



WALLACE DAM



Lake Oconee

Wallace Dam Hydroelectric Project FERC Project Number 2413

Volume 2

Public

Exhibit E

May 2018

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² Contains Critical Energy Infrastructure Information – Do Not Release

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Exhibit E

Wallace Dam Hydroelectric Project FERC Project Number 2413

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EXECUTIVE SUMMARY

This document is Georgia Power Company's (Georgia Power's) Exhibit E, the Environmental Report, of the application for Federal Energy Regulatory Commission (FERC) relicensing of the existing Wallace Dam Hydroelectric Project (Wallace Dam Project, or the Project) (FERC No. 2413). Georgia Power used the Integrated Licensing Process to develop the license application and is filing Exhibit E in the format of an applicant-prepared environmental assessment following FERC regulations at 18 Code of Federal Regulations (CFR) § 5.18(b). This Exhibit E incorporates by reference supporting data and analyses, including eight resource studies; the applicant's Initial Statement; and Exhibits A, B, C, D, F, Supporting Design Report, G, and H; all collectively comprising Georgia Power's license application.

The Wallace Dam Project is a pumped storage project consisting of Wallace Dam, a powerhouse, and a reservoir (Lake Oconee) on the Oconee River in Hancock, Putnam, Greene, and Morgan Counties, Georgia. Georgia Power operates the Project in a pumped storage mode for peaking power generation. The Wallace Dam Project has a nameplate capacity of 321.3 megawatts. The Project uses Lake Oconee as the upper reservoir and Lake Sinclair, located immediately downstream, as the lower reservoir. Lake Sinclair is operated by Georgia Power as part of the separately licensed Sinclair Hydroelectric Project (Sinclair Project). Georgia Power is not proposing to add capacity or make any major modifications to the Wallace Dam Project under the new license. The Project occupies about 493.7 acres of U.S. Forest Service lands within the Oconee National Forest. The current license expires May 31, 2020.

This Exhibit E provides an environmental analysis, by resource area, of the continuing and incremental impacts of Georgia Power's proposed action to continue operating the Wallace Dam Project. Georgia Power developed this exhibit based on input gained from consultation with state and federal resource agencies, local governments, Indian tribes, and members of the public, and by using information generated from the resource studies conducted under 18 CFR Part 5, consistent with the FERC-approved study plan.

Project Setting

The Wallace Dam Project is located on the main stem of the Oconee River in the Piedmont physiographic province in east-central Georgia. The Project is situated in the upper Oconee River basin of the greater Altamaha River basin. Wallace Dam is located at river mile 172.7, about 13.4 air miles east of the city of Eatonton; 15.4 air miles south of the city of Greensboro; and 19 air miles north of the city of Milledgeville. Wallace Dam is 29.7 river miles upstream of Georgia Power's Sinclair Dam and immediately upstream of Lake Sinclair. Releases from

Wallace Dam flow directly into Lake Sinclair; there is no intervening free-flowing or bypassed reach of river.

The watershed upstream of Wallace Dam covers an area of 1,830 square miles, comprising about 34 percent of the Oconee River basin. At its normal full pool elevation of 435 feet (ft) plant datum (PD)¹, Lake Oconee covers 19,050 acres, has 374 miles of shoreline, and extends about 39 river miles upstream on the Oconee River. The pool elevation of Lake Oconee fluctuates an average of 1.5 ft daily as part of the pumpback operation of Wallace Dam. The average depth of Lake Oconee is 21 ft and the maximum depth is about 120 ft.

Current Operation

Georgia Power operates the Wallace Dam Project in a pumped storage mode for the purpose of peaking power generation. Generation releases occur during peak power demand hours to meet the electrical system demand with renewable, low-emission power that generates no wastes for disposal. Some of this water subsequently passes downstream for hydropower generation at the Sinclair Project to meet both electrical system demand and river flow requirements in the Oconee River downstream of Sinclair Dam. The remaining volume of water from Wallace Dam remains in Lake Sinclair for a few hours before being pumped back up and into Lake Oconee by the reversible units for reuse in the next day's generation cycle. Pumpback operations occur during off-peak demand hours (mostly at night), when electrical system demand is low and the cost of power to accomplish pumpback operations is therefore lower.

During normal daily operations, Lake Oconee fluctuates an average of 1.5 ft, between elevations 435.0 ft and 433.5 ft PD. Lake Oconee typically begins the generation cycle near elevation 435.0 ft and ends near 433.5 ft PD. During nighttime, the pumping cycle refills Lake Oconee, typically to 435.0 ft PD. Depending on power demand, the reservoir does not fluctuate the full amount every day. Daily fluctuations are 2.0 ft or less 100 percent of the time.

Proposed Action and Environmental Measures

For the new license term, Georgia Power proposes to continue operating the Wallace Dam Project in a pumped storage mode for the generation of peaking power. Georgia Power proposes the following environmental measures for the continued operation of the Project.

¹ Plant datum = mean sea level - 0.20 feet (+/- 0.01 feet).

These proposed measures are based on Georgia Power's environmental analysis and consultation with resource agencies and numerous stakeholders.

- Continue to operate the Project during peak power demand hours to meet the electrical system demand with renewable, low-emission power that generates no wastes for disposal.
- Continue to operate the Project to supplement flows during drought to support the downstream Sinclair Project minimum flow requirements. Supporting these requirements would continue to enhance aquatic resources by maintaining flow regimes in the free-flowing reach of the Oconee River downstream of Sinclair Dam and moderating fluctuations of Lake Sinclair.
- Install and operate a forebay oxygen line diffuser system in Lake Oconee to enhance summer dissolved oxygen (DO) concentrations in the tailrace area. Operate the system as needed during the period May 1 through October 31. This would benefit water quality in the tailrace and downstream fisheries, aquatic resources, and recreational fishing, and support applicable water quality standards throughout the hottest months of the year.
- Continuously monitor and report tailrace DO concentrations and water temperature during the period May 1 through October 31 for 3 years following deployment of the forebay oxygen line diffuser system to verify DO enhancements in the tailrace area.
- Enhance recreation amenities at Lawrence Shoals Park by constructing new facilities to replace two campground restrooms, a beach house, a boat ramp restroom, a courtesy dock at the boat ramp, a pavilion and dedicated pavilion restroom, and a guest relations gate house. In addition, upgrade the current well system that supplies water to park facilities and customers. These improvements would continue to support quality recreation opportunities.
- Enhance recreation amenities at Old Salem Park by constructing new facilities to replace two group docks (and add a third group dock), a pavilion and dedicated pavilion restroom, a boat ramp restroom, a courtesy dock at the boat ramp, a beach house, and a guest relations gate house. In addition, upgrade the current well system that supplies water to park facilities and customers, and reconfigure the park entrance and gate house to reduce single-lane traffic congestion and allow for year-round operation of the boat

ramp. These improvements would continue to support quality recreation opportunities and enhance year-round boat-fishing and tournament-fishing access to Lake Oconee.

- Enhance recreation amenities at Parks Ferry Park by constructing new facilities to replace two campground restrooms, a beach house, a courtesy dock at the boat ramp, and a pavilion and dedicated pavilion restroom. In addition, upgrade the current well system that supplies water to park facilities and customers; replace the underground water and electrical service; and reconfigure the entrance gate and gate house to reduce single-lane traffic congestion and allow for year-round operation of the boat ramp. These improvements would continue to support quality recreation opportunities and enhance year-round boat-fishing and tournament-fishing access to Lake Oconee.
- Increase bank fishing access on Lake Oconee by providing a new bank fishing access development at the Area C-5 tract to include a barrier-free pier and gravel parking.
- Increase bank fishing access on Lake Oconee by providing a new bank fishing access development at Jerry's Highway (Hwy) 44 to include a barrier-free pier and gravel parking.
- Enhance recreation amenities and increase bank fishing access at Sugar Creek Boat Ramp by adding a new barrier-free fishing pier, upgrading the vault toilet with a flush toilet, and upgrading the courtesy dock.
- Enhance recreation amenities at Armour Bridge by upgrading the courtesy dock and replacing the vault toilet with a flush toilet.
- Enhance recreation amenities and improve bank fishing access at Long Shoals Boat Ramp by upgrading the courtesy dock and trimming vegetation to provide additional bank fishing access.
- Enhance recreation amenities and improve tailrace bank fishing access at the Georgia Hwy 16 Bridge Boat Ramp downstream of the dam by providing a new barrier-free tailrace fishing pier and a vault toilet. The new fishing pier would replace the bank fishing access provided at the Tailrace Fishing Area, which would be closed due to its limited public use and for security of Wallace Dam's adjacent equipment yard.
- Enhance recreational access at Georgia Power boat launch facilities by installing improved lighting at Lawrence Shoals Park, Old Salem Park, Parks Ferry Park, Sugar

Creek Boat Ramp, Armour Bridge, Long Shoals Boat Ramp, Area C-5 tract, Jerry's Hwy 44, and Hwy 16 Bridge Boat Ramp.

- Implement a Shoreline Management Plan to continue to manage shorelines in accordance with Shoreline Management Guidelines for Georgia Power Lakes and to promote the maintenance of vegetative buffers around the reservoir to protect water quality, aquatic habitat, and cultural and aesthetic resources.
- Install shoreline stabilization consisting of riprap at Old Salem Park, Parks Ferry Park, Long Shoals Boat Ramp, and Armour Bridge to conserve soil resources, maintain shoreline recreational uses, reduce sedimentation and turbidity of adjacent waters, and enhance littoral-zone aquatic habitat.
- Repair the eroded shoreline at the Pond 2 waterfowl impoundment and inspect the water level control structure on the eastern shore of the Wallace Dam tailrace area to conserve soil resources, maintain waterfowl refuge habitat, and protect water quality and aquatic habitat.
- Implement a Historic Properties Management Plan through a Programmatic Agreement to assure the preservation and long-term management of archaeological sites and historic buildings and structures within the project boundary.

ACRONYMS AND ABBREVIATIONS

Advisory Council	Advisory Council on Historic Preservation
APP	Avian Protection Program
BGEPA	Bald and Golden Eagle Protection Act
BMP	best management practice
CFR	Code of Federal Regulations
cfs	cubic feet per second
CZMA	Coastal Zone Management Act
DO	dissolved oxygen
ENR	Environmental and Natural Resources
EPA	U.S. Environmental Protection Agency
EPRI	Electric Power Research Institute
ESA	Endangered Species Act
FERC	Federal Energy Regulatory Commission
FPA	Federal Power Act
fps	feet per second
FS	U.S. Forest Service
ft	feet
FWS	U.S. Fish and Wildlife Service
GDNR	Georgia Department of Natural Resources
Georgia Power	Georgia Power Company
GEPD	Georgia Environmental Protection Division
GEPPC	Georgia Exotic Pest Plant Council
GFC	Georgia Forestry Commission
hp	horsepower
HPMP	Historic Properties Management Plan
Hwy	Highway
I-20	Interstate 20
ILP	Integrated Licensing Process
kV	kilovolt
lbs	pounds
MBTA	Migratory Bird Treaty Act
mgd	million gallons per day
mg/L	milligrams per liter
MW	megawatt
MWH	megawatt-hours
NEGRC	Northeast Georgia Regional Commission
NEPA	National Environmental Policy Act

NERC	North American Electric Reliability Corporation
NF	National Forest
NRHP	National Register of Historic Places
PAD	Pre-Application Document
PD	plant datum
PLP	Preliminary Licensing Proposal
RIR	Regionally Important Resource
ROW	right-of-way
rpm	revolutions per minute
RTE	rare, threatened, and endangered
RV	recreational vehicle
SCORP	Statewide Comprehensive Outdoor Recreation Plan
SD1	Scoping Document
SHPO	State Historic Preservation Officer
sq mi	square miles
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USGS	U.S. Geological Survey
WMA	Wildlife Management Area
WRD	Wildlife Resources Division
WY	water year

1.0 INTRODUCTION

1.1 Application

Georgia Power Company (Georgia Power) is filing an application for a new license for the existing Wallace Dam Hydroelectric Project (Wallace Dam Project, the Project) (FERC No. 2413) with the Federal Energy Regulatory Commission (FERC, the Commission). This document is Exhibit E, the Environmental Report, of the license application. Georgia Power used the Integrated Licensing Process (ILP) to develop the license application following FERC regulations at 18 Code of Federal Regulations (CFR) Part 5. As provided for in 18 CFR §5.18(b), Georgia Power prepared Exhibit E in the format of an applicant-prepared environmental assessment. This Exhibit E incorporates by reference supporting data and analyses, including eight resource studies; the applicant's Initial Statement; and Exhibits A, B, C, D, F, Supporting Design Report, G, and H; all collectively comprising Georgia Power's license application.

The Wallace Dam Project is a pumped storage project consisting of Wallace Dam, a powerhouse, and a reservoir (Lake Oconee) on the Oconee River in Hancock, Putnam, Greene, and Morgan Counties, Georgia (Figures 1 and 2). Georgia Power operates the Project in a pumped storage mode for peaking power generation. The Wallace Dam Project has a nameplate capacity of 321.3 megawatts (MW). The Project uses Lake Oconee as the upper reservoir and Lake Sinclair, located immediately downstream, as the lower reservoir. Lake Sinclair is operated by Georgia Power as part of the separately licensed Sinclair Hydroelectric Project (FERC No. 1951). Georgia Power is not proposing to add capacity or make any major modifications to the Wallace Dam Project under the new license. The Project occupies about 493.7 acres of U.S. Forest Service (FS) lands within the Oconee National Forest (NF), which abuts Lake Oconee's northernmost reaches. The current license expires May 31, 2020.

1.2 Purpose of Action and Need for Power

1.2.1 Purpose of Action

Issuing a new license for the Wallace Dam Project would allow Georgia Power to continue generating electricity at the Project for the term of a new license, making electric power from a renewable resource available to its customers. This Exhibit E analyzes the environmental and economic effects associated with the proposed continued operation of the Project.

Under Section 10(a)(1) of the Federal Power Act (FPA), in deciding whether to issue a license for a hydroelectric project, the Commission must determine that the project will be best adapted to a comprehensive plan for improving or developing a waterway. In addition to the power and developmental purposes for which a license is issued, the Commission must give equal consideration to the purposes of energy conservation; the protection, mitigation of adverse impacts to, and enhancement of fish and wildlife (including related spawning grounds and habitat); the protection of recreational opportunities; and the preservation of other aspects of environmental quality. The analysis provided herein reflects those considerations.

1.2.2 Need for Power

The Wallace Dam Project would provide low-cost, clean, and renewable hydroelectric generation to assist in meeting regional power demand, generation diversity needs, and capacity needs. The Project would have a nameplate capacity of 321.3 MW and generate approximately 390,083 megawatt-hours (MWH) per year.

The North American Electric Reliability Corporation (NERC) annually forecasts electrical supply and demand nationally and regionally for a 10-year period. The Wallace Dam Project is located in the SERC Reliability Corporation (SERC) region of NERC. The SERC region includes all or portions of 16 southeastern and central states. SERC is divided geographically into five assessment areas that are identified as SERC-E, SERC-N, SERC-SE, SERC-PJM, and SERC-MISO. The Wallace Dam Project is in assessment area SERC-SE, which covers portions of Alabama, Georgia, Mississippi, and Florida.

NERC's 2016 Long-Term Reliability Assessment shows the projected growth in capacity demand for the period 2017 to 2026. The summer period is typically the heaviest demand period for Southern Company and Georgia Power. The capacity growth trends for the SERC-SE assessment area for the period of 2017 to 2026 for the summer peak season demand show that the SERC-SE region will need to add 4,321 MW of capacity. This represents a demand increase of 9.05 percent, or a Compound Annual Growth Rate of 0.97 percent.

Based on the present and future use of the Project's power, its low cost, its displacement of nonrenewable fossil fueled generation, the station's contribution to a diversified generation mix, and the increases in demand over the period 2017 to 2026, Georgia Power concludes that power from the Wallace Dam Project will help meet a need for power in the Southern Company service territory as well as in the SERC-SE region during the short and long term.

1.3 Statutory and Regulatory Requirements

1.3.1 Clean Water Act

In accordance with FERC regulations, Georgia Power will coordinate with the Georgia Environmental Protection Division (GEPD) no later than 60 days after notice by FERC of its acceptance of the license application as being ready for environmental analysis (18 CFR § 5.23(b)) to obtain Clean Water Act Section 401 water quality certification for the Project. Georgia Power has been consulting with GEPD throughout this licensing proceeding concerning their information needs for water quality certification.

1.3.2 Endangered Species Act

As FERC's non-federal designee for informal consultation under the Endangered Species Act (ESA), Georgia Power consulted with the U.S. Fish and Wildlife Service (FWS) in developing the FERC-approved study plan for rare, threatened, and endangered (RTE) species, and in

implementing and reporting on the study. Georgia Power filed the RTE Species Study Report for review and comment by FWS and other state and federal resource agencies.

The RTE species study found that two federally listed plant species are presently known to occur on a granite outcrop in the Oconee Wildlife Management Area (WMA) within the Wallace Dam project boundary (Section 3.3.5). Pool sprite (*Amphianthus pusillus*), a federally threatened species, inhabits shallow depressions on granite outcrops where vernal pools form after rainfall. Mat-forming quillwort (*Isoetes tegetiformans*), a federally endangered species, is also restricted to similar habitats. In 2010, Georgia Department of Natural Resources (GDNR) and FWS biologists planted four plugs of mat-forming quillwort (raised off-site) in rainwater pools on the outcrop. Acquired from Georgia Power, this upland site is managed by GDNR. Field surveys of the outcrop in spring 2016 observed pool sprite but did not detect mat-forming quillwort. Signs warn visitors to stay away from the outcrop's sensitive areas.

Transient occurrences of wood stork (*Mycteria americana*), a federally threatened wading-bird species, have been previously sighted in shallow freshwater ponds/wetlands of Oconee NF within the project boundary during post-breeding dispersal, but the species primarily occurs in the Coastal Plain physiographic province and is not known to breed in the Piedmont province, where the Project is located. No other federally listed species or candidate species for listing, and no designated critical habitats, are known to occur within the project boundary.

Continued project operation would not be expected to adversely affect any species listed as federally endangered or threatened under the ESA. FWS concurs that the proposed relicensing of the Wallace Dam Project is not likely to adversely affect federally listed species or critical habitat (D. Imm, FWS, May 21, 2018 letter to K.D. Bose, FERC).

1.3.3 Coastal Zone Management Act

The Coastal Zone Management Act (CZMA) of 1972, as amended, requires that federally licensed and permitted activities affecting any land or water use or natural resource of any coastal zone be consistent with applicable state Coastal Zone Management Programs. The Department of Commerce National Oceanic and Atmospheric Administration's (NOAA's) CZMA federal consistency regulations are found at 15 CFR Part 930.

The state of Georgia's coastal zone includes the counties of Brantley, Bryan, Camden, Charlton, Chatham, Effingham, Glynn, Liberty, Long, McIntosh, and Wayne.² The Wallace Dam Project is not located within the coastal zone of Georgia. The Project is located approximately 310 river miles upstream of the Atlantic Ocean in the Piedmont physiographic province (Figure 1) and upstream of one other existing major dam on the Oconee River. Continued project operation as proposed by Georgia Power would not affect the land or water uses or natural resources of the coastal zone.

² O.C.G.A. § 12-5-322(4).

1.3.4 National Historic Preservation Act

Section 106 of the National Historic Preservation Act (NHPA) requires that every federal agency take into account how each of its undertakings could affect historic properties. Historic properties are districts, sites, buildings, structures, traditional cultural properties, and objects significant in American history, architecture, engineering, and culture that are eligible for inclusion in the National Register of Historic Places (NRHP).

As the Commission's non-federal representative for conducting consultation pursuant to Section 106 of NHPA, Georgia Power has developed a draft Historic Properties Management Plan (HPMP) for the Wallace Dam Project. The HPMP will provide for the preservation and long-term management of the dam, powerhouse, control building, administration building, and a maintenance building, which are considered eligible for inclusion in the NRHP, and six archaeological sites that are either eligible or potentially eligible and recommended for monitoring under the new license. Georgia Power filed a draft HPMP on March 14, 2018, and subsequently received written comments from the Cherokee Nation and email comments from the Georgia State Historic Preservation Officer (SHPO). The draft HPMP has been revised to address these review comments and is being filed concurrently with the license application.

To meet the requirements of Section 106, FERC intends to execute a Programmatic Agreement (PA) between FERC, SHPO, and the Advisory Council on Historic Preservation (Advisory Council) for the protection of historic properties from the effects of the operation of the Wallace Dam Project. Georgia Power has been invited to participate in consultations to develop the PA and to sign as a concurring party. FS and Indian tribes also will be invited to comment on the agreement. The terms of the PA would ensure that Georgia Power addresses and treats all historic properties identified within the Project's area of potential effects under the final HPMP.

1.3.5 Wild and Scenic Rivers Act

Section 7(a) of the Wild and Scenic Rivers Act requires federal agencies to make a determination as to whether the operation of a project under a new license would invade the area or unreasonably diminish the scenic, recreational, and fish and wildlife values present in a designated river corridor. There are no rivers within or in the vicinity of the Wallace Dam project boundary that are designated for inclusion, or are being considered or studied for inclusion, in the National Wild and Scenic Rivers System (<https://www.rivers.gov/index.php>).

1.3.6 Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act requires federal agencies to consult with NOAA Fisheries on all actions that may adversely affect Essential Fish Habitat (EFH). The Wallace Dam Project, located upstream of the Fall Line in the Piedmont province, does not affect any EFH for the maintenance of suitable marine fishery habitat quality and quantity under the Magnuson-Stevens Fishery Conservation and Management Act. The South Atlantic Fishery Management Council has not designated EFH for any species of fish or shellfish found in

the vicinity of the Wallace Dam Project (<https://safmc.net/essential-fish-habitat/>). The Project is located approximately 310 river miles upstream of the Atlantic Ocean, above one other existing major dam on the mainstem Oconee River.

1.4 Public Review and Comments

The Commission’s ILP regulations require that applicants consult with appropriate resource agencies, tribes, and other entities before filing an application for a license. This consultation is the first step in complying with the National Environmental Policy Act (NEPA), Fish and Wildlife Coordination Act, ESA, NHPA, and other federal statutes. Pre-filing consultation must be complete and documented according to the Commission’s regulations.

1.4.1 Scoping Process

Prior to the development of Georgia Power’s license application, FERC conducted scoping pursuant to NEPA to determine what issues and alternatives should be addressed. FERC (2015a) issued a Scoping Document (SD1) on April 17, 2015 to federal, state, and local agencies, non-governmental organizations, and the public to solicit comments on the scope of FERC’s environmental assessment. FERC staff held scoping meetings and a site visit on May 19-20, 2015. A court reporter reported all comments and statements made at the scoping meetings, and these are part of the Commission’s public record for the Project.

In addition to comments provided at the scoping meetings, the following entities provided written comments on SD1 and the Pre-Application Document (PAD), as well as study requests:

<u>Commenting Entities</u>	<u>Date Filed</u>
Barbara Bell Tyson	June 15, 2015
FERC Office of Energy Projects	June 18, 2015
FWS	June 18, 2015
U.S. Environmental Protection Agency (EPA)	June 18, 2015
GDNR Wildlife Resources Division (WRD)	June 19, 2015
FS	June 19, 2015

1.4.2 Comments on the Preliminary Licensing Proposal

Georgia Power (2017a) filed its Preliminary Licensing Proposal (PLP) with the Commission on November 21, 2017. The PLP provided a draft environmental analysis, by resource area, of the continuing and incremental impacts of Georgia Power’s proposal to continue operating the Wallace Dam Project. Georgia Power developed the PLP in consultation with state and federal resource agencies, local governments, Indian tribes, various stakeholders, and other members of the public, and by using the information generated by eight resource studies conducted under the FERC-approved Study Plan (FERC, 2015b, 2017a). The PLP provides a pre-filing consultation

summary of the stakeholders consulted, the study plan development process, the resource study reports and Study Results Meetings, and the numerous other stakeholder meetings (Georgia Power, 2017a).

Congressman Jody Hice of the 10th District of Georgia, on behalf of Barbara Bell Tyson, filed written correspondence pertaining to the PLP on December 12, 2017. GDNR WRD filed written comments on the PLP on February 20, 2018. No other stakeholders provided written comments on the PLP.

Georgia Power considered all comments on the PLP in preparing this Exhibit E. Appendix A provides each comment letter (brackets and numbering in margin added to the GDNR letter by Georgia Power), followed by Georgia Power's responses to the comments.

FWS provided a letter dated May 21, 2018 concurring that project operations are not likely to adversely affect federally-listed species or critical habitat. Appendix A also includes the FWS concurrence letter.

2.0 PROPOSED ACTION AND ALTERNATIVES

This section sets out Georgia Power's licensing proposal for continuing to operate the Wallace Dam Project under the new license. The section first describes the no-action alternative, which is the baseline from which to compare the proposed action and includes the existing project facilities and current project operation. Next, the section describes the applicant's proposal, including Georgia Power's proposed operation and proposed environmental measures. The section concludes with a description of the alternatives considered but eliminated from detailed study.

2.1 No-action Alternative

The Wallace Dam Project is located on the main stem of the Oconee River in east-central Georgia (Figure 1). The Project is situated in the upper Oconee River basin of the greater Altamaha River basin. Wallace Dam is located at river mile 172.7, about 13.4 air miles east of the city of Eatonton, 15.4 air miles south of the city of Greensboro, and 19 air miles north of the city of Milledgeville (Figure 2). Wallace Dam is 29.7 river miles upstream of Georgia Power's Sinclair Dam (river mile 143) and immediately upstream of Lake Sinclair. Releases from Wallace Dam flow directly into Lake Sinclair; there is no intervening free-flowing or bypassed reach of river.

The watershed upstream of Wallace Dam covers an area of 1,830 square miles (sq mi), comprising about 34 percent of the Oconee River basin (Figure 1). At its normal full pool elevation of 435 feet (ft) plant datum (PD)³, Lake Oconee covers 19,050 acres, has 374 miles of shoreline, and extends about 39 river miles upstream on the Oconee River (Figure 3). The pool elevation of Lake Oconee fluctuates on average 1.5 ft daily as part of the pumpback operation of Wallace Dam. The average depth of Lake Oconee is 21 ft and the maximum depth is about 120 ft.

2.1.1 Existing Project Facilities

This section describes the existing project facilities, the project lands and waters within the project boundary, and Georgia Power non-project lands adjacent to the project boundary.

2.1.1.1 Project Facilities

The Wallace Dam Project was built and the reservoir filled to the full pool elevation of 435 ft PD by May 1980. Commercial operation began in December 1979. The Project consists of a reservoir (Lake Oconee), an earth and concrete gravity dam, a powerhouse integral with the dam, a five-gate spillway, a 20,200-ft-long excavated tailrace (into Lake Sinclair), a 230-kilovolt (kV) substation, a 15.67-mile-long transmission line, and appurtenant facilities (Figures 3 and 5).

The main dam has a crest elevation of 445 ft PD, a crest length of 2,395 ft, and height above streambed of 120 ft. The project works across the main dam consist of the following components (and their length) from west to east (Figure 5):

- West earth embankment (347 ft);
- West concrete non-overflow section (300 ft);
- Concrete spillway (266 ft);
- Powerhouse (intake) (531 ft, 4 inches);
- East concrete non-overflow section (226 ft); and
- East earth embankment (725 ft).

The west and east earth embankments are homogenous earth sections with chimney drains (Figure 5). The crests are at elevation 445 ft PD. Riprap protects the upstream slopes against wave action. The east and west non-overflow sections are concrete structures with a crest elevation of 445 ft PD.

The concrete spillway has a crest elevation of 391.0 ft PD. The spillway contains five Tainter gates, each 48-ft high by 42-ft wide (Figure 5). The discharge capacity of each gate is 35,000 cubic ft per second (cfs) at the normal full pool elevation of 435 ft PD.

In addition, there are two small saddle dikes located east of the main dam. They have a total length of about 900 ft and a maximum height of 20 ft. The original ground grade at each location was at or slightly above elevation 435 ft PD and was built up to a crest elevation of 445 ft PD.

At normal full pool, the total reservoir storage of Lake Oconee is approximately 370,000 acre-ft (120.5 billion gallons). The maximum pool for spillway design flood is elevation 441 ft. The normal maximum tailwater elevation is 340 ft.

The powerhouse is integral with and located immediately downstream of the dam on the east side of the river (Figure 5). The intake is integral with the powerhouse and has an invert elevation of 346.14 ft PD. The intake opening is located approximately between elevations 386 ft and 346 ft PD (49 to 89 ft below the normal full pool elevation). There are six penstocks with a diameter of 25.5 ft.

Steel trash racks in front of the intake consist of vertical bars with clear spacing between bars ranging from 9.5 to 10.5 inches (Southern Company, 2017). The steel trash racks in front of the downstream draft tubes consist of vertical bars with clear spacing between bars of 10.5 inches, with openings at each end being 16.5 inches.

The powerhouse contains six turbine-generator units, numbered 1 through 6 from west to east (Table 1). Two units are conventional units (Units 3 and 4), and the remaining four units can also reverse direction and become pumps (Units 1, 2, 5, and 6). The nameplate generating capacity of the Wallace Dam Project is 321.3 MW, which is based on the most efficient or best gate setting,

and the turbine hydraulic capacity is 48,000 cfs at best gate operations. The full gate hydraulic capacity of the Wallace Dam Project is 48,300 cfs.

The Wallace Dam powerhouse operates at rated net head of 89 ft. Table 2 summarizes the turbine design characteristics. Units 1, 2, 5, and 6 are vertical-shaft, Francis type, reversible pump turbines each rated 73,000 horsepower (hp) at 89 ft net head generating and 83,000 hp at 103 ft total dynamic head pumping. Their rated speed is 85.7 revolutions per minute (rpm). The four-unit pumping capacity totals 26,000 cfs. Units 3 and 4 are vertical-shaft, modified propeller type turbines, each rated 78,000 hp at 89 ft net head and with rated speed of 120 rpm.

The dependable capacity of the Project is 327.9 MW in the summertime, the most critical power demand season. Dependable capacity is defined as the maximum average capacity available for 8 hours each day for 5 consecutive days using average summer inflows. Average annual generation for the period 1981 through 2016 was 390,083 MWH.

The transmission facilities at the Wallace Dam Project consist of the 13.8-kV generator leads, two 13.8/230-kV step-up transformers with transformer capacity of 420,000 kV-amperes, a 230-kV substation, and a 230-kV transmission line 15.67 miles long. The transmission line begins at Wallace Dam, extends west, and terminates at a switching station near Eatonton, Georgia (Figure 3). The PAD (Georgia Power, 2015a) provides a map of the transmission line in Appendix C.

2.1.1.2 FERC Project Boundary

The FERC project boundary around Lake Oconee encompasses the normal full pool elevation of 435 ft PD and a fee-simple strip of land owned by Georgia Power around the entire shoreline (with the exception of FS lands) (Figure 3). The shoreline strip is generally 25-ft wide, with the exception of lands comprising the Oconee NF, and expands to widths of 100- or 200-ft across the reservoir from certain recreation areas (Georgia Power, 1971). The project boundary is measured as metes and bounds or elevation contour, depending on location around the reservoir. Larger land parcels define the project boundary in the areas of the project works, Georgia Power's public recreation facilities, and other areas reserved for recreation development. The project boundary extends downstream of Wallace Dam within Lake Sinclair approximately 1.3 river miles to the Georgia Highway (Hwy) 16 bridge. It extends downstream of Wallace Dam on the shoreline about 4.0 river miles as thin strips of land on each side of the narrow upper reach of Lake Sinclair. Thin strips of the project boundary also extend up each side of the Shoulderbone Creek embayment, located downstream of Hwy 16.

The project lands include seven project recreation facilities owned and operated by Georgia Power (Figure 3). Six are on Lake Oconee, and one is on the west shoreline of the tailrace. All seven facilities include a day-use area; six provide boat ramps, picnic tables, and restrooms; and three provide full-service campgrounds and swimming beaches (see Section 3.3.6.1). The facilities include: Armour Bridge, Long Shoals Boat Ramp, Sugar Creek Boat Ramp, Lawrence Shoals Park, Old Salem Park, Parks Ferry Park, and Tailrace Fishing Area.

The project lands include ten undeveloped areas that are reserved for future recreational use in accordance with the current Recreation Plan for the Project (Exhibit R) (Figure 4). The areas are dispersed around the shoreline of Lake Oconee and vary in size from 5 to 561 acres (see Section 3.3.6.1). These project lands reserved for future recreational use include: Area A-1, Area A-2, Tract B, Area B-3, Area B-5, Area C-2, Area C-4, Area C-5, Area C-6, and Area C-7. The A areas are reserved for development of state parks, the B areas to accommodate day use and overnight visitors, and the C areas for access to the reservoir.

The project boundary downstream of Wallace Dam encompasses three small waterfowl impoundments in the floodplain adjacent to the channel within the Oconee WMA (Figures 3 and 5). They include Pond 2 on the east side of the tailrace and Ponds 3 and 4 on the west side downstream of Hwy 16 (Figure 6) (Section 3.3.4). Pond 1 is located within the Sinclair project boundary.

There are approximately 4,442 acres of project lands inside the project boundary between the normal full pool elevation of 435-ft PD and the project boundary. Project lands provide a buffer for aesthetics, wildlife habitat, water quality protection, and recreation. These project lands include about 493.7 acres of FS lands within the Oconee NF along the Oconee River and Apalachee River embayments upstream of Interstate 20 (I-20) (Figure 3). FS manages the Oconee NF lands under the Land and Resource Management Plan for the Chattahoochee-Oconee NF (FS, 2004a).

Georgia Power leases, at no cost, 5,375 acres in and adjacent to project lands to GDNR for use as the Oconee WMA (Figure 3). The Oconee WMA is managed for waterfowl habitat, hunting, and other recreational purposes.

There are 4,427 parcels of land adjacent to the shoreline of Lake Oconee leased by individual residential property owners for lake access. No residences, residential outbuildings, or permanent structures, other than permitted shoreline structures, are allowed within the project boundary. Georgia Power manages the shoreline of Lake Oconee under its Shoreline Management Guidelines (Georgia Power, 2017b) to ensure compliance with the Wallace Dam FERC license and other applicable federal, state, and local laws and regulations.

The FERC project boundary also includes the 15.67-mile-long, 230-kV transmission line extending from Wallace Dam west to a switching station in the vicinity of Eatonton (Figure 3).

2.1.2 Project Safety

The Wallace Dam Project has been operating for more than 38 years under the existing license. During this time, Commission staff has conducted operational inspections focusing on the continued safety of the structures, modifications of structures, efficiency and safety of operations, compliance with the terms of the license, and proper maintenance. In addition, the Project has been inspected and evaluated every 5 years by an independent consultant and a consultant's safety report has been submitted for Commission review.

As part of the relicensing process, Commission staff would evaluate the continued adequacy of the existing and proposed project facilities under a new license. Special articles would be included in any license issued, as appropriate. Commission staff would continue to inspect the Project during the new license term to assure continued adherence to Commission-approved plans and specifications, special license articles relating to construction (if any), operation and maintenance (O&M), and accepted engineering practices and procedures.

2.1.3 Existing Project Operation

Georgia Power operates the Wallace Dam Project in a pumped storage mode for the purpose of peaking power generation. Generation releases occur during peak power demand hours to meet the electrical system demand with renewable, low-emission power that generates no wastes for disposal. Some of this water subsequently passes downstream for hydropower generation at Sinclair Dam to meet both electrical system demand and river flow requirements in the Oconee River downstream of Sinclair Dam. The remaining volume of water from Wallace Dam remains in Lake Sinclair for a few hours before being pumped back up and into Lake Oconee by the reversible units for reuse in the next day's generation cycle. Pumpback operations occur during off-peak demand periods (mostly at night), when electrical system demand is low and the cost of power is therefore lower.

2.1.3.1 Normal Operation

During normal daily operations, Lake Oconee fluctuates between elevations 435.0 ft and 433.5 ft PD. Lake Oconee typically begins the generation cycle near elevation 435.0 ft and ends near 433.5 ft PD. During nighttime, the pumping cycle refills Lake Oconee, typically to elevation 435.0 ft. Depending on power demand, the reservoir does not fluctuate the full amount every day. Daily fluctuations are 2.0 ft or less 100-percent of the time.

The Wallace Dam Project discharges directly into Lake Sinclair, with no intervening riverine reach or bypassed reach. Although there is no instantaneous discharge requirement, daily average discharges exceed 0 cfs about 85 percent of the time and 1,000 cfs about 64 percent of the time (Georgia Power, 2015a).

Nameplate capacity with all units operating is 321.3 MW. The majority of the total annual generation at Wallace Dam comes from the reuse of water pumped back into Lake Oconee during off-peak demand periods (mostly at night), which shows the critical importance of the pumpback operations to the power benefits of the Project (see Table 1 of Exhibit B). During the summer, Wallace Dam usually generates about 7 to 8 hours across the afternoon peak demand period. During fall and winter, peak generation typically lasts 5 to 6 hours.

