

Biological Assessment

U.S. Fish and Wildlife Species

Vogtle Electric Generating Plant

Early Site Permit Application

Burke County, Georgia

January 2008

Docket No. 52-011

U.S. Nuclear Regulatory Commission

Rockville, Maryland

Contents

Abbreviations/Acronyms	iii
1.0 Introduction	1
2.0 Proposed Action	5
3.0 VEGP Site Description	7
3.1 General Terrestrial Ecological Resources Description	7
4.0 Potential Environmental Impacts of Limited Site-Preparation Activities.....	12
5.0 Evaluation of Threatened or Endangered Terrestrial Species Potentially Occurring in the Vicinity of the VEGP Site	15
6.0 Conclusions.....	25
7.0 References.....	26

Figures

1-1 VEGP Site and the 80 km (50 mi) Vicinity	3
1-2 Proposed VEGP Site Footprint	4
5-1 2005 Threatened and Endangered Species Survey Locations at the VEGP Site	16
5-2 VEGP Site Soil Map.....	22

Tables

1-1 Federally Listed Terrestrial Species Occurring in the Vicinity of the VEGP Site	2
4-1 Habitat Types and Acreage Associated with Permanent and Temporary Construction Areas Associated with Construction of Units 3 and 4	13

Abbreviations/Acronyms

ac	acre(s)
BA	biological assessment
BMPs	best management practices
CFR	Code of Federal Regulations
cm	centimeter(s)
CWA	Clean Water Act
DOE	U.S. Department of Energy
EIS	environmental impact statement
ESP	early site permit
FR	Federal Register
ft	foot/feet
FWS	U.S. Fish and Wildlife Service
GDNR	Georgia Department of Natural Resources
ha	hectare(s)
in.	inch(es)
km	kilometer(s)
kV	kilovolt(s)
m	meter(s)
mi	mile(s)
MW(t)	megawatts thermal
NRC	U.S. Nuclear Regulatory Commission
SCDNR	South Carolina Department of Natural Resources
Southern	Southern Nuclear Operating Company, Inc.
TRC	Third Rock Consultants, LLC
USACE	U.S. Army Corps of Engineers
VEGP	Vogtle Electric Generating Plant

1.0 Introduction

The U.S. Nuclear Regulatory Commission (NRC) is reviewing an application from Southern Nuclear Operating Company, Inc. (Southern) for an early site permit (ESP) at a location identified as the Vogtle Electric Generating Plant (VEGP) ESP site. An ESP represents NRC approval of a site or sites for one or more nuclear power facilities, and is a separate action from the filing of an application for a construction permit or combined license for such a facility. Southern's ESP application addressed the impacts of constructing and operating two new nuclear units at the existing VEGP site in Burke County, Georgia. The VEGP site is approximately 42 km (26 mi) south of Augusta, Georgia (Figure 1-1). The proposed ESP site is completely within the confines of the existing VEGP site, with the new units to be constructed and operated adjacent to the existing Units 1 and 2 (Figure 1-2).

The NRC is required to prepare an environmental impact statement (EIS) as part of its review of an ESP application. As required by Title 10 of the Code of Federal Regulations (CFR) Part 51.26, the NRC has published in the *Federal Register* a Notice of Intent (71 FR 58882) to prepare an EIS, conduct scoping, and publish a draft EIS for public comment. The draft EIS was published in September 2007 (NRC 2007). The final EIS will be issued after considering public comments on the draft. The impact analysis in the EIS includes an assessment of the potential environmental impacts of the construction and operation of two new nuclear power units at the VEGP site, including potential impacts to threatened or endangered species. If approved, the ESP would not authorize Southern to begin construction of the new units; however, it would authorize limited site-preparation activities. Thus, only site-preparation activities are considered in this biological assessment (BA).

The purpose of this BA is to provide information to the U.S. Fish and Wildlife Service (FWS) concerning potential impacts of limited site-preparation activities at the VEGP site on threatened and endangered species and designated critical habitat pursuant to Section 7(a)(2) of the Endangered Species Act. The consultation is between the NRC and the FWS.

In a letter dated October 12, 2006, the NRC requested that the FWS Field Office in Brunswick, Georgia, provide information regarding Federally listed species at the proposed VEGP site. This BA examines the impacts of the proposed action on seven Federally listed species (Table 1-1) that could occur in the vicinity of the VEGP site.

The Federally listed species considered in this BA include:

- three plants: smooth coneflower (*Echinacea laevigata*), Canby's dropwort (*Oxypolis canbyi*), and relict trillium (*Trillium reliquum*).
- two birds: the wood stork (*Mycteria americana*) and red-cockaded woodpecker (*Picoides borealis*)
- one reptile: American alligator (*Alligator mississippiensis*)
- one amphibian: flatwoods salamander (*Ambystoma cingulatum*).

Table 1-1. Federally Listed Terrestrial Species Occurring in the Vicinity of the VEGP Site

Scientific Name	Common Name	Federal Status ^(a)	County of Occurrence	Distance from the VEGP Site ^(b)
Plants				
<i>Echinacea laevigata</i>	smooth coneflower	E	Aiken, Barnwell	< 16 km (10 mi)
<i>Oxypolis canbyi</i>	Canby's dropwort	E	Burke	>16 km (10 mi)
<i>Trillium reliquum</i>	relict trillium	E	Aiken	> 16 km (10 mi) ^(c)
Birds				
<i>Mycteria americana</i>	wood stork	E	Barnwell, Aiken, Burke	< 3.2 km (2 mi)
<i>Picoides borealis</i>	red-cockaded woodpecker	E	Barnwell, Aiken, Burke	16 km (10 mi)
Amphibians and Reptiles				
<i>Alligator mississippiensis</i>	American alligator	T(S/A)	Barnwell, Aiken, Burke	Occurs onsite ^(d)
<i>Ambystoma cingulatum</i>	flatwoods salamander	T	Burke	>16 km (10 mi)

(a) Federal status rankings determined by the FWS under the Endangered Species Act: E = Federally endangered, T = Federally threatened, T(S/A) = Threatened due to Similarity of Appearance (FWS 2004a).

(b) GDNR 2007a; SCDNR 2007; Wike et al. 2006

(c) Suitable habitat exists for the relict trillium onsite (PNNL 2006)

(d) TRC 2006

Species included in this table meet at least one of the following criteria:

- species have been recorded to occur on the VEGP site
- species have been recorded to occur within 16 km (10 mi) of the VEGP site in Aiken and Barnwell Counties, South Carolina
- species are listed by FWS (2004a) as occurring or having the potential to occur in Burke County, Georgia
- species are known to have suitable habitat on the VEGP site (PNNL 2006).



Figure 1-1. VEGP Site and the 80 km (50 mi) Vicinity (Southern 2007a)

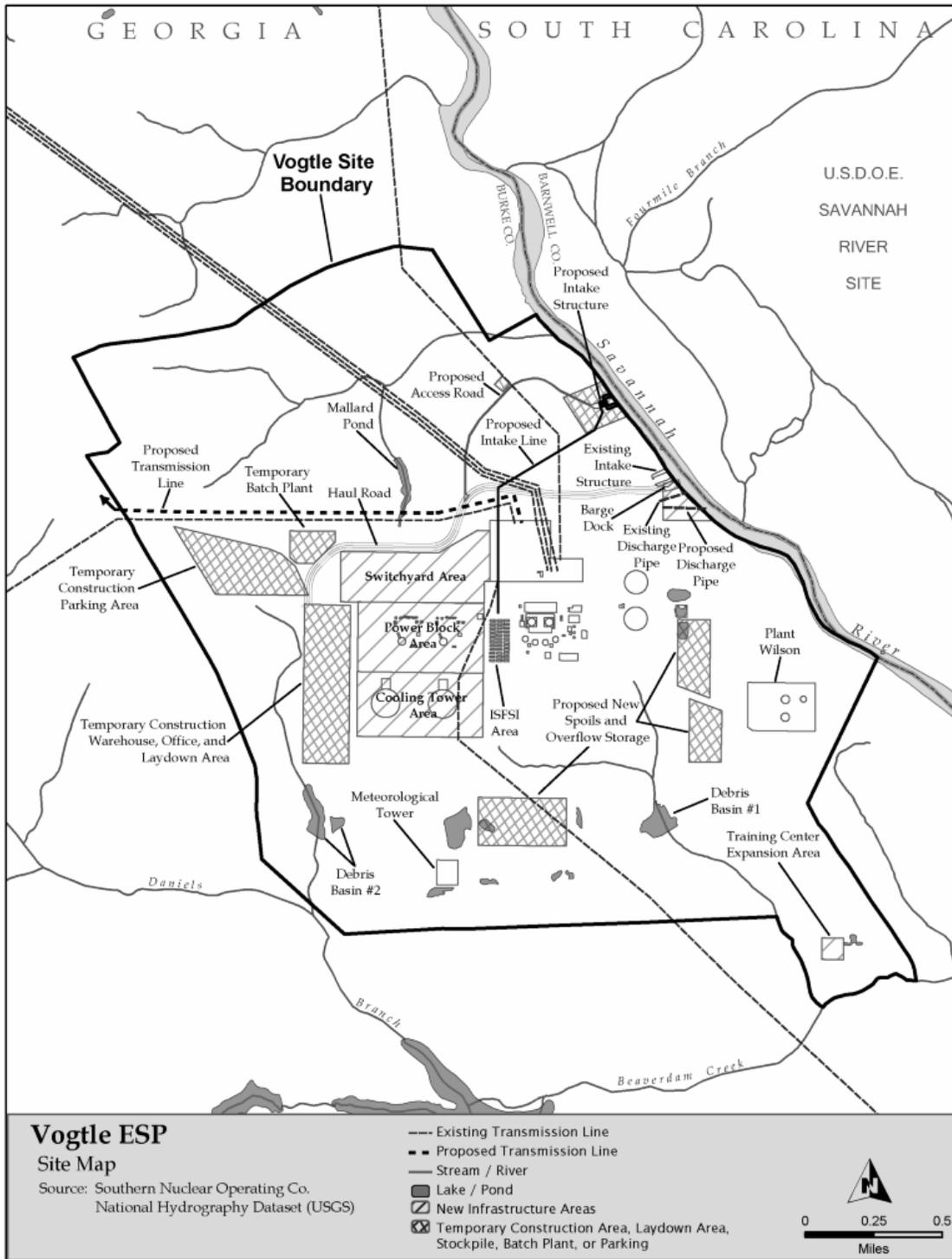


Figure 1-2. Proposed VEGP Site Footprint (Southern 2007c)

