

## Study Report

# Rare, Threatened, and Endangered Species

## Bartletts Ferry Hydroelectric Project FERC Project Number 485

Prepared with



March 2011

# Executive Summary

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A rare, threatened, and endangered species (RTE) study was conducted for Georgia Power Company's Bartletts Ferry Hydroelectric Project (FERC No. 485). The purposes of the study were to identify federally and state protected species, federal candidate species, and other species of concern with known records of occurrence in the three-county project vicinity and to describe the distributions and habitat use of RTE species presently occurring near the Project. The study area (or project area) included the FERC project boundary and a zone around Bartletts Ferry Reservoir extending 2,000 feet beyond the project boundary. Information was developed based on review of existing information and correspondence with the Georgia Department of Natural Resources (GDNR), Alabama Department of Conservation and Natural Resources, and U.S. Fish and Wildlife Service (FWS).

Presently there are no known occurrences of federally protected species within the Bartletts Ferry project boundary. However, there are recent occurrences of two federally protected species within the project area, including:

- Relict trillium (*Trillium reliquum*) – About 700 plants of endangered relict trillium were transplanted from Fort Benning, Georgia, to Blanton Creek Wildlife Management Area outside of the project boundary in 2010. The trillium are being protected on lands managed by GDNR under a memorandum of agreement signed by Georgia Power, Fort Benning, Callaway Gardens, FWS, and GDNR.
- Purple bankclimber (*Elliptioideus sloatianus*) – A single old individual of this threatened freshwater mussel species was found in 2000-2001 downstream of Bartletts Ferry Dam in the upper end of Goat Rock Reservoir. However, no evidence was found of a viable, reproducing population, and mussel surveys conducted in 2010 did not detect the species downstream of Bartletts Ferry Dam.

Six Georgia and/or Alabama state protected wildlife species are known from historical or recent occurrences within the project boundary. Two riverine species of fish, blueshiner (*Cyprinella callitaenia*) and highscale shiner (*Notropis hypsilepis*), and one mussel species, delicate spike (*Elliptio arctata*), have been found in the Riverview shoals area at the upstream end of the project. A single individual of spotted bullhead (*Ameiurus serracanthus*) was identified from the Bartletts Ferry tailrace area, an unusual occurrence in the Piedmont for a species known almost exclusively from the Coastal Plain. An established nesting pair of bald eagles (*Haliaeetus leucocephalus*) resides in a densely forested area near the upstream end of the Project. In addition, ospreys (*Pandion haliaetus*) currently use a nest platform constructed by Georgia Power on Bartletts Ferry Dam.

Two other fish species of special concern in Alabama and/or Georgia are presently known to occur within the project boundary. A population of shoal bass (*Micropterus cataractae*), a sport-fish species endemic to the Apalachicola-Chattahoochee-Flint River basin, presently occurs at the upstream end of the Project. In addition, the Apalachicola redhorse (*Moxostoma* sp.) is a fairly common inhabitant of the project waters and larger tributaries to the project reservoir.

# Contents

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<b>Executive Summary</b> .....	<b>ES-1</b>
<b>1.0 Introduction</b> .....	<b>1</b>
1.1 Objectives.....	1
1.2 Study Area.....	2
<b>2.0 Study Methods</b> .....	<b>3</b>
2.1 Review of Existing Information.....	3
2.2 Field Surveys.....	4
<b>3.0 Protected Species and Species of Concern</b> .....	<b>6</b>
3.1 Federally Protected Species.....	6
3.1.1 Little Amphianthus .....	6
3.1.2 Relict Trillium .....	7
3.1.3 Purple Bankclimber.....	7
3.1.4 Shinyrayed Pocketbook.....	8
3.1.5 Gulf Moccasinshell and Oval Pigtoe.....	8
3.2 Federal Candidate Species .....	9
3.2.1 Georgia Rockcress .....	9
3.2.2 White Fringeless Orchid.....	9
3.2.3 Georgia Aster .....	10
3.3 State Protected Plant Species .....	10
3.3.1 Croomia .....	10
3.3.2 Shoals Spiderlily .....	10
3.3.3 Allegheny Spurge.....	11
3.3.4 Plumleaf Azalea.....	11
3.3.5 Nevius Stonecrop .....	11
3.3.6 Silky Camellia .....	11
3.4 State Protected Wildlife Species .....	11
3.4.1 Chattahoochee Crayfish .....	12
3.4.2 Southern Elktoe .....	12
3.4.3 Delicate Spike.....	12
3.4.4 Spotted Bullhead .....	13
3.4.5 Bluestripe Shiner .....	13
3.4.6 Highscale Shiner.....	13
3.4.7 Broadstripe Shiner.....	14
3.4.8 Seal Salamander.....	14
3.4.9 Gopher Tortoise.....	14
3.4.10 Cooper’s Hawk.....	14
3.4.11 Bachman’s Sparrow .....	15
3.4.12 Common Ground-dove .....	15
3.4.13 American Kestrel.....	15
3.4.14 Bald Eagle .....	15
3.4.15 Osprey.....	16
3.4.16 Meadow Jumping Mouse.....	16

3.5	Other Species of Concern .....	16
3.5.1	Sculptured Pigtoe .....	17
3.5.2	Shoal Bass .....	17
3.5.3	Apalachicola Redhorse .....	17
<b>4.0</b>	<b>Summary .....</b>	<b>18</b>
<b>5.0</b>	<b>References .....</b>	<b>20</b>

**Table**

**1 Rare, Threatened, and Endangered Species with Known Records of Occurrence in the Bartletts Ferry Project Vicinity**

**Figures**

- 1 Project Vicinity in the Middle Chattahoochee River Basin
- 2 Project Boundary and Surrounding Area

# 1.0 Introduction

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This report presents the findings of the Rare, Threatened, and Endangered (RTE) Species Study conducted for the Federal Energy Regulatory Commission (FERC) relicensing of Georgia Power Company's (Georgia Power's) Bartletts Ferry Hydroelectric Project (FERC No. 485) (Bartletts Ferry Project, the Project). The study was conducted according to the approved study plan for the Bartletts Ferry Project. The approved study plan consists of Georgia Power's Revised Study Plan (Georgia Power, 2010) and the Study Plan Determination issued by FERC's Director of the Office of Energy Projects on March 17, 2010 (FERC, 2010). Georgia Power will use the information generated by the study to evaluate the environmental effects of its proposed action in the Preliminary Licensing Proposal, to be filed with FERC by November 21, 2011.

The Bartletts Ferry Project consists of a dam, two powerhouses, and a reservoir (also known as Lake Harding) located on the Chattahoochee River along the Georgia-Alabama border in Harris County, Georgia, and Lee and Chambers Counties, Alabama (Figure 1). Georgia Power operates the Project in a modified run-of-river mode. The Bartletts Ferry Project has an installed capacity of 173 megawatts. Georgia Power is not proposing to add capacity or make any major modifications to the Project under the new license. The Project does not occupy any federally owned lands. The current license expires on December 14, 2014.

Georgia Power proposes to continue operating the Bartletts Ferry Project as it is currently operated. The Pre-Application Document (PAD) describes the project facilities and current operations and summarizes information characterizing the affected environment (Georgia Power, 2009). Project operations are discussed further in the Project Operations and Drought Management Plan Study Report (Georgia Power, 2011a) and the Bartletts Ferry Operations Primer (Georgia Power, 2009, 2011b). Scoping Document 2 (FERC, 2009) summarizes the environmental issues identified during FERC's public scoping process pursuant to the National Environmental Policy Act.

## 1.1 Objectives

The specific study objectives were to:

- List federal and state RTE plant and animal species with known records of occurrence near the Project.
- Identify their habitat requirements.
- Describe distributions and habitat use of RTE species presently occurring near the Project.

Information compiled in the PAD was analyzed and updated in this report based on the findings of field surveys and the collection of new information.

## 1.2 Study Area

The study area (or project area) included lands and waters within the FERC project boundary, generally defined by the 525-foot (ft) plant datum (PD)<sup>1</sup> elevation contour around Bartletts Ferry Reservoir (Lake Harding) and including project lands adjacent to Bartletts Ferry Dam (Figure 2). Approximately 2,480 acres (ac) of lands are located inside the project boundary between the normal full pool elevation of 521 ft PD and the FERC project boundary.

The study area also included a zone around the project reservoir extending 2,000 ft beyond the FERC project boundary. This area was included to encompass a conservatively large area for evaluating potential project effects, although current operations and maintenance do not involve activities that directly affect upland terrestrial habitats outside of the project boundary.

Georgia Power leases 4,758 ac of non-project lands (i.e., lands located outside of the FERC project boundary) adjacent to project lands to the Georgia Department of Natural Resources (GDNR) for use as Blanton Creek Wildlife Management Area (WMA) (Figure 2). The study area included that portion of Blanton Creek WMA within the 2,000-ft zone around the FERC project boundary.

The study area was located entirely within the Chattahoochee River basin, which is part of the larger Apalachicola-Chattahoochee-Flint (ACF) River basin. The study area also is referred to herein as the “project area” because it includes land and waters within and adjacent to the project boundary.

The term “project vicinity” used herein refers to the three-county area surrounding the project, including Harris County, Georgia and Chambers and Lee Counties, Alabama.

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<sup>1</sup> Plant datum = Mean Sea Level + 0.84 ft.

## 2.0 Study Methods

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The study approach followed the approved study plan (Georgia Power, 2010; FERC, 2010) and consisted of the elements described below.

### 2.1 Review of Existing Information

A tabular listing of RTE species with known records of occurrence (historical or present) within the three-county area surrounding the Bartletts Ferry Project (Harris County, Georgia; Lee and Chambers Counties, Alabama), the federal or state status of these species, their habitat requirements, and county of known occurrence was prepared. The listing was based on review of existing information sources and renewed correspondence and contacts with the GDNR, Alabama Department of Conservation and Natural Resources (ADCNR), and U.S. Fish and Wildlife Service (FWS).