Because of its large generating capacity, Wallace Dam is also a black-start facility for Georgia Power, meaning that it can assist in restoring electricity to the nearby system if another major generation facility goes off-line.

2.1.3.2 Drought Operation

The Wallace Dam Project supports the minimum flow requirements of the Sinclair Project during drought (i.e., low-inflow periods). When Sinclair's calculated inflow drops below 250 cfs, water is released from Lake Oconee for continued release downstream of Lake Sinclair. This allows Lake Sinclair to have a consistent elevation so that pumpback operations at Wallace Dam may continue during drought. If Lake Sinclair was lowered below its normal elevation range, the pump units at Wallace Dam would cavitate and could become damaged. The normal minimum pond level at Lake Sinclair is 338.2 ft PD and the pump units begin to cavitate at elevation 337.2 ft PD. During recent drought years, the Wallace Dam Project supplemented river flow in the Oconee River downstream of the Sinclair Project for several months, resulting in sustained periods when the elevation of Lake Oconee was below its normal operating range (Exhibit B).

2.1.4 Existing Environmental Measures

Georgia Power operates the Project to supplement flows during drought to support the downstream Sinclair Project minimum flow requirements. Supplementing flows during drought enhances aquatic resources by maintaining flow regimes in the Oconee River downstream of Sinclair Dam and moderating fluctuations of Lake Sinclair.

Georgia Power owns and operates seven project recreation facilities, which provide for a variety of recreational opportunities and access to project waters. All seven facilities include a day-use area; six provide boat ramps, picnic tables, and restrooms; and three provide full-service campgrounds and swimming beaches. The facilities are listed below and described in Section 3.3.6.1:

- Lawrence Shoals Park, Sugar Creek Boat Ramp, Long Shoals Boat Ramp, and Tailrace Fishing Area in Putnam County
- Old Salem Park, Parks Ferry Park, and Armour Bridge in Greene County

Georgia Power manages project shorelines in accordance with its Shoreline Management Guidelines, which provide guidance to adjacent residents on permitting and constructing shoreline structures. No residential structures are allowed on project lands within the project boundary. The guidelines list specific Lake Oconee requirements and restrictions for constructing seawalls, docks, wharves, boatslips, and boat lifts and personal watercraft lifts. The requirements minimize shoreline disturbance from tree removal, mechanical clearing, and other activities to protect the vegetative buffer zone surrounding the lake. The guidelines also include information about protecting and enhancing the scenic, recreational, and environmental values of the project reservoir.

2.2 Applicant's Proposal

2.2.1 Proposed Project Facilities

Georgia Power is not proposing to add capacity or make any major modifications to the Project under the new license.

2.2.2 Proposed Project Operation

Georgia Power proposes to continue operating the Wallace Dam Project in a pumped-storage mode for the generation of peaking power. Lake Oconee would continue to be operated within a 2.0-ft range to support the pumpback operations at Wallace Dam.

In the event of a planned, non-emergency drawdown that would reduce the elevation of Lake Oconee below the upper 2.0-ft range (elevation 433 ft), Georgia Power proposes to consult with GDNR and to report the schedule to FWS, FERC, and FERC's Atlanta Regional Office at least 10 days prior to the non-emergency drawdown.

The operation of the Wallace Dam Project would continue to be coordinated with the operation of the Sinclair Project. During extended low-flow conditions in the basin, the Wallace Dam Project would continue to supplement flows to support the downstream Sinclair Project minimum flow requirements. When calculated inflow at the Sinclair Project falls below 250 cfs, water would be released from Lake Oconee to supplement the minimum release requirements of Lake Sinclair.

Georgia Power is not proposing to add capacity or make any major modifications to the Project under the new license.

2.2.3 Proposed Environmental Measures

Georgia Power proposes the following measures to protect, mitigate adverse impacts to, or enhance environmental resources at the Wallace Dam Project.

These proposed environmental measures are based on Georgia Power's assessment of the Project and consultation with resource agencies and numerous other stakeholders.

- Continue to operate the Project during peak power demand hours to meet the electrical system demand with renewable, low-emission power that generates no wastes for disposal.
- Continue to operate the Project to supplement flows during drought to support the downstream Sinclair Project minimum flow requirements. Supporting these requirements would continue to enhance aquatic resources by maintaining flow regimes in the free-flowing reach of the Oconee River downstream of Sinclair Dam and moderating fluctuations of Lake Sinclair.

- Install and operate a forebay oxygen line diffuser system in Lake Oconee to enhance summer dissolved oxygen (DO) concentrations in the tailrace area. Operate the system as needed during the period May 1 through October 31. This would benefit water quality in the tailrace and downstream fisheries, aquatic resources, and recreational fishing, and support applicable water quality standards throughout the hottest months of the year.
- Continuously monitor and report tailrace DO concentrations and water temperature during the period May 1 through October 31 for 3 years following deployment of the forebay oxygen line diffuser system to verify DO enhancements in the tailrace area.
- Enhance recreation amenities at Lawrence Shoals Park by constructing new facilities to replace two campground restrooms, a beach house, a boat ramp restroom, a courtesy dock at the boat ramp, a pavilion and dedicated pavilion restroom, and a guest relations gate house. In addition, upgrade the current well system that supplies water to park facilities and customers. These improvements would continue to support quality recreation opportunities.
- Enhance recreation amenities at Old Salem Park by constructing new facilities to replace two group docks (and add a third group dock), a pavilion and dedicated pavilion restroom, a boat ramp restroom, a courtesy dock at the boat ramp, a beach house, and a guest relations gate house. In addition, upgrade the current well system that supplies water to park facilities and customers, and reconfigure the park entrance and gate house to reduce single-lane traffic congestion and allow for year-round operation of the boat ramp. These improvements would continue to support quality recreation opportunities and enhance year-round boat-fishing and tournament-fishing access to Lake Oconee.
- Enhance recreation amenities at Parks Ferry Park by constructing new facilities to replace two campground restrooms, a beach house, a courtesy dock at the boat ramp, and a pavilion and dedicated pavilion restroom. In addition, upgrade the current well system that supplies water to park facilities and customers, replace the underground water and electrical service, and reconfigure the entrance gate and gate house to reduce single-lane traffic congestion and allow for year-round operation of the boat ramp. These improvements would continue to support quality recreation opportunities and enhance year-round boat-fishing and tournament-fishing access to Lake Oconee.
- Increase bank fishing access on Lake Oconee by providing a new bank fishing access development at the Area C-5 tract to include a barrier-free pier and gravel parking.
- Increase bank fishing access on Lake Oconee by providing a new bank fishing access development at Jerry's Hwy 44 to include a barrier-free pier and gravel parking.

- Enhance recreation amenities and increase bank fishing access at Sugar Creek Boat Ramp by adding a new barrier-free fishing pier, upgrading the vault toilet with a flush toilet, and upgrading the courtesy dock.
- Enhance recreation amenities at Armour Bridge by upgrading the courtesy dock and replacing the vault toilet with a flush toilet.
- Enhance recreation amenities and improve bank fishing access at Long Shoals Boat Ramp by upgrading the courtesy dock and trimming vegetation to provide additional bank fishing access.
- Enhance recreation amenities and improve tailrace bank fishing access at the Georgia Hwy 16 Bridge Boat Ramp downstream of the dam by providing a new barrier-free tailrace fishing pier and a vault toilet. The new fishing pier would replace the bank fishing access provided at the Tailrace Fishing Area, which would be closed due to its limited public use and for security of Wallace Dam's adjacent equipment yard.
- Enhance recreational access at Georgia Power boat launch facilities by installing improved lighting at Lawrence Shoals Park, Old Salem Park, Parks Ferry Park, Sugar Creek Boat Ramp, Armour Bridge, Long Shoals Boat Ramp, Area C-5 tract, Jerry's Hwy 44, and Hwy 16 Bridge Boat Ramp.
- Implement a Shoreline Management Plan to continue to manage shorelines in accordance with Shoreline Management Guidelines for Georgia Power Lakes and to promote the maintenance of vegetative buffers around the reservoir to protect water quality, aquatic habitat, and cultural and aesthetic resources.
- Install shoreline stabilization consisting of riprap at Old Salem Park, Parks Ferry Park, Long Shoals Boat Ramp, and Armour Bridge to conserve soil resources, maintain shoreline recreational uses, reduce sedimentation and turbidity of adjacent waters, and enhance littoral-zone aquatic habitat.
- Repair the eroded shoreline at the Pond 2 waterfowl impoundment and inspect the water level control structure on the eastern shore of the Wallace Dam tailrace area to conserve soil resources, maintain waterfowl refuge habitat, and protect water quality and aquatic habitat.
- Implement an HPMP through a PA to assure the preservation and long-term management of archaeological sites and historic buildings and structures within the project boundary.

2.3 Alternatives Considered but Eliminated from Detailed Study

Georgia Power considered three other alternatives but eliminated them from detailed study because none are reasonable under the circumstances of this relicensing. These alternatives are described below.

2.3.1 Issuing a Non-Power License

A non-power license is a temporary license that the Commission will terminate when it determines that another governmental agency will assume regulatory authority and supervision over the lands and facilities covered by the non-power license. At this point, no agency has suggested a willingness or ability to do so. No party has sought a non-power license, and there is no basis for concluding that the Project should no longer be used to produce power. Thus, issuing a non-power license is not a realistic alternative to relicensing the Project.

2.3.2 Federal Government Takeover of the Project

Federal takeover and operation of the Project would require Congressional approval. While that fact alone would not preclude further consideration of this alternative, there is no evidence to indicate that federal takeover should be recommended to Congress. No party has suggested federal takeover would be appropriate, and no federal agency has expressed an interest in operating the Project. Therefore, federal takeover is not a reasonable alternative and has been eliminated from further investigation.

2.3.3 Retiring the Project

Project retirement is not a reasonable alternative to relicensing the Project. Among its benefits, the Wallace Dam Project generates substantial power, supports healthy fish and wildlife populations, provides numerous and diverse recreational opportunities, serves as the source of drinking water for two local communities, and supports the downstream Sinclair Project in meeting its minimum flow requirements. Project retirement could be accomplished with or without dam removal. Either alternative would involve surrender or termination of the existing license. No participant has suggested that project retirement would be appropriate in this case or provided any reasons for project retirement and therefore, there is no basis for recommending it.

3.0 ENVIRONMENTAL ANALYSIS

3.1 General Description of the River Basin

The Wallace Dam Project is located on the Oconee River at river mile 172.7 in the upper Oconee River basin of the greater Altamaha River basin (Figure 1). The Altamaha River basin includes the Oconee, Ocmulgee, and Altamaha Rivers. The Middle Oconee and North Oconee Rivers originate in the Piedmont physiographic province (Edwards et al., 2013). These streams meet at the southern border of Athens-Clarke County to form the Oconee River about 20 river miles upstream of Lake Oconee. The Oconee River flows south for 220 miles and joins the Ocmulgee River in the Coastal Plain physiographic province to form the Altamaha River. The Altamaha River flows 137 miles southeast to the Atlantic Ocean. The Altamaha River basin drains an area of 14,000 sq mi located entirely within Georgia.

The Oconee River basin drains a total watershed area of 5,330 sq mi in east-central Georgia (GEPD, 1998). The watershed upstream of Wallace Dam covers an area of 1,830 sq mi, comprising about 34 percent of the Oconee River basin (Figure 1). From Wallace Dam, the river flows immediately into Lake Sinclair, a 15,330-acre reservoir formed by Sinclair Dam (Figures 2). From Sinclair Dam, the Oconee River flows 143 miles to its confluence with the Ocmulgee River. About 5 miles downstream of Sinclair Dam, the Oconee River enters the Fall Line Hills District, the hilly transition zone that descends from the Piedmont into the Coastal Plain (Edwards et al., 2013).

3.1.1 Dams in the Basin

Two major dams are located on the mainstem Oconee River: Wallace Dam and Sinclair Dam (Figure 2). Sinclair Dam is part of the Sinclair Project and has a generating capacity of 45 MW. There is no intervening reach or bypassed reach of river between Wallace Dam and Lake Sinclair. The two dams impound about 69 river miles of the mainstem Oconee River in the Piedmont physiographic province. There are no other major mainstem dams on the Oconee and Altamaha Rivers downstream.

Two small hydroelectric dams are located upstream of the Wallace Dam Project. Barnett Shoals Dam is located on the Oconee River about 16 river miles upstream. It includes a low-head dam and powerhouse with 2.8 MW of capacity. The Tallassee Shoals Hydroelectric Project (FERC No. 6951), with a capacity of 2.3 MW, is located farther upstream on the Middle Oconee River. In addition, several reservoirs are in tributary systems upstream of Lake Oconee. The larger ones include Bear Creek Regional Reservoir, a 505-acre water supply reservoir next to the Middle Oconee River, and Hard Labor Creek Regional Reservoir, a newly constructed 1,370-acre water supply reservoir in the Apalachee River system.

3.1.2 Major Land Uses

Fourteen counties and over 40 cities and towns are located upstream of the Wallace Dam Project in the upper Oconee River basin. The consolidated government of Athens-Clarke County, with an estimated 124,700 residents in 2016, has the largest upstream population (U.S. Census Bureau, 2017). Estimated 2016 populations for the project counties were: Putnam 21,477, Morgan 18,170, Green 17,003, and Hancock 8,640.

The 116,731-acre Oconee NF includes an area north of I-20 at the upper end of Lake Oconee and an area south of I-20 to the southwest (Figure 2). Four WMAs are located in the vicinity. The Redlands WMA is on Oconee NF lands north of I-20. The Oconee WMA surrounds Wallace Dam and the tailrace area. The Redlands and Oconee WMAs have lands within the project boundary. The Cedar Creek and B. F. Grant WMAs are located west and southwest of the Project. Other public land uses in the project vicinity include the 1,500-acre Rock Eagle 4H Center in Eatonton.

The predominant land uses in northern counties upstream of the Project include a suburban or rural residential mix of low-intensity urban, forested lands, and row crop and pasture lands. With the exception of urban lands around the cities of Eatonton and Greensboro, most of the lands around the Project contain forest, row crop/pasture, or clearcut/sparse vegetation. Lake Oconee is also known for its private residential and resort developments, including many golf courses and marinas (Figure 3).

Livestock, poultry, and dairy operations are relatively intensive in the area. Morgan County ranks among the top beef-producing counties in Georgia (USDA, 2017). Putnam and Morgan Counties are among the top dairy counties (Georgia Milk Producers, Inc., 2017). Timber production and related businesses such as saw mills are also common (Georgia Forestry Commission [GFC], 2015).

3.1.3 Major Water Uses

Surface water provides 94-percent of the water supply used by the municipal, industrial, energy, and agricultural water-use sectors in the upper Oconee River basin (Jacobs, 2017). Sustainable groundwater yields are limited in the crystalline-rock aquifer system that underlies the upper Oconee River basin in the Piedmont province. Substantial portions of the Oconee River watershed upstream and downstream of the Wallace Dam Project are classified for drinking water supply, including Lake Oconee and Lake Sinclair. Other primary uses of the Oconee River near the Project include fishing, aquatic life, recreation, multiple resorts, hydropower generation, and municipal/industrial water supply.

The Oconee River also serves as a primary receiving water for assimilating treated sanitary effluent in the basin. The majority of wastewater is treated by facilities with point source discharges (Jacobs, 2017). About 45 percent of the municipal wastewater generated in the region is treated by onsite treatment systems, such as septic tanks, in areas where public collection systems are unavailable.

3.1.4 Tributary Streams

Lake Oconee and its tributary streams, exclusive of the Oconee River, comprise about 40 percent of the drainage area upstream of Wallace Dam. The five largest tributaries entering Lake Oconee include the following streams (Figures 2 and 3):

- Apalachee River – originates in Gwinnett, Barrow, Walton, and Oconee Counties, flows southeast through Morgan and Greene Counties, and enters the Apalachee River embayment of Lake Oconee; watershed area of about 233 sq mi.
- Hard Labor Creek – originates in Walton County, flows east through Morgan County, and enters the Apalachee River embayment; watershed area of about 86 sq mi.
- Richland Creek – drains portions of Greene County north and west of Greensboro, flows south, and enters the Richland Creek embayment south of I-20; watershed area of about 53 sq mi.
- Sugar Creek – drains portions of southeastern Morgan County and enters the western side of Lake Oconee south of I-20; watershed area of about 49 sq mi.
- Fishing Creek – originates in southwestern Oglethorpe County, drains portions of Greene County, flows west, and enters the eastern upstream end of the Oconee River embayment; watershed area of about 39 sq mi.

3.1.5 Climate

The Oconee River basin is characterized by a moist and temperate climate. Summers are long and hot, and winters are mild and short. Average annual air temperature ranges from 60 to 65°F (GEPD, 1998). Average daily temperatures vary from 40 to 45°F in January to 75 to 80°F in July. Winter low temperatures fall below freezing for only short periods. Average annual precipitation ranges from 47 inches in the lower basin to 56 inches in the upper basin. The wettest month is usually March, and the driest months are usually September and October (U.S. Geological Survey [USGS], 2017).

3.2 Cumulative Effects

3.2.1 Geographic Scope

The geographic scope of analyses for Georgia Power’s Wallace Dam Project defines the Project’s area of potential effect as primarily the FERC project boundary, including:

- Lake Oconee (19,050 acres);
- Wallace Dam tailrace extending downstream to the Hwy 16 bridge; and

- Approximately 4,442 acres of project lands inside the project boundary.

Consistent with FERC's criteria for defining cumulatively affected resources (FERC, 2015a), Georgia Power has analyzed water resources and fishery resources as cumulatively affected resources in this PLP. The geographic scope of the cumulative effects analysis extends beyond the Project's area of potential effect to the physical limits or boundaries of contributing effects from other hydropower and non-hydropower activities within the Oconee River basin. Because the proposed action would affect these resources differently, their geographic scopes of analysis differ, as described below.

The geographic scope of analysis for cumulative effects on water resources encompasses the Oconee River basin from the confluence of the Middle Oconee and North Oconee Rivers in Athens-Clarke County downstream to Sinclair Dam at Milledgeville. This scope of analysis includes those land uses and activities upstream in the basin that contribute to water quality conditions in Lake Oconee and the Wallace Dam tailrace area.

The geographic scope of analysis for cumulative effects on fish and aquatic resources encompasses the historic ranges of highly migratory and formerly more widely distributed native species of fish and freshwater mussels. The historic ranges may extend both upstream of Lake Oconee and downstream through the Altamaha River basin to the Atlantic Ocean.

The analysis of specific resources focuses on how the action of issuing a new license for the continued operation and maintenance of the Wallace Dam Project, as proposed herein by Georgia Power, may cumulatively affect those resources located within the geographic scope of influence.

3.2.2 Temporal Scope

The temporal scope of Georgia Power's cumulative effects analysis includes a discussion of past, present, and reasonably foreseeable future actions and their effects on water resources and fish and aquatic resources. The temporal scope considered the potential for actions occurring up to 50 years into the future, concentrating on the effects on the resources from reasonably foreseeable future actions. The historical discussion of past actions and effects is limited, by necessity, to the amount of available information for each resource. Georgia Power has identified the present resource conditions in this Exhibit E based on the best available information.

3.3 Proposed Action

This section analyzes the continuing and incremental environmental impacts, by resource area, of Georgia Power's proposal to continue operating the Wallace Dam Project. Appendices B through D present Georgia Power's proposed resource enhancement and management plans for environmental measures pertaining to shoreline stabilization, recreation enhancements, shoreline management, and recreation and land use. Appendix F contains Georgia Power's proposed draft license articles for the new license.

3.3.1 Geology and Soils

3.3.1.1 Affected Environment

The Wallace Dam Project is located in the Washington Slope District of the Piedmont physiographic province (Clark and Zisa, 1976). The Piedmont is a hilly upland province underlain by crystalline metamorphic and igneous rocks. The topography is gently rolling and descends from around 700-ft elevation near its northern limits to about 500-ft elevation at its southern margin. Streams in the Washington Slope District occupy broad, shallow valleys separated by broad, rounded divides, with local relief of 50 to 100 ft (Clark and Zisa, 1976).

The Project is located in the Southern Outer Piedmont ecoregion. This ecoregion has low hills, major forest types of loblolly-shortleaf pine, underlying rocks of gneiss, schist and granite, fine sandy loam soils, and a deep, red clayey subsoil (Griffith et al., 2001; Edwards et al., 2013).

The Lake Oconee shoreline is characterized by gently sloping topography in most areas. Rock outcroppings and boulders occur along the shoreline in some areas of the lower end of the reservoir, particularly at the confluence of the Oconee River and Richland Creek (Area A-1) and in Tract B (within the Oconee WMA) next to Lawrence Shoals Park (Figures 3 and 4).

Shoreline Erosion and Sedimentation

Georgia Power (2016a) conducted a shoreline reconnaissance survey of Lake Oconee and the Wallace Dam tailrace area in June 2016. The survey inventoried and characterized existing shoreline conditions and potential sources of erosion and sedimentation within the project boundary. It also characterized physical aquatic habitat and available sources of littoral-zone cover for fish. A total of 146 shoreline segments, or sites, were selected, including 35 sites in each of four sections of the reservoir (upper reservoir, middle reservoir, Richland Creek embayment, lower reservoir) and 6 sites in the tailrace area. The sites included all seven project recreation facilities, three FS recreation areas in the upper reservoir section, nine undeveloped areas on the reservoir reserved for future recreational development, and one site in the tailrace area next to Pond 2 in the Oconee WMA. WRD has indicated that the dike creating Pond 2, along the tailrace shoreline, has been experiencing erosion. Sites were visually assessed and rated for vegetative buffer zone condition, adjacent land uses, bank stability and vegetative protection, shoreline structural stabilization practices (e.g., seawalls, riprap), potential causes of shoreline erosion (project related and non-project related), and sources of littoral-zone fish cover.

The shoreline survey found the vast majority of sites to have stable or moderately stable banks. These sites exhibited low potential for erosion problems due to a high degree of bank vegetative protection and/or the use of shoreline structural stabilization practices, including seawalls, riprap, and combinations thereof. Natural vegetative buffer zone conditions were most widespread in the upper reservoir section (upstream of I-20) and in the tailrace area. Sites with landscaped riparian zones occurred throughout the reservoir but were most prevalent in the Richland Creek embayment and the lower reservoir section (between Hwy 44 and Wallace Dam), reflecting the intensity of

shoreline residential land uses in these areas. Sites with a mixture of landscaped and natural riparian zones were more numerous in the lower reservoir and middle reservoir sections than in the upper reservoir section. Overall, the most common categories of shoreline land uses, in descending frequency of observation, were residential, forested, and recreation access.

The most common potential sources of shoreline erosion inventoried on Lake Oconee, in descending frequency of observation, were wave action from wind and watercraft and residential landscaping. These non-project related sources of erosion were identified most frequently in the lower and middle reservoir sections. In these sections, residential shoreline uses are widespread, the reservoir is more open and the shoreline more exposed to wave action, and boating activity is more concentrated. Other less frequently observed potential sources of erosion were stormwater runoff, recreational access, reservoir fluctuations, tributary inflows, roads and bridges, and lack of natural vegetation.

Reservoir or water level fluctuations related to project operations were identified as a potential source of erosion at five reservoir sites but all of these sites were along undeveloped, heavily vegetated shorelines with natural vegetative buffers, and none exhibited active erosion problems. One site in the tailrace exhibited an active erosion problem next to Pond 2. Although bordered by a well-vegetated riparian zone, this site exhibited a steep erosion cut at the Pond 2 outflow pipe.

All seven sites surveyed at Georgia Power's project recreation facilities were rated as having stable or moderately stable banks. The most common potential sources of shoreline erosion at these sites included wave action from wind and watercraft and recreational access. Although the surveyed sites had stable or moderately stable banks, Georgia Power land management personnel routinely monitor the entire shorelines of the recreation facilities and have identified a need to add protective riprap to the shorelines of four project recreation facilities, including Old Salem Park, Parks Ferry Park, Long Shoals Boat Ramp, and Armour Bridge (Figure 3).

Sixty percent of the surveyed sites had shoreline structural stabilization structures in place; either seawall, riprap, or seawall with riprap at the base. The majority of sites with structural stabilization were located in the lower reservoir, middle reservoir, and Richland Creek embayment sections and were associated with residential lots. Fifty percent of the total shoreline length surveyed had structural stabilization in place in the proportions of 21 percent seawall and riprap combined, 19 percent seawall only, and 10 percent riprap only.

The 15.67-mile transmission line included as part of the Wallace Dam Project is also located entirely within the Piedmont province and Southern Outer Piedmont ecoregion. Relief along the right-of-way (ROW) is gently sloping.

3.3.1.2 Environmental Impacts and Recommendations

Georgia Power proposes to continue operating the Wallace Dam Project in a pumped-storage mode for the generation of renewable peaking power. The Project would continue to supplement flows during drought to support the downstream Sinclair Project minimum flow requirements.

Shoreline Erosion and Sedimentation

Georgia Power's proposed operation would not adversely affect shorelines within the project boundary as a result of erosion and sedimentation. For normal operation, Lake Oconee would continue to be operated year-round between a full-pond elevation of 435.0 ft PD and elevation 433.0 ft, with average daily fluctuations of approximately 1.5 ft. Daily fluctuations would continue to be 2.0 ft or less 100 percent of the time.

During the drier seasons in some years, the daily maximum reservoir elevation may fall below 435.0 ft PD, but the daily fluctuation typically remains within a 2.0-ft range. In drought years, the reservoir level may be drawn down seasonally in the summer or fall due to the combination of low inflows and downstream flow supplementation releases. During these periods, daily fluctuations also usually remain within 2.0 ft as long as pumpback operations can continue. During the period 1997-2016, the reservoir reached a peak elevation of 435.99 ft during a high-flow event and a low elevation of 430.59 ft during the 2007 drought. The daily reservoir fluctuations were less than 2.0 ft during both events. With the exception of drought years, there tends to be little seasonal variation in reservoir operating levels. For the years 1997 through 2016, Lake Oconee was below elevation 433.0 ft only 5 percent of the total hours and above 435.0 ft for 14 percent of the total hours. Daily fluctuations of Lake Oconee were less than 2.0 ft on 100 percent of the days (Georgia Power, 2016a).

Reservoir fluctuations were identified during the shoreline reconnaissance survey as a potential source of erosion at five sites on Lake Oconee, but other contributing sources of erosion were also observed, including wave action from wind and watercraft at four of the sites. None of the sites exhibited severe erosion or bank failure due to reservoir fluctuations.

Georgia Power's operations proposal would not adversely affect shoreline conditions in the project tailrace area. Although instantaneous project releases from Wallace Dam go as low as 0 cfs on a daily basis, there is no dewatering of the tailrace channel because it is located in the impounded upper reach of Lake Sinclair. Lake Sinclair is operated within a normal elevation range of 338.0 to 340.0 ft PD. Thus, daily fluctuations of Lake Sinclair average less than 2.0 ft.

The potential for shoreline erosion in the Wallace Dam tailrace area is further moderated by the use of riprap bank protection just below the dam, along the western shore of the tailrace channel, and along a portion of the eastern shore. In addition, bank and riparian zone vegetation helps to maintain bank stability and minimize erosion along both sides of the tailrace area. One exception is an active erosion problem area next to the Pond 2 outlet area along the eastern shore of the tailrace area.

Georgia Power proposes to repair the eroded shoreline at the Pond 2 waterfowl impoundment and inspect the water level control structure on the eastern shore of the Wallace Dam tailrace area within the Oconee WMA to conserve soil resources, maintain waterfowl refuge habitat, and protect water quality and aquatic habitat. The repair and inspection activities would be conducted in cooperation with WRD.

Shoreline Stabilization

Georgia Power proposes to install shoreline stabilization consisting of riprap at Old Salem Park, Parks Ferry Park, Long Shoals Boat Ramp, and Armour Bridge (Figure 3) to protect the sites from further erosion. Protection of these sites would conserve soil resources, maintain bank fishing and other shoreline recreational uses, reduce sedimentation and turbidity in adjacent waters, and enhance littoral-zone aquatic habitat. Georgia Power proposes to install riprap along approximately 5,100 ft of shoreline at Old Salem Park, 6,000 ft of shoreline at Parks Ferry Park, 2,000 ft of shoreline at Long Shoals Boat Ramp, and 3,400 ft of shoreline at Armour Bridge. Relevant scientific literature dealing with the effects of shoreline structural stabilization practices on littoral zone fish habitat supports the use of riprap, either alone or in front of sea walls, as providing more beneficial fish habitat than the use of seawalls alone (Georgia Power, 2016a).

The Shoreline Stabilization Plan in Appendix B provides further details of the proposed shoreline stabilization measures at each of these four project recreation facilities.

Shoreline Erosion Next to Pond 2 in the Tailrace Area

To address an active erosion problem area, Georgia Power proposes to repair the eroded shoreline next to Pond 2 in the tailrace area and inspect the water level control structure for the waterfowl refuge in cooperation with GDNR. During PAD development, GDNR raised concerns about the streambank erosion occurring at this site. Georgia Power viewed the site in February 2015 and noted that the erosion cut is located on the dike creating the pond at the location of the water level control structure for the waterfowl refuge area. The dike is very steep along its entire length. In addition, the dike slopes are covered by trees and other vegetation having the potential to compromise the integrity of the dike. Implementing the proposed measures in cooperation with GDNR, as described further in the Shoreline Stabilization Plan (Appendix B), would repair the bank undercutting currently taking place next to the Pond 2 dike, conserve soil resources, assist GDNR in identifying needed repairs to the water level control structure, maintain waterfowl refuge habitat within Oconee WMA, and protect water quality and aquatic habitat in the tailrace area.

Shoreline Stabilization License Article

Georgia Power proposes the following shoreline stabilization article for the Wallace Dam Project (see also Appendix F):

Shoreline Stabilization Plan (Article 408)

The Shoreline Stabilization Plan, filed on May 31, 2018, as Appendix B of Exhibit E, is approved and must be implemented, according to the schedule included in the plan.

Within 180 days of completion of all the shoreline stabilization required by the plan, the licensee must file for Commission approval, as-built drawings that show the location of all shoreline stabilization placed in relation to the Wallace Dam project boundary.

Construction of Proposed Enhancement Measures

Construction of the proposed shoreline stabilization measures and Pond 2 erosion repair, construction of the proposed forebay oxygen line diffuser system (Section 3.3.2.2), and construction of the proposed recreational enhancements (Section 3.3.6.2) would cause temporary shoreline disturbances in local areas. Georgia Power proposes to perform all construction associated with these enhancements in such a manner as to minimize impacts on shoreline vegetation, bank stability, and water quality. Proper erosion control and restoration practices during and immediately following all construction activities would minimize impacts. Construction of the proposed riprap stabilization would take place during the fall to minimize impacts to littoral-zone habitats and water quality during the spawning seasons of resident fish.

Unavoidable Adverse Impacts

Unavoidable adverse impacts would include temporary effects of shoreline disturbance from construction of proposed shoreline stabilization, the forebay oxygen line diffuser system, and proposed recreation enhancements. Impacts would be minimized through the implementation of best management practices (BMPs) for minimizing soil disturbance, controlling erosion, restoring natural contours, and re-vegetating disturbed areas.

3.3.2 Water Resources

3.3.2.1 Affected Environment

Water Quantity

Georgia Power calculated a daily inflow record at Wallace Dam using data from the two nearest USGS stream gages (Oconee River at Penfield and Apalachee River at Bostwick) and applying a ratio of the remainder of the ungaged drainage area (Georgia Power, 2015a, 2016b). Monthly minimum, mean, and maximum inflows at Wallace Dam for the years 1997 through 2016 are provided in Table 3. Mean flows ranged from a low of 1,003 cfs in August to a high of 3,577 cfs in March. The highest mean monthly flows occurred in December through April. The lowest mean monthly flows occurred in August through October. The average annual discharge at Wallace Dam is approximately 2,037 cfs.

Water Withdrawals

Surface withdrawals supply the vast majority of water uses in the project vicinity (Jacobs, 2017). Two local governments/water utilities withdraw surface water from Lake Oconee within the project boundary (GEPD, 2016a). The City of Greensboro in Greene County is permitted to withdraw 3.31 million gallons per day (mgd) and a monthly average of 3.00 mgd. The Greensboro intake is in the Oconee River embayment toward the upstream end of Lake Oconee. The City of Madison in Morgan County is permitted for maximum daily and monthly withdrawals of 2.0 mgd. The Madison intake is in the Apalachee River embayment toward the upstream end of Lake

Oconee. Piedmont Water Resources in Greene County has also been permitted for maximum daily and monthly withdrawals of 2.0 mgd but does not have an intake on Lake Oconee at this time (GEPD, 2017).

Treated Wastewater Discharges

The majority of wastewater in the upper Oconee River basin is treated by facilities with point source discharges (Jacobs, 2017). In 2016, there were four water treatment plants, 10 land application permits, four private/industrial permits, and 18 National Pollutant Discharge Elimination System permitted discharges in the four nearest counties upstream of Lake Oconee: Greene, Morgan, Oconee, and Clarke Counties (GEPD, 2016a). These discharges are primary sources of phosphorus to the reservoir. The addition of nutrients to the reservoir contributes to Lake Oconee's trophic status of mesotrophic conditions described below (Georgia Power, 2016b, 2017c).

Water Quality

Water Use Classifications and Attainment Status

GEPD (2015) classifies the water uses of Lake Oconee and the Wallace Dam tailrace area as Recreation and Drinking Water. These classifications also support the Fishing use. In addition to general criteria applicable to all waters, specific criteria apply to these water uses, including numeric criteria for bacteria, DO, pH, and temperature. The applicable DO numeric criteria are a daily average of 5.0 milligrams per liter (mg/L) and no less than 4.0 mg/L at all times.

GEPD (2016b) currently lists Lake Oconee as “assessment pending” relative to its attainment status because of occasional pH excursions outside the numeric criterion range of 6.0 to 8.5 at one of three stations monitored by GEPD, but sampling was recently suspended due to staff resource management changes. Georgia Power's monthly water quality sampling at nine stations in Lake Oconee in 2015-2016 found rare instances of pH above 8.5 (less than 1.5 percent of measurements) (Georgia Power, 2016b). GEPD's most recent Triennial Review for Water Quality Standards (GEPD, 2018a) proposed a revised pH standard for Lakes Oconee and Sinclair from 8.5 to 9.5. This is consistent with other lakes in the region (GEPD, 2018b) and should result in Lake Oconee meeting its designated uses. GEPD (2016b) currently lists the Wallace Dam tailrace area (Lake Sinclair) as supporting its designated uses.

Numerous tributary streams to Lake Oconee upstream of the project boundary are listed as not supporting their designated uses due to fecal coliform violations and/or fish community impacts (GEPD, 2016b; Georgia Power, 2016b; Jacobs, 2017). Non-point sources, including urban runoff from upstream communities, are the likely causes of impairment to these streams. Sixteen miles of the Oconee River and 35 miles of the Apalachee River immediately upstream of Lake Oconee are impaired due to fecal coliform violations. Segments of Richland Creek, Sugar Creek, Fishing Creek, and several other tributaries upstream of Lake Oconee also do not support their designated uses.

Studies have indicated that cattle farming areas in the Lake Oconee watershed contribute significantly to the impairment of main tributaries entering the lake (Bachoon et al, 2009). In 2013, GEPD described impending changes to its rules for specific numeric criteria for Lake Oconee for chlorophyll-*a* and nutrients to reduce nutrient over-enrichment of the reservoir from human activities and natural sources in the upstream watershed. In April 2018, GEPD (2018b) described its proposed revised water quality criteria for Lake Oconee including chlorophyll-*a*, total nitrogen, and total phosphorus as follows:

- Chlorophyll-*a*: for the months April through October, the average of monthly mid-channel photic zone composite samples shall not exceed the chlorophyll-*a* concentration at the locations listed below more than once in a 5-year period:
 - Oconee River Arm at Hwy 44: 26 µg/L
 - Richland Creek Arm: 15 µg/L
 - Upstream from the Wallace Dam forebay: 18 µg/L
- Total nitrogen: Not to exceed a growing season average of 2 mg/L as nitrogen in the photic zone.
- Total phosphorus: Not to exceed a growing season average of 0.2 mg/L in the photic zone.

These criteria revisions may go into effect by 2019. It should be noted that for the 5-year period examined, these criteria have been met in Lake Oconee.

Water Quality of Lake Oconee

Historically, quarterly water monitoring data collected by Georgia Power have indicated good overall water quality conditions in Lake Oconee (Georgia Power, 2015a). Georgia Power (2016b) conducted water quality monitoring of Lake Oconee from August 2015 through August 2016. Monitoring included monthly vertical profile measurements of water temperature, DO, pH, specific conductivity, and turbidity at 1-meter intervals throughout the water column at nine stations. Surface grab samples were collected quarterly at six stations and analyzed for a range of water chemistry parameters. In addition, Georgia Power (2016b) conducted hourly measurements of vertical profiles in Lake Oconee over the course of two day-night sampling events in summer 2016 to represent normal summer generation and pumpback operations. Lake Oconee water quality monitoring, including vertical profiles and water chemistry, continued quarterly in a second season of study from fall 2016 through summer 2017 (Georgia Power, 2017c).

