

- *May affect, is not likely to adversely affect*—the proposed action may affect listed species and/or critical habitat; however, the effects are expected to be discountable, insignificant, or completely beneficial.
- *No effect*—the proposed action will not affect federally listed species or critical habitat.

3.0 RESULTS

3.1 ECOLOGICAL OVERVIEW

The project area consists of numerous vegetated communities across the 41-mile project area including, palustrine emergent (PEM), palustrine scrub-shrub (PSS), palustrine forested (PFO), and estuarine emergent (EEM) wetlands, as well as herbaceous, scrub-shrub, and forested uplands as described below.

3.2 VEGETATION

Biologists identified seven general types of vegetative communities within the project area. Determination of wetland habitat (type) is based on the classification system developed by Cowardin et al. (1979). These vegetative communities were classified as herbaceous upland, scrub-shrub upland, forested upland, PEM, PSS, PFO, and EEM wetlands. Examples of common dominant species identified within each vegetative community are listed below.

3.2.1 *Herbaceous Upland*

Herbaceous upland communities occur throughout the project area and are found within existing maintained right of way (ROW). Common dominant herbaceous species within the herbaceous upland communities include Bermuda grass (*Cynodon dactylon*), Italian ryegrass (*Lolium multiflorum*), Canada goldenrod (*Solidago canadensis*), roundpod St. Johnswort (*Hypericum cistifolium*, FACW), broom grass (*Andropogon virginicus*, FAC), candyroot (*Polygala nana*, FAC), heartwing sorrel (*Rumex hastatulus*, FAC), cogon grass (*Imperata cylindrical*, UPL), poverty rush (*Juncus tenuis*, FAC), slender crab grass (*Digitaria filiformis*, UPL), tapered rosette grass (*Dichanthelium acuminatum*, FAC), cuman ragweed (*Ambrosia psilostachya*, FAC), perennial rye grass (*Lolium perenne*, FACU), romerillo (*Bidens alba*, UPL), and American beauty berry (*Callicarpa americana*, UPL). In occasional instances trees, saplings, shrubs, or woody vines were identified as minor components of herbaceous uplands. Common dominant tree, sapling, or shrub species which occur in these instances include red maple (*Acer rubrum*, FAC) slash pine (*Pinus ellioittii*, FACW), long leaf pine (*Pinus palustris*, UPL), sweetbay (*Magnolia virginiana*, FACW), Chinese tallow (*Triadica sebifera*, FAC) dwarf live oak (*Quercus minima*), American holly (*Ilex opaca*, FAC), and saw greenbriar (*Smilax bona-nox*, FAC).

3.2.2 *Scrub-Shrub Upland*

Scrub-shrub upland communities occur throughout the project area and are mostly found along the edges of existing maintained ROW. Common dominant sapling or shrub species within scrub-shrub upland communities include yaupon (*Ilex vomitoria*, FAC), fetterbush (*Lyonia lucida*, FACW), gallberry (*Ilex glabra*, FACW), swamp titi (*Cyrilla racemiflora*, FACW), eastern sweet shrub (*Calycanthus floridus*, FACU), swamp bay (*Persea palustris*, FAC), wax myrtle (*Myrica cerifera*,

FAC), American holly (*Ilex opaca*, FAC), slash pine, and highbush blueberry (*Vaccinium corymbosum*). In occasional instances trees, herbaceous species, or woody vines, were identified as minor components for scrub-shrub uplands. Common examples of the following are longleaf pine, southern magnolia (*Magnolia grandiflora*, UPL), dwarf live oak, red maple, and herbaceous species such as American beauty berry, broom grass, and saw palmetto (*Serenoa repens*, FACU).

3.2.3 Forested Upland

Forested upland communities occur throughout forested portions of the project area along the edge of the existing maintained ROW. Common dominant tree or sapling species within the forested upland communities include slash pine, longleaf pine, southern magnolia, sweetbay, tulip poplar (*Liriodendron tulipifera*, FAC), dwarf live oak, water oak (*Quercus nigra*, FAC), and laurel oak (*Quercus laurifolia*, FAC). In occasional instances shrubs, herbaceous species, or woody vines, were identified as minor components of forested uplands. Common dominant shrub species which occur in these instances include fetterbush, gallberry, yaupon, and eastern sweetbush (*Calycanthus floridus*, FACU). Common herbaceous plants were western bracken fern (*Pteridium aquilinum*, FACU), cogon grass, broom grass, American beauty berry, St. Andrew's cross (*Hypericum hypericoides*, FAC), and Bermuda grass.

3.2.4 Palustrine Emergent Wetland

PEM wetlands occur throughout the project area and are found within existing maintained ROW. Common dominant herbaceous species within the PEM wetland communities include swamp smartweed (*Polygonum hydropiperoides*, OBL), pale pitcher plant (*Sarracenia alata*, OBL), crimson pitcher plant (*Sarracenia leucophylla*, OBL), parrot pitcher plant (*Sarracenia psittacina*, OBL), roundleaf sundew (*Drosera rotundifolia*, OBL), netted chainfern (*Woodwardia areolata*, OBL), Virginia chainfern (*Woodwardia virginica*, OBL), royal fern (*Osmunda regalis*, OBL), common rush (*Juncus effuses*, OBL), roundhead rush (*Juncus validus*, FACW), roundpod St. Johnswort, St. Andrew's cross (*Hypericum hypericoides*, FAC), candyweed (*Polygala lutea*, FACW), Frank's sedge (*Carex frankii*, OBL), false hopsedge (*Carex lupuliformis*, OBL), whitehead bugbutton (*Lachnocaulon anceps*, OBL), foxtail clubmoss (*Lycopodiella alopecuroides*, OBL), broadleaved cattail (*Typha latifolia*, OBL), bushy broom grass (*Andropogon glomeratus*, FACW), *cogon grass, Carolina spider lily (*Hymenocallis caroliniana*, FACW), creeping primrose willow (*Ludwigia repens*, OBL), floating primrose willow (*Ludwigia peploides*, OBL), velvet panicum (*Dicanthelium scoparium*, FACW), disk waterhyssop (*Bacopa rotundifolia*, OBL), and anglestem beaksedge (*Rhynchospora caduca*, FACW). In occasional instances, trees such as slash pine, saplings such as red maple, and sweetbay, shrubs such as wax myrtle and swamp titi, or woody vines such as sawtooth blackberry (*Rubus argutus*, FAC) and coral greenbriar (*Smilax walteri*, OBL) were identified as minor components within PEM wetlands.