Key sources of information included but were not limited to the following:

- The Nongame Conservation Section (NCS) of GDNR's Wildlife Resources Division (WRD), which maintains an on-line database of element occurrences and species accounts for protected species and tracking information for special concern species in Georgia ([www.georgiawildlife.com](http://www.georgiawildlife.com)) (GDNR, 2010)
- Correspondence from NCS listing known occurrences of RTE species in Georgia within a 3-mile radius of the project site (K. Morris, GDNR, April 21, 2010 letter to T. Dodd, Georgia Power)
- Correspondence from ADCNR's Natural Heritage Section providing lists of federally listed and state protected species that are believed to occur in Lee and Chambers Counties, Alabama (A. Peters, ADCNR, April 1, 2010 letter to T. Dodd, Georgia Power)
- Correspondence from FWS' Georgia Ecological Services Field Office (A. Lawrence, FWS, April 9, 2010 e-mail to T. Dodd, Georgia Power) and review of FWS county occurrence lists available on-line from the Georgia ([www.fws.gov/athens](http://www.fws.gov/athens)) and Alabama Ecological Services Field Offices ([www.fws.gov/daphne/es/specieslist.html](http://www.fws.gov/daphne/es/specieslist.html)) (FWS, 2004, 2010a)
- The Alabama Natural Heritage Program (ANHP) on-line rare species database ([http://www.alnhp.org/submit\\_query.php](http://www.alnhp.org/submit_query.php)) (ANHP, 2011a, 2011b) and the ANHP (2010) inventory list, which tracks the RTE plant and animal species of Alabama
- The FWS (2010b) annual review of native species that are candidates for listing as federally threatened or endangered
- The FWS Endangered Species Program on-line database, which provides species profiles of federally listed and candidate species and links to associated listing information, critical habitat designations, and recovery plans (<http://www.fws.gov/endangered/>)

- The FWS recovery plan (Butler et al., 2003), critical habitat designation (FWS, 2007a), and recent 5-year review (FWS, 2007b) for federally protected species of freshwater mussels known from the ACF River basin
- NatureServe Explorer, an on-line database of current information on the conservation status, distribution, and life history of RTE species (<http://www.natureserve.org/explorer/>) (NatureServe, 2010)
- *Alabama Wildlife* volumes published for ADCNR's Comprehensive Wildlife Conservation Strategy (Mirarchi, 2004; Mirarchi, Garner, et al., 2004; Mirarchi, Bailey, et al., 2004), which provide information on Alabama species of conservation concern
- Manuals on Georgia's rare plants (Patrick et al., 1995; Chafin, 2007) and protected animals (GDNR, 1999)
- Scientific literature, including publications and texts on the distribution and habitat use of native species of freshwater mussels (Williams et al., 2008; Brim Box and Williams, 2000) and fish (Boschung and Mayden, 2004; Mettee et al., 1996) in the ACF River basin

## 2.2 Field Surveys

A reconnaissance-level field survey of the study area was conducted in April 2010 to observe representative terrestrial, wetland, and riparian habitats and to identify potentially suitable habitats for RTE species of plants and wildlife. This survey was conducted concurrently with surveys of wildlife and botanical resources and wetlands, riparian, and littoral habitats, the findings of which are documented in separate Study Reports (Georgia Power, 2011c, d).

The field reconnaissance survey was timed to coincide with flowering times of several RTE plant species having the potential to occur in the study area. Pedestrian surveys were conducted on April 26 to 28 by Georgia Power biologist Jim Candler, Georgia Power forester Kym Partridge, and CH2M HILL biologist Rich Reaves. Shoreline and wetland communities were surveyed from boats on April 26 to 28 by Georgia Power biologists Tom Broadwell and Tony Dodd and CH2M HILL biologists Betsy Jorgensen and Josh Jamell.

Field surveys were conducted according to the following methods:

- Existing topographic maps, National Wetlands Inventory maps, and recent aerial photography were inspected prior to the survey to identify areas of representative community types and potentially suitable habitat for protected species of interest.
- Surveys were conducted by biologists visually assessing habitats along and landward of the shoreline from a boat and walking on Georgia Power and public lands during spring to coincide with flowering times of spring ephemeral vegetation.
- Areas inaccessible by boat or from public lands within the project area were evaluated by inspecting existing aerial photography.
- Field notes were recorded for dominant vegetative cover classes, unique or unusual habitat types, observations of bird, reptile, amphibian, and mammal species, and

evidence of wildlife (nests, tracks, scat, etc.). Particular attention was paid to any areas of potentially suitable habitat as determined by field observation.

Initial surveys identified one spring-seep wetland located outside of the project boundary containing potentially suitable habitat for white fringeless orchid (or monkeyface orchid) (*Platanthera integrilabia*), a federal candidate species. This wetland was resurveyed on August 11, 2010 during the species' flowering period (mid-July to late August) (Patrick et al., 1995). The timing of the survey was coordinated with GDNR botanist Tom Patrick. The entire wetland was walked by biologists Jim Candler, Rich Reaves, and forester Kym Partridge. No other potentially suitable habitats for RTE plant species were observed within the project area and, therefore, no additional season-specific plant surveys were conducted.

The analysis of RTE aquatic species in this report considered the results of the fall 2009 freshwater mussel survey and the 2010 freshwater mussel and fish surveys conducted by Georgia Power. These surveys were conducted according to the approved study plan and are documented in the separate Fish and Aquatic Resources Study Report (Georgia Power, 2011e).

## 3.0 Protected Species and Species of Concern

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Thirty-one state and/or federally protected species and federal candidate species of plants and wildlife potentially occur in the three-county project vicinity based on known element occurrence records (historical or present) or species range and habitat data suggesting the potential for species occurrence. Table 1 provides brief habitat descriptions for each of these species and for 17 other species of concern potentially occurring in the project vicinity, including special concern plant and animal species in Georgia (GDNR, 2010) and animal species of high or highest conservation concern in Alabama (Mirarchi, 2004).

The following sections evaluate the present or potential use of habitats within the project area by federally or state protected species and federal candidate species. State species of concern are also discussed where field observations, survey data, or other information were readily available on their occurrence within the project area.

### 3.1 Federally Protected Species

Six federally threatened and endangered species potentially occur within the project vicinity (Table 1). These include two plants and four freshwater mussels:

- Little amphianthus (or pool sprite) (*Amphianthus pusillus*) – threatened
- Relict trillium (*Trillium reliquum*) – endangered
- Purple bankclimber (*Elliptoideus sloatianus*) – threatened
- Shinyrayed pocketbook (*Hamiota subangulata*) – endangered
- Gulf moccasinshell (*Medionidus penicillatus*) – endangered
- Oval pigtoe (*Pleurobema pyriforme*) – endangered

Currently there are no known occurrences of federally protected species within the Bartletts Ferry project boundary. However, there are recent occurrences of two federally protected species within the project area: a newly transplanted population of endangered relict trillium in Blanton Creek WMA; and a threatened purple bankclimber (mussel) in the Chattahoochee River about 0.3 mile downstream of the Project (as discussed below).

#### 3.1.1 Little Amphianthus

Little amphianthus, a federally threatened plant, is a diminutive annual aquatic herb. It occurs in the Piedmont exclusively in shallow, flat-bottomed depressions on granitic (granite or metamorphosed granite) outcrops, where vernal pools form after rainfall (Patrick et al., 1995; Chafin, 2007). The species flowers from March to April and plants are visible in the spring. Currently, Harris County supports a limited population at one to five pools, and Chambers County supports a population at one pool (FWS, 2008). Because the species' habitat is so distinctive, nearly all known populations were discovered prior to publication of the recovery plan in 1993 (FWS, 2008). Granitic outcrops supporting vernal pool species are not known to occur within the Bartletts Ferry project area. The species' preferred granitic outcrop habitat was not encountered during the April 2010 field survey and is unlikely to occur within the project area; hence, the species was not detected.

### 3.1.2 Relict Trillium

Relict trillium, a federally endangered plant, is a perennial herb that inhabits mature mesic hardwood forests in deep soils having high organic matter content, typically in rich ravines or floodplain terraces close to creeks or rivers (Patrick et al., 1995; Chafin, 2007; NatureServe, 2010). The largest and most vigorous populations are known from the Lower Piedmont-Fall Line hills region in the Chattahoochee and Savannah River basins (NatureServe, 2010). Relict trillium in Georgia flowers from mid-March through April.

No relict trillium were detected in the species' preferred habitat, minimally disturbed alluvial forests, within the project boundary during the April field reconnaissance survey.

Relict trillium presently occurs as a newly transplanted population in Blanton Creek WMA (Figure 2), within the project area but outside of the FERC project boundary. In cooperation with Georgia Power, GDNR biologists transplanted approximately 700 plants from Fort Benning, Georgia into a rich, mesic hardwood forest area in the WMA in early spring 2010. The plants were displaced by the expansion of Fort Benning. The transplant site in Blanton Creek WMA is located several hundred feet outside of the project boundary at an elevation about 25 ft higher than the normal full pool of Bartletts Ferry Reservoir. The trillium were observed during the field reconnaissance survey and their survival since transplant was visually estimated at over 95 percent. The trillium were planted in multiple rows, and are expected to start spreading mostly downhill, although ants disperse trillium seeds and they can spread in any direction. This part of the WMA will be protected from timber harvesting or future development to comply with the memorandum of agreement signed in January 2010. Georgia Power, Fort Benning, Callaway Gardens, FWS, and GDNR signed the memorandum of agreement to protect these plants in perpetuity.