2.0 Proposed Action

The proposed Federal action is issuance of an ESP for a site at VEGP for two Westinghouse AP1000 nuclear reactors. If approved, an ESP would authorize Southern to perform, at its discretion, the limited site-preparation activities allowed by NRC regulations in 10 CFR 50.10(e)(1) and described in Section 3.9.2 of Southern's Environmental Report (ER) (Southern 2007a) and listed in the site redress plan (Southern 2007b). The site redress plan describes the measures that may be necessary to restore (i.e., redress) the site to a condition suitable for other appropriate use as required by NRC regulations in 10 CFR 52.17(c) in the event the project does not proceed to construction or the site is abandoned.

In accordance with the site redress plan, the site would be redressed in the event that the NRC issues the requested ESP, the ESP holder performs the limited site-preparation activities, the ESP is not referenced in an application for a construction permit or combined license, and no alternative use is found for the site. Any facilities or structures constructed as part of the site-preparation activities that could be used in the future may be left in place, provided they meet local zoning and pose no safety or environmental hazard.

Prerequisites to limited site-preparation activities include, but are not limited to, documentation of existing site conditions within the VEGP site and acquisition of the necessary permits (e.g., local building permits, a National Pollutant Discharge Elimination System permit [40 CFR Part 122], a Clean Water Act (CWA) Section 404 permit, and a General Stormwater Permit). After these prerequisites are completed, planned limited site-preparation activities could proceed and might include some or all the activities pursuant to 10 CFR 52.17(c) and 10 CFR 50.10(e)(1). In its ESP application, Southern requested approval to perform the following limited site-preparation activities for the two new nuclear units at the VEGP site (Southern 2007a):

- prepare the site for construction of the facilities (including such activities as clearing, grading, construction of temporary access roads, and preparation of borrow areas)
- install temporary construction support facilities (including items such as warehouses, shop facilities, utilities, concrete mixing plants, docking and unloading facilities, and construction support buildings)
- excavate for facility structures
- construct service facilities (including items such as roadways, paving, railroad spurs, fencing, exterior utility and lighting systems, transmission lines, and sanitary sewage treatment facilities)

- construct structures, systems, and components that do not prevent or mitigate the consequences of postulated accidents that could cause undue risk to the health and safety of the public; including but not limited to
 - cooling towers
 - intake and discharge structures
 - circulating water lines
 - fire protection equipment
 - switchyard and onsite interconnections
 - barge slip modification.

Construction of the onsite portion of a new 500-kV transmission line to handle the power generated by the proposed new units is included in the activities Southern requested as part of the site-preparation activities. However, construction of a new transmission line offsite was not addressed in the site redress plan and, therefore, is not considered in this BA.

3.0 VEGP Site Description

The VEGP site is located on the Savannah River shoreline approximately 24 km (15 mi) east-northeast of Waynesboro, Georgia, and 42 km (26 mi) southeast of Augusta, Georgia (Figure 1-1). The existing site consists of two Westinghouse pressurized water reactors, a turbine building, a switchyard, intake and discharge structures, and support buildings. Two generating units (Units 1 and 2) are currently operating at the site (Figure 1-2). Plant Wilson, a six-unit, oil-fueled combustion turbine facility built in 1974 and owned by the Georgia Power Company, as well as ancillary structures and systems related to Units 1 and 2 are also located onsite. The existing Units 1 and 2 and Plant Wilson would remain and continue to operate. They would not be affected by this action.

The footprint for Units 3 and 4 is in a previously disturbed area adjacent to the existing VEGP Units 1 and 2 (Figure 1-2). The existing Units 1 and 2 and the proposed Units 3 and 4 would share certain support structures such as office buildings and water, wastewater, and waste-handling facilities; however, the new intake and discharge facilities for Units 3 and 4 would be separate from the Units 1 and 2 intake and discharge. Each proposed Westinghouse AP1000 reactor would have a rated thermal power level of 3400 MW(t) (Southern 2007a). For the circulating water cooling system, Southern proposed natural-draft cooling towers, and for the service water system, mechanical-draft cooling towers.

The proposed Units 3 and 4 would use a new transmission line in combination with existing transmission lines. The existing Units 1 and 2 are interconnected with the regional power grid via two 500-kV transmission lines and four 230-kV transmission lines that run through four rights-of-way. The existing transmission lines would not be modified. One new 500-kV transmission line would be constructed to handle the power generated by the proposed new Units 3 and 4. The proposed new transmission line would be routed to the Thomson substation, which is located west of Augusta, Georgia. Although the precise route of the new transmission line has not been determined, Georgia Power Company has conducted a routing study (GPC 2007). Generally, the transmission line would be routed northwest from the VEGP site, passing west of the U.S. Army Garrison, Fort Gordon, and then north to the Thomson substation. The new transmission line right-of-way would be approximately 96 km (60 mi) long and 46 m (150 ft) wide (Southern 2007a).

3.1 General Terrestrial Ecological Resources Description

The VEGP site is approximately 1282.5 ha (3169 ac) in size and is located in the sandhills of the Upper Coastal Plain Region, approximately 48 km (30 mi) southeast of the Fall Line (Eco-Sciences 2007; Southern 2007a). The site has 12 soil types and several major habitat types, including ponds, pine plantations, native upland pines, and the bottomland hardwoods that are

found along stream drainages onsite and adjacent to the Savannah River (NRCS 2003a; TRC 2006). Approximately 320 ha (800 ac) of the VEGP site consists of power generation and maintenance facilities, parking lots, roads, cleared areas, and mowed grass. Previously disturbed areas onsite, including portions of the proposed Vogtle ESP site Units 3 and 4 footprint, are vegetated with a mix of planted pines and old field vegetation (Southern 2007a). Approximately 247.7 ha (612 ac) of hardwoods, 661.3 ha (1634 ac) of pine forests, and 38.8 ha (96 ac) of open areas are on the VEGP site (Southern 2007a).

The land surrounding the VEGP site consists of both developed and undeveloped parcels. Pasture or farmland, pine plantations, and abandoned (old) fields predominate the developed portions, while much of the undeveloped land is composed of oak-hickory hardwoods and sandhill-upland pine communities (Southern 2006a, 2007a). The Savannah River floodplain ranges from approximately 30 m (100 ft) to 240 m (800 ft) wide at the VEGP site. However, most of the VEGP site is situated atop steep river bluffs along the Savannah River shoreline and is separated from the floodplain (Southern 2007a).

Directly across the Savannah River from the VEGP site is the Savannah River Site, a U.S. Department of Energy (DOE) facility with restricted access (Southern 2007a). River swamp, bottomland hardwood, and upland pine-hardwood communities occur on the DOE Savannah River Site within 10 km (6 mi) of the VEGP site (Southern 2007a). The Savannah River Swamp comprises about 3800 ha (9400 ac) and borders the Savannah River on the southwestern edge of Savannah River Site, adjacent to the VEGP site (Wike et al. 2006).

Wildlife Habitat

The VEGP site is characterized by low, gently rolling sandy hills. Scrub oaks, including turkey (*Quercus laevis*), post (*Q. stellata*), and willow oak (*Q. phellos*), and longleaf pine (*Pinus palustris*) occur in the upland wooded areas that were not previously cultivated. Red oak (*Q. rubra*), water oak (*Q. nigra*), and maple (*Acer* sp.) dominate the lowland hardwood areas. Bald cypress (*Taxodium distichum*) and water tupelo (*Nyssa aquatica*) characterize the Savannah River floodplain. To prevent erosion, grasses and the small shrubby sericea lespedeza (*Lespedeza cuneata*) were planted in several open areas created during construction of Units 1 and 2 (Southern 2006a).

Longleaf Pine, Scrub-Oak, and Oak-Hickory Upland Communities

The longleaf pine-scrub oak community is found on ridge tops as well as south and west slopes in undisturbed upland areas on the VEGP site. Common canopy species in this habitat include longleaf pine, turkey oak, and bluejack oak (*Quercus incana*). The shrub layer is composed of sparkleberry (*Vaccinium arboreum*), dwarf huckleberry (*Gaylussacia dumosa*), and yellow jessamine (*Gelsemium sempervirens*). The density and diversity of the herbaceous ground cover varies with the degree of canopy closure. Under dense shade, only clumps of slender

woodoats (*Chasmanthium laxum*) are found. In more open areas, gopher weed (*Baptisia perfoliata*), jointweed (*Polygonella americana*), tread-softly (*Cnidocolus stimulosus*), and reindeer lichen (*Cladina rangiferina*) are common (TRC 2006).