3.2.5 Palustrine Scrub-shrub Wetland

PSS wetlands occur within the project area and are found within existing ROW and along the edges of existing maintained ROWs. The dominant shrub and sapling species within the PSS wetland communities include, swamp titi, buckwheat titi (*Cliftonia monophylla*, OBL), gall berry, large gallberry (*Ilex coriacea*, FACW), fetterbush, swamp bay, eastern baccharis (*Baccharis halimifolia*,

FACW), wax myrtle, sweetleaf (*Symplocos tinctoria*, FAC), highbush blueberry, pawpaw (*Asimina triloba*, FAC), and yaupon. In occasional instances, trees such as red maple, sweetgum (*Liquidambar styraciflua*, FAC), sweetbay, slash pine, *Chinese tallow, laurel oak, and overcup oak (*Quercus lyrata*, OBL), herbaceous species, or woody vines were identified as minor components within PSS wetlands. Common dominant herbaceous species which occur in these instances include bushy bluestem, netted chainfern, Virginia chainfern, royal fern, bog button, foxtail clubmoss, roundpod St. Johnswort, common rush, and Franks sedge. Common dominant vine species observed were coral greenbriar, southern dewberry (*Rubus trivialis*, FAC), and Florida grape (*Vitis cinerea*, FACW).

3.2.6 Palustrine Forested Wetland

PFO wetlands occur within the project and are found within the existing ROW and along the edges of existing maintained ROWs. The dominant shrub and sapling species within the PSS wetland community include swamp tupelo (*Nyssa biflora*, OBL), tulip poplar, sweetbay, slash pine, bald cypress (*Taxodium distichum*, OBL), water oak, cherrybark oak (*Quercus pagoda*, FACW), overcup oak, laurel oak, swamp chestnut oak (*Quercus michauxii*, FACW), and boxelder (*Acer negundo*, FACW). On occasion shrubs such as wax myrtle, swamp titi, sweetleaf, gall berry, and fetterbush dominated the understory. Woody vines such as sawtooth blackberry, coral greenbriar, and saw greenbriar (*Smilax bona-nox*, FAC) were identified as minor components within PFO wetlands.

3.2.7 Estuarine Emergent Wetland

EEM wetlands occur within the project area around the southern Escatawpa River crossing. The dominant vegetation within these communities include giant cut grass (*Zizaniopsis miliacea*, OBL), broadleaved cattail, California bulrush (*Schoenoplectus californicus*, OBL), and on occasion trees such as bald cypress and swamp tupelo.

3.3 ALABAMA AND MISSISSIPPI NATURAL DIVERSITY DATABASE RECORDS

According to the USFWS and the Alabama and Mississippi NDD records (**Appendix A**), there are occurrence records for two federally protected species within 5 miles of the project area. The gopher tortoise (*Gopherus polyphemus*) occurs in both Jackson County, Mississippi and Mobile County, Alabama. The bald eagle (*Haliaeetus leucocephalus*), which has been delisted from the federal list of threatened and endangered species, is also documented in the project vicinity. A summary of these species as they relate to the proposed project is discussed in detail in Section 3.4.

Absence of mapped occurrences in the NDD database does not constitute an absence of protected species within the project area.

3.4 SPECIES EVALUATION

The Alabama and Mississippi USFWS NDD data (2011) lists a total of 16 federally threatened or endangered species that have the potential to occur in Jackson County, Mississippi and Mobile County, Alabama. The Alabama and Mississippi USFWS NDD (2011) lists one candidate species as well as one delisted species that has the potential to occur in both counties. Additionally the Alabama and Mississippi NDD (2011) list two important state listed species. Table 1 summarizes the habitat requirements, the potential for occurrence, and possible effects on these species. All

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currently listed candidates, threatened, or endangered species that are assigned the occurrence categories “known to occur” or “may occur” and which may be affected, are discussed in detail in Sections 3.4.1 through 3.4.13.

Table 1: Federally Listed Species Potentially Occurring in Jackson County Mississippi and Mobile County Alabama.