### 3.1.3 Purple Bankclimber

The purple bankclimber, a federally threatened mussel, is endemic to the ACF River basin, where it is known primarily from the main channels of the Apalachicola and Flint Rivers (Williams et al., 2008; Brim Box and Williams, 2000). The species prefers sand, fine gravel, or muddy sand substrates in moderate current. The species often is found in waters over 3 meters deep in the main channels of rivers. It can be locally abundant in the Flint and Apalachicola Rivers. A few old individuals have been found in reservoirs, but the species does not appear to reproduce in impounded waters (Williams et al., 2008).

The purple bankclimber presently is known from the Chattahoochee River only in the tailwater area of Bartletts Ferry Dam (FWS, 2007a; Williams et al., 2008), downstream of the project boundary in the upstream end of Goat Rock Reservoir (Georgia Power, 2009). A single live specimen was collected there in 2000, the first time the species was recorded from the Chattahoochee River in 150 years (FWS, 2000). The same specimen was recaptured in 2001 during an intensive survey of Goat Rock Reservoir under drawdown conditions; however, no other live individuals or relic shells of purple bankclimber were found among 579 native mussels (Zuiderveen et al., 2002; Georgia Power, 2002). This single large and presumably old specimen, and the lack of continuously flowing riverine habitat associated with all known viable populations, indicated to FWS (2007a) that there was little or no possibility of a reproducing population at this locality. Thus, the Chattahoochee River was not included in the critical habitat designation for the species (FWS, 2007a). The nearest

known viable purple bankclimber population occurs in the Apalachicola River in Florida, about 170 river miles downstream of, and eight dams removed from, the Project.

The mussel surveys conducted by Georgia Power in 2010 in the Bartletts Ferry tailrace area and in the Riverview shoals area at the upstream end of Bartletts Ferry Reservoir did not detect the occurrence of the purple bankclimber within the project boundary (Georgia Power, 2011e). In addition, no live individuals or relic shells of purple bankclimber were found in the tailwater reach downstream of the project boundary, where the single old individual was found in 2000 and 2001.

### **3.1.4 Shinyrayed Pocketbook**

The shinyrayed pocketbook, a federally endangered mussel, is endemic to eastern Gulf Coast drainages, including the ACF River basin, where it historically occurred in the main channel and tributaries of the Chattahoochee River (Brim Box and Williams, 2000). The species inhabits medium creeks to large rivers with slow to moderate current and various combinations of clay, sand, and gravel substrates (Williams et al., 2008). The species apparently no longer occurs in the Chattahoochee River main stem, although a relic shell was found in the river in 1999 (Butler et al., 2003; A. Lawrence, FWS, personal communication, March 25, 2009). The nearest known extant population of shinyrayed pocketbook to the Bartletts Ferry Project occurs in Uchee Creek, an Alabama tributary to the Chattahoochee River (Butler et al., 2003; FWS, 2007b). Uchee Creek enters Walter F. George Reservoir below the Fall Line, about 36 river miles downstream of, and five dams removed from, the Project.

There are no known viable populations of shinyrayed pocketbook presently occurring in the vicinity of the Bartletts Ferry Project. No live or shell material of the shinyrayed pocketbook was found during an intensive 2001 survey of the upper Goat Rock Reservoir just downstream of Bartletts Ferry Dam, an effort involving 177 surveyor hours over a 2-day draw-down period (Zuiderveen et al., 2002). In addition, the mussel surveys conducted by Georgia Power in 2010 in the Bartletts Ferry tailrace area and in the Riverview shoals area at the upstream end of the Project did not detect any live individuals or relic shells of shinyrayed pocketbook (Georgia Power, 2011e).

### **3.1.5 Gulf Moccasinshell and Oval Pigtoe**

The Gulf moccasinshell and oval pigtoe, mussels both endemic to the ACF River basin and now endangered, historically occurred in the main channel and tributaries of the Chattahoochee River in the Fall Line area; however, both species appear to be extirpated from the main channel of the Chattahoochee River and from historical tributary sites in the Fall Line area of Georgia and Alabama (Brim Box and Williams, 2000; Williams et al., 2008). Neither species is expected to presently occur in the project vicinity. Historical records indicate that Gulf moccasinshell was once abundant in the Flint River and the Chipola River (tributary to Apalachicola River) but was scarce elsewhere (Brim Box and Williams, 2000). Most historical records of the oval pigtoe are from tributaries to mainstem rivers (Brim Box and Williams, 2000).

The nearest known extant populations of Gulf moccasinshell and oval pigtoe in the Chattahoochee River basin occur in tributaries in southwest Georgia, about 115 river miles downstream and seven dams removed from the Project near the Florida border (Butler et al.,

2003; FWS, 2007b). FWS (2007a) did not designate any critical habitat for these species in the mainstem of the Chattahoochee River or in the vicinity of the Bartletts Ferry Project.

Neither the 2001 mussel survey of the upper Goat Rock Reservoir (Zuiderveen et al., 2002) nor the 2010 mussel surveys conducted by Georgia Power (2011e) detected the occurrence of any live individuals or relic shells of Gulf moccasinshell or oval pigtoe within the project area.

## 3.2 Federal Candidate Species

Three federal candidate species, all plants, potentially occur in the project vicinity (Table 1):

- Georgia rockcress (*Arabis georgiana*)
- White fringeless orchid (or monkeyface orchid) (*Platanthera integrilabia*)
- Georgia aster (*Symphyotrichum georgianum*)

None of these species are presently known to occur within the Bartletts Ferry project area.

### 3.2.1 Georgia Rockcress

Georgia rockcress is a perennial herb found in dry shallow soils on rocky bluffs (limestone, shale, granite-gneiss) and slopes along water courses. It also is found in sandy loam along eroding riverbanks (Patrick et al., 1995; Chafin, 2007). Flowering occurs from March to April (Chafin, 2007). Currently, 17 populations are known from the Coastal Plain, Piedmont, and Ridge and Valley provinces of Alabama and Georgia (FWS, 2010c). The only extant population known in the Piedmont is also the largest population in Georgia (about 1,000 flowering stems), located about 6 river miles downstream of Bartletts Ferry on rocky outcrops above the Chattahoochee River in Harris and Muscogee Counties near Goat Rock Dam (FWS, 2010c). Georgia Power owns this land at Goat Rock and protects it for Georgia rockcress and Nevius stonecrop (*Sedum nevii*), another Georgia threatened species restricted to river bluffs (Table 1), through the FERC license conditions for the Middle Chattahoochee Project.

Georgia rockcress was not detected on the exposed bedrock surfaces below Bartletts Ferry Dam within the project area during the April 2010 field reconnaissance survey. No other potentially suitable habitat was encountered.

### 3.2.2 White Fringeless Orchid

White fringeless orchid is a perennial herb with an erect stem up to 4 ft tall that grows in seasonally wet, perched, sandy, springhead swamps dominated by red maple (*Acer rubrum*) and blackgum or swamp tupelo (*Nyssa biflora*) (Patrick et al., 1995; Chafin, 2007). Flowering occurs from mid-July to late August (Patrick et al., 1995). Alabama currently is known to support eight populations of white fringeless orchid and Georgia supports eight populations, but none are found in Harris, Chambers, or Lee Counties (FWS, 2010d).

White fringeless orchid was not found during the April and August 2010 field surveys. Although the April survey identified one area containing potentially suitable habitat, a spring-seep wetland located outside of the project boundary, a resurvey of the entire wetland on August 11 (during the flowering period) did not detect any orchids.

### 3.2.3 Georgia Aster

Georgia aster is a perennial herb forming colonies by underground stems (Chafin, 2007). It inhabits dry oak-pine flatwoods and uplands and other early successional habitats in Alabama, Georgia, and the Carolinas (FWS, 2010e). Flowering in Georgia occurs from late September to mid-November (Chafin, 2007). Most populations grow next to roads, in utility rights-of-way, and other open areas where vegetation maintenance practices (e.g., burning, mowing) mimic natural disturbance. Georgia aster is presumed to occur in 8 Alabama counties and 22 Georgia counties (FWS, 2010e). A population is known to occur downstream of the Bartletts Ferry Project within the Goat Rock development of the Middle Chattahoochee Project in Harris County.

Georgia aster was not detected during the 2010 field surveys, although potentially suitable habitat could be present in maintained rights-of-way in the project area outside of the project boundary.

## 3.3 State Protected Plant Species

Six other Georgia protected plant species potentially occur in the project vicinity, including four listed as state threatened and two as rare (Table 1). State protected plants in Georgia are listed as endangered, threatened, rare, or unusual, in descending order of scarcity. Alabama does not have a state law affording protection to state rare plants.

None of the following species are presently known to occur within the project area.

### 3.3.1 Croomia

Croomia (*Croomia pauciflora*), a Georgia threatened species, is a perennial herb with an erect stem about 6 inches tall. It occurs in patches of plants connected by underground stems (Chafin, 2007) and inhabits rich, moist, deciduous forests in ravines and on river bluffs. Croomia flowers in April and May. About 15 populations are currently known in Georgia (Chafin, 2007). One known occurrence is located approximately 3 miles north of the Bartletts Ferry Project (K. Morris, GDNR, April 21, 2010 letter to T. Dodd, Georgia Power). The species presently occurs in Blanton Creek WMA outside of the project area (T. Patrick, GDNR, personal communication, August 7, 2010). Croomia is known to occur in Chambers and Lee Counties but is not state protected in Alabama (ANHP, 2010). Croomia was not detected within the Bartletts Ferry project area during the 2010 field reconnaissance survey.