The north and east slopes in the undisturbed uplands support the more mesic oak-hickory community. The canopy in this community is mainly composed of white oak (*Quercus. alba*), white ash (*Fraxinus americana*), mockernut hickory (*Carya alba*), and flowering dogwood (*Cornus florida*). A few turkey oaks and a scattering of shortleaf pine (*Pinus echinata*) are also present (TRC 2006).

A steep bluff separates the dry upland forest from the intermittently flooded bottomland along the Savannah River. The bluff is completely wooded and in places still supports some very large trees, several in excess of 0.9 m (3 ft) in diameter. Common canopy species include oak, mockernut hickory, tuliptree (*Liriodendron tulipifera*), sweetgum (*Liquidambar styraciflua*), American elm (*Ulmus americana*), basswood (*Tilia americana*), and Florida maple (*Acer barbatum*). The understory is composed of smaller trees, shrubs, and vines. Common understory species include pawpaw (*Asimina triloba*), hophornbeam (*Ostrya virginiana*), muscadine (*Vitis rotundifolia*), American beautyberry (*Callicarpa americana*), crossvine (*Bignonia capreolata*), and poison ivy (*Toxicodendron radicans*). The herbaceous ground cover varies with soil moisture. On the upper slope, where the soil is drier, Christmas fern (*Polystichum acrostichoides*), white snakeroot (*Ageratina altissima*), and several species of aster are most common. On the lower slopes and around seeps, dominant plant species include mottled trillium (*Trillium maculatum*), wild ginger (*Asarum canadense*), false nettle (*Boehmeria cylindrica*), and jewelweed (*Impatiens capensis*) (TRC 2006).

Planted Pine

The planted pine plantations on the VEGP site are of various ages and differ in the stocking rates. The plantations vary from a nearly closed canopy with very little understory, to areas that resemble old fields with only scattered pine. The sparse herbaceous ground cover in areas with a closed canopy consists of bracken fern (*Pteridium aquilinum*). In the more open areas, dog fennel (*Eupatorium capillifolium*), broomsedge (*Andropogon virginicus*), and blackberry (*Rubus* sp.) are common. Loblolly (*Pinus taeda*) and longleaf pines are the primary overstory species (TRC 2006). Pine plantations are managed through prescribed burning every 3 to 5 years, timber thinning after 20 years, and aesthetic cuts after thinning. Burning is limited to 25 to 30 percent of the upland and planted pine acreage each year (Southern 2006a). Planted loblolly plantations cover approximately 142 ha (350 ac) of lands that have been reclaimed from original plant construction (Southern 2006a).

Native longleaf pine are being reestablished by Southern on or near the VEGP site. These pines are managed on a long rotation basis, allowing the trees to live from 60 to 100 years (Southern 2006a).

Streams and Wetlands

The wetlands associated with the VEGP site include those near the Savannah River, as well as those near ponds and streams located onsite. Eco-Sciences of Georgia (Eco-Sciences) was contracted by Southern to survey the VEGP site in December 2006 to determine where jurisdictional waters of the United States occur. Approximately 69 ha (170 ac) of potential jurisdictional wetlands were identified on the site during the Eco-Sciences survey (Southern 2007b). These include 48 wetlands, 6 perennial streams, 13 intermittent streams, and 3 ephemeral streams.

Principal waterbodies onsite include Mallard Pond and two streams in the southern portion of the VEGP site (Figure 1-2). Mallard Pond encompasses 2 ha (5 ac) in a hardwood cove just north of the footprint for the proposed new Units 3 and 4 (Southern 2006a). A small unnamed stream at Hancock Landing drains Mallard Pond. From Mallard Pond, it flows north and east into the Savannah River. The stream is approximately 0.6 m (2 ft) to 1.2 m (4 ft) wide and less than 0.3 m (1 ft) deep, except where beavers (*Castor canadensis*) have created dams and ponds (Southern 2007a).

Two streams are located in the southern portion of the VEGP site (Figure 1-2). One of these streams is located in the southwestern portion of the VEGP site and drains south through Debris Basin #2, into Daniels Branch, and then into Telfair Pond. Telfair Pond drains to the east via Beaverdam Creek, which enters the Savannah River approximately 3.2 km (2 mi) downstream of the existing intake structure. The other small stream is in the southeastern portion of the site and flows south through the Debris Basin #1 (Southern 2007a). This unnamed tributary flows directly into Beaverdam Creek. Although Beaverdam Creek is outside the VEGP site boundary, the two small streams mentioned above are within the site. Several wetland areas within each of these stream drainages were identified (Eco-Sciences 2007), including wetlands associated with the two debris basins. Debris Basins #1 and #2 were originally built as stormwater retention basins during construction of Units 1 and 2.

Debris Basin #1 is about 2.4 ha (6 ac) in size, and Debris Basin #2 is about 2 ha (5 ac) (Southern 2006a). Eco-Sciences found the dominant vegetation in wetlands associated with Debris Basin #1 includes black willow (*Salix nigra*), cinnamon fern (*Osmunda cinnamomea*), sweetgum, giant cane (*Arundinaria gigantea*), and red maple (*Acer rubrum*). Dominant vegetation associated with wetlands around Debris Basin #2 includes black willow, sedges (*Carex* spp.), greenbrier (*Smilax* spp.), sweetgum, and giant cane (Eco-Sciences 2007).

The natural or beaver enhanced wetlands associated with these drainages have open to closed canopies depending on water depth. In those areas with a tree canopy, the dominant species are water oak, red maple, and blackgum (*Nyssa sylvatica*). There is also a relatively dense understory of vines and shrubs composed of giant cane, trumpet creeper (*Campsis radicans*),

muscadine, and American holly (*Ilex opaca*). The herbaceous ground cover is dominated by cinnamon fern and royal fern (*O. regalis*) (TRC 2006).

The general habitat along the Savannah River on the VEGP site is a mix of hardwoods and bald cypress-water tupelo. Bald cypress and water tupelo are the dominant canopy species in the wetter sites along the river. American sycamore (*Platanus occidentalis*), boxelder (*Acer negundo*), sugarberry (*Celtis laevigata*), and swamp chestnut oak (*Quercus michauxii*) occupy the slightly higher, drier ground. The understory is composed of American holly, ironwood (*Carpinus caroliniana*), water locust (*Gleditsia aquatica*), giant cane, and buttonbush (*Cephalanthus occidentalis*). Ground cover is sparse and limited to those species that can survive both inundation and dense shade. Dominant groundcover species include richweed (*Pilea pumila*), lizard's tail (*Saururus cernuus*), sensitive fern (*Onoclea sensibilis*), and Virginia dayflower (*Commelina virginica*) (TRC 2006).

Southern has estimated that 9.1 ha (22.5 ac) of wetlands along the Savannah River would be directly affected during construction of the cooling water intake structure, the barge facility, and the discharge structure for the proposed Units 3 and 4 (Southern 2007b). Eco-Sciences (2007) identified three potential jurisdictional wetlands in the vicinity of the proposed structures. The soil in these wetlands is classified as loamy sand that is more than 91 cm (36 in.) deep. The dominant species present in two of the wetlands are bald cypress, American sycamore, and red maple. A smaller wetland (0.006 ha [0.015 ac]) is also located near the proposed water intake. The dominant species in this wetland include ironwood and giant cane.

4.0 Potential Environmental Impacts of Limited Site-Preparation Activities

This section provides information on the limited site-preparation activities of the proposed new Units 3 and 4 at the VEGP site and the impacts on the terrestrial ecosystem. Southern stated that “BMPs (best management practices) used to minimize impacts during preconstruction and construction activities begin with a programmatic construction environmental control plan being put in place” (Southern 2007b). This plan would address BMPs that would be used to minimize impacts. The plan would cover topics such as erosion and sedimentation control, sensitive resources, spill prevention and response, noise and vibration, air emissions, and general site maintenance. Southern also states that regular environmental compliance inspections of construction activities would be performed to ensure that site activities are in compliance with all applicable environmental requirements (Southern 2007b).

The site includes land developed for industrial use, previously disturbed land, and undeveloped land. Approximately 200 ha (500 ac) would be disturbed by construction of Units 3 and 4. The area that would be affected by construction activities of permanent facilities is approximately 125 ha (310 ac). An additional 77 ha (190 ac) would be disturbed for temporary facilities and spoils storage (Southern 2007b). The total acreage amounts needed for each major construction activity and the associated habitat types that would be disturbed are provided in Table 4-1. It is unlikely that each activity would disturb the entire area identified, and where possible, efforts would be made to minimize disturbance (Southern 2007b).

Temporary impacts on the 77 ha (190 ac) associated with spoils areas, parking lots, offices, warehouses, and laydown yards would occur in planted longleaf and loblolly pine habitats and in previously disturbed areas. Of the 125 ha (310 ac) that would be disturbed by construction of the powerblock, cooling towers, switchyard, roads, and simulator building, approximately 113 ha (279 ac) or 90 percent of the land area required for these activities would be previously disturbed land, open fields, or planted pine habitats. About 1.6 ha (4 ac) of land containing mixed hardwood and pine forest would be permanently removed for the simulator building.

Approximately 10.4 ha (25.7 ac) of habitat onsite would be permanently removed for construction of the new 500-kV transmission line. The new transmission line would originate in the new switchyard and would be routed west across the south end of Mallard Pond. It would follow the existing Vogtle-Scherer 500-kV right-of-way west until it exits the site boundary. The right-of-way would be 46 m (150 ft) wide, and six transmission tower structures would be located onsite. Transmission towers would be located to free span Mallard Pond and minimize habitat impacts.