Common Name (Scientific Name)	Status*	Range or Habitat Requirements	Potential for Occurrence in Project Area	Determination of Effect
BIRDS				
Bald eagle (<i>Haliaeetus leucocephalus</i>)	USFWS (DL) all counties	Found primarily near large bodies of water. Nests in tall trees or cliffs near water.	May occur. Mississippi and Alabama NDD occurrence records indicate the presence of bald eagles within and around the project area.	May affect, is not likely to adversely affect. See Section 3.4.1 below.
Piping plover (<i>Charadrius melodus</i>)	USFWS (T) all counties	Wintering migrant along the Mississippi and Alabama coast; beaches and bayside mud or salt flats.	Unlikely to occur. The project area does not occur near coastal beaches.	No effect.
Mississippi Sandhill Crane (<i>Grus canadensis pulla</i>)	USFWS (E) all counties	Open pine savannah. Today found only in the Mississippi Sandhill Crane National Wildlife Refuge.	Unlikely to occur. The project does not cross near the national wildlife refuge in which the current and only population lives.	No effect.
Red-Cockaded Woodpecker (<i>Picoides borealis</i>)	USFWS (E) Mobile county	Suitable nesting habitat for the RCW consists of pine stands that contain mature (60+ year old) trees with DBH of 16 inches or greater and is devoid of a midstory. Suitable foraging habitat consists of pine stands in which 50% of pines are mature.	Unlikely to occur. The project area lacks adequate nesting habitat.	May affect, is not likely to adversely affect. See Section 3.4.2 below.
Wood Stork (<i>Mycteria americana</i>)	USFWS (E) all counties	Freshwater wetlands dominated by large cypress trees in which they use to nest in colonies. Regular visitors to the state of Alabama but have not been observed nesting since the 1960's.	Unlikely to occur. The project area is historic habitat.	May affect, is not likely to adversely affect. See Section 3.4.3 below
*Bewick's Wren (<i>Thryomanes bewickii</i>)	Alabama (E) Jackson county	Brush habitat in open country or open woodlands.	Unlikely to occur. The project area is historic habitat.	No effect.
REPTILES and AMPHIBIANS				
Atlantic hawksbill sea turtle (<i>Eretmochelys imbricata</i>)	USFWS (E) all counties	Found in clear waters off of mainland and island shelves. Commonly found near coral reef formations. The turtles nest on sandy beaches with a close proximity to coral reefs.	Unlikely to occur. The project area does not occur near coastal waters.	No effect.
Green sea turtle (<i>Chelonia mydas</i>)	USFWS (T) all counties	Found in gulf and bay systems with shallow water seagrass beds, open water between feeding and nesting areas, and barrier island beaches.	Unlikely to occur. The project area does not occur near coastal waters.	No effect.
Kemp's Ridley sea turtle (<i>Lepidochelys kempii</i>)	USFWS (E) all counties	Found in gulf and bay systems with shallow water; feeds primarily on crabs, snails, clams, and other crustaceans and plants; nests April through August.	Unlikely to occur. The project area does not occur near coastal waters.	No effect.
Leatherback sea turtle (<i>Dermochelys coriacea</i>)	USFWS (E) all counties	Found in pelagic (open ocean) habitats. Has been found in coastal areas. Lays nests in large expanses of beach.	Unlikely to occur. The project area does not occur near coastal waters.	No effect.
Flatwoods Salamander (<i>Ambystoma cingulatum</i>)	USFWS (T) Mobile County	Found in pine flatwood communities dominated by longleaf or slash pine with wiregrass cover. Isolated pocket wetlands dominated by cypress and black gum trees.	Unlikely to occur. Habitat is available, however, the project area is historic habitat.	May affect, is not likely to adversely affect. See Section 3.4.4 below.

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Gopher Frog (<i>Rana sevosia</i>)	USFWS (E) Jackson County	Found in upland, sandy areas dominated by longleaf pine forests, with isolated, temporary, wetland breeding sites within.	Unlikely to occur. Abundant habitat is available however; this species has not been observed in the project vicinity in over 50 years.	May affect, is not likely to adversely affect. See Section 3.4.5 below.
Gopher tortoise (<i>Gopherus polyphemus</i>)	USFWS (T) In parts of its range	The gopher tortoise digs and lives in burrows throughout its range from South Carolina, into Florida, west into Alabama and far east Louisiana. They can use a variety of upland habitats including scrub, pine Flatwoods, and dunes along the beach. Tortoises have also been observed using newly created edge habitat due to the construction of pipeline and power line easements.	Likely to occur. The project area has an abundance of suitable habitat.	May affect, is likely to adversely affect unless tortoises are found and relocated. See Section 3.4.6 below.
Alabama Red-bellied turtle (<i>Pseudemys alabamensis</i>)	USFWS (E) all counties	Found in shallow water ranging from 3 to 6 feet in backwater bays, lakes, and river channels. This turtle prefers broad vegetated expanses in these shallow water habitats. Current distribution is thought to occur in the Mobile Bay and its tributary system.	Unlikely to occur. The project area does not occur near broad expanses of shallow water such as bays.	No effect. Section 3.4.7 below.
Yellow blotched map turtle (<i>Graptemys flavimaculata</i>)	USFWS (T) all counties	Found in the Pascagoula River drainage system. Inhabits sandy/mud bottomed rivers and tributaries. It is associated with vegetated debris such as snags and fallen down trees.	May occur. The project does not cross the Pascagoula River but does cross the Escatawpa River and tributaries.	May affect, is not likely to adversely affect. See Section 3.4.8 below
Eastern Indigo Snake (<i>Drymarchon corais couperi</i>)	USFWS (T) all counties	Almost always associated with gopher tortoises and gopher tortoise habitats.	May occur. Project area does support abundant gopher tortoise habitat and burrows.	May affect, is not likely to adversely affect. See Section 3.4.9 below
Black Pine Snake (<i>Pituophis melanoleucus lodingi</i>)	USFWS (C)	Xeric, fire maintained longleaf pine forest with well drained sandy soils. Usually found along hill tops, in open canopied and dense herbaceous areas.	May occur. Project area does support abundant gopher tortoise habitat and burrows	May affect, is not likely to adversely affect. See Section 3.4.10 below
Fish				
Gulf Sturgeon (<i>Acipenser oxyrinchus desotoi</i>)	USFWS (T) all counties	Found in coastal rivers along the Gulf of Mexico. These rivers contain high levels of tanic acid that make the water appear dark in color.	May occur. Project area does cross the Escatawpa River twice. This river is a large tanic coastal river.	May affect, is not likely to adversely affect. See Section 3.4.11 below.
*Iron Color Shiner (<i>Notropis chaybacus</i>)	Mississippi (T)	Inhabits slow acidic blackwater streams and drainages and other types of vegetated wetlands from Chipola River to Big Creek.	May occur. Project area does cross Big Creek and tributaries.	May affect, is not likely to adversely affect. See Section 3.4.12 below.
Plants				
Louisiana quillwort (<i>Isoetes louisianensis</i>)	USFWS (E) all counties	Occurs in small blackwater streams as well as sand and gravel mud bars and steam banks. Associated with Laurel and water oaks as well as sweet bay magnolia trees.	Unlikely to occur. Historic populations. Species has not been identified in the part of Jackson county the project occurs in.	May affect, is not likely to adversely affect. See Section 3.4.13 below.
<p>USFWS Status Definitions E = Endangered. The ESA specifically prohibits the take of a species listed as endangered. Take is defined by the ESA as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to engage in any such conduct. T = Threatened. The ESA specifically prohibits the take of a species listed as threatened. Take is defined by the ESA as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to engage in any such conduct. C=Candidate species. A species that has warranted further attention to gain federally threatened or endangered status. DL = Delisted. Delisted species are those which USFWS had previously listed as threatened or endangered. These species are considered rare and vulnerable to population decrease. This listing has no legal protection. Range or habitat information is from USFWS 2011, and Campbell 2003 *Indicates a state listed species. These two species are not federally listed and have no federal protection.</p>				