Quarterly water chemistry data indicated good overall water quality conditions in Lake Oconee for the duration of the two-year study (Georgia Power, 2016b, 2017c). As with historical data, total phosphorus concentrations, turbidity, and fecal coliform densities for the two-year period were usually higher at upstream or tributary stations, indicating likely influences from upstream

urban runoff and other nonpoint sources. Trophic State Index scores continued to indicate mesotrophic conditions.

Monthly water quality vertical profiles recorded for Lake Oconee from June 2015 through August 2016 revealed the extent of mixing in Lake Oconee that occurs as a result of pumpback operations. Typically, southeastern reservoirs exhibit summertime thermal stratification with warmer temperatures near the surface, a sharp decrease in temperature at mid-depths, and cooler waters at the bottom. The monthly temperature profiles at Station OC1 in the Wallace Dam forebay (Figure 7) show that the water column remained well mixed for most of the year with little variation from the surface to the bottom. Very limited thermal stratification was observed in the late spring and early summer (March-April 2016, June 2015, and June 2016). The monthly DO profiles at Station OC1 exhibited a similar pattern of relatively uniform values for most of the year, indicative of a well-mixed water column, but there was a more pronounced gradient of declining DO values with increasing depth observed in June 2015, June and July 2016, and to a lesser extent in March and April 2016. DO gradients near the surface in summer months were likely due to photosynthesis.

Seasonal water quality vertical profiles of Lake Oconee collected in 2003-2017 indicate that vertical stratification becomes most developed in the spring and early summer, as surface temperatures rise and cooler water is still available (Georgia Power, 2016b, 2017c). By August, the water column exhibits warmer temperatures and only narrow temperature variation from the surface to the bottom. The effects of mixing on reduced temperature variation were most evident in the forebay, at other mainstem reservoir stations, and the tributary embayments closest to Wallace Dam.

Hourly monitoring events conducted in Lake Oconee over day-night periods in July and August 2016 indicated that temporary stratification develops in the forebay and other mainstem locations during the quiet period following pumpback and during generation (Georgia Power, 2016b). However, once pumpback begins, the water column becomes completely mixed in the forebay, as water is pumped in from Lake Sinclair. Similar but less complete effects of mixing occurred at other mainstem reservoir sampling stations. Tributary locations, especially the one in Richland Creek, remain stratified throughout the generation and pumpback cycle with respect to DO concentrations and temperature, indicating that dam operations have little short-term effects on water quality in Richland Creek.

Water Quality of Wallace Dam Tailrace Area

Georgia Power (2016b, 2017c) conducted continuous DO and water temperature monitoring in the Wallace Dam tailrace from July 2015 through September 2017 to characterize the effects of continued project operation on water quality. Water quality data were recorded every 60 minutes. The continuous monitoring data were aligned with real-time project operational data from the same periods, which indicated how the turbines were being operated (generation, pumpback, number of units). In addition, Georgia Power conducted hourly measurements of DO and water temperature in the tailrace area over the course of two day-night events in August 2016.

The tailrace monitoring data indicated similar overall seasonal patterns between the two seasons of study. As average water temperature increased in spring and summer, average DO values decreased. As water began cooling in late summer and early fall, average DO values increased. Lower DO concentrations in summer months are expected as warmer temperatures decrease oxygen solubility in water and the growing season contributes additional biomass to the water column, increasing biological oxygen demand.

Summer tailrace DO values below 4.0 mg/L occurred during periods throughout much of the summer. These DO depressions were correlated with generation. In summer 2016, tailrace DO depressions occurred almost exclusively in June and July. In summer 2017, DO depressions began in May and extended into August. Pumpback operations and photosynthesis during interim daytime periods on the same days corresponded with increases in tailrace DO values, usually to above 4.0 mg/L. The DO values during generation corresponded with DO levels in the forebay of Wallace Dam at depths of 2 to 7 m and greater.

In water year (WY) 2016 (October 1, 2015, through September 30, 2016), DO values less than 4.0 mg/L occurred in 8.6 percent of the hourly readings (Georgia Power, 2017c). In water year 2017, 14.0 percent of the readings were less than 4.0 mg/L. Sixty-nine days of WY 2016 (19 percent) and 93 days of WY 2017 (25 percent) had daily average DO values less than 5.0 mg/L. Outside of the months May-August, tailrace minimum DO values were always higher than 4.0 mg/L.

Hourly tailrace monitoring events in August 2016 indicated water quality to be relatively uniform across the tailrace channel during each event (Georgia Power, 2016b). DO values decreased after generation began and remained low throughout the interim and pumpback periods. DO recovery began during the daylight interim period, consistent with daytime photosynthesis in upper Lake Sinclair.

Although DO depressions occurred daily in the tailrace area during summer generation, overall water quality conditions are good and support an aquatic community typical of southeastern reservoirs and the designated uses of the tailrace reach. In addition, the tailrace supports important fishing and other recreational opportunities.

Transmission Line

The Wallace Dam transmission line is located entirely within the upper Oconee River basin. The headwaters and small streams crossed by the ROW, including Jenkins Branch, Crooked Creek, Turkey Creek, and Rooty Creek, all drain south to Lake Sinclair (Figure 3). The water quality of these streams is affected by non-point source runoff from rural and urban land uses. Turkey Creek and Rooty Creek are part of a total maximum daily load for fecal coliform in the Oconee River Watershed (EPA, 2002).

3.3.2.2 Environmental Impacts and Recommendations

Project Operations

During the drier seasons in some years, the daily maximum reservoir elevation may fall below 435.0 ft PD, but the daily fluctuation remains within a 2.0-ft range. In drought years, the reservoir level may be drawn down seasonally in the summer or fall due to the combination of low inflows and downstream flow supplementation releases. During these periods, daily fluctuations also usually remain within 2.0 ft as long as pumpback operations continue. With the exception of drought years, there tends to be little seasonal variation in reservoir operating levels. For the years 1997 through 2016, Lake Oconee was below elevation 433.0 ft only 5 percent of the total hours and above 435.0 ft for 14 percent of the total hours.

Georgia Power proposes to continue operating the Wallace Dam Project in a pumped-storage mode for the generation of peaking power. The Project would continue to supplement flows during drought to support the downstream Sinclair Project minimum flow requirements.

Downstream Minimum Flow

Wallace Dam has no minimum flow requirement because it releases directly into the downstream Lake Sinclair. Georgia Power's Wallace Dam operation proposal would continue to support the minimum flow requirements of the Sinclair Project during drought. When the Sinclair Project's calculated inflow drops below 250 cfs, water from Lake Oconee is released to supplement Oconee River flows downstream of the Sinclair Project.

Lake Elevations during Normal, Drought, and Flood Operations

For normal operations, Lake Oconee fluctuates between elevation 435 ft PD, which is full pond, and elevation 433 ft PD. The average daily fluctuation of Lake Oconee is approximately 1.5 ft; however, 100 percent of the time daily fluctuations are 2.0 ft or less.

Georgia Power's operations proposal includes continuing to operate Lake Oconee within a 2.0-ft daily fluctuation range to support the pumpback operations at Wallace Dam. Operating within this range enables Georgia Power to optimize the generating capacity of the Project to meet peak power demand. Maintaining this range allows for consistent access to the reservoir for recreation. It also protects the various permitted intake structures on the reservoir.

During drought conditions and because of Wallace Dam's support role in meeting minimum flow requirements downstream of the Sinclair Project, there may be sustained lake levels below the upper 2.0-ft range proposed during normal conditions. In several recent droughts, there was a gradual multi-month drawdown of Lake Oconee as the flows released downstream exceeded the incoming flows. In 2016, the low level was approximately 4.25 ft below full pool elevation. Even during periods of drought and low lake levels, Georgia Power is able to maintain the 2.0-ft daily fluctuation range limitation.

Outside of drought conditions, Georgia Power's operations proposal does not include regular drawdowns of Lake Oconee because there are no drawdowns for homeowner and shoreline maintenance. However, because there may be drawdowns for planned dam maintenance activities, Georgia Power proposes to consult with GDNR prior to any non-emergency drawdowns outside of the upper 2.0-ft range (elevation 433 ft) and notify FWS and FERC of the drawdown schedule at least 10 days in advance. Under emergency operating conditions, the same agencies would be notified within 10 days after the incident.

During flood conditions, the elevation of Lake Oconee sometimes rises above 435 ft; specifically, approximately 14 percent of the hours in 1997 through 2016. The project turbine units are large and pass a large amount of flow (Table 1), and they cannot operate below a minimum gate setting without causing damage to the units. During rising flow conditions, the reservoir elevation rises slightly until either the inflows subside or there is enough flow to add more turbine units.

Project Operations License Articles

Based on the analysis provided above, Georgia Power proposes the following project operations license articles for the Wallace Dam Project (see also Appendix F):

Fluctuation Limits (Article 401(a))

The licensee will operate the Wallace Dam Project to limit the daily fluctuation of Lake Oconee to 2 ft.

Drawdowns (Article 401(b))

In the event of a planned, non-emergency drawdown that would reduce the reservoir elevation below 433 ft PD, the licensee must consult with GDNR. When non-emergency drawdowns are scheduled with GDNR, the licensee shall report the schedule to FWS, the Commission, and the Commission's Atlanta Regional Office at least 10 days prior to the non-emergency drawdown. In the case of an emergency drawdown, the licensee must notify GDNR, FWS, the Commission, and the Commission's Atlanta Regional Office within 10 days after each such incident.

Coordinated Operations (Article 401(c))

The operation of the Wallace Dam Project (FERC No. 2413) shall be coordinated with the operation of the Sinclair Project (FERC No. 1951) so that the licensee for No. 2413 is authorized to utilize the Sinclair Reservoir as a source of water at no cost and as a lower pool for the operation of the pumped-storage facilities of the Wallace Dam Project when operating under this license. During extended low flow conditions in the basin, the Wallace Dam Project supplements flows to support the downstream Sinclair Project minimum flow requirements. When calculated inflow at the Sinclair Project falls below 250 cfs, water will

be released from Lake Oconee to supplement the minimum release requirements of Lake Sinclair.

Project Operation Compliance Monitoring (Article 402)

The licensee must monitor project operation and reservoir elevations to ensure compliance with the operational requirements of Article 401 of this license. The licensee must monitor the hourly headwater elevations, which are recorded at the plant electronically, and maintain such records for periodic review. These data must be made available to the Commission at any time upon request. In addition, the licensee must document annually in a report, compliance with the fluctuation requirements of Article 401. The report must be filed with the Commission and GDNR by March 1 of the year following the monitoring.

Water Quality in the Tailrace Area

In its Comments on Relicensing Study Reports dated January 20, 2017, GDNR expressed concern about summer DO concentrations and requested that Georgia Power examine options for improving DO concentrations at the Project. Georgia Power (2017) filed a study plan for a newly proposed “Study of Aeration Methods to Enhance Summer Dissolved Oxygen in the Wallace Dam Tailrace Area” on February 20, 2017. The Director issued a determination on requests for study modifications and new studies on March 17, 2017, which approved the new study (FERC, 2017a).

Georgia Power (2017d) conducted the aeration methods study to identify and evaluate, using water quality data collected during the first season of study (2015-2016), technically feasible and cost-effective aeration methods for increasing summer DO concentrations in the tailrace area. To perform the aeration methods assessment, Georgia Power contracted the support of R.J. Ruane, M. H. Mobley, and P. J. Wolff. Their report (Ruane et al., 2017) is provided as an appendix to the study report.

The aeration methods assessment characterized and modeled the water withdrawal zone at the turbine intakes, screened a full range of aeration alternatives for technical feasibility and efficacy, modeled turbine aeration to assess the potential for turbine venting and the addition of forced air, and modeled in-lake aeration approaches (Georgia Power, 2017d). Two alternatives were identified as being technically feasible, including a forebay oxygen line diffuser system and draft tube aeration using compressed air. Conceptual designs were developed for these two alternatives for further evaluation and comparison as to installation and annual operation costs, practicality of system deployment, and other potential issues associated with system operation. In addition, Georgia Power conducted site visits of two oxygen line diffuser systems operated by the U.S. Army Corps of Engineers (USACE) at J. Strom Thurmond Lake and Richard B. Russell Lake on the Savannah River, which are similar in overall design to the concept evaluated for Wallace Dam. The site visits provided an opportunity to discuss operation and maintenance of the systems with USACE personnel.

The study concluded that a forebay oxygen line diffuser system is the most technically feasible and cost-effective approach for enhancing summer DO concentrations in the Wallace Dam tailrace. Forebay oxygen line diffuser systems are designed to place oxygen in a reservoir in the intake withdrawal zone to meet a target DO concentration in the dam releases. Diffuser lines consisting of porous hose weighted to sink to depth are used to spread oxygen bubbles over a large area to obtain high oxygen transfer efficiencies. The diffusers are supplied with oxygen from an on-shore liquid oxygen storage facility. As the bubbles rise in the water column, they oxygenate water in the withdrawal zone above. The system is designed so that a sufficient volume of enhanced-DO water passes through the turbines and into the tailrace to meet the DO target. Oxygen line diffuser systems are currently being successfully operated at 15 hydropower projects across the U.S., including 11 applications in the southeastern U.S. Although draft tube aeration using compressed air would also be technically feasible, the installation costs would be substantially higher and important limitations for such a system include potential total dissolved gas issues, reduced generating efficiency, and turbine maintenance issues (Ruane et al., 2017).

The estimated capital cost of a forebay oxygen line diffuser system at Wallace Dam is \$4,699,000 (Ruane et al., 2017). The cost estimate includes the diffuser lines, supply lines, and liquid oxygen storage facility. Annual liquid oxygen costs and system monitoring costs are estimated to range from \$150,000 to \$300,000 based on tailrace monitoring data for 2015 and 2016. By comparison, the estimated capital cost of draft tube aeration using compressed air is \$15,190,000 (Ruane et al., 2017). This cost assumes two blowers per turbine. Estimated annual costs are \$140,000 due to losses in net generation.

Proposed Forebay Oxygen Line Diffuser System

Based on the findings of the aeration methods study, Georgia Power proposes to install and operate a forebay oxygen line diffuser system in Lake Oconee to enhance summer dissolved DO concentrations in the Wallace Dam tailrace area. This system would benefit water quality in the tailrace and downstream fisheries, aquatic resources, and recreational fishing, and support applicable water quality standards throughout the hottest months of the year. The analysis for the conceptual design showed that a diffuser system with a maximum oxygen capacity of 200 tons per day would be required for worst-case conditions, but that median oxygen use would be about 60 tons per day (Ruane et al., 2017). The conceptual design includes two sets of diffuser lines to provide operational flexibility for oxygen placement in the forebay. The two sets would be installed in sequence and extend longitudinally about 0.7 mile upstream of the dam as shown in Figure 8. The upstream set of diffusers would be operated to inject a low level of oxygen continuously to maintain an oxygenated forebay volume during non-generation. The set closest to the dam would be operated to boost oxygen output during generation. The diffuser lines would be placed at various levels above the bottom to efficiently aerate the withdrawal zone. Operation of the system would be optimized to the extent practical to achieve tailrace DO concentration targets in the tailrace of 4.0 mg/L instantaneous and 5.0 mg/L daily average. The system would operate in the months May through August, when needed.

Installation of the proposed forebay oxygen line diffuser system in Lake Oconee would require the construction of an onshore liquid oxygen facility (Ruane et al., 2017). Georgia Power proposes to construct the facility at the location shown in Figure 9. The facility would include a driveway, liquid oxygen tanks, a vaporizer system, oxygen flow control valves, and piping leading to the reservoir. The liquid oxygen facility would be approximately 3 acres in total area on the northeast side of Wallace Dam in Hancock County.

Proposed Tailrace Monitoring

Georgia Power proposes to continuously monitor and report tailrace DO concentrations in the months May through September for 3 years following deployment of the forebay oxygen line diffuser system to verify DO enhancements in the tailrace area. The monitoring would be conducted using an automatic probe recording measurements at 60-minute intervals at Station OCTR in the tailrace. Prior continuous monitoring at the same location in 2015-2017 and hourly tailrace transect measurements from August 2016 validate station OCTR as being representative of tailrace water quality during project operations (Georgia Power, 2016b). Based on the extensive record of DO and water temperature data previously collected at the same location, the effectiveness of the oxygen diffuser system would be readily determined within the 3-year monitoring period.

Tailrace Water Quality License Articles

Based on the analysis provided above, Georgia Power proposes the following license articles for the Wallace Dam Project regarding tailrace water quality enhancement and monitoring (see also Appendix F):

Tailrace Water Quality Enhancement (Article 403)

Within 2 years of the issuance of the license, the licensee shall install and operate a DO enhancement system to improve summer DO concentrations in the Wallace Dam tailrace area. The licensee must operate the DO enhancement system as needed during the period May 1 through October 31 each year. The DO enhancement system must be in place throughout the period May-October, unless the DO monitoring required by Article 404 shows that a longer period is needed to enhance DO in the tailrace.

Use of the DO enhancement system may be temporarily modified if required by operating emergencies beyond the control of the licensee, or for short periods upon mutual agreement between the licensee and GDNR. In the event of a planned modification, the licensee must notify the Commission at least 10 days in advance.

In the event of an emergency modification to the DO enhancement system, the licensee must notify the Commission and GDNR no later than 10 days after each such incident.

Tailrace Water Quality Monitoring (Article 404)

The licensee shall monitor DO and water temperature in the Wallace Dam tailrace area during the period May 1 through October 31 each year monitoring is to occur following the installation and deployment of the DO enhancement system. Monitoring shall be conducted using an automatic probe recording measurements at 60-minute intervals at Station OCTR, or other representative location. The licensee shall prepare a monitoring report annually for each of the first 3 years of monitoring, with the annual report due by January 31 of the following calendar year.

In addition, the licensee will file a 3-year monitoring report with FERC, due by April 30 of the calendar year following the third year of monitoring. The 3-year monitoring report must include:

1. The DO data collected during the 3-year monitoring effort;
2. A discussion of the effectiveness of the DO enhancement system;
3. Any recommendations for modifying the DO enhancement system or monitoring effort; and
4. Documentation of consultation with GDNR, copies of the agency's comments and recommendations on the completed report after it has been prepared and provided to the agency for review, and specific descriptions of how the agency's comments are addressed in the report. The licensee must allow a minimum of 30 days for the agencies to comment and to make recommendations before filing the report with FERC. If the licensee does not adopt a recommendation, the filing must include the licensee's reasons, based on project-specific reasons.

The approved Tailrace Water Quality Monitoring Program must not be amended without prior FERC approval. FERC reserves the right to require changes to the program based on the information provided in the 3-year monitoring report.

Cumulative Effects

Georgia Power operates the Wallace Dam Project as a peaking and pumped-storage plant. Daily reservoir fluctuations average about 1.5 ft and are 2.0 ft or less 100 percent of the time. By consistently operating Lake Oconee within a relatively narrow and highly predictable range of reservoir elevations, operation of the Project also benefits public water supply intakes in the reservoir as well as the reservoir's designated Recreation uses. Georgia Power's proposal to continue operating the Project to supplement flows during drought to support the downstream Sinclair Project minimum flows would continue to enhance aquatic habitat for riverine species of fish and mussels and highly migratory and diadromous fishes in the Oconee River downstream of Sinclair Dam (Section 3.3.3.2).

Historical water quality studies and the two-year study conducted as part of the relicensing documented that Lake Oconee receives water from the upstream watersheds that is high in nutrients. The main streams entering Lake Oconee and numerous other upstream tributaries are not currently supporting their designated uses, primarily due to impaired biological communities (fish or macroinvertebrates) or due to high fecal coliform levels (Jacobs, 2017). The surrounding agricultural land uses upstream of Lake Oconee are likely a major contributor to the nutrient-enriched waters entering the reservoir and the water quality conditions that result in summer DO depressions in the Wallace Dam tailrace area. Georgia Power's proposal to install and operate a forebay oxygen line diffuser system would reduce effects of nutrient enrichment originating in the upstream watershed and benefit downstream water quality, fisheries, aquatic resources, and recreation opportunities by supporting applicable water quality standards through the hottest months of the year.

Pending nutrient criteria (GEPD, 2018b) for Lake Oconee will also bring about improved water quality. The state water plan has targeted both Lake Oconee and Lake Sinclair for the implementation of management practices to reduce nutrient loading in the upstream watershed (Jacobs, 2017). Reduced nutrient loading, combined with the addition of oxygen to the forebay, will increase the assimilative capacity of the reservoir for the incoming oxygen demand.

For these reasons, continued operation of the Wallace Dam Project would have a highly beneficial cumulative effect on the Oconee River in providing a popular fishery and recreation destination, as well as protecting the river's designated uses within the project reservoir and downstream of the Project to the free-flowing Oconee River below the Sinclair Project.

Unavoidable Adverse Impacts

Construction of the proposed forebay oxygen line diffuser system would likely have some short-term unavoidable adverse impacts upon water quality. Installation of the system would cause disturbance of soil and minimal disturbance to the reservoir bottom sediments. This could result in short-term adverse effects on local water quality with increased turbidity and oxygen demand from sediments and soils. All effects are likely to be short-term and minimal in magnitude.

3.3.3 Fish and Aquatic Resources

3.3.3.1 Affected Environment

The Wallace Dam Project is located on the upper Oconee River in the Piedmont of the larger Altamaha River basin. The upper Oconee River basin principally supports warm-water fisheries. The impounded waters of Lake Oconee dominate aquatic habitats within the project boundary and the principal fisheries inhabiting project waters are reservoir fisheries. Wallace Dam discharges directly into Lake Sinclair, which also supports a reservoir fishery. Free-flowing streams in the project area are the Oconee River, Apalachee River, and other tributaries entering Lake Oconee (Section 3.1.4). The Sinclair Project impounds 29.7 miles of river and separates Wallace Dam from the lower free-flowing reach of the Oconee River. The Oconee River flows 143 miles from

Sinclair Dam through the Fall Line Hills District and into the Coastal Plain to join the Ocmulgee River and form the Altamaha River.

The upper Oconee River basin in the vicinity of the Wallace Dam Project supports about 57 species of fish (Table 4). The families with the most species include minnows, catfishes, sunfishes, suckers, and perches. Standardized surveys conducted by WRD have documented the occurrence of at least 28 species of fish within Lake Oconee (GDNR, 2014a); several other non-game species not targeted by the surveys also likely reside there. The principal sport fishes inhabiting Lake Oconee include largemouth bass, black crappie, striped bass, white bass-striped bass hybrids (hybrid bass), white bass, channel catfish, blue catfish, flathead catfish, and a variety of sunfishes. Nine fish species believed to be introduced and non-native to the Oconee River basin occur in the project vicinity.

Lake Oconee

Lake Oconee covers 19,050 acres and has 374 miles of shoreline (Figure 3). The bottom is mostly clay with rocky outcroppings in some areas in the lower end of the reservoir, particularly around the confluence of the Oconee River and Richland Creek. Standing timber and fish plots (stands topped out below the surface) are distributed throughout Lake Oconee and provide cover for black crappie and other sunfishes and serve as nursery habitat for forage species, including gizzard shad and threadfin shad (Van den Avyle and Petering, 1988). When Lake Oconee was constructed, about 1,250 acres of timber were left standing in flooded channels and smaller inlets as wildlife habitat. Fifty timber stands totaling about 235 acres were cut off 10 ft below the full-pool surface as submerged habitat for reservoir fish. Other important fish habitat structures in Lake Oconee include anchored fish attractors, artificial reefs, native aquatic vegetation, sunken trees, spawning gravel, and riprap.

Based on a shoreline reconnaissance survey of Lake Oconee and the Wallace Dam tailrace area conducted in June 2016 (Georgia Power, 2016a, 2016c), the most frequently observed sources of littoral-zone fish cover, in descending order, were overhanging vegetation, docks and piers, riprap, emergent vegetation, and large woody debris. On the basis of proportional length, riprap was the predominant source of shoreline fish cover, followed by overhanging vegetation and docks and piers. Riprap was most prevalent in the lower reservoir, middle reservoir, and Richland Creek sections of Lake Oconee, where residential and resort development are widespread and riprap is commonly used to stabilize shorelines. Overhanging vegetation was the predominant cover type in the less developed upper reservoir section.

Lake Oconee supports a popular fishery for largemouth bass, black crappie, striped bass, hybrid bass, channel catfish, blue catfish, and a variety of other species (GDNR, 2017b). The lake has numerous public access areas providing for a wide range of boat- and bank-fishing opportunities and tournament fishing. Tournament fishing is popular and primarily targets largemouth bass. For the years 1996 through 2014, the average tournament bass weight on Lake Oconee (1.8 to 2.1 pounds [lbs]) ranked among the top five reservoirs in Georgia in 17 of the 19 years (Georgia Bass

Chapter Federation, 1996-2014). The average largest bass reported in Lake Oconee tournaments during those years weighed from 3.5 to 4.6 lbs.

GDNR annually stocks striped bass and hybrid bass into Lake Oconee. Since 2011, stocking numbers have transitioned away from a predominance of striped bass to that of hybrid bass, based on angler preferences for hybrid bass (GDNR, 2017b). Current stocking rates are about 15 hybrid bass and 5 striped bass per acre.

Lake Oconee also provides a popular year-round catfish fishery. Blue catfish and flathead catfish were introduced in the mid-1990's and their populations expanded rapidly (Homer and Jennings, 2011). Anglers now have the opportunity to catch trophy-size catfish, with some blue catfish and flathead catfish exceeding 40 lbs (GDNR, 2017b).

Wallace Dam Tailrace Area

From Wallace Dam the Oconee River flows directly into Lake Sinclair, a 15,330-acre reservoir. Shorelines in the tailrace area are primarily forested downstream to the end of the project boundary. The Lake Sinclair fishery is dominated by many of the same reservoir species found in Lake Oconee (Table 4). Lake Sinclair supports a popular fishery for largemouth bass, hybrid bass, striped bass, channel catfish, blue catfish, black crappie, bluegill, and redbreast sunfish (GDNR, 2017b). The tailrace area also supports at least four species of native freshwater mussels, as described below.

Freshwater Mussels

The Altamaha River basin is inhabited by a freshwater mussel fauna consisting of about 18 species, seven of which are endemic to the basin (Johnson et al., 2012; Wisniewski et al., 2005). Two freshwater mussel surveys were conducted in summer 2016, one in Lake Oconee and the other in the Wallace Dam tailrace area (Dinkins, 2016a, 2016b). The surveys documented the occurrence of four native freshwater mussel species within the project boundary, none of which are listed as federally threatened or endangered, or state protected. All four species were found in both Lake Oconee and the tailrace area, including:

- Altamaha slabshell (*Elliptio hopetonensis*) – endemic;
- Inflated floater (*Pyganodon gibbosa*) – endemic;
- Paper pondshell (*Utterbackia imbecillis*); and
- Variable spike (*Elliptio* sp. cf. *icterina*).

The Lake Oconee mussel survey yielded 355 live specimens. All four species were found in the main channel and tributary embayments. The vast majority of mussels (98.3 percent) were found downstream of I-20. The most common species was Altamaha slabshell, which comprised 71

percent of the live native mussels found in Lake Oconee, followed in relative abundance by inflated floater, paper pondshell, and variable spike. The largest number of live mussels (168) was found at a main-channel site located 2 kilometers (1.2 miles) upstream of Wallace Dam, near the reservoir forebay. This was the only site where boulders were present and the only site where all four species were found together in Lake Oconee.

The Wallace Dam tailrace survey yielded 1,479 live specimens of the same four species. The Altamaha slabshell comprised 97.5 percent of all live native mussels found and was followed in relative abundance by variable spike, and inflated floater and paper pondshell. The vast majority of the mussels found in the tailrace area (98.2 percent) occurred in the main channel. The largest number of live mussels (501) was found in the main channel about 300 meters (984 ft) downstream of the powerhouse along the east bank.

Migratory Fishes

The Wallace Dam Project is located approximately 310 river miles upstream of the Atlantic Ocean (Figure 1) and 35 river miles upstream of the Fall Line Hills District. Sinclair Dam poses a barrier to the upstream migration of diadromous⁴ and other migratory riverine fishes into the project area.

Eight highly migratory and/or diadromous species presently occur in portions of the Altamaha River basin, including six anadromous⁵ species, one catadromous species⁶, and one migratory riverine species:

- Shortnose sturgeon (*Acipenser brevirostrum*) – anadromous; federally endangered;
- Atlantic Sturgeon (*Acipenser oxyrinchus oxyrinchus*) – anadromous; federally endangered;
- American shad (*Alosa sapidissima*) – anadromous;
- Blueback herring (*Alosa aestivalis*) – anadromous;
- Hickory shad (*Alosa mediocris*) – anadromous;
- Striped bass (*Morone saxatilis*) – anadromous or highly migratory;
- American eel (*Anguilla rostrata*) – catadromous; and
- Robust redhorse (*Moxostoma robustum*) – highly migratory riverine.

Of the eight species, striped bass and American shad are the only species presently known to occur within the Wallace Dam project boundary. Striped bass occur as a land-locked population

⁴ Diadromous species migrate between freshwater and marine/estuarine environments to complete their life cycles.

⁵ Anadromous species migrate from marine/estuarine to freshwater environments to spawn.

⁶ Catadromous species migrate from freshwater to marine environments to spawn.

maintained by stocking, with no evidence or expectation of successful natural reproduction upstream of Wallace Dam. GDNR began stocking American shad into Lake Oconee in 2015 based on historical evidence that the species formerly occurred as far upstream in the Oconee River as Athens-Clarke County (GDNR, 2014b). Successful natural reproduction of American shad is not expected to occur upstream of Wallace Dam. Downstream in the river basin, American shad migrate upstream as far as Sinclair Dam and likely spawn in portions of the lower Oconee River.

American eels presently range upstream in the Oconee River basin as far as Sinclair Dam, although a relatively recent occurrence is known from Hard Labor Creek upstream of Lake Oconee (Table 4) (GDNR, 2014c). No American eels have been reported from annual GDNR fishery surveys of Lake Oconee GDNR (2014a).

Shortnose sturgeon and Atlantic sturgeon, both listed as federally endangered species, use portions of the Altamaha River and lower Ocmulgee River and/or Oconee River downstream of Sinclair Dam for spawning runs. Critical habitat has been designated for Atlantic sturgeon to include the lower Oconee River below Sinclair Dam, but not the Oconee River upstream of Sinclair Dam or Wallace Dam (National Oceanic and Atmospheric Administration, 2017).

Blueback herring and hickory shad are currently limited in distribution to the Altamaha River and Ocmulgee River (GDNR, 2014d; Straight et al., 2009).

Robust redhorse, a Georgia endangered species, is a migratory riverine species that inhabits the Oconee and Ocmulgee Rivers in the Altamaha River basin. It inhabits the Oconee River downstream of Sinclair Dam and a tributary of Lake Sinclair. Recent surveys upstream of Lake Oconee and in the Wallace Dam tailrace area did not detect the species (Robust Redhorse Conservation Committee's Oconee Technical Working Group, 2014, 2015; Zelko, 2012, 2013). Because the robust redhorse is currently undergoing status review by FWS to determine if federal listing is warranted, a more detailed account of the species is provided in Section 3.3.5 (Threatened and Endangered Species).

State Protected Aquatic Species

Georgia Power (2016c, 2016d) identified and evaluated federally and state protected species, and other species of interest, with known records of occurrence in the project vicinity. No federally threatened and endangered aquatic species are presently known to occur within the project boundary.

Four Georgia protected fish and freshwater mussel species potentially occur in the project vicinity (Table 12). State protected species in Georgia are listed as endangered, threatened, rare, or unusual, in descending order of rarity. None of these species are presently known to occur within the project boundary:

- Atlantic pigtoe (*Fusconaia masoni*) – Georgia endangered;

- Robust redbhorse (*Moxostoma robustum*) – Georgia endangered;
- Altamaha shiner (*Cyprinella xaenura*) – Georgia threatened; and
- Goldstripe darter (*Etheostoma parvipinne*) – Georgia rare.

The mussel species Atlantic pigtoe, although reported for Hancock County, does not occur in the Oconee River basin. It inhabits the adjacent Ogeechee River basin. The goldstripe darter occupies spring-fed headwater creeks in the Coastal Plain downstream in the basin. The robust redbhorse inhabits the Oconee River below Lake Sinclair and a tributary of Lake Sinclair but has not been found upstream of Wallace Dam (see Section 3.3.5).

Of the state protected aquatic species, only the Altamaha shiner presently occurs in the Oconee River basin upstream of Wallace Dam (Georgia Power, 2016c). This species is endemic to the Piedmont of the upper Altamaha River basin in north-central Georgia. The Altamaha Shiner inhabits rocky and sandy pools in creeks and small rivers. There are no known occurrence records of the species from Lake Oconee within the project boundary. Since 2010, the Altamaha Shiner has been reported from tributary streams upstream of Lake Oconee and outside of the project boundary (Albanese et al., 2015a). The nearest collections documented since 2010 were from the lower Apalachee River upstream of Lake Oconee. The most recent occurrence records from Richland Creek, Oconee River, and Hard Labor Creek just upstream of Lake Oconee are over 11 years old.

Transmission Line

Fish and aquatic resources inhabiting the headwaters and small streams crossed by the Wallace Dam transmission line likely include several of the same fish species listed for smaller tributaries to Lake Oconee (Table 4).

3.3.3.2 Environmental Impacts and Recommendations

Project Operations

Georgia Power proposes to continue operating the Wallace Dam Project in a pumped storage mode for the generation of peaking power. The Project would also be operated to continue to supplement flows during drought to support the downstream Sinclair Project minimum flow requirements. Supporting the downstream Sinclair minimum flow requirements would continue to enhance aquatic resources in the Oconee River downstream by maintaining flow regimes in the free-flowing reach of river downstream of Sinclair Dam and moderating fluctuations of Lake Sinclair.

Georgia Power’s proposed operation would not adversely affect fish and aquatic resources because daily fluctuations of Lake Oconee would continue to be 2.0 ft or less 100 percent of the time, there would be no dewatering of the tailrace area because it is within the impounded upper reach of Lake Sinclair, and average daily fluctuations of Lake Sinclair would continue to be less than 2.0 ft.

Annual GDNR fishery survey data for Lake Oconee indicate an overall healthy and balanced fish community typical of southeastern Piedmont reservoirs. In addition, recent and historic water quality monitoring data show that although pumpback causes mixing of the entire water column of the lower mainstem reservoir during summer, water temperature and DO conditions within the forebay and lower reservoir remain within acceptable ranges for most of the resident sport fish species, as analyzed below.

During drought years, Wallace Dam operations to support downstream Sinclair minimum flow requirements would result in periods of up to several months when the elevation of Lake Oconee falls below its normal operating range. Lake Oconee drawdowns during several recent drought years were up to 4.25 ft below the normal full pond elevation (Exhibit B). The lowered elevations would occur only during the drier months of drought years, usually from mid-summer to fall, after the spring and early summer spawning seasons of many resident sport fishes. The drought drawdowns would reduce the area of available littoral-zone habitat for the rearing of young fish. However, impacts to Lake Oconee habitat would be offset by maintaining consistency of littoral-zone habitat in Lake Sinclair over the drought period and sustaining minimum flow releases downstream of Sinclair Dam. Continued drought operations in this manner would not be expected to result in significant adverse effects to fisheries resources in Lake Oconee and the Oconee River.

Summer Habitat for Sport Fishes

Lake Oconee

During pre-filing consultation, GDNR WRD expressed interest in the effects of continued project operations on summer reservoir water quality and habitat for sport fish species such as largemouth bass and striped bass (J. Biagi, GDNR, June 15, 2015 letter to K.D. Bose, FERC). To address this concern, Georgia Power (2016c) assessed the availability of suitable summer water quality for sport fish species in Lake Oconee. The assessment used water quality data collected by Georgia Power, standardized fisheries survey data for Lake Oconee collected by WRD, and species-specific water quality preference criteria reported in the scientific literature.

First, vertical water temperature and DO profile data collected during the warmest months of the year were analyzed for the spatial and temporal extent of mixing that occurs in Lake Oconee from pumpback and generation cycles. Based on mixing tendencies and patterns, the reservoir was segregated into three areas for analysis of the fisheries data: mainstem reservoir, tributary embayments, and upstream reservoir. Next, multiple years of fisheries survey data for the lake were analyzed to compare population characteristics of representative sport fishes between these different areas of the reservoir. The analysis included largemouth bass and striped bass as the primary species of interest, as well as black crappie, bluegill, and hybrid bass. In addition, summer habitat suitability for largemouth bass and striped bass in Lake Oconee was evaluated on the basis of temperature, DO concentration, and time of year, with consideration for ranges defined by scientific literature sources as appropriate for each species.

