipeline emergency. As a part of pipeline operations and maintenance, the Applicants would conduct regular patrols of the pipeline right-of-way. The patrol program would include monthly aerial and periodic ground patrols of the pipeline facilities to survey surface conditions on and adjacent to the pipeline right-of-way for evidence of leaks, unauthorized excavation activities, erosion and wash-out areas, areas of sparse vegetation, damage to permanent erosion control devices, exposed pipe, missing markers and signs, new residential developments, and other conditions that might affect the safety or operation of the pipeline. The cathodic protection system would also be inspected periodically to ensure that it is functioning properly. In addition, pigs are regularly sent through the pipeline to check for corrosion and irregularities in the pipe in accordance with DOT requirements. All MLVs would be installed with equipment such that they may be remotely operated from a control center. The Applicants would be required to keep detailed records of all inspections and supplements the corrosion protection system as necessary to meet the requirements of 49 CFR 192.

The Applicants would also maintain a liaison with the appropriate fire, police, and public officials as part of each Applicants' emergency operating procedures. Communications with these parties would include the potential hazards associated with the Applicants' facilities located in their service area and prevention measures undertaken; the types of emergencies that may occur on or near the new pipeline facilities; the purpose of pipeline markers and the information contained on them; pipeline location information; recognition of and response to pipeline emergencies; and procedures to contact the Applicants for more information.

In addition, the Applicants would install a supervisory control and data acquisition system on each pipeline system, which would continuously monitor gas pressure, temperature, and volume at specific locations along the pipeline. These system would be continuously monitored from each Applicants' gas control center: Transco's and Sabal Trail's systems would be monitored from their respective Gas Control Centers located in Houston, Texas; FSC's system would be monitored from its Pipeline Control Center in Juno Beach, Florida. The systems would provide continuous information to the control center operators and has threshold and alarm values set such that warnings are provided to the operators if critical parameters are exceeded.

### 3.5.2 Right-of-Way Maintenance

In addition to the survey, inspection, and repair activities described above, operation of the pipeline would include maintenance of the right-of-way. The right-of-way would be allowed to revegetate after restoration; however, larger shrubs and brush may be periodically removed near the pipeline. The frequency of the vegetation maintenance would depend upon the vegetation growth rate. The Applicants have indicated that they would not need to maintain vegetation (i.e., mow) within the 50-foot-wide permanent right-of-way in most land uses types. However, in accordance with the Applicant's construction and restoration plans, routine vegetation maintenance clearing of the permanent right-of-way is allowed but would not be done more frequently than every 3 years. To facilitate periodic corrosion and leak surveys, a corridor not exceeding 10 feet in width centered on the pipeline may be maintained annually in an herbaceous state. In no case would routine vegetation maintenance clearing occur between April 15 and August 1 of any year. Vegetation maintenance would not normally be required in grazing areas.

Pipeline facilities would be clearly marked at line-of-sight intervals and at crossings of roads, railroads, and other key points. The markers would clearly indicate the presence of the pipeline and provide a telephone number and address where a company representative may be reached in the event of an emergency or prior to any excavation in the area of the pipeline by a third party. Each Applicant participates in the national and state One-Call systems in Alabama, Georgia, and Florida.

# 4.0 SPECIES AND CRITICAL HABITAT CONSIDERED

This section describes the species that may occur within the project area. Table 4-1 in appendix A of this BA summarizes our rationale for our no effect determination. Table 4-2 in appendix A of this BA summarizes our rationale for the remaining determinations. Section 5 describes surveys that have been completed and analyzes the federal species that may be affected by the Hillabee Expansion Project.

## 4.1 HILLABEE EXPANSION PROJECT

Transco initiated consultation with FWS' Alabama Ecological Services Field Office in October 2013. A total of 39 federally listed, candidate, or petitioned species may occur in the counties crossed by the Hillabee Expansion Project. Further consultation with the FWS and an assessment of habitat that would be impacted by the Hillabee Expansion Project identified 14 federal special status species that could occur in the project area. Transco prepared a Species Survey Protocol Document that identified survey requirements and protocols for special status species. The Alabama Department of Conservation and Natural Resources (ADCNR) and FWS approved the content and use of the survey document. We have reviewed the survey document and find it adequate.

As stated in section 2.2.1.3, Transco would utilize an 8.2 acre contractor yard in Mississippi to house contractor management offices and to stage and store vehicles, equipment, pipe, and other materials. This project area has been previously disturbed and lacks any suitable wildlife habitat; therefore, we conclude the use of this site would have *no effect* on federal species.

Transco completed species-specific surveys in 2014 and 2015. None of the federal special status species were identified during the surveys; however, suitable habitat was present for two of the species. Based on survey results and consultation with the FWS, we have determined the project would have *no effect* on 31 species; *is not likely to adversely affect* 2 species; and *is not likely to jeopardize or cause a trend towards federal listing* for 6 species. No designated critical habitat would be crossed by the Hillabee Expansion Project.

## 4.2 SABAL TRAIL PROJECT

Sabal Trail consulted with the FWS, NMFS, ADCNR, Alabama Natural Heritage Program (ALNHP)-Auburn University, Georgia Department of Natural Resources (GADNR), Florida Natural Areas Inventory (FNAI), and the Florida Fish and Wildlife Conservation Commission (FWC) to determine if any federal species, including proposed, petitioned, or candidate species, or their designated or proposed critical habitats, occur within the Sabal Trail Project area. A total of 71 federally listed species occur in the counties crossed by the Sabal Trail Project. Biologists familiar with the project area reviewed the information received from these agencies and the habitat that would be crossed by the project and developed a list of special status species that could potentially occur within the study area and be affected by the project. Sabal Trail prepared a Comprehensive Listed Species Protocol Document that identified survey requirements and protocols for special status species. The FWS, ADCNR, GADNR, and FWC and approved the content and use of the Comprehensive Listed Species Protocol Document for the Sabal Trail Project. We have reviewed the document and find it adequate.

Sabal Trail completed species-specific surveys in 2014 and 2015. Based on survey results and consultation with the FWS, we have determined the project would have *no effect* on 40 species; *is not likely to adversely affect* 13 species; *is likely to adversely affect* 5 species; and *is not likely to jeopardize or cause a trend towards federal listing* for 13 species.

Critical habitat was designated for the following species that may be affected by the Sabal Trail Project: the Flint River for the fat-three-ridge, finelined pocketbook, Gulf moccasinshell, inflated spike, oval pigtoe, purple bankclimber, and shinyrayed pocketbook; Uchee Creek for the shinyrayed pocketbook; and the Suwannee River for the Gulf sturgeon. Critical habitat is further discussed in section 5.

## 4.3 FLORIDA SOUTHEAST CONNECTION PROJECT

FSC consulted with the FWS, NMFS, FNAI, and FWC to determine if any federal species, including federal candidate or petitioned species, or their designated or proposed critical habitats occur within the FSC Project area. A total of 43 federally listed species could occur in the counties crossed by FSC Project. FSC completed general habitat surveys in 2013 and 2014 using a 300-foot-wide survey corridor along the proposed pipeline alignment. Based on the habitat preferences for the listed species, habitat that was identified during the field surveys, and through consultation with resource agencies, biologists developed a list of 25 plants and 10 wildlife species have the highest likelihood of occurring in the study corridor. FSC developed a Comprehensive Listed Species Survey Protocols document in coordination with the FWS that identifies where species-specific surveys should be completed and the methodologies that should be used to complete the surveys. We have reviewed the document and find it adequate.

FSC completed sensitive species surveys in 2014 and 2015. Based on survey results and consultation with the FWS, we have determined the project would have *no effect* on 23 species; *is not likely to adversely affect* 7 species; is *likely to adversely affect* 9 species; and *is not likely to jeopardize or cause a trend towards federal listing* for 4 species. No designated critical habitat would be crossed by the FSC Project.

# 5.0 EFFECTS ANALYSIS AND DETERMINATIONS OF EFFECT

The Applicants have proposed several measures to minimize impacts on federally listed species and their habitats. We have summarized these measures to provide a context for our discussion of impacts. The Applicants also have proposed species-specific avoidance and conservation measures that are discussed throughout this section to further minimize impacts on federally listed species and their habitats. This BA also includes recommendations from the draft EIS and measures we believe are necessary to prevent adverse impacts on federally listed species and adverse modifications to designated critical habitat, and are included in the discussions below.

The Applicant's measures to minimize impacts on federally listed species and proposed/designated critical habitat have been developed in consultation with applicable resource agencies, and include:

- complying with other federal, state, and local permit requirements and conditions;
- collocating the pipeline facilities with existing rights-of-way to minimize vegetation clearing and habitat fragmentation;
- limiting the construction and operational right-of-way widths to the minimum necessary;
- developing and implementing a Migratory Bird Conservation Plan in consultation with the FWS to minimize impacts on migratory birds;
- screening water withdrawal intake hoses to prevent fish entrapment and entrainment;
- installing trench ramps at regular intervals to provide wildlife exits and placing gaps in the temporary trench spoil piles and pipe stringing to allow wildlife to migrate through the construction corridor;
- implementing an invasive species management plan to minimize and control the spread of noxious and invasive species;
- restoring preconstruction topography in uplands, wetlands, and waterbodies to the greatest extent practicable;
- restoring disturbed areas with appropriate seed mixes that would eventually restore habitat characteristics, including native grasses, shrubs, and trees; and
- limiting routine ROW maintenance mowing and prohibiting maintenance mowing during the bird nesting season (generally April 15 to August 1 in Alabama and Georgia and March 1 to August 31 in Florida).

## 5.1 CUMULATIVE EFFECTS ANALYSIS

The National Environmental Policy Act requires that federal agencies consider the cumulative impacts of proposals under their review. Cumulative impacts are defined in the Council of Environmental Quality regulations at 40 CFR 1508.7 as "…the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable actions regardless of what agency…or person undertakes such other actions." These actions can include

previously approved or conducted actions as well as pending actions with the FERC or other federal, state, and local agencies, plus privately financed projects when they have overlapping impacts with the environmental resources that the SMP Project would impact. However, the concept of cumulative effects is frequently misunderstood as it relates to section 7 consultation and determining the likelihood of jeopardy or adverse modification. The concept of cumulative effects, as it relates to a BA, includes all non-federal actions that are reasonably certain to occur within the action area under consideration. Future federal actions requiring separate consultation are not discussed in this BA (FWS, 1998).

Section 3.14 of the draft EIS identifies reasonably foreseeable projects that may cumulatively impact resources that would be affected by construction and operation of the SMP Project. These projects were identified through internet research and consultation with state and local agencies and development authorities. Nearly all of the foreseeable projects identified in the draft EIS fall into two types of actions: residential/commercial developments or road expansion/modification projects. The residential/ commercial developments would consist of localized activities that range from a few acres to several hundred acres in size. The majority of the road projects are relatively small in size and would have limited resource impact potential.

Cumulative impacts on federal species could result if other reasonably foreseeable future projects would also affect these same species or their habitat. If constructed, the SMP Project and other projects in the area could result in varying degrees of cumulative impact on different habitats and the species that utilize them depending on the type and scope of each project, their proximity to each other, the timeframe in which they are constructed, and the measures that would be implemented to avoid or reduce impacts. However, the majority of impacts associated with the SMP Project would occur during or continue relatively shortly after construction which would take place in three states over a period of 5 years, and the SMP Project would be largely collocated with existing infrastructure. In addition, the SMP Project would be constructed and maintained in general accordance with our Plans and Procedures, and the Applicants would have to comply with other state and federal permits and regulations that are protective of wetlands, waterbodies, endangered species, cultural resources, air quality, and other resources. Therefore, we conclude that construction and operation of the SMP Project would not significantly contribute to cumulative environmental impacts on federal species.

## 5.2 HILLABEE EXPANSION PROJECT

### 5.2.1 Mussels

Finelined pocketbook (*Hamiota altilis*)

The finelined pocketbook is a federally threatened mussel species occurring in Chilton, Coosa, and Tallapoosa Counties, Alabama, which include the Billingsley Loop, Autauga Loop, Verbena Loop, Proctor Creek Loop, Hissop Loop, and Alexander City Loop. The preferred habitat for the finelined pocketbook is small creeks to large rivers with sand and gravel substrates with moderate flow, and is specifically found in the Cahaba, Coosa, and Tallapoosa Rivers and their tributaries (ALNHP, 2014). Critical habitat has been designated for the finelined pocketbook in Alabama but would not be crossed by the project.

Transco conducted aquatic surveys for mussels during May and August 2014 within the named perennial creeks that would be crossed by the Hillabee Expansion Project. The surveyed reach of all streams included a zone at least 300 feet upstream and 300 feet downstream of the proposed pipeline crossing location and were conducted using survey guidelines published by the FWS (Carlson et al., 2008). For the proposed loops described above, surveyed streams included Little Mulberry Creek, Swift Creek, Indian Creek, Autauga Creek, Proctor Creek, Oaktasasi Creek, Town Creek, and Hillabee Creek.

The finelined pocketbook was not identified in any of these streams; however, suitable habitat was identified in the Little Mulberry Creek, Swift Creek, and Indian Creek, and to a lesser extent in Oaktasasi Creek, Town Creek, and Hillabee Creek.

Transco proposes to cross Town Creek and Hillabee Creek using the wet open-cut crossing method and the other referenced waterbodies using a dry open-cut method (see section 3.2.1). We anticipate that use of a dry open-cut crossing method would minimize downstream sedimentation and turbidity impacts on any mussel populations that may reside downstream of the surveyed project area. Use of the wet open-cut crossing method at Town Creek and Hillabee Creek would increase downstream sedimentation and turbidity impacts, but these impacts would be limited to less than 48 hours of in-water activity while the pipeline is installed.

Hydrostatic test water appropriations and discharges proposed at Little Mulberry Creek, Swift Creek, Proctor Creek, and Hillabee Creek could have minor water availability and quality impacts on potential downstream populations of the mussel. However, Transco would be required to maintain downstream flow rates during water appropriations to protect aquatic life, and these impacts would be localized, temporary, and similar to natural low-water conditions in the streams.

Transco would operate and maintain the proposed facilities in accordance with federal requirements, which include right-of-way maintenance and possible repairs of the installed pipeline. If maintenance or repairs are conducted within or adjacent to streams, impacts on aquatic species could occur, and would be similar to those of the installation of the pipeline described above.

Transco would implement its construction and restoration plans and comply with water appropriation permits from the ADCNR and discharge permits from the Alabama Department of Environmental Management to minimize potential water and aquatic resource impacts. Transco would also comply with the requirements in its CBMPP, which are based on our Plan and Procedures, during operation of the facilities to minimize potential erosion and waterbody impacts during maintenance activities. Because limited suitable habitat is present, no species were identified during mussel surveys, and Transco would implement measures during construction and operation of the pipeline to minimize stream impacts and comply with state and federal permits, we conclude the Hillabee Expansion Project *is not likely to adversely affect* populations of the finelined pocketbook that may reside downstream of the Hillabee Expansion Project and survey corridor.

### 5.2.2 Fish

Blue shiner (*Cyprinella caerulea*)

The blue shiner is a federally threatened fish species that potentially occurs in Coosa County, Alabama, including the Proctor Creek and Hissop Loop portions of the Hillabee Expansion Project. Blue shiners prefer clear, medium to large streams and are found in shallow pools with slow currents or in backwaters over sand and gravel substrates. Spawning occurs from late April to late July. Critical habitat has not been designated for the blue shiner.

Stream surveys indicated potential habitat for this species is present in Proctor Creek and its unnamed tributary. Transco's aquatic surveys of these streams did not identify the blue shiner in either stream. Further, the Alabama shiner and tricolor shiner, two congeners often found with the blue shiner, were not present, suggesting Proctor Creek and its unnamed tributary may be too small and/or too degraded to support the blue shiner. Because the blue shiner was not identified during aquatic surveys, Transco would cross both streams using a dry open-cut method (minimizing turbidity and sedimentation downstream), and would implement its construction and restoration plans to minimize stream impacts, we

conclude that construction and operation of the Hillabee Expansion Project *is not likely to adversely affect* populations of blue shiner.

### 5.2.3 Reptiles

Black pine snake (*Pituophis melanoleucus lodingi*)

The black pine snake is a federal candidate reptile species that potentially occurs along the Rock Springs and Butler Loops in Choctaw County, Alabama. Black pine snakes are typically found in upland longleaf pine forests with sandy, well-drained soils and dense grassy or herbaceous groundcover, and are also found within stream or river corridors in or near pitcher plant bogs adjacent to longleaf pine forests. The FWS issued a proposed rule on October 7, 2014 to list the species as threatened and designate critical habitat. The proposed critical habitat would not be crossed by the Hillabee Expansion Project.

Black pine snakes were not observed during Transco's field reconnaissance surveys and are not known to occur in the immediate project area. The majority of soils crossed by the Rock Springs Loop and Butler Loop are moderately well drained to well drained loamy sands, and 45.8 percent of the pipeline right-of-way and extra workspace areas are in upland forest and planted pine forest. Although the proposed loops would be constructed adjacent to Transco's existing maintained pipeline right-of-way and only limited longleaf pine is present in the area, there is potential for the snake to be present in the area.

Construction activities would likely force any snakes within the construction area to relocate to undisturbed adjacent habitats during construction and restoration. However, the potential exists for direct impact or mortality from construction equipment and vehicle strikes. Similar impacts could occur during maintenance and operation of the pipeline facilities. If a black pine snake is found during construction, Transco would allow the snake to leave the project area on its own accord or be moved by a trained biologist. Once construction is complete and the pipeline right-of-way is restored, it is anticipated that black pine snakes would utilize the restored pipeline right-of-way as they did prior to construction.

Transco would instruct construction and restoration personnel that they are prohibited from intentionally harming any wildlife, including snakes. Open trenches would be monitored daily and wildlife ramps would be installed to allow wildlife to escape the open trench. Restoration of the temporary and permanent construction rights-of-way would allow reuse of the impacted areas within black pine snake habitat. Because the black pine snake has a low probability of occurrence within the project area, would be allowed to leave the project area on its own accord or be moved by a trained biologist, and would not be excluded from the right-of-way following construction, we conclude the Hillabee Expansion Project *is not likely to jeopardize or cause a trend towards federal listing* for the black pine snake.

Eastern diamondback rattlesnake (*Crotalus adamanteus*)

The Eastern diamondback rattlesnake (diamondback) is currently petitioned to be listed as threatened under the ESA. The diamondback is restricted to the Lower Coastal Plain of the southeastern U.S. from southern North Carolina to eastern Louisiana, with the stronghold of their range in Florida and southern Georgia. Diamondbacks could occur within the Rock Springs and Butler loops in Choctaw County, Alabama. Diamondback surveys were not required by the ADCNR or FWS. Habitat destruction, indiscriminate killing, rattlesnake round-ups, and highway mortality contribute to the decline of the diamondback (Giese et al., 2011).

Diamondbacks generally inhabit dry sandy areas, palmetto or wiregrass flatwoods, pinewoods, coastal dune habitats, or hardwood hammocks. Diamondbacks generally avoid wet areas but sometimes are found along the edges of swamps. Diamondbacks rely heavily on gopher tortoise burrows or stump holes during the winter months, emerging on warm days to bask. Most diamondback movement occurs between summer mornings and evenings.

Potential impacts on the diamondback would be similar to that described for the black pine snake above. Transco also would implement the same avoidance and conservations measures for the diamondback as described above. Therefore, we conclude the Hillabee Expansion Project *is not likely to jeopardize or cause a trend towards federal listing* for the diamondback.

## 5.3 SABAL TRAIL PROJECT

### 5.3.1 Mollusks

Sabal Trail completed an assessment to determine the potential presence of mussels, crayfish, and fish within the project area. All perennial stream and river crossings were evaluated using a desktop review of GIS aerials, state historical database records, species occurrence maps, and life history characteristics. Waterbody crossings that exhibited potential for aquatic species were field assessed for habitat suitability. Halawakee Creek (Mainline MP 44.3), Little Uchee Creek (Mainline MP 55.5), and Mossy Creek (Mainline MP 128.5) were prioritized for mussel survey. Waterbodies that are proposed for HDD crossings were excluded from Sable Trail's assessment. All mussel surveys were conducted utilizing the FWS' Freshwater Mussel Survey Protocol (Carlson et al., 2008). No special status mussels were identified during the survey efforts.

Delicate spike (*Elliptio arctata*)

The delicate spike is a petitioned mussel species that inhabits the main channels of the Apalachicola and Flint Rivers, as well as larger tributaries, such as the Chipola River in northern Florida (Williams et al., 2008). The Georgia Natural Heritage Database also contains a record of this species occurring in the lower Withlacoochee River in Lowndes County near the Florida state line; however, this record is outside all other published accounts of the range of this species and the database acknowledges the accuracy of this record as "Medium" and should be considered with caution until further validated by the GADNR. Historical shell specimens indicate that the species once occurred in the Chattahoochee River but it has not been collected in this river in modern times and is likely extirpated. The delicate spike has been reported from a range of habitats, including main channels of rivers, shorelines, and among and under rocks. The species may be well adapted for the tail waters of small tributary reservoirs, although it is not expected to occur within the impounded portions of reservoirs (Brim Box and Williams, 2000).

Project-specific surveys were not conducted for the delicate spike. Suitable habitat for the delicate spike is likely to occur at the Sabal Trail Project's crossing of the Flint River, at approximate Mainline MP 163.1. It may also occur along the Withlacoochee River, at approximate Mainline MP 231.3; however, this possibility is based solely on the single, unconfirmed record noted above. Sabal Trail proposes to cross the Flint River and Withlacoochee River using the HDD crossing method, which would avoid direct impacts on the bed and banks of the waterbodies. However, this method is not without risk. Should an inadvertent return occur within or adjacent to the waterbodies during HDD activities, the release could reduce available oxygen, alter stream pH, cover habitat or individuals, affect food or prey availability, or interfere with gill function and development. Sabal Trail would implement its HDD Contingency Plan (see appendix F of the draft EIS), which identifies measures to reduce inadvertent return potential and to mitigate release impacts, should it occur, including:

- locating HDD entry and exit points a sufficient distance from waterbodies to minimize the potential for erosion or contaminants from entering the waterbodies;

- utilizing the surface casing or intersect methods, as necessary, to minimize the potential of an inadvertent return;

- installing silt fence or sandbag dams to reduce or stop the flow of an inadvertent return that occurs adjacent to a waterbody;

- implementing measures to isolate the inadvertent return from the flowing waterbody. Sable Trail would use a vacuum truck or pump(s) to remove the drilling fluid, working from downstream to upstream, to allow maximum visibility. Hand tools may be used to scarify the sediments and ensure removal to the maximum extent practicable;

- diverting stream flow, if necessary, using temporary barriers to isolate the impact area. Only a portion of the stream would be diverted to minimize dewatering impacts. Water would be able to pass through the site in its natural condition; and

- consulting with agencies to determine appropriate clean-up procedures for an inadvertent return. If it is impracticable to remove the drilling fluid from the surface water, a clear written explanation would be submitted to the applicable regulatory agencies.

Sabal Trail estimates that about 2.6 million and 2.1 million gallons of water would be withdrawn from the Flint River and Withlacoochee River, respectively, during HDD and hydrostatic testing activities. Sabal Trail would implement measures to reduce hydrostatic test water withdrawal and discharge impacts on aquatic resources, including:

- floating and screening water intakes to reduce entrainment or impingement of species;

- reusing hydrostatic test water to the extent practicable;

- maintaining adequate flow rates to protect aquatic life, provide for all waterbody uses, and provide downstream withdrawals of water by existing users;

- discharging into dewatering structures in upland areas within the construction work area, or discharge test water to a well-vegetated and stabilized area, if practical, and maintaining at least a 50-foot vegetated buffer from adjacent waterbody/wetland areas. If an adequate buffer is not available, sediment barriers or similar erosion control measures would be installed;

- avoiding discharges into state-designated special waters, waterbodies that provide habitat for federally listed threatened or endangered species, or waterbodies designated as public water supplies, unless the relevant federal, state, and local permitting agencies grant written permission;

- regulating discharge rates, using energy dissipation device(s), and installing sediment barriers, as necessary, to prevent sedimentation and streambed scour; and

- obtaining and complying with water withdrawal and discharge permits.

No impacts on the Flint River and Withlacoochee River are anticipated during operation of the pipeline. Because the proposed pipeline would be installed by the HDD method, it would be infeasible to conduct maintenance or repairs of the pipeline due to its installed depth under the waterbody. Should future maintenance of the pipeline be required, Sabal Trail would likely have to install a new pipeline segment adjacent to the existing pipeline using the HDD technique.

Direct effects at these crossings would be avoided by installing the pipeline using the HDD crossing method. Transco would also implement its construction plans at the HDD entry and exit workspaces to minimize erosion and sedimentation potential. An inadvertent return of drilling fluid could occur during HDD activities into the Flint and Withlacoochee Rivers; however, Sabal Trail's HDD Contingency Plan would avoid or minimize these impacts to the extent practicable. Water withdrawals from these waterbodies could indirectly affect the mussel; however, compliance with state water withdrawal requirements and the Procedures would minimize impacts on the species. Therefore, we conclude the Sabal Trail Project *is not likely to jeopardize or cause a trend towards federal listing* for the delicate spike.

Fat three-ridge (*Amblema neislerii*)

The fat three-ridge is a federally endangered mussel that inhabits the mainstem of both large and small rivers in the Apalachicola, Chipola, and Flint Rivers of Georgia and Florida. It prefers streams with a moderate current velocity, a 1-meter water depth, and a silty, sand substrate, but has been reported to tolerate a wide range of conditions relative to habitat (Brim Box and Williams, 2000). Brim Box and Williams (2000) reported no live individuals from the Flint River mainstem during their surveys, but more recent collections have produced a few live individuals near Newton, Georgia. Williams et al. (2008) reported it as a hypothetical occurrence in Alabama because no live individuals have ever been collected from the Chattahoochee drainage, despite there being the likelihood that it once inhabited the basin.

Project-specific surveys were not conducted for the fat three-ridge; however, portions of the Sabal Trail Project in Georgia and Florida would cross waterbodies that could support the fat three-ridge. Installation of the pipeline using a dry open-cut crossing method, which would be used in all waterbodies that are flowing at the time of construction, would minimize downstream sedimentation and turbidity impacts on any mussel populations that may reside downstream of the project area.