Table 4-1. Habitat Types and Acreage Associated with Permanent and Temporary Construction Areas Associated with Construction of Units 3 and 4

Construction Area	Hectares (Acres) Affected	Dominant Habitat Type
Permanent		
Powerblock	30.4 (75.2)	Planted loblolly pine/previously disturbed
Cooling Tower	28.0 (69.3)	Previously disturbed/industrial
Switchyard	27.8 (68.7)	Open fields/planted loblolly pine
Cooling Water Intake Structure	5.1 (12.5)	Bottomland hardwoods/wetlands
Barge Slip/Discharge Structure	4.2 (10.3)	Bottomland hardwoods/wetlands
500-kV Transmission Line (onsite impacts only)	9.8 (24.3)	Planted loblolly pine, previously disturbed industrial, open fields
	0.6 (1.4)	Pond and bottom land hardwood
Simulator Building	1.6 (4.0)	Mixed hardwoods and pine
Onsite Roads	16.7 (41.3)	Open fields, planted pine, previously disturbed
Temporary		
Parking	18.2 (44.5)	Planted longleaf pine
Batch House	4.1 (10.2)	Planted longleaf pine
Warehouse, Office, and Laydown	26.0 (63)	Mixed planted loblolly/longleaf pine/previously disturbed
Spoils Area: two at 14.6 ha (36 ac) each	29.1 (72)	Mixed planted loblolly/longleaf pine
Source: Southern (2007b, 2007d)		

The land area near Mallard Pond that would be crossed by the line is approximately 0.6 ha (1.4 ac). This land is composed of pond and bottomland hardwood habitat. The remaining 9.8 ha (24.3 ac) is a mixture of planted loblolly pine, previously disturbed industrial areas, and open fields, and is included in the 113 ha (279 ac) (Southern 2007d).

About 9.1 ha (22.5 ac) of wetlands would be directly affected by construction activities for Units 3 and 4, including approximately 5.1 ha (12.5 ac) during construction of the cooling water intake structure and 4 ha (10 ac) during the construction of the barge facility and discharge structure (Southern 2007b). Most of the acreage involved would be along the Savannah River (Southern 2007b). Although Southern included the total of 5.1 ha (12.5 ac) of wetlands in the estimate for permanent disturbance, it estimates that the actual cooling water intake structure and canal would be located on about 1.2 ha (3 ac) of wetlands. Impacts to the remaining 3.84 ha (9.5 ac) of the construction area associated with the cooling water intake structure would be temporary (Southern 2007b). Temporary construction ramps at the canal and cooling water intake structure areas would be removed and disturbed areas around the intake structure would then be stabilized and re-vegetated to preclude future erosion. Erosion and sediment controls would remain in place and would be maintained as long as necessary (Southern 2007b).

The cooling water intake structure houses the river water make-up pumps, traveling screens, screen wash pumps, and associated equipment. Southern has committed to minimize impacts to adjacent wetland areas and the Savannah River during the construction process. The construction would be conducted under a CWA Section 404 permit. In early 2007, Southern submitted the Request for Jurisdictional Determination Form to the U.S. Army Corps of Engineers (USACE) and began the Section 404 permitting process (Southern 2007b).

There is the potential for other construction activities associated with the proposed Units 3 and 4 to have indirect impacts to wetlands at the VEGP site. These activities are not likely to require a CWA Section 404 permit from the USACE. Potentially, indirect impacts (e.g., sedimentation) to Debris Basins #1 and #2, Mallard Pond, Telfair Pond, and Beaverdam Creek could occur as a result of construction activities.

In summary, an estimated 9.11 ha (22.5 ac) of wetlands habitat on the VEGP site would be altered to construct permanent structures and facilities associated with construction of the proposed Units 3 and 4 at the ESP site. This represents about 13 percent of the total 69 ha (170 ac) of wetlands currently available onsite. Within 16 km (10 mi) of the site, there are approximately 41,092 ha (101,538 ac) of wetlands, including about 33,369 ha (82,455 ac) of wetlands along the Savannah River (FWS 2004b, 2004c). Wetland habitat that would be altered is less than 0.03 percent of the total wetland acreage in the vicinity. An estimated 112.5 ha (278 ac) of upland habitat including planted pines, previously disturbed areas, and open fields would be removed during construction of permanent structures and facilities (including the onsite portion of the new transmission line), representing about 16 percent of the total 700 ha (1730 ac) of planted pine and open areas currently available onsite. The amount of planted pines that would be disturbed is less than 0.5 percent of the available forested habitat (23,788 ha [58,781 ac]) in the vicinity of the VEGP site (NRSAL 2003). An estimated 1.6 ha (4 ac) of mixed hardwood and pine habitat would be lost to permanent structures and facilities, representing much less than 1 percent of the total 247.7 ha (612 ac) of hardwood habitat available onsite. Approximately 0.6 ha (1.4 ac) of land composed of pond and bottomland hardwood would be crossed by the new transmission line onsite.

Habitats associated with temporary impacts to 77 ha (190 ac) resulting from construction of parking areas, the batch plant, warehouses, laydown yards, and spoils areas would be re-vegetated following construction activities.

5.0 Evaluation of Threatened or Endangered Terrestrial Species Potentially Occurring in the Vicinity of the VEGP Site

This section describes Federally listed or proposed threatened and endangered terrestrial species and designated and proposed critical habitat that may occur in the vicinity of the VEGP site. Table 1-1 lists the endangered, threatened, and other special-status species that may occur in the vicinity of the VEGP site. This list is composed of Federally listed species with recorded occurrences in Burke County (GDNR 2007a), species listed on the FWS website as having the potential to occur in Burke County (FWS 2004a), or species within 16 km (10 mi) of the site in Aiken and Barnwell Counties in South Carolina (SCDNR 2007).

Surveys for Federally listed species classified as threatened or endangered were conducted in spring, summer, and fall 2005 at the VEGP site by Third Rock Consultants, LLC. The surveys were conducted on 675 ha (1669 ac) of the 1283 ha (3169 ac) that comprise the VEGP site (TRC 2006). These surveys were conducted for all known areas that would be disturbed by the pre-construction and construction activities for the proposed Units 3 and 4 (Figure 5-1). A majority of the areas surveyed on the site were areas that had not been previously disturbed during the construction of Units 1 and 2 at the VEGP site or cleared for transmission lines. No Federally listed plant species were found on the VEGP site during the 2005 surveys. The American alligator was the only Federally listed species observed on the VEGP site during the 2005 surveys. One adult alligator was observed in Mallard Pond during the summer survey. It is Federally listed as "...threatened due to similarity of appearance" to the endangered American crocodile (*Crocodylus acutus*) (TRC 2006).

Seven Federally listed terrestrial plant and animal species may occur in the vicinity of the VEGP site. No designated or proposed critical habitat for terrestrial species occurs on or in the general area of the site.

Red-Cockaded Woodpecker – Endangered

The red-cockaded woodpecker (*Picoides borealis*) was listed by the FWS as endangered in 1970 (35 FR 16047). The red-cockaded woodpecker's historic range extended from north Florida to New Jersey and Maryland, as far west as Texas and Oklahoma, and inland to Missouri, Kentucky, and Tennessee. This species has been extirpated in New Jersey, Maryland, Tennessee, Missouri, and Kentucky (FWS 2007a), and currently, it is estimated that about 6000 family groups of red-cockaded woodpeckers, or 15,000 birds, remain in Florida north to Virginia and west to southeast Oklahoma and eastern Texas. This represents about 1 percent of the woodpecker's original range (FWS 2007a). Critical habitat has not been