Most sport fish species residing in Lake Oconee are capable of tolerating seasonally high water temperatures and occasionally lower DO levels in summer. GDNR standardized fishery survey data for Lake Oconee indicate an overall healthy and balanced fish community (Georgia Power, 2016c). Recent and historic water quality monitoring data show that although pumpback operations cause mixing of the entire water column of the lower mainstem reservoir by August, water temperature and DO conditions remain within acceptable ranges for most of the resident sport fish species.

One exception is striped bass. Summer temperature profiles for Lake Oconee sufficiently explain the limiting nature of habitat suitability for striped bass, as reflected in low catch rates and low relative condition of the population based on length-weight relationships (Georgia Power, 2016c). Summer water temperatures exceeding 29°C throughout the reservoir in many summers is likely the principal factor limiting survival and growth of the population. While juvenile striped bass have a higher thermal tolerance, up to 32°C (90°F), adult striped bass prefer temperatures around 25°C (77°C) or less and begin to experience mortality above 28 or 29°C (82-84°F) (Crance, 1984; Coutant, 1985, 2013). Although suitable DO conditions were available throughout much of the reservoir, by late July and August, temperatures were often higher than temperature criteria defining suitable adult striped bass habitat. Thus, the evidence indicates that it is naturally high water temperatures throughout Lake Oconee, and not low DO concentrations, that limit the availability of suitable summer habitat for striped bass (Georgia Power, 2016c). Hybrid bass on the other hand, which are now stocked in larger numbers than striped bass, exhibit a wider tolerance range to temperature than striped bass. Hybrid bass can tolerate a temperature range of 4-33°C (33-91°F), although optimal growth is between 25-27°C (77-81°F) (Hodson, 1989).

Largemouth bass survival and growth are supported by summer water quality conditions in Lake Oconee based on the documented temperature and DO tolerances of largemouth bass (Georgia Power, 2016c). The catch rates, relative condition, and length-frequency distribution of largemouth bass in Lake Oconee indicate the presence of an overall healthy population. In addition, the weight characteristics of tournament bass caught in Lake Oconee compare favorably to other Georgia reservoirs.

Wallace Dam Tailrace

Continuous DO monitoring in the Wallace Dam tailrace recorded summer DO depressions below 4.0 mg/L and daily average values less than 5.0 mg/L in parts of three consecutive summers, 2015-2017 (Georgia Power 2016b, 2017c). DO depressions occurred daily during periods in May, June, July, and/or August, with instantaneous values occasionally falling below 2.0 mg/L. Although most sport fishes found in the project reservoir and tailrace are warmwater, habitat-generalist species capable of tolerating high water temperatures and DO levels below 4.0 mg/L for short periods, prolonged exposure to low DO concentrations may lead to stress and result in avoidance or compromise growth and survival of some species and life stages (Georgia Power, 2016c, and references cited therein). Nevertheless, resident fishes in upper Lake Sinclair are likely to use tailrace habitats in the summer despite warm temperatures and daily DO depressions below 4.0

mg/L. Channel catfish, bluegill, threadfin shad, redbreast sunfish, largemouth bass, and other species likely find suitable summer habitat within the tailrace area. Based on historical Georgia WRD electrofishing data, collected annually in September, sportfish abundance (e.g., largemouth bass, bluegill, redbreast sunfish, and black crappie) immediately below the Wallace Dam tailrace area does not differ considerably from other locations in Lake Sinclair. In addition, native mussel species inhabit the reach. The tailrace mussel survey in August 2016 found four native species of mussels, with the greatest numbers occurring a short distance downstream of the powerhouse (Section 3.3.3.1, Freshwater Mussels). Thus, the tailrace area supports self-sustaining populations of aquatic species indicative of a balanced community. In addition, it offers recreational fishing opportunities below Wallace Dam.

Continuous tailrace monitoring data indicate that the tailrace is unlikely to provide suitable adult striped bass habitat for much of the summer due to water temperatures exceeding 29°C (Georgia Power, 2016b, 2017c). Georgia Power's proposal to install and operate a forebay oxygen line diffuser system to enhance summer DO concentrations in the tailrace (see below) would improve overall summer sport-fish habitat in the tailrace area (and in the forebay) and support applicable water quality standards throughout the hottest months of the year. However, naturally high water temperatures would continue to limit the availability of suitable summer habitat for striped bass both in Lake Oconee and the tailrace area.

Proposed Forebay Oxygen Line Diffuser System to Enhance Summer DO

Georgia Power proposes to install and operate a forebay oxygen line diffuser system to enhance summer DO concentrations in the Wallace Dam tailrace area (Section 3.3.2.2). The conceptual design includes two sets of diffuser lines extending about 0.7-mile long in the Lake Oconee forebay (Figure 8). The longer upstream set of diffuser lines would inject a low level of oxygen continuously to maintain an oxygenated forebay volume during non-generation, while the shorter downstream set of diffuser lines would boost oxygen output during generation. Operation of the system would be optimized to the extent practical to achieve tailrace DO concentration targets in the tailrace of 4.0 mg/L instantaneous and 5.0 mg/L daily average. The system would operate in the months May through August, when needed.

Operation of the proposed forebay oxygen line diffuser system would enhance summer DO concentrations in the Wallace Dam tailrace area and benefit downstream water quality, fisheries, aquatic resources, and recreation opportunities while supporting applicable water quality standards throughout the hottest months of the year. Habitat in the tailrace area would be enhanced for the fish community, including sport fishes, freshwater mussels, and other aquatic species by reducing the potential for chronic stress from low DO, which otherwise could result in avoidance of the tailrace area and/or reduced feeding, growth, and survival. Summer recreational fishing prospects would also be improved by increased activity and feeding levels of sport fishes.

Operation of the oxygen line diffuser system would also increase summer DO levels in the forebay withdrawal zone of Lake Oconee. Based on the conceptual design, the area of DO improvement

would extend about 0.7-mile upstream of the dam (Ruane et al., 2017; Georgia Power, 2017d). This zone has a surface area on the order of 275 acres. Rising bubbles from diffuser lines near the bottom would increase DO levels in the water column, thereby enhancing conditions for species occupying open waters of the forebay. Although the Lake Oconee fishery is balanced and healthy and no evidence was found of summer DO stress (Georgia Power, 2016c), the increased DO levels would improve water quality in the forebay and likely contribute favorably to feeding, growth, and survival. The fishes most likely to benefit from increased DO would be schooling forage fish (threadfin shad, gizzard shad, and stocked American shad), the pelagic sport fish hybrid bass and striped bass (when temperatures are suitable), and larger catfish and bass that feed in the lower mainstem reservoir. Native freshwater mussels in benthic habitats near the forebay could also benefit from increased DO levels. The summer 2016 mussel survey found the largest number of live mussels at a main-channel site with boulders about 1.2 miles upstream of the dam (Section 3.3.3.1, Freshwater Mussels).

GDNR requests consideration for entrainment monitoring following the installation of the proposed forebay oxygen line diffuser system because of the potential to attract additional fish into the area due to the improved water quality (M. Thomas, GDNR, February 19, 2018 letter to K.D. Bose, FERC). Evidence is lacking to indicate that existing levels of fish entrainment occurring at the Project results in significant adverse effects to the fish community (see Fish Entrainment and Turbine-Induced Mortality below). In addition, although DO concentrations would increase in habitats upstream and downstream of the dam, summer water temperatures would remain warm and continue to limit the suitability of habitat for striped bass both in Lake Oconee and the tailrace area. Warm water temperatures would persist over a wide area of open-water habitat, extending upstream of Wallace Dam into Lake Oconee and downstream into the upper reach of Lake Sinclair. The DO improvements therefore would be limited in their potential to attract and concentrate fish near the intake or draft tubes and thereby significantly increase the risk of fish entrainment. Therefore, Georgia Power does not propose entrainment monitoring following installation and deployment of the aeration system.

Fish Passage

Georgia Power's proposal to continue operating the Wallace Dam Project would have little or no additional effect on upstream passage of highly migratory or diadromous fish species. The Project is located 310 river miles upstream of the Atlantic Ocean and 29.7 miles upstream of Sinclair Dam on the Oconee River (Figures 1 and 2). Sinclair Dam impedes upstream migration of highly migratory and diadromous fish species into the project area.

Striped bass and American shad stocked into Lake Oconee would continue to have the ability to pass downstream through the Wallace Dam powerhouse into Lake Sinclair, and most of these fish would be expected to survive turbine passage (see below). However, there is no evidence that either species can successfully reproduce upstream of Wallace Dam or that spawning and rearing habitats are available, and therefore, upstream passage at Wallace Dam currently is not a factor in their ability to complete their life cycles in the Altamaha River basin. Moreover, coastal runs of

shortnose sturgeon, Atlantic sturgeon, American shad, blueback herring, hickory shad, striped bass, and American eel would all be limited in the upstream extent of their natural migrations in the Oconee River by Sinclair Dam.

Fish Entrainment and Turbine-Induced Mortality

Fish approaching the powerhouse intake in Lake Oconee during generation, and the draft tubes on the downstream side of the powerhouse during pumpback, may become entrained and subjected to the risks of turbine-induced injury or mortality. Georgia Power (2016c) analyzed the potential for fish entrainment and turbine-induced mortality at the Wallace Dam Project using an approved desktop approach, drawing upon entrainment field studies completed at numerous other hydroelectric projects, including other pumped storage facilities. Common trends and data from other studied sites were applied with consideration of the site-specific physical, operational, and fisheries characteristics of the Wallace Dam Project. The fish entrainment analysis described the likely size distribution, species composition, and seasonal distribution of fish entrainment occurring at the Project, with emphasis on applying data from 11 other southeastern sites, including the Richard B. Russell and Jocassee pumped storage sites in the nearby Savannah River basin. Potential differences in the magnitude of entrainment between generation and pumpback were evaluated based on sampling trends from the Richard B. Russell and Jocassee sites. The likely mortality rates of entrained fish passing through the Wallace Dam turbines were assessed based on detailed examination of the turbine passage survival database prepared by the Electric Power Research Institute (EPRI, 1997). In addition, to address interests expressed by WRD during pre-filing consultation, the fish entrainment evaluation reviewed turbine passage survival study data for American shad and assessed the potential implications of entrainment to striped bass and hybrid bass management.

In its comments on Georgia Power's fish entrainment evaluation (Georgia Power, 2016c), WRD requested additional information and analysis, including an estimate of the total number of fish entrained, hourly operational data, bar spacing for the draft tube trashracks, and how these factors affect entrainment (J. Biagi, GDNR, January 20, 2017 letter to K.D. Bose, FERC). Based upon FERC's subsequent approval of WRD's requested modifications to the Fish Entrainment Evaluation (T. L. Turpin, FERC, March 17, 2017 letter to C.R. O'Mara, Southern Company Generation), the analysis of entrainment in the PLP (Georgia Power, 2017) incorporated additional hourly operational information and the bar spacing of the intake and draft tube trash racks, and estimated the total number of fish entrained annually by applying monthly entrainment rates from the Jocassee site. The Jocassee site was used for the extrapolation because of the availability of a robust dataset of monthly generation and pumping data and associated monthly entrainment rates derived from hydroacoustic sampling (Degan and Mueller, 2013).

In its comments on the entrainment extrapolation provided in the PLP, GDNR requested additional analysis of annual fish entrainment to include extrapolating entrainment sampling data reported in January 2018 for USACE at the Richard B. Russell site (Aquacoustics, 2018) (M. Thomas, GDNR, February 19, 2018 letter to K.D. Bose, FERC). Based on these newly available data, GDNR noted

that entrainment estimates for the Richard B. Russell site are substantially higher than those estimates extrapolated from the Jocassee site to Wallace Dam. Because of the similar operational and morphological characteristics of the Richard B. Russell and Wallace Dam sites, GDNR believes that extrapolating entrainment data from Richard B. Russell would provide a more accurate depiction of entrainment at Wallace Dam. The following analysis estimates the order of magnitude of annual entrainment potentially occurring at Wallace Dam by also applying monthly entrainment rates from the Richard B. Russell site on the Savannah River.

Entrainment Size Distribution

Common trends and data from other studied hydroelectric sites, including nine sites in South Carolina and Georgia, indicate that small and/or young-of-year (YOY) fish less than 6 inches long likely comprise the vast majority of fish entrained by the Wallace Dam Project during generation and pumpback (Georgia Power, 2016c). Based on size-class composition of entrainment samples from 42 hydroelectric developments, fish less than 4 inches long averaged 68.4 percent of entrainment, and fish less than or equal to 6 inches long averaged 85 percent of entrainment (EPRI, 1997). At Richard B. Russell, fish less than or equal to 6 inches long comprised 89 percent of entrainment during conventional generation, with fish under 4 inches long comprising 71 percent of total entrainment.

Sampling of pumpback entrainment at Jocassee and Richard B. Russell reported similar findings with respect to the numerical dominance of small fish (Table 14 in Georgia Power, 2016c, and included references). At Jocassee, 71 percent of fish entrained by generation were under 6 inches, and 86 percent of fish entrained by pumpback were under 6 inches (Degan and Mueller, 2013). Ninety-four percent of the 1996 pumpback net sample at Richard B. Russell was less than 5.4 inches long; 90 percent were 1.5 to 3.4 inches long (Nestler et al., 1999). Only 0.2 percent of entrained fish were longer than 8.4 inches. Consistent size trends were observed during pumpback hydroacoustic sampling at Richard B. Russell in 2017. Fish 3.1 inches long and smaller comprised 85.7 percent of entrained fish in the spring, 90.8 percent in the summer, 93 percent in the fall, and 98.5 percent in the winter (Aquacoustics, 2018). Less than 3 percent of the entrained fish in any season were greater than 4.7 inches long. Wallace Dam pumpback entrainment is likely to be similarly dominated by small and YOY fish.

Existing studies reviewed in the fish entrainment evaluation found no consistent associations or relationships between trash rack bar sizing and the size of entrained fish (FERC, 1995; Winchell, 2000). The steel trash racks in front of the Wallace Dam powerhouse intake consist of vertical bars with clear spacing between bars ranging from 9.5 to 10.5 inches. The steel trash racks in front of the downstream draft tubes consist of vertical bars with clear spacing between bars of 10.5 inches, with openings at each end being 16.5 inches. Virtually all species and size classes of fish residing in Lake Oconee are narrow enough in body dimensions to pass through the racks. Nevertheless, field studies across a wide range of trash rack spacing indicate that the vast majority of entrained fish are much smaller than the length of fish that would physically be excluded from passing through the trash racks (FERC, 1995; EPRI, 1997). The size of entrained fish tends to be

similar among sites, despite widely differing trash rack spacing, indicating the greater abundance and higher susceptibility of small fish to entrainment. For instance, the Youghiogheny site in Pennsylvania has 10-inch clear spacing between bars, comparable to that of Wallace Dam, yet only 0.8 percent of the entrained fish were 4 inches long or longer. The Richard B. Russell site study had forebay trash rack spacing of 8 inches (conventional generation), yet fish smaller than 6 inches comprised 89 percent of entrainment. Thus, reducing trash rack bar spacing at the Wallace Dam Project would not be expected to substantially affect the size distribution of entrained fish; small fish would continue to be the most susceptible.

Entrainment Species Composition

Entrainment studies at other southeastern hydroelectric sites indicate that entrainment at Wallace Dam is likely to be numerically dominated by species of shad (threadfin shad and gizzard shad), sunfishes, and/or catfishes (Georgia Power, 2016c). At sites with higher densities of shad as forage fish, shad may strongly dominate entrainment composition, especially where over-winter survival of threadfin shad populations is variable due to cold-weather conditions. As sites where shad densities are lower, or in years following severe winter kill of threadfin shad when standing stocks of shad are low, sunfishes, catfishes, and other species may comprise a larger proportion. Minnows and suckers also may be commonly entrained. Species of all of these families are well represented in Lake Oconee and Lake Sinclair.

Entrainment during generation and pumpback at Richard B. Russell is numerically dominated by threadfin shad and blueback herring, reflecting the tremendous abundance of these forage species in large impoundments in the Savannah River basin (Nestler et al., 1999). Mobile hydroacoustic surveys conducted in 1996 of the open water area of J. Strom Thurmond Reservoir, the lower reservoir for Richard B. Russell, estimated spring populations of 68 million blueback herring and 57 million threadfin shad, and summer populations of 42 million blueback herring and 1,322 million threadfin shad (Nestler et al., 1999). The summer abundance was over 10 times the spring abundance, and the length frequency distribution of threadfin shad indicated that 98 percent of the fish were spawned that year. A large-scale mark-recapture study in May 1996 estimated the population size of adult blueback herring to be about 89 million fish (Isely and Tomasso, 1998). Lakes Oconee and Sinclair notably lack blueback herring populations; the species has not been introduced to these reservoirs.

The entrainment sampling conducted at the Jocassee site used hydroacoustic monitoring to estimate entrainment numbers and sizes of fish, while reservoir fish collections indicated that threadfin shad and blueback herring were the dominant forage species and corresponded in size with the entrained fish (Degan and Mueller, 2013).

A substantial proportion of entrained fish at the Wallace Dam Project likely consists of small or YOY sport-fish species, including bluegill, black crappie, other sunfishes, and catfishes. The sunfish, catfish, and perch families commonly comprised over 50 percent of entrainment in sites in the EPRI database. Notably, largemouth bass, one of the region's premier sport fish, was absent

from the top five entrained species at southeastern projects (Georgia Power, 2016c). Similarly, striped bass and hybrid bass were absent from the top entrained species. The relative abundance of sport fish species in pumpback entrainment at Richard B. Russell was low, only 0.03 percent for largemouth bass, 0.02 percent for striped bass, and 0.01 percent for hybrid bass. Ninety-seven percent of the entrained striped bass and 84 percent of the entrained hybrid bass were less than 15 inches long (Nestler et al., 1999). While these popular sport fishes are likely to occasionally be entrained at Wallace Dam, they do not appear to be especially susceptible to entrainment.

The potential for striped bass, hybrid bass, and white bass to become entrained by Wallace Dam generation flows may be highest in early summer, as the water column warms and fish actively seek cooler water deeper in the forebay. However, the forebay mixes completely in the summer as a result of pumpback operations, eliminating cooler layers of water for striped bass and hybrid bass to preferentially seek near the intake. Lake Sinclair populations may become more susceptible to entrainment by pumpback operations in early spring, when upstream migrant adults tend to congregate in the Wallace Dam tailrace area; however, these fish are also larger and thus more capable of escaping intake velocities near the draft tubes.

Entrainment Seasonal Distribution and Pumpback Operations

Peak entrainment rates during generation at Wallace Dam likely occur in the spring and summer for most species, when young fish are most abundant and tend to be dispersing between habitats, but entrainment rates for shad may peak in the fall and winter (Georgia Power, 2016c). Based on studies conducted at the Richard B. Russell and Jocassee pumped storage sites, where the majority of entrained fish are threadfin shad and blueback herring, more fish are likely to be entrained during pumpback than generation. Factors likely contributing to higher entrainment rates during pumping include the shallower depth and narrower width of the tailrace area, closer proximity of shallow-water habitats, and the seasonal behavior and diurnal activity of some fish. In contrast, the open forebay and deep-water location of the Lake Oconee intake is relatively distant from shoreline and littoral-zone habitats.

Monthly total generation at the Wallace Dam Project is usually highest during the summer months, when energy demand is high (Table 5). Pumpback duration would also be highest during these summer months to meet the generation demand and because mean monthly inflow is lower during summer months, requiring extended pumpback to refill Lake Oconee.

Wallace Dam hourly operations by month for the water years 2016 and 2017⁷ show that generation occurs primarily in the afternoon and early evening hours and pumpback occurs primarily between midnight and the early daylight hours (Tables 6 and 7). Wallace Dam operation hours by unit for the water years 2016 and 2017 indicate that Units 3 and 4 tend to be used most frequently for generation (Tables 8 and 9). These units are the modified propeller turbines that are not reversible

⁷ A water year is the 12-month period October 1 – September 30.

(Table 2). Pumpback typically uses three or four of the reversible units (Units 1, 2, 5, and 6) each month. Pumpback hours are spread relatively evenly among all four units in many months.

Recovery-net and hydroacoustic sampling of entrainment at the Richard B. Russell site has estimated annual pumpback entrainment to be on the order of 1.7 times higher than generation entrainment (Nestler et al., 1999; M. Thomas, GDNR, February 19, 2018 letter to K.D. Bose, FERC). Monthly entrainment rates during pumpback in 2015-2017 ranged from a low of 147 fish per hour in March to a high of 7,631 fish per hour in October (Table 10). The highest pumpback entrainment rates occurred from July to December, reflecting a preponderance of small threadfin shad and blueback herring spawned earlier in the year.

Hydroacoustic sampling at the Jocassee site estimated that annual pumpback entrainment was about 2.7 times higher than generation entrainment (Table 10). Monthly entrainment rates during generation ranged from a low of 55 fish per hour in June to a high of 189 fish per hour in January. Monthly pumpback entrainment exhibited much more pronounced seasonal variation, ranging from 61 fish per hour in February to 468 fish per hour in July. Like the Richard B. Russell site, pumpback entrainment rates at Jocassee were highest from July to December, after the spawning seasons of threadfin shad and blueback herring.

Wallace Dam Entrainment Extrapolation

To estimate the potential order of magnitude of annual and seasonal entrainment occurring at the Wallace Dam Project, monthly entrainment rates were extrapolated from both the Richard B. Russell and Jocassee sites using Wallace Dam monthly operations data for the water years 2016 and 2017. Table 12 compares the operational and physical characteristics of the three pumped storage hydropower developments. All three developments have similar configurations on larger streams, with the pumpback being used to augment conventional hydropower, and use four reversible units of similar hydraulic capacities. All three sites are in southeast Atlantic Coast river basins above the Fall Line within 110 miles of one another and therefore overlap substantially in fish species composition. In addition, quality monthly operational and hydroacoustic entrainment sampling data are readily available for use, from 2012-2013 for Jocassee (Degan and Mueller, 2013) and 2015-2017 for Richard B. Russell (Aquacoustics, 2018). The entrainment sampling at both sites was performed by the consultant Aquacoustics.

The entrainment extrapolation from these sites assumes that the pelagic fish community at Wallace Dam is dominated by shad, is similar in density and susceptibility to entrainment as the pelagic fish communities at the Richard B. Russell and Jocassee sites, and that seasonal variation in entrainment is similar. The fact that the Richard B. Russell and Jocassee reservoirs support large populations of blueback herring and Lake Oconee does not (shad species in Lake Oconee include threadfin shad and gizzard shad) suggests that the entrainment estimates extrapolated to the Wallace Dam Project may be conservatively high. While entrainment estimates are extrapolated by month, it is not possible to extrapolate species and size class data from the available Jocassee site data because the species detected passing through the turbines were not identified and size-

class estimates by month were not presented (Degan and Mueller, 2013). Likewise, species data cannot be extrapolated from the Richard B. Russell hydroacoustic data, although length-frequency data are available seasonally (Aquacoustics, 2018), as summarized above.

Table 13 provides monthly hours of generation and pumping for the Wallace Dam Project for water years 2016 and 2017. The average monthly operations data for both years were applied to the monthly Richard B. Russell pumpback entrainment rates from Table 10 to derive estimates of monthly pumpback entrainment at the Wallace Dam Project (Table 14). Based on this extrapolation and its assumptions, total annual pumpback entrainment at Wallace Dam would be predicted to be on the order of 12.4 to 19.4 million fish annually (average of 14.8 million), with the vast majority of entrained fish being young clupeids (shad and herring). However, this prediction likely significantly overestimates pumpback entrainment at Wallace Dam for the following reasons. First, the prediction is premised in part on the occurrence of a large population of blueback herring, which does not exist at the Project. Important physical and water quality differences between the sites also differentially influence the temporal distribution of fish in the tailrace, and thus, their susceptibility to entrainment. The forebay of Russell Lake undergoes thermal stratification that maintains releases of cooler water into the tailrace area through the summer. As summer progresses and water temperatures increase in open-water habitats of the downstream reservoir, blueback herring seek refuge and concentrate in the upper part of the lake and in the Russell tailrace area (Isely and Tomasso, 1998), thereby increasing their risk of entrainment. Conversely, the forebay of Wallace Dam becomes well mixed during the summer from pumpback operations, resulting in warm temperatures in both the reservoir and tailrace. No cool-water refuge develops in the tailrace area to attract shad and other species to the upper end of Lake Sinclair. USACE conducted hydroacoustic fisheries surveys in the Wallace Dam tailrace in 1988 for comparison to the Richard B. Russell tailrace (Schreiner, 1990). The study found that fish biomass was much higher in the Richard B. Russell tailrace than in the Wallace Dam tailrace, where the warmer temperatures, lower DO levels, and higher turbidity apparently were less attractive as habitat for prey and sport fish such as striped bass and hybrid bass (Schreiner, 1990).

Table 15 presents the extrapolation of Jocassee entrainment rates from Table 11 to the average monthly operations data for Wallace Dam. Based on this extrapolation and its assumptions, total annual entrainment at the Wallace Dam Project is estimated to be on the order of 2,500,000 fish. Based on actual Wallace Dam generation and pumping hours for 2016-2017, the estimate includes about 800,000 fish entrained during generation and 1,700,000 entrained during pumpback. Pumpback entrainment is estimated to be about 2.1 times higher than generation entrainment.

Extrapolation of entrainment sampling data from the Richard B. Russell and Jocassee pumped storage sites predicts that annual entrainment at Wallace Dam falls within broad ranges: from 800,000 to 8.3 million fish entrained during generation, and from 1.7 to 19.4 million fish entrained during pumpback. Although similar operational characteristics exist between the projects, the Wallace Dam Project differs from Richard B. Russell in having a much smaller total reservoir area (Table 12), lacking a blueback herring population with high reproductive capacity, and providing warmer summer habitat in the tailrace area that is less attractive for prey or sport fish than the cool,

hypolimnetic releases from thermally stratified Russell Lake. The Wallace Dam Project has a total reservoir area larger than but similar to that of Jocassee (low-end estimates), but differs from Jocassee in lacking a blueback herring population and being a more productive reservoir, containing shallower and warmer water. Based on these comparisons, although the magnitude of annual entrainment may be higher at Wallace Dam than the Jocassee site as suggested by GDNR, it is more likely to fall within the lower portion of the predicted ranges for generation and pumpback than the very high estimates derived from the Richard B. Russell site.

Turbine Passage Mortality

The results of turbine passage survival studies conducted at other hydroelectric sites indicate that the mostly small fish entrained by the Wallace Dam Project are likely to survive turbine passage. Trends in turbine passage survival studies at numerous hydroelectric sites predict average immediate survival rates at Wallace Dam in the range of 91 to 95 percent for small fish and 83 to 88 percent for moderate-sized and large fish, depending on the unit type.

GDNR has expressed interest in striped bass and hybrid bass regarding turbine passage because of their migratory behavior and the resources expended on their management. Stocked fingerlings and small juveniles may be the size classes of striped bass and hybrid bass most susceptible to entrainment at Wallace Dam during generation because fingerlings are stocked annually at a rate of about 20 total fish per acre in Lake Oconee. These young fish likely school in open waters and may exhibit downstream migratory behavior as juveniles. They become vulnerable to entrainment as they approach the dam; however, because of their small body size, the vast majority would be expected to survive turbine passage. Adult striped bass and hybrid bass, while large and potentially subject to higher turbine mortality rates if entrained, are facultative in their downstream migratory behavior and may not be as strongly inclined to migrate downstream, as evidenced by low numbers of striped bass in entrainment samples at other sites (Georgia Power, 2016c). In addition, adult striped bass have strong swimming capabilities and would be much more capable of escaping intake velocities. Furthermore, the striped bass habitat analysis indicates that summer habitat conditions are sub-optimal for adult fish, especially in the lower end of the reservoir near the dam. By late August in most years, temperatures throughout the water column become unsuitably warm for adult striped bass.

GDNR contends that the Jocassee entrainment extrapolation underestimates entrainment at the Wallace Dam Project. Assuming the magnitude of total annual entrainment at Wallace Dam is twice that predicted by the Jocassee extrapolation (5 million fish), that 75 percent of all entrained fish are small fish (less than or equal to 6 inches), that turbine-passage survival rates are 93 percent for small fish and 85 percent for larger fish, then total annual entrainment mortality could be on the order of 450,000 fish. If total annual entrainment is on the order of 19 million fish as predicted by the Richard B. Russell extrapolation, which the analysis above indicates likely provides a significant overestimate, then total annual entrainment mortality would be on the order of 1.7 million fish.

GDNR is concerned about the potential impacts of entrainment at Wallace Dam on larger game fish species, which are highly important to fisheries managers and anglers (M. Thomas, GDNR, February 19, 2018 letter to K.D. Bose, FERC). The agency comments that a veneer with 2-inch spacing installed on the downstream draft tubes at the Richard B. Russell site in 1993 resulted in significantly lower entrainment rates of larger fishes. However, the cooler releases in the tailrace at Richard B. Russell attract fish toward the draft tubes, whereas the warm-water releases from Wallace Dam do not provide a similar refuge habitat. The sampling conducted after installation of the veneer was also influenced by other measures taken to redistribute fish away from the draft tubes there, including a reconfigured sound repulsion system and an expanded lighting system; these factors also would have contributed to lower entrainment rates, not just the 2-inch veneer (Nestler et al., 1999). In addition, impingement of fish occurred on the veneer, introducing another source of mortality. As analyzed above, existing studies have found no clear associations between trash rack spacing and the size of entrained fish. Thus, reducing bar spacing in front of the downstream draft tubes at Wallace Dam would be expected to provide only small, incremental reductions in the entrainment of larger fish, while introducing a risk of impingement.

Entrainment losses of young fish, which typically exhibit high rates of natural mortality due to density-dependent factors (e.g., limited habitat space or food), may tend to be offset by increased survival of the young fish remaining in the reservoir due to reduced competition for limiting resources. Compensatory density-dependence operates to offset the loss of individuals in populations, allowing populations to persist under conditions of increased mortality. Increased mortality in fish populations may occur from natural causes (food availability, predation, disease, etc.) or from anthropogenic activities, such as fishing or introductions of non-native species (e.g., blue catfish). Compensatory density-dependence, which is a major underlying assumption in the management of fish populations, may be an important factor in offsetting losses of young fish due to entrainment mortality.

The fact that entrainment occurs does not necessarily equate with high potential for adverse impacts of entrainment to resident fish populations. Entrainment may be higher at some sites simply because the resident fish populations are healthy and produce high relative abundance of juvenile fish that may become susceptible to entrainment as they disperse between habitats or approach the dam.

Overall, Lake Oconee supports a healthy fishery and evidence is lacking to suggest that current levels of fish entrainment and turbine mortality may be adversely affecting the fish community of Lake Oconee and the Oconee River. Continued operation of the Wallace Dam Project is likely to have only minor effects on fish populations and recreational fishing opportunities as a result of fish entrainment and turbine-induced mortality.

Cumulative Effects

Continued operation of the Wallace Dam Project would likely contribute to cumulative effects on fisheries and aquatic resources to a relatively small extent due to the Project's location and physical

attributes. The project dam is located upstream of the Fall Line Hills District that posed a natural obstacle to the upstream migration of some diadromous and other highly migratory species. The Fall Line area delimits the historic distribution of many species or life stages of fish and mussels preferring either Piedmont or Coastal Plain habitats. Sinclair Dam downstream of the Project would continue to regulate the river flow, and it and Barnett Shoals Dam upstream of Lake Oconee would impede fish migration and limit tributary connectivity irrespective of the continued operation of the Project.

Georgia Power's proposal to continue operating the Project to supplement flows during drought to support the downstream Sinclair Project minimum flows would continue to enhance aquatic resources in the Oconee River. These minimum flows provide for the maintenance of flow regimes in the free-flowing reach of river downstream of Sinclair Dam. The Oconee River downstream of Sinclair Dam provides habitat for the Georgia endangered robust redhorse, hosts spawning runs of diadromous fishes, and recently was designated as critical habitat for the federally endangered Atlantic sturgeon.

The cumulative effects of Georgia Power's licensing proposal on diadromous fish migrations would be minor, if any. There are no fish passage facilities at Lake Sinclair downstream or Barnett Shoals Dam upstream. The striped bass and American shad stocked upstream of Wallace Dam, although part of restoration efforts for each species, are not expected to result in the establishment of reproducing populations upstream of Wallace Dam due to lack of sufficient length of free-flowing river upstream for drifting early stages.

Cumulative entrainment mortality effects for the fish species inhabiting the Oconee River are likely to be relatively minor. Only a small proportion of the fish entrained during generation and pumpback would likely be killed by turbine passage, and the losses of these mostly small and YOY fish would be of minor significance to the existing fisheries resources. Moreover, Lake Oconee sustains a healthy and highly popular recreational fishery with numerous public access points that would not exist without the Project. In this regard, the Project contributes beneficially to cumulative effects in the Oconee River basin. These benefits far outweigh the effects of entrainment mortality.

Unavoidable Adverse Impacts

Unavoidable fish losses resulting from entrainment mortality would continue to occur with continued project operation. These losses, however, would not significantly affect fish populations and recreational fishing opportunities in the Oconee River.

3.3.4 Terrestrial Resources

This section evaluates the effects of the proposed action on terrestrial wildlife and botanical resources as well as wetlands, riparian, and littoral habitats.

3.3.4.1 Affected Environment

Georgia Power (2016e) conducted a terrestrial resources study to describe terrestrial wildlife and botanical resources occurring in the project area that use representative upland habitats and to describe floodplain, wetlands, and riparian habitats occurring in the project area. Field reconnaissance surveys were conducted in April, May, and June 2016 to observe representative terrestrial communities and associated wildlife habitat, to characterize wetland, riparian, and littoral habitats, and to search potentially suitable habitat for rare, threatened, and endangered (RTE) species of plants and wildlife. The survey areas included the project recreation facilities and the 15.67-mile project transmission line ROW.

In response to FERC staff questions from the Initial Study Results Meeting, Georgia Power provided additional information on terrestrial resources at the Project (C.R. O'Mara, Southern Company Generation, February 20, 2017 letter to K.D. Bose, FERC). The additional information pertained to vegetation management activities in the transmission line ROW, the waterfowl impoundments downstream of Wallace Dam, exotic invasive plant species occurrences, invasive vegetation monitoring and management activities, vegetative community evaluation forms, and the wetland survey methods.

Terrestrial Vegetative Communities

The dominant terrestrial vegetative community types in the project area include mixed pine-hardwood forest, pine plantation/pine forest, and floodplain and riparian forest (Georgia Power, 2016e).⁸ Collectively, these three community types cover about 65.3 percent of the project area. Developed land covers 19.5 percent of the project area, while agricultural land covers 11.5 percent. The remaining 3.7 percent of the project area includes the transmission line easement, which consists mostly of herbaceous habitat types; mesic slope forest and dry oak/pine forest, scrub-shrub and emergent wetlands, and granite outcrops. Although small in area of coverage, granite outcrops provide unique habitats that often harbor sensitive plant species.

Mixed pine-hardwood forest is the most common community type within the project boundary, occupying about 34 percent. It occurs on much of the narrow strip of land between Lake Oconee and the project boundary, and on recreation facilities and adjacent public lands. The overstory is dominated by loblolly pine, mockernut and pignut hickories, southern red oak, sweetgum, and tuliptree. Understory species include blackgum, flowering dogwood, southern sugar maple, eastern redbud, hawthorn, sparkleberry, and black cherry. Dominant herbaceous species include Christmas fern, woodoats, partridge berry, violets, and greenbriers.

Floodplain and riparian forest occur along streams and rivers, occupying 13.7 percent of lands within the project boundary. Canopy species include sweetgum, American sycamore, sugarberry, red maple, black willow, black walnut, green ash, box elder, and water oak. Pine plantations and

⁸ For the purposes of the Terrestrial Resources Study, the project area (or study area) was defined to include a zone extending 2,000 ft beyond the project boundary to encompass a conservatively large area for characterizing the existing environment.

pine forests occupy only 6 percent of the land within the project boundary but occupy 17.7 percent within 2,000 ft of the project boundary. This community type is dominated by loblolly pine in the overstory and various oaks and hickories, sweetgum, and tuliptree in the understory. Pine plantations managed with prescribed burns, such as those in the Oconee NF and Redlands WMA, provide a relatively open understory.

Granite outcrops occupy about 17 acres (0.23 percent) of the lands within the project boundary. They contain smooth, exposed granite and rocks with widely scattered patches of vegetation. Vegetation varies from moss and lichens to herbs, shrubs, and trees. Microhabitats occur within shallow depressions, which may retain ephemeral pools and support sensitive plant species adapted to this unique environment. Depressions were found to harbor stitchwort, elf orpine, toadflax, and Piedmont quillwort, as well as pool sprite, a federally endangered plant species (Section 3.3.5). The largest granite outcrop within the project boundary is Eatonton Outcrop, located within the Oconee WMA adjacent to Lawrence Shoals Park. The property is managed by GDNR and protected from foot traffic and recreational activity.