### 3.3.2 Shoals Spiderlily

Shoals spiderlily (*Hymenocallis coronaria*), a Georgia threatened species, is a perennial herb that inhabits broad, rocky shoals in the Fall Line area of Georgia, central Alabama, and South Carolina (Patrick et al., 1995). Flowering occurs from mid-May to June. A sizeable population of shoals spiderlily presently occurs in Flat Shoals Creek, which is a tributary entering the upper end of Bartletts Ferry Reservoir (Figure 1), in Harris County upstream of the project boundary and the project area (RedOrbit News, 2008). In 1992, shoals spiderlily was found in one small clump of shoal habitat about 400 ft downstream of the Riverview powerhouse at the upstream end of the Bartletts Ferry Project (FERC, 1993). A small occurrence of the species also has been documented about 14 river miles downstream of Bartletts Ferry in bedrock crevices below Oliver Dam (Georgia Power, 2002).

The long, strap-like leaves of shoals spiderlilies were not detected in shoal habitats observed within the Bartletts Ferry project area during the April 2010 field surveys. The species potentially occurs in the Riverview shoals area below Riverview Diversion Dam upstream of the project boundary (Figure 2). However, its occurrence could be precluded or limited there by daily flow fluctuations that result from the peaking operations of upstream West Point Dam (Figure 1). Spiderlilies are sensitive to altered stream flow regimes (Patrick et al., 1995).

### 3.3.3 Allegheny Spurge

Allegheny spurge (*Pachysandra procumbens*), a Georgia rare species, is a perennial herb which inhabits moist hardwood forests with soils high in calcium (Chafin, 2007). It flowers in late March and April. Six populations have been observed in Georgia but only four are believed to be extant, all on private land (Chafin, 2007). Allegheny spurge was not detected in the project area during the 2010 field surveys.

### 3.3.4 Plumleaf Azalea

Plumleaf azalea (*Rhododendron prunifolium*), a Georgia threatened species, is a shrub which typically grows 7 to 10 ft tall and inhabits moist soils of rich hardwood forest ravines and wet, sandy streambanks (Patrick et al., 1995; Chafin, 2007). Flowering occurs in July and August. Fewer than 40 populations are known in Georgia, and most occur in state parks (Chafin, 2007). The species is known to occur in Lee County but is not state protected in Alabama (ANHP, 2010). Plumleaf azalea was not detected in the project area during the 2010 field surveys.

### 3.3.5 Nevius Stonecrop

Nevius stonecrop (*Sedum nevii*), a Georgia threatened species, is a perennial, low, succulent, mat-forming herb that grows in shallow soil pockets on steep bluffs of granitic gneiss above the Chattahoochee River (Patrick et al., 1995; Chafin, 2007). Flowering occurs in May and June. Only four populations of nevius stonecrop are known in Georgia, and three are protected by a management agreement with Georgia Power. One of these populations is located about 6 river miles downstream of Bartletts Ferry near Georgia Power's Goat Rock Dam. Nevius stonecrop was not detected in the Bartletts Ferry project area during the 2010 field surveys and no potentially suitable habitat was encountered.

### 3.3.6 Silky Camellia

Silky camellia (*Stewartia malacodendron*), a Georgia rare species, is a shrub or small tree that grows to 19 ft tall (Chafin, 2007). It inhabits rich ravine and slope forests and lower slopes of sandhills above bogs and creeks, mostly in the Coastal Plain and rarely in the Piedmont foothills (Patrick et al., 1995). Silky camellia was not detected during the 2010 field surveys, and it is unlikely that suitable habitat occurs within the project area.

## 3.4 State Protected Wildlife Species

Sixteen state protected wildlife species potentially occur in the project vicinity, including one crayfish, two mussels, four fish, one amphibian, one reptile, six birds, and one mammal (Table 1). State protected animals in Georgia are listed as endangered, threatened, rare, or

unusual. Alabama regulations afford “state protected” status to some nongame wildlife and invertebrate species.

Six of these state protected wildlife species are known from recent or current occurrences within the project boundary, including one mussel (delicate spike), three fish (bluestripe shiner, highscale shiner, spotted bullhead) and two birds (bald eagle and osprey).

### 3.4.1 Chattahoochee Crayfish

The Chattahoochee crayfish (*Cambarus howardi*) is a Georgia threatened species and a Priority 2 (P2) species of high conservation concern in Alabama. In the Chattahoochee River basin, it ranges from seven Georgia counties in the upper portion of the basin, not including Harris County, to the Halawakee Creek system in Lee County, Alabama (GDNR, 2009; NatureServe, 2010; ANHP, 2010). Halawakee Creek is a tributary to Bartletts Ferry Reservoir (Figure 1). Chattahoochee crayfish inhabit moderate to swiftly flowing, clear streams with rocky substrate, often in riffle habitat. Thus, while the species could occur in the lower free-flowing reach of Halawakee Creek near the project boundary, it may be limited to clean, free-flowing riffles located farther upstream in the system beyond the influence of normal fluctuations of Bartletts Ferry Reservoir. The crayfish was not detected during the 2010 field surveys.

### 3.4.2 Southern Elktoe

The southern elktoe (*Alasmidonta triangulata*), a Georgia endangered species, is endemic to the ACF River basin, where it historically occurred in all of the major rivers (Brim Box and Williams, 2000). Today it is very rare in the Chattahoochee River basin. It no longer occurs in the main channel of the Chattahoochee River and is found only in the Uchee Creek system of Alabama, where it is rare. The southern elktoe was not detected in the Bartletts Ferry project area during the 2001 mussel survey of the upper Goat Rock Reservoir (Zuiderveen et al., 2002) or during the 2010 mussel surveys conducted by Georgia Power (2011e).

### 3.4.3 Delicate Spike

The delicate spike (*Elliptio arctata*), a Georgia endangered species, historically occurred in main channels and tributaries of rivers in the ACF River basin (Brim Box and Williams, 2000). The species is found primarily in moderate current in crevices among and under large rocks, on fine gravel and sand substrates, or among roots in beds of vegetation (Brim Box and Williams, 2000; Williams et al., 2008). A single live specimen of delicate spike was found within the project boundary at the upstream end of the Project during the 2010 Georgia Power mussel surveys (Georgia Power, 2011e). In addition, a single live specimen of delicate spike was found during an intensive survey of the upper reach of Goat Rock Reservoir (downstream of the Bartletts Ferry project boundary) in 2001 (Zuiderveen et al., 2002). The specimen was found in shallow water along the Georgia side of the river. The delicate spike also is tracked by ADCNR as a Priority 1 (P1) species of highest conservation concern in Alabama. The mussel surveys conducted by Georgia Power in 2010 did not detect any live individuals or relic shells of the delicate spike downstream of Bartletts Ferry Dam (Georgia Power, 2011e).

### 3.4.4 Spotted Bullhead

Spotted bullhead (*Ameiurus serracanthus*), a Georgia rare species, occurs in the eastern Gulf Coastal Plain, including the lower Chattahoochee River basin (Boschung and Mayden, 2004; Mettee et al., 1996; NatureServe, 2010). It typically inhabits large streams and rivers with moderate current and rocky or sandy substrates. Georgia Power's 2010 fishery survey collected one bullhead individual in the Bartletts Ferry tailrace area within the project boundary that was identified as spotted bullhead (Georgia Power, 2011e). This occurrence, located in the Piedmont upstream of the Fall Line, would be unusual in that spotted bullhead is known to occur almost exclusively in the Coastal Plain below the Fall Line (Mettee et al., 1996; Boschung and Mayden, 2004), although historical records show an occurrence in Halawakee Creek upstream of the Project (Boschung and Mayden, 2004).

### 3.4.5 Bluestripe Shiner

Bluestripe shiner (*Cyprinella callitaenia*), a Georgia rare species, is endemic to the ACF River basin where it is found in large creeks and rivers with moderate flow and sandy or rocky substrates, and in some backwater habitats (Boschung and Mayden, 2004; Mettee et al., 1996; Shepard et al., 1995). Bluestripe shiners were found in the 1990s within the project boundary in the Riverview shoals area at the upstream end of the project and in the upper reach of the project reservoir next to Johnson Island (WWETCO, 2002; EA Engineering, Science, and Technology, Inc. [EAEST], 1992). Historical and some 1990s collections also have documented small numbers of the species from stream habitats upstream of the project boundary in Flat Shoals and Mountain Oak Creeks in Georgia (WWETCO, 2002), and Halawakee Creek in Alabama (Shepard, 1995; Walser et al., 2000; Maceina et al., 2007) (Figure 1). Johnston and Maceina (2008) surveyed Halawakee Creek in 2005 and 2006 and did not find any bluestripe shiners at known historical collection sites. They associated the species decline in this and other Alabama tributaries with changing land use and habitat degradation in the upstream watersheds. However, two individuals were collected in Osanippa Creek during sampling conducted in July 2009 for the Alabama state-wide Index of Biotic Integrity project (Henderson, 2009).

The 2010 fishery surveys conducted by Georgia Power, which included the lower free-flowing reaches of larger tributaries entering Bartletts Ferry Reservoir and the Bartletts Ferry tailrace area, did not detect the bluestripe shiner (Georgia Power, 2011e).

### 3.4.6 Highscale Shiner

Highscale shiner (*Notropis hypsilepis*), a Georgia rare species, is found in the ACF River basin above the Fall Line, where it inhabits small to large streams over sandy or rocky substrates (Boschung and Mayden, 2004; Mettee et al., 1996). Populations are generally small, and recent collections indicate fewer populations and declining numbers (Boschung and Mayden, 2004). One individual of highscale shiner was collected during four seasonal surveys of the Riverview shoals area in 1998 to 2000 within the project boundary at the upstream end of the Project (WWETCO, 2002). Historical and some recent collections also have documented the species from free-flowing stream habitats upstream of the project boundary in Flat Shoals Creek (WWETCO, 2002), Mountain Oak Creek (Walser et al., 2000), Osanippa Creek (Maceina et al., 2007), and Halawakee Creek (Walser et al., 2000; Maceina et al., 2007). The 2010 fishery surveys conducted by Georgia Power did not detect the species in the lower reaches of larger tributaries entering the project boundary (Georgia Power, 2011e).