3.4.1 Bald Eagle

Current Federal Status: The bald eagle has been delisted by the USFWS. However it still holds protection under the Bald and Golden Eagle Protection Act (BGEPA).

Habitat and Range Requirements: Bald eagles build large stick nests lined with soft materials such as grass, leaves, and Spanish moss. Nests are used for several years by the same pair of eagles, with the birds adding materials each year. Nests are often very large, measuring 6 feet across and weighing hundreds of pounds. In south Alabama and Mississippi, eagle nest-building activities generally begin in October of each year. Peak egg-laying occurs in December and hatching occurs in January. The young eagles generally fledge in April after 10-12 weeks of growth but parental care continues in the nesting territory for another 4-6 weeks. Adults and juveniles begin to migrate north in May (Campbell, 1995).

Eagles are vulnerable to disturbance throughout the nesting period but are particularly vulnerable during the first 12 weeks, during courtship, nest-building, egg-laying, incubation and brooding. Disturbance at this time may cause nest abandonment and chilled or overheated eggs or young. Human activity, even late in the nesting cycle, may cause premature fledging and reduce the young eagles' chance of survival (Campbell, 1995).

Once a suitable breeding territory is found, breeding pairs will return to the same area year after year, often using alternate nests within the territory during different breeding years. Although a given nest may be lost due to weather or age of the tree, a pair often returns to the same territory to begin building another nest. In cases where one member of a pair dies, the nest may be colonized by the surviving member returning with a new mate. Nesting territories can also be inherited by subsequent generations (Campbell, 1995).

Bald eagles generally inhabit areas near large bodies of open water such as lakes, marshes, rivers, and sea coasts where there are plenty of fish to eat and tall trees for nesting and roosting (Campbell, 1995). Although the bald eagle was removed from the federal endangered species list on June 28, 2007, this species remains protected by the BGEPA of 1940 and the Migratory Bird Treaty Act of 1918.

SWCA discovered in our file search through the Mississippi and Alabama wildlife departments that there are records for bald eagles nesting near the Lower Escatawpa River in Mississippi. Based on these results, SWCA conducted an extensive aerial survey to identify bald eagle nests. The methods and results of this survey are discussed below.

Potential for Occurrence: This species likely occurs within the project area. Large expanses of open water with large associated forested wetlands occur throughout the southern portion of this project.

Determination of Impact: SWCA biologists Mr. Tom Sankey and Ms. Colette Craft were flown by Mr. Doug Dickey of Apex Helicopters out of Trent Lott Airport (TLA) to the project area on the morning of February 23, 2012. The investigators utilized a Robinson R-44 helicopter to complete a

bald eagle survey. The investigators took off from TLA at approximately 0930. The weather was cloudy and overcast. Visibility was estimated at 2 miles and the winds were out of the southwest at 5-10 knots. The investigators arrived at the northern end of the pipeline ROW in Mobile County by approximately 0950 to initiate the aerial survey.

The entire proposed ROW was searched methodically for the presence of bald eagles and/or eagle nests. The majority of the survey effort was spent searching a swath of land centered on the northern and the southern Escatawpa River crossings. These areas were searched for a distance of approximately one mile upstream of the proposed ROW and for a distance of approximately one mile downstream of the proposed ROW. The purpose of the survey was to ensure that eagle nests were not within the vicinity of the proposed pipeline construction area. The investigators left the project area at approximately 1330, after spending approximately 3 hours and 40 minutes in the search area.

Results of the Bald Eagle Survey

A total of five large nests were identified within the Lower Escatawpa River wetland complex during the helicopter survey (**Appendix C**). Nests 1 and 2 were identified as either inactive or abandoned bald eagle nests or possible osprey nests (*Pandion haliaetus*). Nest 4 was identified as either an inactive or abandoned eagle nest. Another nest was later identified as an osprey nest and is not shown in **Appendix C**. Nest 3 was determined to be a probable active bald eagle nest during the 2011-2012 breeding season.

Nest 1 is located over 2,700 feet away from the proposed project ROW. Nest 2 is located immediately adjacent to the proposed project area. Nest 3 is located approximately 5,000 feet west of the project area. Nest 4 is located immediately adjacent to the Escatawpa River, approximately 500 feet northeast of the proposed project area. SWCA biologists located one adult and two recently fledged juvenile bald eagles in the immediate vicinity of Nest 3.

Based on the results of the aerial survey, SWCA was able to verify that bald eagles are actively nesting in the Lower Escatawpa River marshes and tributaries in the vicinity of the proposed project area. With respect to the remainder of the project pipeline ROW (i.e., those areas located outside of the Lower Escatawpa River marshes and tributaries), due to the project's distance from large waterbodies, the lack of available foraging, roosting and nesting habitat for this species in the project area, as well as the mobility of this species, it is our professional opinion that the proposed project is not likely to adversely affect this species within the remainder of the project area (i.e., outside the Lower Escatawpa River marshes and tributaries).