Critical habitat was established for the fat three-ridge in November 2007. The Sabal Trail Project crosses critical habitat for the fat three-ridge at Mainline MP 163.1 on the Flint River. Sabal Trail would implement the HDD and hydrostatic testing measures identified for the delicate spike to avoid and minimize impacts on water resources and special status species at the Flint River crossing.

Hydrostatic test water appropriations and discharges could have minor water availability and quality impacts. Sabal Trail would implement its construction and restoration plans and comply with water appropriation and discharge permits from state agencies to minimize potential water and aquatic resource impacts.

Because Sabal Trail would implement the measures identified above, we conclude the proposed crossing of the Flint River and other waterbodies in the Apalachicola, Chipola, and Flint River systems of Georgia and Florida, as well as potential maintenance activities during operation of the pipeline facilities, *are not likely to adversely affect* the fat three-ridge or its designated critical habitat.

Finelined pocketbook (*Hamiota altilis*)

Federal status and habitat preference for the finelined pocketbook were previously discussed in section 5.2.1. Project-specific surveys were not conducted for the finelined pocketbook; however, portions of the Sabal Trail Project that cross the Tallapoosa River system between Mainline MPs 0 and 30 could support the finelined pocketbook. As discussed for the delicate spike, we anticipate that the HDD method proposed to cross Hillabee Creek (Mainline MP 1.3) and the Tallapoosa River (Mainline MP 7.4) would avoid and minimize impacts on mussels that may be within these waterbodies. Similarly, impacts associated with using the dry open-cut crossing methods or conducting hydrostatic test water appropriations or discharges would be similar to that described for the delicate spike and fat three-ridge. Therefore, we conclude the Sabal Trail Project *is not likely to adversely affect* populations of the finelined pocketbook.

Gulf moccasinshell (*Medionidus penicillatus*)

The Gulf moccasinshell was federally listed as endangered by the FWS on March 16, 1998. The Gulf moccasinshell prefers sand/silt substrates in slight current to sand/gravel substrates in moderate currents in a wide variety of stream sizes. Historically, this species occurred in the mainstem and tributaries of the Chattahoochee, Flint, and Apalachicola River systems, including the Chipola River in northwest Florida. Brim Box and Williams (2000) reported the Gulf moccasinshell as being one of the rarest species encountered during their survey of 324 sites with only one individual found in the Flint River mainstem. There are no recent records of occurrence in the Chattahoochee River and Brim Box and Williams (2000) believes the species may now be extirpated from this drainage. Project-specific surveys were not conducted for the Gulf moccasinshell.

The Sabal Trail Project would cross the Chattahoochee and Flint River systems, which are upper order streams of the Apalachicola River, between Mainline MPs 30 and 184. The Sabal Trail Project intersects critical habitat for the Gulf moccasinshell at approximate Mainline MP 163.1 on the Flint River. Sabal Trail would cross the Chattahoochee and Flint Rivers using the HDD crossing method. As discussed above for the delicate spike and fat three-ridge, we conclude that the proposed waterbody crossing methods and water use requirements *are not likely to adversely affect* the Gulf moccasinshell or its designated critical habitat.

Inflated spike (*Elliptio purpurella*)

The inflated spike is a petitioned mussel that is endemic to the Chattahoochee, Chipola, and Flint River drainages of the Apalachicola River Basin in Alabama, Georgia, and Florida (Williams et al., 2008). Brim Box and Williams (2008) reported finding the species only in tributaries to the Flint River below the fall line.[8] This species inhabits medium to large creeks and small rivers and is commonly found in some combination of clay, sand, gravel, and limestone in moderate current (Brim Box and Williams, 2000). This species is presumably a short-term brooder and gravid in the spring (Williams et al., 2008).

Project-specific surveys were not conducted for the inflated spike; however, suitable habitat for the inflated spike could occur within the Chattahoochee and Flint River systems between Mainline MPs 30 and 184. Critical habitat for the inflated spike is crossed at the Flint River. As discussed above for the delicate spike and fat three-ridge, we conclude that the proposed waterbody crossing methods and water

[8] The fall line is a geographic boundary about 20 miles wide that runs across Georgia from Columbus to Augusta. The fall line forms where the Upper Coastal Plain sedimentary rock meets the Piedmont crystalline rock, and forms shoals and waterfalls that impede navigation and certain biota movement.

use requirements *are not likely to jeopardize or cause a trend towards federal listing* for the inflated spike.

Oval pigtoe (*Pleurobema pyriforme*)

The oval pigtoe is a federally endangered mussel that occurs in a variety of substrates including sand bars, rock bottoms, muddy sand, silty sand, and sand/gravel of small to large streams with slow to moderate current. It tends to prefer mid-channel areas with current as opposed to along slack-water areas or near stream banks (Brim Box and Williams, 2000). Host fish are inferred based on laboratory infection and include sailfin shiner and eastern mosquitofish.

The oval pigtoe occurs in most major drainages in southern Georgia and northern Florida, including the Suwannee, Flint, Chipola, and Apalachicola Rivers. Brim Box and Williams (2000) reported the species to be extirpated from the Chattahoochee River drainage, with the exception of Sawhatchee Creek in Georgia, which is not crossed by the project. Historical records of the oval pigtoe in Uchee Creek and Little Uchee Creek have not been reconfirmed during more recent sampling events. Project-specific surveys were not conducted for the oval pigtoe; however, preferred habitat is likely present in southern Georgia and northern Florida.

The Sabal Trail Project intersects the critical habitat for the oval pigtoe at approximate Mainline MP 163.1 on the Flint River. Critical habitat is also designated in the Santa Fe River in northcentral Florida; however, the designated critical habitat is approximately 30 miles upstream of the proposed Santa Fe River crossing. As discussed above for the delicate spike and fat three-ridge, we conclude that the proposed waterbody crossing methods and water use requirements *are not likely to adversely affect* the oval pigtoe or its designated critical habitat.

Purple bankclimber (*Elliptoideus sloatianus*)

The purple bankclimber is a federally threatened mussel that inhabits medium to large rivers and is endemic to the Apalachicola, Chattahoochee, and Flint River basins in Georgia and Florida. The species prefers sand, muddy sand, or fine gravel substrates, often occurs in deeper water (greater than 3 meters deep) and is also often found near limestone outcroppings. The purple bankclimber is presumed to be a short-term brooder with gravidity possible during winter, fall and summer (Williams et al., 2008). Recently published data suggest that the Gulf sturgeon may be the primary glochidial host fish for the purple bankclimber (Fritts et al., 2012). Secondary hosts are likely the blackbanded darter and the Halloween darter (Fritts et al., 2012; O'Brien and Williams, 2002). Project-specific surveys were not conducted for the purple bankclimber.

The Sabal Trail Project intersects the critical habitat for the purple bankclimber at approximate Mainline MP 163.1 on the Flint River. As discussed above for the delicate spike and fat three-ridge, we conclude that the proposed waterbody crossing methods and water use requirements *are not likely to adversely affect* the purple bankclimber or its designated critical habitat.

Rayed creekshell (*Anodontoides radiatus*)

The rayed creekshell is a federally petitioned mussel that inhabits small to medium creeks with slight to moderate current in substrates composed of mud, sand, and gravel (Williams et al., 2008), and is typically found in slack water areas along the banks. The species occurs in most major drainages along the northern Gulf Coast and extending westward into southeastern Louisiana. In the SMP Project area, this species occurs within the Chattahoochee and Flint drainages (Mainline MPs 30 to 184). Historically,

it occurred in the mainstem of each, but all modern collections (i.e., within last 40 years) have occurred in specific tributaries and not the river mainstems.

Potential habitat for the rayed creekshell was present at Little Uchee Creek (Mainline MP 55.5), Uchee Creek (Mainline MP 70.8), and Mossy Creek (Mainline MP 128.5). Uchee Creek would be crossed by the HDD crossing method and Mossy Creek would be crossed by either the dry open-cut crossing method or bore method. Sabal Trail's mussel survey of Mossy Creek identified 108 mussel individuals consisting of four species (Gulf spike, southern rainbow, little spectaclecase, and purple liliput); however, an unverified specimen of rayed creekshell was also identified. Biologist anticipate the specimen was a misidentified juvenile southern rainbow. The rayed creekshell was not encountered alive or as shell material during the mussel survey in Little Uchee Creek.

As discussed above for the delicate spike and fat three-ridge, we conclude that the proposed waterbody crossing methods and water use requirements *are not likely to jeopardize or cause a trend towards federal listing* for the rayed creekshell.

Shinyrayed pocketbook (*Hamiota subangulata*)

The shinyrayed pocketbook is a federally endangered mussel that is presently known to occur in a handful of tributaries to the Chattahoochee and Flint Rivers, as well as the mainstem of the Flint and Chipola Rivers. The shinyrayed pocketbook prefers medium sized creeks and rivers in clean or silty sand substrates in slow to moderate current (Williams and Butler, 1994). It has also been recorded in clay/sand and sand/rock substrates (Brim Box and Williams, 2000). This species is gravid from May to August. The primary fish hosts are the largemouth and spotted black bass.

The Sabal Trail Project intersects the critical habitat for this species at approximate Mainline MP 70.8 on Uchee Creek in Russell County, Alabama and at approximate Mainline MP 163.1 on the Flint River. Sabal Trail proposes to cross these waterbodies using the HDD crossing method; therefore, no direct impacts on these waterbodies are anticipated. Shinyrayed pocketbook may also occur in Little Uchee Creek, which is not designated critical habitat for the species, but the creek discharges directly to critical habitat at its confluence with Uchee Creek, which is approximately 30 river miles downstream from the proposed pipeline crossing. Numerous historic mill dams on Little Uchee Creek exists between this confluence and the proposed crossing of Little Uchee Creek. Therefore, there is likely no impact from project construction on this species in the Little Uchee Creek. Sabal Trail's mussel survey in Little Uchee Creek did not encounter the shinyrayed pocketbook or shell material. Further, habitat was largely unsuitable for this species as it consisted mostly of bedrock riffles separated by wide, deep runs having a coarse, loose sand mid-channel substrate bordered by a coarse silt/sand mix nearer the banks.

As discussed above for the delicate spike and fat three-ridge, we conclude that the proposed waterbody crossing methods and water use requirements *are not likely to adversely affect* the shinyrayed pocketbook or its designated critical habitat.

Southern clubshell (*Pleurobema decisum*)

The southern clubshell is a federally endangered mussel that historically was found in most major streams and rivers of the Mobile River basin of Georgia, Alabama, and Mississippi, but has now been eliminated from much of this historic range. The southern clubshell prefers large streams and rivers with moderate flow and sand or gravel substrates, and can sometimes be found in pools with slow or no current. No project-specific surveys were conducted for the southern clubshell; however, suitable habitat is likely present in several of the waterbodies crossed in Alabama and Georgia. Critical habitat has been established for the southern clubshell in Alabama, but would not be crossed by the Sabal Trail Project.

As discussed above for the delicate spike and fat three-ridge, we conclude that the proposed waterbody crossing methods and water use requirements *are not likely to adversely affect* populations of the southern clubshell.

Southern elktoe (*Alasmidonta triangulate*)

The Southern elktoe is a federally petitioned mussel, which inhabits large creeks and the mainstems of rivers within a preferred habitat of sandy mud substrate, particularly in and around rock pools (Brim Box and Williams, 2000). The species is endemic to the Apalachicola River basin and is historically known from the Chattahoochee, Flint, Chipola, and Apalachicola Rivers. Brim Box and Williams (2000) considered it extirpated from the mainstems of the Chattahoochee, Flint, and Apalachicola Rivers; although, an extant population was more recently discovered in the lower Flint River near Bainbridge, Georgia where the impounded effects from Lake Seminole are evident. Brim Box and Williams (2000) reported collection of one live individual in Uchee Creek in 1995. The Auburn University Natural History Museum includes more recent collections from Uchee Creek near Seale, Alabama during 2004. No critical habitat is designated for the Southern elktoe.

Suitable habitat for the Southern elktoe could occur at Sabal Trail's proposed crossing of Uchee Creek at approximate Mainline MP 70.8, which would be crossed by the HDD method. Sabal Trail's mussel survey in Little Uchee Creek did not produce any Southern elktoe alive or as shell material. Habitat at the proposed crossing of Little Uchee Creek was largely unsuitable as it consisted mostly of bedrock riffles separated by wide, deep runs having a coarse, loose sand mid-channel substrate bordered by a coarse silt/sand mix nearer the banks. As discussed above for the delicate spike and fat three-ridge, we conclude that the proposed waterbody crossing methods and water use requirements *are not likely to jeopardize or cause a trend towards federal listing* for the Southern elktoe.

### 5.3.2 Fish

Gulf sturgeon (*Acipenser oxyrinus desotoi*)

The Gulf sturgeon was jointly listed as threatened by the FWS and NMFS on September 30, 1991. NMFS confirmed on January 28, 2014, that the Sabal Trail Project does not fall under its jurisdiction for this fish species because the project does not occur within the marine units of critical habitat.

The Gulf sturgeon is an anadromous species that resides in estuarine or Gulf of Mexico waters during winter months and migrates into rivers to spawn. Adult sturgeon may migrate hundreds of miles upstream to find suitable spawning habitat. The upstream migration begins in early spring through early May and the downstream migration begins in September through October.

Seven major drainages, ranging from the Pascagoula River in Louisiana to the Suwannee River, Florida, have been designated as critical habitat for the species. The Sabal Trail Project would cross designated critical habitat at the Suwannee River crossing at Mainline MP 267.4R. Sabal Trail would cross the Suwannee River using the HDD crossing method. If the HDD method is successfully installed and no inadvertent returns occur within the river, installation of the pipeline would have no effect on the gulf sturgeon or the constituent elements of critical habitat. However, should an inadvertent return occur within the river, sedimentation and turbidity caused by the release of drilling mud may affect the abundance of food and prey items, spawning sites with substrates suitable for egg deposition, aggregation or resting holes, water and sediment quality, breathing and gill function of sturgeon, and the ability to avoid prey species. As described for the delicate spike, Sabal Trail would implement its HDD

Contingency Plan (see appendix F of the draft EIS), which identifies measures to reduce inadvertent return potential and to mitigate release impacts, should it occur.

Sabal Trail estimates that 2.2 million gallons of water would be withdrawn from the Suwannee River during HDD activities. No hydrostatic test water would be withdrawn from the Suwannee River. As discussed for the delicate spike, Sabal Trail would implement measures to minimize entrainment or impingement of aquatic species and would not discharge any water into or adjacent to the Suwannee River without approval from the FWS or state permitting agencies. Based on historical stream flow data compiled by the U.S. Geologic Survey (USGS), the volume of water that would be appropriated from the Suwannee River would not affect the rivers flow regime or water quality, which are constituent elements of the species critical habitat.

Because Sabal Trail would cross the Suwannee River by using the HDD crossing method, would implement its construction and restoration plan and HDD Contingency Plan, and would comply with state and federal permitting requirements at this river crossing, we conclude that the proposed waterbody crossing methods and water use requirements *are not likely to adversely affect* the Gulf sturgeon or its designated critical habitat.

### 5.3.3 Insects

Highlands tiger beetle (*Cicindela highlandensis*)

The highlands tiger beetle is a federal candidate species whose known range is restricted to the Lake Wales Ridge in Polk and Highlands Counties, Florida. Preferred habitat includes open scrub or open areas adjacent to dense scrub, with typical scrub vegetation, and appears absent from low or dwarf scrub. Knisley and Hill (1996) conducted a detailed study of utilized vegetation and soil types for the beetle and found most sites were characterized by a high percent of open fine sand (less than 50 percent) with low vegetation in relation to adjacent habitat.

The Sabal Trail Project crosses marginal to low quality habitat for the highlands tiger beetle between Mainline MPs 449.5 and 451.5. Due to the lack of open sand patches in this location, it is unlikely the beetle occupies this habitat. The species is known to take flight when threatened, so, if present, it would likely take flight and avoid direct construction-related impacts. Construction of the pipeline and maintenance activities during operation of the pipeline right-of-way may create open and maintained patches of low vegetation, which may temporarily improve habitat characteristics for the beetle. Therefore, we conclude the Sabal Trail Project *is not likely to jeopardize or cause a trend towards federal listing* for the highlands tiger beetle.

### 5.3.4 Amphibians

Frosted flatwoods salamander (*Ambystoma cingulatum*)

The frosted flatwoods salamander is a federally threatened species that is found in the lower southeastern Coastal Plain of the United States from southern South Carolina southward to Marion County, Florida and westward to the Apalachicola and Flint Rivers (Pauly et al., 2007). The salamander utilizes a variety of habitats depending on its life stage. Post-larval individuals occupy burrows in mesic longleaf pine-wiregrass flatwoods and savannas with little to no midstory and an open overstory of widely scattered longleaf pine. Ground cover typically consists of low-growing shrubs, such as saw palmetto, gallberry, and blueberries that co-exist with grasses and forbs.

Breeding occurs in acidic, tannin-stained ephemeral wetlands that range in size from 0.05 to 25 acres and are typically not more than 0.5 meter deep. The overstory typically includes pond cypress, blackgum, and slash pine, but can also include red maple, sweetgum, sweetbay, and loblolly bay of varying cover. The representative groundcover is composed of graminaceous species including beakrushes, sedges, panic grasses, bluestems, jointtails, three-awned grass, plumegrass, nutrush, and yellow-eyed grasses. The floor of breeding sites is generally riddled with crayfish burrows and can include smaller, non-predatory fishes. Critical habitat has been designated for the frosted flatwoods salamander but is not crossed by the proposed Sabal Trail Project.

Species-specific surveys for the frosted flatwoods salamander were not required by the FWC, GADNR, or FWS. Sabal Trail did not identify the frosted flatwoods salamander during wetland surveys or during any of the listed species surveys completed for the Sabal Trail Project; however, we acknowledge that this does not preclude the species from occupying the project area. If present during pipeline construction or maintenance activities, the species could be injured or killed by pedestrian or equipment travel.

The FWS does not currently have a conservation or recovery plan for the frosted flatwoods salamander, but preservation of ephemeral wetlands and adjacent upland longleaf pine and wiregrass habitat is necessary to conserve the species. Sabal Trail would restore wetland areas after construction and it is anticipated the frosted flatwoods salamander would utilize the restored wetlands after restoration is complete. The clearing of longleaf pine habitats adjacent to ephemeral wetlands would result in a long-term loss of adult-stage habitat until this habitat is restored within the temporary construction right-of-way, which could take several decades or longer to complete. Wiregrass habitat restoration would generally occur within a few years after construction is complete. Longleaf pine habitat would be permanently lost where the permanent pipeline easement would be maintained in a herbaceous state to facilitate pipeline inspections.

Given the rarity of this species, the absence of any nearby recent records of the species, and the mobile nature of the adult phase of this species, we conclude it is unlikely the Sabal Trail Project would affect the current population of frosted flatwoods salamander. Therefore, we conclude the project *is not likely to adversely affect* the frosted flatwoods salamander and its preferred habitat.

Striped newt (*Notophthalmus perstriatus*)

The striped newt is a federal candidate species whose location is restricted to parts of southern Georgia, the northern half of peninsular Florida, and the eastern Florida panhandle (Conant and Collins, 1998). Preferred habitat includes longleaf pine and turkey oak stands within intact native understories, followed by scrub and pine flatwoods. Exclusion of fire from these fire-dependent communities has altered plant community composition and structure resulting in reduced habitat quality for the species. Ephemeral wetlands are critical to the newt's reproductive cycle. Adult newts migrate from uplands to fishless, ephemeral wetlands to breed from November to February.

In Georgia, striped newts have only been found at five fragmented and isolated locations: Fort Stewart, Joseph W. Jones Ecological Research Center, Fall Line Sandhills Natural Area, Ohoopee Dunes Natural Area, and the Lentile Property. As of 2010, only the Joseph W. Jones Ecological Research Center and Fort Stewart are known to support viable populations, neither of which intersect the Sabal Trail Project area.

From 2005 to 2010, Enge surveyed ponds in suitable habitat in Florida on a number of conservation lands (Enge, 2011). He found that, although the newt has a wider range in Florida than in Georgia, it remains abundant only on public lands such as the Camp Blanding Military Reservation and

Jennings State Forest in Clay County, the Ocala National Forest in Marion County, and the Katherine Ordway Preserve-Swisher Memorial Sanctuary in Putnam County. The Sabal Trail Project crosses Marion County but is approximately 23 miles from the Ocala National Forest. Two voucher specimens were recorded in northern Gilchrist County and in northeastern Levy County, and potential habitat could be present in these areas. Sabal Trail's review of the FWC online Research Institute data for striped newt indicates no positive identifications within the project area, although presence information on private lands is limited.

Species-specific surveys for the striped newt were not required by the FWC, GADNR, or FWS. Sabal Trail did not identify the striped newt during wetland surveys or during any of the listed species surveys completed for the Sabal Trail Project; however, we acknowledge that this does not preclude the species from occupying the project area.

The FWS does not currently have a conservation or recovery plan for the striped newt, but preservation of ephemeral wetlands and adjacent upland buffer habitat is necessary to conserve the species. Similar to the discussion for the frosted flatwoods salamander, direct impacts on the salamander could occur and temporary and long-term impacts on habitat would occur during construction and maintenance of the pipeline.

Given the rarity of this species, the absence of any nearby recent records of the species, and the mobile nature of the adult phase of this species, we conclude it is unlikely the Sabal Trail Project would affect the current population of striped newts. Therefore, we conclude the project *is not likely to jeopardize or cause a trend towards federal listing* for the striped newt and its preferred habitat.

### 5.3.5 Reptiles

Alligator snapping turtle (*Macrochelys temminckii*)

The alligator snapping turtle is currently petitioned for federal listing by the FWS and is listed as state protected in Alabama, threatened in Georgia, and as a species of special concern in Florida. In its southern range, alligator snapping turtles were historically used for food and a high amount of harvesting in the 1960s and 1970s contributed to regional population declines. Natural threats include predation of turtle eggs by feral hogs, raccoons, and fire ants (FWC, 2014).

Alligator snapping turtles are primarily found in deep rivers and canals, but also in lakes, streams, and swamps located near running water. Alligator snapping turtles are highly aquatic and rarely leave the water except to nest. Nesting has been documented in Florida from April to June and usually occurs on steep riverbanks not far from the water (Pritchard, 1992).

Species-specific surveys for the turtle were not required by the FWC, GADNR, or FWS. Sabal Trail did not identify the turtle during wetland surveys or during any of the listed species surveys completed for the Sabal Trail Project; however, we acknowledge that this does not preclude the species from occupying the project area.

Construction of the Sabal Trail Project across river systems, lakes, and deep water wetland systems would have temporary, short-term impacts on any turtles that may be present within the construction area. Turtles that may be present during construction or maintenance activities would likely relocate upstream or downstream of waterbody crossing, or to adjacent inundated areas within lake or wetland systems. Turtles would likely return to the project area after these activities are complete. No long-term habitat impacts are anticipated. Direct impacts on the turtle or nest sites could occur if construction coincides with the nesting season.

The FWS does not currently have a conservation or recovery plan for the alligator snapping turtle, but preservation of habitat and minimizing harvesting and bycatch of the species are necessary to conserve the species. Sabal Trail would restore streams and wetlands after construction and it is anticipated the alligator snapping turtle would utilize the restored areas after restoration is complete. In addition to implementing its construction and restoration plans, Sabal Trail would implement the following best management practices to minimize impacts on the alligator snapping turtle:

- Enforce slow speeds for all construction traffic;
- Monitor construction activities and inspect the pipeline trench each day for injured or trapped wildlife; and
- Implement a "no-kill" policy during construction of the project. Informational pamphlets would be provided informing project personnel that under no circumstance should any animal found on the construction right-of-way be killed. When encountered, the species locations would be reported and the animal would be allowed to leave the area of its own accord without harassment by project personnel.

Because the species would generally be able to avoid the construction area and habitat would only be temporarily disturbed during construction and restoration of the project, we conclude the Sabal Trail Project *is not likely to jeopardize or cause a trend towards federal listing* for the alligator snapping turtle.

<u>American alligator (Alligator mississippiensis)</u>

The American alligator (alligator) is listed as federal threatened due to similarity of appearance to the American crocodile (*Crocodylus acutus*). The Sabal Trail Project is outside the known range of the crocodile. Alligators occur from southeast Oklahoma and east Texas to North Carolina and Florida, and prefer freshwater lakes and slow-moving rivers and associated wetlands and brackish water habitats. Species-specific surveys for the alligator were not required by the FWC, GADNR, or FWS; however, several alligators were documented during Sabal Trail's wetland surveys and listed species survey efforts and are likely to occur within suitable habitats during construction of the project. Critical habitat has not been designated for the alligator.

Construction and operation of the Sabal Trail Project would have temporary, short-term impacts on any alligators that may be present within the construction or maintenance work areas. Alligators that may be present would likely move to adjacent habitats during these activities. Injury or mortality to alligators could occur as they move across the pipeline right-of-way or access roads to find adjacent undisturbed habitat, or if alligators fall into open pipeline trenches during movement across the right-of-way. Depending on activity timeframes, nest disturbance or destruction could occur.

It is anticipated that alligators would return to or utilize the pipeline easement after habitat restoration is complete; therefore, no long-term habitat impacts are anticipated. In addition, Sabal Trail would implement its construction and restoration plans and the speed restriction, trench inspection, and harassment best management practices described for the alligator snapping turtle above to minimize impacts on the alligator.

Considering the above construction practices and conservation measures, we conclude the Sabal Trail Project *is not likely to adversely affect* the American alligator.

Bluetail mole skink (*Plestiodon egregius lividus*) and Florida sand skink (*Neoseps reynoldsi*)

The bluetail mole skink and Florida sand skink are federally threatened lizards that occupy a variety of xeric upland habitats on the Lake Wales Ridge in Polk, Osceola, and Highlands Counties, Florida. These xeric uplands include rosemary and oak-dominated scrub, turkey oak barrens, high pine, and xeric hammocks. Optimal habitat includes areas with few plant roots, open canopies, scattered shrub vegetation, and patches of bare, loose sand. Within these habitat types, skinks are typically found under leaves, logs, palmetto fronds, and other ground debris. Shaded areas provide suitable microhabitat conditions for thermoregulation, egg incubation, and foraging (Mount, 1963). Critical habitat has not been designated for the skinks.