### 3.4.7 Broadstripe Shiner

The broadstripe shiner (*Pteronotropis euryzonus*), a Georgia rare species and Alabama P2 species, is endemic to the middle Chattahoochee River basin in Alabama and Georgia, where it is found mainly below the Fall Line in the Coastal Plain. The broadstripe shiner is known from only eight localities in Georgia and is restricted in Alabama to Chattahoochee River tributaries from Uchee Creek south in the watershed (Mirarchi, Bailey, et al., 2004). The species typically inhabits relatively undisturbed small headwater creeks or spring-fed habitats, sometimes with tannin-stained water. It is usually associated with aquatic vegetation (Mettee et al., 1996; Boschung and Mayden, 2004). The Bartletts Ferry project area is located in the Piedmont rather than the Coastal Plain and lacks such habitats. The species was not collected during the 2010 fishery surveys (Georgia Power, 2011e).

### 3.4.8 Seal Salamander

The seal salamander (*Desmognathus monticola*), an Alabama state protected species, occurs in mountain streams and high- to moderate-gradient rock streams in wooded ravines or seepages (NatureServe, 2010). Historical occurrences are known from Chambers and Lee Counties (ANHP, 2010). Potentially suitable habitat for seal salamander, if present in the project area, would likely be limited to unimpounded, wooded streams located upstream of the project boundary. The species was not observed in creek habitats searched during the April 2010 field reconnaissance survey.

### 3.4.9 Gopher Tortoise

The gopher tortoise (*Gopherus polyphemus*), an Alabama state protected species and P2 species of high conservation concern, ranges in the southeastern U.S. from South Carolina to Louisiana. Although still common in parts of its range, this terrestrial tortoise species is in substantial decline in other areas, resulting in its “partial status” as a federally listed species (Table 1). The gopher tortoise is not federally protected in the Bartletts Ferry project vicinity but is listed as federally threatened west of the Mobile and Tombigbee Rivers in western Alabama, Mississippi, and Louisiana. In Georgia, large populations occur in the western Fall Line Sand Hills in the Coastal Plain (NatureServe, 2010). Gopher tortoises excavate deep burrows in well-drained, deep sandy soils having a relatively open canopy, which allows for deep burrows necessary for thermoregulation, nesting, and shelter (Mirarchi, Bailey, et al., 2004). No suitably deep, sandy soils for gopher tortoise burrows were observed during the field reconnaissance survey. Project area soils are characterized by a predominance of clay and shallow rock.

### 3.4.10 Cooper’s Hawk

Cooper’s hawk (*Accipiter cooperi*), an Alabama state protected species, is a medium-sized raptor that is widely distributed across North America (NatureServe, 2010). It occurs primarily in mature forests, open woodlands, forest edges, and river gorges (Peterson and Peterson, 2002). Potentially suitable habitat for Cooper’s hawk occurs in upland habitats in the project area. The species has been sighted in the project vicinity during Columbus Audubon Society Christmas bird counts and during annual breeding bird surveys conducted by the U.S. Geological Survey (USGS) in east-central Chambers County (Lanett, Alabama survey route) (Sauer et al., 2008) (see Wildlife and Botanical Resources Study Report). Cooper’s hawk was not detected during the April 2010 field reconnaissance survey.

### 3.4.11 Bachman's Sparrow

Bachman's sparrow (*Aimophila aestivalis*), a Georgia rare species and an Alabama P2 species, is associated with abandoned fields with dense ground cover, open pine woods, and regenerating clearcuts (Schneider, 1999; Mirarchi, Bailey, et al., 2004). In Georgia, Bachman's sparrows are primarily found in the southern Piedmont and Coastal Plain and are often associated with open, mature pine forests where red-cockaded woodpeckers are found because the habitat allows the growth of thick grassy ground cover (Schneider, 1999). Bachman's sparrow is not presently known to occur in the project area in Georgia, although it is known to occur in Chambers County (ANHP, 2010), where it is prioritized as a species of high conservation concern (Table 1). Bachman's sparrow has been sighted during USGS breeding bird surveys conducted along the Lanett route in east-central Chambers County (Sauer et al., 2008). The species was not sighted during the April 2010 field reconnaissance survey in the project area.

### 3.4.12 Common Ground-dove

Common ground-dove (*Columbina passerina*), an Alabama state protected species, is a small dove species that ranges from southern North America south through Mexico, Antilles, and Central America to northern South America (NatureServe, 2010). It occurs primarily in open habitats, including old fields, orchards, young pine plantations, wood edges, roadsides, and coastal dunes (Peterson and Peterson, 2002; NatureServe 2010). Common ground-dove has been sighted at a relatively low frequency during breeding bird surveys along the Lanett survey route east-central in Chambers County (Sauer et al., 2008). The species was not observed during the field reconnaissance survey.

### 3.4.13 American Kestrel

American kestrel (*Falco sparverius*), a Georgia rare species and Alabama P2 species of high conservation concern, is a small falcon species that is widespread and breeds throughout much of North America (NatureServe, 2010). It can be found in a wide variety of open to semi-open habitats, including farmland, woodland borders, meadows, grasslands, parkland, and suburbs (Peterson and Peterson, 2002; Mirarchi, Bailey, et al., 2004). Potentially suitable habitat for American kestrel occurs in the project area. Although not detected during the field reconnaissance survey, the species is known to occur in Lee County (ANHP, 2010) and has been sighted during Columbus Audubon Society Christmas bird counts.

As part of the Power of Flight partnership program between Southern Company and the National Fish and Wildlife Foundation, Georgia Power (2011f) recently announced a grant to the Avian Research and Conservation Institute to produce a range-wide strategic plan for recovery of the remnant, steadily declining population of southeastern American kestrel. This project includes research and management activities for the species across the Southeast, including Georgia.

### 3.4.14 Bald Eagle

The bald eagle (*Haliaeetus leucocephalus*) is a Georgia threatened species and an Alabama state protected species. Although the species has recovered in the lower 48 states and FWS (2007c) removed it from the federally threatened species list, it remains protected under the federal Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act.

An established nesting pair of bald eagles occurs within the Bartletts Ferry project boundary in a densely forested area near the upstream end of the Project. Bald eagle nesting at

Bartletts Ferry was first documented during the 2001-2002 nesting season (J. Ozier, GDNR, personal communication, January 6, 2011). The nest has been occupied every year since and has produced from one to two young each year except 2007.

Bald eagles inhabit areas associated with open water and mature, secluded forests where there are abundant fish and large trees for nesting. Juveniles and non-nesting adults can be seen throughout Georgia, but known nesting activity is concentrated mostly along the coast and near major rivers, wetlands, and reservoirs in the southern and central parts of the state (Ozier, 1999). They primarily feed on fish but will also eat small mammals, waterfowl, and carrion. Bald eagles usually nest in trees near water and are known to nest on cliffs. Nest trees are usually along shorelines in relatively remote areas free of human disturbance.

### 3.4.15 Osprey

The osprey (*Pandion haliaetus*), an Alabama state protected species, is a large raptor that ranges throughout much of the world (NatureServe, 2010). Ospreys occur along rivers, lakes, reservoirs, and coasts. They plunge into water feet first for fish, build large nests on living or dead trees, and often nest on man-made structures such as utility poles and pilings. Ospreys commonly occur in the Bartletts Ferry project area and currently reside within the project boundary in the tailrace area. Since 2007, ospreys have been using a nest platform constructed by Georgia Power on the eastern spillway abutment of Bartletts Ferry Dam.

### 3.4.16 Meadow Jumping Mouse

The meadow jumping mouse (*Zapus hudsonius*), an Alabama state protected and P2 species of high conservation concern, historically was widely distributed in North America (NatureServe, 2010). It prefers moist lowland habitats with dense vegetation and thickets near ponds, marshes, and streams. In Alabama, the meadow jumping mouse is known only from four localities, including two in Chambers County and one in Lee County (Mirarchi, Bailey, et al., 2004). The species' occurrence in Alabama is considered historical, as there have been no reported collections since the 1970s (ANHP, 2010).

## 3.5 Other Species of Concern

An additional 17 plant and wildlife species tracked as special concern species in Georgia or as species of highest or high conservation concern in Alabama (and without federal or state protection) potentially occur in the project vicinity (Table 1). Five of these species are plants, seven are aquatic wildlife (crayfish, mollusks, and fish), and five are terrestrial wildlife (reptile, birds, and mammals).

None of the plants (bottlebrush buckeye, shining indigo-bush, Piedmont bigleaf aster, southern twayblade, American ginseng) or the terrestrial wildlife species (eastern kingsnake, American woodcock, barn owl, Brazilian free-tailed bat, black bear) were identified or encountered in the project area during the 2010 field reconnaissance survey.

Of the seven aquatic wildlife species (sharpnose crayfish, black-crest elimia, flaxen elimia, sculptured pigtoe, dusky shiner, shoal bass, Apalachicola redhorse), recent field observations and data are readily available for evaluating the occurrence of three of these species in the project area (sculptured pigtoe, shoal bass, Apalachicola redhorse). Two of these species, shoal bass and Apalachicola redhorse, are presently known to occur within the project boundary.

### 3.5.1 Sculptured Pigtoe

Sculptured pigtoe (*Quadrula infucata*) formerly occurred in the Chattahoochee River but now appears to be extirpated from the mainstem river (Brim Box and Williams, 2000). The species is found in sand, muddy sand, and fine gravel substrates in small to large streams with moderate current. It does not appear to tolerate impounded conditions very well based on surveys reported on by Brim Box and Williams (2000). Zuiderveen et al. (2002) found a relic shell of sculptured pigtoe in the upper reach of Goat Rock Reservoir in 2001. The species was not detected during the 2010 mussel surveys conducted in the Bartletts Ferry tailrace area and the Riverview shoals area at the upstream end of Bartletts Ferry Reservoir (Georgia Power, 2011e).