Based on the location of the confirmed probable active nest within 5,000 feet of the proposed ROW, as well as the location of additional possible inactive nests in the project area, it is possible that bald eagles may nest within the immediate project vicinity during the upcoming 2012-2013 breeding season. SWCA recommends performing a boat or an additional helicopter survey during the beginning of the 2012-2013 bald eagle breeding season (i.e., December 2012 or January 2013) to determine if eagles are in the area and are nesting within the project area. If Nests 2 and 4 are active, then it will be necessary for the project to either be constructed via HDD across this portion of the

Escatawpa River, or construction will need to be delayed until after the end of the eagle breeding season (i.e., after March 2013).

3.4.2 Red-Cockaded Woodpecker

Current Federal Status: Federally endangered throughout its range.

Habitat and Range Requirements: Suitable nesting habitat for red-cockaded woodpecker (RCW) consists of pine stands that contain pine trees greater than 60 years of age, approximately 16-inch diameter at breast height (dbh), and that are located within 0.5 mile of suitable foraging habitat. Suitable foraging habitat for the RCW consists of pine stands in which 50 percent or more of the dominant trees are mature pines (greater than 30 years old, 10 inch dbh). Preferred nesting habitat is typically devoid of moderate to heavy mid-story layers (20 to 50 feet above the ground) (USFWS, 1985).

The RCW recovery plan survey protocol states that if the project area contains any suitable foraging habitat that will be impacted by the project, that habitat, if it contains any 60 year old pine trees or older, and all other suitable nesting habitat within 0.8 km (0.5 mi) of the project site, regardless of ownership, must be surveyed for the presence of red-cockaded woodpeckers (USFWS, 1985).

The project area's upland habitat consists mainly of mixed young pine and hardwoods or young silvicultural stands. Approximately 40-60 percent of the canopy is comprised of slash pine and long leaf pine approximately 10-20 years old with a dbh average of 12-16 inches. The pines are closely spaced along the ROW, with a tall midstory (40-50 feet) and at times a very thick understory (15-30 feet) existing within the project corridor. No 60 year old or older trees were identified within the project area and surrounding vicinity. The age and size of the pines are not suitable for RCW nesting habitat. Furthermore, most of these areas were determined not to be potential RCW foraging or nesting habitat due to the overall height and density of the midstory and understory. However, several areas along the project corridor did match up with potential foraging habitat requirements. In these areas the pine to hardwood ratio was adequate. The trees were spread farther apart and greater than 50% of the canopy was occupied by either maturing slash or long leaf pine. The midstory was thin and adequate to allow for flight paths.

Potential for Occurrence: RCWs have not been observed recently in either county the project occurs in. Habitat assessment was conducted during the gopher tortoise and wetland surveys. No suitable nesting habitat was documented.

Determination of Impact: The red cockaded woodpecker has not been observed in Mobile County, Alabama and Jackson County, Mississippi for a long time. SWCA conducted habitat surveys along the entire length of the proposed project and did not observe any habitat that would be considered RCW nesting habitat. Due to the lack of recent observations and habitat to support the species in the project vicinity it is our opinion that this project will not have any adverse affects to the red cockaded woodpecker.

3.4.3 Wood Stork

Current Federal Status: Federally endangered throughout its range.

Habitat and Range Requirements: Wood storks are large wading birds that inhabit freshwater wetlands. They use tall cypress trees near wetlands and waterbodies as colonial nesters. Nesting sites historically reached upwards of 10,000 pairs. Today the colonies are much smaller. They are regular visitors to Alabama's swamps and wetlands to forage, but are not known to nest in the state since the 1960's. Nesting has also not been confirmed in Mississippi (MDWFP, 2001).

Potential for Occurrence: This species is highly mobile, and has not been observed actually nesting or breeding in Alabama since the 1960s, and it has been an unconfirmed breeder in Mississippi.

Determination of Impact: Due to the absence of breeding individuals and known breeding colonies it is unlikely that this project will adversely affect this species.

3.4.4 Flatwoods Salamander

Current Federal Status: Threatened

Habitat and Range Requirements: Adults live underground in pine flatwood communities dominated by longleaf or slash pine with wiregrass ground cover in isolated pocket wetlands dominated by cypress and gum trees (Palis, 1996; Palis and Means, 2005). Ponds that are free of predatory fish are preferred breeding habitat. In Alabama, range is restricted to the lower coastal plain in Mobile, Baldwin, Escambia, Covington, Geneva, and Houston counties. No individuals have been found in Alabama since 1981 despite intensive survey of 143 ponds in winter (1992-1993 and 1993-1994) (Goodwin, 2002).

Potential for Occurrence: Abundant habitat is available throughout the proposed project route; however, Due to the lack of recent populations and individuals being found within Alabama, it is SWCA's opinion that this project will not likely adversely affect this species.

Determination of Impact: SWCA believes that this species had historic populations in this area. However, due to the extreme time frame in which it has not been documented in either state it is SWCA's opinion that the proposed project may affect, but is not likely to adversely affect this species.

3.4.5 Gopher Frog

Current Federal Status: Endangered

Habitat and Range Requirements: This species was once found in nine counties from Louisiana, Mississippi, and Alabama. It has not been observed in Louisiana since 1967 or in Alabama since 1922. The gopher frog is presently known to inhabit only one site in Harrison County, Mississippi (MDWFP, 2001).

Typical habitat for this species includes both upland, sandy areas dominated by longleaf pine forests, with isolated, temporary, wetland breeding sites within. The frogs spend most of their lives underground. They use active and abandoned gopher tortoise and armadillo burrows (Ashton and Ashton, 2008). This species requires sufficient winter precipitation to fill up breeding habitat to allow for reproduction.