The project transmission line ROW is maintained as predominantly herbaceous and shrub vegetation under Southern Company's Transmission Vegetation Management Program. The program involves mowing on a 6-year cycle, applying herbicides to control re-sprouting of cut stems, spot-treating with herbicide every 2 years between mowing, and pruning limbs along the edge of the ROW on a 10-year cycle. The transmission ROW habitat is dominated by herbaceous plant species. The corridor consists mainly of uplands and occasional perennial and intermittent stream crossings. Herbaceous wetlands occur at some stream crossings. Upland vegetation includes grasses, goldenrods, thoroughworts, goundsel/ragworts, plantains, clovers, tick-trefoils and other early successional species. Herbaceous wetland vegetation includes arrow arum, devil's beggartick, stiff marsh bedstraw, and sedges.

Vegetated Wetlands

Forested, herbaceous/emergent, and scrub-shrub wetlands cover approximately 911 acres within the project boundary (Georgia Power, 2016e). Forested wetlands are the dominant vegetated wetland type, occupying about 651 acres, or 8.9 percent of the lands within the project boundary. They occur primarily along the rivers and larger tributary streams to Lake Oconee, particularly within the floodplains of the Oconee and Apalachee Rivers and larger tributary streams, including Richland Creek, Sugar Creek, Beaverdam Creek, and Lick Creek. Downstream of Wallace Dam, forested wetlands occur within the project boundary along Shoulderbone Creek, Sikes Creek, and Herndon Branch. Dominant overstory vegetation in forested wetlands includes sugarberry, water hickory, green ash, willow oak, blackgum, red maple, box elder, and American sycamore. Understory species include persimmon, rusty blackhaw, switchcane, black willow, and ironwood. The herbaceous layer may contain broadbeech fern, netted chainfern, common lady-fern, sensitive fern, and lizard's tail.

Emergent/herbaceous wetlands and scrub-shrub wetlands cover 143 acres (1.9 percent) and 117 acres (1.6 percent), respectively, of lands within the project boundary (Georgia Power, 2016e). Emergent and herbaceous wetlands are scattered around the reservoir in shallow coves, on shallow sediment-deposition flats in the upper reaches of the reservoir, in the Dyar Pasture Recreation Area waterfowl pond/wetland, in areas flooded by beaver dams, and in small areas along the fringe of the reservoir. Common vegetation in emergent and herbaceous wetlands include lizard's tail, parrotfeather, marshpepper knotweed, rice cutgrass, false nettle, alligatorweed, sedges, devil's beggartick, softtrush, and pennywort.

Scrub-shrub wetlands occur in areas between forested wetlands and emergent wetlands or open water. They also occur on small islands formed from sediment deposition in the upper reaches of the reservoir and along the edges of beaver ponds. Dominant woody vegetation in scrub-shrub include buttonbush, alder, silky dogwood, black willow, and Virginia willow.

Aquatic and Wetland Plants

The April-June 2016 field reconnaissance surveys documented 53 species of aquatic and wetlands plants from Lake Oconee and its surrounding wetland, riparian, and littoral habitats (Georgia Power, 2016e). Aquatic and wetland plants were those species classified as obligate or facultative-wetland species by the U.S. Department of Agriculture (USDA) PLANTS Database (USDA Natural Resources Conservation Service, 2017). True aquatic plants, those requiring the presence of standing water for support, included alligatorweed, parrotfeather, and duckweed. Alligatorweed and parrotfeather are classified as Category 1 and Category 2 invasive plants, respectively, in Georgia (Georgia Exotic Pest Plant Council [GEPPC], 2017).⁹ The other wetland plants consisted primarily of native species adapted to hydric conditions.

Exotic Invasive Plant Species

Scattered occurrences of exotic invasive plant species are present throughout the project boundary, but the majority of the area is notably absent of invasive plant species that dominate a particular stratum within the community (Georgia Power, 2016e). The project recreation facilities within the project boundary do not contain dominant stands of invasive species. However, exceptions include the following areas that contain dominant stands of exotic invasive plant species (Georgia Power, 2016e):

- Alligatorweed (*Alternanthera philoxeroides*) – An estimated 51 acres of emergent and herbaceous wetlands within the project boundary are dominated by alligatorweed. Alligatorweed roots in wet soils or shallow water and grows out into waterways. The largest population occurs within the Dyar Pasture Recreation Area waterfowl pond/wetland, which includes over 30 acres of emergent, scrub-shrub, and forested

⁹ Category 1 species pose serious problems because they extensively invade native plant communities and displace native species (GEPPC, 2017). Category 2 species pose a moderate problem by invading native plant communities and displacing native species, but to a lesser degree than Category 1 species.

wetlands. Alligatorweed is the dominant emergent wetland species present within the open area of the pond/wetland. Smaller, scattered patches of alligatorweed occur along the edges of sediment-deposition islands in the upstream end of Lake Oconee. Georgia Power spot-treated this area of the lake with herbicide in summer 2016 to control alligatorweed.

- Chinese privet (*Ligustrum sinense*) – An estimated 122 acres of land within the project boundary are dominated by Chinese privet, a Category 1 invasive (GEPPC, 2017). The vast majority of this land is in the floodplain of the Oconee River at the upstream end of the Project. Chinese privet is a woody shrub that has been widely used as ornamental hedging. One small population was also documented within the floodplain of the upper reaches of Richland Creek within the project boundary. Chinese privet primarily spreads via root suckers and seed dispersal by birds.
- Japanese stiltgrass (= Nepalese browntop) (*Microstegium vimineum*) – An estimated 6 acres of land within the project boundary are dominated by Japanese stiltgrass, a Category 1 invasive plant (GEPPC, 2017). The species is a delicate, sprawling, annual grass that invades forested floodplains as well as ditches, forest edges, fields, and trails. Japanese stiltgrass was documented in five small floodplain locations around Lake Oconee.

Georgia Power monitors invasive aquatic plants within Lake Oconee by visual observations made by shoreline management specialists during their routine reservoir inspections. Depending on the plant species and conditions observed, licensed herbicide specialists have chemically treated small areas within the project boundary to manage nuisance conditions or help prevent further infestation, as warranted. Since 2000, the need for herbicide treatments in Lake Oconee have been infrequent, small-scale (<1 acre), and in each instance specifically targeted to certain species, including alligator weed, floating primrose willow, American lotus, parrotfeather, Egeria, or Lyngbya.

In addition, Georgia Power administers a shoreline residential aquatic vegetation management program through its website (<http://georgiapowerlakes.com/oconeesinclair/>). This program allows property owners to apply for an Individual Aquatic Herbicide Treatment Permit for nuisance aquatic vegetation. If approved by Georgia Power, the permit allows the homeowner to contract the work using a state-certified aquatic pesticide commercial applicator.

Wildlife Resources

Lake Oconee, the adjoining Oconee WMA and Oconee NF, and the project transmission line ROW provide quality habitat for a diverse wildlife community (Georgia Power, 2016e). Common mammals include white-tailed deer, northern raccoon, gray squirrel, eastern chipmunk, nine-banded armadillo, striped skunk, eastern cottontail, gray fox, fox squirrel, hispid cotton rat, and coyote. Mammals in wetland, littoral, and open-water habitats include American beaver, muskrat, and northern river otter.

At least 115 bird species use diverse wetland and upland habitats in the project area, (Georgia Power, 2016e). Numerous species seasonally migrate through the area while many others reside locally and breed in the area. Neotropical migrant songbirds include over 20 species of warblers observed during the reconnaissance survey. Common resident breeding birds include northern cardinal, American crow, blue jay, Carolina chickadee, Carolina wren, mourning dove, and red-bellied woodpecker. Raptors include red-tailed hawk, red-shouldered hawk, broad-winged hawk, turkey vulture, black vulture, Mississippi kite, osprey, bald eagle, great horned owl, and barred owl. Waterfowl include wood duck, blue-winged teal, mallard, red-breasted merganser, and Canada goose. Wading bird observations included great blue heron, great egret, green heron, and little blue heron, but no wading bird rookeries were observed. One island in the Richland Creek embayment contained four great blue heron nests.

Waterfowl habitat within the project boundary includes about 49 acres of waterfowl conservation area at Dyar Pasture Recreation Area near the upstream end of Lake Oconee (Figure 3) and three smaller waterfowl impoundments downstream of Wallace Dam in the Oconee WMA (Ponds 2, 3, and 4; see Figure 5). The Dyar Pasture waterfowl conservation area includes over 30 acres of emergent, scrub-shrub, and forested wetlands and is controlled by a dike and outlet structure. GDNR manages the pond for FS as waterfowl habitat and a bird sanctuary.

GDNR manages waterfowl Ponds 2 and 3 downstream of Wallace Dam but no longer actively manages Pond 4. The Pond 2 control structure is currently non-operational because of erosion of the dike and other maintenance issues. Pond 2 encompasses about 13 acres and is vegetated by mid-successional stands of green ash, red maple, river birch, and blackgum. It is managed as a waterfowl refuge area, with no hunting allowed. Pond 3 is actively managed as a seasonally flooded agricultural field covering about 25 acres. Black willow, box elder, and red maple occupy higher elevations around the pond. Pond 3 is available for public wildlife viewing, bird observations, and educational purposes; hunting is allowed by quota only. Pond 4 includes about 54 acres and is comprised of scrub-shrub and emergent wetlands with areas of open water. Common vegetation includes black willow, silky dogwood, and alder. Hunting is allowed on Pond 4. Recent GDNR annual aerial surveys of the ponds have recorded an average of 400 ducks (G. Balkcom, GDNR, January 31, 2017 email communication with W. Greene, Georgia Power). Common species observed include ring-necked duck, green-winged teal, mallard, wood duck, gadwall, and northern shoveler.

Common amphibian and reptile species in the project area include southern leopard frog, Cope's gray treefrog, southern cricket frog, southern toad, American bullfrog, green anole, five-lined skink, black racer, northern water snake, eastern copperhead, and eastern kingsnake (Georgia Power, 2016e). The turtle species pond slider and river cooter commonly occur within Lake Oconee and tributary streams.

The wildlife community occurring along the project transmission line ROW is comprised of typical species that utilize the same types of habitat found throughout the project area.

State Protected Plant Species

Georgia Power (2016d) identified and evaluated federally and state protected species and other species of interest with known records of occurrence in the four-county project vicinity. Five federally threatened and endangered plant species potentially occur within the project vicinity, as evaluated in Section 3.3.5 (Threatened and Endangered Species). Pool sprite (*Amphianthus pusillus*), a federally threatened species, presently occurs on granite outcrop habitat within the project boundary (Section 3.3.5).

Ten other Georgia protected plant species potentially occur in the project vicinity (Table 16) (Georgia Power, 2016d). State protected species in Georgia are listed as endangered, threatened, rare, or unusual, in descending order of rarity.

None of these ten Georgia protected plant species were observed within the project boundary during the field reconnaissance surveys (Georgia Power, 2016d) (Table 16):

- Carolina trefoil (*Acmispon helleri*) – Georgia endangered;
- Sun-loving draba (*Draba aprica*) – Georgia endangered;
- Dwarf hatpins (*Eriocaulon koernickianum*) – Georgia endangered;
- Oglethorpe oak (*Quercus oglethorpensis*) – Georgia threatened;
- Bay star-vine (*Schisandra glabra*) – Georgia threatened;
- Granite stonecrop (*Sedum pusillum*) – Georgia threatened;
- Ovate catchfly (*Silene ovata*) – Georgia rare;
- Silky camelia (*Stewartia malacodendron*) – Georgia rare;
- Piedmont barren strawberry (*Waldsteinia lobata*) – Georgia rare; and
- Pink ladyslipper (*Cypripedium acaule*) – Georgia unusual.

Sun-loving draba is a perennial herb that inhabits shallow soils on and around granite outcrops, usually under red cedar trees (Chafin, 2007). GDNR data include records of occurrence of sun-loving draba on the granite outcrop in the Oconee WMA within the project boundary and next to Lawrence Shoals Park; however, none were observed there during the field reconnaissance surveys (Georgia Power, 2016d).

Oglethorpe oak grows up to 80-ft tall and inhabits wet, clayey soils, particularly along seepages, stream terraces, and most hardwood forests (Chafin, 2007). GDNR data indicate that Oglethorpe

oak occurs in limited areas on both sides of Lake Oconee in Green and Putnam Counties (Georgia Power, 2016d). None were observed during the field surveys.

State Protected Wildlife Species

One federally endangered wildlife species, the red-cockaded woodpecker (*Lueconotopicus borealis*, formerly genus *Picoides*), is known to occur in the project vicinity. It is evaluated in Section 3.3.5 (Threatened and Endangered Species).

Four Georgia protected terrestrial wildlife species (two reptiles and two birds) potentially occur in the project vicinity (Table 16) (Georgia Power, 2016d). The two birds presently occur within the project boundary, including:

- Bald eagle (*Haliaeetus leucocephalus*) (Georgia threatened) – eagles currently reside year-round within and adjacent to the Wallace Dam Project boundary. Bald eagles were observed in scattered locations around Lake Oconee during the reconnaissance survey (Georgia Power, 2016d, 2016e). Based on data from GDNR for 2016, at least two active bald eagle nests were located within the project boundary and five others were either abandoned or of undetermined status. A total of five eaglets successfully fledged during 2016 from nests surrounding Lake Oconee.
- Bachman's sparrow (*Peucaea aestivalis*) (Georgia rare) – a large, secretive sparrow with a whistled song, Bachman's sparrow prefers open and mature pinewoods, but also occurs in clearcuts, utility ROWs, and early stages of old field succession with dense ground cover (NatureServe, 2017). Historically, the species inhabited longleaf pine woodlands. During the field reconnaissance survey, the calls of Bachman's sparrows were identified at six locations along the project transmission line ROW.

The two state protected reptiles, southern hognose snake (*Heterodon simus*) and spotted turtle (*Clemmys guttata*), are not presently known to occur within the project boundary. In Georgia, both species historically occurred primarily south of the Project in the Coastal Plain (NatureServe, 2017).

Avian Protection Program

Georgia Power implements an Avian Protection Program (APP) in accordance with an agreement between the FWS, Edison Electric Institute, and Avian Power Line Interaction Committee. The APP specifies procedures to be followed by all Georgia Power employees to maintain compliance with the Migratory Bird Treaty Act, the Bald and Golden Eagle Protection Act, and ESA, as it applies to avian species. The APP establishes a company policy of not disturbing wildlife and includes guidance pertaining to: (1) active nests; (2) injured birds; (3) handling live or dead birds or their nests only in accordance with permits issued by the FWS; (4) not disturbing live or dead birds, or nests of threatened and endangered avian species; (5) appropriate remedial actions for avian interactions; (6) reporting to Georgia Power Environmental and Natural Resources (ENR)

any protected, threatened, endangered, or migratory species (including eggs or chicks) suspected to be in an area that company operations will impact; and (7) reporting immediately to ENR any woodpecker nest cavities found in live pine trees that are subject to company operations.

In addition, Georgia Power's Forestry Policy Manual covers the protection and management of rare, threatened, and endangered species. With respect to bald eagles, Georgia Power forest managers communicate regularly with ENR and GDNR personnel regarding eagle nest locations on Georgia Power lands within and adjacent to the Wallace Dam project boundary. WRD conducts aerial monitoring of bald eagles at Lake Oconee every other year as part of its statewide monitoring program. Georgia Power forest managers and ENR biologists document any sightings of new potential bald eagle nests and coordinate those through ENR biologists, who check their records and contact WRD for confirmation as appropriate. Georgia Power's timber harvesting management on project lands results in long rotations of mature and over-mature pine trees, which are the preferred nest sites for bald eagles.

Wildlife Management on Georgia Power Lands

Georgia Power has a forestry and timber management program at Lake Oconee that is managed by a registered forester. Much of the forested land within the project boundary is managed primarily to provide a shoreline buffer for water quality protection, visual aesthetics, and wildlife habitat. Where deemed appropriate, the forester, using best professional judgment, practices more active forestry management in the following areas within the project boundary: the Oconee WMA, Area A-2, Area B-3, and Area B-5 (Figure 5). On these tracts, Georgia Power practices long rotation management of natural pine, both loblolly and shortleaf, on the uplands, and mixed species hardwood management in the streamside management zones. A few upland stands have been regenerated to improved loblolly pine (selectively bred for improved productivity). The shoreline timber is infrequently thinned to improve regeneration, especially of shade-tolerant species. Georgia Power follows the GDNR Forestry for Wildlife Partnership guidelines and GFC best management practices for blending timber management and wildlife management on these lands.

Georgia Power also manages the areas designated as future recreation sites (Areas A-2, B-3, and B-5) with public recreation in mind. This includes removing some mature pines to foster the growth of hardwoods and subcanopy trees, such as dogwoods, with consideration for visual aesthetics and safety in addition to timber and wildlife management.

3.3.4.2 Environmental Impacts and Recommendations

Georgia Power's proposal to continue operating the Project in a pumped-storage mode for the generation of peaking power would not involve activities directly affecting upland terrestrial, wetland, riparian, or littoral habitats for wildlife and botanical resources. Continued project operation also would not adversely affect any state protected plant and wildlife species. Vegetation and wildlife would be preserved and enhanced by Georgia Power's proposed land management measures to continue to manage shorelines in accordance with Shoreline Management Guidelines for Georgia Power Lakes and to promote and maintain vegetative buffers around Lake Oconee.

Bald Eagle

Although the bald eagle has been removed from the federally threatened species list, it remains protected under the federal Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA). To conserve and protect habitat for bald eagles within the project boundary in compliance with MBTA and BGEPA, Georgia Power would continue to implement its existing APP and Forestry Policy Manual. Because nesting bald eagles are known to occur within the project boundary, protection and management activities would continue to be focused on land management activities that avoid disturbance to active nest sites. Under the APP, Georgia Power implements current FWS national guidance (FWS, 2007a) pertaining to prescribed distance buffers, natural or landscape buffers, and activity-specific guidelines where applicable. In addition, Georgia Power forest managers and natural resource specialists would continue to communicate regularly with GDNR personnel regarding eagle nest locations within and adjacent to the project boundary and cooperate with GDNR's regular monitoring of bald eagles at Lake Oconee.

Exotic Invasive Plant Species

Although several exotic invasive terrestrial plant species are relatively common (but rarely dominant) in the project area, operation of the Wallace Dam Project has not been a major factor contributing to the occurrence or spread of these species (Georgia Power, 2016e). The occurrence of exotic invasive plant species has resulted mainly from surrounding residential development and anthropogenic disturbance along roadways and in riparian habitats in watersheds upstream of the Project. Exotic invasive species such as Chinese privet, Japanese stiltgrass, and Japanese honeysuckle are now widespread and common throughout Georgia and the eastern and southern U.S., typically in floodplains (Merriam and Feil, 2002; Loewenstein and Loewenstein, 2005) and irrespective of the location of impoundments. Chinese privet has achieved an especially widespread distribution, occupying up to 59 percent of the floodplain of the upper Oconee River upstream of Lake Oconee (Ward, 2002).

The project recreation facilities do not contain dominant stands of invasive species, and therefore, public use of these facilities is not being adversely impacted. Chinese privet and Japanese stiltgrass are common in areas along the upper reach of Lake Oconee and along undeveloped floodplains near major tributary channels entering the reservoir. Where dominant stands of these species occur in the project boundary, they often extend onto neighboring lands outside of the project boundary (Georgia Power, 2016e). Control of these species throughout the project boundary would not be feasible given the adjoining private land holdings and upstream sources of propagules (seeds, rhizomes, etc.). The spread of invasive plants is often linked to urbanization, residential development, and anthropogenic disturbance of riparian habitats (Loewenstein and Loewenstein, 2005; Burton et al., 2005).

Alligatorweed is the dominant emergent wetland species present in the Dyar Pasture pond/wetland. GDNR manages the wetland for FS as a waterfowl conservation area and bird sanctuary.

Alligatorweed spreads naturally by animals or water (Madsen, 2017). Stem fragments float and can disperse and become rooted to form new colonies. Stems may also be transported on boats and boat trailers. Drawdown increases the abundance of alligatorweed by stimulating seed germination on damp soil (Madsen, 2017), and this could be a factor contributing to the species' dominance in the Dyar Pasture pond. Water levels in Dyar Pasture are controlled by the pond management practices of WRD.

Georgia Power would continue to monitor invasive aquatic plants within Lake Oconee during routine reservoir inspections. Nuisance invasive aquatic plants would be treated periodically within the project boundary, as warranted, to reduce infestations that could affect public access to the reservoir or Wallace Dam hydropower operations. In addition, Georgia Power would continue to administer its existing shoreline residential aquatic vegetation management program through its website. Property owners could apply for an Individual Aquatic Herbicide Treatment Permit, and if approved by Georgia Power, contract for the treatment of nuisance aquatic vegetation using a state-certified aquatic pesticide commercial applicator.

Construction of Proposed Enhancement Measures

Installation of the proposed forebay oxygen line diffuser system in Lake Oconee (Section 3.3.2) would require the construction of an onshore liquid oxygen facility. The facility would include a driveway, liquid oxygen tanks, a vaporizer system, oxygen flow control valves, and piping leading to the reservoir. At the proposed site, facility construction would permanently remove approximately 3 acres of mixed pine-hardwood forest on the northeast side of Wallace Dam in Hancock County (Figure 9). No wetlands or streams would be directly impacted.

Wildlife would be displaced from the construction area and immediate adjacent lands during construction. The animals displaced would move into adjacent mixed-pine hardwood forest and pine forest that would remain contiguous to the impact area. Displaced animals would be able to relocate to suitable habitat because the surrounding forest would provide dispersal corridors. Sufficient suitable habitat is expected to be available for assimilation of displaced animals, and therefore, secondary impacts to animal populations would likely be negligible.

There is an active bald eagle nest about 4,300 ft northeast of the proposed site. Under its existing APP, Georgia Power would implement current FWS (2007a) national guidance for avoiding disturbance to nesting activity during construction. Terrain and forest vegetation would shield construction activity from the view of the nest. If an additional or alternate nest is found nearby prior to or during construction, the nest management guidelines would be applied to it as well.

Once the liquid oxygen facility becomes operational, animals would be expected to adjust to the disturbance and resume use of adjacent habitats. Operational noise would be limited to the summer and generated by vehicle traffic to and from the facility, the offloading of liquid oxygen from trucks using valves and pipes, and expansion and contraction of the vaporizer system. Noise levels would be minor, and therefore, operation of the facility would be unlikely to adversely affect

wildlife. Moreover, forested vegetation around the site would buffer visual and noise disturbance from operational activity.

Construction of the proposed shoreline structural stabilization (Section 3.3.1) and recreational improvements (Section 3.3.6) would temporarily disturb upland and riparian vegetation and associated wildlife in the vicinity of the construction site. However, these disturbances would be short in duration and the sites would be restored, including reseeded as necessary following construction.

Unavoidable Adverse Impacts

Construction of the liquid oxygen facility for the forebay oxygen line diffuser system would result in the permanent removal of approximately 3 acres of upland, mixed pine-hardwood forest and displacement of its associated wildlife to adjacent habitats.

Some minor land disturbances would occur in upland and riparian areas during construction of shoreline structural stabilization and new recreation facilities. These disturbances would be temporary, and all sites would be revegetated following construction.

3.3.5 Threatened and Endangered Species

3.3.5.1 Affected Environment

Georgia Power (2016c, 2016d) identified and evaluated federally listed species and species under review for federal listing with known records of occurrence in the project vicinity. Seven federally protected species of plants and wildlife and one fish species under federal status review potentially occur in the project vicinity (Table 16). No federal candidate species for listing presently occur in the project vicinity.

Federally Protected Species

Seven federally threatened and endangered species potentially occur within the project vicinity, including five plants and two birds (Table 16). They include:

- Pool sprite (*Amphianthus pusillus*) – threatened;
- Black-spored quillwort (*Isoetes melanospora*) – endangered;
- Mat-forming quillwort (*Isoetes tegetiformans*) – endangered;
- Harperella (*Ptilimnium nodosum*) – endangered;
- Michaux's sumac (*Rhus michauxii*) – endangered;
- Red-cockaded woodpecker (*Lueconotopicus* [= *Picoides*] *borealis*) – endangered; and

- Wood stork (*Mycteria americana*) – threatened.

Two of the plant species, pool sprite and mat-forming quillwort, presently occur (or recently have been planted) in vernal pools on a granite outcrop in the Oconee WMA (Eatonton Outcrop). This outcrop is within the project boundary near Lawrence Shoals Park, Putnam County¹⁰. Acquired from Georgia Power, the property is managed by GDNR. Signs placed in the area warn visitors to stay away from the outcrop's sensitive areas.

None of the other federally protected species are known to occur within the project boundary. All seven federally listed species are described below.

Pool Sprite

Pool sprite (or little amphianthus) is a diminutive, annual herb that occurs in the Piedmont exclusively in shallow, flat-bottomed depressions on granite outcrops, where vernal pools form after rainfall (Patrick et al., 1995; Chafin, 2007). Pool sprite begins flowering in February or March and continues until the habitat becomes desiccated later in the spring. The seeds remain dormant until suitable moisture and light conditions for germination occur in late autumn. In Georgia, pool sprite is found in about seven preserves and parks, with the pools containing the species totaling less than 1 acre (Chafin, 2007). One or two large populations (15 to 20 pools) exist in Greene and Hancock Counties (FWS, 2008). Pool sprite has been documented as inhabiting the Eatonton Outcrop in the Oconee WMA in Putnam County (FWS, 2008, GDNR, 2010); this site is within the project boundary. The outcrop has many pools occupied by pool sprite (FWS, 2008). Pool sprite were observed in two depressions at this outcrop site during the field reconnaissance survey in spring 2016 (Georgia Power, 2016d).

Black-spored quillwort

Black-spored quillwort is an inconspicuous perennial herb and fern ally that is restricted to shallow, seasonally flooded, flat-bottomed pools on granite outcrops (Patrick et al., 1995; Chafin, 2007). These vernal pools are entirely rock-rimmed, generally occur near the summit, and typically have a depth less than 1 ft. The plants produce spores in early May to June. The species is endemic to the Piedmont of Georgia. Historically known from 15 sites in central Georgia, including Greene County, black-spored quillwort currently exists at only 8 sites in Georgia, none of which are occupied by the Wallace Dam Project (FWS, 2008). The species was not detected during the spring 2016 field surveys (Georgia Power, 2016d).

¹⁰ The PAD (Georgia Power, 2015a) identified known occurrences of these species as being just outside of the project boundary. The RTE Species Study Report (Georgia Power, 2016e) states that pool sprite was found inside the project boundary within Lawrence Shoals Park. Closer examination of the occurrence information relative to the project boundary indicates that the known occurrences are within the project boundary but outside of Lawrence Shoals Park.

Mat-forming Quillwort

Mat-forming quillwort is an obscure perennial herb and fern ally that is restricted to shallow, flat-bottomed vernal pools on granite outcrops, where it forms dense mats (Patrick et al., 1995; Chafin, 2007). These depressions are less than 1-ft deep, entirely rock-rimmed, and contain gravelly soil. Plants are usually visible in October to May. Historically known from 13 populations in Georgia, populations are confined to porphyritic granite outcrops in Columbia, Hancock, Putnam, and Greene Counties (FWS, 2008). The majority of these sites contain only one or two pools with mat-forming quillwort. In 2010, WRD and FWS biologists planted four plugs of mat-forming quillwort (raised off-site) in rainwater pools at the Eatonton Outcrop in the Oconee WMA (GDNR, 2010), within the project boundary. The species was not detected during the spring 2016 field surveys (Georgia Power, 2016d).

Harperella

Harperella is an annual herb with erect stems to 3-ft tall that occurs in wet savannas or on the edge of cypress ponds in the Coastal Plain, and in seeps on granite outcrops in the Piedmont (Patrick et al., 1995; Chafin, 2007). Plants flower in late May to early July and fruit from July to August. Only two sites with small populations of harperella are currently known in Georgia, including one in Greene County (Chafin, 2007). The species is not presently known to occur within the Wallace Dam project boundary. Harperella was not detected during the spring 2016 field surveys (Georgia Power, 2016d).

Michaux's Sumac

Michaux's sumac (or dwarf sumac) is a low-growing, colonial shrub that occurs on dry, open, rock, or sandy woodlands over bedrock rich in calcium, magnesium, or iron (Chafin, 2007). Fire or some other form of disturbance may be essential for maintaining the open habitat preferred by the species (NatureServe, 2017). Lacking periodic disturbance, this type of habitat is gradually overtaken and eliminated by shrubs and trees. Historically, Michaux's sumac occurred in the lower Piedmont and upper Coastal Plain. Of the four known extant occurrences of the species in Georgia, none are within the four counties occupied by the Project (FWS, 2014). The nearest occurrence is in Newton County about 30 miles west of the Project. Michaux's sumac was not detected during the 2016 field surveys (Georgia Power, 2016d).

Red-cockaded Woodpecker

The red-cockaded woodpecker is a small woodpecker that is endemic to open, mature and old-growth pine ecosystems in the southeastern U.S. (Ozier and Schneider, 2010; FWS, 2003). Red-cockaded woodpeckers excavate roosting and nesting cavities almost exclusively in old, living pines. Cavity trees are usually infected with red-heart disease, which softens the heartwood. The birds typically nest and roost in longleaf, slash, or loblolly pine trees; the excavation may take several years. Red-cockaded woodpeckers are cooperative breeders that live in family groups consisting of a breeding pair and often one to three helper male offspring from previous years.

Typically, about 150 acres of suitable habitat are required by each family group. Georgia has five remaining population centers. One of these is the Piedmont Recovery Unit (FWS, 2003), which includes a population on Oconee NF in Putnam County located over 8 miles west of Lake Oconee. FS manages 8.3 acres in the Sugar Creek Watershed Management Area specifically for red-cockaded woodpecker habitat (FS, 2004a, 2004b). The species does not currently inhabit pine forests within the project boundary and is not expected to colonize there because stands of large pines are relatively small and isolated and have low probability of being used.

Wood Stork

The wood stork is a large, long-legged wading bird that uses a variety of freshwater and estuarine wetlands in the Coastal Plain for breeding, feeding, and roosting (Harris et al., 2010; FWS, 2007b). The breeding range of the wood stork in the U.S. includes peninsular Florida, the Coastal Plain and large river systems of Georgia and South Carolina, and southeastern North Carolina. The current breeding range and known distribution of wood storks in Georgia is limited to the Coastal Plain (FWS, 2007b); breeding does not occur in the Piedmont. After the breeding season, wood storks disperse widely throughout the Coastal Plain and less commonly into the Piedmont. Transient occurrences of wood storks have been reported across Georgia, and a few individuals have been sighted near the project area between June and October, particularly in shallow freshwater areas (D. Imm, FWS, Field Supervisor, January 20, 2017 letter to K.D. Bose, FERC). Wood storks have been sighted previously at the Dyar Pasture Recreation Area waterfowl pond/wetland within the project boundary in late summer during drought years (FS, 2004b). Nevertheless, the species does not breed in the Piedmont and the most heavily used habitat during the fall is the coastal marshes (Harris et al., 2010).

Species Under Review

The robust redhorse, a Georgia endangered species, is currently undergoing a status review by FWS to determine if listing as a threatened or endangered species is warranted (FWS, 2011). The robust redhorse is a migratory riverine sucker that occurs in large rivers of the Atlantic slope in Georgia, South Carolina, and North Carolina (Freeman et al., 2016; Rhode et al., 2009). It occurs in the Oconee and Ocmulgee Rivers in the Altamaha River basin. The species typically inhabits main-channel, free-flowing rivers in riffles, runs, and pools (Freeman et al., 2016; Rhode et al., 2009).

A population currently exists in the Oconee River downstream of Sinclair Dam, but the species is not known to occur upstream of Wallace Dam (Albanese et al., 2015b). Recent occurrences of robust redhorse in a tributary to Lake Sinclair (Little River) and the upper end of Lake Sinclair appear to have resulted from escaped hatchery fish in the tributary (Zelko, 2012). Focused survey efforts in the Wallace Dam tailrace in 2014 and 2015 did not detect any robust redhorse (Robust Redhorse Conservation Committee's Oconee Technical Working Group, 2014 and 2015). Electrofishing status surveys in spring 2012 and spring 2013 upstream of Lake Oconee, including

segments of the Oconee River and Apalachee River, did not collect or observe any robust redhorse upstream of Wallace Dam (Zelko, 2012, 2013).

3.3.5.2 Environmental Impacts and Recommendations

Continued project operation as proposed by Georgia Power would not be expected to adversely affect any federally threatened and endangered species or species under review. There is no designated critical habitat for federally protected species within the project boundary. Pool sprite is the only federally protected species presently known to reside within the project boundary. Mat-forming quillwort was raised off-site and planted in the wild at Eatonton Rock, but it is unknown whether a viable population exists. Nevertheless, the Eatonton Outcrop is the largest granite outcrop within the project boundary and is the only habitat known to support federally listed plant species. There is potential that other rare plant species restricted to granite outcrop habitats could also occur there. GDNR's current management of the outcrop serves to protect and maintain this important habitat within the project boundary. Moreover, the spring 2016 field survey did not identify any dominant stands of terrestrial exotic invasive plants that threaten the native plant populations.

Wood storks do not breed or normally reside in the Piedmont, but transient individuals may occasionally disperse into the area after the breeding season and forage in the Dyar Pasture waterfowl pond and other shallow wetlands. If sightings of wood storks or any other federally protected bird species are reported within the project boundary, Georgia Power would implement applicable guidance of the existing APP to avoid harassment or harm to the birds.

3.3.6 Recreation and Land Use

3.3.6.1 Affected Environment

Project Area Recreational Facilities

Georgia Power owns and operates seven project recreation facilities that provide for a variety of recreational opportunities (Figure 3, Table 17). Six of the facilities are located on Lake Oconee, and one is on the west shoreline of the tailrace area. All seven facilities include a day-use area; six provide boat ramps, picnic tables, and restrooms; and three provide full-service campgrounds and swimming beaches.

Lawrence Shoals Park

Lawrence Shoals Park is an 83.6-acre facility located just west of Wallace Dam, a short distance from Georgia Hwy 16 in Putnam County. The park is located entirely within the project boundary and consists of a campground and day-use area. The park is open from March 1 through Labor Day. It offers a full-service campground, including recreational vehicle (RV) parking slots, picnic tables, playgrounds, and restrooms. The park has about 62 total campsites. Additionally, the park has day-use areas that include large-capacity overlook picnic pavilions, a two-lane boat ramp, three

boat docks, picnic tables, a swimming beach, restrooms, and nature trails. The park has 68 parking slots (30 slots at the boat ramp), including one handicapped accessible slot at the boat ramp. Parking fees charged at the park entrance, which is staffed by a Georgia Power park host, are \$25 per night for RV camping, \$20 per night for tent camping, and \$5 per vehicle for day-use activities.

Old Salem Park

Old Salem Park is an 83.3-acre facility located in the middle section of Lake Oconee, south of Georgia Hwy 44 in Greene County. The park is located entirely within the project boundary and consists of a campground and day-use area that are open from March 1 through October 30. Old Salem Park offers a full-service campground, including RV parking slots, restrooms, and a playground. The park has about 92 total campsites. The day-use amenities also include a large-capacity picnic pavilion, a two-lane boat ramp, three boat docks, picnic tables, a swimming beach, and restrooms. Old Salem Park includes 123 parking slots, including one handicapped accessible slot at the boat ramp. Parking fees charged at the entrance by the Georgia Power park host are \$25 per night for RV camping, \$20 per night for tent camping, and \$5 per vehicle for day-use activities.

Parks Ferry Park

Parks Ferry Park is a 91.0-acre facility located toward the upper section of Lake Oconee just south of I-20 in Greene County. The park is located entirely within the project boundary. It consists of a campground and day-use area that are open from late April through Labor Day. Parks Ferry Park provides a full-service campground, including RV parking slots, restrooms, and a playground. The park has about 53 total campsites. Other day-use amenities include a large-capacity overlook picnic pavilion, a two-lane boat ramp, one boat dock, picnic tables, a swimming beach, an outdoor sports area, and restrooms. Parks Ferry Park includes 74 parking slots, including one handicapped accessible slot at the boat ramp. Parking fees charged at the entrance by the Georgia Power park host are \$25 per night for RV camping, \$20 per night for tent camping, and \$5 per vehicle for day-use activities.

Sugar Creek Boat Ramp

Sugar Creek Boat Ramp is a 10.4-acre facility located on the Sugar Creek embayment in Putnam County. The facility is located entirely within the project boundary and is open year-round. Georgia Power charges a day-use fee of \$5 per vehicle using an honor box payment system at the park entrance. Sugar Creek Boat Ramp provides a two-lane boat ramp, one boat dock, shoreline access for fishing, picnic tables, a restroom, and 37 parking slots for vehicles with boat trailers, including one handicapped accessible slot.