### 3.5.2 Shoal Bass

The shoal bass (*Micropterus cataractae*) is a black bass species endemic to the ACF River basin where it is found in rocky shoals or swift-water habitats in the main channels of rivers and large creeks (Williams and Burgess, 1999; Mettee et al., 1996). Shoal bass exhibit an apparent strong preference for flowing water and relatively low tolerance of impoundments compared to other black bass species. Shoal bass are taken by anglers in the Riverview shoals at the upstream end of the project boundary (Thompson and Hornsby, 1990). Georgia Power fishery surveys and telemetry studies conducted in 2010 have documented the occurrence of a shoal bass population at the upstream end of the Project that moves between the Riverview shoals area and rocky reaches of Flat Shoals Creek upstream of the project boundary. Shoal bass use or move through habitats within the project boundary at Riverview shoals, the upper reach of Bartletts Ferry Reservoir, and the Flat Shoals Creek embayment (Georgia Power, 2011e). One juvenile shoal bass also was collected in the lower free-flowing reach of Halawakee Creek within the project boundary (Georgia Power, 2011e). Historical and recent occurrences of shoal bass have been documented upstream of the project boundary in Flat Shoals, Halawakee, and Osanippa Creeks (Maceina et al., 2007; WWETCO, 2002). The species has also been found in the Bartletts Ferry tailrace area within the project boundary (WWETCO, 2002; Georgia Power, 2002) but was not collected there in the 2010 fishery surveys (Georgia Power, 2011e).

### 3.5.3 Apalachicola Redhorse

The Apalachicola redhorse (*Moxostoma* sp.), endemic to the ACF River basin, is a fairly common inhabitant of the project waters and the larger tributaries upstream of the project boundary (Georgia Power, 2009). The species has been found in the Riverview shoals area within the project boundary and in Flat Shoals, Mountain Oak, Osanippa, and Halawakee Creeks upstream of the project boundary. The 2010 fishery surveys conducted by Georgia Power (2011e), which included the lower free-flowing reaches of larger tributaries entering Bartletts Ferry Reservoir and the Bartletts Ferry tailrace area, did not detect the Apalachicola redhorse.

## 4.0 Summary

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Thirty-one state and/or federally protected species and federal candidate species of plants and wildlife potentially occur in the three-county project vicinity (Table 1). They include two federally listed plant species; four federally listed freshwater mussel species; three federal candidate plant species; six other state protected plant species; and 16 other state protected wildlife species.

Presently there are no known occurrences of federally protected species within the Bartletts Ferry project boundary. However, there are recent occurrences of two federally protected species within the project area, including:

- **Relict trillium** – Approximately 700 plants were transplanted from Fort Benning, Georgia, to Blanton Creek WMA outside of the project boundary. The transplanted population is being protected in perpetuity on lands managed by GDNR under the terms of a signed memorandum of agreement.
- **Purple bankclimber** – A single old individual was found in 2000 and 2001 downstream of the project boundary in the upper end of Goat Rock Reservoir. No evidence was found of a viable, reproducing population; hence, the Chattahoochee River has not been designated as critical habitat for the species. Mussel surveys conducted by Georgia Power in 2010 did not detect any purple bankclimbers in the tailrace area downstream of Bartletts Ferry Dam or in the Riverview shoals area at the upstream end of the Project.

None of the three federal candidate plant species (Table 1) are presently known to occur within the project area. Potentially suitable habitat for white fringeless orchid identified during the April 2010 field reconnaissance survey was resurveyed in August 2010 when the species flowers in Georgia, but no orchids were found.

Six other Georgia protected plant species potentially occur in the project vicinity, including four listed as state threatened and two as rare (Table 1). None of the species are presently known to occur within the project area.

Sixteen other Georgia and/or Alabama state protected wildlife species potentially occur in the project vicinity, including one crayfish, two mussels, four fish, one amphibian, one reptile, six birds, and one mammal (Table 1). Six of the species are known from historical or recent occurrences within the project boundary, including:

- **Delicate spike** (Georgia endangered species) – a single individual was found in 2010 in Riverview shoals at the upstream end of the Project.
- **Bluestripe shiner** and **highscale shiner** (Georgia rare species) – both riverine species have been found in Riverview shoals within the project boundary and in larger tributaries to Bartletts Ferry Reservoir in unpounded reaches upstream of the Project.
- **Spotted bullhead** (Georgia rare species) – a single individual was identified in the Bartletts Ferry tailrace area during the 2010 fishery surveys, an unusual occurrence in the Piedmont for a species known almost exclusively from the Coastal Plain.

- **Bald eagle** (Georgia threatened, Alabama state protected) – eagles currently reside within the Bartletts Ferry project boundary in a densely forested area near the upstream end of the Project. A nesting pair was first documented there in 2001-2002, and the nest has been occupied every year since, producing one to two young in most years.
- **Osprey** (Alabama state protected) – osprey reside within the Bartletts Ferry project boundary in the tailrace area, where they have been using a nest platform constructed by Georgia Power on Bartletts Ferry Dam and successfully producing young the past 2 years.

Seventeen other plant and wildlife species of special concern in Georgia or of highest or high conservation concern in Alabama (and without federal or state protection) potentially occur in the project vicinity (Table 1). Two of these species are presently known to occur within the project boundary, including:

- **Shoal bass** (Georgia special concern, Alabama P2) – a population presently occurs at the upstream end of the Project. Fish move seasonally through the upper end of Bartletts Ferry Reservoir between Riverview shoals and rocky reaches of Flat Shoals Creek upstream of the project boundary. Historical and recent occurrences are also known from Flat Shoals, Halawakee, and Osanippa Creeks upstream of the project boundary.
- **Apalachicola redhorse** (Georgia special concern) – this species is a fairly common inhabitant of the project waters and the larger tributaries upstream of the project boundary, including Flat Shoals, Mountain Oak, Osanippa, and Halawakee Creeks.

Georgia Power proposes to continue operating the Bartletts Ferry Project in a modified run-of-river mode. Georgia Power is not proposing to add capacity or make any major modifications to the Project under the new license. Continued project operation as proposed would not be expected to adversely affect any federally or state listed or federal candidate species of plants and wildlife.

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# Tables

TABLE 1

Rare, Threatened, and Endangered Species with Known Records of Occurrence in the Bartletts Ferry Project Vicinity<sup>a</sup>

Scientific Name	Common Name	Federal Status <sup>b</sup>	Georgia Status <sup>c</sup>	Alabama Status/ Priority <sup>d</sup>	Habitat <sup>e</sup>	County of Known Occurrence
<b>PLANTS:</b>						
<i>Aesculus parviflora</i>	Bottlebrush buckeye		SC		Mesic bluff and ravine forests	Harris, GA
<i>Amorpha nitens</i>	Shining indigo-bush		SC		Rocky, wooded slopes; alluvial woods	Harris, GA
<i>Amphianthus pusillus</i>	Little amphianthus	LT	T		Vernal pools on granite outcrops	Harris, GA; Chambers, AL
<i>Arabis georgiana</i>	Georgia rockcress	C	T		Rocky or sandy river bluffs and banks, in circumneutral soil	Harris, GA
<i>Croomia pauciflora</i>	Croomia		T		Mesic hardwood forests, usually with <i>Fagus</i> and <i>Tilia</i>	Harris, GA; Chambers, Lee, AL
<i>Eurybia jonesiae</i>	Piedmont bigleaf aster		SC		Rich deciduous forests bordering rivers and streams; moist ravines	Harris, GA
<i>Hymenocallis coronaria</i>	Shoals spiderlily		T		Rocky shoals of broad, open rivers	Harris, GA; Lee, AL
<i>Listera australis</i>	Southern twayblade		SC		Poorly drained circumneutral soils	Harris, GA
<i>Pachysandra procumbens</i>	Allegheny spurge		R		Mesic hardwood forests over basic soils	Harris, GA
<i>Panax quinquefolius</i>	American ginseng		SC		Mesic hardwood forests; cove hardwood forests	Harris, GA
<i>Platanthera integrilabia</i>	White fringeless orchid	C <sup>f</sup>	T		Red maple-gum swamps; peaty seeps and streambanks with <i>Parnassia asarifolia</i> and <i>Oxypolis rigidior</i>	Harris, GA (?)
<i>Rhododendron prunifolium</i>	Plumleaf azalea		T		Mesic hardwood forests in ravines and on sandy, seepy streambanks	Harris, GA; Lee, AL
<i>Sedum nevirii</i>	Nevius stonecrop		T		Gneiss ledges on river bluffs	Harris, GA
<i>Stewartia malacodendron</i>	Silky camellia		R		Along streams on lower slopes of beech-magnolia or beech-basswood-Florida maple forests	Harris, GA
<i>Symphotrichum georgianum</i>	Georgia aster	C	T		Upland oak-hickory-pine forests and openings; sometimes with <i>Echinacea laevigata</i> or over amphibolite	Harris, GA
<i>Trillium reliquum</i>	Relict trillium	LE	E		Mesic hardwood forests; limesink forests; usually with <i>Fagus</i> and <i>Tilia</i>	Harris, GA; Lee, AL

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Rare, Threatened, and Endangered Species with Known Records of Occurrence in the Bartletts Ferry Project Vicinity<sup>a</sup>