Potential for Occurrence: Abundant habitat is available throughout the proposed project route; however, due to the amount of time which has passed since this species was last documented in the project area; it is SWCA's opinion that this project will not likely adversely affect this species.

Determination of Impact: SWCA believes that this species had historic populations in this area. However, due to the extreme time frame in which it has not been documented in the project area, it is SWCA's opinion that the proposed project is not likely to adversely affect this species. Also due to Plains ability to narrow the ROW foot print, the majority of gopher tortoise burrows have been avoided. Only six active burrows occur within the construction ROW, limiting the available habitat for this species.

3.4.6 Gopher Tortoise

Current Federal Status: Federally threatened in both counties the project occurs in. The species is protected through much of its range from South Carolina, throughout Florida, and into the four eastern parishes of Louisiana.

Habitat and Range Requirements: The gopher tortoise (*Gopherus polyphemus*) ranges from South Carolina all through Florida and west into the four most eastern parishes of Louisiana. Gopher tortoises favor dry, sandy ridges with broad open stands of turkey oak and long leaf pine along with other scrub species. They have also been documented in frequently edge habitats around roads, fence lines, and pipeline ROWs. Habitats much have well drained sandy soils with a relatively shallow water table. Burrows will be dug up to 30' long and 9 feet deep. Burrows are typically dug to the water table so that the end chamber can maintain a constant level of humidity.

Potential gopher tortoise habitat was first located by examining aerial imagery. Large areas that were indicative of classic gopher tortoise habitat such as sand hills, open pine and turkey oak savannahs, and existing linear line ROW were selected for ground-truthing. It is important to note that due to constant habitat alterations, identifying natural gopher tortoise habitat has become problematic (Ashton and Ashton, 2008). These animals are rather adaptive and will flourish in edge habitat (Ashton and Ashton, 2008).

The on-ground gopher tortoise survey protocol was adapted from the Florida Fish and Wildlife Conservation Commission Gopher Tortoise Management Plan (2007) and from Ashton and Ashton (2008). No actual linear line survey protocol currently exists. SWCA adapted the standard survey protocol used for large tracts of land to fit to a 200-foot-wide linear corridor. In the 200-foot-wide corridor, SWCA established three equally-spaced transects that traversed the entire length of the area to be surveyed. A team of three biologists (one biologist per transect) walked the 200-foot-wide corridor looking for burrows or other signs of gopher tortoises. To increase survey success and total area surveyed within the 200-foot corridor, perpendicular transects were added every 100 feet. SWCA adapted the survey to fit a 100% survey model.

Once gopher tortoise burrows were found, the state of the burrow was determined. Burrows were identified as active, inactive, abandoned or impacted, depending on the state of the burrow entrance (Ashton and Ashton, 2008), and as defined below:

- An **active** burrow has a defined shape and a clear mouth and apron; recent tracks and feces may be present in or around the burrow; and active feeding “lanes” may be visible in thicker vegetation.
- An **inactive** burrow has a defined shape but may have leaves and other debris blocking the mouth and apron; no fresh tracks or feces are found in the immediate area; could be a secondary burrow for a tortoise or one that is used intermittently by many tortoises in the pod.
- An **abandoned** burrow has lost its defined shape, and the entrance may be collapsed or clogged with debris or plant roots.
- An **impacted** burrow may be active, inactive, or abandoned. The entrance to the burrow has been damaged, possibly by a potential predator (such as dog or coyote) or by human activity. Impacted burrows are not identified on any of the attached maps, as they transcend active, inactive and abandoned categories.

GPS locations were taken for all burrows regardless of their state. The burrows’ distance and bearing to the nearest transect was also taken (Florida Fish and Wildlife Conservation Commission Gopher Tortoise Management Plan 2007; Ashton and Ashton, 2008). Each burrow was photographed; between two to four photos of the apron and the entrance were taken to document the state of the burrow and to document possible tortoise activity.

Using this methodology resulted in the vast majority of the 200-foot-wide corridor being surveyed. It is highly unlikely that gopher tortoise burrows or activity within the survey corridor went undetected during the field survey.

Results of Gopher Tortoise Survey

Mr. Eric Munscher (Florida-certified Gopher Tortoise Agent-permit # GTA-09-00286A), Mr. Matt Gagnon, Mrs. Lynne Ray, Mrs. Michelle Wood-Ramirez, and Mrs. Kristal Schneider surveyed over 18 miles of potential habitat along the proposed pipeline corridor in February 14th-21th, April 18th-26th, and May 20th-June 2nd, 2012. The remaining 23 miles of line was also surveyed for the presence of absence of gopher tortoises during the wetland delineation. A total of 19 pods (tortoise concentrations, possibly family units) were found along the route on various properties (**Appendix B**). Of the 19 pods a total of 254 burrows were identified and mapped. Of the 254 burrows identified, 185 were considered to be active and showed signs of tortoise movement (tracks, trails in vegetation, or fresh scat) or displayed defined burrow shape and clean entrance, 27 were considered inactive, largely due to no evidence of recent tortoise movement and the degree of debris in the entrance to the burrow, and 42 were considered abandoned (**Appendix B**). The abandoned burrows all suffered from partially or fully collapsed burrow entrances, vegetation growing within burrow or apron, and other obstructions. Of the 254 burrows located, 10 were impacted in some manner. The most common form of impact observed was the result of an animal (i.e., a dog or coyote) digging at the entrance of the burrow (see photos in **Appendix D**). SWCA observed numerous dogs in the vicinity of some of the active tortoise pods.

SWCA identified 6 active burrows within the proposed 50-foot-wide construction corridor. An additional 103 active burrows are located within the 200-foot-wide survey corridor (see **Appendix B**).