Armour Bridge

Armour Bridge is a 10.7-acre boat-ramp facility located on the Richland Creek embayment within Reynolds Lake Oconee, a gated resort community, in Greene County. The entire facility is located within the project boundary. Open year-round, Georgia Power charges a day-use fee of \$5 per

vehicle at the Lake Club Guard House, which controls public access to this part of the resort community. Armour Bridge provides a two-lane boat ramp, one boat dock, shoreline access for fishing, picnic tables, a restroom, and 40 parking slots for vehicles with boat trailers.

Long Shoals Boat Ramp

Long Shoals Boat Ramp is a 12.1-acre facility located on the southern main-stem portion of Lake Oconee in Putnam County. The site is located entirely within the project boundary and is open year-round. Georgia Power charges a day-use fee of \$5 per vehicle using an honor box payment system at the park entrance. Long Shoals Boat Ramp provides a two-lane boat ramp, one boat dock, shoreline access for fishing, picnic tables, a restroom, and 34 parking slots for vehicles with boat trailers, including one handicapped accessible slot.

Tailrace Fishing Area

The Tailrace Fishing Area is located in the vicinity of the Georgia Hwy 16 bridge over the Oconee River about 0.4 mile downstream of Wallace Dam. The site is on the west shoreline of the Wallace Dam tailrace in the headwaters of Lake Sinclair. The facility offers tailrace fishing access from the bank. It includes an unpaved road and parking area and a shoreline fishing platform. Only the shoreline platform is located within the project boundary, which in this area includes a thin strip of land along the shoreline.

Project Lands Reserved for Future Recreational Use

Georgia Power's Recreation Plan for the Wallace Dam Project currently includes the following ten areas within the project boundary reserved for future recreation development (Figure 4) (Section 2.1.1.2):

- Area A-1: a heavily forested 138-acre tract located on a peninsula formed by the confluence of Richland Creek and the Oconee River in Greene County.
- Area A-2: a heavily forested 465-acre tract located at the confluence of Sugar Creek and the Oconee River in Putnam and Morgan Counties.
- Tract B: a 561-acre area next to Lawrence Shoals Park in Putnam County that Georgia Power conveyed to the State of Georgia. The area includes undeveloped shoreline and associated buffer and a unique granite outcropping (Eatonton Outcrop) that supports two federally protected plant species. It also contains several miles of multi-use and foot trails that connect with Lawrence Shoals Park and the Rock Hawk Effigy and trail system located outside of, and partly inside of, the project boundary.
- Area B-3: a heavily forested 107-acre tract located on the Apalachee River in Greene County approximately 0.5 river mile below U.S. Hwy 278.

- Area B-5: a heavily forested 106-acre tract located on a peninsula formed by the confluence of Richland Creek and Rocky Creek tributaries in Greene County.
- Area C-2: a 9-acre tract located on Lick Creek at Georgia Hwy 44 in Putnam County.
- Area C-4: a moderately forested 8-acre tract located on the Apalachee River in Greene County.
- Area C-5: a moderately forested 10-acre tract located on the Oconee River at Hwy 44 in Greene County.
- Area C-6: a 5-acre tract located on Richland Creek at Georgia Hwy 44 in Greene County.
- Area C-7: a 9-acre site located on Beaverdam Creek approximately 2 miles above its confluence with Richland Creek in Greene County.

Forest Service Recreation Areas

The FS Oconee Ranger District owns and operates three recreation areas located on Oconee NF lands north of I-20 (Figure 3; Table 17). They are located within the Redlands WMA and provide direct access to the northern-most reaches of Lake Oconee. They offer motorized boating access at eight boat lanes and extensive parking facilities including over 100 parking slots at each of the larger facilities.

Dyar Pasture Recreation Area

Dyar Pasture Recreation Area is a 241.1-acre area located off Copeland Road in Greene County. The recreation area provides access to the upper reaches of Lake Oconee and the Oconee River upstream. The recreation area charges a user fee and provides an unimproved parking area, two-lane boat ramp, boat dock, picnic facilities, shoreline access for fishing, nature trails, and a restroom. Additionally, Dyar Pasture Recreation Area contains a 49.26-acre waterfowl conservation area within the Wallace Dam project boundary, offering opportunities for wildlife viewing. A total of 84.93 acres of the recreation area are located within the project boundary. The boat ramp, boat dock, and shoreline are within the project boundary, while the parking and additional recreation amenities are outside the project boundary.

Redlands Recreation Area

Redlands Recreation Area is a 1,393.7-acre site located off U.S. Hwy 278 in Greene County. The recreation area provides access to the upper reaches of Lake Oconee north of I-20. The recreation area charges a user fee and provides a parking area, three-lane boat ramp, boat dock, picnic facilities, shoreline access for fishing, and a restroom. Only a portion of the recreation area, 8.03 acres, is located within the project boundary. The boat ramp, boat dock, and shoreline are within

the project boundary, while the parking and additional recreation amenities are outside the project boundary. Redlands Recreation Area provides 100 parking slots for vehicles with boat trailers.

Swords Recreation Area

Swords Recreation Area is a 314.9-acre park located off Blue Springs Road in Morgan County. The recreation area provides access to Lake Oconee north of I-20, including the Apalachee River embayment. The recreation area charges a user fee and provides a parking area, three-lane boat ramp, boat dock, picnic facilities, shoreline access for fishing, and a restroom. Only 7.23 acres are located within the project boundary. The boat ramp, boat dock, and shoreline are within the project boundary, while the parking and additional recreation amenities are outside the project boundary. Swords Recreation Area provides 100 parking slots for vehicles with boat trailers.

Project Area Recreational Use

Georgia Power (2016f) assessed recreational use at the Project using a combination of recreational use sampling conducted for a recent Form 80 submittal, customer satisfaction surveys of campground customers, user surveys at Georgia Power boat ramps and popular bank fishing areas, and written, phone, and in-person surveys with various user groups.

Recreation surveys were administered to 166 users at the three Georgia Power boat ramps within the project boundary (Sugar Creek, Armour Bridge, Long Shoals) during five survey events between March and June 2016 (Georgia Power, 2016f). Over 23 percent of those visiting these boat ramps were from the four counties occupied by the Project (Greene, Hancock, Morgan, and Putnam). The highest proportion of users surveyed was from Putnam County (10 percent) followed by Dekalb (8 percent) and Morgan (8 percent) Counties. The five most common reasons cited by users for visiting Lake Oconee were boat fishing (47 percent), pleasure boating (13 percent), tournament fishing (9 percent), bank fishing (8 percent), and jet skiing (4 percent). The average length of visit to Georgia Power boat ramps was 6.5 hours for an average party size of 3.08. User suggestions for facility improvements indicated that facilities are aging and in need of replacement/remodeling and there are opportunities for beneficial amenities at existing sites. Frequently noted desired improvements included improved boat docks, restrooms, boat ramps, parking, trash pickup, and lighting.

Recreation surveys also were administered to 77 users at 14 popular bank fishing locations on Lake Oconee during the same survey events in 2016 (Georgia Power, 2016f). Thirty-six percent of those visiting Lake Oconee primarily for bank fishing were from Hancock, Morgan, Newton, and Putnam Counties. Bank anglers averaged 5.6 hours per visit and 3.1 visits per month, with the highest visitation in the spring. The mostly commonly noted improvements desired by bank anglers were additional bank fishing access/piers, installation or improvement of restrooms, improved lighting, and additional trash cans.

Of 398 campground users surveyed in 2014, the majority noted that the registration process is easy, the park and restrooms are clean, park hosts are courteous and respectful, and camping

facilities meet their needs at the Wallace Dam Project. The primary user recommendations related to improving the cleanliness of the restroom facilities at Lawrence Shoals and Parks Ferry Parks and keeping the parks open later in the year (October/November).

Estimated annual recreation use was approximately 605,000 total visits to Lake Oconee in 2015, of which 471,900 were for day use and 133,100 were for night use (Georgia Power, 2016f). An estimated 169,247 of these visits (28 percent) occurred at the seven project recreation facilities. Future recreational use is projected to be approximately 805,369 in 2050 after applying the corresponding percent population growth from the 24-county area representing 89 percent of the Project's recreation users. Overall recreation use at the Project is forecasted to increase by a third (33 percent) between 2015 and 2050. Analysis of future demand indicates that the existing parking facilities at the Project have adequate capacity for current and future average use (Georgia Power, 2016f).

Regional Recreation Opportunities

Extensive recreational opportunities exist within a 60-mile radius of the Wallace Dam Project. Three other Georgia Power reservoirs (Lakes Sinclair, Jackson, and Juliette), ranging in size from 3,600 to 15,330 acres, provide opportunities for fishing, boating, picnicking, camping, and viewing natural scenery. J. Strom Thurmond Lake, operated by USACE on the Savannah River, covers 71,000 acres and has 1,200 miles of shoreline with 61 access points, including 35 operated by USACE. Oconee NF offers premier opportunities for hunting, wildlife viewing, and warmwater fishing experiences on streams and lakes. The Oconee, Redlands, Cedar Creek, and B.F. Grant WMAs provide opportunities for hunting, camping, bird watching, fishing, hiking, picnicking, canoeing, horseback riding, and bicycling. Nine state parks offer a variety of water-based and non-water based recreation activities. In addition, the Piedmont Wildlife Refuge provides numerous sites for hiking, fishing, and wildlife observation.

Land Use and Relevant Resource Management Plans

The predominant land uses in this portion of the upper Oconee River basin historically have been suburban or rural residential mix, composed of low-intensity urban, forested lands, and row crop and pasture lands. Except for limited pockets of urban land around Eatonton and Milledgeville, most of the lands around the Project contain forest, row crop/pasture, or clearcut/sparse vegetation. Land use for the project boundary is primarily undeveloped and is either deciduous or pine forest (12 percent of the total area) or forested wetlands (5 percent of the total area). Less than 2 percent of the project lands are being used for low- or high-intensity urban purposes. Sixty-three percent of the lands within 2,000-ft of the Project are forested, while approximately 811 acres (1 percent) are on low- or high-intensity urban uses. Most of these urban uses are clustered near the central portion of the reservoir along Lake Oconee Parkway (Georgia Hwy 44).

Land use in the vicinity of the Wallace Dam transmission line is predominantly undeveloped, forested/timberlands or agricultural land used for dairy or poultry farming. The remaining areas

are occupied by aquatic or wetland features, a few residential properties, and small roads. The only urban area near the transmission line ROW is Eatonton.

Georgia Power manages the shoreline of Lake Oconee in accordance with its Shoreline Management Guidelines. No residential structures are allowed on project lands within the project boundary. Landowners adjacent to the project boundary must sign a valid access lease agreement before applying to Georgia Power for a permit. A permit must be obtained before beginning any construction, renovation, tree removal, or land disturbance on Georgia Power land, as well as dredging activities. The guidelines list specific Lake Oconee requirements and restrictions for constructing seawalls, docks, wharves, boatslips, and boat lifts and personal watercraft lifts. The requirements minimize shoreline disturbance from tree removal, mechanical clearing, and other activities to protect the 25-ft vegetative buffer surrounding the lake; the project license requires wider buffers in some areas of the reservoir. The guidelines also include a shoreline use section with information about protecting and enhancing the scenic, recreational, and environmental values of the reservoir, as well as maintaining compatibility with the overall reservoir recreational use.

FERC-Approved Comprehensive Waterway Plans

Section 10(a)(2)(A) of the FPA, 16 U.S.C. § 803(a)(2)(A), requires FERC to consider the extent to which a project is consistent with Federal or State comprehensive plans for improving, developing, or conserving a waterway or waterways affected by the Project. FERC (2017b) currently lists 33 comprehensive plans for the state of Georgia. Table 18 lists the 15 plans potentially relevant to recreation and land use. The most recent and directly relevant comprehensive plan, Georgia's Statewide Comprehensive Outdoor Recreation Plan (SCORP), is described below.

The Georgia SCORP for 2017-2021 (Georgia State Parks, 2016) reports on the state of parks and greenspaces and offers guidance to state and local decision-makers and citizens on ways to promote healthy communities, enhance economic vitality, and conserve natural resources. A public parks inventory shows that Putnam and Greene Counties have between 10 and 20 percent of their areas available for outdoor recreation, while Morgan and Hancock Counties have less than 5 percent available. For many recreators, the quality of their experience depends in large part on the quality of the facilities they use. In recognition of this importance, about 60 percent of Land and Water Conservation Fund awards to local governments between 2006 and 2015 were targeted toward the rehabilitation of existing facilities.

Public survey results, focus groups, and public comments underscore the popularity and importance of trails. Trails support a wide range of outdoor recreation activities and are relatively inexpensive to design, construct, and maintain when strategically placed and supported by local communities. About 63 percent of survey respondents self-identified as being outdoor recreators, enjoying such activities as walking, jogging, running, picnicking, swimming, and observing wildlife and nature. About 20 to 30 percent of recreators indicate that physical limitations can be

a barrier, indicating the continuing importance of addressing this challenge in the planning, development, and rehabilitation of parks.

Northeast Georgia Plan 2035

The Northeast Georgia Plan 2035, applicable to Greene and Morgan Counties, describes Lake Oconee and the Apalachee River as Regionally Important Resources (RIRs) with potential for development conflicts due to their overlap with potential “Developed” and “Developing” Character Areas (Northeast Georgia Regional Commission [NEGRC], 2011). The plan notes that the region’s Desired Development Patterns include facilities for bicycles, including bikeways or bike lanes, and parking racks, as well as the preservation of environmentally sensitive areas by setting them aside as public parks, trail corridors, or greenbelts (NEGRC, 2012).

Regionally Important Resources Plan, Middle Georgia

The Middle Georgia Regionally Important Resources Plan (Middle Georgia Regional Commission, 2010), applicable to Putnam County, describes Lake Oconee and the Oconee River as RIRs with potential for development conflicts. The plan notes that the area surrounding Lake Oconee is becoming increasingly covered by impervious surfaces from rapid residential and commercial development, threatening the water quality of Lake Oconee. In addition, the Oconee River is vulnerable to both urban runoff and rapid growth and development upstream. The plan notes that the region’s General Policies and Protection Measures include recommendations for development of new land development ordinances designed to protect RIRs, as well as the preservation of environmentally sensitive areas by setting them aside as public parks, trails, or greenbelts.

Central Savannah River Area Plan 2035

The Central Savannah River Area Plan 2035, applicable to Hancock County, describes the Oconee WMA and Lake Sinclair as RIRs with potential for development conflicts. The Plan notes that Hancock County has areas of significant disinvestment, levels of poverty, and/or unemployment substantially higher than average levels for the region. It emphasizes the importance of timber to Hancock County, with forest lands representing just over 90 percent (267,000 acres) of the County’s total area (Central Savannah River Area Regional Commission, 2011).

Land and Resource Management Plan, Chattahoochee-Oconee National Forests

The Land and Resource Management Plan (Forest Plan) prepared by FS (2004a) guides the agency’s natural resource management activities and sets management standards for Oconee NF. Oconee NF is managed by the Forest Supervisor headquartered in Gainesville, Georgia, and one ranger district. The Forest Plan describes resource management practices; levels of habitat production, protection, and management; and the availability and suitability of lands for resource management. It provides forest-wide direction for management of the land and its resources, as well as specific management prescription direction within single land allocations. At each level,

management direction consists of goals, objectives, and standards. Management prescriptions applied to specific Oconee NF lands include, but are not limited to, management, maintenance, and restoration of plant associations to their ecological potential; red-cockaded woodpecker habitat (for that portion of Oconee NF south of I-20, outside the vicinity of the Wallace Dam Project); experimental forests; dispersed recreation areas with vegetation management; recommended scenic river segments; areas managed to restore or maintain old-growth characteristics; and rare communities.

3.3.6.2 Environmental Impacts and Recommendations

Recreation Improvements

Georgia Power identified potential recreation enhancements throughout the relicensing process in agency and stakeholder meetings during scoping, study planning, study results meetings, and the PLP meeting. The proposed improvements were also informed by campground customer satisfaction surveys in 2011 and 2014, recreation user surveys at boat ramps and bank fishing areas in 2016, and user group and law enforcement surveys in 2016. Georgia Power proposes to further improve recreational access and facilities by working with GDNR and local stakeholders to implement the following measures, several of which are illustrated conceptually in Figures 10 through 18 and detailed in Appendix C, Proposed Recreation Enhancement Measures Plan:

- Lawrence Shoals Park – enhance recreation amenities by constructing new facilities to replace two campground restrooms, a beach house, a boat ramp restroom, a courtesy dock at the boat ramp, a pavilion and dedicated pavilion restroom, and a guest relations gate house. In addition, upgrade the current well system that supplies water to park facilities and customers. These improvements would continue to support quality recreation opportunities.
- Old Salem Park – enhance recreation amenities by constructing new facilities to replace two group docks (and add a third group dock), a pavilion and dedicated pavilion restroom, a boat ramp restroom, a courtesy dock at the boat ramp, a beach house, and a guest relations gate house. In addition, upgrade the current well system that supplies water to park facilities and customers, and reconfigure the park entrance and gate house to reduce single-lane traffic congestion and allow for year-round operation of the boat ramp. These improvements would continue to support quality recreation opportunities and enhance year-round boat-fishing and tournament-fishing access to Lake Oconee.
- Parks Ferry Park – enhance recreation amenities by constructing new facilities to replace two campground restrooms, a beach house, a courtesy dock at the boat ramp, and a pavilion and dedicated pavilion restroom. In addition, upgrade the current well system that supplies water to park facilities and customers, replace the underground water and electrical service, and reconfigure the entrance gate and gate house to reduce single-lane traffic congestion and allow for year-round operation of the boat ramp. These improvements would continue

to support quality recreation opportunities and enhance year-round boat-fishing and tournament-fishing access to Lake Oconee.

- Area C-5 – increase bank fishing access on Lake Oconee by providing a new bank fishing access development at the Area C-5 tract to include a barrier-free pier and gravel parking.
- Jerry’s Hwy 44 – increase bank fishing access on Lake Oconee by providing a new bank fishing access development at Jerry’s Hwy 44 to include a barrier-free pier and gravel parking. Jerry’s Hwy 44 is a public access point on Georgia Power land commonly used for bank fishing. It is currently undeveloped and accessed from Hwy 44 and the parking lot of Jerry’s Bait and Tackle, an adjacent business. Figure 3 shows the site as Hwy 44 Public Fishing (Jerry’s).
- Sugar Creek Boat Ramp – enhance recreation amenities and increase bank fishing access by adding a new barrier-free fishing pier, upgrading the vault toilet with a flush toilet, and upgrading the courtesy dock.
- Armour Bridge – enhance recreation amenities by upgrading the courtesy dock and replacing the vault toilet with a flush toilet.
- Long Shoals Boat Ramp – enhance recreation amenities and improve bank fishing access by upgrading the courtesy dock and trimming vegetation to provide additional bank fishing access.
- Georgia Hwy 16 Bridge Boat Ramp – enhance recreation amenities and improve tailrace bank fishing access at the existing Georgia Hwy 16 Bridge Boat Ramp in Hancock County downstream of the dam (Figure 3) by providing a new barrier-free tailrace fishing pier and a vault toilet. The new fishing pier would replace the bank fishing access provided at the Tailrace Fishing Area, which would be closed due to its limited public use and for security of Wallace Dam’s adjacent equipment yard.
- Improved lighting - enhance recreational access at Georgia Power boat launch facilities by installing improved lighting at Lawrence Shoals Park, Old Salem Park, Parks Ferry Park, Sugar Creek Boat Ramp, Armour Bridge, Long Shoals Boat Ramp, Area C-5 tract, Jerry’s Hwy 44, and Hwy 16 Bridge Boat Ramp.

The proposed enhancement measures at Lawrence Shoals Park, Old Salem Park, and Parks Ferry Park would replace and upgrade aging facilities to improve the diverse recreational opportunities at Lake Oconee. The measures respond to primary user recommendations at these full-service campgrounds and would improve the quality of experience using restrooms, beach houses, and pavilions, as well as entering and leaving the facility. As emphasized in the Georgia SCORP (Georgia State Parks, 2016), the quality of experience for many recreators depends in large part on the quality of the facilities they use.

Existing recreation amenities would also be upgraded at Georgia Power's three day-use facilities on Lake Oconee (Sugar Creek Boat Ramp, Armour Bridge, and Long Shoals Boat Ramp). Upgrades include new courtesy docks at all three boat ramps and upgrading vault toilets to flush toilets at Sugar Creek and Armour Bridge.

WRD has expressed interest in expanding fishing tournament access to Lake Oconee and ensuring that accommodations are available to tournament anglers year-round (J. Biagi, GDNR, January 20, 2017 letter to K.D. Bose, FERC). WRD continues to recommend that a public boating access facility to support fishing events with greater than 75 boats is needed during the proposed license term (M. Thomas, GDNR, February 19, 2018 letter to K.D. Bose, FERC). The agency is concerned about the current reliance on one private boating access site for adequate accommodations for larger tournament fishing events. At Sugar Creek Boat Ramp, which tournament anglers use regularly in conjunction with the private marina across the Sugar Creek embayment, public access will be enhanced by upgrading the courtesy boat dock, adding a fishing pier, which will provide separation and reduce use conflicts between boaters and bank fishers, upgrading the restroom, and installing improved lighting. The proposed reconfiguration of the park entrances and gate houses at Old Salem and Parks Ferry would allow boating access to be expanded to year-round at these facilities, which would enhance public boating access available for year-round boat fishing and tournament fishing. In addition, replacing the courtesy boat docks and installing improved lighting at both Old Salem and Parks Ferry Parks and replacing the boat dock restroom at Old Salem Park will enhance the quality of the tournament fishing experience at these facilities. Should the private marina close in the future and/or demand for public boating access begin to regularly exceed the capacity of existing facilities, Georgia Power will consult with GDNR to develop a plan to ensure that appropriate public boating access for fishing tournaments remains available year-round. Future options could include adding ramp lanes and parking at Sugar Creek Boat Ramp and/or Parks Ferry Park.

WRD would also like to see additional and/or improved access for bank fishing at the Project. Georgia Power's proposed enhancement measures for Area C-5 and Jerry's Hwy 44 would add new barrier-free bank fishing piers at these locations, along with parking. Bank fishing opportunities would also be improved at the Sugar Creek Boat Ramp by adding a new barrier-free fishing pier and at the Long Shoals Boat Ramp by trimming existing vegetation to provide additional shoreline access to bank fishing sites. In addition, lighting would be added or improved at each of these bank fishing locations.

WRD requests that proposed new fishing piers be fabricated to house fish attractor lighting (M. Thomas, GDNR, February 19, 2018 letter to K.D. Bose, FERC). Attaching lighting to a pier above the water, such as energy-efficient light-emitting diode (LED) lights, may enhance fishing by attracting schools of baitfish and predators to the illuminated area. Georgia Power is not proposing to install fish attractor lighting on the new piers at Area C-5, Jerry's Hwy 44, Sugar Creek Boat Ramp, and Hwy 44 Boat Ramp. However, Georgia Power will consult with GDNR on designing the piers to accommodate fish attractor lighting in the future. Decisions on installing fish attractor lighting at specific sites would need to balance stakeholder interests, aquatic habit

features (e.g., depth, clarity), the area of illumination, boat traffic, safety, and potential law enforcement considerations.

Finally, Georgia Power proposes to close the Tailrace Fishing Area on the west side of the Wallace Dam tailrace area and relocate tailrace bank fishing access to the existing Georgia Hwy 16 Bridge Boat Ramp on the east side of the tailrace area (Figure 3). The existing Tailrace Fishing Area would be closed because of its current limited public use and for security of Wallace Dam's adjacent equipment yard. Tailrace bank fishing access would be enhanced at the Georgia Hwy 16 Bridge Boat Ramp by installing a new barrier-free fishing pier, a vault toilet, and improved lighting.

Recreation Enhancements License Article

Based on the analysis provided above, Georgia Power proposes the following recreation enhancements license article for the Wallace Dam Project (see also Appendix F):

Recreation Enhancement Measures Plan (Article 410)

The Recreation Enhancement Measures Plan, filed on May 31, 2018, as Appendix E of Exhibit E, is approved and must be implemented, according to the schedule included in the plan.

Within 180 days of completion of all the recreation facilities required by the plan, the licensee must file, for Commission approval, as-built drawings that show the location, type, and layout of all constructed recreation facilities in relation to the Wallace Dam project boundary.

The approved Recreation Enhancement Measures Plan must not be amended without prior Commission approval. The Commission reserves the right to make changes to any revisions filed for the Recreation Enhancement Measures Plan.

Future Recreational Development

Georgia Power proposes to reserve nine areas within the project boundary for future recreational use. They include Area A-1, Area A-2, Tract B, Area B-3, Area B-5, Area C-2, Area C-4, Area C-6, and Area C-7 (Section 3.3.6.1; Figure 4). Area C-5 would be developed for bank fishing access under Georgia Power's licensing proposal. Georgia Power would continue to manage these reserved lands under the new license in a manner consistent with preserving the scenic, environmental, and recreational values of Lake Oconee, until such time they may be approved by FERC to be developed for recreational use.

Congressman Jody Hice filed a letter with FERC on December 12, 2017, on behalf of Ms. Barbara Bell Tyson of Buckhead, Georgia. Ms. Tyson expressed concern about Georgia Power's 1974 acquisition of 176.8 acres of her mother's land by eminent domain. She and her sister Miriam Bell Foster first raised the issue during NEPA scoping. The land was acquired as part of Area A-2

(Section 3.3.6.1; Figure 4), a parcel that was reserved for use as a future state park but has not been developed. Area A-2 is situated partly within both Putnam and Morgan Counties. Ms. Tyson believes that Lake Oconee has more public parks, camp sites, and boat ramps today than are needed. Because the land has not been developed as a state park, and she believes is unlikely to be developed as such in the next 50 years, Ms. Bell requests that the 176.8 acres previously owned by her mother (now deceased) be transferred to her and her sister, who she indicates would have inherited the land.

Georgia Power purchased property rights for future recreational use, including Area A-2, pursuant to Article 5 of its original license for the Project. Article 5 requires Georgia Power to obtain for use in perpetuity all lands necessary or appropriate for the construction, maintenance, and operation of the Project, including recreation. The license requirements were determined pursuant to Section 10(a)(1) of the FPA, which requires that licensed projects be best adapted to the comprehensive development of the waterway, considering all beneficial uses, including recreational resources.

The recreation study conducted by Georgia Power (2016f) estimated annual recreation use of about 605,000 total visits to the Project in 2015, with 28 percent of these visits occurring at the project recreation facilities. Projected growth in the 24-county area, from which about 89 percent of the recreation users originate, predicts that overall recreational use at the Project will increase by 33 percent, or to about 805,000 visits in 2050. Surveyed users of the project recreation facilities express overall satisfaction with the existing campgrounds and boat ramps. Analysis of future demand indicates that project recreation facility carrying capacity is adequate to accommodate future average spring and summer use (Georgia Power, 2016f).

Georgia Power proposes to continue to reserve Area A-2 for future recreational development as a state park under the new license. GDNR has expressed continued interest in developing a state park on Lake Oconee. Area A-2 is the largest tract centrally located on the reservoir in proximity to I-20 (Figure 4). Georgia Power would continue to manage Area A-2 to provide a shoreline buffer for water quality protection, visual aesthetics, and wildlife habitat. Georgia Power would also continue to practice forestry and timber management at the site to include rotation of natural pine on the uplands and mixed-species hardwood management in streamside management zones. With future public recreation in mind, management of the site would continue to include removing some mature pines to foster the growth of hardwoods and subcanopy trees, with consideration for visual aesthetics and safety, in addition to timber and wildlife management.

Reservoir Shoreline Management

Georgia Power proposes to continue to manage the Lake Oconee shorelines in accordance with its current Shoreline Management Guidelines for Georgia Power Lakes, as incorporated by the proposed Shoreline Management Plan provided in Appendix D. The Shoreline Management Guidelines promote the maintenance of vegetative buffers around the reservoir to protect water quality, aquatic habitat, and cultural and aesthetic resources. The guidelines provide guidance to

adjacent residents on permitting and constructing shoreline structures in a manner that preserves and enhances the scenic, recreational, and environmental values of the reservoir, as well as maintaining compatibility with overall recreational uses of the reservoir.

The guidelines list specific Lake Oconee requirements and restrictions for constructing seawalls, docks, wharves, boat slips, boat lifts, and personal watercraft lifts. The requirements minimize shoreline disturbance from tree removal, mechanical clearing, and other activities to protect the 25-ft vegetative buffer surrounding the lake; the project license requires wider vegetative buffers in some areas of the reservoir. The proposed Shoreline Management Plan also includes the management of submerged timber in Lake Oconee.

Georgia Power's Oconee/Sinclair Land Management Office staff manages the Wallace Dam project boundary shoreline. The Lake Resources Manager is responsible for the shoreline management program. Two full-time shoreline management staff are responsible for permitting and inspections. One and one-half administrative staff administer the legal documents required by Georgia Power in order to obtain a shoreline permit. Georgia Power undeveloped land is managed by one Georgia Power forester certified as a Professional Forester in Georgia. In addition, two trucks and two boats are dedicated to shoreline management at the Wallace Dam Project. Georgia Power maintains GIS maps of the shoreline and a database of all adjacent property owners.

Shoreline Management License Articles

Based on the analysis provided above, Georgia Power proposes the following shoreline management license article for the Wallace Dam Project (see also Appendix F):

Shoreline Management Plan (Article 411)

The Shoreline Management Plan, filed on May 31, 2018, as Appendix D of Exhibit E, is approved. The approved Shoreline Management Plan must not be amended without prior Commission approval. The Commission reserves the right to make changes to any revisions filed for the Shoreline Management Plan.

Recreation and Land Use Plan

Georgia Power proposes to operate and maintain project recreation facilities and manage Georgia Power-owned lands within the project boundary for recreation, environmental quality, and visual aesthetic purposes for the term of the new license as described in the proposed Recreation and Land Use Plan in Appendix E. The proposed plan updates and supersedes the revised Recreation Plan (Exhibit R) approved under the original license order.

In addition, the proposed Recreation and Land Use Plan incorporates a Submerged Timber Management Plan (Appendix E) for the cutting of timber in Lake Oconee that was set aside in the original license for fish and wildlife habitat (see Section 3.3.3.1). The original license required that a total of 1,250 acres of timber in areas dispersed around the reservoir be left uncut for fish

and wildlife habitat. Standing timber areas within the reservoir are marked with signage and buoys and identified on maps used by anglers. Much of the standing timber has now decayed to the point that it is below the waterline, and the remaining timber continues to decay. Because the submerged timber has the potential to create a boating hazard, Georgia Power proposes to manage these areas for fish habitat and public safety. If a boating hazard is identified, Georgia Power would consult with GDNR to determine the area(s) to be cut. Timber would be cut to a depth of up to 10 ft below the full-pool surface and left to sink and remain as complex bottom habitat. Cut logs that float would be removed from the reservoir.

Recreation and Land Use Plan License Article

Georgia Power proposes the following recreation and land use article for the Wallace Dam Project (see also Appendix F):

Recreation and Land Use Plan (Article 409)

The Recreation and Land Use Plan, filed on May 31, 2018, as Appendix E of Exhibit E, is approved. The approved Recreation and Land Use Plan must not be amended without prior consultation with GDNR and approved by FERC.

Construction of Proposed Enhancement Measures

Construction of the proposed recreation enhancements and construction of the proposed shoreline stabilization measures (Section 3.3.1.2) could cause temporary disturbances due to noise and limited recreation access at the project recreation facilities; however, to the extent practical, construction would occur during the fall and winter when recreation use is lowest. Georgia Power proposes to perform all construction work in accordance with its Shoreline Management Program, described above, to minimize impacts to environmental resources, including water quality and historic properties, near the construction projects. These minor, temporary disturbances, particularly the infrastructure improvements and installation of new restrooms, beach houses, and gate houses, could affect existing vegetation and local water quality; however, implementation of proper erosion control and restoration practices during and immediately following construction would minimize these impacts.

Construction of the proposed forebay oxygen line diffuser system in Lake Oconee, including the onshore liquid oxygen facility (Section 3.3.3.2), could also cause temporary disturbances to public recreation activities on Lake Oconee near the Wallace Dam forebay. All construction work at the shoreline would be performed in accordance with the Shoreline Management Program to minimize impacts. Once the liquid oxygen facility is completed, operational noise would be limited to the summer months and would be expected to be minor. Forested vegetation around the site would buffer visual and noise disturbance from operational activity. For these reasons, construction of the forebay oxygen line diffuser system is expected to have minimal impacts on project recreation and land use.

Unavoidable Adverse Impacts

Construction of the proposed bank fishing recreation enhancements at Area C-5, Jerry's Hwy 44, and the Hwy 16 Bridge Boat Ramp would permanently change the use of minor amounts of land within the project boundary.

3.3.7 Aesthetic Resources

3.3.7.1 Affected Environment

Lake Oconee's public access points offer diverse views of the project impoundment, shorelines, and tailrace areas. Georgia Power's Shoreline Management Guidelines help to protect the vegetative buffer surrounding Lake Oconee and preserve and enhance the aesthetic value of the reservoir.

Generally, the central and southern portions of Lake Oconee provide the most developed views, including low intensity residential, golf courses, resorts, marinas, campgrounds, commercial areas along Georgia Hwy 44, and various public and private recreation access areas (Figure 3). The shoreline vegetative buffer zone in these parts of the reservoir includes a mix of landscaped, landscaped-natural, and natural conditions. Significant stretches of undeveloped forested shoreline occur in the southern end of the reservoir in association with Georgia Power's Lawrence Shoals Park, Oconee WMA, and other areas reserved as buffer areas or for future recreation development.

The northern portions of Lake Oconee upstream of I-20 and surrounded by tracts of the Oconee NF provide the most rural and undeveloped views. Viewsheds in these parts of the reservoir include forested, agricultural, and low intensity residential land uses beyond the shoreline, as well as public recreation access areas, highway and railroad crossings, and small undeveloped islands within the reservoir.

The Wallace Dam transmission line traverses a mostly rural landscape. Vegetative density near the ROW is high and visibility of the line is restricted in many areas. No major highways travel near the line for most of its length. Generally, the east and west ends of the ROW provide the most open views. The east end of the line near Wallace Dam is visible where it intersects Georgia Highway 16 and Lawrence Shoals Park.

3.3.7.2 Potential Resource Impacts

Georgia Power's proposed operation and proposed shoreline protection and recreational enhancement measures would not adversely affect aesthetic resources within the project boundary. Construction of the liquid oxygen facility for the forebay oxygen line diffuser system would result in some temporary unavoidable adverse impacts upon aesthetics. However, once the system is installed, the impact would be minimal. The liquid oxygen facility would be mostly shielded from view by vegetation in the area from both the reservoir and from land.

Unavoidable Adverse Impacts

No unavoidable adverse impacts are anticipated.

3.3.8 Cultural Resources

3.3.8.1 Affected Environment

Georgia Power assessed the historic hydro-engineering resources of the Wallace Dam Project to document the existing conditions of the hydropower facility and its support buildings (TRC, 2016a). Although the Project is not yet 50 years old, it will become so during the next license term in 2029. The assessment was performed to develop a historic context and engineering analysis for future eligibility determination of the Wallace Dam Project for listing in the NRHP.

Wallace Dam is the newest and largest of the 18 hydroelectric plants in Georgia Power's generating system. The Project was completed in three construction periods between 1970 and 1979 under the design and engineering authority of Georgia Power. The dam, powerhouse, control building, administration building, and other support buildings are in Hancock and Putnam counties (Figures 3 and 5). Wallace Dam possesses several unique engineering features (TRC, 2016a). It was Georgia Power's first pumped storage hydroelectric project. At the time of construction, the Project's pump turbines were the largest ever manufactured by Allis-Chalmers (now Voith Hydro). The turbines feature innovative individual servomotors for each wicket gate, which provide economy and simplicity in design, and were reported to be the first used in the U.S. The powerhouse control building and administration building express a standardized version of the Brutalist architectural style that was common among public utility facilities across the nation during the 1970s. Other support buildings include a sewage lift station and maintenance buildings. Wallace Dam has not undergone any major structural or mechanical alterations since it was constructed in 1979 and it retains excellent physical integrity.

Georgia Power also tested and evaluated certain archaeological sites within the area of potential effects (TRC, 2016b). The cultural resources of the Wallace Dam project area have been well-studied, as summarized in the PAD (Georgia Power, 2015a). Since 1996, Georgia Power has annually monitored seven archaeological sites. Phase II testing was conducted in 2016 at three of these sites (9GE751, 9GE952, and 9HK23) to assist in determining their NRHP eligibility and to aid in evaluating the need for continued cultural resources monitoring. Sites 9GE751 and 9HK23 were previously recommended eligible for the NRHP, while the eligibility of 9GE952 was unknown.