Foraging activities of skinks are primarily at the soil surface or at shallow depths to 2 inches (FWS, 1999), usually during the morning or evening. Sandy soils at elevations above 82 feet mean sea level are key habitat requirements of the skinks (FWS, 2013a). Using elevation and soils data and through consultation with the FWS, a total of 71.7 and 185.5 acres of potentially suitable habitat was identified for the bluetail mole skink and Florida sand skink within Sabal Trail's survey corridor, respectively.

Skinks were not directly observed during general wildlife and habitat surveys in 2014 and 2015; however, the characteristic sinusoidal tracks of skinks were detected at six sites in Lake, Polk, and Osceola Counties, Florida. Between March 10 and May 8, 2015, Sabal Trail conducted coverboard surveys at these sites to confirm skink presence and to identify additional areas that may be occupied by skinks. The coverboard surveys were completed in all suitable skink habitats using approved survey protocols developed in conjunction with the FWS. Based on the cover board surveys and the pedestrian surveys that were completed in 2104 and 2015, skinks were confirmed present at one sparse grass/pasture habitat site and assumed present in five additional native xeric habitats. Based on the current configuration of the project's construction workspace, 25.5 acres of occupied skink habitat would be impacted by the project.

Skinks that may be present within the construction workspaces or within areas that are maintained during operation of the pipeline could be injured or killed by construction activities, such as vegetation clearing and removal, debris piling (soil stock piling), potential burning, construction, restoration, and equipment traffic along the right-of-way and access roads. Occupied habitats would be temporarily lost during construction and pipeline maintenance activities and would not be suitable for use until restoration is complete. Additionally, if the pipeline right-of-way is restored to full vegetation cover, suitable swimmable soil conditions may render the habitat useless and create a barrier for skink movement.

Sabal Trail prepared and filed a report that analyzed the probability of skinks recolonizing the construction right-of-way after construction and restoration of the Sabal Trail Project is complete.[9] Sabal Trail's report summarized previous skink monitoring surveys and determine that skink recolonization typically occurs shortly after disturbances are complete and swimmable soils remain on the site. We have review the information contained in Sabal Trail's report and concur with its findings. To minimize skink habitat and soil impacts, Sabal Trail would implement the following measures:

- Soil disturbances would be limited in skink habitat to only those areas required to establish the pipeline trench.

[9] Sabal Trail's skink recolonize report can be found in Appendix W of Sabal Trail's July 7, 2015 supplemental information filing at: https://elibrary.ferc.gov/IDMWS/Doc_Family.asp?document_id=14355066

- In occupied native xeric habitats, the construction corridor would be cleared with vegetation mulching equipment such as a hydroaxe to minimize soil disturbance and to allow for the resprouting of scrub vegetation to ensure the natural recruitment of vegetation.

- With the exception of proposed non-compacted access roads, the top 4 to 6 inches of the topsoil (A soil horizon) over the trench line within the six occupied skink sites would be removed and placed at the edge of the nonworking side of the construction right-of-way immediately adjacent to other suitable habitat (present at all six occupied sites), allowing skinks to emigrate to this habitat. The trench spoil would be stockpiled immediately adjacent to the segregated topsoil; its height should form a temporary barrier and minimize skink movement towards the trench. Following pipeline installation, the segregated soils would be returned to the trench line.

- All occupied skink sites would be allowed to revegetate by the natural recruitment of species with no planting of exotic, sod-forming grasses.

- Post-construction maintenance of the 50-foot permanent right-of-way would be limited to mowing with a rubber-tired bush-hog once every three years or less, if required, between the months of August and February when skinks are less active.

To offset temporary habitat impacts and potential injury and harm to skinks, Sabal Trail proposes to purchase credits from an approved Florida sand skink conservation bank prior to the initiation of construction. Based on discussion with FWS staff, Sabal Trail proposes to purchase 5.1 acre-credits for the proposed temporary impacts on the 25.5 acres of occupied skink habitat (a 0.20:1 mitigation ratio).

Due to the presence of skinks within the proposed construction area, we conclude the Sabal Trail Project *is likely to adversely affect* the bluetail mole skink and Florida sand skink. We are requesting formal consultation with the FWS regarding this species. Sabal Trail would not be allowed to commence construction until our consultation with the FWS is complete and the Director of OEP provides written confirmation that construction can commence.

Eastern diamondback rattlesnake (*Crotalus adamanteus*)

Federal status and habitat preference for the diamondback were previously discussed in section 5.2.3. As part of a 2-year study on the ecological impacts of State Route 200 on the Ross Prairie Ecosystem, which is less than 1 mile north of the proposed Mainline, researchers captured five diamondbacks and tracked those individuals using radio-telemetry. Two of the snakes were killed by humans and one transmitter failed. The average home range for the two remaining diamondbacks was approximately 200 acres. None of the tracked diamondbacks crossed State Route 200, but they were commonly found in the adjacent right-of-way (as a result one snake was killed by a utility worker). As part of the road kill surveys for the same study, one dead diamondback was found (Smith, 2005).

The Sabal Trail Project may have temporary impacts on the diamondback if the species is displaced from suitable foraging, burrowing, resting, or wintering habitat during construction or maintenance activities. Additionally, if construction or maintenance occurs during the active nesting season, noise from these activities could potentially disturb or disrupt any nearby nests. Direct mortality of adults is unlikely, but could occur due to vehicles or equipment strikes or if snakes are trapped in the open pipeline trench. Diamondbacks are a mobile species and in most instances, are capable of avoiding approaching vehicles and/or equipment by leaving the work area during active construction. Because diamondbacks use a variety of habitats, suitable habitat and prey species are likely present adjacent to the

project workspace. Construction and operation of the pipeline should result in a minimal loss or alteration of some habitat, and is not expected to result in significant long-term loss or contribute to any cumulative loss of habitat. The species is expected to utilize the pipeline right-of-way after restoration is completed and as gopher tortoises are released from temporary holding pens back to the restored upland habitats to excavate new burrows (see the gopher tortoise discussion below).

Wherever possible, Sabal Trail would avoid clearing or disturbing active or known gopher tortoise burrows; and if burrow disturbance is unavoidable, a trained biologist would relocate diamondbacks observed during the burrow excavations outside the construction area. Sabal Trail would implement its construction and restoration plans and the speed restriction, trench inspection, and harassment best management practices described for the alligator snapping turtle above to minimize impacts on diamondbacks. By implementing the protection and conservation measures described above, we conclude the Sabal Trail Project *is not likely to jeopardize or cause a trend towards federal listing* for the diamondback.

Eastern indigo snake (*Drymarchon couperi*)

The Eastern indigo snake (indigo) is listed as threatened by the FWS. The indigo is a large, black, non-venomous snake that is widely distributed throughout central and south Florida and in southern Alabama, but primarily occurs in sandhill habitats in northern Florida and Georgia (FWS, 1999). Population declines have been attributed to over-collecting for the domestic and international pet trade and loss of habitat to development and agriculture (FWS, 2008). The current population size is not accurately known, but it is estimated that between 10,000 and 100,000 individuals exist today (NatureServe, 2015). Critical habitat has not been designated for the indigo.

The indigo is a terrestrial and fossorial predator that will eat any vertebrate small enough to be overpowered. Habitat preference for the indigo ranges based on local climate conditions. In extreme southern reaches of its range (south Florida), the indigo inhabits sandhill regions dominated by mature longleaf pines, turkey oaks, and wiregrass; in addition to coastal scrub; dry glades; palmetto flats; prairie; brushy riparian; and canal corridors with wet fields (NatureServe, 2015). In the northern portion of its range, including southern Alabama, the indigo requires deep sand ridges and is often found in similar habitats to the gopher tortoise. The indigo is dependent on gopher tortoise burrows in the northern extent of its range (Alabama, Georgia, and northern Florida) and utilizes them as a refuge from extreme hot and cold temperatures. Copulation occurs primarily in fall and winter, and eggs are laid (often in gopher burrows) in May to June (NatureServe, 2015). Hatchlings appear from late July through October (NatureServe, 2015).

The FWC Fish and Wildlife Research Institute indicates potential habitat for the indigo occurs in southern Lake County near the Green Swamp and Richloam Wildlife Management Area, southwestern Marion County near the Ross Prairie Ecosystem (including Halpata Tastanaki Preserve), Gilchrist County near Dry Prairie Hammock, southern Suwannee County near the Suwannee River, and western Hamilton County near the Withlacoochee River. Because indigos often inhabit gopher tortoise burrows, the indigo may be present in all areas that have been identified as gopher tortoise habitat. Sabal Trail did not conduct species-specific surveys for the indigo, but biologists observed one live adult indigo and collected one confirmed adult indigo shed from a second location within the project area during general habitat surveys. Both observations were associated with native upland habitats containing gopher tortoise burrows in areas associated with the Ross Prairie Ecosystem.

Construction and maintenance activities would temporarily displace indigos from suitable foraging, burrowing, resting, or wintering habitat. Because indigos use a variety of habitats, construction and maintenance of the pipeline should result in a minimal loss of habitat, and is not expected to result in

long-term or cumulative loss of habitat. Construction and operational activities are not expected to result in a noticeable loss of prey species for the indigo. Wherever possible, Sabal Trail would avoid clearing or disturbing active or known gopher tortoise burrows.

Indirect impacts on indigos adjacent to the construction or maintenance workspaces may occur from pedestrian, equipment, and vehicular traffic, as well as vibration from these activities. Although construction personnel would be advised to avoid snakes through the pamphlets described above for the alligator snapping turtle, the operation of equipment in brushy, grassy, or otherwise vegetated areas may disturb snakes that are not readily visible. Construction and restoration of the Sabal Trail Project is proposed to occur year-round, and activities would generally occur during daylight hours when indigos are active.

Direct mortality of indigos may occur from vehicle or equipment strikes or if snakes become trapped in an open trench. Indigo are a mobile species and in most instances, would be capable of avoiding approaching vehicles and/or equipment. However, indigo fatalities from vehicle strikes are common.

Because of the potential for indigos to occupy the project area, and based on consultations with FWS, Sabal Trail would complete a 100 percent pre-construction survey of all potentially occupied gopher tortoise burrows within 25 feet of the project footprint (described below). Each burrow would be inspected with a remote video system to determine occupancy by tortoises and/or protected commensal species, such as the indigo. Any indigo utilizing the burrows would be allowed to vacate the burrow or would be relocated to an unused burrow in adjacent habitat off of the right-of-way.

In addition to the survey and relocation measures identified above, Sabal Trail would implement its construction and restoration plans and the speed restriction, trench inspection, and harassment best management practices described for the alligator snapping turtle above. Sabal Trail would also implement the Standard Protection Measures for the Eastern Indigo Snake (FWS, 2013b) to further minimize or avoid impacts on this species, which includes the following measures:

- place informational posters identical to those recommended by the FWS at strategic locations along the project right-of-way, proposed access roads, and in construction offices;
- conduct meetings lead by an designated agent prior to construction to educate project personnel on the informational posters and how to properly report the identification of a live, injured, or dead indigos within the right-of-way;
- maintain and replace all posters and education materials as necessary throughout the duration of the project; and
- electronically submit a post construction monitoring report to the FWS within 60 days of project completion.

Although implementing the avoidance and conservation measures above would minimize adverse impacts on the indigo, the handling and relocating of indigos found within the construction right-of-way would be considered harm under the definition of the ESA. Therefore, we conclude that constructing and operating the Sabal Trail Project *is likely to adversely affect* the Eastern indigo snake and are requesting formal consultation with the FWS for this species. Per our recommendation at the beginning of section 3.8 of the draft EIS, Sabal Trail would not be allowed to commence construction until our consultation

with the FWS is complete and the Director of OEP provides written confirmation that construction can commence.

Gopher tortoise (Gopherus polyphemus)

In the Sabal Trail Project area, the gopher tortoise is a federal candidate species and is currently listed as threatened by the FWC. The gopher tortoise occurs in the southeastern coastal plain from southern South Carolina to extreme eastern Louisiana (Conant and Collins, 1998). The core of the current eastern range of gopher tortoises is in southern Georgia and Florida. Land conversion for development is the primary threat to the gopher tortoise (Auffenberg and Franz, 1982). Conversion of native habitats for agricultural and silviculture uses, loss of habitat due to fire suppression, and human predation also threaten gopher tortoise populations (Diemer, 1986).

The gopher tortoise most often lives on well-drained sandy soils in transitional (forest and grassy) areas. It is commonly associated with a pine overstory and an open understory of grasses and forbs intermixed with sunny areas for nesting. Gopher tortoises can sometimes be found in more marginal habitat such as roadsides, ditch banks, utility and pipeline rights-of-way, pastures, and even marginal wetland habitat, especially if their preferred habitat has been lost. Tortoises typically occupy areas with water table depths of 1 to more than 3 feet below the ground surface.

Gopher tortoises excavate burrows for protection from weather extremes, desiccation, and predators. The burrows may be as long as 50 feet and up to 25 feet below the ground surface, but generally average 18 feet in length and 7 feet below the ground surface. In habitats were the water table is high, tortoises may extend the burrow into the water table. Their burrows also serves as an important refuge for many other invertebrate and vertebrate species. Over 300 invertebrates and 60 vertebrate species have been documented to use gopher tortoise burrows (Jackson and Milstrey, 1989).

Sabal Trail conducted gopher tortoise burrow surveys throughout the Sabal Trail Project area in accordance with methodologies approved by the FWS and state agencies. The results of these field surveys were used to estimate the number of tortoises within the project area pursuant to the FWC Gopher Tortoise Permitting Guidelines (FWC, 2013). Sabal Trail surveyed approximately 21 percent of the potentially suitable habitat it would be cross by the project. Based on burrow findings, Sabal Trail estimates that 2,498 gopher tortoises occur within the 300-foot-wide survey corridor.

If occupied during construction, mechanical crushing of active burrows could result in injury or death of gopher tortoises. Mortality could occur due to impact with vehicles or equipment. Gopher tortoises may attempt to move from the construction area by crossing roads and would be at higher risk of impact from increased vehicle traffic. Because tortoises are slow-moving, they are at risk from equipment strikes.

Indirect and long-term effects from the project would likely be minimal and limited to areas of permanent habitat loss from aboveground facilities (i.e., compressor stations, M&R stations, and valve sites). To minimize impacts on the species, Sabal Trail would complete a 100 percent survey of the project construction workspace, including potentially occupied burrows within 25 feet of the workspace. Surveys and tortoise relocations would be conducted by an authorized tortoise agent in accordance with the FWC Gopher Tortoise Permitting Guidelines (FWC, 2013). Sabal Trail would obtain and/or modify conservation permits for documenting tortoises and relocating tortoises to an off-site, approved recipient site. In addition to Sabal Trail's construction and restoration plans, Sabal Trail would implement the speed restriction, trench inspection, and harassment best management practices described for the alligator snapping turtle above. Sabal Trail would also implement the following measures during construction to minimize or preclude disturbance and mortality of gopher tortoises along the entire project area:

- clear the project in a manner that avoids the creation of uncleared habitat islands surrounded by cleared land and provides escape routes from the construction area;

- construct temporary exclusion pens using silt fence outside of the project footprint. The silt fencing would be trenched/buried at a minimum of 8 inches deep; backfilled with soil and compacted; and maintained in good repair to prevent tortoises and burrow commensals from reentering the construction areas; and

- notify the FWC immediately of any injury or mortality to gopher tortoises or other protected species.

Impacts on the gopher tortoise would be temporary due to displacement of individuals during construction. The temporary loss of habitat during construction could affect gopher tortoises; however, maintenance of the right-of-way during operation of the proposed facilities would create better foraging and refuge sites in areas of marginal habitat. By implementing the measures above and the Gopher Tortoise Permitting Guidelines, the Sabal Trail project *is not likely to jeopardize or cause a trend towards federal listing* for the gopher tortoise.

### 5.3.6 Mammals

Florida panther (*Puma concolor coryi*)

The Florida panther is a federally endangered species that historically ranged across the southeastern United States including Arkansas, Louisiana, Mississippi, Alabama, Georgia, Florida, and parts of Tennessee and South Carolina. Breeding populations are now generally limited to the southern tip of Florida, south of the Caloosahatchee River. The Florida panther is a wide-ranging, secretive species that occurs at low densities. They require large contiguous areas to meet their social, reproductive, and energetic needs. Males have a home range on average of 200 square miles and females about 75 square miles. Panther habitat selection is related to prey availability (i.e., habitats that make prey vulnerable to stalking and capturing are selected). Dense understory vegetation provides some of the most important feeding, resting, and denning cover for panthers. Critical habitat has not been designated for the Florida panther.

Florida panthers were not observed during field surveys; however, potential habitat for the Florida panther is present along the project. During the public scoping period for the project, stakeholders reported siting of the Florida panther near the proposed project, although the precise location and accuracy of the sightings cannot be confirmed. If present within the project area during construction, the Florida panther would be temporarily displaced from the construction right-of-way and surrounding areas to similar habitats nearby. Florida panthers displaced from the right-of-way would return to the newly disturbed area and adjacent, undisturbed habitats soon after completion of construction. Routine maintenance activities on the permanent right-of-way would have similar, but less extensive, effects on the Florida panther in the area, depending on the time of year it was conducted. The overall impact on the Florida panther would not be significant because of the short duration of the disturbance and because pipeline facilities would be, to a large extent, adjacent to existing maintained rights of-way.

The southern extent of the Sabal Trail Project area is considered habitat for the Florida panther and some large tracts of contiguous land could harbor the species. Construction and operation of the project may affect panther movement patterns and result in temporary and permanent habitat loss for the species. The creation of a new pipeline corridor in undisturbed areas would also fragment larger undisturbed blocks of habitat for the species (see section 3.6.3.1 of the draft EIS for a discussion on forest fragmentation). However, because the species is highly mobile, can occupy a large home range, and

adequate habitat is present for the species, we conclude the Sabal Trail Project *is not likely to adversely affect* the Florida panther.

### 5.3.7 Birds

Crested caracara (*Caracara cheriway*)

The crested caracara is currently listed as threatened by the FWS under the ESA. In Florida, populations occur between Orlando and the Everglades and reside primarily in wet or dry prairies, improved pastures, and open areas sparsely vegetated with cabbage palm, scrub oak, and cypress (FWS, 1999). Nests are often built in cabbage palms. Crested caracaras do not re-use nests, but will frequently construct new nests in a tree that was used in previous years (FWS, 1999). The primary nesting season is January through March during the winter dry season, although egg laying can begin as early as late September and may last until April. Incubation lasts 4 weeks, and young fledge after 8 weeks (FWS, 1999). Caracaras lay two or three eggs, and generally will only raise one brood per season, unless the first attempt is unsuccessful (FWS, 1999). Critical habitat has not been designated for the crested caracara.

Crested caracaras are resident, non-migratory raptors that feed opportunistically on a wide variety of food sources, including invertebrates and small to medium-sized amphibians, reptiles, birds, and mammals. In addition to capturing live prey, they commonly feed on carrion (FWS, 1999). Crested caracaras will forage on the wing, from a perch, or from the ground.

Potential effects on caracaras could include loss of active nests, eggs, and/or fledglings if construction and maintenance activities were constructed during the nesting season and construction displaces adults from suitable nesting and foraging habitats within or adjacent to the construction right-of-way. Equipment traffic may result in inadvertent "road-kill," which would provide a food source, but conversely may increase the risk of vehicle strikes. Maintenance and periodic clearing activities along the operational pipeline right-of-way could increase foraging habitat for the caracara.

The Sabal Trail Project intersects the FWS consultation area for the species in Florida in Lake, Orange, Osceola, and Polk Counties. Sabal Trail completed surveys for the crested caracara throughout appropriate habitat areas in accordance with the Comprehensive Listed Species Survey Protocol Document developed in conjunction with and approved by the FWS. Surveys were completed between March and May of 2014 and in February of 2015. No crested caracaras were identified during surveys, and no known records of the species occur within 3 miles of the project. Individuals that may be sighted during construction would likely occur as transients and would not be impacted by construction activities.

The project would temporarily and permanently affect preferred habitat for the species; however, no direct impacts on the crested caracara are anticipated. Therefore, we conclude the Sabal Trail Project *is not likely to adversely affect* the crested caracara.

Florida scrub-jay (*Aphelocoma coerulescens*)

The Florida scrub-jay (scrub-jay) is currently listed as threatened by the FWS. Scrub-jays are non-migratory medium-sized jays that are endemic to scrub habitats in the Florida peninsula. The largest populations occur in Brevard, Highlands, Polk, and Marion Counties. Population declines have been attributed to the loss of scrub habitat from land development. Development has also led to increased mortality from vehicles and domestic cats. Fire suppression has also created habitats that are too densely vegetated for scrub-jay occupation. Critical habitat has not been designated for the scrub-jay.

The project intersects the FWS Consultation Area for the scrub-jay in Orange, Osceola, Polk, Lake, Sumter, Marion, and Levy Counties. According to the FWS, potentially suitable scrub-jay habitat includes the "classic" scrub types of xeric oak scrub, scrubby pine flatwoods, scrubby coastal strand, and sand pine scrub. Additional habitats considered include pine-mesic oak, xeric oak, sand live oak, improved, unimproved and woodland pastures, citrus groves, rangeland, pine flatwoods, longleaf pine xeric oak, sand pine, sand pine plantations, forest regenerations areas, sand other than beaches, and disturbed rural and burned areas (FWS, 2007). Breeding lasts about 90 days, from early March through June. Nests are built 4 to 12 feet above the ground in wild olive, sand pine, or scrub oak. Scrub-jays are monogamous and maintain territories throughout the year. Often, offspring of the pair from a previous season assist in raising young and defending the territory (FWS, 1990a).

Sabal Trail completed scrub-jay surveys in 2014 and 2015 in accordance with the Comprehensive Listed Species Survey Protocol Document developed in conjunction with and approved by the FWS. Seven scrub-jay territories were identified in Citrus, Marion, and Sumter Counties, Florida. In Territory 1, two adult scrub-jays were observed and responded to calls during 2014 surveys while defending a territory associated with a utility corridor and active blueberry farm. Sabal Trail resurveyed Territory 1 in June 2015. Surveyors observed that the previously occupied territory within Sabal Trail's proposed construction workspace had been mechanically cleared and the scrub to the south of the existing utility corridor had been disturbed. Scrub-jays did not respond to two separate playback call events within the right-of-way or to playback calls south of the existing utility corridor. Due to habitat loss and alteration, scrub-jays are no longer present at Territory 1.

In Marion County, two scrub-jay territories consisting of scrub habitat were observed near Marion Oaks during 2014 surveys. Territory 2 is approximately 28 acres in size (0.6 acre within the proposed construction workspace) and consists of two adults and one subadult. Territory 3 is approximately 15 acres in size (0.2 acre within the construction workspace) and consists of four adults and two yearlings. The majority of both territories are south of the proposed pipeline workspace.

In Sumter County, four scrub-jay territories were identified in close proximity to one another within and adjacent to a maintained electric transmission line corridor. Territory 4 is approximately 76 acres in size (11 acres within the proposed construction workspace) and consists of two adults and a juvenile. Territory 5 is approximately 65 acres in size (8.5 acres within the proposed construction workspace) and consists of two adults, two helpers, and a juvenile. Each of these families utilizes low scrub oak in the utility corridor as its primary and nesting habitat and the adjacent overgrown shrub as refuge from predators.

Surveys in 2014 identified Territories 6 and 7, which consisted of degraded scrub habitat and contained families of at least two adults. Territories 6 and 7 were resurveyed on two occasions in 2015. During the first survey event, 4 adults arrived from the east of the territories and did not exhibit territorial responses to playback calls, which indicate the territories may no longer be utilized by scrub-jays. On the second survey event, the degraded scrub habitat was cleared and the area converted to agricultural use. Due to habitat loss, scrub-jays are no longer present at Territories 6 and 7.

Potential effects from the Sabal Trail Project on scrub-jays could include loss of active nests, eggs, and/or fledglings if the project were constructed during the nesting season (typically March 1 to June 30) and displacement of individuals from otherwise suitable foraging habitats along the project. Construction activities could also disrupt nesting activities adjacent to the proposed construction workspace. Indirect effects would include the permanent loss of scrub habitat from maintenance clearing along the permanent pipeline right-of-way. While some low woody growth may be allowed in the permanent right-of-way, nesting habitat would be permanently lost. Additionally, scrub habitat in the

temporary construction workspace may not be suitable for use by Florida scrub jays for a number of years after initial right-of-way restoration is complete.

Sabal Trail would implement its construction and restoration plans and the Migratory Bird Conservation Plan to avoid and minimize adverse impacts on bird resources in the project area. Sabal Trail would also implement the following construction and operational measures to minimize impacts on scrub-jays in known occupied territories:

- In Territories 2 to 5, soil disturbance would be limited to those areas required to excavate the pipeline trench and facilities associated with pipeline protection. Pipeline markers with test leads may be placed along the portion of the pipeline that parallels existing electric transmission lines.

- Scrub vegetation would be cleared with equipment such as a hydroaxe to minimize soil disturbance and to allow the resprouting and natural recruitment of scrub vegetation. This clearing practice would also be implemented within 100 meters of territory boundary if the adjacent habitat is suitable for scrub-jays.

- Trench spoil would be temporarily stockpiled on the non-working side of the construction workspace.

- Territories would be allowed to revegetate naturally with no planting of exotic, sod-forming grasses; and

- Post-construction maintenance would be limited to mowing with a rubber-tired bush-hog once every three years or less, if required, during the months of August through February.

To further minimize direct and indirect impacts on scrub-jays, we have recommended in the draft EIS that Sabal Trail avoid construction within occupied scrub-jay habitat during the nesting season (March 1 to June 30), unless preconstruction surveys confirm that scrub-jays do not occupy the project area and Sabal Trail receives written confirmation from the Commission that construction activities can occur within this timeframe.

Although Sabal Trail's conservation measures and our recommendations above would avoid and minimize impacts on scrub-jays, we conclude that construction and operation of the Sabal Trail project *is likely to adversely affect* the scrub-jay, and request formal consultation with the FWS for this species. Per our recommendation at the beginning of section 3.8 of the draft EIS, Sabal Trail would not be allowed to commence construction until our consultation with the FWS is complete and the Director of OEP provides written confirmation that construction can commence.