Bucket pit fall traps will be set at the entrance to all active burrows within the construction ROW, and tortoises found will have to be relocated to adequate acceptable habitat. Relocation habitat will be decided by the USFWS and Alabama / Mississippi state agencies. If adequate habitat remains on site tortoises should be able to remain within their breeding pod to keep adequate genetic flow available within the pod.

Tortoise removal will be conducted by certified gopher tortoise agents to assure proper compliance with federal and state regulations concerning the animals' welfare.

Certified gopher tortoise agents as well as environmental inspectors will be present during the construction aspect of this project and will be able monitor the presence of tortoises within the area. Heavy reinforced silt fencing will be placed at the edge of the construction ROW to deter gopher tortoises from entering the construction area.

3.4.7 Alabama Red-Bellied Turtle

Current Federal Status: Endangered throughout its range.

This highly endangered turtle prefers broad, vegetated expanses of shallow water (3 to 6 feet in depth) in backwater bays, lakes, and along river channels (USFWS, 1990). It has been suggested by Dobie (1985a) that snags and dense beds of submersed and emergent aquatic vegetation provide food and cover for this species. Current distribution is thought to be contained to Mobile Bay and its tributary streams. One of the only known major nesting sites is located on a dredged material disposal area known as Gravine Island (Dobie, 1985a).

The only area along the proposed route that offers potential habitat for this species is the Escatawpa River marshes. However, populations of this species are not known to occur within this area (USFWS, 1990).

Determination of Impact: Due to the extremely low population numbers and limited known nesting areas, SWCA believes that the proposed project would likely not adversely affect this species.

3.4.8 Yellow-Blotched Map Turtle

Current Federal Status: Threatened

Habitat and Range Requirements: This species is endemic to Mississippi and the Pascagoula River drainage system including the Escatawpa River (MDWFP, 2001). The largest viable current population is located in the lower Pascagoula River. This species requires waterbodies with strong, consistent current and large sandbars. As with most of this genus this species spends a great amount of time basking on vegetated debris (fallen down trees) (MDWFP, 2001).

Potential for Occurrence: This species may occur in the project area. The project crosses the Escatawpa River twice and numerous smaller tributaries of the river system. This turtle could find suitable habitat within these waterways.

Determination of Impact: It is highly unlikely that this project would have any adverse effects to this species. Several major waterbodies, including the two crossings of the Escatawpa River will be horizontally directional drilled (HDD) and as such will not have any direct impact to associated wildlife.

3.4.9 Eastern Indigo Snake

Current Federal Status: Threatened

Habitat and Range Requirements: This very large diurnal snake's habitat preference appears to vary with season and perhaps with latitude; it favors dry xeric habitats in winter and more mesic habitats in summer. Seasonal movements between these habitat types occur during fall and spring. In areas where the eastern indigo snakes occur sympatrically with gopher tortoises, they rely heavily on tortoise burrows (both active and abandoned) for denning and nesting sites (USFWS, 1982; Stevenson et al., 2003; Ashton and Ashton, 2008). Eastern indigo snakes have very large home ranges (>100 hectares or 250 acres). Although eastern indigo snakes remain active throughout much of the winter, their home ranges in winter are smaller. Breeding occurs November-April. Females lay clutches of 5 to 12 eggs between March and July. Eggs hatch 90 - 120 days later. Males are territorial and male-male combat is known to occur (USFWS, 1982; Stevenson et al., 2003; Ashton and Ashton, 2008).

Potential for Occurrence: This species may occur in the project area. The majority of habitat which was surveyed for the presence of gopher tortoise would be adequate habitat for this species. Since this species has such a large home range and spends much time within animal burrows, we cannot confirm its presence or absence within the proposed project area. It is assumed that this species may likely be found within the project area.

Determination of Impact: Due to the amount of suitable habitat due to the presence of gopher tortoises throughout the proposed project route it is likely that this species would occur within the project area. Gopher tortoises found within the proposed project construction ROW will be trapped using bucket traps beginning April 1, 2013. All tortoises trapped will be relocated to suitable habitat out of the construction corridor. The potential for an eastern indigo snake to be living in one of these burrows is likely. Certified gopher tortoise agents and environmental inspectors will be on hand during the tortoise extractions and construction phase of this project to ensure threatened and endangered species safety. If an indigo snake is observed it will be taken out of the construction zone and moved to suitable habitat. Based on these precautions, it is SWCA's opinion that the proposed project may affect, but is likely to not adversely affect this species. Also due to Plains ability to narrow the ROW foot print, the majority of gopher tortoise burrows within the survey area have been avoided. Only six active burrows occur within the construction ROW, limiting the available habitat for this species.

3.4.10 *Black Pine Snake*

Current Federal Status: Candidate species.

Habitat and Range Requirements: This large snake species inhabits similar habitat to the eastern indigo snake and the gopher tortoise. They require long leaf pine forest with well drained sandy soils, open canopy, thin midstory with a thick herbaceous layer. The habitat should be maintained by frequent burning. They are believed to spend a great deal of time inside abandoned gopher tortoise burrows (MDWFP, 2001).

Potential for Occurrence: Habitat that meets this species needs is abundant throughout the project vicinity. The gopher tortoise is found throughout the region and numerous abandoned burrows were located. It is possible that black pine snakes occur within this area but no recent evidence has shown this to be true. All known occurrences of this snake in Mississippi are from the northwest of Jackson County, Mississippi.