Based on the results of the Phase II testing, sites 9GE751 and 9HK23 were recommended not eligible for inclusion in the NRHP (TRC, 2016b). Accordingly, Georgia Power believes that further monitoring of these two sites is not warranted under the new FERC license. The investigation of site 9GE952 found that the site extends outside of the project boundary and may yet yield significant information. Until such time, TRC (2016b) recommends that the NRHP eligibility status of this site remain unassessed, that monitoring continue, and that stabilization

measures be considered, given the reservoir's proximity to the densest portion of the site. In addition, based on the results of previous investigations, the study recommended that site 9PM990 be added to the list of sites for monitoring under the new FERC license.

The Rock Hawk effigy is in uplands adjacent to Lake Oconee and serves as the centerpiece of the Rock Hawk Effigy and Trails system (Georgia Power, 2015a). Although the trails and interpretive signage are maintained by Georgia Power, the effigy itself is not within the Wallace Dam project boundary.

No historic or archaeological sites listed or recommended for inclusion in the NRHP are known to occur along the Wallace Dam-Eatonton transmission line in Putnam County. An intensive archaeological survey conducted along the proposed route in 1979, prior to construction, documented three historic-period archaeological sites and four isolated finds within the impact corridor (SSI Earth Systems Division, 1979). However, none of the sites were recommended for nomination to the NRHP and none of the finds warranted further research.

3.3.8.2 Environmental Impacts and Recommendations

Georgia Power proposes to implement a HPMP through a PA to assure the preservation and long-term management of archaeological sites and historic buildings and structures within the project boundary. The HPMP would be implemented through a PA between FERC, SHPO, and the Advisory Council. Georgia Power has been invited to participate in consultations to develop the PA and to sign as a concurring party. FS and Indian tribes also will be invited to comment on the agreement. The terms of the PA will ensure that Georgia Power addresses and treats all historic properties identified within the Project's area of potential effects under the final HPMP.

Georgia Power filed a draft HPMP for the Wallace Dam Project on March 14, 2018. Hard copies were also distributed to the Restricted Service List for the PA noticed by FERC on June 11, 2015, as well as to LeeAnne Wendt, Tribal Archaeologist of the Muscogee (Creek) Nation. The HPMP provides for the preservation and long-term management of the dam, powerhouse, control building, administration building, and a maintenance building, which are considered eligible for inclusion in the NRHP, and six archaeological sites that are either eligible or potentially eligible and recommended for monitoring under the new license.

Georgia Power received written comments on the draft HPMP from the Cherokee Nation and email comments from SHPO on April 27, 2018 and May 22, 2018. The HPMP being filed with the license application has been revised to address the review comments.

Historic Properties License Article

Georgia Power proposes the following historic properties license article for the Wallace Dam Project:

Programmatic Agreement and Historic Properties Management Plan (Article 412)

The licensee must implement the PA among FERC, GDNR Historic Preservation Division, and Advisory Council as executed by the parties. In the event the PA is terminated, the licensee must continue to implement the provisions of its approved HPMP. The Commission reserves the right to require changes to the HPMP.

Unavoidable Adverse Impacts

No unavoidable adverse impacts are anticipated.

4.0 DEVELOPMENTAL ANALYSIS

This section describes the electric power benefits of the Wallace Dam Project, compares the economic costs of the Project to the economic costs of two alternative generating sources, and provides the estimated cost for each of the environmental measures under Georgia Power's proposed action.

4.1 Power and Economic Benefits of the Project

The Wallace Dam Project would provide low-cost, clean, and renewable hydroelectric generation to assist in meeting regional power demands, generation diversity needs, and capacity needs. The Project would have a nameplate capacity of 321.3 MW and generate approximately 390,083 MWH per year. Further, it would help meet the projected growth in demand for both the SERC region and the SERC-SE assessment area, given that in other regions of the country some fossil-fueled stations have come offline in recent years.

4.2 Comparison of Alternatives

Georgia Power analyzed the Project's use of the river's water resources to generate hydropower by estimating the economic costs of the Project for the proposed action, which includes the existing Wallace Dam Project plus the proposed enhancement measures, and compared those costs to the economic costs of two alternative generating sources, including new combined cycle station and a new combustion turbine station.

Georgia Power based its economic studies on electric power conditions for the first year of the new license, 2020, with no inflation or escalation.¹¹ Georgia Power analyzed costs over a 40-year license term and a 50-year license term. The most likely alternative source of generating power for the Wallace Dam Project would be a new combustion turbine station, due to the replacement costs. However, costs for a new combined cycle station were also analyzed are included in the comparison.

The analysis used levelized annual costs to determine a net present value of costs for: 1) the proposed action, which includes the existing Wallace Dam Project; 2) an equivalent combined cycle station; and 3) an equivalent combustion turbine station. The details of this analysis are based on privileged and confidential commercial and financial information, the release of which would cause substantial harm to Georgia Power. Accordingly, these details are protected from public disclosure pursuant to 18 CFR § 388.112, but are included in the Privileged Information Volume of this license application (see Appendix G for further explanation), for use by FERC staff.

¹¹ See Mead Corporation Publishing Paper Division, 72 FERC 61,027 July 13, 1995.

The analysis shows that power produced from the Wallace Dam Project under the proposed action is more economical than power produced from the most likely alternative power source (i.e., building a new combustion turbine station).

4.3 Cost of Environmental Measures

Georgia Power has proposed a number of environmental enhancement measures for this license application, as described in Section 3.3. These enhancements and the projected capital and O&M costs of the enhancements are listed in Table 19 and 20. These capital and O&M costs are also included in the levelized costs provided in the Privileged Information Volume of this license application.

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 Comparison of Alternatives

In addition to the power and economic benefits of the Wallace Dam Project, Georgia Power's proposal to continue operating the Project includes numerous measures that would provide substantial environmental benefits in the Oconee River basin. Table 21 summarizes the environmental effects of the no-action alternative and Georgia Power's proposed action.

5.2 Comprehensive Development and Recommended Alternative

Sections 4(e) and 10(a)(1) of the FPA require the Commission to give equal consideration to the power development purposes and to the purposes of energy conservation, the protection, mitigation of adverse impacts to, and enhancement of fish and wildlife, the protection of recreational opportunities, and the preservation of other aspects of environmental quality. Any license must be best adapted to a comprehensive plan for improving or developing a waterway or waterways for all beneficial public uses. In determining whether, and under what conditions, a hydropower license should be issued, the Commission will weigh the costs and benefits of its recommended alternative against other proposed measures.

Based on review of the environmental and economic effects of the proposed project and its alternatives, Georgia Power recommends the proposed project with the various enhancement measures below as the preferred alternative. Georgia Power recommends this alternative because:

- Issuance of a new hydropower license would allow Georgia Power to operate the Project as an economically beneficial and dependable source of electrical energy for its customers.
- The 321.3 MW of electric energy generated from a clean, renewable resource would offset the use of fossil-fueled generating plants, thereby conserving nonrenewable resources and avoiding pollution that may be associated with fossil-fueled generation plants.
- The public benefits of this alternative would exceed those of the no-action alternative.
- The recommended measures would protect and enhance water quality, enhance fish and wildlife resources, and would provide improved recreation opportunities at the Project.

In addition, Georgia Power is requesting a 50-year license for the Wallace Dam Project. A 50-year license would be in the public interest because of the substantial environmental benefits of Georgia Power's comprehensive proposed environmental measures and its significant expenditures for the Project. Georgia Power's proposed environmental measures, taken collectively with its other recent environmental stewardship activities in the project area related to licensing, constitute a substantial investment in new environmental protection and enhancement measures.

A 50-year term is justified by:

- Georgia Power’s installation and operation of a DO enhancement system to improve summer DO concentrations in the Wallace Dam tailrace area. The system would be operated as needed during the months May-October, which would benefit water quality in the tailrace and downstream fisheries, aquatic resources, and recreational fishing, and support applicable water quality standards throughout the hottest months of the year.
- Georgia Power’s proposal to limit the daily fluctuation of Lake Oconee to 2 ft. Consistently operating Lake Oconee within this relatively narrow and highly predictable range of daily fluctuation would provide numerous benefits, including:
 - Protecting and maintaining the integrity of shorelines by minimizing erosion and sedimentation;
 - Maintaining wetlands and associated wildlife habitat;
 - Maintaining quality boating, recreational access, and visual aesthetics for the public, lakefront homeowners, and resorts; and
 - Protecting the existing public water supply intakes for the cities of Greensboro and Madison.
- Georgia Power’s proposal to continue operating the Project to supplement flows during drought to support the downstream Sinclair Project minimum flows. Supporting these requirements would continue to enhance aquatic habitat for riverine species of fish and mussels, and highly migratory and diadromous fishes, in the Oconee River downstream of Sinclair Dam.
- Georgia Power’s proposed recreation enhancement measures at nine project recreation sites. These include replacing and upgrading aging facilities to promote diverse recreational opportunities; installing new fishing piers to expand bank fishing access to the reservoir and tailrace; providing year-round boating and tournament-fishing access to additional boat-ramp facilities; and improving lighting at all project recreation facilities. These comprehensive measures would significantly improve recreational access to the project waters and guarantee water-based recreational opportunities adequate to meet future average demand in the region surrounding the Project. In addition, the reservation of nine areas within the project boundary for future recreation use would assure the Project’s ability to meet recreational demand beyond 2050 for state parks, day use and overnight visitors, and recreational boating access to the project waters.
- Georgia Power’s proposal to continue its commitment to preserve and enhance the environmental, aesthetic, and recreational values of the Project, including shoreline buffer

areas, through its Shoreline Management Guidelines and proposed Shoreline Management Plan.

Moreover, continued operation of the Wallace Dam Project would have a highly beneficial cumulative effect on the Oconee River in providing a popular fishery and recreation destination, as well as protecting the river's designated uses within the project reservoir and downstream of the Project to the free-flowing Oconee River below the Sinclair Project.

5.3 Unavoidable Adverse Effects

Unavoidable adverse impacts of Georgia Power's proposal to continue operating the Wallace Dam Project would include temporary effects of shoreline disturbance from construction of the proposed forebay oxygen line diffuser system, shoreline structural stabilization, and proposed recreation enhancements. Some minor land disturbances would occur in upland and riparian areas during construction. However, these disturbances and impacts would be temporary. Impacts would be minimized through the implementation of BMPs for minimizing soil disturbance, controlling erosion, restoring natural contours, and re-vegetating disturbed areas following construction. Construction of the liquid oxygen facility for the forebay oxygen line diffuser system would result in the permanent removal of approximately 3 acres of upland forest; however, adjacent forested habitat would be suitable for assimilating displaced wildlife.

Unavoidable fish losses resulting from turbine entrainment mortality would continue to occur with continued project operation. These losses, however, would not significantly affect fish populations and recreational fishing opportunities in the Oconee River.

5.4 Recommendations of Fish and Wildlife Agencies

Under the provisions of Section 10(j) of the FPA, each hydroelectric license issued by the Commission shall include conditions based on recommendations provided by federal and state fish and wildlife agencies for the protection, mitigation, or enhancement of fish and wildlife resources affected by the project.

Section 10(j) of the FPA states that whenever the Commission believes that any fish and wildlife agency recommendation is inconsistent with the purposes and the requirements of the FPA or other applicable law, the Commission and the agency will attempt to resolve any such inconsistency, giving due weight to the recommendations, expertise, and statutory responsibilities of such agency.

The Commission staff will request recommendations and preliminary license terms and conditions from the resource agencies, including Section 10(j) recommendations, in the public notice issued upon Commission determination that the application is ready for environmental analysis (18 CFR § 5.22).

5.5 Consistency with Comprehensive Plans

Section 10(a)(2)(A) of the FPA, 16 U.S.C. § 803(a)(2)(A), requires the Commission to consider the extent to which a project is consistent with Federal or State comprehensive plans for improving, developing, or conserving a waterway or waterways affected by the Project. FERC (2017b) currently lists 33 comprehensive plans for Georgia.

Table 18 in the Land Use and Relevant Resource Management Plans subsection of 3.3.6 lists the 15 potentially relevant plans by state. Based on a review of the agency and public comments filed on the project, and on an independent analysis pursuant to Sections 4(e), 10(a)(1), and 10(a)(2) of the FPA, Commission staff will determine whether the issuance of a new license for the Wallace Dam Project, with the recommended enhancement measures, would permit the best comprehensive development of the Oconee River.

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7.0 CONSULTATION DOCUMENTATION

Georgia Power identified and contacted numerous stakeholders during the pre-application activities leading up to the preparation of Exhibit E. In addition to FERC, the following agencies, governments, and non-governmental organizations were consulted via telephone, e-mail, mail, website distribution of information, and/or face-to-face meetings in accordance with the distribution protocol established in the PAD (Georgia Power, 2015a):

- American Rivers
- Altamaha Riverkeeper
- Baldwin County
- Blue Springs Marina
- Bone Island Grill
- Rep. Mickey Channell
- Cherokee Nation of Oklahoma
- Cuscowilla
- Ducks Unlimited
- Eastern Band of Cherokee Indians
- City of Eatonton
- EPA Region 4
- Georgia Bass Federation
- GDNR - GEPD
- GDNR - WRD
- GDNR
- GDNR - Oconee WMA
- GFC
- Georgia Soil and Water Conservation District Region IV

- Boathouse at Harbor Club
- Greene County
- Greene County Chamber
- Greene County Sheriff
- City of Greensboro
- GDNR - Historic Preservation Division
- Hancock County
- HOA - Harbor Club
- HOA - Rock Island Cove
- HOA - Sugar Bend
- HOA - Double Branches
- HOA - Oconee Heights
- HOA - Salem Plantation
- HOA - Parks Mill Crossing
- HOA - Sebastian Cove
- HOA - Indian Hills Estate
- HOA - Pioneer Woods
- HOA - Stoneridge
- HOA - The Pointe
- HOA - Waters Edge
- Harbor Club
- Sen. Burt Jones (REP)
- Rep. Rusty Kidd

- Lake Country Board of Realtors
- Lake Oconee Anglers
- Lake Oconee Bass Club
- Lake Oconee Water Watch
- The Lodge at Lake Oconee
- City of Madison
- City of Milledgeville
- Morgan County
- Morgan County Sheriff
- Morgan County Chamber
- Muskogee (Creek) Nation
- Oconee Outdoors Marina
- USDA - Oconee River Resource Conservation & Development Office
- Rep. Butch Parish
- Putnam County
- Putnam County Sheriff
- Putnam County Chamber
- Reynolds Plantation
- Ritz Carlton
- City of Sparta
- Sugar Creek Marina
- United Keetoowah Band of Cherokee
- USDA FS- Southern Region

- USDA FS, Chattahoochee-Oconee Nat. Forests
- FWS
- Waterfront Marina

Table 22 lists the names and addresses of the federal, state, and interstate resource agencies, Indian tribes, and members of the public with which Georgia Power consulted in the development of this Exhibit E. Stakeholders consulted also included more than 65 lake residents, homeowners, and other members of the public.

TABLES

TABLE 1

Nameplate Generating Capacity and Hydraulic Capacity of the Wallace Dam Turbine Units

Unit	Nameplate Capacity of Turbines (hp)	Nameplate Capacity of Generators (MW)	Maximum Hydraulic Capacity Full Gate (cfs)	Most Efficient Hydraulic Capacity Best Gate (cfs)	Commercial Operation Date
1 ^a	73,000	52.20	7,960	7,900	1980
2 ^a	73,000	52.20	7,960	7,900	1980
3	78,000	56.25	8,250	8,200	1980
4	78,000	56.25	8,250	8,200	1980
5 ^a	73,000	52.20	7,960	7,900	1980
6 ^a	73,000	52.20	7,960	7,900	1979
Total		321.3	48,340	48,000	NA

^a Pumped storage units

TABLE 2
Design Characteristics of the Wallace Dam Turbine Units

Unit	Turbine Type	Turbine Arrangement	Turbine Operating Speed (rpm)	Unit Hydraulic Capacity Best Gate (cfs) ^a	Number of Runners per Turbine	Runner Inlet Diameter (inches)	Number of Runner Buckets/Blades	Bucket Spacing at Inlet (inches)	Peripheral Runner Velocity (fps)
1	Francis (reversible)	Vertical	85.7	7,900 (6,500)	1	253	6	132	95
2	Francis (reversible)	Vertical	85.7	7,900 (6,500)	1	253	6	132	95
3	Modified Propeller	Vertical	120	8,200	1	202	8	80	106
4	Modified Propeller	Vertical	120	8,200	1	202	8	80	106
5	Francis (reversible)	Vertical	85.7	7,900 (6,500)	1	253	6	132	95
6	Francis (reversible)	Vertical	85.7	7,900 (6,500)	1	253	6	132	95
Total – Generation				48,000					
Total – Pumpback				26,000					

Source: Southern Company Generation Hydro Services

^aHydraulic capacity of the pump-turbines in pumping mode is shown in parentheses.

TABLE 3
 Monthly Minimum, Mean, and Maximum Flow by Month at Wallace Dam, 1997-2016

Month	Minimum Flow (cfs)	Mean Flow (cfs)	Maximum Flow (cfs)
January	1,046	2,829	6,527
February	1,048	3,447	9,586
March	1,627	3,577	7,240
April	764	2,731	7,318
May	523	1,932	5,202
June	386	1,495	4,299
July	263	1,476	6,100
August	180	1,003	3,122
September	179	1,151	5,052
October	146	1,316	5,693
November	288	1,924	7,982
December	673	2,700	8,054

TABLE 4
Fishes Known to Occur in the Vicinity of the Wallace Dam Project Based on Historical and Recent Records

Family/Scientific Name	Common Name	Project Boundary	Tributaries to Lake Oconee Upstream of Project Boundary							Lake Sinclair
		Lake Oconee	Oconee River	Greenbriar Creek	Apalachee River	Hard Labor Creek	Sugar Creek	Richland Creek	Town Creek	
GARS:										
<i>Lepisosteus osseus</i>	longnose gar	X	X	X	X	X	X	X	X	X
BOWFIN:										
<i>Amia calva</i>	bowfin							X	X	
FRESHWATER EELS:										
<i>Anguilla rostrata</i>	American eel					X				
HERRINGS AND SHADS:										
<i>Dorosoma cepedianum</i>	gizzard shad	X	X	X	X	X	X	X	X	X
<i>Dorosoma petenense</i>	threadfin shad ^a	X	X	X	X		X	X	X	X
MINNOWS:										
<i>Campostoma pauciradii</i>	bluefin stoneroller		X							
<i>Cyprinella callisema</i>	Ocmulgee shiner		X		X	X	X			X
<i>Cyprinella xaenura</i>	Altamaha shiner ^b		X		X	X		X		
<i>Cyprinus carpio</i>	common carp ^a	X	X	X	X	X	X	X	X	X
<i>Hybognathus regius</i>	Eastern silvery minnow		X		X	X	X			
<i>Hybopsis rubrifrons</i>	rosyface chub		X	X	X	X	X	X	X	
<i>Nocomis leptocephalus</i>	bluehead chub		X	X	X	X	X	X	X	
<i>Notemigonus crysoleucas</i>	golden shiner	X	X	X	X		X	X	X	X
<i>Notropis hudsonius</i>	spottail shiner		X		X	X	X	X		X
<i>Notropis longirostrus</i>	longnose shiner					X				
<i>Notropis lutipinnis</i>	yellowfin shiner		X	X	X	X	X	X	X	
<i>Opsopoeodus emiliae</i>	pugnose minnow									X
SUCKERS:										
<i>Erimyzon oblongus</i>	creek chubsucker		X	X	X	X		X	X	

TABLE 4

Fishes Known to Occur in the Vicinity of the Wallace Dam Project Based on Historical and Recent Records

Family/Scientific Name	Common Name	Project Boundary	Tributaries to Lake Oconee Upstream of Project Boundary							Lake Sinclair	
		Lake Oconee	Oconee River	Greenbriar Creek	Apalachee River	Hard Labor Creek	Sugar Creek	Richland Creek	Town Creek		
<i>Minytrema melanops</i>	spotted sucker	X				X	X	X			X
<i>Moxostoma anisurum</i>	silver redhorse	X									X
<i>Moxostoma collapsum</i>	notchlip redhorse		X		X	X	X				X
<i>Moxostoma rupiscartes</i>	striped jumprock	X	X	X	X	X	X	X	X	X	
<i>Moxostoma sp. cf. lachneri</i>	brassy jumprock	X	X		X	X	X				
NORTH AMERICAN CATFISHES:											
<i>Ameiurus brunneus</i>	snail bullhead	X	X	X	X	X	X	X	X	X	X
<i>Ameiurus catus</i>	white catfish	X	X	X	X	X	X	X	X	X	X
<i>Ameiurus natalis</i>	yellow bullhead	X	X	X	X		X	X	X		
<i>Ameiurus nebulosus</i>	brown bullhead	X					X	X			X
<i>Ameiurus platycephalus</i>	flat bullhead	X									X
<i>Ictalurus furcatus</i>	blue catfish ^a	X	X	X	X		X				X
<i>Ictalurus punctatus</i>	channel catfish	X	X	X	X	X	X	X	X	X	X
<i>Noturus gyrinus</i>	tadpole madtom		X	X		X		X	X		
<i>Noturus insignis</i>	margined madtom		X		X	X					
<i>Noturus leptacanthus</i>	speckled madtom				X	X					
<i>Pylodictus olivaris</i>	flathead catfish ^a	X			X		X				X
PIKES:											
<i>Esox americanus</i>	redfin pickerel		X	X	X	X				X	X
<i>Esox niger</i>	chain pickerel		X		X			X			
PIRATE PERCHES:											
<i>Aphredoderus sayanus</i>	pirate perch		X	X	X	X		X	X		
SILVERSIDES:											
<i>Labidesthes sicculus</i>	brook silverside				X	X					X

TABLE 4
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Family/Scientific Name	Common Name	Project Boundary	Tributaries to Lake Oconee Upstream of Project Boundary							Lake Sinclair	
		Lake Oconee	Oconee River	Greenbriar Creek	Apalachee River	Hard Labor Creek	Sugar Creek	Richland Creek	Town Creek		
LIVEBEARERS:											
<i>Gambusia holbrooki</i>	eastern mosquitofish ^c		X	X		X			X	X	X
TEMPERATE BASSES:											
<i>Morone chrysops</i>	white bass ^a	X	X	X	X		X	X	X	X	X
<i>Morone saxatilis</i>	striped bass	X	X	X	X		X	X	X	X	X
<i>Morone chrysops</i> x <i>M. saxatilis</i>	hybrid bass	X	X	X	X		X	X	X	X	X
SUNFISHES:											
<i>Centrarchus macropterus</i>	flier		X	X						X	
<i>Lepomis auritus</i>	redbreast sunfish	X	X	X	X	X	X	X	X	X	X
<i>Lepomis cyanellus</i>	green sunfish ^a	X	X	X	X	X	X	X	X	X	X
<i>Lepomis gulosus</i>	warmouth	X	X	X	X	X	X	X	X	X	X
<i>Lepomis macrochirus</i>	bluegill	X	X	X	X	X	X	X	X	X	X
<i>Lepomis microlophus</i>	redeer sunfish	X	X	X	X	X	X	X	X	X	X
<i>Micropterus punctulatus</i>	spotted bass ^a	X									
<i>Micropterus salmoides</i>	largemouth bass	X	X	X	X	X	X	X	X	X	X
<i>Micropterus sp. cf. coosae</i>	redeye bass		X			X	X		X		
<i>Pomoxis annularis</i>	white crappie ^a				X						
<i>Pomoxis nigromaculatus</i>	black crappie	X	X	X	X	X	X	X	X	X	X
PERCHES:											
<i>Perca flavescens</i>	yellow perch ^a	X	X	X	X	X	X	X	X	X	X
<i>Percina nigrofasciata</i>	blackbanded darter				X						
<i>Etheostoma hopkinsi</i>	Christmas darter		X	X		X	X	X	X	X	
<i>Etheostoma inscriptum</i>	turquoise darter		X	X	X	X				X	
<i>Etheostoma olmstedii</i>	tessellated darter		X	X	X	X				X	X

TABLE 4
 Fishes Known to Occur in the Vicinity of the Wallace Dam Project Based on Historical and Recent Records

Family/Scientific Name	Common Name	Project Boundary	Tributaries to Lake Oconee Upstream of Project Boundary							Lake Sinclair
		Lake Oconee	Oconee River	Greenbriar Creek	Apalachee River	Hard Labor Creek	Sugar Creek	Richland Creek	Town Creek	
Estimated Number of Taxa^d		28	43	33	45	39	33	34	33	32
Data Sources^e		1, 2	3, 4	3	3, 5	3	3	3	3	6, 7

^a Introduced, non-native to the Altamaha River basin (Lee et al., 1980).

^b Altamaha shiner is Georgia state-listed as “threatened.”

^c Western mosquitofish (*Gambusia affinis*) may also have been introduced in the basin.

^d Total excludes hybrids.

^e Data sources: Georgia Power (2015a) and sources listed therein

TABLE 5
Monthly Total Generation (Megawatt-Hours) for the Wallace Dam Project for Years 1997-2016^a

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1997	32,169	28,573	26,200	27,431	21,793	26,819	42,052	37,352	31,077	32,939	36,386	41,208	383,999
1998	29,059	40,544	39,901	35,002	43,008	45,556	48,437	52,516	53,852	38,400	14,441	27,456	468,172
1999	28,562	32,923	34,472	32,209	28,147	35,567	46,963	46,421	41,990	37,166	34,076	34,908	433,404
2000	39,294	42,862	33,951	25,220	37,512	38,246	42,252	42,619	37,575	28,867	30,874	32,525	431,797
2001	11,679	17,519	33,361	24,610	35,508	37,921	32,897	34,156	22,830	16,123	13,542	18,617	298,763
2002	29,207	18,323	31,837	32,078	39,451	40,362	42,136	44,417	41,187	36,606	23,454	32,395	411,453
2003	36,418	25,961	44,400	30,459	38,789	32,894	48,182	46,972	43,818	34,933	38,479	35,626	456,931
2004	33,457	30,180	34,092	28,715	37,988	42,151	41,283	41,976	42,732	32,375	32,871	34,993	432,813
2005	35,232	28,360	29,654	28,216	32,443	33,242	37,982	38,335	29,466	32,221	27,274	19,814	372,239
2006	34,716	27,836	27,447	31,586	35,130	36,052	36,679	42,842	30,615	31,204	31,408	34,015	399,530
2007	36,782	29,065	37,003	33,407	31,724	28,590	28,831	31,726	34,299	37,462	29,842	35,530	394,261
2008	30,009	22,871	24,361	28,610	28,011	27,400	29,603	33,083	30,729	22,964	18,151	20,675	316,467
2009	20,888	14,967	33,477	30,565	40,983	39,651	41,906	42,673	35,380	39,083	36,656	37,217	413,446
2010	37,498	38,212	27,597	25,390	34,477	35,313	41,532	40,741	41,582	37,913	25,422	22,681	408,358
2011	21,472	21,837	32,877	29,678	28,478	29,965	30,944	34,827	34,267	30,218	27,598	26,796	348,957
2012	26,632	20,411	30,823	32,346	33,545	36,550	32,713	35,109	34,247	29,446	24,096	20,446	356,364
2013	19,595	23,019	22,204	24,571	22,612	26,895	30,728	32,411	29,605	27,126	17,672	27,538	303,976
2014	23,736	20,174	18,569	28,714	24,062	23,135	34,129	33,854	32,591	33,444	20,048	25,055	317,511
2015	20,662	15,666	27,813	28,287	25,175	22,408	29,721	35,087	26,432	26,231	34,474	50,155	342,111
2016	30,603	23,374	21,645	21,451	22,799	27,139	27,336	38,230	47,924	40,666	30,903	29,157	361,227
Average	28,884	26,134	30,584	28,927	32,082	33,293	37,315	39,267	36,110	32,269	27,383	30,340	382,589

Source: Southern Company Generation Hydro Services

^a Values color-coded to show highs (blue) and lows (red).

TABLE 6

Summary of Wallace Dam Hourly Generation by Month for Water Years 2016 and 2017

MONTH	Number of Days of Generation at a Given Hour during a Given Month (max=60-62) for WY2016 and WY2017																							
	12AM	1AM	2AM	3AM	4AM	5AM	6AM	7AM	8AM	9AM	10AM	11AM	12PM	1PM	2PM	3PM	4PM	5PM	6PM	7PM	8PM	9PM	10PM	11PM
Jan	10	6	6	6	3	4	4	15	27	21	17	17	16	15	16	16	16	16	19	36	41	40	33	14
Feb	7	5	5	3	2	2	2	12	20	19	16	6	11	12	11	12	14	14	21	40	42	35	28	13
Mar	3						1	13	18	10	15	17	18	15	17	15	10	13	12	23	34	44	37	13
Apr	12	7	4	4	4	2	3	8	11	11	11	9	13	12	13	20	24	27	25	29	31	46	36	24
May	1											1	2	6	16	24	30	41	45	46	48	48	32	14
Jun	6	5	5	5	4	4	3	2	1	1	1	1	8	11	21	34	39	42	45	46	46	42	31	15
Jul	4						1	1	1	2	2	3	11	20	38	43	47	57	53	51	47	36	22	9
Aug		1	1	1	1	1	1					1	1	15	31	41	49	52	56	50	53	44	38	4
Sep												1	5	11	25	36	51	55	57	57	54	47	30	8
Oct	2	2	1	1	1	1	1	1	4	4	5	11	16	17	29	32	34	37	39	37	50	47	33	16
Nov	5	4	4	4	4	4	6	13	18	21	19	19	18	19	21	23	25	28	40	54	51	42	24	11
Dec	9	9	9	9	10	9	10	19	27	31	28	24	20	16	13	12	14	15	38	49	45	40	32	13

Source: Southern Company Generation Hydro Services

^a Values color-coded to show highs (blue) and lows (red).

TABLE 7

Summary of Wallace Dam Hourly Pumpback by Month for Water Years 2016 and 2017

MONTH	Number of Days of Pumpback at a Given Hour during a Given Month (max=60-62) for WY2016 and WY2017 ^a																							
	12AM	1AM	2AM	3AM	4AM	5AM	6AM	7AM	8AM	9AM	10AM	11AM	12PM	1PM	2PM	3PM	4PM	5PM	6PM	7PM	8PM	9PM	10PM	11PM
Jan		8	24	26	24	19	9	6	1						1	1	1							
Feb	2	10	28	34	32	26	13	9	4	4	3	3	2	5	5	5	6	6	2	1	1	1	1	1
Mar	4	12	41	50	52	44	21	8	2	1	1	1	1	1	5	5	5	2	2	1	1	1	1	1
Apr	6	10	34	38	37	35	25	16	8	6	6	5	3	3	3	3	3	3	3	3	3	3	3	3
May	1	8	38	48	54	53	41	22	11	2														
Jun	1	8	38	48	50	50	44	22	13	4														
Jul	3	12	42	57	58	57	49	34	21	3														
Aug	10	20	58	60	60	60	58	47	29	17	5	2												1
Sep	16	30	50	57	59	59	58	49	39	28	14	2												3
Oct	15	32	49	54	55	55	48	39	27	15	7	1												
Nov	13	21	32	37	38	38	25	11	4	3	2	1	1		1	2	1						1	3
Dec	13	28	43	41	41	38	27	13	6	3	2					1	3	3	1				1	3

Source: Southern Company Generation Hydro Services

^a Values color-coded to show highs (blue) and lows (red).

TABLE 8

Summary of Wallace Dam Generation and Pumpback Hours by Unit and Month for Water Year 2016^a

Month	Generation (Total Hours)						Pumpback (Total Hours) ^b						Total Generation	Total Pumpback	
	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6			
Jan	26	128	110	212	47	15	8	28	--	--	42	34	538	112	
Feb	17	58	154	137	46	0	34	35	--	--	52	0	412	121	
Mar	48	71	144	98	28	0	88	92	--	--	56	0	387	235	
Apr	25	52	127	124	49	0	86	87	--	--	88	0	377	261	
May	45	74	136	104	29	15	137	108	--	--	131	66	403	441	
Jun	44	72	174	152	22	21	162	149	--	--	145	135	485	591	
Jul	91	100	124	133	29	12	149	152	--	--	156	139	488	597	
Aug	79	94	198	196	95	34	211	218	--	--	221	202	696	851	
Sep	148	68	217	222	156	69	279	271	--	--	279	276	879	1104	
Oct	22	77	143	157	35	29	0	163	--	--	114	112	463	388	
Nov	43	73	240	218	17	5	0	55	--	--	50	22	596	126	
Dec	45	113	321	278	81	27	0	89	--	--	89	21	866	199	
													Total	6,587	5,023

Source: Southern Company Generation Hydro Services

^a Values color-coded to show highs (blue) and lows (red).^b Units 3 and 4 are not reversible units.

TABLE 9

Summary of Wallace Dam Generation and Pumpback Hours by Unit and Month for Water Year 2017^a

Month	Generation						Pumpback ^b						Total Generation	Total Pumpback
	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6		
Jan	35	50	106	94	11	22	57	66	--	--	58	48	318	229
Feb	44	63	75	86	43	35	110	93	--	--	128	108	346	439
Mar	97	132	46	89	67	51	155	164	--	--	166	119	481	605
Apr	171	178	138	77	54	26	173	182	--	--	181	90	644	626
May	55	103	152	98	31	20	112	117	--	--	122	70	457	421
Jun	29	105	206	84	52	11	100	102	--	--	99	79	486	381
Jul	54	76	188	180	56	44	170	168	--	--	145	132	597	614
Aug	47	66	190	184	113	71	195	190	--	--	212	188	670	785
Sep	107	15	170	125	74	34	194	30	--	--	185	176	525	584
Oct	155	123	212	198	39	25	236	235	--	--	228	221	752	920
Nov	114	132	78	150	74	40	179	189	--	--	171	175	587	714
Dec	49	58	140	137	90	50	181	175	--	--	183	182	524	721
Total												6,387	7,039	

Source: Southern Company Generation Hydro Services

^a Values color-coded to show highs (blue) and lows (red).^b Units 3 and 4 are not reversible units.

TABLE 10

Richard B. Russell Site Pumpback Operations, Acoustic-Sampled Entrainment Estimates, and Entrainment Rates, 2015-2017

Month	Russell Pumping Operation (Hours)			Russell Total Pumpback Entrainment (Number of Fish)			Russell Pumpback Entrainment Rate (Fish per Hour)		
	2015	2016	2017	2015	2016	2017	2015	2016	2017
January	603	No pumping	812	728,039	--	1,601,065	1,207	--	1,972
February	476	No pumping	646	237,151	--	436,428	498	--	676
March	178	No pumping	309	26,110	--	103,265	147	--	334
April	No pumping	No pumping	182	--	--	74,679	--	--	410
May	56	20	241	109,669	33,640	95,294	1,958	1,682	395
June	430	377	451	285,078	924,655	767,813	663	2,453	1,702
July	642	587	693	781,336	2,179,878	2,145,481	1,217	3,714	3,096
August	673	742	703	1,786,737	2,818,004	1,820,149	2,655	3,798	2,589
September	778	793	669	2,907,779	4,267,874	1,731,629	3,738	5,382	2,588
October	799	649	433	5,856,600	4,952,735	1,092,194	7,330	7,631	2,522
November	20	732	473	98,541	5,254,124	3,302,726	4,927	7,178	6,983
December	--	779	296	--	4,390,570	1,101,093	--	5,636	3,720
Total	4,655	4,967	5,908	12,817,040	24,821,481	14,271,815			

Source: Aquacoustics (2018)

TABLE 11

Jocassee Site Monthly Operations, Acoustic-Sampled Entrainment Estimates, and Entrainment Rates

Month	Jocassee Operation (Hours)		Jocassee Total Entrainment (Number of fish)		Jocassee Entrainment Rate (Fish per hour)	
	Generation	Pumping	Generation	Pumping	Generation	Pumping
January	325	397	61,529	74,033	189	187
February	282	236	45,733	14,489	162	61
March	287	391	32,652	53,053	102	121
April	433	542	57,751	44,553	133	82
May	363	591	56,898	47,139	157	80
June	483	695	26,586	111,044	55	160
July	514	741	49,332	346,820	96	468
August	437	641	47,640	272,317	109	425
September	421	503	44,797	165,355	106	329
October	446	483	39,582	193,481	89	400
November	331	365	61,780	120,928	187	331
December	274	320	28,615	75,891	105	237
Total	4,595	5,904	552,894	1,519,102		

Source: Degan and Mueller (2013)

TABLE 12

Comparison of Richard B. Russell, Jocassee, and Wallace Dam Site and Operational Characteristics for Entrainment Data Extrapolation

	Richard B. Russell	Jocassee Site^a	Wallace Dam Project
Site Characteristics:			
Location	Savannah River basin, GA and SC	Savannah River basin, SC	Altamaha River basin, GA
Physiographic province	Piedmont	Piedmont and Blue Ridge	Piedmont
Drainage area	2,890 sq mi	145 sq mi	1,830 sq mi
Reservoir area (upper)	26,650 (Russell Lake)	7,980 acres (Lake Jocassee)	19,050 acres (Lake Oconee)
Reservoir area (lower)	71,100 (Thurmond Lake)	17,660 acres (Lake Keowee)	15,330 acres (Lake Sinclair)
Operational Characteristics:			
Nameplate generating capacity	600 MW	710.1 MW	321.3 MW
Head	136-141 ft	316 ft	89 ft
Number of generating units	8	4	6
Generation hydraulic capacity	60,000 cfs	36,200 cfs	48,000 cfs (Best Gate)
Number of pumpback units	4	4	4
Pumpback hydraulic capacity	30,000 cfs	31,720 cfs	26,000 cfs

Sources: USACE (<http://www.sas.usace.army.mil/About/Divisions-and-Offices/Operations-Division/Richard-B-Russell-Dam-and-Lake/Hydropower/>); Duke Energy (2014); Southern Company Generation Hydro Services.