Wood stork (*Mycteria americana*)

The wood stork is currently listed as threatened by the FWS under the ESA. Presently, the wood stork breeding population is believed to be greater than 8,000 nesting pairs. Nesting is currently restricted to Florida, Georgia, South Carolina, and North Carolina. Critical habitat has not been designated for the wood stork.

Wood storks prefer areas where there are freshwater or brackish wetlands. They nest primarily in cypress or mangrove swamps, with nests usually in the upper branches of these trees (Ogden, 1978). Nesting trees range from low shrubs to cypress as tall as 100 feet. Wood storks nest colonially, often in conjunction with other wading bird species, and generally occupy the larger-diameter trees at a colony

site (Rodgers et al., 1996). Nesting is tied to receding water levels and concentration of food sources, regardless of date. Foraging habitat includes freshwater marshes and stock ponds, managed impoundments, depressions in cypress heads and swamp sloughs, and shallow, seasonally flooded roadside and agricultural ditches. Nesting in Florida begins as early as October and generally from March to July in Georgia. Wood storks tend to use the same colony nest sites over many years, as long as the sites remain undisturbed and sufficient feeding habitat remains in the surrounding wetlands.

The FWS has mapped core foraging areas for the wood stork. The Sabal Trail Project currently passes through 16 core foraging areas known to be active from 2009 to 2014. The Sabal Trail project would impact 0.03 percent of the available wetland habitat within these core foraging areas.

Sabal Trail completed helicopter surveys for the wood stork in accordance with the Comprehensive Listed Species Survey Protocol Document that was developed in conjunction with and approved by the FWS and FWC. Helicopter surveys were completed in late February, March, May, and June 2014 and in late February and May 2015. Occasional wood storks were observed foraging or roosting in wetlands during surveys, and no nesting colonies were identified.

Two wood stork breeding colonies at Crevasse Pond (i.e., Bentley and Bentley East) were identified based on records in the GADNR database. Bentley contains nesting wood storks while Bentley East only contains roosting and foraging wood storks. Surveys conducted in 2014 and 2015 identified 40 to 50 adults in each colony. Sabal Trail revised its proposed pipeline alignment near Crevasse Pond to minimize potential disturbance to these colonies and the extent to which foraging wetlands would be impacted. We have analyzed the new route alignment near Crevasse Pond and confirm that suitable wetlands and foraging habitat for the wood stork are no longer impacted in this area. The FWS agreed that construction along the new pipeline alignment could occur within the primary zone[10] of the Bentley colony outside the nesting season if a pre-construction survey and continued biological monitoring determines no wood storks are exhibiting nesting behavior.

Because no known nesting colonies would be impacted by the project, potential impacts on the wood stork would be limited to the temporary harassment or displacement from foraging habitat and the temporary alteration of foraging habitat during construction and restoration activities. According to the Habitat Management Guidelines for Wood Stork in the Southeast Region (FWS, 1990b), human activity closer than 300 feet could disturb storks in active feeding areas if vegetation screening is present, and closer than 750 feet if no vegetation is present. Because wood storks are capable of traveling long distances in search of food, use a variety of wetland habitats, and ample foraging habitat is available in the project area, the temporary displacement of storks into other suitable foraging habitats is not expected to result in adverse impacts on wood storks. Additionally, construction of the project is not expected to result in any long-term disturbance or alteration of foraging habitat, as appropriate wetland and waterbody restoration and mitigation measures would be implemented (see sections 3.2.1 and 3.2.2).

Sabal Trail would implement its Migratory Bird Conservation Plan and habitat restoration measures outlined in its construction and restoration plans. Sabal Trail also proposes to implement restrictions on herbicide and pesticide use during operation of the pipeline to minimize impacts on wildlife. Additionally, Sabal Trail has reserved 45.41 Functional Loss Credits of offset wetland impacts during construction. By implementing the Crevasse route variation, the conservation and mitigation

[10] The primary zone extends between 1,000 and 1,500 feet in all directions from a wood stork colony boundary when there are no visual or broad aquatic barriers, and never less than 500 feet with strong visual or aquatic barriers. The exact width of the primary zone in each direction can vary within this range, depending on the amount of visual screen (tall trees) surrounding the colony, the amount of relatively deep, open water between the colony and nearest human activity, and the nature of the nearest human activity.

measures, the Migratory Bird Conservation Plan, and purchasing functional loss credits, we conclude the Sabal Trail Project *is not likely to adversely affect* the wood stork.

### 5.3.8 Plants

Longspurred mint (*Dicerandra cornutissima*)

Longspurred mint is a federally endangered plant that is currently known from only 15 occurrences in Marion and Sumter Counties, Florida, and has likely been extirpated from several of these known sites. Longspurred mint occurs in turkey oak and scrub habitats consisting of turkey oak, sand pine, evergreen oaks, heaths, and alicia. Longspurred mint grows in natural clearings of bare ground and colonizes disturbed areas of open sand along roadsides. All of the habitats where longspurred mint occurs are exceedingly well-drained, infertile soils, and are either fire-maintained ecosystems or disturbed areas along the margins of such systems. The plant flowers from late September through October and can be recognized by its short leaves and aromatic smell. Critical habitat has not been designated for the longspurred mint.

Sabal Trail surveyed appropriate habitats for the longspurred mint in Marion County in late September through October 2014 during the preferred flowering period. Surveys in June 2015 were conducted by expert botanists that were approved by FWS to complete surveys outside the survey window for the species. Habitat was not surveyed if it appeared to be managed for fire exclusion and exhibited dense, closed canopy, was converted to pasture with dense grass cover, or was converted to pine plantation or citrus grove. Groupings of longspurred mint were identified between Mainline MPs 398 and 405.

Longspurred mint generally requires fires or other disturbances to maintain suitable habitat. Construction and operation of the pipeline would directly impact small portions of the populations that were identified during survey; however, maintenance of the pipeline right-of-way may create additional suitable habitat for the species. Sabal Trail would place safety fence along the eastern edge of the construction right-of-way along the largest area of existing plant population prior to commencing construction activities in order to reduce disturbance to populations adjacent to the right-of-way. Signs indicating an environmental sensitive area would be placed with the safety fence.

As currently proposed, construction of the Sabal Trail Project would destroy the longspurred mint population within the construction workspace. Improper construction techniques could also render the pipeline right-of-way unsuitable for recolonization of the species. Because of these proposed direct and adverse effects to the species, we have recommended in the draft EIS that Sabal Trail should file for the review and written approval by the Director of OEP, results of consultation with the FWS indicating the minimization/avoidance measures that would be used for the longspurred mint, including (in the order listed), opportunities for:

- avoidance of plant locations and associated habitat as feasible, including “necking-in” or reducing construction footprint;
- “temporary” removal of plants and soil profile plugs (which include the A and B horizons) with the intent to replace to original location post construction; and
- transplanting and seed banking (only after all other options are considered).

Implementation of our recommendation would avoid or minimize impacts on the longspurred mint. However, further consultation with the FWS is necessary to determine feasible and appropriate avoidance and conservation measures for the species. Therefore, we conclude the Sabal Trail Project *is*

*likely to adversely affect* the longspurred mint, and request formal consultation with the FWS for this species. Per our recommendation at the beginning of section 3.8 of the draft EIS, Sabal Trail would not be allowed to commence construction until our consultation with the FWS is complete and the Director of OEP provides written confirmation that construction can commence.

## 5.4 FLORIDA SOUTHEAST CONNECTION PROJECT

### 5.4.1 Reptiles

American alligator (*Alligator mississippiensis*)

Federal status and habitat preference for the American alligator were previously discussed in section 5.3.5. Surveys for the alligator were not required by the FWC and FWS; however, several alligators were documented during FSC's field surveys and are likely to occur within suitable habitats during construction of the FSC Project.

Construction of the FSC Project across alligator habitat would have temporary, short-term impacts on any alligators that may be present within the construction area. Alligators that may be present would likely move to adjacent habitats during construction activities. Injury or mortality to alligators could occur as they move across the construction right-of-way or access roads to find adjacent undisturbed habitat, or if alligators fall into open pipeline trenches during movement across the right-of-way. Depending on construction timeframes, nest disturbance or destruction could occur during construction activities.

It is anticipated that alligators would return to or utilize the pipeline right-of-way after habitat restoration is complete; therefore, no long-term habitat impacts are anticipated. In addition to implementing its construction and restoration plans, FSC would ensure that slow speeds are used by construction traffic and would employ a designated agent to monitor construction activities and inspect the pipeline trench for injured or trapped wildlife. Considering the above construction practices and conservation measures, and the reason for its listing, we conclude the FSC Project *is not likely to adversely affect* the American alligator.

Bluetail mole skink (*Plestiodon egregius lividus*) and Florida sand skink (*Neoseps reynoldsi*)

Federal status and habitat preference for the Florida sand skink and bluetail mole skink were previously discussed in section 5.3.5. Through consultation with the FWS, a total of 222 acres of potentially suitable habitat was identified for the bluetail mole skink and Florida sand skink within FSC's survey corridor.

Skinks were not directly observed during general wildlife and habitat surveys in 2014 and 2015; however, the characteristic sinusoidal tracks of skinks were detected at 16 locations between MPs 2.5 to 35.8. FSC conducted coverboard surveys in 2015 at these sites to confirm skink presence and to identify additional areas that may be occupied by skinks. The coverboard surveys were completed in all suitable skink habitats using approved survey protocols developed in conjunction with the FWS. No skinks or skink tracks were identified during the coverboard surveys. Based on the current configuration of FSC's construction workspace, 74.2 acres of occupied and potentially occupied skink habitat would be impacted by the project.

Skinks that may be present within the construction workspaces or within areas that are maintained during operation of the pipeline could be injured or killed by construction activities, such as vegetation clearing and removal, debris piling (soil stock piling), potential burning, construction, restoration, and

equipment traffic along the right-of-way and access roads. Occupied habitats would be temporarily lost during construction and pipeline maintenance activities and would not be suitable for use until restoration is complete. Additionally, if the pipeline right-of-way is restored to full vegetation cover, suitable swimmable soil conditions may render the habitat useless and create a barrier for skink movement.

To minimize skink habitat and soil impacts, FSC would implement the following measures:

- The top 4 to 6 inches of topsoil (A soil horizon) over the trenchline at the 16 occupied (known or presumed) skink sites would be removed and placed at the edge of the right-of-way immediately adjacent to other suitable habitat (present in most cases), allowing skinks to emigrate to this habitat. The remaining trench spoil would be stockpiled immediately adjacent to the segregated topsoil; its height should form a temporary barrier and therefore minimize skink movements back toward the trench. Following pipeline installation, the soils would be backfill, and the segregated topsoil returned to the top soil layer.

- All areas within known or presumed occupied skink habitat would be allowed to revegetate by natural recruitment. Planting of sod-forming grasses would not be allowed within native xeric habitats.

- Within native xeric habitats, clearing of untrenched habitats would be performed using vegetation mulching equipment to minimize soil disturbance and allow for resprouting of native vegetation.

- Up to 3 years of post-construction monitoring within a portion of the known or presumed occupied skink habitat would be conducted to document skink recolonization within areas of temporary impact.

To offset temporary habitat impacts and potential injury and harm to skinks, FSC proposes to purchase credits from an approved Florida sand skink conservation bank prior to the initiation of construction. FSC proposes to purchase 14.8 acre-credits for the proposed temporary impacts on the 25.5 acres of occupied skink habitat (a 0.20:1 mitigation ratio).

Due to the presence of skinks within the proposed construction area, we conclude the FSC Project *is likely to adversely affect* the bluetail mole skink and Florida sand skink, and are requesting formal consultation with the FWS for this species. Per our recommendation at the beginning of section 3.8 of the draft EIS, FSC would not be allowed to commence construction until our consultation with the FWS is complete and the Director of OEP provides written confirmation that construction can commence.

Eastern indigo snake (*Drymarchon couperi*)

Federal status and habitat preference for the Eastern indigo snake were previously discussed in section 5.3.5. Potential habitat for the indigo occurs throughout the FSC Project area. Because indigos often inhabit gopher tortoise burrows, the indigo may be present in all areas that have been identified as gopher tortoise habitat.

Construction and maintenance activities would temporarily displace indigos from suitable foraging, burrowing, resting, or wintering habitat. Because indigos use a variety of habitats, construction and maintenance of the pipeline should result in a minimal loss of habitat, and is not expected to result in long-term or cumulative loss of habitat. Construction and operational activities are not expected to result

in a noticeable loss of prey species for the indigo. Wherever possible, FSC would avoid clearing or disturbing active or known gopher tortoise burrows.

Indirect impacts on indigos adjacent to the construction or maintenance workspaces may occur from pedestrian, equipment, and vehicular traffic, as well as vibration from these activities. Although construction personnel would be advised to avoid snakes, the operation of equipment in brushy, grassy, or otherwise vegetated areas may disturb snakes that are not readily visible. Construction and restoration of the FSC Project is proposed to occur year-round, and activities would generally occur during daylight hours when indigos are active.

Direct mortality of indigos may occur from vehicle or construction equipment strikes or if snakes become trapped in an open trench. Indigo are a mobile species and, in most instances, would be capable of avoiding approaching vehicles and/or equipment. However, indigo fatalities from vehicle strikes are common.

Because of the potential for indigos to occupy the project area, and based on consultations with FWS, FSC would complete a 100 percent pre-construction survey of all potentially occupied gopher tortoise burrows within 25 feet of the project footprint. Each burrow would be inspected with a remote video system to determine occupancy by tortoises and/or protected commensal species, such as the indigo. Any indigo utilizing the burrows would be allowed to vacate the burrow or would be relocated to an unused burrow in adjacent habitat off of the right-of-way.

In addition to the survey and relocation measures identified above, FSC would implement its construction and restoration plans, enforce slow speeds for all construction traffic, and monitor construction activities and inspect the pipeline trench each day for injured or trapped wildlife. FSC also would implement the following Standard Protection Measures for the Eastern Indigo Snake (FWS, 2013b) to further minimize or avoid impacts on this species:

- Place informational posters at strategic locations along the project right-of-way, proposed access roads, and in construction offices. Posters would be identical to those recommended by the FWS;

- Conduct meetings lead by an designated agent prior to construction to educate project personnel on the informational posters and how to properly report the identification of a live, injured, or dead indigos within the right-of-way;

- Maintain and replace all posters and education materials as necessary throughout the duration of the project; and

- Electronically submit a post construction monitoring report to the FWS within 60 days of project completion.

Although implementing the avoidance and conservation measures above would minimize adverse impacts on the indigo, the handling and relocation of indigos found within the construction right-of-way would be considered harm under the definition of the ESA. Therefore, we conclude that construction and operation of the FSC Project *is likely to adversely affect* the Eastern indigo snake, and request formal consultation with the FWS for this species. Per our recommendation at the beginning of section 3.8 of the draft EIS, FSC would not be allowed to commence construction until our consultation with the FWS is complete and the Director of OEP provides written confirmation that construction can commence.

Eastern diamondback rattlesnake (*Crotalus adamanteus*)

Federal status and habitat preference for the diamondback were previously discussed in section 5.2.3, and potential impacts to the diamondback would be similar to that described for the indigo above. FSC would implement its construction and restoration plans, enforce slow speeds for all construction traffic, and monitor construction activities and inspect the pipeline trench each day for injured or trapped wildlife. It is anticipated the diamondback would return to or utilize the pipeline right-of-way after habitat restoration is complete; therefore, no long-term habitat impacts are anticipated. Therefore, we conclude that construction and operation of the FSC Project *is not likely jeopardize or cause a trend towards federal listing* for the diamondback.

Gopher tortoise (*Gopherus polyphemus*)

Federal status and habitat preference for the gopher tortoise were previously discussed in section 5.3.5. FSC field biologists identified 318 gopher tortoise burrows during field surveys in 2014. If occupied during construction, mechanical crushing of active burrows could result in injury or death of gopher tortoises. Mortality could occur due to impact with vehicles or equipment. Gopher tortoises may attempt to move from the construction area by crossing roads and would be at higher risk of impact from increased vehicle traffic. Because tortoises are slow-moving, they are at risk from equipment strikes.

Indirect and long-term effects from the project would likely be minimal and limited to areas of permanent habitat loss (i.e., M&R stations and MLVs). To minimize impacts on the species, FSC would complete a 100 percent survey of the construction workspace, including potentially occupied burrows within 25 feet of the project workspace. Surveys and tortoise relocations would be conducted by an authorized tortoise agent in accordance with the FWC Gopher Tortoise Permitting Guidelines (FWC, 2013). FSC would obtain any necessary permits for documenting tortoises and to relocate tortoises to an off-site, approved recipient site. In addition to implementing its construction and restoration plans, FSC would implement the following measures to protect the gopher tortoise:

- Clear the project in a manner that avoids the creation of uncleared habitat islands surrounded by cleared land and provides escape routes from the construction area;
- Install exclusion fencing along active construction areas to prevent tortoises from entering the construction area;
- Enforce slow speeds for all construction traffic; and
- Inspect the trench daily for trapped or injured wildlife.

Impacts on the gopher tortoise would be temporary due to displacement of individuals during construction. The temporary loss of habitat during construction could also affect gopher tortoises; however, maintenance of the right-of-way during operation of the proposed facilities would create better foraging and refuge sites in areas of marginal habitat. By implementing the measures above and the Gopher Tortoise permitting guidelines, the FSC Project *is not likely jeopardize or cause a trend towards federal listing* for the gopher tortoise.

### 5.4.2 Mammals

Florida bonneted bat (*Eumops floridanus*)

The Florida bonneted bat is currently listed as endangered by the FWS under the ESA. Once considered to be a subspecies, recent scientific research indicates that the Florida bonneted bat is distinct from other *Eumops* outside Florida and should be classified as a separate species (McDonough, et al., 2008).

The Florida bonneted bat is medium size but is the largest of Florida's native bats. Preferred habitat includes 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. 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. 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 less than 10 meters 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). 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). Critical habitat has not been designated for the Florida bonneted bat.

Based on Florida land use, cover and forms classification system data, approximately 73 acres of potentially suitable roosting habitat is present between MPs 34.3 and 72.9. FSC completed a pedestrian survey within the preferred habitat between September 30 and October 13, 2014 to identify potential roosting locations. Seven large hollow tree snags were located, and two additional snags were documented within a proposed staging area. Each tree was closely inspected by experienced biologists and none exhibited any indications of bat presence. No bats were observed or heard during the habitat survey.

Direct effects to the bat could include death or injury to roosting bats as a result of clearing activities, loss of potential roost/nest sites, and temporary disturbance due to noise, vibration, and human presence. Indirect effects include exposure of the bats to predators, temporary loss of foraging habitat, and breeding disruption. Once constructed, the pipeline right-of-way would continue to serve as potential foraging areas for bats; however, current and future roosting habitat would be removed along the maintained pipeline right-of-way. A few man-made structures or buildings that could serve as roost or nest sites may also be removed during construction. If structures would be removed, FSC would inspect each structure prior to teardown to determine if bats are present within the structure.

Given the low likelihood of occurrence within the project area, the minimal habitat impacts that would occur to roosting habitat, and because structure removal would not impact bats, we conclude the FSC Project *is not likely to adversely affect* the Florida bonneted bat.

Florida panther (*Puma concolor coryi*)

Federal status and habitat preference for the Florida panther were previously discussed in section 5.3.6. The FSC Project area is considered habitat for the federal endangered Florida panther. If present within the project area during construction, the Florida panther would be temporarily displaced from the

construction right-of-way and surrounding areas to similar habitats nearby. Florida panthers displaced from the right-of-way would return to the newly disturbed area and adjacent, undisturbed habitats soon after completion of construction. Routine maintenance activities on the permanent right-of-way would have similar, but less extensive, effects on the Florida panther in the area, depending on the time of year it was conducted. The overall impact on the Florida panther would not be significant because of the short duration of the disturbance and because pipeline facilities would be located, to the extent feasible, adjacent to existing maintained rights of-way.

Construction of the project may affect panther movement patterns and result in temporary and permanent loss of foraging habitat for the panther. However, because the majority of FSC Project would be constructed along existing roads, utility corridors, and within agricultural areas, minimal habitat fragmentation would occur. Because construction and restoration would be limited in duration, habitat impacts would be minimal, and the species is highly mobile, we conclude the FSC Project *is not likely to adversely affect* the Florida panther.

### 5.4.3 Birds

Crested caracara (*Caracara cheriway*)

Federal status and habitat preference for the crested caracara were previously discussed in section 5.3.7. The FSC Project crosses crested caracara habitat and intersects the consultation areas for the species in Osceola, Polk, Okeechobee, St. Lucie, and Martin Counties. A review of the FNAI indicates seven historical records within 1 mile of the proposed pipeline route, and general wildlife surveys identified eight caracaras along the proposed route. Sightings occurred along roadways, which serve as a food source (carrion road-kill) for the birds.

FSC conducted surveys for caracara nests and nesting habitats (e.g., mature cabbage palms) in January 2015 using approved FWS survey protocols. A total of 26 individual caracara sightings were documented at 10 distinct survey locations between FSC MPs 54.2 and 123.6. No nest sites were documented within the proposed FSC right-of-way; however, the proposed right-of-way lies within the primary nest protection zone (985 feet) of two confirmed caracara nest sites located near MPs 69.2 and 111.0. Both nests were within the crown of a mature cabbage palm tree in a pasture. The nest location at MP 69.2 is separated from the right-of-way by State Road 60, a major two-lane highway.

Potential effects on caracaras could include loss of active nests, eggs, and/or fledglings if construction and maintenance activities were constructed during the nesting season and construction displaces adults from suitable nesting and foraging habitats within or adjacent to the construction right-of-way. Equipment traffic may result in inadvertent “road-kill,” which would provide a food source, but conversely may increase the risk of vehicle strikes. Maintenance and periodic clearing activities along the operational pipeline right-of-way could increase foraging habitat for the caracara.

In addition to implementing its construction and restoration plans and enforcing speed restrictions, FSC would implement the following measures to protect caracaras:

- Known nest trees would be avoided;
- Conduct nest surveys within known caracara location if construction activities would coincide with the caracaras breeding and nesting season. If nests are identified within the FSC Project area, construction activities would be postponed in the primary nest protection zone (985 feet) around each nest until young have fledged. The Biological Monitor would determine when project activities can begin;

- Carrion found within active construction areas would be removed to minimize possible vehicle injury to caracaras;

- Construction personnel would be trained on identifying caracaras, instructed on harassment protocols, and instructed to allow caracaras to leave work areas before construction activities can resume;

- Restore native herbaceous vegetation within all areas affected by pipeline construction;

- Limit the removal of optimal nesting substrate (i.e., cabbage palm trees in excess of 16 feet in height) within caracara habitat to the minimum extent necessary to install and maintain the pipeline facilities; and

- Report dead or injured birds to the FWS.

By implementing the measures above, we conclude the FSC Project *is not likely to adversely affect* the crested caracara.

Everglade snail kite (*Rostrhamus sociabilis plumbeus*)

The Everglade snail kite (snail kite) is listed as federally endangered by the FWS. Snail kites are medium-sized (approximately 42-inch wingspan) diurnal raptors, distributed primarily through Central and South America and the Caribbean, with the population in peninsular Florida representing the northern extent of the species' range. In Florida, its range is restricted to southern and central counties within the drainage systems of the Upper St. Johns River, Kissimmee Valley, Lake Okeechobee, Loxahatchee Slough, the Everglades, and the Big Cypress basin (FWS, 1999).

Snail kites have a highly specialized diet, feeding almost entirely on apple snails. Foraging habitat for the snail kite, therefore, corresponds with the presence of apple snails, which includes freshwater marshes but can also include open water habitats in shallow lakes or lake edges. Nests are usually constructed 1 to 3 meters above the water line in low trees or shrubs, although sometimes nests are constructed in emergent vegetation such as cattails or sawgrass (Hipes et al., 2001). Nesting can occur at any time of year and the peak breeding season can fluctuate depending on climate and rainfall (FWS, 1999). The entire nesting cycle takes about 3 months from nest building to fledging of young (FWS, 1999). Because the snail kite is endemic to only a very few freshwater systems, it is highly dependent on the integrity of the hydrology and the water quality of those systems (FWS, 1999). Critical habitat has been designated for the snail kite, but occurs outside of the FSC Project area along the west shore of Lake Okeechobee and further south into the Everglades. However, all of the counties crossed by the FSC Project are within the FWS's consultation area for the snail kite.

According to the FNAI, the closest record of snail kites to the FSC Project is 8 miles. However, data provided by FWS indicate snail kites have historically nested between MPs 52.9 and 53.5 within the Lake Kissimmee marshlands. Based on field reconnaissance and wetland surveys, the project would affect approximately 127 acres of suitable nesting and foraging habitat for the snail kite.

FSC conducted snail kite surveys within potential snail kite habitat in February and March 2015 according to approved FWS survey protocols. Snail kites were observed at the southern edge of Lake Kissimmee between Mileposts 52.9 and 53.1. At this location, both a male and a female snail kite were observed on the same day, although at different times, and no interaction was observed between the birds. Behavioral observations of the female bird suggested a potential nest site at MP 52.9 within a cluster of willow trees. Because of difficulty reaching the potential nest site, its presence has not been positively

confirmed. This potential nest, while located in the project area, is approximately 1,400 feet from any proposed construction activities.

The FWS has established guidelines that recommend activities such as pipeline construction do not occur within 1,640 feet of an active nest. Prior to construction and if construction activities would occur within the snail kite nesting season, FSC would complete snail kite nest surveys near Lake Kissimmee to determine if active nests occur within 1,640 of project work areas. If active nests are found, FSC would postpone construction until young have fledged the nest. FSC also proposes to cross Lake Kissimmee and its adjacent wetland habitat using the HDD crossing method, which would avoid impacts on foraging and nesting habitat. To further minimize impacts on the snail kite, FSC would implement its construction and restoration plans and train construction personnel to identify snail kites and prevent kite harassment. By implementing the conservation and construction measures above, we conclude the FSC Project *is not likely to adversely affect* the snail kite.

Florida scrub-jay (*Aphelocoma coerulescens*)

Federal status and habitat preference for the Florida scrub-jay were previously discussed in section 5.3.7. The Florida scrub-jay has historically been found in all five counties crossed by the FSC Project and intersects the consultation area for this species in Polk, Osceola, and Okeechobee Counties. A review of the FNAI identified six recorded observations near the proposed FSC Project route: two in Osceola County and four in Polk County. Florida scrub-jays have been documented within 1 mile of the proposed project in at least one location in the 1980s.