Scientific Name	Common Name	Federal Status <sup>b</sup>	Georgia Status <sup>c</sup>	Alabama Status/ Priority <sup>d</sup>	Habitat <sup>e</sup>	County of Known Occurrence
<b>CRAYFISH:</b>						
<i>Cambarus howardi</i>	Chattahoochee crayfish		T	--/P2	Moderate to swiftly flowing, clear streams with rocky substrate, often in riffle habitat	Lee, AL
<i>Procambarus acutissimus</i>	Sharpnose crayfish		SC		Temporary fluctuating pools or ponds to permanent lotic habitats; sometimes in simple burrows	Harris, GA
<b>MUSSELS AND SNAILS:</b>						
<i>Alasmidonta triangulata</i>	Southern elktoe		E		Large creeks and river mainstems in sandy mud and rock pools	Harris, GA
<i>Elimia albanyensis</i>	Black-crest elimia		SC		Slackwater habitats in medium-sized rivers	Harris, GA
<i>Elimia boykiniana</i>	Flaxen elimia		SC		Gravel or cobble shoals with moderate current	Harris, GA
<i>Elliptio arcata</i>	Delicate spike		E	--/P1	Large rivers and creeks with some current in sand and sand and limestone rock substrates	Harris, GA
<i>Elliptoideus sloatianus</i>	Purple bankclimber	LT	T	SP/P1	Small to large rivers with moderate current and substrate of sand, fine gravel, or muddy sand	Harris, GA; Lee, AL
<i>Hamiota subangulata</i>	Shinyrayed pocketbook	LE	E	SP/P1	Medium creeks to large rivers with slow to moderate current and clay, sand, and gravel	Lee, AL
<i>Medionidus penicillatus</i>	Gulf moccasinshell	LE	E	SP/P1	Sandy/rocky medium-sized rivers & creeks	Harris, GA
<i>Pleurobema pyriforme</i>	Oval pigtoe	LE	E	SP/P1	Sandy, medium-sized rivers & creeks	Lee, AL
<i>Quadrula infucata</i> (= <i>Quincuncina infucata</i> )	Sculptured pigtoe		SC	--/P1	Main channels of rivers and large streams with moderate current in sand and limestone rock substrate	Harris, GA; Chambers, Lee, AL
<b>FISH:</b>						
<i>Ameiurus serracanthus</i>	Spotted bullhead		R		Large streams and rivers with moderate current and rock-sand substrate in Coastal Plain	Chambers, Lee, AL
<i>Cyprinella callitaenia</i>	Bluestripe shiner		R		Flowing areas in large creeks and medium-sized rivers over rocky substrates; impounded stream mouths	Harris, GA; Lee, AL
<i>Notropis cummingsae</i>	Dusky shiner			--/P2	Low-gradient blackwater streams in Coastal Plain	Lee, AL

TABLE 1

Rare, Threatened, and Endangered Species with Known Records of Occurrence in the Bartletts Ferry Project Vicinity<sup>a</sup>

Scientific Name	Common Name	Federal Status <sup>b</sup>	Georgia Status <sup>c</sup>	Alabama Status/ Priority <sup>d</sup>	Habitat <sup>e</sup>	County of Known Occurrence
<i>Notropis hypsilepis</i>	Highscale shiner		R		Flowing areas of small to large streams over sand or bedrock substrates in Piedmont	Harris, GA; Chambers, Lee, AL
<i>Micropterus cataractae</i>	Shoal bass		SC	--/P2	Shoals and riffles of large streams to rivers	Harris, GA; Chambers, Lee, AL
<i>Moxostoma</i> sp.	Apalachicola redhorse		SC		Pools, runs, and riffles (shoals) of large rivers and their tributaries	Harris, GA; Chambers, Lee, AL
<i>Pterotropis euryzonus</i>	Broadstripe shiner		R	--/P2	Small, clear to blackwater streams in Coastal Plain	Lee, AL
<b>AMPHIBIANS:</b>						
<i>Desmognathus monticola</i>	Seal salamander			SP/--	High- to moderate-gradient rocky streams in wooded ravines or seepages	Chambers, Lee, AL
<b>REPTILES:</b>						
<i>Gopherus polyphemus</i>	Gopher tortoise	LT, PS <sup>g</sup>		SP/P2	Deep sandy soils in open areas of sandhills and Coastal Plain	Lee, AL
<i>Lampropeltis getula getula</i>	Eastern kingsnake			--/P2	Ground-dwelling, in various terrestrial habitats	Lee, AL
<b>BIRDS:</b>						
<i>Accipiter cooperi</i>	Cooper's hawk			SP/--	Mature forests, open woodlands, forest edges	Lee, AL
<i>Aimophila aestivalis</i>	Bachman's sparrow		R	--/P2	Open pine forests with diverse herbaceous ground cover	Chambers, AL
<i>Columbina passerina</i>	Common ground-dove			SP/--	Farms, orchards, wood edges, roadsides, waste places, coastal dunes	Chambers, Lee, AL
<i>Falco sparverius</i>	American kestrel		R	--/P2	Open country, woodland borders, meadows, grasslands, parkland, farmlands, suburbs	Lee, AL
<i>Haliaeetus leucocephalus</i>	Bald eagle	DL <sup>h</sup>	T	SP/--	Edges of lakes & large rivers; seacoasts	Harris, GA; Chambers, AL
<i>Pandion haliaetus</i>	Osprey			SP/--	Rivers, lakes, reservoirs and sea coasts	Harris, GA; Chambers, AL
<i>Scolopax minor</i>	American woodcock			--/P2	Wet thickets, moist woods, brushy swamps	Chambers, Lee, AL
<i>Tyto alba</i>	Barn owl		SC		Open and partly open country (grassland, marsh, pasture, hayfields), often around human habitation	Harris, GA

TABLE 1

Rare, Threatened, and Endangered Species with Known Records of Occurrence in the Bartletts Ferry Project Vicinity<sup>a</sup>

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<b>MAMMALS:</b>						
<i>Tadarida brasiliensis</i>	Brazilian free-tailed bat			--/P2	Human-made structures, mainly in Coastal Plain	Lee, AL
<i>Ursus americanus</i>	Black bear			--/P1	Large undeveloped wooded tracts; reported from Lee County but no evidence of established population	Lee, AL
<i>Zapus hudsonius</i>	Meadow jumping mouse			SP/P2	Various habitats with dense vegetation; thickets near ponds, marshes, and streams; historical occurrence	Chambers, Lee, AL

Sources: A. Peters, ADCNR, April 1, 2010 letter to T. Dodd, Georgia Power; ANHP (2011a, b); K. Morris, GDNR, April 21, 2010 letter to T. Dodd, Georgia Power; GDNR (2010); A. Lawrence, FWS, April 9, 2010 e-mail communication with T. Dodd, Georgia Power; FWS (2004, 2010a, b).

<sup>a</sup> This is a listing of federal and state protected species, federal candidate species, and other state species of conservation concern with known records of occurrence in Harris County, Georgia, and Chambers and Lee Counties, Alabama, for which the GDNR Nongame Conservation Section, ADCNR State Lands Division, ANHP, or FWS have records of locations in their databases. Other state species of concern include special concern plant and animal species in Georgia and species of conservation concern in Alabama. Alabama species of conservation concern included herein are wildlife species listed as either State Protected (Alabama Wildlife and Freshwater Fisheries, 2009) or assigned Priority 1 (highest) or Priority 2 (high) levels of conservation concern (Mirarchi, 2004; ANHP, 2010).

<sup>b</sup> Federal status: **LE** = listed endangered; **LT** = listed threatened; **C** = candidate; **PS** = partial status, listed in only a portion of the species range; **DL** = delisted.

<sup>c</sup> Georgia protected status: **E** = Georgia endangered; **T** = Georgia threatened; **R** = Georgia rare. **SC** = Georgia special concern species (tracked but not protected).

<sup>d</sup> Alabama status: **SP** = state protected. Alabama conservation priority: **P1** = Priority 1, highest conservation concern; **P2** = Priority 2, high conservation concern.

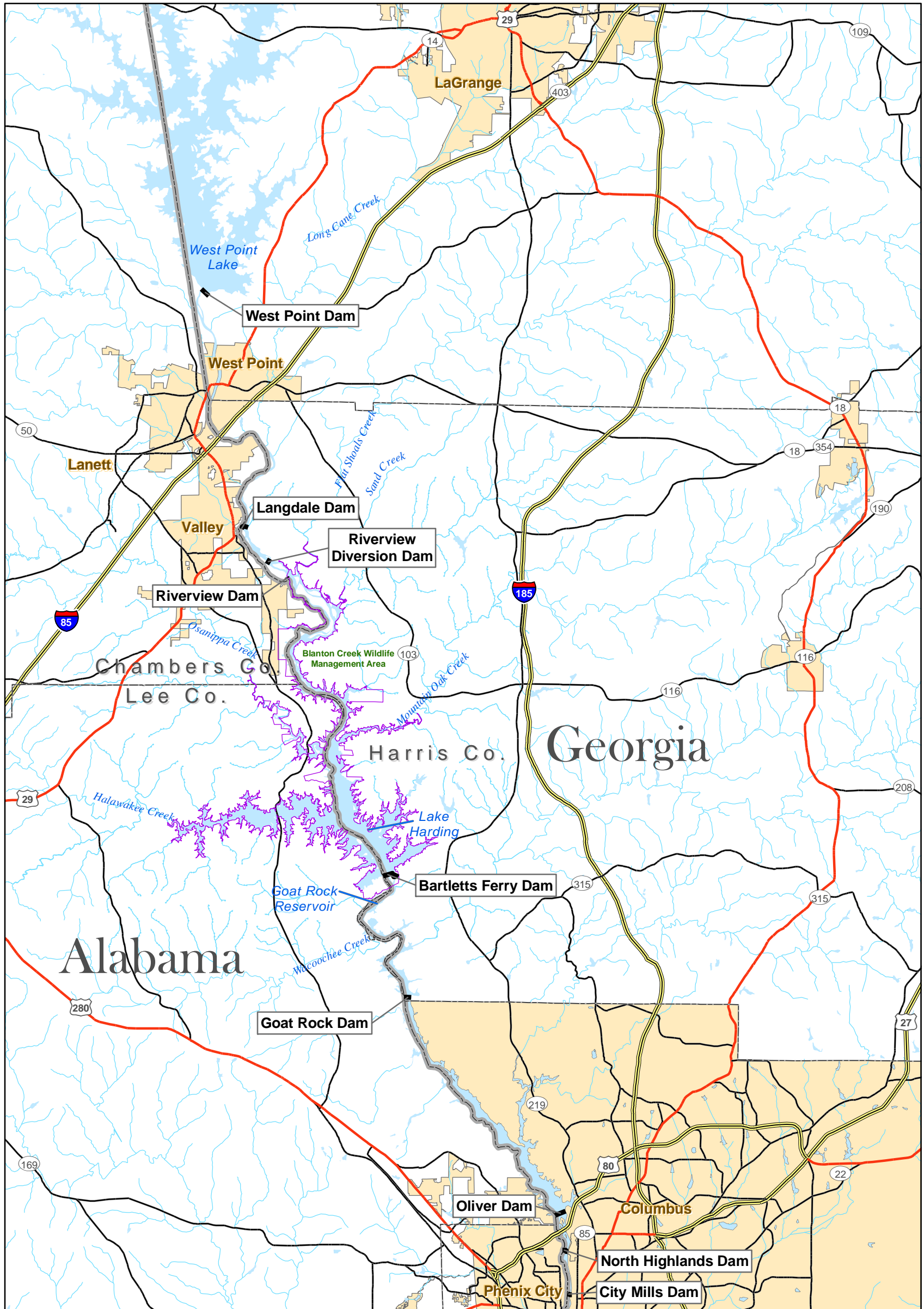
<sup>e</sup> Habitat descriptions from GDNR (2009); Mirarchi, Garner et al. (2004); Mirarchi, Bailey et al. (2004); NatureServe (2010); and Peterson and Peterson (2002).