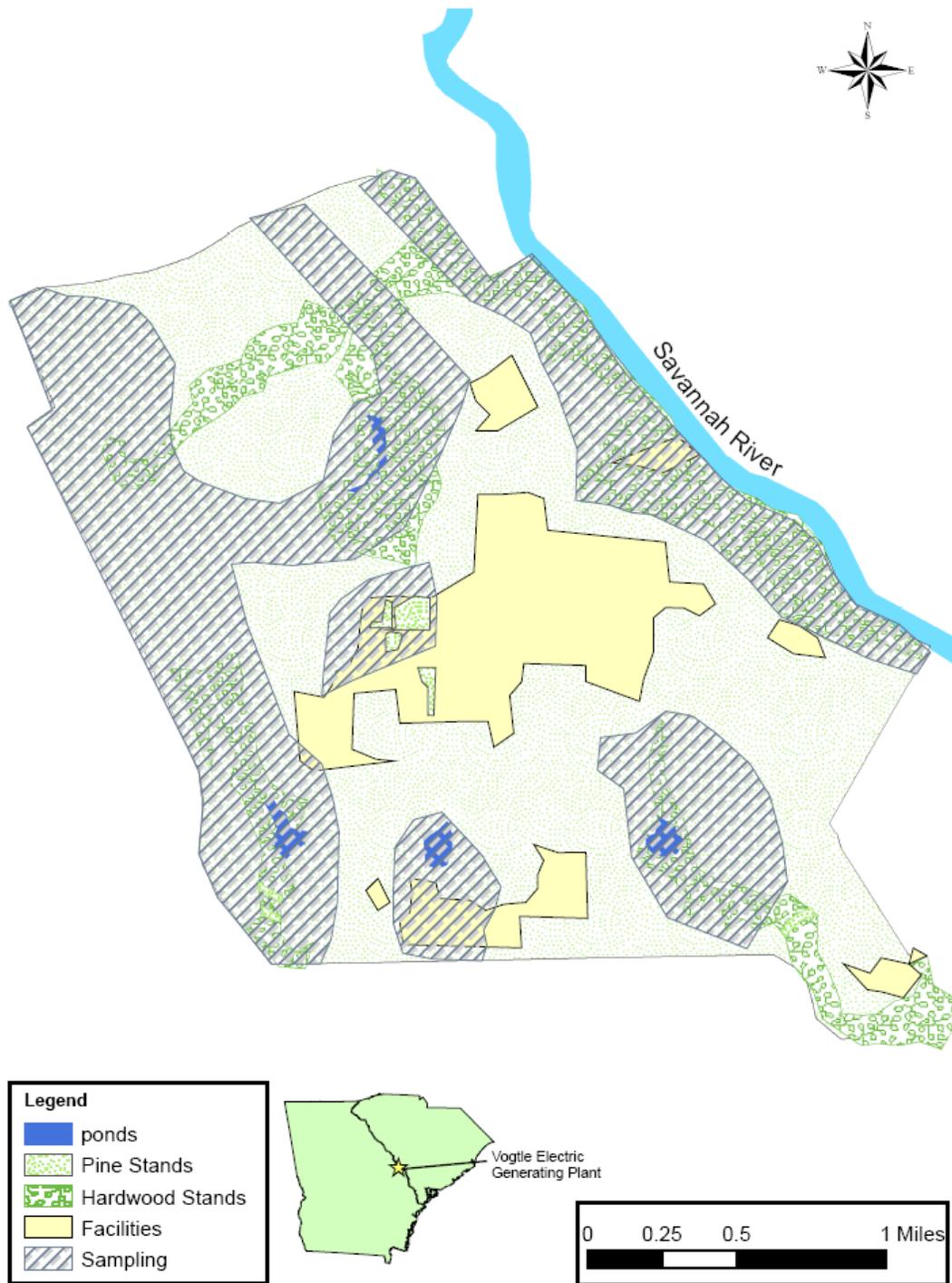


Figure 5-1. 2005 Threatened and Endangered Species Survey Locations at the VEGP Site (Southern 2007b)

established for red-cockaded woodpeckers (FWS 2007b). In 1998, there were 665 family groups of red-cockaded woodpeckers in Georgia (GDNR 1999).

The red-cockaded woodpecker is endemic to open, mature, and old growth pine ecosystems in the southeastern United States. Red-cockaded woodpeckers require open pine woodlands and savannahs with large old pines for nesting and roosting habitat for family groups (clusters). Large old pines are required as cavity trees because the cavities are excavated completely within inactive heartwood and the higher incidence of heartwood decay in older trees greatly facilitates excavation. Cavity trees must be in open stands with little or no hardwood midstory and few or no overstory hardwoods. Suitable foraging habitat consists of mature pines with an open canopy, low densities of small pines, little or no hardwood or pine midstory, few or no overstory hardwoods, and abundant native bunchgrass and forb groundcovers (FWS 2003a).

Red-cockaded woodpeckers are a cooperatively breeding species, living in family groups that typically consist of a breeding pair with or without one or two male helpers. In red-cockaded woodpeckers (and other cooperative breeders), a large pool of helpers is available to replace breeders when they die. Helpers do not disperse very far and typically occupy vacancies on their natal territory or a neighboring one (FWS 2003a). A typical territory for an active group ranges from approximately 51 to 80 ha (125 to 200 ac), but can be as large as 240 ha (600 ac). The size of the particular territory is related to both habitat and population density (FWS 2007a). Dispersal is primarily undertaken by young birds; mate loss and an apparent avoidance of inbreeding sometimes cause adults to disperse, and adults may also occasionally move to neighboring territories for unknown reasons (Walters et al. 1988). In a North Carolina study, females dispersed a maximum of 31.4 km (19.5 mi) and males a maximum of 21.1 km (13.1 mi) (Walters et al. 1988).

Southern is currently working on enrolling the VEGP site in the Georgia Department of Natural Resources (GDNR) Safe Harbor Program. Safe Harbor Agreements are arrangements that encourage voluntary management for red-cockaded woodpeckers while protecting the participating landowners and their rights for development in the event these woodpeckers become established on the private property. Landowners entering into safe harbor agreements must establish a baseline number of individuals that would be maintained in the event that they are observed. Surveys at the VEGP site conducted in February 2006 found no occurrence of red-cockaded woodpeckers onsite. Southern expects to have the Safe Harbor Agreement in place by the end of 2007 (Southern 2006a).

There are no recorded occurrences of the red-cockaded woodpecker in Burke County, Georgia (GDNR 2007a) and no active colonies within 16 km (10 mi) of the VEGP site in South Carolina (SCDNR 2007, Wike et al. 2006); however, red-cockaded woodpeckers are listed as having the potential to occur in Burke County, Georgia, (FWS 2004a) and Aiken and Barnwell Counties in South Carolina (FWS 1999). There are no known historical occurrences of the red-cockaded woodpecker on the VEGP site, and they were not identified in the 2005 threatened and

endangered species survey or the 2006 Safe Harbor Program baseline survey (Southern 2006a, 2006b, 2007a; TRC 2006). In 2003, a total of 177 red-cockaded woodpeckers in 45 family groups were recorded on the DOE Savannah River Site.

Suitable habitat for foraging and nesting occurs within the VEGP site, but does not occur in the proposed construction footprint. The types of habitat that would be disturbed during construction mainly consist of previously disturbed areas, planted pines, hardwoods, wetlands along the Savannah River, and open fields. Red-cockaded woodpeckers are found mainly in large stands of old longleaf pine. Based on the distance to the closest known active colony, and the fact that red-cockaded woodpeckers have not been recorded on the VEGP site or in the general vicinity, it is unlikely red-cockaded woodpeckers are foraging on the site, and there is no evidence of nesting onsite. It is unlikely red-cockaded woodpeckers would be encountered during construction activities except as a possible transient individual. Therefore, the staff concludes that limited site-preparation activities for VEGP Units 3 and 4 are not likely to adversely affect the red-cockaded woodpecker.

Wood Stork – Endangered

Breeding populations of the wood stork (*Mycteria americana*) are Federally listed as endangered and currently occur or have recently occurred only in Alabama, Florida, Georgia, and South Carolina (49 FR 7332; FWS 1997). There were 13 active colonies of wood storks in Georgia during the 2002 breeding season with an estimated 1227 nesting pairs (FWS 2003b). No critical habitat has been designated for this species (FWS 2007c).

The wood stork is a highly colonial species, usually nesting and feeding in flocks. Its habitat includes freshwater and brackish wetlands, and it normally nests in bald cypress or red mangrove (*Rhizophora mangle*) swamps. At freshwater sites, nests are often constructed in bald cypress and swamp tupelo (*Nyssa biflora*). Wood storks in Georgia and South Carolina lay eggs from March to late May, with fledging occurring in July and August (FWS 1997).

Wood storks have a unique feeding technique (tacto-location) and typically require higher prey concentrations than other birds. They tend to rely on depressions in marshes or swamps where prey can become concentrated during low-water periods (FWS 1997). A study from a wood stork colony in east-central Georgia found the diet was mostly composed of fish, including sunfishes (*Lepomis* spp.), bowfin (*Amia calva*), redfin pickerel (*Esox americanus americanus*), and lake chubsuckers (*Erimyzon* spp.) (FWS 1997).

Wood storks in east-central Georgia forage in a wide variety of wetland habitats including hardwood and cypress swamps, ponds, marshes, drainage ditches, and flooded logging roads. Typical wood stork foraging sites have reduced quantities of both submerged and emergent macrophytes. The water in the foraging areas is either still or very slowly moving, and the depth is normally between 5 and 41 cm (2 and 16 in.). It has been suggested storks may have

difficultly feeding in water with a depth more than 50 cm (20 in.) (Coulter and Bryan 1993). Differences among seasons, rainfall, and surface-water patterns often cause storks to change where and when certain habitats are used for nesting, feeding, or roosting. These hydrological changes may cause storks to shift the timing or intensity of feeding at a local wetland, or cause entire regional populations of birds to make large geographic shifts between one year and the next. Because nesting storks generally use foraging sites that are located within about 50 km (31 mi) of the colony, successful colonies are those that are in regions where birds have options to feed under a variety of rainfall and surface-water conditions. Maintaining a wide range of feeding site options requires that many different types of wetlands, both large and small, and relatively long and short annual hydro-periods be available for foraging (FWS 1997).

The closest known wood stork colonies to the VEGP site are located in Jenkins and Screven Counties, Georgia. The Birdsville colony is located at Big Dukes Pond, a 570-ha (1400-ac) cypress swamp, which is 12.6 km (7.8 mi) northwest of Millen in Jenkins County, Georgia. The VEGP site is approximately 45 km (28 mi) from the Birdsville colony. The Chew Mill Pond colony in Jenkins County is approximately 6 km (3.7 mi) southwest of the Birdsville colony. Chew Mill Pond has a history of being a wood stork foraging site and a wading bird rookery. Researchers consider it to be an overflow or satellite colony of the Birdsville colony (Wike et al. 2006). The Jacobsons Landing colony in Screven County is approximately 43 km (27 mi) southeast of the VEGP site. In 1996, it contained an estimated 40 wood stork nests. These colonies are within the maximum radius that wood storks travel during daily feeding flights [60 to 70 km (37 to 43 mi)] (Coulter and Bryan 1993). Foraging wood storks have been recorded throughout Burke County, Georgia (Coulter and Bryan 1993; Wike et al. 2006), and in the Savannah River Swamp on the DOE Savannah River Site in South Carolina, which is adjacent to the VEGP site (Wike et al. 2006).