FSC completed acoustic callback surveys for the scrub-jay at various locations along the project route where appropriate habitat was present. The surveys were completed in September and October 2014 and March 2015 using methodologies and locations approved by the FWS. No scrub-jays were observed or heard during the survey efforts. However, an adult pair was observed in early March 2015 near MP 48.8 during surveys for other wildlife species. This pair was not observed during the October 2014 surveys. Subsequent surveys conducted biweekly in April and early May 2015 consistently recorded this pair in the same general location (MPs 48.6 to 48.9); however, no nesting activity was observed nor did the pair exhibit behavioral patterns consistent with territoriality. Habitat within this location consists of improved pasture north of the proposed right-of-way and palmetto prairie south of the proposed right-of-way.

Construction of the FSC Project would impact approximately 36 acres of xeric upland scrub habitat. If construction activities would occur within the nesting season within any scrub-jay habitat (March 1 to June 30), FSC would survey the habitat for nesting signs. Should Florida scrub-jays initiate nesting within an area to be cleared, a 125-ft buffer would be established around the nest tree. The nest buffer would be for the duration of scrub-jay nesting season, until young have successfully fledged, or the nest has failed. While this measure may avoid adverse effects to scrub-jays nesting within the cleared right-of-way, it may not avoid adverse impacts to scrub-jays nesting adjacent to the cleared right-of-way or foraging in the area. Therefore, we have recommended in the draft EIS that FSC avoid construction within occupied scrub-jay habitat during the nesting season (March 1 to June 30), unless preconstruction surveys confirm that scrub-jays do not occupy the project area and FSC receives written confirmation from the Commission that construction activities can occur within this timeframe.

In addition to our recommendation in the draft EIS, FSC would implement its construction and restoration plans, Migratory Bird Conservation Plan, prevent the planting of sod-forming grasses, and report dead or injured birds to the FWS. By implementing the conservation and construction measures above, we conclude the FSC Project *is not likely to adversely affect* the scrub-jay.

Wood stork (*Mycteria americana*)

Federal status and habitat preference for the wood stork were previously discussed in section 5.3.7. The FSC Project currently passes through six core foraging areas. Preliminary helicopter surveys were conducted for colonial nesting water birds in 2014. Wood storks were observed foraging in wetlands during the surveys. Additional wading bird surveys were completed in March 2015 in accordance with the Comprehensive Listed Species Survey Protocol Document developed in conjunction with and approved by the FWS and FWC. No nesting wood storks were identified during the survey.

Because no known nesting colonies would be impacted by the FSC Project, potential impacts on the wood stork would be limited to the temporary harassment or displacement from foraging habitat and the temporary alteration of foraging habitat during construction and restoration activities. According to the Habitat Management Guidelines for Wood Stork in the Southeast Region (FWS, 1990b), human activity closer than 300 feet could disturb storks in active feeding areas if vegetation screening is present, and closer than 750 feet if no vegetation is present. Because wood storks are capable of traveling long distances in search of food, use a variety of wetland habitats, and ample amounts of foraging habitat are available in the project area, the temporary displacement of storks into other suitable foraging habitats is not expected to result in adverse impacts on wood storks. Additionally, construction of the FSC Project is not expected to result in any long-term disturbance or alteration of foraging habitat, as appropriate wetland and waterbody restoration and mitigation measures would be implemented (see sections 3.2.1 and 3.2.2).

FSC would implement the Migratory Bird Conservation Plan and the habitat restoration measures outlined in its construction and restoration plans. FSC would also implement restrictions on herbicide and pesticide use during operation of the pipeline to minimize impacts on wildlife. The FWC stated it would also require, through its Construction Environmental Resource Permit, that FSC complete colonial water bird surveys prior to construction activities to determine if water bird nests are present, and if found, maintain a minimum distance of 330 feet between the edge of the nesting area and any disturbance activity during the breeding season. By implementing these survey, conservation, and mitigation measures, we conclude the FSC Project *is not likely to adversely affect* the wood stork.

### 5.4.4 Plants

Florida bonamia (*Bonamia grandiflora*), Lewton's polygala (*Polygala lewtonii*), Papery whitlow-wort (*Paronychia chartacea spp. Chartacea*), Scrub buckwheat (*Eriogonum longifolium var.gnaphalifolium*), Scrub mint (*Dicerandra frutescens*), and Small's jointweed (*Polygonella myriophylla*)

The Florida bonamia is a federally threatened species endemic to the Florida peninsula. The Florida bonamia is typically found in sand pine scrub consisting of evergreen scrub oak and sand pine with openings between the trees and shrubs occupied by lichens and herbs. The species generally requires an open canopy in full sunlight in order to avoid competition from the surrounding shrubs, and prefers white, acidic sands. The Florida bonamia is also known to live in disturbed areas near roadways and clearings caused by logging operations. Critical habitat has not been designated for Florida bonamia. FSC completed surveys for the Florida bonamia between September 22 and October 15, 2014. Several individual Florida bonamia plants were documented at one location near the edge of the pipeline corridor near MP 9.0. As currently proposed, construction of the FSC Project would destroy Florida bonamia individuals within the construction workspace.

Lewton's polygala is a federally endangered species that is endemic to the Lake Wales and Mount Dora Ridges of Highlands, Polk, Osceola, Orange, Lake, and Marion Counties, Florida. It is found in oak scrub and high pine, but is more common in the transitional areas between these two

community types. The species is found in sunny openings and often colonizes disturbed sites, such as roadsides and fire lanes. Critical habitat has not been designated for Lewton's polygala. FSC completed surveys for Lewton's polygala in spring 2015. Individuals of this species were documented at one location near MP 8.9. As currently proposed, construction of the project would destroy these individuals that are within the proposed construction workspace.

The papery whitlow-wort is a federally threatened species which is endemic to the Lake Wales Ridge scrub of Highlands, Polk, Osceola, Orange, and Lake Counties, Florida. It is found in rosemary scrub or the rosemary phase of sand pine scrub communities where it colonizes disturbed, open, sandy sites. It prefers the well-drained, white sands of the St. Lucie or Archbold soil types (FWS, 1999). Critical habitat has not been designated for the papery whitlow-wort. FSC completed surveys for the papery whitlow-wort between September 22 and October 15, 2014. Several groups of papery whitlow-wort were documented along the pipeline corridor between MPs 8.0 and 35.6. As currently proposed, construction of the project would destroy several populations of papery whitlow-wort that are within the construction workspace.

The scrub buckwheat is a federally threatened species that occurs in high pine and turkey oak barren habitats in Marion, Pasco, Hillsborough, Lake, Orange, Osceola, Highlands, and Polk Counties, Florida. Critical habitat has not been designated for the scrub buckwheat. FSC completed surveys for the scrub buckwheat between September 22 and October 15, 2014. A few isolated patches of scrub buckwheat were documented by FSC within the pipeline corridor between MPs 8.8 and 9.0. As currently proposed, construction of the project would destroy several populations of scrub buckwheat that are within the construction workspace.

The scrub mint is a federally endangered species that inhabits the southern portion of the Lake Wales Ridge in Highlands County. Its preferred habitat is excessively drained, yellow sandy soils of the Astatula and Paola soil types, but has also been found on a moderately well-drained, yellow sand of the Orsino type. In these soil types, the scrub mint occurs adjacent to or within disturbed areas in sand pine scrub, oak scrub, and sandhill habitats with shallow litter layers that have an incomplete, or non-existent, tree and shrub canopy (Menges, 1992). At present, the species is known from only 12 sites in Highlands County. Critical habitat has not been designated for the scrub mint. FSC completed surveys for the scrub mint between September 22 and October 15, 2014. The scrub mint was documented by FSC at several locations within the pipeline corridor between MPs 8.6 and 9.0. As currently proposed, construction of the project would destroy those scrub mint individuals that are within the construction workspace.

Small's jointweed is a federally endangered species that is endemic to the Lake Wales Ridge of Highlands, Polk, Osceola, and Orange Counties, Florida. It is a low, spreading shrub that prefers moderately disturbed areas of bare white or yellow sand. Critical habitat has not been designated for Small's jointweed. FSC completed surveys for Small's jointweed in spring 2015. Individuals of this species were documented at one location near MP 35.5. As currently proposed, construction of the project would destroy these individuals that are within the proposed construction workspace.

Improper construction techniques could also render the pipeline right-of-way unsuitable for recolonization of these plant species. Because of these proposed direct and adverse effects to the species, we have recommended in the draft EIS that prior to construction, FSC should file for the review and written approval by the Director of OEP, results of consultation with the FWS indicating the minimization/avoidance measures that would be used to minimize impacts on these species, including (in the order listed), opportunities for:

- avoidance of plant locations and associated habitat as feasible, including "necking-in" or reducing construction footprint;

- "temporary" removal of plants and soil profile plugs (which include the A and B horizons) with the intent to replace to original location post construction; and
- transplanting and seed banking (only after all other options are considered).

Implementation of our recommendation would avoid or minimize impacts on these plant species. However, further consultation with the FWS is necessary to determine feasible and appropriate avoidance and conservation measures. Therefore, we conclude the FSC Project *is likely to adversely affect* the Florida bonamia, Lewton's polygala, papery whitlow-wort, scrub buckwheat, scrub mint, and Small's jointweed, and request formal consultation with the FWS for these species. Per our recommendation at the beginning of section 3.8 of the draft EIS, FSC would not be allowed to commence construction until our consultation with the FWS is complete and the Director of OEP provides written confirmation that construction can commence.

# 6.0 CONCLUSION

The Applicants proposed several measures to minimize impacts on federal species and their habitats, which are discussed throughout this BA. For the scrub-jay, longspurred mint, Florida bonamia, Lewton's polygala, papery whitlow-wort, scrub buckwheat, scrub mint, and Small's jointweed, we determined additional avoidance or conservation measures are necessary to reduce adverse effects that would otherwise occur if the project is constructed, and in part, are basing our determinations of effects on implementation of these measures. Notwithstanding the above, we have determined the SMP project may adversely affect eleven federally listed species (blue-tailed mole skink, Eastern indigo snake, Florida sand skink, scrub-jay, longspurred mint, Florida bonamia, Lewton's polygala, papery whitlow-wort, scrub buckwheat, scrub mint, and Small's jointweed), and are requesting formal consultation with the FWS for these species. Table 6-1 summarizes our determinations of effect for the SMP Project.

TABLE 6-1

**Summary of Effects to Federally Listed Species for the Southeast Market Pipelines Project**

| Determination of Effect | Hillabee Expansion Project | Sabal Trail Project | Florida Southeast Connection Project |
|---|---|---|---|
| No Effect | Alabama heelsplitter<br>Alabama moccasinshell<br>Coosa moccasinshell<br>Fat three-ridge<br>Georgia pigtoe<br>Heavy pigtoe<br>Orangenacre mucket<br>Ovate clubshell<br>Rayed kidneyshell<br>Southern acornshell<br>Southern clubshell<br>Southern combshell<br>Southern pigtoe<br>Triangular kidneyshell<br>Upland combshell<br>Tulotoma snail<br>Painted rocksnail<br>Round rocksnail<br>Alabama sturgeon<br>Gulf sturgeon<br>Gray bat<br>Indiana bat<br>Northern long-eared bat<br>Red-cockaded woodpecker<br>Wood stork<br>Alabama canebrake pitcher-plant<br>Granite pool sprite/Little amphianthus<br>Kral's water-plantain<br>Mohr's Barbara button<br>Price's potato-bean<br>Tennessee yellow-eyed grass | Ochlockonee moccasinshell<br>Ovate clubshell<br>Southern pigtoe<br>Upland combshell<br>Tulotoma snail<br>Squirrel Chimney Cave Shrimp<br>Indiana bat<br>Northern long-eared bat<br>Everglades snail kite<br>Florida grasshopper sparrow<br>Piping plover<br>Red-cockaded woodpecker<br>American chaffseed<br>Avon park hare-bells<br>Britton's beargrass<br>Canby's dropwort<br>Carter's mustard<br>Clasping warea/Wide-leaf warea<br>Cooley's meadowrue<br>Cooley's waterwillow<br>False poison sumac<br>Florida blazing star<br>Florida bonamia<br>Florida jointweed/wireweed<br>Florida ziziphus<br>Highlands scrub hypericum<br>Lewton's polygala<br>Little amphianthus<br>Okeechobee gourd<br>Papery whitlow-wort<br>Perforate reindeer lichen<br>Pygmy fringe tree<br>Relict trillium<br>Scrub buckwheat<br>Scrub lupine<br>Scrub mint<br>Scrub pigeon-wing | American crocodile<br>Florida grasshopper sparrow<br>Kirtland's warbler<br>Piping plover<br>Red-cockaded woodpecker<br>Avon park hare-bells<br>Britton's beargrass<br>Carter's mustard<br>Clasping warea/Wide-leaf warea<br>Florida blazing star<br>Florida jointweed/wireweed<br>Florida ziziphus<br>Highlands scrub hypericum<br>Lakela's mint<br>Perforate reindeer lichen<br>Pygmy fringe tree<br>Scrub lupine<br>Scrub pigeon-wing<br>Scrub plum<br>Short-leaved rosemary<br>Tiny polygala |

TABLE 6-1

**Summary of Effects to Federally Listed Species for the Southeast Market Pipelines Project**

| Determination of Effect | Hillabee Expansion Project | Sabal Trail Project | Florida Southeast Connection Project |
|---|---|---|---|
| | | Scrub plum<br>Short-leaved rosemary<br>Small's jointweed/Sandlace, | |
| Not Likely to Adversely Affect | Finelined pocketbook<br>Blue shiner | Fat three-ridge<br>Finelined pocketbook<br>Gulf moccasinshell<br>Oval pigtoe<br>Purple bankclimber<br>Shinyrayed pocketbook<br>Southern Clubshell<br>Gulf sturgeon<br>Frosted flatwoods salamander<br>American alligator<br>Florida panther<br>Crested caracara<br>Wood stork | American alligator<br>Florida bonneted bat<br>Florida panther<br>Crested caracara<br>Everglades snail kite<br>Florida scrub-jay<br>Wood stork |
| Likely to Adversely Affect | | Blue-tailed mole skink<br>Eastern indigo snake<br>Florida sand skink<br>Florida scrub-jay<br>Longspurred mint | Blue-tailed mole skink<br>Eastern indigo snake<br>Florida sand skink<br>Florida bonamia<br>Lewton's polygala<br>Papery whitlow-wort<br>Scrub buckwheat<br>Scrub mint<br>Small's jointweed/Sandlace |
| **Critical Habitat** | | | |
| Not Likely to Adversely Affect | | Fat three-ridge<br>Gulf moccasinshell<br>Oval pigtoe<br>Purple bankclimber<br>Shinyrayed pocketbook<br>Gulf sturgeon | |
| **Proposed, Petitioned, or Candidate Species** | | | |
| Not Likely to Jeopardize | Alligator snapping turtle<br>Alabama shad<br>Black pine snake<br>Eastern diamondback rattlesnake<br>Northern long-eared bat<br>Georgia rockcress<br>White fringeless orchid | Delicate spike<br>Inflated spike<br>Rayed creekshell<br>Southern elktoe<br>Alabama shad<br>Highlands tiger beetle<br>Striped newt<br>Alligator snapping turtle<br>Eastern diamondback rattlesnake<br>Gopher tortoise<br>Whooping crane<br>Georgia rockcress<br>White fringeless orchid | Striped newt<br>Eastern diamondback rattlesnake<br>Gopher tortoise<br>Red knot<br>Whooping crane |

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# APPENDIX A

Table 4-1 Federal Species that Would Not be Affected by the Southeast Market Pipelines Project

Table 4-2 Federal Species that May be Affected by the Southeast Market Pipelines Project

TABLE 4-1

**Federal Species that Would Not be Affected by the Southeast Market Pipelines Project**

| Species | Federal Status [a] | Preferred Habitat | Hillabee Expansion Project Determination [b] | Sabal Trail Project Determination [b] | Florida Southeast Connection Project Determination [b] |
|---|---|---|---|---|---|
| Mussels | | | | | |
| Alabama heelsplitter, *Lasmigona alabamensis* | T | Rivers with soft, stable substrate and slow to moderate currents. Known to occur in Choctaw County, Alabama. | *No effect* – no waterbodies with preferred habitat characteristics are found along the Rock Springs and Butler Loops in Choctaw County. | | |
| Alabama moccasinshell, *Medionidus acutissimus* | T | Shallow, moderately flowing waters with sand and gravel substrate. Historically known in Chilton County, Alabama but appears extirpated from the Upper Alabama River Drainage. | *No effect* – project does not cross preferred habitat in Chilton County. Mussel surveys of Autauga Creek and Little Mulberry Creek did not identify any mussel species. | | |
| Coosa moccasinshell, *Medionidus parvulus* | E | Historically widespread, now a few localized populations in Coosa River headwater tributaries in Georgia. Habitat consists of perennial streams with sand/gravel/cobble substrate. | *No effect* – appears to have been extirpated from the Mobile River Basin in Alabama. Not identified during mussel surveys. | | |
| Fat three-ridge, *Amblema neislerii* | E | Slow to moderate current in sandy and gravel substrates. Currently found in the Flint River system in Georgia and the Apalachicola and lower Chipola Rivers in Florida. Critical habitat designated at the Flint River. | *No effect* – project is outside the known range of species. | | |
| Georgia pigtoe, *Pleurobema hanleyianum* | E | Medium sized rivers with good current and a sand/gravel substrate. Species extirpated in Alabama and only known to occur in the in the Upper Conasauga River in Murray and Whitfield Counties, Georgia. | *No effect* – extirpated in Alabama. Not identified during mussel surveys. | | |
| Heavy pigtoe, *Pleurobema taitianum* | E | Localized populations in Alabama and Tombigbee rivers. Found in riffles and shoals of small to large rivers on sandy gravel to gravel-cobble substrates and with moderate to fast currents. | *No effect* – project does not cross areas known to contain this species. Not identified during mussel surveys. | | |

TABLE 4-1

**Federal Species that Would Not be Affected by the Southeast Market Pipelines Project**

| Species | Federal Status [a] | Preferred Habitat | Hillabee Expansion Project Determination [b] | Sabal Trail Project Determination [b] | Florida Southeast Connection Project Determination [b] |
|---|---|---|---|---|---|
| Ochlockonee moccasinshell, *Medionidus simpsonianus* | E | Main stem in areas with current and typically prefers mixed sand and gravel substrates | | *No effect* – proposed HDD crossing of the Ochlockonee River is well upstream of any known occurrence of the species. | |
| Orangenacre mucket, *Hamiota perovalis* | T | High quality stream and small river habitat on stable sand/ gravel/cobble substrates in moderate to swift currents. Endemic to the western Mobile Basin. Persists in the Buttahatchie River, East Fork Tombigbee River, the headwaters of the Sipsey Fork, Sipsey and Little Cahaba Rivers, and Bogue Chitto Creek. | *No effect* – project does not cross waterbodies or drainages known to contain this species. | | |
| Ovate clubshell, *Pleurobema perovatum* | E | Small creeks to large rivers with sand and gravel substrates. | *No effect* – mussel surveys did not identify suitable habitat, or mussels, within the surveyed stream reach. | *No effect* – species is considered extirpated from project area. | |
| Rayed kidneyshell, *Ptychobranchus foremanianus* | E | Conasauga River in the Coosa River drainage. Found in flowing water habitats in medium to large rivers. Usually occurs in mixtures of sand and gravel in moderate to swift current. | *No effect* – only small to mid-sized streams crossed in these counties within the Coosa River drainage system. Not identified during mussel surveys. | | |
| Southern acornshell, *Epioblasma othcaloogensis* | E | Restricted to shoal habitats. Historically widespread in the Coosa and Cahaba rivers. Known from throughout the main stem of the Coosa as well as from Choccolocco, Kelly, Little Canoe, and Mill creeks in Alabama. | *No effect* – likely extinct in Alabama. Not identified during mussel surveys. | | |
| Southern clubshell, *Pleurobema decisum* | E | Shoals of large rivers to small streams that are highly oxygenated with sand and gravel substrate. Currently extirpated from much of its range and the Tombigbee and Tallapoosa River drainages support most of the population in Alabama. | *No effect* – no records of this species near the project and the current range is restricted to a few specific locations outside project area. Not identified during mussel surveys. | | |

TABLE 4-1

**Federal Species that Would Not be Affected by the Southeast Market Pipelines Project**

| Species | Federal Status [a] | Preferred Habitat | Hillabee Expansion Project Determination [b] | Sabal Trail Project Determination [b] | Florida Southeast Connection Project Determination [b] |
|---|---|---|---|---|---|
| Southern combshell, *Epioblasma penita* | E | Shoal habitats. Remnant populations are found only in Buttahatchie River. Possibly distributed upstream into Alabama. | *No effect* – the current range is restricted to a few specific locations outside the project area. Not identified during mussel surveys. | | |
| Southern pigtoe, *Pleurobema georgianum* | E | Riffles, runs, and shoals of medium creeks to large rivers, typically in sand and gravel substrates. Endemic to the Coosa river basin. Occurrences are extremely rare. | *No effect* – not known to occur in streams crossed by the project. Not identified during mussel surveys. | *No effect* – no occurrences in Georgia streams crossed by the project. Unlikely to occur in Tallapoosa County Alabama. | |
| Triangular kidneyshell, *Ptychobranchus greenii* | E | Areas of sand and gravel with moderate to swift current. Endemic to Mobile Basin upstream of the Fall Line. Extant in a few tributaries of most major rivers in that system. | *No effect* – no records of this species within project locations and not identified during mussel surveys. | | |
| Upland combshell, *Epioblasma metastriata* | E | Shoal habitats of medium to large rivers. Historic range included the Black Warrior River, Cahaba River, and the Coosa River. May be extirpated from project area. | *No effect* – likely extirpated from the project area. | *No effect* – likely extirpated from the project area. | |
| Snails | | | | | |
| Tulotoma snail, *Tulotoma magnifica* | T | Flowing waters of mainstem rivers and large tributaries under cobble and boulders in shoal and riffle habitats. Remaining populations generally restricted to lotic habitats in lower reaches of Coosa River and its main tributaries. | *No effect* – preferred habitat not crossed or within reasonable distance downstream of proposed waterbody crossings. Species was not identified during aquatic surveys. | *No effect* – preferred habitat not crossed or within reasonable distance downstream of proposed waterbody crossings. Species was not identified during aquatic surveys. | |
| Painted rocksnail, *Leptoxis taeniata* | T | Lotic habitats. Currently only known from three populations in the lower reaches of three Coosa River tributaries - Choccolocco Creek, Buxahatchie Creek, and Ohatchee Creek. | *No effect* – project does not cross habitat for this species and it was not identified during aquatic surveys. | | |
| Round rocksnail, *Leptoxis ampla* | T | Lotic habitats. Historically found in Coosa and Cahaba rivers and tributaries. | *No effect* – project does not cross habitat for this species and it was not identified during aquatic surveys. | | |

TABLE 4-1

**Federal Species that Would Not be Affected by the Southeast Market Pipelines Project**

| Species | Federal Status [a] | Preferred Habitat | Hillabee Expansion Project Determination [b] | Sabal Trail Project Determination [b] | Florida Southeast Connection Project Determination [b] |
|---|---|---|---|---|---|
| Fish | | | | | |
| Alabama shad, *Alosa alabamae* | Pet (NMFS) | Anadromous. Adults live in salt water but migrate upstream to spawn (usually in April). Mostly occurs within the Choctawhatchee River system. | Not likely to jeopardize – preferred habitat of large streams with moderate current are not crossed by the project. Currently not known in the project area. NMFS confirmed there are no species under its review that could be affected by the project. | Not likely to jeopardize – current known river segments are not crossed by the project. NMFS confirmed there are no species under its review that could be affected by the project. | |
| Alabama sturgeon, *Scaphirhynchus suttkusi* | E | Deep, swiftly moving currents over permanent sand and gravel substrates. | *No effect* – preferred habitat is not crossed by the project and species not found during aquatic surveys. | | |
| Gulf sturgeon, *Acipenser oxyrinchus desotoi* | T | An anadromous species where adults live in saltwater and migrate into medium to large coastal rivers. | *No effect* – preferred habitat is not crossed by the project and species not found during aquatic surveys. | | |
| Crustaceans | | | | | |
| Squirrel chimney cave shrimp, *Palaemonetes cummingi* | T | Occupies the flooded Squirrel Chimney Cave in Alachua County, Florida. | | *No effect* – squirrel Chimney Cave would not be impacted. Procedures to prevent and mitigate groundwater contamination would be implemented. | |
| Reptiles | | | | | |
| American crocodile, *Crocodylus acutus* | T | | | | *No effect* – unlikely to occur in project area. |
| Mammals | | | | | |
| Gray bat, *Myotis grisescens* | E | Occupies and roosts in caves near permanent water in winter and summer. | *No effect* – no caves or suitable habitat is located within the project areas. | | |
| Indiana bat, *Myotis sodalis* | E | Hibernates in caves, mostly in tight clusters. In summer, females form small maternity colonies in tree hollows and behind loose bark. Roosting habitat includes loose or furrowed tree bark or dead and dying trees. Forages in suitable areas near roosting habitat. | *No effect* – project is on the southern extent of the species known range. Species was not identified during 2015 mist net surveys. | *No effect* – project is on the southern extent of the species known range. Species was not identified during 2015 mist net surveys. | |