Determination of Impact: Due to the amount of suitable habitat due to the presence of gopher tortoises throughout the proposed project route it is likely that this species would occur within the project area. Gopher tortoise burrows that are within the proposed projects construction ROW will be dug up with the tortoises being relocated to suitable habitat out of the project corridor. The potential for an black pine snake to be living in one of these burrows is likely. Certified gopher tortoise agents and environmental inspectors will be on hand during the tortoise extractions and the construction phase of this project to ensure threatened and endangered species safety. If an indigo snake is observed it will be taken out of the construction zone and moved to suitable habitat. Based on these precautions, it is SWCA's opinion that the proposed project may affect, but is likely to not adversely affect this species. Also due to Plains ability to narrow the ROW foot print, the majority of gopher tortoise burrows within the project survey corridor have been avoided. Only six active burrows occur within the construction ROW, limiting the available habitat or this species.

3.4.11 *Gulf Sturgeon*

Current Federal Status: Endangered throughout its range.

Habitat and Range Requirements: Gulf sturgeon can be found in coastal rivers of the Gulf of Mexico from the Suwannee River in Florida, to the Pearl River in Louisiana. The rivers which support sturgeons contain high levels of tannic acid that make the water appear dark in color. Sturgeons spawn near the headwaters of rivers, and spend the summer in the middle to lower portions of rivers. The most viable population of Gulf sturgeon in Alabama is located in the Choctawhatchee River near Geneva where over two dozen individuals were observed from 1991-1994 (Fox et al. 2000).

Potential for Occurrence: The project does cross the Escatawpa River twice along with large tributaries such as Big Creek. It is unlikely but not impossible that this species could be found within the project vicinity.

Determination of Impact: The Escatawpa River, will be crossed via horizontal directional drill (HDD) in accordance with U.S. Army Corps. of Engineers (USACE) requirements. In our opinion, due to this species' discontinuous population, the overall lack of appropriate habitat along the project route and the Escatawpa River being crossed via HDD, this project will not likely adversely affect this species.

3.4.12 Iron Colored Shiner

Current Federal Status: This species has a very sporadic distribution. Due to this it is considered to be endangered throughout its range.

Habitat and Range Requirements: This fish can be found throughout the Atlantic and Gulf coast drainages from Maine to Texas. It has a very sporadic distribution in south Alabama from the Chipola River system west to Big Creek in Mobile County.

This shiner inhabits small, slow, acidic blackwater streams draining swamps and other types of vegetated wetlands. Spawning in Alabama likely occurs from April to August. During spawning, females use sand-bottomed pools to broadcast their eggs.

Potential for Occurrence: The project does cross the Escatawpa River twice along with large tributaries such as Big Creek. It is unlikely but not impossible that this species could be found within the project vicinity.

Determination of Impact: The proposed project crosses Big Creek; however, this creek will be crossed via HDD. It is our opinion that due to the sporadic and discontinuous distribution of this species and the fact that Big Creek will be drilled, this project will not likely adversely affect this species.

3.4.13 Louisiana quillwort

Current Federal Status: Endangered throughout its range.

Habitat and Range Requirements: This species is found associated with mineral soil in bottomland forested wetlands. These wetlands typically see seasonal flooding. Overstory trees are typically several species of oak including water oak and water oak, as well as red maple, tulip poplar, and black gum. The shrub layer is sparse with titi usually being the dominate plant. This species is also typically associated with perennial waterbodies (MDWFP, 2001).

Potential for Occurrence: Most of the documented occurrences of this species in Mississippi occur in colonies around the De Soto Ranger District of DNF (Forrest, Perry, Stone, Harrison, and extreme northwest Jackson counties) (MDWFP, 2001). The proposed project occurs in the far southeastern corner of Jackson County. It is unlikely that this species would be found in this area with no known occurrences.

Determination of Impact: No known occurrences have been documented in the vicinity of the proposed project. The known colonies of this species occur over 20 miles to the northwest of the proposed project. Experienced wetland delineators conducted an extensive wetland delineation throughout the project area taking over 500 data points documenting several hundred species. Not

one included an observation of this species. It is SWCA's professional opinion that this species will not be adversely affected by this project.

4.0 LIMITATIONS AND WARRANTY

Within the limitations of schedule, budget, and scope of work, SWCA warrants that this study was conducted in accordance with accepted environmental science practices, including the technical guidelines, evaluation criteria, and species' listing status in effect at the time this evaluation was performed.

The results and conclusions of this report represent the best professional judgment of SWCA scientists. No other warranty, expressed or implied, is made.

Please be aware that only the USFWS and/or lead federal agency can determine compliance with the Endangered Species Act.

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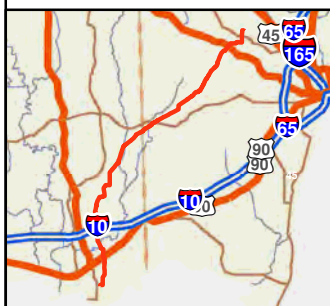
<http://www.fws.gov/pacific/eagle/NationalBaldEagleManagementGuidelines.pdf>. Accessed July 25,
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Appendix A

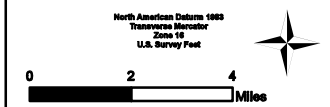
USFWS and Alabama and Mississippi Threatened and Endangered Species Lists and NDD occurrence map

**PLAINS
 SOUTHCAP L.L.C.**
**NDD MAP
 41-MILE-LONG TEN-MILE FACILITY TO PASCAGOULA
 PIPELINE PROJECT**
**JACKSON COUNTY, MS
 MOBILE COUNTY, AL**

- Legend**
-  Project Centerline
 -  All Other Species
 -  Gopher Tortoise
 -  Potential Habitat Black Bear
 -  Potential Habitat Gopher Tortoise / Red Cockaded Woodpecker



Background: USA Topo maps (ESRI Basemap)
 Topographic Quad Name:
 Mapper: JR
 Approved By: EM
 SWCA Project No: 22832
 Date Produced: 08/24/2012
 Revision Date:



SWCA, Environmental Consultants
 7255 Langley, Suite 100
 Houston, Texas 77040
 (713) 834-8900 phone
 (713) 834-8906 fax
 www.swca.com