Wood storks were reported in the vicinity of the Savannah River Site before the site was established in 1952, and before the discovery of the Birdsville colony. Storks have been followed from the Birdsville colony to the DOE Savannah River Site. Data from the aerial wood stork surveys of the Savannah River Swamp and the studies at the Birdsville colony suggest that the Savannah River Swamp probably is not used extensively during the breeding or pre-fledging phases of the Birdsville colony. Most of the observations of storks on the Savannah River Site occur during the late-nestling or the post-fledging period, which occurs between June and September. Some of the birds observed foraging in the Savannah River Swamp may be storks from farther south, either non-breeders or birds that have already finished breeding for the year (Wike et al. 2006).

No wood storks were identified in the threatened and endangered species surveys completed in 2005, and there are no known historical records of wood storks occurring on the VEGP site (Southern 2006b; TRC 2006). The closest known colony is more than 40 km (25 mi) from the VEGP site. Although forage areas may be 60 to 70 km (37 to 43 mi) from the colony,

85 percent are within 19 km (12 mi) (Coulter and Bryan 1993). Suitable foraging habitat includes wetlands and open water with low flow rates, depths less than 50 cm (20 in.), and reduced quantities of both submerged and emergent macrophytes. These habitats exist on the VEGP site, and wood storks have been seen within 3.2 km (2 mi) of the site in the Savannah River Swamp. Foraging from June to September on the VEGP site appears possible in wetland areas along stream drainages, ponds, drainage ditches, and the wetlands along the Savannah River. During construction of the cooling water intake and discharge structures and the barge facility, suitable foraging habitat along the Savannah River may be affected. However, this species is highly mobile and any impacts associated with construction on the VEGP site would be short-term and negligible. Therefore, the NRC staff concludes that limited site-preparation activities for VEGP Units 3 and 4 are not likely to adversely affect the wood stork.

Flatwoods Salamander – Threatened

The flatwoods salamander (*Ambystoma cingulatum*) was listed by the FWS as threatened in 1999 (64 FR 15691). The historical range of the flatwoods salamander included parts of the states of Alabama, Florida, Georgia, and South Carolina that are in the lower Coastal Plain of the southeastern United States. Survey work completed since 1990 indicate that 51 populations of flatwoods salamanders are known from across the historical range. Most of these occur in Florida (36 populations or 71 percent). Eleven populations have been found in Georgia, four in South Carolina, and none have been found in Alabama. The last breeding record for Burke County was in the 1940s (FWS 2004a). Critical habitat was proposed in February 2007 in Miller and Baker Counties, Georgia (72 FR 5856). These counties are more than 290 km (180 mi) southeast of the VEGP site.

Adults and sub-adults are fossorial, occur in open mesic pine forests, and are closely associated with pine/wiregrass (*Aristida stricta*) habitats dominated by longleaf or slash pine maintained by frequent fire (Petranka 1998). During the breeding period, which coincides with heavy rains from October to December, these salamanders move to isolated, shallow, small, acidic, tannin-stained depressions (forested with emergent vegetation) that dry completely on a cyclic basis (i.e., ephemeral ponds) (72 FR 5856).

There are no recorded occurrences of flatwood salamanders within 16 km (10 mi) of the VEGP site, no known historical occurrences onsite, and they were not identified in the 2005 threatened and endangered species survey (Southern 2006b, TRC 2006; GDNR 2007a). Suitable habitat for the flatwoods salamander may occur onsite, but suitable habitat is not found within the construction area footprint for the proposed new Units 3 and 4. The types of habitat that would be disturbed during construction mainly consist of previously disturbed areas, planted pine, hardwoods, wetlands along the Savannah River, and open fields. Flatwoods salamanders are not likely to be encountered during construction at the VEGP site, and adverse impacts are unlikely. Therefore, the NRC staff concludes that limited site-preparation activities for the proposed VEGP Units 3 and 4 are not likely to adversely affect the flatwoods salamander.

American Alligator – Threatened Based on Similarity of Appearance

In 1967, the American alligator (*Alligator mississippiensis*) was classified by the FWS as endangered throughout its range, including Georgia. By 1987, following several reclassification actions in other states, it was reclassified to “...threatened based on similarity of appearance” to the American crocodile in the remainder of its range, including Georgia (52 FR 21059). The alligator is no longer biologically imperiled in Georgia. Its populations are considered disjunct, limited to suitable habitat, and stable. The reclassification helps prevent excessive take of the alligator and protects the American crocodile (52 FR 21059).

During surveys of the VEGP site made by Third Rock Consultants, LLC (TRC) in the summer of 2005, an alligator was observed in Mallard Pond (TRC 2006). Alligator habitat consists of swamps, marshes, ponds, lakes, and slow-moving streams and rivers. Alligators appear to be relatively common in the general vicinity of the VEGP site (Wike et al. 2006). Alligators in the specific location of the intake structure, barge facility, or discharge structure may be temporarily displaced, but there is ample wetland habitat in the region. The alligators may be minimally affected by construction at the VEGP site. Therefore, the NRC staff concludes that limited site-preparation activities for the proposed VEGP Units 3 and 4 are not likely to adversely affect the American alligator.

Canby's Dropwort – Endangered

Canby's dropwort (*Oxypolis canbyi*) was listed as endangered by the FWS in 1986 (51 FR 6690). This species is native to the Coastal Plain from Delaware (historical only), Maryland, North Carolina, South Carolina, and Georgia. Historically, this plant was found in Burke, Dooly, Lee, and Sumter Counties in Georgia. There is no critical habitat designated for this species (FWS 1990a).

Canby's dropwort has been found in a variety of habitats, including ponds dominated by pond cypress (*Taxodium ascendens*), grass-sedge-dominated Carolina bays, wet pine savannahs, shallow pineland ponds, and cypress-pine swamps or sloughs. The largest and most vigorous populations occur in open bays or ponds, which are wet throughout most of the year and have little or no canopy cover. Sites occupied by this species generally have infrequent and shallow inundations (5 to 30 cm [2 to 12 in.]). The species' water requirements are narrow, with too little or too much water being detrimental (FWS 1990a). Suitable habitat is normally on a sandy loam or loam soil, which is underlain by a clay layer, which along with the slight gradient of the areas result in the retention of water. Known soil types that support populations of Canby's dropwort are Rembert loam, Portsmouth loam, McColl loam, Grady loam, Coxville fine sandy loam, and Rains sandy loam. These soil types are similar in that they have a medium-to-high organic content, a high water table, and are deep, poorly drained, and acidic (FWS 1990a). None of these soil types occur on the VEGP site. Soil types found on the site include soils in the Chastain-Tawcaw association; Lucy, Osier, and Bibb soils; the Tawcaw-Shellbluff

association; and Fuquay, Bonifay, and Troup series soils (NRCS 2003a). The soil types that would be disturbed during construction include Lucy, Troup, and Tawcaw-Shellbluff (Figure 5-2). Lucy and Troup soils are deep, well-drained soils occurring in the upland (NRCS 1997, 2003b). The Tawcaw-Shellbluff soils occur in the Savannah River floodplain and are acidic, poorly drained, and deep (NRCS 2002, 2003c).

Canby's dropwort has not been recorded within 16 km (10 mi) of the VEGP site. There are no known historical occurrences of Canby's dropwort on the VEGP site, and it was not identified in the 2005 threatened and endangered species survey (Southern 2006b; TRC 2006; GDNR 2007a). There are two historical records in Burke County, Georgia, around Waynesboro, Georgia (51 FR 6690), and these populations are currently thought to be extirpated (FWS 1990a).

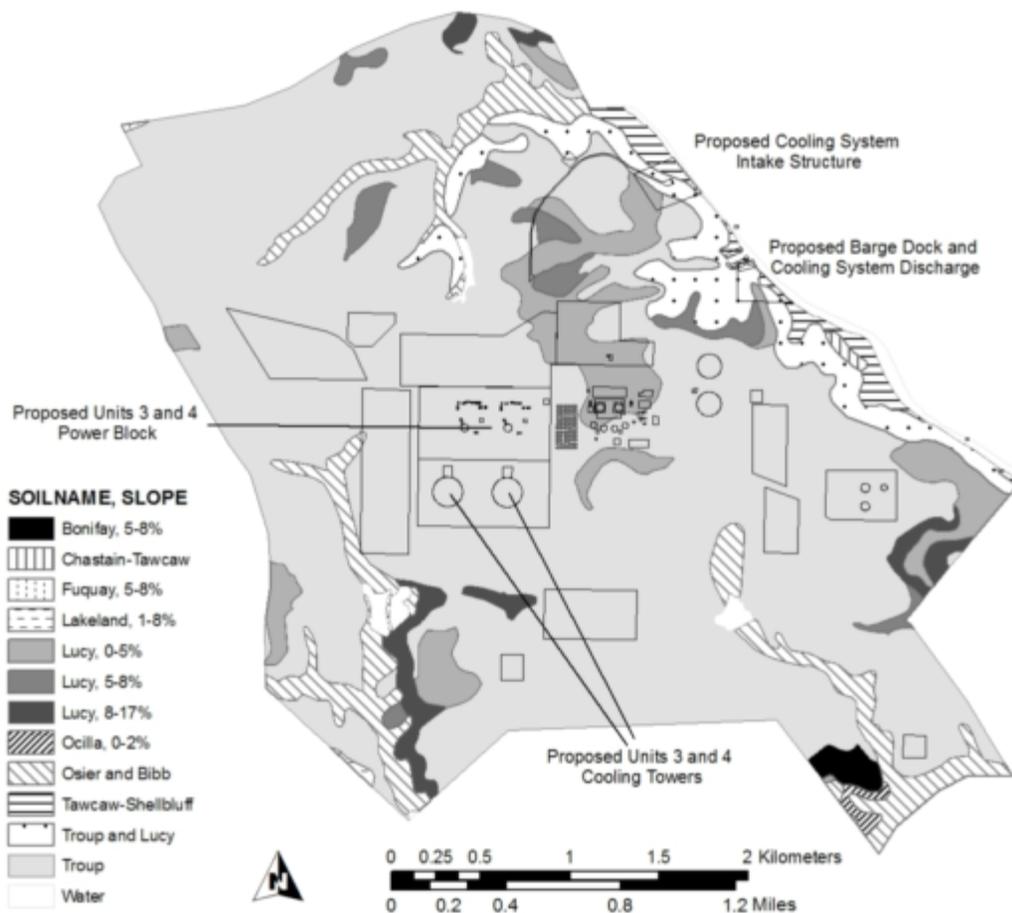


Figure 5-2. VEGP Site Soil Map (NRCS 2003a)