TABLE 4-1

**Federal Species that Would Not be Affected by the Southeast Market Pipelines Project**

| Species | Federal Status [a] | Preferred Habitat | Hillabee Expansion Project Determination [b] | Sabal Trail Project Determination [b] | Florida Southeast Connection Project Determination [b] |
|---|---|---|---|---|---|
| Northern long-eared bat, *Myotis septentrionalis* | T | Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests. | *No effect* – project is likely outside the bats known range. Species was not identified during 2015 mist net surveys. | *No effect* – project is likely outside the bats known range. Species was not identified during 2015 mist net surveys. | |
| Birds | | | | | |
| Everglades snail kite, *Rostrhamus sociabilis plumbeus* | E | Large inland freshwater marshes, edges of shallow lakes, and other flat water courses with marsh edge where apple snails can be found. These habitats are semipermanently flooded often on organic substrate of peat overlying oolitic limestone or sand or directly on limestone or marl. | | *No effect* – Not known to occur in the project area. | |
| Florida grasshopper sparrow, *Ammodramus savannarum floridanus* | E | Large areas of frequently burned dry prairie habitat, with patchy open areas sufficient for foraging. May persist in pasture lands that have not been intensively managed so as to remove all vegetation clumps. | | *No effect* – project is north of the known range of the species; Less than 1 acre of potential habitat would be impacted. No known historic occurrences within 3 miles of the project. | *No effect* – survey did not identify species within the project area. No permanent habitat impacts are anticipated. |
| Kirtland's warbler, *Setophaga kirtlandii* | E | Breeds in scrubby jack pine forests in the Midwest. Winters in the Bahamas. | | | *No effect* – migrant through project area. Conservation measures would be implemented to minimize bird impacts. |
| Piping plover, *Charadrius melodus* | T | Open, sandy beaches, tidal mudflats, and sandflats along both coasts. | | *No effect* – preferred habitat would not be impacted. | *No effect* – preferred habitat would not be impacted. |
| Rufa red knot, *Calidris canutus rufa* | PT | Breeds in drier tundra areas such as sparsely vegetated hillsides. Outside breeding season, found in intertidal, marine habitats near coastal inlets, estuaries, and bays. | | | Not likely to jeopardize – preferred habitat would not be affected. |

TABLE 4-1

**Federal Species that Would Not be Affected by the Southeast Market Pipelines Project**

| Species | Federal Status [a] | Preferred Habitat | Hillabee Expansion Project Determination [b] | Sabal Trail Project Determination [b] | Florida Southeast Connection Project Determination [b] |
|---|---|---|---|---|---|
| Red-cockaded woodpecker, *Picoides borealis* | E | Open, mature pine woodlands with a diversity of grass, forb, and shrub species. Generally occupies longleaf pine flatwoods in north and central Florida, mixed longleaf pine and slash pine in south-central Florida, and slash pine in south Florida. Forages in pines of various ages, but prefer more mature pines. Most colony locations are known. | *No effect* – no suitable habitat identified during field surveys. Pine forests along the project are almost exclusively planted pines. | *No effect* – suitable habitat present but no individuals or cavity trees identified during surveys. Further desktop analysis did not identify any known occurrences within 0.5 miles of the project. | *No effect* – suitable habitat present but no individuals or cavity trees identified during surveys. Further desktop analysis did not identify any known occurrences within 0.5 miles of the project. |
| Whooping crane, *Grus americana* | EP | Shallow marshes and open grasslands. | | Not likely to jeopardize – experimental population could migrate through project area. | Not likely to jeopardize – experimental population could migrate through project area. |
| Wood stork, *Mycteria americana* | E | Nests colonially in inundated forested wetlands, including cypress strands and domes, mixed hardwood swamps, sloughs, and mangroves. Increasingly nesting in artificial habitats such as impoundments and dredged areas with native or exotic vegetation in north and central Florida. Forages mainly in shallow water in freshwater marshes, swamps, lagoons, ponds, tidal creeks, flooded pastures and ditches. | *No effect* – no rookeries were observed during field surveys. Potential foraging habitat within project areas; however, species could avoid project area and utilize available adjacent foraging habitat. | | |
| Plants | | | | | |
| Alabama canebrake pitcher-plant, *Sarracenia rubra ssp. alabamensis* | E | Sandhill seeps, swamps, and sloping bogs along the Fall Line Hills. Deep, peaty sands or clay soils are preferred. Grows best exposed to full or nearly full sunlight. | *No effect* – minimal marginal habitat was present. Not identified during species-specific plant surveys in 2014. | | |
| American chaffseed, *Schwalbea americana* | E | Savannas and pinelands. Depends on fire to maintain habitat. | | *No effect* – not identified during species-specific plant surveys in 2014 and limited suitable habitat present. | |

TABLE 4-1

**Federal Species that Would Not be Affected by the Southeast Market Pipelines Project**

| Species | Federal Status [a] | Preferred Habitat | Hillabee Expansion Project Determination [b] | Sabal Trail Project Determination [b] | Florida Southeast Connection Project Determination [b] |
|---|---|---|---|---|---|
| Avon park hare-bells, *Crotalarioa avonensis* | E | White sand scrub habitat. | | *No effect* – not identified during species-specific plant surveys in 2014 and occurrences are generally south of the project area. | *No effect* –no suitable habitat present in the project area. |
| Britton's beargrass, *Nolina brittoniana* | E | Dry pinewoods and sand pine scrub. | | *No effect* – not identified during species-specific plant surveys in 2014 and 2015; limited suitable habitat present. | *No effect* – not identified during species-specific field surveys. |
| Canby's dropwort, *Oxypolis canbyi* | E | Swamps, bogs, ponds, and in other areas that have wet soils and little canopy cover. Soils with high organic content support the most vigorous populations. | | *No effect* – not identified during species-specific plant surveys in 2014 and limited suitable habitat present. | |
| Carter's mustard, *Warea carteri* | E | Pinelands, scrub sandhills. | | *No effect* – unlikely to occur in project area. | *No effect* – not identified during species-specific surveys in 2014. |
| Clasping warea/Wide-leaf warea, *Warea amplixifolia* | E | Dry pinelands and sandhills. | | *No effect* – unlikely to occur in project area. | No effect – not identified during species-specific surveys in 2014. |
| Cooley's meadowrue, *Thalictrum cooleyi* | E | Grass-sedge bogs, wet pine savannahs, and in seasonally wet swamp forests. Occurs on land that is subjected to disturbances such as fire and mowing. Soils often slightly acidic and moist, but does not tolerate standing water. | | *No effect* – not identified during species-specific plant surveys in 2014 and limited suitable habitat present. | |
| Cooley's waterwillow, *Justicia cooleyi* | E | Moist to seasonally wet rocky woods. | | *No effect* – not identified during species-specific plant surveys in 2014 and limited suitable habitat present. | |
| False poison sumac, *Rhus michauxii* | E | Sandy or rocky open woods. | | *No effect* – unlikely to occur in project area. | |
| Florida blazing star, *Liatris ohlingerae* | E | Rosemary balds, especially those balds with edges transitional to oak scrub, scrubby flatwoods, and disturbed scrub. | | *No effect* – unlikely to occur in project area. | *No effect* – not identified during species-specific surveys in 2014. |
| Florida bonamia, *Bonamia grandiflora* | T | Openings or disturbed areas in white sand scrub on central Florida ridges with scrub oaks, sand pine, and lichens. | | *No effect* – not identified during species-specific plant surveys in 2014 and most habitat was not suitable for the plant. | |

TABLE 4-1

**Federal Species that Would Not be Affected by the Southeast Market Pipelines Project**

| Species | Federal Status [a] | Preferred Habitat | Hillabee Expansion Project Determination [b] | Sabal Trail Project Determination [b] | Florida Southeast Connection Project Determination [b] |
|---|---|---|---|---|---|
| Florida jointweed/wireweed, *Polygonella basiramia* | E | Rosemary phase of sand pine scrub on white sands at higher elevations of the Lake Wales Ridge. | | *No effect* – unlikely to occur in project area. | *No effect* – not identified during species-specific surveys in 2014. |
| Florida ziziphus, *Ziziphus celata* | E | Endemic to the Lake Wales Ridge. High pine habitat or the transition zone between scrubby flatwoods and high pine. Excessively drained, nutrient poor soil types including Tavares fine sand, Astatula sand, and Candler sand. | | *No effect* – unlikely to occur in project area. | *No effect* – not identified during species-specific field surveys. |
| Four-petal pawpaw, *Asimina tetramera* | E | Florida scrub alongside sand pine, saw palmetto, and several types of oak. | | | *No effect* – unlikely to occur in project area. |
| Fragrant prickly apple, *Harrisia fragrans/Cereus eriophorus var. fragrans* | E | Early-successional sand pine scrub habitat where the water table is normally deeper than three meters. | | | *No effect* – unlikely to occur in project area. |
| Georgia rockcress, *Arabis georgiana* | PT | Shallow, flat-bottomed depressions (solution pits, vernal pools) on granite outcrops with thin, gravelly soils and winter-spring inundation. | Not likely to jeopardize – no preferred habitat was present. Not identified during species-specific plant surveys in 2014. | Not likely to jeopardize – unlikely to occur in project area. | |
| Granite pool sprite/Little amphianthus *Amphianthus pusillus* | T | Very rare plant, endemic to shallow, rock-rimmed, flat-bottomed solution pools on granitic outcrops. | No effect – no preferred habitat was present. Not identified during species-specific plant surveys in 2014. | | |
| Highlands scrub hypericum, *Hypericum cumulicola* | E | Open patches in white sand scrubs and rosemary balds. Occasionally in openings in scrubby flatwoods and oak scrubs over yellow sands. | | *No effect* – unlikely to occur in project area. | *No effect* – not identified during species specific surveys in 2014. |
| Kral's water-plantain, *Sagittaria secundifolia* | T | Sandstone crevices of shoals, or in shallow pools of rapidly flowing streams. Often found with riverweed. | *No effect* – no preferred habitat was present. Not identified during species-specific plant surveys in 2014. | | |
| Lakela's mint, *Dicerandra immaculate* | E | Scrub on the Atlantic Coast Ridge. | | | *No effect* – unlikely to occur in project area. |

TABLE 4-1

**Federal Species that Would Not be Affected by the Southeast Market Pipelines Project**

| Species | Federal Status [a] | Preferred Habitat | Hillabee Expansion Project Determination [b] | Sabal Trail Project Determination [b] | Florida Southeast Connection Project Determination [b] |
|---|---|---|---|---|---|
| Lewton's polygala, *Polygala lewtonii* | E | Oak scrub, sandhills, and the transition zones between high pine and turkey oak barrens. | | *No effect* – not identified during species-specific plant surveys in 2014 and most habitat was not suitable for the plant. | |
| Little amphianthus, *Amphianthus pusillus* | T | Shallow vernal, ephemeral pools where seeds can lie dormant for years until suitable moisture is available. | | *No effect* – unlikely to occur in project area. | |
| Mohr's Barbara button, *Marshallia mohrii* | T | Seasonally wet, sandy clay soils in prairie-like meadows along shale-bedded streams and utility and highway rights-of-way. | *No effect* – minimal preferred habitat was present. Not identified during species-specific plant surveys in 2014. | | |
| Okeechobee gourd, *Cucurbita okeechobeensis* | E | Edges and islands in St. Johns River and Lake Okeechobee. | | *No effect* – preferred habitat is not impacted. | |
| Papery whitlow-wort (Paper nailwort), *Paronychia chartacea* | T | Scrub and rosemary scrub, which is also known as the rosemary phase of sand pine scrub. In rosemary scrub, can become very abundant after a fire or after disturbance along fire lanes or trails. | | *No effect* – unlikely to occur in project area. | |
| Perforate reindeer lichen, *Cladonia perforata* | E | High rosemary scrub habitats, white sand patches within scrub areas dominated by scrub oaks and sand pines. | | *No effect* – unlikely to occur in project area. | *No effect* – not identified during species-specific field surveys. |
| Price's potato-bean, *Apios priceana* | T | Open woods and along wood edges in limestone areas. Known to grow along roadways and powerline corridors. | *No effect* – preferred habitat is present; however, not identified during species-specific plant surveys in 2014. | | |
| Pygmy fringe tree, *Chionanthus pygmaeus* | E | Scrub, sandhill, high pineland, xeric hammock, and transitional habitats | . | *No effect* – unlikely to occur in project area. | *No effect* – not identified during species-specific field surveys. |
| Relict trillium, *Trillium reliquum* | E | Mesic hardwood forests near riverine and wetland habitats where humidity is high and in soils with high organic matter content. Robust populations exist in the Savannah and Chattahoochee River drainages. | | *No effect* – not identified during species-specific plant surveys in 2014 and most habitat was not suitable for the plant. | |

TABLE 4-1

**Federal Species that Would Not be Affected by the Southeast Market Pipelines Project**

| Species | Federal Status [a] | Preferred Habitat | Hillabee Expansion Project Determination [b] | Sabal Trail Project Determination [b] | Florida Southeast Connection Project Determination [b] |
|---|---|---|---|---|---|
| Scrub buckwheat, *Eriogonum longifolium var.gnaphalifolium* | T | Pine-forested sand hills and scrub oak sand ridges. | | *No effect* – not identified during species-specific plant surveys in 2014 and most habitat was not suitable for the plant. | |
| Scrub lupine, *Lupinus aridorum* | E | 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. | | *No effect* – unlikely to occur in project area. | *No effect* – not identified during species-specific field surveys. |
| Scrub mint, *Dicerandra frutescens* | E | Sand pine, scrub, and sandhill habitats. | | *No effect* – not identified during species-specific plant surveys in 2014 and occurrences are generally south of project area. | |
| Scrub pigeon-wing, *Clitoria fragrans* | T | Turkey oak barrens with wire grass, bluejack and turkey oak, scrub hickory, and scrub high pine. | | *No effect* – unlikely to occur in project area. | *No effect* – not identified during species-specific field surveys. |
| Scrub plum, *Prunus geniculata* | E | Sandhill and oak scrub maintained by periodic fire. | | *No effect* – not identified during species-specific plant surveys in 2014 and most habitat was not suitable for the plant. | *No effect* – not identified during species-specific field surveys. |
| Short-leaved rosemary, *Conradina brevifolia* | E | White sand scrub with scattered overstory of sand pine and scrub oak in clearings with other endemic shrubs and herb scrub vegetation. | | *No effect* – not identified during species-specific plant surveys in 2014 and most habitat was not suitable for the plant. | *No effect* – not identified during species-specific field surveys. |
| Small's jointweed/ Sandlace, *Polygonella myriophylla* | E | Dry white-sand scrub dominated by Florida rosemary, as well as oak scrub, flatwoods, roadsides, and occasionally sandhills. | | *No effect* – unlikely to occur in project area. | |
| Tennessee yellow-eyed grass, *Xyris tennesseensis* | E | Sand and gravel bars along small to medium sized streams over dolomite and wet seeps. | *No effect* – habitat is present and similar species (*Xyris jupicai*) was identified; however *X. tennesseensis* was not identified during species-specific plant surveys in 2014. | | |

TABLE 4-1

**Federal Species that Would Not be Affected by the Southeast Market Pipelines Project**

| Species | Federal Status [a] | Preferred Habitat | Hillabee Expansion Project Determination [b] | Sabal Trail Project Determination [b] | Florida Southeast Connection Project Determination [b] |
|---|---|---|---|---|---|
| Tiny polygala, *Polygala smallii* | E | Sand pockets of pine rocklands, open sand pine scrub, slash pine, high pine, and well-drained coastal spoil. Requires high light levels and open sand with little to no organic litter accumulation. | | | *No effect* – unlikely to occur in project area. |
| White fringeless orchid, *Platanthera integrilabia* | C | Riverine and palustrine habitats. Generally found in wet, flat areas at the head of streams. Also found with sphagnum species and in partially shaded areas. | Not likely to jeopardize – minimal habitat is present and other orchid species were identified; however *P. integrilabia* was not identified during species-specific plant surveys in 2014. | Not likely to jeopardize – unlikely to occur in project area. | |

[a] Federal Status Key: T = Threatened; E = Endangered; C = Candidate; Pet = Petitioned for Listing; PT = Proposed Threatened; PE = Proposed Endangered; EP = Experimental Population.

[b] NLAA = Not Likely to Adversely Affect; LAA = Likely to Adversely Affect. If no determination is provided, the species is not known to occur in the project area.

TABLE 4-2

**Federal Species that May be Affected by the Southeast Market Pipelines Project**

| Species | Federal Status [a] | Preferred Habitat | Hillabee Expansion Project Determination [b] | Sabal Trail Project Determination [b] | Florida Southeast Connection Project Determination [b] |
|---|---|---|---|---|---|
| Mussels | | | | | |
| Delicate spike, *Elliptio arctata* | Pet | Atlantic Slope drainages from North Carolina to the Savannah River. Occurs in fast flowing water with gravel and sand substrate. Rare and may be extirpated from most of its Georgia Range. | | Not likely to jeopardize – preferred habitat crossed, but would be avoided by HDD and contingency plan would be implemented if an inadvertent return of drilling fluid occurred. | |
| Fat three-ridge, *Amblema neislerii* | E | Slow to moderate current in sandy and gravel substrates. Currently found in the Flint River system in Georgia and the Apalachicola and lower Chipola Rivers in Florida. Critical habitat designated at the Flint River. | | NLAA – crosses critical habitat at MP 163.1 (Flint River). Proposed HDD of Flint River and contingency plan would minimize impacts to the species and critical habitat. | |
| Finelined pocketbook, *Hamiota altilis* | T | Small creeks to large rivers. Prefers sand and sand/gravel mix in areas with moderate flow. Known to occur in the Cahaba, Coosa, and Tallapoosa Rivers and their tributaries in Alabama. | NLAA – preferred habitat found in Little Mulberry, Swift, and Indian Creeks, and to a lesser extent in Oaktasasi, Town and Hillabee Creeks. Species not identified during mussel surveys in these streams, but could reside downstream of survey corridor. Measures to minimize stream impacts would be implemented. | NLAA – measures to minimize stream impacts would be implemented, such as HDD crossing of Hillabee Creek and the Tallapoosa River, and dry crossings of other perennial streams. | |
| Gulf moccasinshell, *Medionidus penicillatus* | E | The channels of medium-sized creeks to large rivers and prefers gravel, sand, or silty sand substrates in slow to moderate currents. Critical habitat designated at Flint River. | | NLAA – crosses critical habitat at MP 163.1 (Flint River). Proposed HDD of Flint River and contingency plan would minimize impacts to the species and habitat. | |
| Inflated spike, *Elliptio purpurella* | Pet | Endemic to the Apalachicola-Chattahoochee-Flint River Basin; however, recent surveys indicate presence in the Flint River in Georgia. | | Not likely to jeopardize – proposed HDD of Flint River and contingency plan would minimize impacts to the species and habitat. | |

TABLE 4-2

**Federal Species that May be Affected by the Southeast Market Pipelines Project**

| Species | Federal Status [a] | Preferred Habitat | Hillabee Expansion Project Determination [b] | Sabal Trail Project Determination [b] | Florida Southeast Connection Project Determination [b] |
|---|---|---|---|---|---|
| Oval pigtoe, *Pleurobema pyriforme* | E | River main stems and smaller tributary streams. Prefers sand bars, rock bottoms, and sand and muddy sand substrates. Critical habitat designated in the Flint River at the proposed crossing. Critical habitat located 30 miles downstream of the Santa Fe River crossing. | | NLAA – proposed HDD of Flint River and Santa Fe River and contingency plan would minimize impacts to the species and its critical habitat. | |
| Purple bankclimber, *Elliptoideus sloatianus* | E | Sand, fine gravel or muddy sand substrates with moderate current and deeper water habitat within the main channels of larger rivers. Critical habitat crossed at the Flint River. | | NLAA – proposed HDD of Flint River and contingency plan would minimize impacts to the species and its critical habitat. | |
| Rayed creekshell, *Anodontoides radiatus* | Pet | Endemic to southeastern Gulf Coastal Plain streams and waterways associated with the Apalachicola-Chattahoochee-Flint River system. Might be found in the Flint River system in Georgia. | | Not likely to jeopardize – proposed HDD of Flint River, and measures to minimize other stream impacts, would be implemented to minimize impacts to this species. | |
| Shinyrayed pocketbook, *Hamiota (=Lampsilis) subangulata* | E | Medium-sized creeks and rivers with slow to moderate current and clean or silty sand substrates. Known to occur in Uchee Creek. Critical habitat designated at Uchee Creek. | | NLAA – proposed HDD of Uchee Creek and contingency plan would minimize impacts to the species and its critical habitat. | |
| Southern clubshell, *Pleurobema decisum* | E | Shoals of large rivers to small streams that are highly oxygenated with sand and gravel substrate. Currently extirpated from much of its range and the Tombigbee and Tallapoosa River drainages support most of the population in Alabama. | | NLAA – measures to minimize stream impacts would be implemented. | |

TABLE 4-2

**Federal Species that May be Affected by the Southeast Market Pipelines Project**

| Species | Federal Status [a] | Preferred Habitat | Hillabee Expansion Project Determination [b] | Sabal Trail Project Determination [b] | Florida Southeast Connection Project Determination [b] |
|---|---|---|---|---|---|
| Southern elktoe, *Alasmidonta triangulata* | Pet | Restricted to the Apalachicola Basin where it is found in the Chattachoochee River system in Alabama and Georgia, the Flint River system in Georgia, and the Apalachicola and lower Chipola rivers in Florida. Preferred habitat includes large rivers in sand-mud substrate. | | Not likely to jeopardize – no preferred habitat, live specimens, or shell fragments found during mussel survey of Little Uchee Creek. HDD of Flint River and Uchee Creek would minimize waterbody impacts. | |
| Fish | | | | | |
| Blue shiner, *Cyprinella caerulea* | T | Clear, medium to large streams and are found in shallow pools with slow currents or in backwaters over sand and gravel substrates. | NLAA – not identified during species-specific surveys, but known locations and preferred habitat is found in proximity to project area. | | |
| Gulf sturgeon, *Acipenser oxyrinchus desotoi* | T | An anadromous species where adults live in saltwater and migrate into medium to large coastal rivers. | | NLAA – critical habitat crossed at ML MP 264.1 (Suwannee River). HDD crossing and contingency plan would be implemented. | |
| Insect | | | | | |
| Highlands tiger beetle, *Cicindela highlandensis* | C | Open, sandy, well-drained scrub with or without sand pine. Requires interconnected patches of bare sand and partial shade. | | Not likely to jeopardize – limited preferred habitat would be affected in its known range (Polk County). | |
| Amphibians | | | | | |
| Frosted flatwoods salamander, *Ambystoma cingulatum* | T | Pristine pine flatwoods (longleaf or slash) communities with wiregrass groundcover and scattered wetlands dominated by cypress or gum. Usually breeds in ponds that lack predatory fish and have some emergent herbaceous vegetation. Critical habitat designated but not crossed. | | NLAA – preferred habitat would be temporarily and permanently impacted by construction and operation of the project; however, the species is unlikely to be present in the project area. | |
| Striped newt, *Notophthalmus perstriatus* | C | Xeric, sandhill and scrub habitat, but can also be found in pine flatwoods. Breeds in depressional marshes that lack predatory fish. | | Not likely to jeopardize – not anticipated to occur within the project area. | Not likely to jeopardize – outside known rage of the species. |

TABLE 4-2

**Federal Species that May be Affected by the Southeast Market Pipelines Project**

| Species | Federal Status [a] | Preferred Habitat | Hillabee Expansion Project Determination [b] | Sabal Trail Project Determination [b] | Florida Southeast Connection Project Determination [b] |
|---|---|---|---|---|---|
| Reptiles | | | | | |
| Alligator snapping turtle, *Macrochelys temminckii* | Pet | Strictly a turtle of rivers, though utilizes backwater swamps, overflow lakes, and impoundments as well as main channels. | Not likely to jeopardize – suitable habitat is present. Mobile species which would likely avoid construction. Temporary impacts to wetland and waterbody would occur. Measures to minimize wetland and stream impacts and restore these areas would be implemented. | Not likely to jeopardize – suitable habitat is present. Mobile species which would likely avoid construction. Temporary impacts to wetland and waterbody would occur. Measures to minimize wetland and stream impacts and restore these areas would be implemented. | |
| American alligator, *Alligator mississippiensis* | SAT | Marshy freshwater habitats, such as marshes, swamps, rivers, and lakes. Spotted living in tidal areas and even (rarely) in the ocean. | | NLAA – conservation measures would be implemented to minimize impacts. | NLAA – conservation measures would be implemented to minimize impacts. |
| Black pine snake, *Pituophis melanoleucus lodingi* | C | Upland, open longleaf pine forests with sandy, well-drained soils and dense grassy or herbaceous groundcover. Also found within stream or river corridors and in or near pitcher plant bogs located within or adjacent to longleaf pine forests. | Not likely to jeopardize – low potential to occur in the project area. Temporary habitat impacts. Individuals could be injured or killed by equipment and vehicle strikes, or indirectly disturbed by construction activities. | | |
| Blue-tailed mole skink, *Eumeces egregius lividus* | T | Well-drained sandy uplands above 82 feet in elevation. Usually with an abundance of scattered shrubs and lichens. Favors rosemary, oak, and sand pine scrubs; occasional in turkey oak barrens, sandhill, and xeric hammock. Requires loose sand (for burrowing) with patches of sparse to no groundcover or canopy. Often found in leaf litter. | | LAA – Present (verified and assumed) within six sites along the proposed project. Conservation measures and offsetting mitigation is proposed by Sabal Trail. | LAA – Suitable habitat is present and initial information indicates the species is present. Our determination will be provided once the results of 2015 surveys are provided. |

TABLE 4-2

**Federal Species that May be Affected by the Southeast Market Pipelines Project**

| Species | Federal Status [a] | Preferred Habitat | Hillabee Expansion Project Determination [b] | Sabal Trail Project Determination [b] | Florida Southeast Connection Project Determination [b] |
|---|---|---|---|---|---|
| Eastern diamond-backed rattlesnake, *Crotalus adamanteus* | Pet | Dry pine flatwoods and pine/turkey oak hills. | Not Likely to jeopardize – known in the project area. Temporary habitat impacts. Individuals could be injured or killed by equipment and vehicle strikes, or indirectly disturbed by construction activities. Conservation measures in place to minimize impacts. | Not Likely to jeopardize – known in the project area. Temporary habitat impacts. Individuals could be injured or killed by equipment and vehicle strikes, or indirectly disturbed by construction activities. Conservation measures in place to minimize impacts. | Not Likely to jeopardize – known in the project area. Temporary habitat impacts. Individuals could be injured or killed by equipment and vehicle strikes, or indirectly disturbed by construction activities. Conservation measures in place to minimize impacts. |
| Eastern indigo snake, *Drymarchon couperi* | T | Upland habitats, often found in prairies, agricultural fields, and human altered habitats, and may co-exist with gopher tortoises inside gopher tortoise burrows. | | LAA – identified during wildlife surveys. Conservation measures approved by the FWC and FWS would be implemented to minimize impacts; however, snake relocation could affect the snake. | LAA – identified during wildlife surveys. Conservation measures approved by the FWC and FWS would be implemented to minimize impacts; however, snake relocation could affect the snake. |
| Florida sand skink, *Neoseps reynoldsi* | T | Native xeric uplands with excessively well-drained soils. Sand pine scrub, xeric oak scrub, rosemary scrub and scrubby flatwoods, as well as high pine communities that include sandhill, longleaf pine/turkey oak, turkey oak barrens, and xeric hammocks. | | LAA – Present (verified and assumed) within six sites along the proposed project. Conservation measures and offsetting mitigation is proposed by Sabal Trail. | LAA – Suitable habitat is present and initial information indicates the species is present. Our determination will be provided once the results of 2015 surveys are provided. |
| Gopher tortoise, *Gopherus polyphemus* | C | Dry upland habitats, including sandhills, scrub, xeric oak hammock, and dry pine flatwoods. Commonly uses disturbed habitats such as pastures, old fields, and road shoulders. Excavate deep burrows for refuge from predators, weather, and fire. | | Not likely to jeopardize – temporary habitat and burrow impacts. Relocation impacts. Conservation measures approved by the FWC and FWS would be implemented to minimize impacts. | Not likely to jeopardize – temporary habitat and burrow impacts. Relocation impacts. Conservation measures approved by the FWC and FWS would be implemented to minimize impacts. |
| Mammals | | | | | |
| Florida bonneted bat, *Eumops floridanus* | E | Roosts in palms, hollow trees, and buildings. Forages high in the air over natural and human-altered landscapes. | | | NLAA – potential nesting trees would be removed. Structures would be surveyed prior to removal. Unlikely potential of bonneted bats in the project area. |