<sup>f</sup> Not on current GDNR list for Harris County but included on previous list for Harris County as presented by Georgia Power (2009, 2010), and therefore, considered herein.

<sup>g</sup> Listed as threatened west of the Mobile and Tombigbee Rivers in western Alabama, Mississippi, and Louisiana; not listed as threatened in the Bartletts Ferry project vicinity.

<sup>h</sup> Although no longer listed as federally threatened, the bald eagle remains protected under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act.

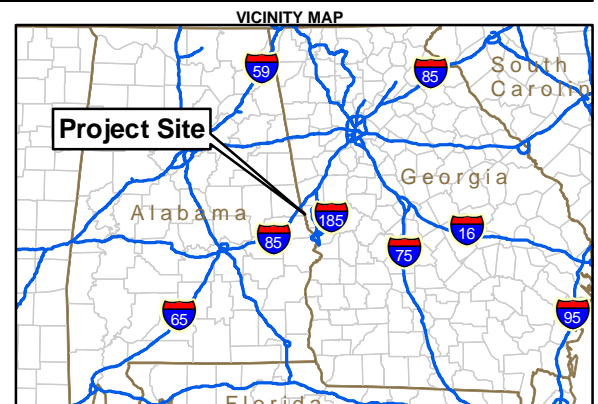
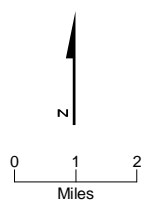
# Figures



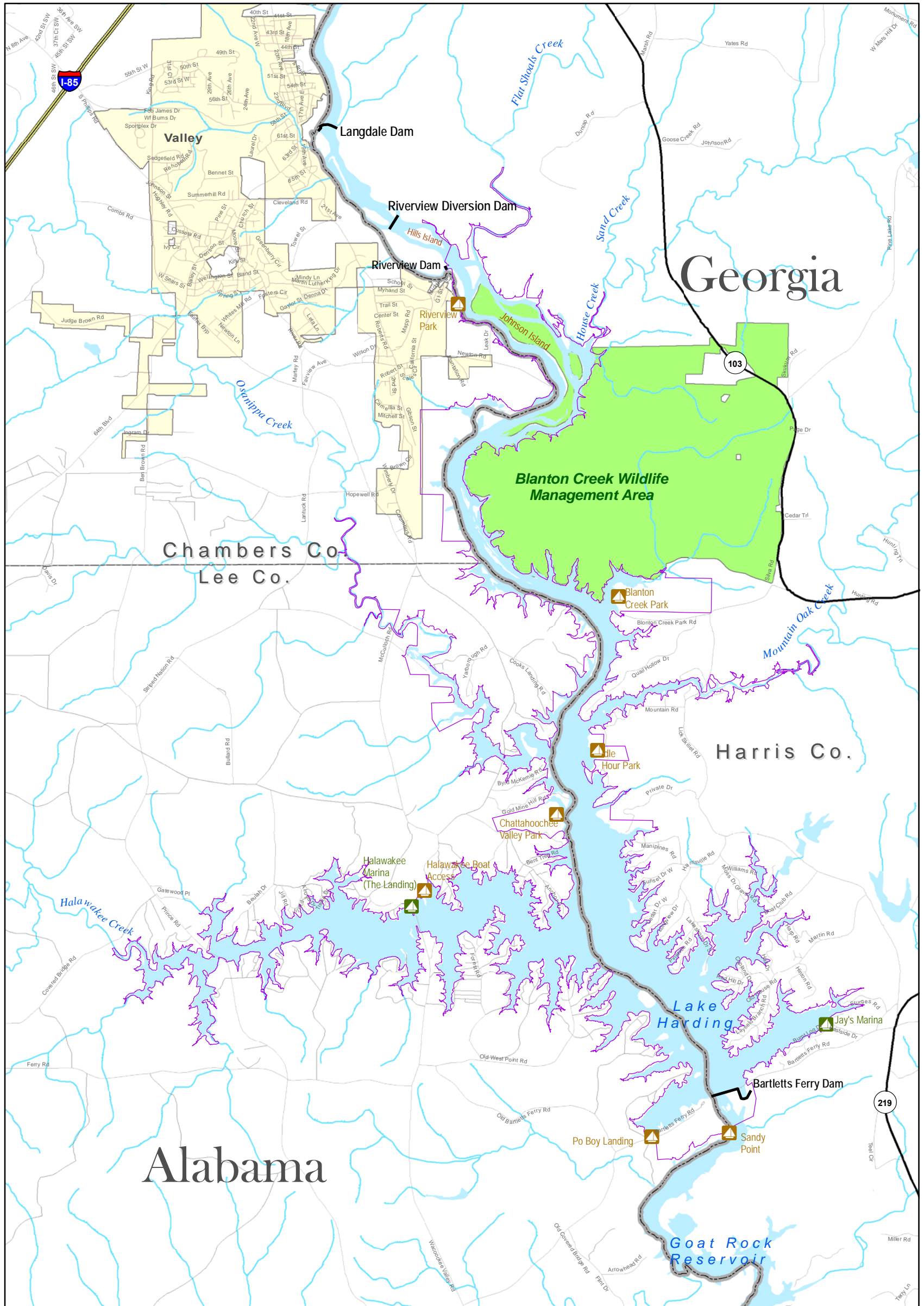
- Notes:
1. FERC Project Boundary source Georgia Power
  2. Basemap data source ESRI 2006

**Legend**

- |                         |                    |                    |
|-------------------------|--------------------|--------------------|
| FERC Project Boundary   | Interstate Highway | Blanton Creek WMA  |
| Dam                     | US Highway         | Incorporated Areas |
| River or Stream Channel | State Highway      |                    |
| Lake                    | County Road        |                    |
| GA/AL State Boundary    | Local Road         |                    |
| County Boundary         |                    |                    |



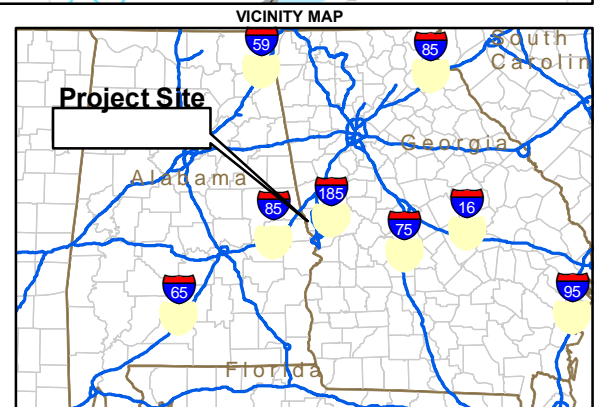
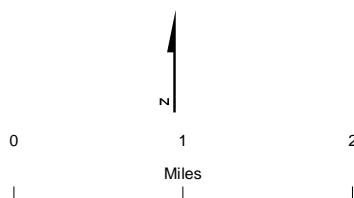
**Figure 1**  
**Project Vicinity in the Middle**  
**Chattahoochee River Basin**  
 Bartletts Ferry Project (FERC No. 485)



- Notes:
1. Georgia/Alabama State Boundary source USGS
  2. FERC Project Boundary source Georgia Power
  3. Basemap data source ESRI 2006
  4. Blanton Creek WMA source Georgia DNR

**LEGEND**

- |                           |                      |                    |
|---------------------------|----------------------|--------------------|
| FERC Project Boundary     | GA/AL State Boundary | Incorporated Areas |
| Dam                       | County Boundary      | Blanton Creek WMA  |
| River or Stream Channel   | Interstate Highway   |                    |
| Lake                      | US Highway           |                    |
| Private Recreation Access | State Highway        |                    |
| Public Recreation Access  | County Road          |                    |
|                           | Local Road           |                    |



**Figure 2**  
**Project Boundary and Surrounding Area**  
 Bartletts Ferry Project (FERC No. 485)