It is unlikely that the VEGP site contains suitable habitat for Canby's dropwort. Canby's dropwort is normally found on a sandy loam or loam soil, which is underlain by a clay layer. Soil types known to support populations of Canby's dropwort are not found on the VEGP site (NRCS 2003a). Because of the lack of suitable habitat, it is unlikely there would be construction-associated impacts to this species at the VEGP site. Therefore, the staff concludes that limited site-preparation activities for the proposed VEGP Units 3 and 4 are not likely to adversely affect Canby's dropwort.

Smooth Coneflower – Endangered

The smooth coneflower (*Echinacea laevigata*) was listed by the FWS as endangered in 1992 (57 FR 46340). The smooth coneflower occurs in meadows and open woodlands on basic or near-neutral soils (Patrick et al. 1995). The soil types that would be disturbed during construction include Lucy, Troup, and Tawcaw-Shellbluff (Figure 5-2). These soil types are generally acidic (NRCS 1997, 2002, 2003b, 2003c). The smooth coneflower is often found with eastern redcedar (*Juniperus virginiana*) or button snakeroot (*Eryngium yuccifolium*) (Patrick et al. 1995). These species are not known to occur on the VEGP site (Southern 2006a), and it is unlikely that suitable habitat occurs onsite.

The smooth coneflower is known to occur in Stephens County, Georgia (Patrick et al. 1995), and is also found in Aiken and Barnwell Counties, South Carolina more than 8 km (5 mi) from the VEGP site (SCDNR 2007). There are no known occurrences of this species in Burke County, Georgia (FWS 2004c), no historical occurrences on the VEGP site, and it was not recorded in the 2005 threatened and endangered species survey (TRC 2006; Southern 2006b). Therefore, the staff concludes that limited site-preparation activities for the proposed VEGP Units 3 and 4 are not likely to adversely affect the smooth coneflower.

Relict Trillium – Endangered

The relict trillium (*Trillium reliquum*) was listed as endangered by the FWS in 1988 (53 FR 10879). Populations of relict trillium are limited to portions of Georgia, South Carolina, and Alabama (FWS 1990b). In 1990, 14 known populations of this species occurred in Clay, Lee, Early, Talbot, Columbia, and Macon Counties, Georgia. Relict trillium is also known to occur in Aiken County, South Carolina, more than 16 km (10 mi) from the VEGP site (SCDNR 2007).

There are no known occurrences of relict trillium in Burke County (FWS 2004a), no historical occurrences on the VEGP site, and it was not recorded in the 2005 and 2007 threatened and endangered species surveys (TRC 2006; Southern 2006b; GDNR 2007b). Relict trillium is found primarily in moist hardwood forests that have had little or no disturbance in the recent past. The soils on which it grows vary from rocky clays to alluvial sands, but all exhibit a high organic matter content in the upper soil layer. Most sites appear to be free from the influence of fire, both in the recent and distant past. Timber harvesting at the known sites has been limited

to selective cutting. Relict trillium does occur on less than optimum sites, such as power and sewer line rights-of-way, and apparently it can become reestablished after intense disturbance to the habitat, such as agricultural activity (FWS 1990b).

The NRC staff met with biologists from the GDNR in October 2006. During this meeting, the GDNR staff told the NRC staff that relict trillium had the potential to occur on the VEGP site in suitable habitat along the Savannah River (PNNL 2006). The forested bluff at the VEGP site provides suitable habitat for this Federally endangered species. This bluff was surveyed during the seasonal field surveys conducted in 2005 (TRC 2006). In addition, in the spring of 2007, GDNR biologists surveyed suitable habitat along the Savannah River in the vicinity of the proposed intake structure for relict trillium (GDNR 2007b). The spring 2005 and 2007 surveys were conducted during the flowering period for the relict trillium, which is the best time for positive identification of this species (Patrick et al. 1995). The relict trillium was a targeted species that received special attention during the surveys (Southern 2007b; GDNR 2007b). Although suitable habitat for the species exists within the proposed intake structure construction footprint for the two new units, relict trillium has not been identified through surveys, and it is unlikely that it occurs within the area proposed for disturbance. Therefore, the staff concludes that limited site-preparation activities for the proposed VEGP Units 3 and 4 are not likely to adversely affect relict trillium.

6.0 Conclusions

No Federally listed threatened or endangered species are known to occur at the VEGP site, with the exception of the American alligator. There are no areas designated or proposed as critical habitat for threatened and endangered species in the vicinity of the VEGP site.

The wood stork has been seen in the Savannah River Swamp within 3.2 km (2 mi) of the VEGP site. However, the closest wood stork colony is about 45 km (28 mi) from the site. The wood stork may occasionally use suitable habitat on the VEGP site for foraging or roosting. However, this species is highly mobile, and any impacts associated with the construction activities on the VEGP site would be negligible. Site-preparation activities for the new Units 3 and 4 would have no impact on known wood stork nesting, and these activities are not likely to alter foraging behavior of wood storks in the vicinity.

The red-cockaded woodpecker, relict trillium, and flatwoods salamander are not known to occur within 16 km (10 mi) of the VEGP site. Though suitable habitat may exist for these species onsite, it is not within the construction footprint. It is unlikely there is suitable habitat for the smooth coneflower and Canby's dropwort onsite. Therefore, there are no anticipated impacts on these species associated with limited site-preparation activities on the VEGP site.

The American alligator appears to be relatively common in the Savannah River near the VEGP site. Alligators may be displaced in the wetlands that would be temporarily disturbed or removed during construction, but there is ample wetland habitat in the vicinity. Therefore, there are no anticipated long-term effects to this species associated with the limited site-preparation activities.

The staff concludes that limited site-preparation activities for the proposed VEGP Units 3 and 4 are not likely to adversely affect the red-cockaded woodpecker, wood stork, relict trillium, smooth coneflower, Canby's dropwort, American alligator, or flatwoods salamander.

7.0 References

10 CFR Part 50. Code of Federal Regulations, Title 10, *Energy*, Part 50, “Domestic Licensing of Production and Utilization Facilities.”

10 CFR Part 51. Code of Federal Regulations, Title 10, *Energy*, Part 51, “Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions.”

10 CFR Part 52. Code of Federal Regulations, Title 10, *Energy*, Part 52, “Early Site Permits, Standard Design Certifications, and Combined Licenses for Nuclear Power Plants.”

40 CFR Part 122. Code of Federal Regulations, Title 40, *Protection of Environment*, Part 122, “EPA Administered Permit Programs: the National Pollutant Discharge Elimination System.”

35 FR 16047. October 13, 1970. “Conservation of Endangered Species and Other Fish or Wildlife.” *Federal Register*.

49 FR 7332. February 28, 1984. “U.S. Breeding Populations of the Wood Stork Determined to be Endangered.” *Federal Register*.

51 FR 6690. February 25, 1986. “Endangered and Threatened Wildlife and Plants: Determination of *Oxypolis Canbyi* (Canby’s dropwort) to be an Endangered Species.” *Federal Register*.

52 FR 21059. June 4, 1987. “Reclassification of the American Alligator to Threatened Status Due to Similarity of Appearance Throughout the Remainder of its Range.” *Federal Register*.

53 FR 10879. April 4, 1988. “Endangered and Threatened Wildlife and Plants: Determination of Endangered Status for the Relict Trillium.” *Federal Register*.

57 FR 46340. October 8, 1992. “Endangered and Threatened Wildlife and Plants: *Echinacea laevigata* (Smooth coneflower) Determined to be Endangered.” *Federal Register*.

64 FR 15691. April 1, 1999. “Endangered and Threatened Wildlife and Plants: Final Rule to List the Flatwoods Salamander as a Threatened Species.” *Federal Register*.

71 FR 58882. October 5, 2006. “Southern Nuclear Operating Company, Inc., Vogtle ESP Site; Notice of Intent to Prepare an Environmental Impact Statement and Conduct Scoping Process.” *Federal Register*.

72 FR 5856. February 7, 2007. "Endangered and Threatened Wildlife and Plants: Designation of Critical Habitat for the Flatwoods Salamander." *Federal Register*.

Clean Water Act (also called the Federal Water Pollution Control Act). 33 USC 1251, et seq.

Coulter M.C. and A.L. Bryan. 1993. "Foraging Ecology of Wood Storks (*Mycteria americana*) in East-Central Georgia I. Characteristics of Foraging Sites." *Colonial Waterbirds* 16(1): 59-70.