TABLE 4-2

**Federal Species that May be Affected by the Southeast Market Pipelines Project**

| Species | Federal Status [a] | Preferred Habitat | Hillabee Expansion Project Determination [b] | Sabal Trail Project Determination [b] | Florida Southeast Connection Project Determination [b] |
|---|---|---|---|---|---|
| Florida panther, *Puma concolor coryi* | E | Extensive blocks of mostly forested communities. Large wetlands that are generally inaccessible to humans are important for diurnal refuge. Will tolerate improved areas in a mosaic of natural communities. | | NLAA – mobile species with large home range. | NLAA – mobile species with large home range. |
| Birds | | | | | |
| Crested caracara, *Caracara cheriway* | T | Open country, including wet prairie and pasture lands with cabbage palm, cabbage palm/live oak hammocks, and shallow ponds and sloughs. Preferred nest trees are cabbage palms, followed by live oaks and pines. | | NLAA – direct impacts unlikely. Temporary and permanent impacts to preferred habitat. Conservation measures would be implemented to minimize bird impacts. | NLAA – direct impacts unlikely. Temporary and permanent impacts to preferred habitat. Conservation measures would be implemented to minimize bird impacts. |
| Everglades snail kite, *Rostrhamus sociabilis plumbeus* | E | Large inland freshwater marshes, edges of shallow lakes, and other flat water courses with marsh edge where apple snails can be found. These habitats are semipermanently flooded often on organic substrate of peat overlying oolitic limestone or sand or directly on limestone or marl. | | | NLAA – preferred habitat would be crossed by HDD. Conservation measures would be implemented to avoid bird and habitat impacts. |
| Florida scrub-jay, *Aphelocoma coerulescens* | T | Fire dominated, low-growing, oak scrub habitat found on well-drained sandy soils. May persist in areas with sparser oaks or scrub areas that are overgrown, but at much lower densities and with reduced survivorship. | | LAA – four active territories would be crossed by the project. Avoidance and conservation measures are proposed. | NLAA – additional surveys pending. Implementation of our recommendation would allow necessary consultation and development of appropriate conservation measures. |

TABLE 4-2

**Federal Species that May be Affected by the Southeast Market Pipelines Project**

| Species | Federal Status [a] | Preferred Habitat | Hillabee Expansion Project Determination [b] | Sabal Trail Project Determination [b] | Florida Southeast Connection Project Determination [b] |
|---|---|---|---|---|---|
| Wood stork, *Mycteria americana* | E | Nests colonially in inundated forested wetlands, including cypress strands and domes, mixed hardwood swamps, sloughs, and mangroves. Increasingly nesting in artificial habitats such as impoundments and dredged areas with native or exotic vegetation in north and central Florida. Forages mainly in shallow water in freshwater marshes, swamps, lagoons, ponds, tidal creeks, flooded pastures and ditches. | | NLAA – identified in the project area and suitable habitat is present. Conservation measures and implementation of Staff's recommendation would minimize stork impacts. | NLAA – identified in the project area and suitable habitat is present. Conservation measures and implementation of Staff's recommendation would minimize stork impacts. |
| Plants | | | | | |
| Florida bonamia, *Bonamia grandiflora* | T | Openings or disturbed areas in white sand scrub on central Florida ridges with scrub oaks, sand pine, and lichens. | | | LAA – identified during field surveys near MP 9. Implementation of our recommendation would minimize impacts but conservation measures to be developed and Section 7 consultation to be completed. |
| Lewton's polygala, *Polygala lewtonii* | E | Oak scrub, sandhills, and the transition zones between high pine and turkey oak barrens. | | | LAA – identified during surveys near MP 8.9 and is located within proposed construction workspace. |
| Longspurred mint, *Dicerandra cornutissima* | E | Open areas in sand pine scrub or oak scrub and in the ecotones between these and turkey oak communities. | | LAA – identified in the project area and suitable habitat is present. Implementation of our recommendation would minimize impacts but conservation measures to be developed and Section 7 consultation to be completed. | |
| Papery whitlow-wort (Paper nailwort), *Paronychia chartacea* | T | Scrub and rosemary scrub, which is also known as the rosemary phase of sand pine scrub. In rosemary scrub, can become very abundant after a fire or after disturbance along fire lanes or trails. | | | LAA – identified during species-specific surveys in 2014 in numerous locations between MPs 8 and 37. Implementation of our recommendation would minimize impacts but conservation measures to be developed and Section 7 consultation to be completed. |

TABLE 4-2

**Federal Species that May be Affected by the Southeast Market Pipelines Project**

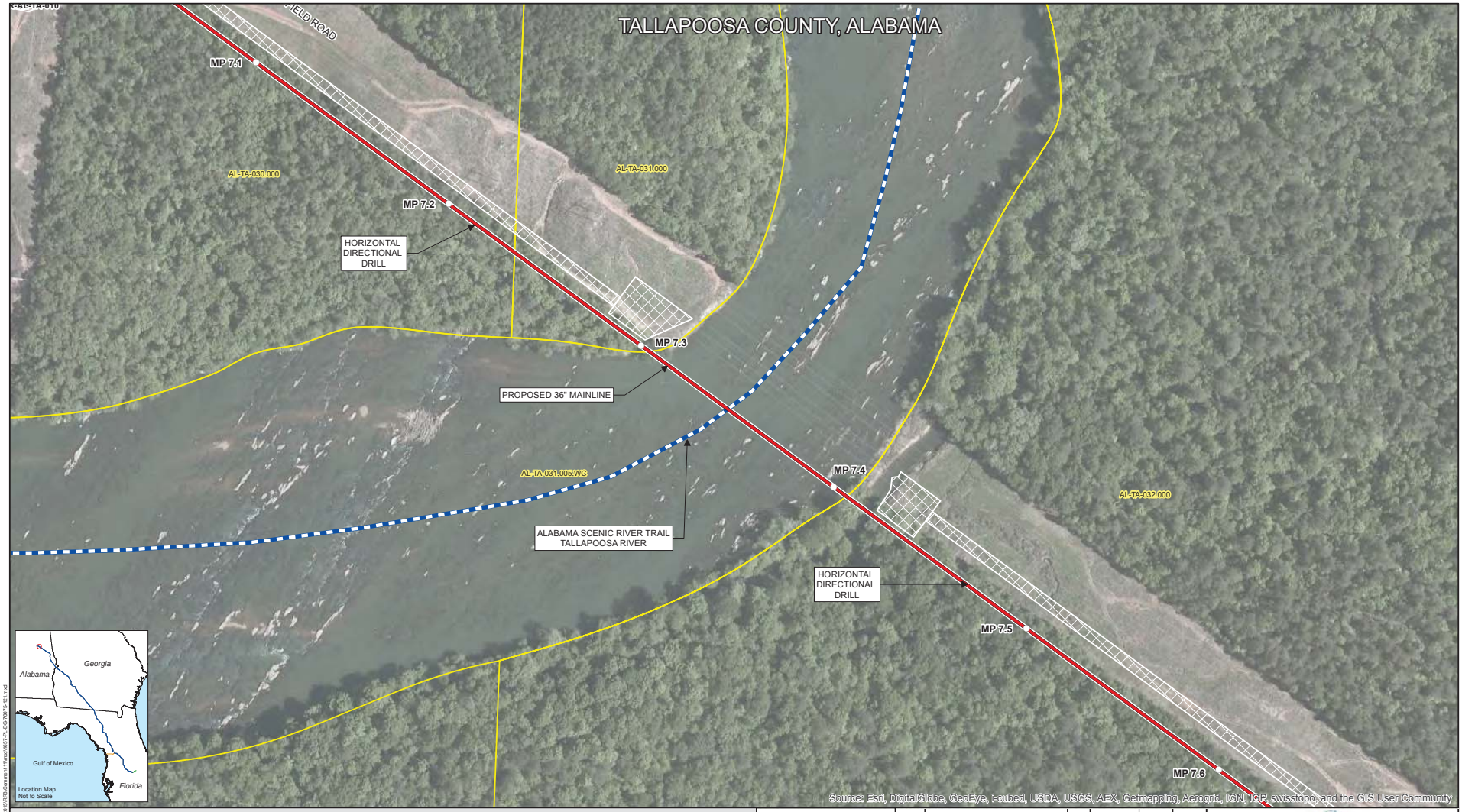
| Species | Federal Status [a] | Preferred Habitat | Hillabee Expansion Project Determination [b] | Sabal Trail Project Determination [b] | Florida Southeast Connection Project Determination [b] |
|---|---|---|---|---|---|
| Scrub buckwheat, *Eriogonum longifolium var.gnaphalifolium* | T | Pine-forested sand hills and scrub oak sand ridges. | | | LAA – identified during species-specific surveys in 2014 near MP 9. Implementation of our recommendation would minimize impacts but conservation measures to be developed and Section 7 consultation to be completed. |
| Scrub mint, *Dicerandra frutescens* | E | Sand pine, scrub, and sandhill habitats. | | | LAA – identified during species-specific surveys in 2014 near MP 9. Implementation of our recommendation would minimize impacts but conservation measures to be developed and Section 7 consultation to be completed. |
| Small's jointweed/ Sandlace, *Polygonella myriophylla* | E | Dry white-sand scrub dominated by Florida rosemary, as well as oak scrub, flatwoods, roadsides, and occasionally sandhills. | | | LAA – Identified at one location near MP 35.5 and may be located within the proposed construction workspace. |

[a] Federal Status Key: T = Threatened; E = Endangered; C = Candidate; Pet = Petitioned for Listing; PT = Proposed Threatened; PE = Proposed Endangered; EP = Experimental Population; BGEPA = Bald and Golden Eagle Protection Act; SAT = Similarity of Appearance - Threatened

[b] NLAA = Not Likely to Adversely Affect; LAA = Likely to Adversely Affect. If no determination is provided, the species is not known to occur in the project area.

# APPENDIX L

SABAL TRAIL PROJECT
SITE-SPECIFIC CROSSING PLANS
FOR THE FLORIDA NATIONAL SCENIC TRAILS




## Legend

- MILE POSTS
- PROPOSED 36" MAINLINE
- PROPOSED 24" CITRUS COUNTY LINE
- ACCESS ROADS
- FLORIDA NATIONAL SCENIC TRAIL
- FLORIDA NATIONAL SCENIC TRAIL CONNECTORS
- GREENWAY TRAILS
- COUNTIES
- PARCELS
- FLORIDA STATE LANDS
- HDD ENTRY/EXIT
- BORE-ENTRY/EXIT
- DETOUR

**** TRAIL CROSSINGS BY HDD***

- PERMANENT EASEMENT
- TEMPORARY WORKSPACE
- ADDITIONAL TEMPORARY WORKSPACE

N W E S

0 100 200
Feet
Scale: 1 Inch = 200 Feet

| NO. | REVISION - DESCRIPTION | BY | DATE | CHK'D | APP'D |
|---|---|---|---|---|---|
| 0 | ISSUED FOR PERMITTING | GIE | 03/24/2015 | TW | JC |

FERC DATA REQUEST MARCH 2015

Sabal Trail TRANSMISSION

SABAL TRAIL PROJECT
PROPOSED 36" MAINLINE
TRAIL CROSSING MAP

TALLAPOOSA COUNTY, ALABAMA

DWG NO: 1657-PL-DG-70075-121 | SHT: 1 of 17 | REV: 0

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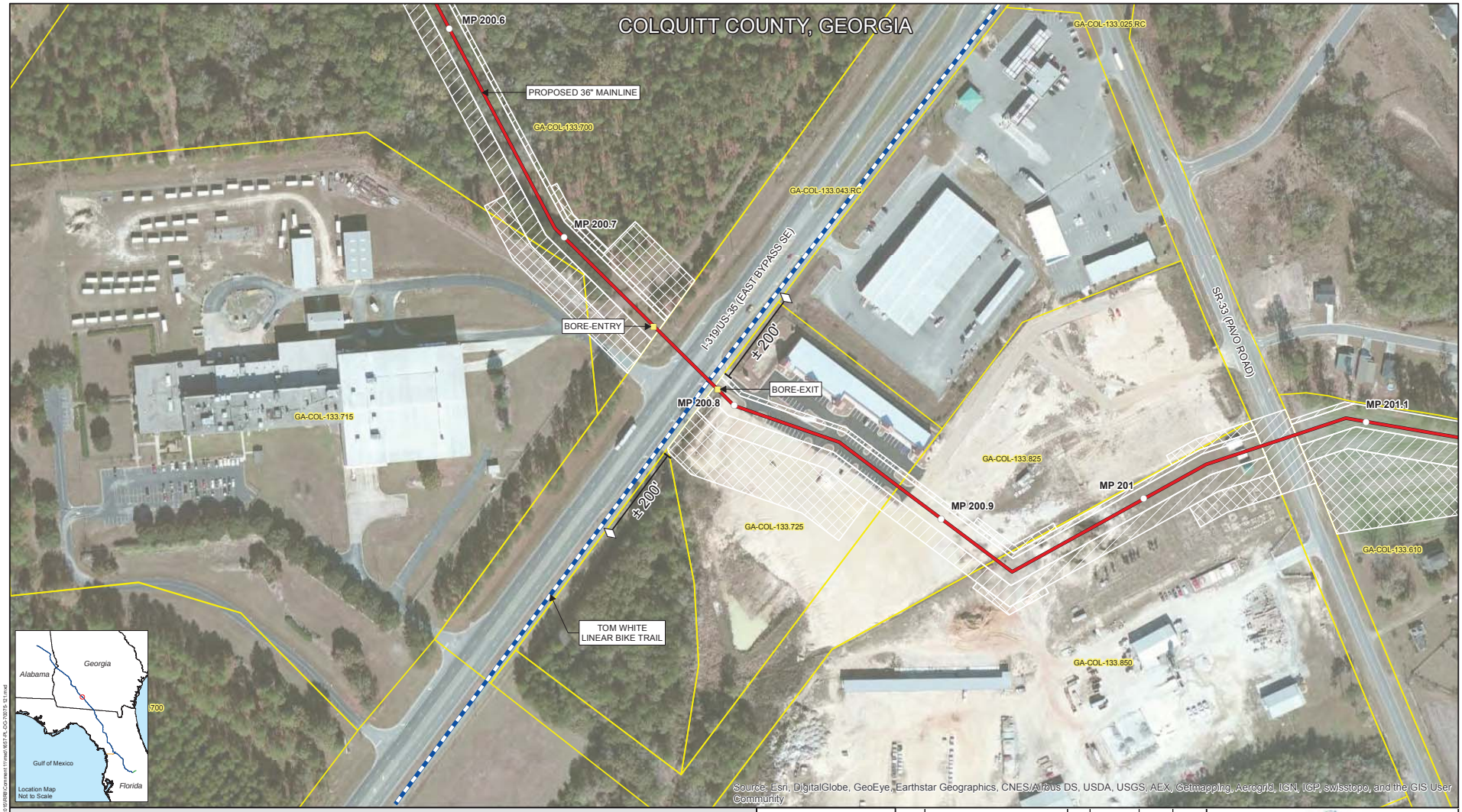


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- MILE POSTS
- PROPOSED 36" MAINLINE
- PROPOSED 24" CITRUS COUNTY LINE
- ACCESS ROADS
- FLORIDA NATIONAL SCENIC TRAIL
- FLORIDA NATIONAL SCENIC TRAIL CONNECTORS
- GREENWAY TRAILS
- COUNTIES
- PARCELS
- FLORIDA STATE LANDS
- HDD ENTRY/EXIT
- BORE-ENTRY/EXIT
- ATTENTION: PIPELINE CONSTRUCTION AHEAD
- DETOUR
- PERMANENT EASEMENT
- TEMPORARY WORKSPACE
- ADDITIONAL TEMPORARY WORKSPACE

N W E S

0 100 200
Feet
Scale: 1 Inch = 200 Feet

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FERC DATA REQUEST MARCH 2015

Sabal Trail TRANSMISSION

SABAL TRAIL PROJECT
PROPOSED 36" MAINLINE
TRAIL CROSSING MAP

COLQUITT COUNTY, GEORGIA

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- MILE POSTS
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- PROPOSED 24" CITRUS COUNTY LINE
- ACCESS ROADS
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- FLORIDA NATIONAL SCENIC TRAIL CONNECTORS
- GREENWAY TRAILS
- COUNTIES
- PARCELS
- FLORIDA STATE LANDS
- HDD ENTRY/EXIT
- BORE-ENTRY/EXIT
- ATTENTION: PIPELINE CONSTRUCTION AHEAD
- DETOUR
- PERMANENT EASEMENT
- TEMPORARY WORKSPACE
- ADDITIONAL TEMPORARY WORKSPACE

N W E S

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Feet
Scale: 1 Inch = 200 Feet

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FERC DATA REQUEST MARCH 2015

Sabal Trail TRANSMISSION

SABAL TRAIL PROJECT
PROPOSED 36" MAINLINE
TRAIL CROSSING MAP

HAMILTON COUNTY, FLORIDA

DWG NO: 1657-PL-DG-70075-121 | SHT: 3 of 17 | REV: 0

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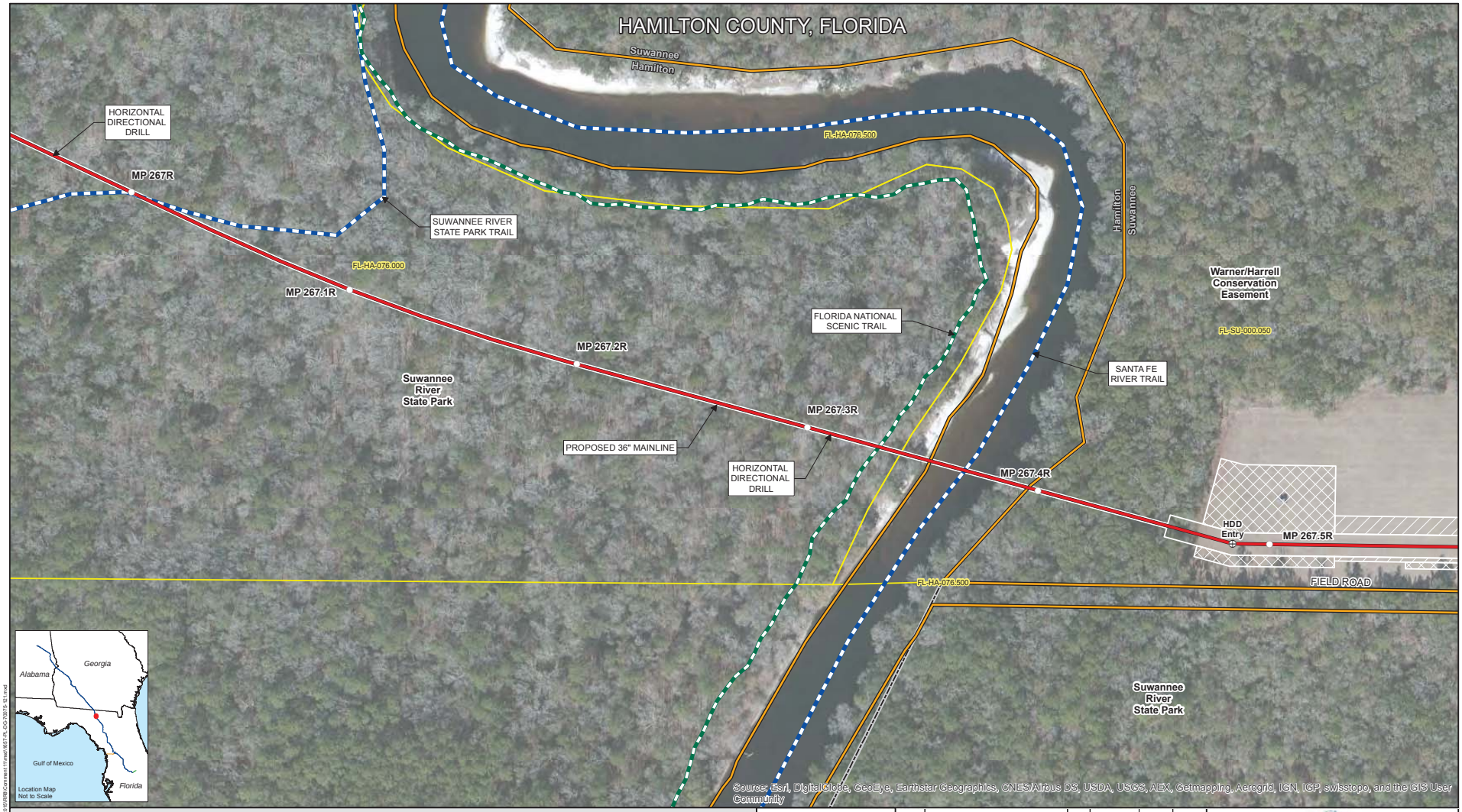


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- FLORIDA NATIONAL SCENIC TRAIL CONNECTORS
- GREENWAY TRAILS
- COUNTIES
- PARCELS
- FLORIDA STATE LANDS
- HDD ENTRY/EXIT
- BORE-ENTRY/EXIT
- DETOUR

*** TRAIL CROSSINGS BY HDD**

- PERMANENT EASEMENT
- TEMPORARY WORKSPACE
- ADDITIONAL TEMPORARY WORKSPACE

N W E S

0 100 200
Feet
Scale: 1 Inch = 200 Feet

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FERC DATA REQUEST MARCH 2015

Sabal Trail TRANSMISSION

SABAL TRAIL PROJECT
PROPOSED 36" MAINLINE
TRAIL CROSSING MAP

HAMILTON COUNTY, FLORIDA

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- ACCESS ROADS
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- FLORIDA NATIONAL SCENIC TRAIL CONNECTORS
- GREENWAY TRAILS
- COUNTIES
- PARCELS
- FLORIDA STATE LANDS
- HDD ENTRY/EXIT
- BORE-ENTRY/EXIT
- ATTENTION: PIPELINE CONSTRUCTION AHEAD
- DETOUR
- PERMANENT EASEMENT
- TEMPORARY WORKSPACE
- ADDITIONAL TEMPORARY WORKSPACE

N W E S

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Feet
Scale: 1 Inch = 200 Feet

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FERC DATA REQUEST MARCH 2015

Sabal Trail TRANSMISSION

SABAL TRAIL PROJECT
PROPOSED 36" MAINLINE
TRAIL CROSSING MAP

SUWANNEE COUNTY, FLORIDA

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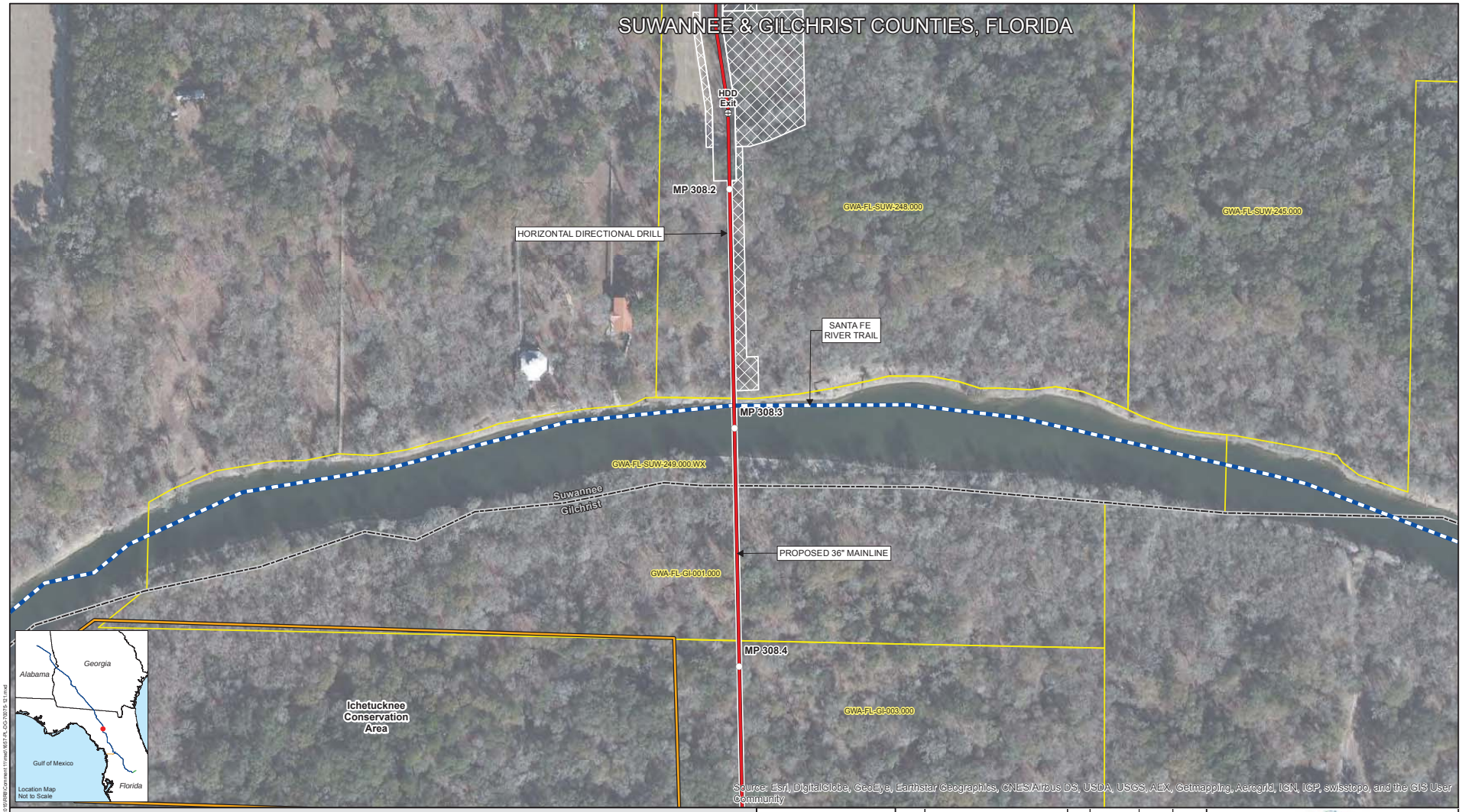


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- GREENWAY TRAILS
- COUNTIES
- PARCELS
- FLORIDA STATE LANDS
- HDD ENTRY/EXIT
- BORE-ENTRY/EXIT
- DETOUR

*** TRAIL CROSSINGS BY HDD**

- PERMANENT EASEMENT
- TEMPORARY WORKSPACE
- ADDITIONAL TEMPORARY WORKSPACE

N W E S

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Feet
Scale: 1 Inch = 200 Feet

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FERC DATA REQUEST MARCH 2015

Sabal Trail TRANSMISSION

SABAL TRAIL PROJECT
PROPOSED 36" MAINLINE
TRAIL CROSSING MAP

SUWANNEE & GILCHRIST COUNTIES, FLORIDA

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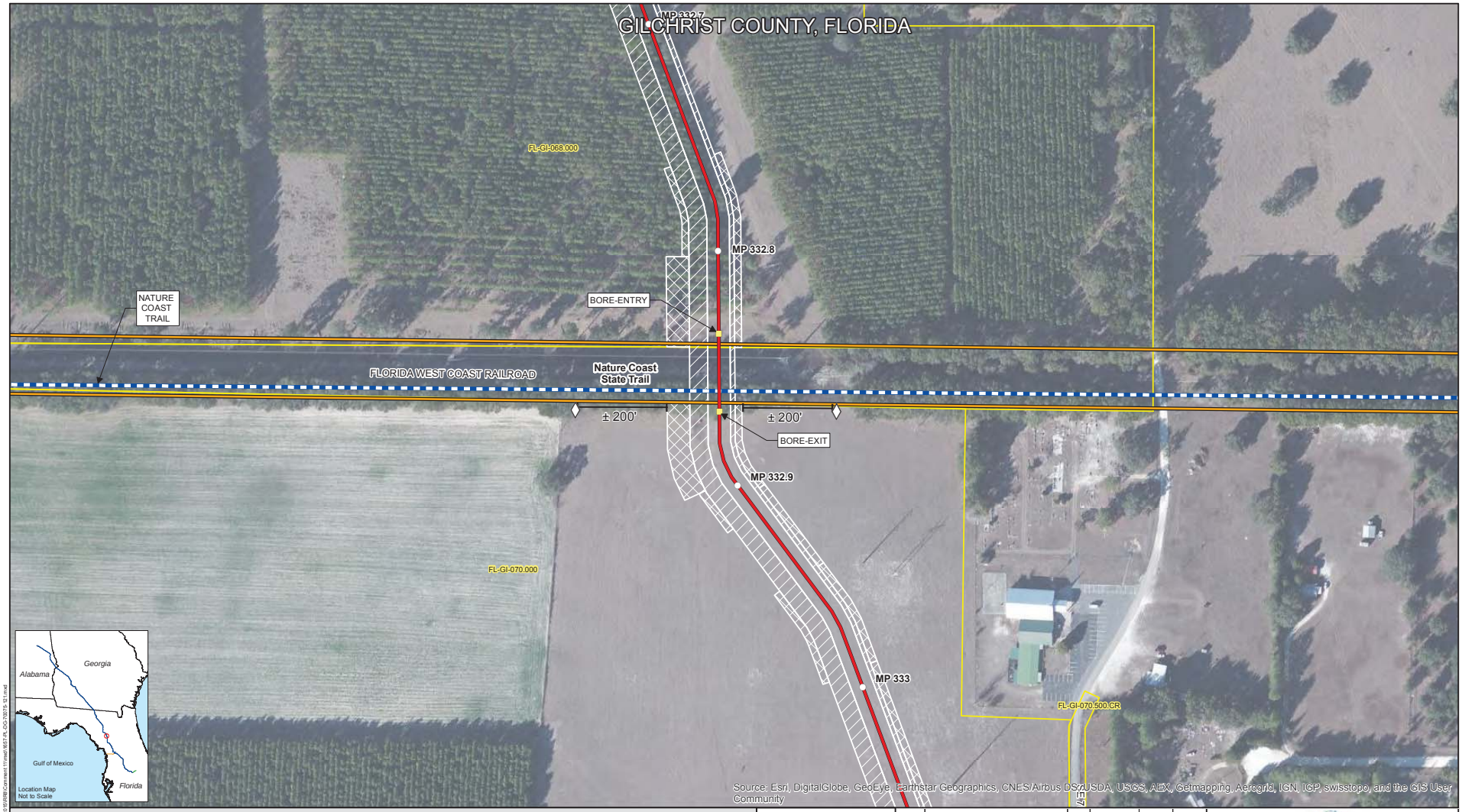


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- FLORIDA STATE LANDS
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- BORE-ENTRY/EXIT
- ATTENTION: PIPELINE CONSTRUCTION AHEAD
- DETOUR
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- TEMPORARY WORKSPACE
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Scale: 1 Inch = 200 Feet

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FERC DATA REQUEST MARCH 2015

Sabal Trail TRANSMISSION

SABAL TRAIL PROJECT
PROPOSED 36" MAINLINE
TRAIL CROSSING MAP

GILCHRIST COUNTY, FLORIDA

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FERC DATA REQUEST MARCH 2015

Sabal Trail TRANSMISSION

SABAL TRAIL PROJECT
PROPOSED 36" MAINLINE
TRAIL CROSSING MAP

MARION COUNTY, FLORIDA

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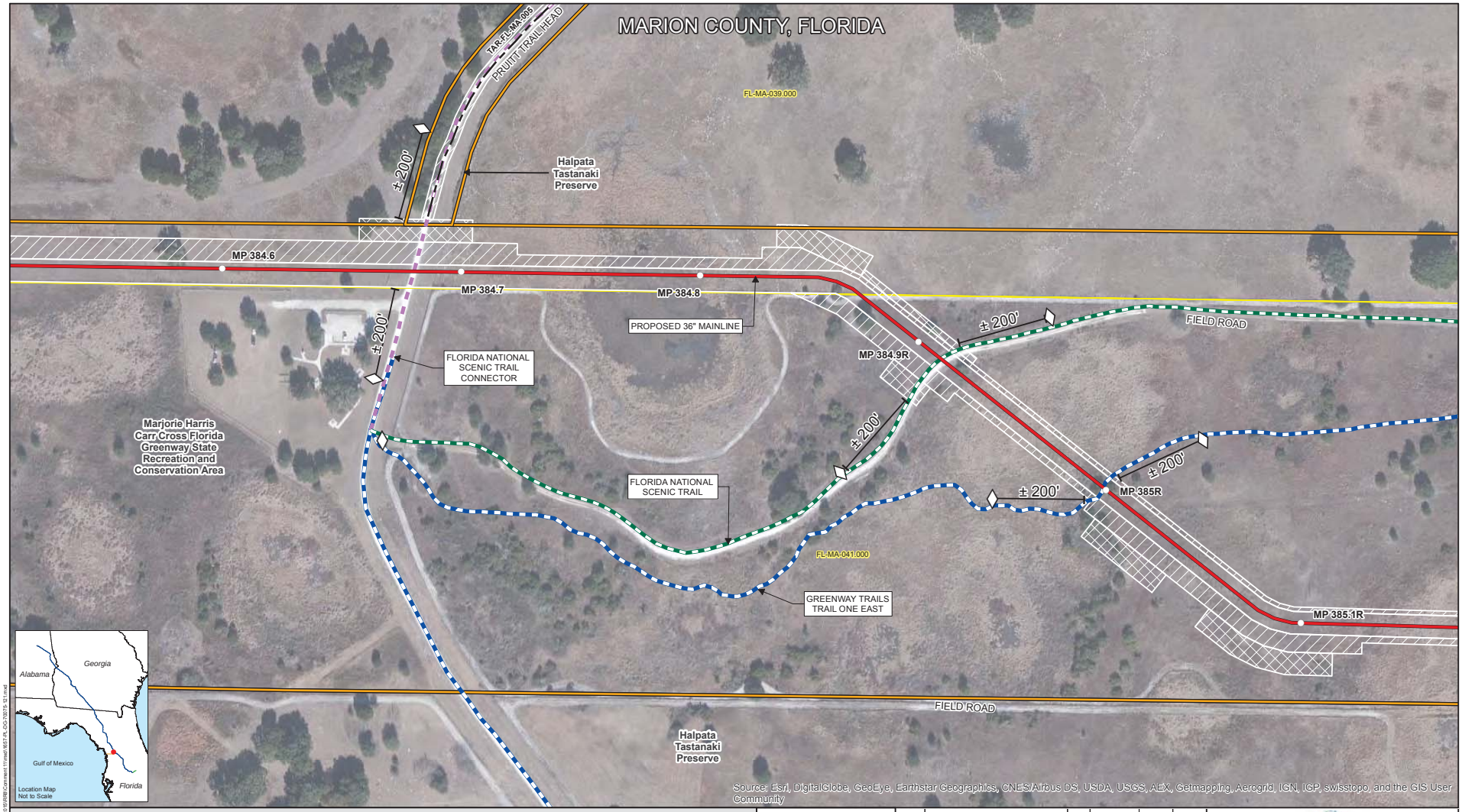


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Scale: 1 Inch = 200 Feet

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FERC DATA REQUEST MARCH 2015

Sabal Trail TRANSMISSION

SABAL TRAIL PROJECT
PROPOSED 36" MAINLINE
TRAIL CROSSING MAP

MARION COUNTY, FLORIDA

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- GREENWAY TRAILS
- COUNTIES
- PARCELS
- FLORIDA STATE LANDS
- HDD ENTRY/EXIT
- BORE-ENTRY/EXIT
- ATTENTION: PIPELINE CONSTRUCTION AHEAD
- DETOUR

**** DETOUR WOULD BE ESTABLISHED APPROXIMATELY AUGUST 2016.***

- PERMANENT EASEMENT
- TEMPORARY WORKSPACE
- ADDITIONAL TEMPORARY WORKSPACE

N W E S

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Feet
Scale: 1 Inch = 200 Feet

| NO. | REVISION - DESCRIPTION | BY | DATE | CHK'D | APP'D |
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FERC DATA REQUEST MARCH 2015

Sabal Trail TRANSMISSION

SABAL TRAIL PROJECT
PROPOSED 36" MAINLINE
TRAIL CROSSING MAP

MARION COUNTY, FLORIDA

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- FLORIDA STATE LANDS
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- BORE-ENTRY/EXIT
- ATTENTION: PIPELINE CONSTRUCTION AHEAD
- DETOUR
- PERMANENT EASEMENT
- TEMPORARY WORKSPACE
- ADDITIONAL TEMPORARY WORKSPACE

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Feet
Scale: 1 Inch = 200 Feet

| NO. | REVISION - DESCRIPTION | BY | DATE | CHK'D | APP'D |
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FERC DATA REQUEST MARCH 2015

Sabal Trail TRANSMISSION

SABAL TRAIL PROJECT
PROPOSED 36" MAINLINE
TRAIL CROSSING MAP

MARION COUNTY, FLORIDA

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- FLORIDA STATE LANDS
- HDD ENTRY/EXIT
- BORE-ENTRY/EXIT
- ATTENTION: PIPELINE CONSTRUCTION AHEAD
- DETOUR
- PERMANENT EASEMENT
- TEMPORARY WORKSPACE
- ADDITIONAL TEMPORARY WORKSPACE

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Feet
Scale: 1 Inch = 200 Feet

| NO. | REVISION - DESCRIPTION | BY | DATE | CHK'D | APP'D |
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FERC DATA REQUEST MARCH 2015

Sabal Trail TRANSMISSION

SABAL TRAIL PROJECT
PROPOSED 36" MAINLINE
TRAIL CROSSING MAP

MARION COUNTY, FLORIDA

DWG NO: 1657-PL-DG-70075-121 | SHT: 12 of 17 | REV: 0

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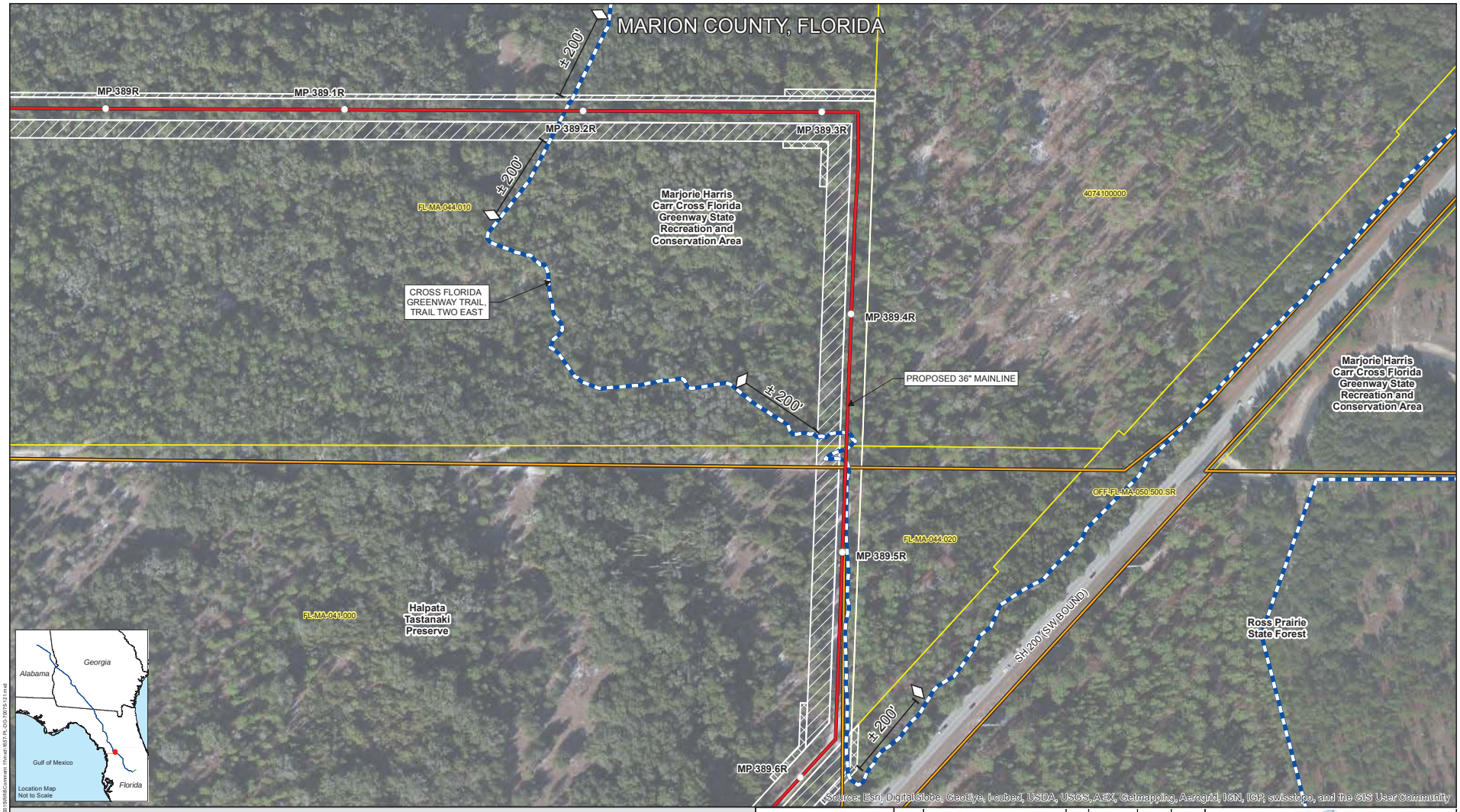


## Legend

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- FLORIDA NATIONAL SCENIC TRAIL CONNECTORS
- GREENWAY TRAILS
- COUNTIES
- PARCELS
- FLORIDA STATE LANDS
- HDD ENTRY/EXIT
- BORE-ENTRY/EXIT
- ATTENTION: PIPELINE CONSTRUCTION AHEAD
- DETOUR
- PERMANENT EASEMENT
- TEMPORARY WORKSPACE
- ADDITIONAL TEMPORARY WORKSPACE

N W E S

0 100 200 Feet

Scale: 1 Inch = 200 Feet

| NO. | REVISION - DESCRIPTION | BY | DATE | CHK'D | APP'D |
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| 0 | ISSUED FOR PERMITTING | GIE | 03/24/2015 | TW | JC |

FERC DATA REQUEST MARCH 2015

Sabal Trail TRANSMISSION

SABAL TRAIL PROJECT
PROPOSED 36" MAINLINE
TRAIL CROSSING MAP

MARION COUNTY, FLORIDA

DWG NO: 1657-PL-DG-70075-121 | SHT: 13 of 17 | REV: 0

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Legend

- MILE POSTS
- PROPOSED 36" MAINLINE
- PROPOSED 24" CITRUS COUNTY LINE
- ACCESS ROADS
- FLORIDA NATIONAL SCENIC TRAIL
- FLORIDA NATIONAL SCENIC TRAIL CONNECTORS
- GREENWAY TRAILS
- COUNTIES
- PARCELS
- FLORIDA STATE LANDS
- HDD ENTRY/EXIT
- BORE-ENTRY/EXIT
- ATTENTION: PIPELINE CONSTRUCTION AHEAD
- DETOUR
- PERMANENT EASEMENT
- TEMPORARY WORKSPACE
- ADDITIONAL TEMPORARY WORKSPACE

N W E S

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Scale: 1 Inch = 200 Feet

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FERC DATA REQUEST MARCH 2015

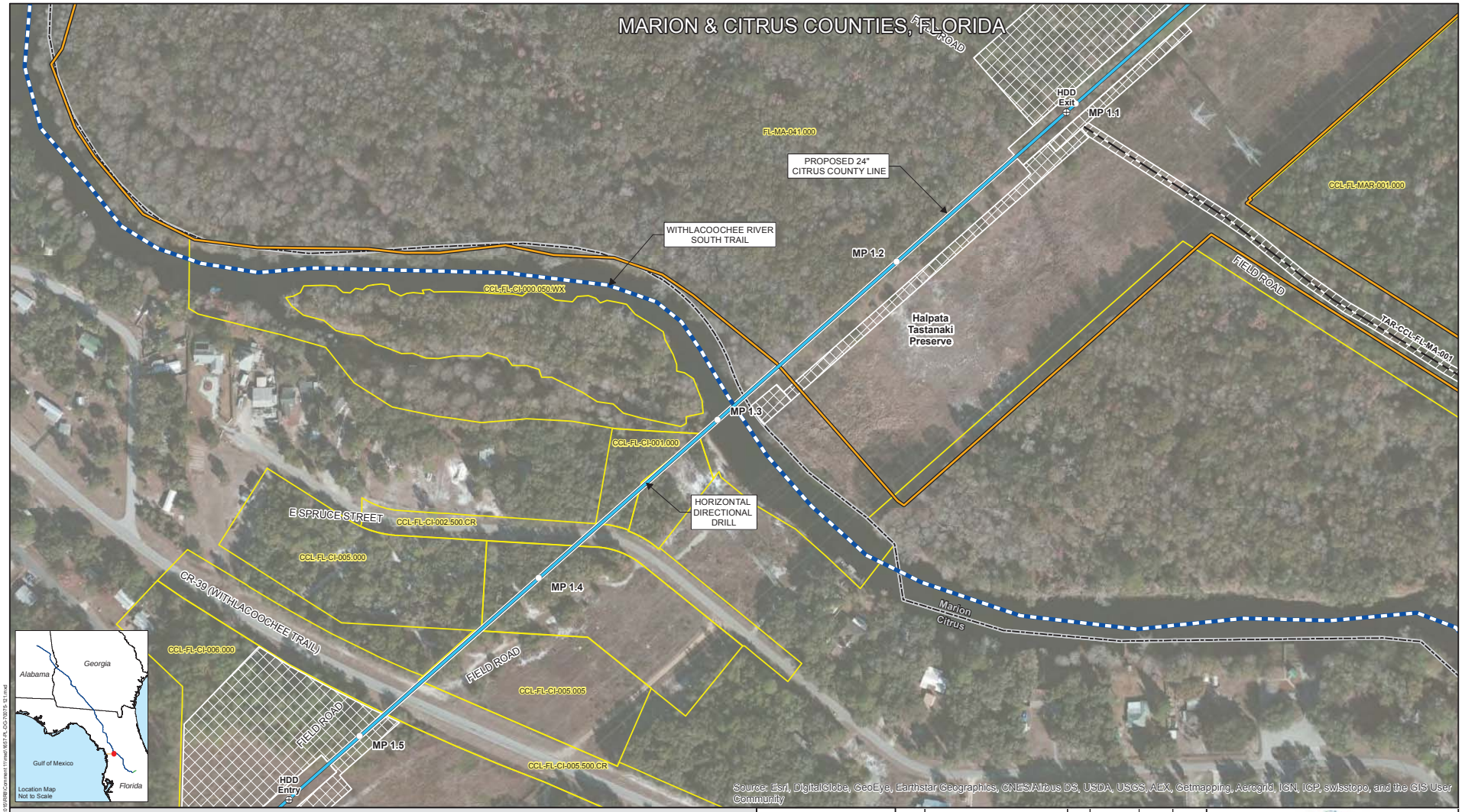
Sabal Trail TRANSMISSION

SABAL TRAIL PROJECT
PROPOSED 36" MAINLINE
TRAIL CROSSING MAP

MARION COUNTY, FLORIDA

DWG NO: 1657-PL-DG-70075-121 | SHT: 14 of 17 | REV: 0

Date: 3/30/2015 Time: 3:12:56 PM User ID/Pc: U:\Projects\Transmission\Sabal Trail\Project Maps\1657-PL-DG-70075-121.mxd




Legend

- MILE POSTS
- PROPOSED 36" MAINLINE
- PROPOSED 24" CITRUS COUNTY LINE
- ACCESS ROADS
- FLORIDA NATIONAL SCENIC TRAIL
- FLORIDA NATIONAL SCENIC TRAIL CONNECTORS
- GREENWAY TRAILS
- COUNTIES
- PARCELS
- FLORIDA STATE LANDS
- HDD ENTRY/EXIT
- BORE-ENTRY/EXIT
- DETOUR

**** TRAIL CROSSINGS BY HDD***

- PERMANENT EASEMENT
- TEMPORARY WORKSPACE
- ADDITIONAL TEMPORARY WORKSPACE

N W E S

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Feet
Scale: 1 Inch = 200 Feet

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FERC DATA REQUEST MARCH 2015

Sabal Trail TRANSMISSION

SABAL TRAIL PROJECT
PROPOSED 24" CITRUS COUNTY LINE
TRAIL CROSSING MAP

MARION & CITRUS COUNTIES, FLORIDA

DWG NO: 1657-PL-DG-70075-121 | SHT: 15 of 17 | REV: 0

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Legend

- MILE POSTS
- PROPOSED 36" MAINLINE
- PROPOSED 24" CITRUS COUNTY LINE
- ACCESS ROADS
- FLORIDA NATIONAL SCENIC TRAIL
- FLORIDA NATIONAL SCENIC TRAIL CONNECTORS
- GREENWAY TRAILS
- COUNTIES
- PARCELS
- FLORIDA STATE LANDS
- HDD ENTRY/EXIT
- BORE-ENTRY/EXIT
- ATTENTION: PIPELINE CONSTRUCTION AHEAD
- DETOUR
- PERMANENT EASEMENT
- TEMPORARY WORKSPACE
- ADDITIONAL TEMPORARY WORKSPACE

N W E S

0 100 200
Feet
Scale: 1 Inch = 200 Feet

| NO. | REVISION - DESCRIPTION | BY | DATE | CHK'D | APP'D |
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FERC DATA REQUEST MARCH 2015

Sabal Trail TRANSMISSION

SABAL TRAIL PROJECT
PROPOSED 24" CITRUS COUNTY LINE
TRAIL CROSSING MAP

CITRUS COUNTY, FLORIDA

DWG NO: 1657-PL-DG-70075-121 | SHT: 16 of 17 | REV: 0

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- MILE POSTS
- PROPOSED 36" MAINLINE
- PROPOSED 24" CITRUS COUNTY LINE
- ACCESS ROADS
- FLORIDA NATIONAL SCENIC TRAIL
- FLORIDA NATIONAL SCENIC TRAIL CONNECTORS
- COUNTIES
- PARCELS
- FLORIDA STATE LANDS
- HDD ENTRY/EXIT
- BORE-ENTRY/EXIT
- ATTENTION: PIPELINE CONSTRUCTION AHEAD
- DETOUR

**** TRAIL CROSSINGS BY HDD***

- PERMANENT EASEMENT
- TEMPORARY WORKSPACE
- ADDITIONAL TEMPORARY WORKSPACE

N W E S

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Feet
Scale: 1 Inch = 200 Feet

| NO. | REVISION - DESCRIPTION | BY | DATE | CHK'D | APP'D |
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FERC DATA REQUEST MARCH 2015

Sabal Trail TRANSMISSION

SABAL TRAIL PROJECT
PROPOSED 36" HUNTERS CREEK LINE
TRAIL CROSSING MAP

OSCEOLA COUNTY, FLORIDA

DWG NO: 1657-PL-DG-70075-121 | SHT: 17 of 17 | REV: 0

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# APPENDIX M

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## Appendix M

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# APPENDIX N

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## Appendix N

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