Eco-Sciences of Georgia (Eco-Sciences). 2007. "Jurisdictional Waters Report, Vogtle Electric Generating Plant." Found in *Southern Nuclear Operating Company, Vogtle Early Site Permit Application, Response to Requests for Additional Information on the Environmental Report*. Letter report from Southern Nuclear Operating Company (Birmingham, Alabama) to the U.S. Nuclear Regulatory Commission (Washington, D.C.). Accession number ML0760460323.

Endangered Species Act. 16 USC 1531, et seq.

Georgia Department of Natural Resources (GDNR). 1999. "A Conservation Plan for Red-Cockaded Woodpeckers (*Picoides borealis*) on Private Lands in Georgia." Georgia Department of Natural Resources, Wildlife Resources Division, Nongame/Natural Heritage Section, Nongame-Endangered Wildlife Program, Forsyth, Georgia. Available at http://www.jonesctr.org/conservation/monitoring_mapping/Gahcp11a.pdf. Accessed on August 7, 2007.

Georgia Department of Natural Resources (GDNR). 2007a. E-mail from Greg Krakow (Georgia Department of Natural Resources) to Amanda Stegen (Pacific Northwest National Laboratory, Terrestrial Ecology Scientist), regarding "Digital Rare Element Data for Pacific National Laboratory." Accession No. ML070851855.

Georgia Department of Natural Resources (GDNR). 2007b. Plant Vogtle Rare Plant Survey. Summary by Tom Patrick, Georgia Department of Natural Resources June 14, 2007. Accession No. ML072080264.

Georgia Power Company (GPC). 2007. *Corridor Study - Thomson Vogtle 500-kV Transmission Project*. Atlanta, Georgia. Accession No. ML070460368.

Natural Resources Conservation Service (NRCS). 1997. Troup Series. Accessed at <http://www2.ftw.nrcs.usda.gov/osd/dat/T/TROUP.html> on May 9, 2007.

Natural Resources Conservation Service (NRCS). 2002. Shellbluff Series. Accessed at <http://www2.ftw.nrcs.usda.gov/osd/dat/S/SHELLBLUFF.html> on May 9, 2007.

Natural Resources Conservation Service (NRCS). 2003a. *Soil Survey Geographic (SSURGO) Database for Burke County, GA*. USDA Natural Resources Conservation Service, National Cartography and Geospatial Center, Fort Collins, Colorado. Available at <http://SoilDataMart.nrcs.usda.gov>.

Natural Resources Conservation Service (NRCS). 2003b. Lucy Series. Accessed at <http://www2.ftw.nrcs.usda.gov/osd/dat/L/LUCY.html> on May 9, 2007.

Natural Resources Conservation Service (NRCS). 2003c. Tawcaw Series. Accessed at <http://www2.ftw.nrcs.usda.gov/osd/dat/T/TAWCAW.html> on May 9, 2007.

National Resource Spatial Analysis Laboratory (NRSAL). 2003. 1998 Vegetational Land Cover Map of Georgia. Institute of Ecology, University of Georgia, Athens, Georgia. Available at <http://www.gis.state.ga.us>.

Pacific Northwest National Laboratory (PNNL). 2006. *Vogtle Early Site Permit Site Audit Trip Report*. Accession No. ML071020517.

Patrick T.S., J.R. Allison, and G.A. Krakow. 1995. *Protected Plants of Georgia, an Information Manual on Plants Designated by the State of Georgia as Endangered, Threatened, Rare or Unusual*. Georgia Department of Natural Resources, Wildlife Resources Division, Georgia Natural Heritage Program. Available at <http://georgiawildlife.dnr.state.ga.us/assets/documents/trilre.pdf>

Petranka J. 1998. *Salamanders of the U.S. and Canada*. Smithsonian Institution Press, Washington, D.C.

South Carolina Department of Natural Resources (SCDNR). 2007. E-mail from Julie Holling (SCDNR) to Amanda Stegen (Pacific Northwest National Laboratory, Terrestrial Ecology Scientist) "Federal Threatened and Endangered Species in the Vicinity of Vogtle Electric Generating Plant," April 18, 2007. Accession No. ML071230462.

Southern Nuclear Operating Company, Inc. (Southern). 2006a. "Wildlife Habitat Council 2006 Recertification Application for Vogtle Electric Generating Plant." Found in *Southern Nuclear Operating Company, Vogtle Early Site Permit Application, Response to Requests for Additional Information on the Environmental Report*. Letter report from Southern Nuclear Operating Company (Birmingham, Alabama) to the U.S. Nuclear Regulatory Commission (Washington, D.C.). Accession No. ML0760460323.

Southern Nuclear Operating Company, Inc. (Southern). 2006b. *Southern Nuclear Operating Company, Vogtle Early Site Permit Application, Environmental Site Audit Information Needs*.

Letter Report from Southern Nuclear Operating Company (Birmingham, Alabama) to the U.S. Nuclear Regulatory Commission (Washington, D.C.). Accession No. ML063520382.

Southern Nuclear Operating Company, Inc. (Southern). 2007a. *Southern Nuclear Operating Company, Vogtle Early Site Permit Application: Environmental Report, Rev. 2*. Southern Company, Birmingham, Alabama.

Southern Nuclear Operating Company, Inc. (Southern). 2007b. Southern Nuclear Operating Company, Vogtle Early Site Permit Application, Response to Requests for Additional Information on the Environmental Report. Letter report from Southern Nuclear Operating Company (Birmingham, Alabama) to the U.S. Nuclear Regulatory Commission (Washington, D.C.). Accession No. ML0760460323.

Southern Nuclear Operating Company, Inc (Southern). 2007c. Early Site Permit Application for the Vogtle Electric Generating Plant. Part 4. Site Redress Plan, Revision 0. Southern Company, Birmingham, Alabama.

Southern Nuclear Operating Company, Inc. (Southern). 2007d. Vogtle Early Site Permit Application Environmental Site Audit Information Needs - Second Round. Letter Report AR-07-0924 from Southern Nuclear Operating Company (Birmingham, Alabama) to the U.S. Nuclear Regulatory Commission (Washington, D.C.), May 10, 2007. Accession No. ML071510102.

Third Rock Consultants, LLC (TRC). 2006. *Threatened and Endangered Species Survey Final Report. Vogtle Electric Generating Plant and Associated Transmission Corridors*. Lexington, Kentucky.

U.S. Fish and Wildlife (FWS). 1990a. *Canby's Dropwort Recovery Plan*. Atlanta, Georgia.

U.S. Fish and Wildlife Service (FWS). 1990b. *Recovery Plan for the Relict Trillium*. Atlanta, Georgia.

U.S. Fish and Wildlife Service (FWS). 1997. *Revised Recovery Plan for the U.S. Breeding Population of the Wood Stork*. Atlanta, Georgia.

U.S. Fish and Wildlife Service (FWS). 1999. Federally-Listed Species in South Carolina Counties. Accessed at <http://www.fws.gov/southeast/es/SCarolina.htm> on April 25, 2007

U.S. Fish and Wildlife Service (FWS). 2003a. *Recovery Plan for the Red-Cockaded Woodpecker (Picoides borealis)*. Second Revision. Atlanta, Georgia. 296 pp.

U.S. Fish and Wildlife (FWS). 2003b. *Wood Stork Report, A Newsletter Dedicated to Sharing Information about the Wood Stork*. Volume 2, Number 1, March 2003, Washington, D.C.

U.S. Fish and Wildlife Service (FWS). 2004a. Listed Species in Georgia Counties. Accessed at http://www.fws.gov/athens/endangered/counties_endangered.html on April 20, 2007.

U.S. Fish and Wildlife Service (FWS). 2004b. Georgia GIS Clearinghouse. Accessed at <http://gis1.state.ga.us/download.asp?dataID=39621> on December 11, 2006.

U.S. Fish and Wildlife Service (FWS). 2004c. USFWS Wetlands Open GIS Consortium (OGC) Web Map Services (WMS). Accessed at http://wetlandswms.er.usgs.gov/imf/imf.jsp?site=extract_tool&stateDD=SC&areaDD=Lower%2048%20USGS%2024K on May 8, 2007.

U.S. Fish and Wildlife Service (FWS). 2007a. Red-Cockaded Woodpecker. Accessed at <http://www.fws.gov/ncsandhills/rcw.htm> on April 4, 2007.

U.S. Fish and Wildlife Service (FWS). 2007b. Species Profile: Red-Cockaded Woodpecker (*Picoides borealis*). Accessed at <http://ecos.fws.gov/speciesProfile/SpeciesReport.do?sPCODE=B04F> on April 17, 2007

U.S. Fish and Wildlife Service (FWS). 2007c. Species Profile: Wood Stork (*Mycteria americana*). Accessed at <http://ecos.fws.gov/speciesProfile/SpeciesReport.do?sPCODE=B06O> on April 26, 2007.

U.S. Nuclear Regulatory Commission. 2007. *Draft Environmental Impact Statement for an Early Site Permit (ESP) at the Vogtle Electric Generating Plant Site*. NUREG-1872. Washington, D.C.

Walters J.R., P.D. Doerr, and J.H. Carter, III. 1988. "The Cooperative Breeding System of the Red-Cockaded Woodpecker." *Ethology* 78:275-305.

Wike L.D., F.D. Martin, E.A. Nelson, N.V. Halverson, J.J. Mayer, M.H. Paller, R.S. Riley, M.G. Serrato, and W.L. Specht. 2006. *SRS Ecology: Environmental Information Document*. WSRC-TR-2005-00201. Savannah River Site, Aiken, South Carolina.