TABLE 13
Wallace Dam Project Monthly Operations for Water Years 2016 and 2017

Month	Wallace Dam Operation 2016 (Hours)		Wallace Dam Operation 2017 (Hours)		Wallace Dam Average Operation, 2016-2017 (Hours)	
	Generation	Pumping	Generation	Pumping	Generation	Pumping
January	538	112	318	229	428	171
February	412	121	346	439	379	280
March	387	235	481	605	434	420
April	377	261	644	626	510	443
May	403	441	457	421	430	431
June	485	591	486	381	485	486
July	488	597	597	614	543	606
August	696	851	670	785	683	818
September	879	1104	525	584	702	844
October	463	388	752	920	608	654
November	596	126	587	714	592	420
December	866	199	524	721	695	460
Total	6,587	5,023	6,387	7,039	6,487	6,031

Source: Southern Company Generation Hydro Services

TABLE 14

Extrapolated Wallace Dam Pumpback Entrainment Estimates using Richard B. Russell Monthly Pumpback Entrainment Rates and Wallace Dam Average Monthly Pumping Operations

Month	Russell Entrainment Rate (Fish per hour) ^a			Wallace Dam Average Pumping, 2016-2017 (Hours) ^b	Wallace Dam Entrainment Extrapolation (Number of fish) ^c		
	2015	2016	2017		2015	2016	2017
January	1,207	NP	1,972	171	178,490	--	291,618
February	498	NP	676	280	120,796	--	163,972
March	147	NP	334	420	53,476	--	121,504
April	NP	NP	410	443	--	--	157,548
May	1,958	1,682	395	431	730,954	627,919	147,460
June	663	2,453	1,702	486	279,112	1,032,672	716,514
July	1,217	3,714	3,096	606	638,641	1,948,983	1,624,678
August	2,655	3,798	2,589	818	1,882,218	2,692,529	1,835,428
September	3,738	5,382	2,588	844	2,733,834	3,936,194	1,892,767
October	7,330	7,631	2,522	654	4,156,232	4,326,904	1,430,016
November	4,927	7,178	6,983	420	1,792,916	2,612,045	2,541,086
December	--	5,636	3,720	460	--	2,245,078	1,481,847
Total				6,031	12,566,669	19,422,325	12,404,437

^a Source: Aquacoustics (2018)

^b Source: Southern Company Generation Hydro Services

^c Calculated as:

Entrainment rate X average pumping X 0.867 (ratio of Wallace Dam to Russell pumpback hydraulic capacity)

^d NP = no pumping.

TABLE 15

Extrapolated Wallace Dam Entrainment Estimates using Jocassee Monthly Entrainment Rates and Wallace Dam Average Monthly Operations

Month	Jocassee Entrainment Rate (Fish per hour) ^a		Wallace Dam Average Operation, 2016-2017 (Hours) ^b		Wallace Dam Entrainment Extrapolation (Number of fish)	
	Generation	Pumping	Generation	Pumping	Generation	Pumping
January	189	187	428	171	80,821	31,907
February	162	61	379	280	61,378	17,072
March	102	121	434	420	44,294	50,790
April	133	82	510	443	67,847	36,357
May	157	80	430	431	67,530	34,460
June	55	160	485	486	26,682	77,720
July	96	468	543	606	52,104	283,374
August	109	425	683	818	74,406	347,650
September	106	329	702	844	74,359	277,635
October	89	400	608	654	54,068	261,700
November	187	331	592	420	110,634	138,979
December	105	237	695	460	72,936	108,931
Total			6,487	6,031	787,057	1,666,574

^a Source: Degan and Mueller (2013)

^b Source: Southern Company Generation Hydro Services

TABLE 16

Federally and State Protected Plant and Wildlife Species with Known Records of Occurrence in the Wallace Dam Project Vicinity^a

Scientific Name	Common Name	Federal Status ^b	Georgia Status ^c	Habitat ^d	County
PLANTS:					
<i>Acmispon helleri</i>	Carolina trefoil		E	Clayey soil over ultramafic rock; post oak-blackjack oak savannas	Greene
<i>Amphianthus pusillus</i>	Pool sprite	LT	T	Shallow, flat-bottomed depressions (solution pits, vernal pools) on granite outcrops, with thin gravelly soils and winter-spring inundation.	Greene Putnam Hancock
<i>Cypripedium acaule</i>	Pink ladyslipper		U	Upland oak-hickory-pine forests; piney woods.	Greene Morgan
<i>Draba aprica</i>	Sun-loving draba		E	Granite and amphibolite outcrops, usually in red cedar litter	Putnam
<i>Eriocaulon koernickianum</i>	Dwarf hatpins		E	Seepage areas and wet depressions on granite outcrops, often with horned bladderwort.	Greene Hancock
<i>Isoetes melanospora</i>	Black-spored quillwort	LE	E	Shallow, temporarily flooded, flat-bottomed pools formed by natural erosion on granite outcrops.	Greene
<i>Isoetes tegetiformans</i>	Mat-forming quillwort	LE	E	Shallow pools formed by natural erosion on granite outcrops.	Greene Putnam Hancock
<i>Ptilimnium nodosum</i>	Harperella	LE	E	Granite outcrop seeps; shallow seasonal ponds in limestone depressions.	Greene Putnam Hancock
<i>Quercus oglethorpensis</i>	Oglethorpe oak		T	Wet clay soils of upland seepage swamps, stream terraces, and moist hardwood forests.	Greene Putnam
<i>Rhus michauxii</i>	Michaux's sumac	LE	E	Dry open, rocky, or sandy woodlands over mafic bedrock; on ridges and river bluffs.	Newton ^e
<i>Schisandra glabra</i>	Bay star-vine		T	Moist, deciduous hardwood forests on lower slopes, stream terraces, and floodplains.	Morgan
<i>Sedum pusillum</i>	Granite stonecrop		T	Granite outcrops, usually in mats of moss beneath red cedar trees.	Greene

TABLE 16

Federally and State Protected Plant and Wildlife Species with Known Records of Occurrence in the Wallace Dam Project Vicinity^a

Scientific Name	Common Name	Federal Status ^b	Georgia Status ^c	Habitat ^d	County
<i>Silene ovata</i>	Ovate catchfly		R	Mesic deciduous or beech-magnolia forests over limestone; bouldery, high-elevation oak forests	Hancock
<i>Stewartia malacodendron</i>	Silky camellia		R	Rich ravine and slope forests; lower slopes of sandhills above bogs and creek swamps.	Hancock
<i>Waldsteinia lobata</i>	Piedmont barren strawberry		R	Stream terraces, floodplain forests, and rocky, lower slopes with oak-hickory-pine forest.	Morgan
MUSSELS:					
<i>Fusconaia masoni</i>	Atlantic pigtoe		E	Sand and gravel in large creeks and rivers; occurs in Ogeechee River but not Oconee River.	Hancock
FISH:					
<i>Cyprinella xaenura</i>	Altamaha shiner		T	Small tributaries and rivers; often found in small pools with rocky to sandy substrates.	Greene Morgan Putnam
<i>Etheostoma parvipinne</i>	Goldstripe darter		R	Small streams, spring seeps, and runs with aquatic vegetation; occurs below the Fall Line.	Hancock
<i>Moxostoma robustum</i>	Robust redhorse	UR	E	Medium to large rivers, shallow riffles to deep flowing water; moderately swift current.	Putnam
REPTILE:					
<i>Clemmys guttata</i>	Spotted turtle		U	Heavily vegetated swamps, marshes, bogs, and small ponds in soft, mucky substrates.	Hancock
<i>Heterodon simus</i>	Southern hognose snake		T	Sandhills; fallow fields; longleaf pine-turkey oak	Hancock
BIRDS:					
<i>Haliaeetus leucocephalus</i>	Bald eagle		T	Almost always nest near open water (rivers, lakes, coastal waters, wetlands). Usually found in large, open-topped pines near open water.	Greene Morgan Hancock Putnam

TABLE 16

Federally and State Protected Plant and Wildlife Species with Known Records of Occurrence in the Wallace Dam Project Vicinity^a

Scientific Name	Common Name	Federal Status ^b	Georgia Status ^c	Habitat ^d	County
<i>Leuconotopicus borealis</i> (= <i>Picoides borealis</i>)	Red-cockaded woodpecker	LE	E	Large expanses of mature, open pine forest, particularly longleaf, slash, or loblolly pine. Nests in old living pines.	Putnam
<i>Mycteria americana</i>	Wood stork	LT	E	Freshwater and estuarine wetlands in the Coastal Plain; transient individuals occasionally disperse into Piedmont after breeding season	Greene
<i>Peucaea aestivalis</i>	Bachman's sparrow		R	Open pine or oak woods, clear-cuts, utility rights-of-way, old fields, and brushy areas.	Hancock

^a This list is for rare species with known element of occurrence records in Hancock, Greene, Morgan, and/or Putnam Counties, Georgia.

^b Federal status: **LE** = listed endangered; **LT** = listed threatened; **UR** = under review to determine if listing may be warranted.

^c Georgia state status: **E** = Georgia endangered; **T** = Georgia threatened; **R** = Georgia Rare; **U** = Georgia unusual.

^d Habitat descriptions from GDNR (2017a), Chafin (2007), NatureServe (2017).

^e Species included at request of USFWS; nearest known element of occurrence record in Newton County, Georgia, outside the four-county project vicinity.

TABLE 17

Recreation Facilities Providing Access to the Wallace Dam Project

Park/Facility	County	Total Acreage	Acreage within Project Boundary	Address	Amenities
Georgia Power Owned and Operated Facilities (located within Project Boundary):					
Armour Bridge	Greene	10.72	10.72	Brown's Ford Road, Greensboro	Boat ramp (2 lanes), 40 parking slots, dock, picnic tables, fishing, restroom, public access within Reynolds Lake Oconee
Lawrence Shoals Park	Putnam	83.58	83.58	123 Wallace Dam Road, Eatonton	Boat ramp (2 lanes), 68 parking slots, 3 docks, full-service campground, nature trails, swimming beach, restrooms, picnic tables, picnic pavilion, barrier-free access, playground
Long Shoals Boat Ramp	Putnam	12.06	12.06	Long Shoals Road, Eatonton	Boat ramp (2 lanes), 34 parking slots, dock, picnic tables, fishing, restroom, barrier-free access
Old Salem Park	Greene	83.34	83.34	1530 Old Salem Road, Greensboro	Boat ramp (2 lanes), 123 parking slots, 3 docks, full-service campground, swimming beach, restrooms, picnic tables, picnic pavilion, playground
Parks Ferry Park	Greene	90.98	90.98	1491 Parks Mill Road NE, Greensboro	Boat ramp (2 lanes), 74 parking slots, dock, full-service campground, swimming beach, restrooms, picnic pavilion, playground
Sugar Creek Boat Ramp	Putnam	10.39	10.39	Parks Mill Road, Buckhead	Boat ramp (2 lanes), 37 parking slots, dock, picnic tables, fishing, restroom, barrier-free access
Tailrace Fishing Area	Putnam	NA ^a	<0.1	Wallace Dam Road West	Fishing platform, parking.
FS Owned and Operated Facilities:					
Dyar Pasture Recreation Area	Greene	241.08	84.93	USFS Road 1276 at Copeland Road, Greensboro	Boat ramp (2 lanes), fishing, nature trail, picnic facilities, restroom
Redlands Recreation Area	Greene	1,393.69	8.03	USFS Road 1255 at US Hwy 278, Greensboro	Paved boat ramp (3 lanes), 2 picnic tables and grill, restroom (no water), 100 parking slots
Swords Recreation Area	Morgan	314.87	7.23	Blue Springs Road, Buckhead	Paved boat ramp (3 lanes), boat dock, restroom, 100 parking slots
Privately Owned and Operated Facilities:					
Apalachee Bait Shop & Fish Camp	Morgan	10.98	0.10	1010 Apalachee River Rd, Madison	Boat launch, primitive campsites, restrooms
Blue Springs Marina	Morgan	6.21	1.18	1291 Blue Springs Drive, Buckhead	Food, gas, restaurant, marina, restrooms

TABLE 17

Recreation Facilities Providing Access to the Wallace Dam Project

Park/Facility	County	Total Acreage	Acreage within Project Boundary	Address	Amenities
Boathouse at Harbor Club	Greene	6.40	0.64	3991 Walker Church Road, Greensboro	Food, full-service campground, gas, marina, picnic, restrooms
Greene County Boat Ramp	Greene	0.55	0.06	SE End of Howard Lewis Road, White Plains	
Great Waters Marina	Putnam	1.86	0.22	154 Oakton South, Eatonton	Reynolds Lake Oconee – dry-slip boat storage, pontoon boat rentals, on-demand launching, marina stores, fuel
Hwy 44 Public Fishing (Tract C-5)	Greene	10.30	10.09	136 Clack Cir, Eatonton	Shoreline fishing
Hwy 44 Public Fishing (Jerry's)	Putnam	3.06	0.69	1054 Greensboro Rd, Eatonton	Gas, store
Lake Club Marina	Greene	4.77	0.04	Brown's Ford Road, Greensboro	Reynolds Lake Oconee – indoor/outdoor pools, food, children's area, beach access, boat ramps and docks
The Landing Marina	Greene	2.65	0.01	1021 Long Cove Drive, Greensboro	Reynolds Lake Oconee – dry-slip boat storage, pontoon boat rentals, on-demand launching, marina stores, fuel
North Shore Resort	Greene	53.46	0.12	2541 Carey Station Road, Greensboro	Full RV accommodations, rental units, picnic pavilions, 2 swimming pools, fishing, swimming, boat ramp, game courts, playground, RV storage
Oconee Outdoors and Marina	Putnam	2.80	0.08	891 Greensboro Road, Eatonton	Full-service marina with dry storage, fishing, boat ramps
Reynolds Plantation Marina	Greene	7.88	0.03	100 Linger Longer Road, Greensboro	Reynolds Lake Oconee – dry-slip boat storage, pontoon boat rentals, on-demand launching, marina stores, fuel
Sugar Creek Marina	Putnam	11.42	1.74	353 Parks Mill Road, Buckhead	Gas, marina, picnic, restrooms
Waterfront Marina	Putnam	8.12	1.32	144 Collis Marina Road, Eatonton	Food, full-service campground, gas, marina, picnic, restrooms

^a Area outside of project boundary is part of Sinclair Project (FERC No. 1951).

TABLE 18

Federal or State Comprehensive Waterway Plans Potentially Applicable to Project Recreation or Land Use

Comprehensive Plan	Potentially Applicable to Recreation or Land Use (Yes or No)
Atlantic States Marine Fisheries Commission. 1998. Amendment 1 to the Interstate Fishery Management Plan for Atlantic sturgeon (<i>Acipenser oxyrinchus oxyrinchus</i>). (Report No. 31). July 1998.	Yes
Atlantic States Marine Fisheries Commission. 1998. Interstate fishery management plan for Atlantic striped bass. (Report No. 34). January 1998.	Yes
Atlantic States Marine Fisheries Commission. 1999. Amendment 1 to the Interstate Fishery Management Plan for shad and river herring. (Report No. 35). April 1999.	Yes
Atlantic States Marine Fisheries Commission. 2000. Technical Addendum 1 to Amendment 1 of the Interstate Fishery Management Plan for shad and river herring. February 9, 2000.	Yes
Atlantic States Marine Fisheries Commission. 2009. Amendment 2 to the Interstate Fishery Management Plan for shad and river herring, Arlington, Virginia. May 2009.	Yes
Atlantic States Marine Fisheries Commission. 2010. Amendment 3 to the Interstate Fishery Management Plan for shad and river herring, Arlington, Virginia. February 2010.	Yes
Atlantic States Marine Fisheries Commission. 2000. Interstate Fishery Management Plan for American eel (<i>Anguilla rostrata</i>). (Report No. 36). April 2000.	Yes
Georgia Department of Natural Resources. 1985. Water availability and use - Oconee River Basin. Atlanta	Yes
Georgia Department of Natural Resources. Georgia Statewide Comprehensive Outdoor Recreation Plan (SCORP): 2008-2013. Atlanta	Yes
Georgia Department of Natural Resources. 1986. Water availability and use report - Altamaha River Basin. Atlanta	Yes
National Marine Fisheries Service. 1998. Final Recovery Plan for the shortnose sturgeon (<i>Acipenser brevirostrum</i>). Prepared by the Shortnose Sturgeon Recovery Team for the National Marine Fisheries Service, Silver Spring, Maryland. December 1998.	Yes
National Park Service. The Nationwide Rivers Inventory. Department of the Interior, Washington, D.C. 1993.	Yes
State of Georgia. Office of the Governor. 1987. Water resources management strategy-summary document. Atlanta, Georgia. January 12, 1987.	Yes
U.S. Fish and Wildlife Service. National Marine Fisheries Service. Georgia Department of Natural Resources. 2013. Priority restoration and management actions for the American Shad in the Altamaha River Basin, Georgia. Athens, Georgia. 2013.	Yes
U.S. Fish and Wildlife Service. No date. Fisheries USA: the recreational fisheries policy of the U.S. Fish and Wildlife Service. Washington, D.C.	Yes

Source: FERC (2017b)

TABLE 19

Cost of Environmental Measures Proposed by Georgia Power for the Wallace Dam Project for a 40-year License

Item	Major Category	Components	O&M \$	Total O&M \$ for 40-year license term	Capital \$
1	Shoreline Stabilization				
1.1		Install shoreline stabilization consisting of riprap at Old Salem Park, Parks Ferry Park, Long Shoals Boat Ramp, and Armour Bridge Boat Ramp to conserve soil resources, maintain shoreline recreational uses, reduce sedimentation and turbidity of adjacent waters, and enhance littoral-zone aquatic habitat.	\$3,000	\$120,000	\$260,000
1.2		Repair the eroded shoreline at the Pond 2 waterfowl impoundment and inspect the water level control structure on the eastern shore of the Wallace Dam tailrace area to conserve soil resources, maintain waterfowl refuge habitat, and protect water quality and aquatic habitat.		\$120,000	\$50,000
2	Operational Measures to Enhance Summer DO				
2.1		Install and operate a forebay oxygen line diffuser system in Lake Oconee to enhance summer dissolved oxygen (DO) concentrations in the tailrace area. This would benefit water quality in the tailrace and downstream fisheries, aquatic resources, and recreational fishing, and support applicable water quality standards throughout the hottest months of the year.			\$4,699,000
2.2		Design of forebay oxygen system model and additional cost of field studies and water quality/aeration modeling.			\$500,000
2.3		Annual cost of oxygen for system.	\$300,000	\$12,000,000	
2.4		Start-up management to optimize system.			\$150,000
2.5		Annual cost for managing system.	\$20,000	\$800,000	
2.6		Continuously monitor DO and water temperature in the Wallace Dam tailrace area during the period May 1 through October 31 for length of the license.	\$30,000	\$1,200,000	
3	Recreation Enhancement Measures				
3.1	Lawrence Shoals Park	Enhance recreation amenities at Lawrence Shoals Park by constructing new facilities to replace two campground restrooms, a beach house, a boat ramp restroom, a courtesy dock at the boat ramp, a pavilion and	\$87,000	\$3,480,000	\$1,500,000

TABLE 19

Cost of Environmental Measures Proposed by Georgia Power for the Wallace Dam Project for a 40-year License

Item	Major Category	Components	O&M \$	Total O&M \$ for 40-year license term	Capital \$
		dedicated pavilion restroom, and a guest relations gate house. In addition, upgrade the current well system that supplies water to park facilities and customers. Additional O&M costs include personnel responsible for cleaning, trash pick-up, landscaping, park management costs, and park hosts.	\$10,000	\$400,000	
3.2	Old Salem Park	Enhance recreation amenities at Old Salem Park by constructing new facilities to replace two group docks (and add a third group dock), a pavilion and dedicated pavilion restroom, a boat ramp restroom, a courtesy dock at the boat ramp, a beach house, and a guest relations gate house. In addition, upgrade the current well system that supplies water to park facilities and customers, and reconfigure the park entrance and gate house to reduce single-lane traffic congestion and allow for year-round operation of the boat ramp. These improvements would continue to support quality recreation opportunities and enhance year-round boat-fishing and tournament-fishing access to Lake Oconee. Additional O&M costs include personnel responsible for cleaning, trash pick-up, landscaping, park management costs, and park hosts.	\$114,000	\$4,560,000	\$1,000,000
			\$10,000	\$400,000	
3.3	Parks Ferry Park	Enhance recreation amenities at Parks Ferry Park by constructing new facilities to replace two campground restrooms, a beach house, a courtesy dock at the boat ramp, and a pavilion and dedicated pavilion restroom. Upgrade the current well system that supplies water to park facilities and customers; replace the underground water and electrical service; and reconfigure the entrance gate and gate house to reduce single-lane traffic congestion and allow for year-round operation of the boat ramp. Additional O&M costs include personnel responsible for cleaning, trash pick-up, landscaping, park management costs, and park hosts.	\$90,000	\$3,600,000	\$1,440,000
			\$10,000	\$400,000	
3.4	Area C-5 tract	Increase bank fishing access on Lake Oconee by providing a new bank fishing access development at the Area C-5 tract to include a pier and gravel parking.	\$30,000	\$1,200,000	\$110,000

TABLE 19

Cost of Environmental Measures Proposed by Georgia Power for the Wallace Dam Project for a 40-year License

Item	Major Category	Components	O&M \$	Total O&M \$ for 40-year license term	Capital \$
		Additional O&M costs include personnel responsible for cleaning, trash pick-up, landscaping, and park management costs.	\$10,000	\$400,000	
3.5	Jerry's Hwy 44	Increase bank fishing access on Lake Oconee by providing a new bank fishing access development at Jerry's Hwy 44 to include a pier and gravel parking. Additional O&M costs include personnel responsible for cleaning, trash pick-up, landscaping, and park management costs.	\$30,000 \$10,000	\$1,200,000 \$400,000	\$97,500
3.6	Sugar Creek	Enhance recreation amenities and increase bank fishing access at Sugar Creek Boat Ramp by adding a new fishing pier, upgrading the vault toilet with a flush toilet, and upgrading the courtesy dock. Additional O&M costs include personnel responsible for cleaning, trash pick-up, landscaping, and park management costs.	\$24,000 \$10,000	\$960,000 \$400,000	\$180,000
3.7	Armour Bridge Boat Ramp	Enhance recreation amenities at Armour Bridge Boat Ramp by upgrading the courtesy dock and replacing the vault toilet with a flush toilet. Additional O&M costs include personnel responsible for cleaning, trash pick-up, landscaping, and park management costs.	\$24,000 \$10,000	\$960,000 \$400,000	\$170,000
3.8	Long Shoals Boat Ramp	Enhance recreation amenities and improve bank fishing access at Long Shoals Boat Ramp by upgrading the courtesy dock and trimming vegetation to provide additional bank fishing access. Additional O&M costs include personnel responsible for cleaning, trash pick-up, landscaping, and park management costs.	\$24,000 \$10,000	\$960,000 \$400,000	\$440,000
3.9	Tailrace Fishing Pier	Enhance recreation amenities and improve tailrace bank fishing access at the Georgia Hwy 16 Bridge Boat Ramp downstream of the dam by providing a new tailrace fishing pier and a vault toilet. The new fishing pier would replace the bank fishing access provided at the Tailrace Fishing Area.	\$30,000	\$1,200,000	\$25,000

TABLE 19

Cost of Environmental Measures Proposed by Georgia Power for the Wallace Dam Project for a 40-year License

Item	Major Category	Components	O&M \$	Total O&M \$ for 40-year license term	Capital \$
		Additional O&M costs include personnel responsible for cleaning, trash pick-up, landscaping, and park management costs.	\$10,000	\$400,000	
3.10	Improve Lighting at all areas	Enhance recreational access at Georgia Power boat launch facilities by installing improved lighting at Lawrence Shoals Park, Old Salem Park, Parks Ferry Park, Sugar Creek Boat Ramp, Armour Bridge Boat Ramp, Long Shoals Boat Ramp, Area C-5 tract, Jerry's Hwy 44, and Hwy 16 Bridge Boat Ramp.			\$25,000
4	Cultural Resources Education				
4.1		Implement a HPMP through a PA to assure the preservation and long-term management of archeological sites and historic buildings and structures within the project boundary. Enhance public understanding of cultural resources in the project area by establishing and maintaining web-based educational material related to the history of the Project, the history of hydropower in the region, and the overall prehistoric and historic context of the area	\$1,000	\$40,000	\$20,000
5	Shoreline Management				
5.1		Implement a Shoreline Management Plan to continue to manage shorelines in accordance with Shoreline Management Guidelines for Georgia Power Lakes and to further promote the maintenance of vegetative buffers, water quality, and aquatic habitat around the reservoir by developing educational materials that would include web-based and printed material on topics including shoreline vegetation, buffers, pet waste, lawn care practices, native vegetation, and debris disposal that would contribute to improved water quality and aquatic habitat around the reservoir.			\$15,000
5.2	Maintenance Personnel	Two dedicated shoreline specialists responsible for the permitting, compliance, and inspection of shoreline facilities on Lake Oconee	\$150,000	\$6,000,000	
Total All Environmental Measures				\$41,880,000	\$10,731,500

TABLE 20

Cost of Environmental Measures Proposed by Georgia Power for the Wallace Dam Project for a 50-year License

Item	Major Category	Components	O&M \$	Total O&M \$ for 50 year license term	Capital \$
1	Shoreline Stabilization				
1.1		Install shoreline stabilization consisting of riprap at Old Salem Park, Parks Ferry Park, Long Shoals Boat Ramp, and Armour Bridge Boat Ramp to conserve soil resources, maintain shoreline recreational uses, reduce sedimentation and turbidity of adjacent waters, and enhance littoral-zone aquatic habitat.	\$3,000	\$150,000	\$260,000
1.2		Repair the eroded shoreline at the Pond 2 waterfowl impoundment and inspect the water level control structure on the eastern shore of the Wallace Dam tailrace area to conserve soil resources, maintain waterfowl refuge habitat, and protect water quality and aquatic habitat.		\$120,000	\$50,000
2	Operational Measures to Enhance Summer DO				
2.1		Install and operate a forebay oxygen line diffuser system in Lake Oconee to enhance summer dissolved oxygen (DO) concentrations in the tailrace area. This would benefit water quality in the tailrace and downstream fisheries, aquatic resources, and recreational fishing, and support applicable water quality standards throughout the hottest months of the year.			\$4,699,000
2.2		Design of forebay oxygen system model and additional cost of field studies and water quality/aeration modeling			\$500,000
2.3		Annual cost of oxygen for system	\$300,000	\$15,000,000	
2.4		Start-up management to optimize system			\$150,000
2.5		Annual cost for managing system.	\$20,000	\$1,000,000	
2.6		Continuously monitor DO and water temperature in the Wallace Dam tailrace area during the period May 1 through October 31 for length of the license.	\$30,000	\$1,500,000	
3	Recreation Enhancement Measures				
3.1	Lawrence Shoals Park	Enhance recreation amenities at Lawrence Shoals Park by constructing new facilities to replace two campground restrooms, a beach house, a boat ramp restroom, a courtesy dock at the boat ramp, a pavilion and	\$87,000	\$4,350,000	\$1,500,000

TABLE 20

Cost of Environmental Measures Proposed by Georgia Power for the Wallace Dam Project for a 50-year License

Item	Major Category	Components	O&M \$	Total O&M \$ for 50 year license term	Capital \$
		dedicated pavilion restroom, and a guest relations gate house. In addition, upgrade the current well system that supplies water to park facilities and customers. Additional O&M costs include personnel responsible for cleaning, trash pick-up, landscaping, park management costs, and park hosts.	\$10,000	\$500,000	
3.2	Old Salem Park	Enhance recreation amenities at Old Salem Park by constructing new facilities to replace two group docks (and add a third group dock), a pavilion and dedicated pavilion restroom, a boat ramp restroom, a courtesy dock at the boat ramp, a beach house, and a guest relations gate house. In addition, upgrade the current well system that supplies water to park facilities and customers, and reconfigure the park entrance and gate house to reduce single-lane traffic congestion and allow for year-round operation of the boat ramp. These improvements would continue to support quality recreation opportunities and enhance year-round boat-fishing and tournament-fishing access to Lake Oconee. Additional O&M costs include personnel responsible for cleaning, trash pick-up, landscaping, park management costs, and park hosts.	\$114,000 \$10,000	\$5,700,000 \$500,000	\$1,000,000
3.3	Parks Ferry Park	Enhance recreation amenities at Parks Ferry Park by constructing new facilities to replace two campground restrooms, a beach house, a courtesy dock at the boat ramp, and a pavilion and dedicated pavilion restroom. Upgrade the current well system that supplies water to park facilities and customers; replace the underground water and electrical service; and reconfigure the entrance gate and gate house to reduce single-lane traffic congestion and allow for year-round operation of the boat ramp. Additional O&M costs include personnel responsible for cleaning, trash pick-up, landscaping, park management costs, and park hosts.	\$90,000 \$10,000	\$4,500,000 \$500,000	\$1,440,000
3.4	Area C-5 tract	Increase bank fishing access on Lake Oconee by providing a new bank fishing access development at the Area C-5 tract to include a pier and gravel parking.	\$30,000	\$1,500,000	\$110,000

TABLE 20

Cost of Environmental Measures Proposed by Georgia Power for the Wallace Dam Project for a 50-year License

Item	Major Category	Components	O&M \$	Total O&M \$ for 50 year license term	Capital \$
		Additional O&M costs include personnel responsible for cleaning, trash pick-up, landscaping, and park management costs.	\$10,000	\$500,000	
3.5	Jerry's Hwy 44	Increase bank fishing access on Lake Oconee by providing a new bank fishing access development at Jerry's Hwy 44 to include a pier and gravel parking. Additional O&M costs include personnel responsible for cleaning, trash pick-up, landscaping, and park management costs.	\$30,000 \$10,000	\$1,500,000 \$500,000	\$97,500
3.6	Sugar Creek	Enhance recreation amenities and increase bank fishing access at Sugar Creek Boat Ramp by adding a new fishing pier, upgrading the vault toilet with a flush toilet, and upgrading the courtesy dock. Additional O&M costs include personnel responsible for cleaning, trash pick-up, landscaping, and park management costs.	\$24,000 \$10,000	\$1,200,000 \$500,000	\$180,000
3.7	Armour Bridge Boat Ramp	Enhance recreation amenities at Armour Bridge Boat Ramp by upgrading the courtesy dock and replacing the vault toilet with a flush toilet. Additional O&M costs include personnel responsible for cleaning, trash pick-up, landscaping, and park management costs.	\$24,000 \$10,000	\$1,200,000 \$500,000	\$170,000
3.8	Long Shoals Boat Ramp	Enhance recreation amenities and improve bank fishing access at Long Shoals Boat Ramp by upgrading the courtesy dock and trimming vegetation to provide additional bank fishing access. Additional O&M costs include personnel responsible for cleaning, trash pick-up, landscaping, and park management costs.	\$24,000 \$10,000	\$1,200,000 \$500,000	\$440,000
3.9	Tailrace Fishing Pier	Enhance recreation amenities and improve tailrace bank fishing access at the Georgia Hwy 16 Bridge Boat Ramp downstream of the dam by providing a new tailrace fishing pier and a vault toilet. The new fishing pier would replace the bank fishing access provided at the Tailrace Fishing Area. Additional O&M costs include personnel responsible for cleaning, trash pick-up, landscaping, and park management costs.	\$30,000 \$10,000	\$1,500,000 \$500,000	\$25,000

TABLE 20

Cost of Environmental Measures Proposed by Georgia Power for the Wallace Dam Project for a 50-year License

Item	Major Category	Components	O&M \$	Total O&M \$ for 50 year license term	Capital \$
3.10	Improve Lighting at all areas	Enhance recreational access at Georgia Power boat launch facilities by installing improved lighting at Lawrence Shoals Park, Old Salem Park, Parks Ferry Park, Sugar Creek Boat Ramp, Armour Bridge Boat Ramp, Long Shoals Boat Ramp, Area C-5 tract, Jerry's Hwy 44, and Hwy 16 Bridge Boat Ramp.			\$25,000
4	Cultural Resources Education				
4.1		Implement a HPMP through a PA to assure the preservation and long-term management of archeological sites and historic buildings and structures within the project boundary. Enhance public understanding of cultural resources in the project area by establishing and maintaining web-based educational material related to the history of the Project, the history of hydropower in the region, and the overall prehistoric and historic context of the area	\$1,000	\$50,000	\$20,000
5	Shoreline Management				
5.1		Implement a Shoreline Management Plan to continue to manage shorelines in accordance with Shoreline Management Guidelines for Georgia Power Lakes and to further promote the maintenance of vegetative buffers, water quality, and aquatic habitat around the reservoir by developing educational materials that would include web-based and printed material on topics including shoreline vegetation, buffers, pet waste, lawn care practices, native vegetation, and debris disposal that would contribute to improved water quality and aquatic habitat around the reservoir.			\$15,000
5.2	Maintenance Personnel	Two dedicated shoreline specialists responsible for the permitting, compliance, and inspection of shoreline facilities on Lake Oconee	\$150,000	\$7,500,000	
Total All Environmental Measures				\$52,350,000	\$10,731,500

TABLE 21
Comparison of Alternatives for the Wallace Dam Project

Resource	No-Action Alternative	Proposed Action
Generation	390,083 MWH	390,083 MWH
Geologic and Soil Resources	Stable or moderately stable banks around most of reservoir and tailrace shoreline; active erosion problem next to Pond 2 in tailrace area.	Continued normal daily reservoir fluctuations of 2.0 ft or less; shoreline stabilization with protective riprap at Old Salem Park, Parks Ferry Park, Long Shoals Boat Ramp, and Armour Bridge; repair of eroded shoreline next to Pond 2 in tailrace area.
Water Resources	Good overall water quality conditions in reservoir and tailrace area; summer DO depressions in tailrace area.	Forebay oxygen line diffuser system to enhance summer DO concentrations in tailrace area, benefiting water quality, fisheries, aquatic resources, and recreation, and supporting applicable water quality standards.
Fish and Aquatic Resources	Healthy and balanced warm-water fish community typical of southeastern reservoirs.	Continued operation during low-inflow periods to support downstream Sinclair Project minimum flow requirements; continued daily reservoir fluctuations of 2.0 ft or less providing consistency of littoral-zone habitat; forebay oxygen line diffuser system to enhance summer DO concentrations and benefiting fisheries and aquatic resources in tailrace and forebay of Lake Oconee.
Terrestrial Resources	Forested, herbaceous/emergent, and scrub-shrub wetlands totaling 911 acres within project boundary; mostly minor occurrences of exotic invasive plant species, project recreation facilities not being adversely impacted; waterfowl habitat includes ponds at Dyar Pasture Recreation Area and in Oconee WMA; active bald eagle nest sites within project boundary.	Continued implementation of existing APP, Forestry Policy Manual, routine reservoir inspections, and shoreline residential aquatic vegetation management program.; removal of 3 acres of upland habitat for liquid oxygen facility; however, adjacent forested habitat suitable for assimilating displaced wildlife, and thus, impacts likely to be negligible.
Threatened and Endangered Species	Granite outcrop with vernal pools supporting federally-listed pool sprite and mat-forming quillwort on land owned and managed by GDNR; signs warn visitors to stay away from outcrop's sensitive areas.	Continued project operation not expected to adversely affect any federal listed plant and wildlife species or critical habitat.
Recreation	Operation and maintenance of seven recreation facilities providing a variety of recreational opportunities	Enhancements to recreational access at nine locations to support quality recreation opportunities,

TABLE 21
Comparison of Alternatives for the Wallace Dam Project

Resource	No-Action Alternative	Proposed Action
	including boating, bank fishing, camping, picnicking, and swimming,	including three new project recreation facilities, rehabilitation and replacement of aging existing facilities, expanded year-round access for boat fishing and fishing tournaments, new bank fishing access, improved tailrace fishing access, and improved lighting.
Land Use	Reservoir shorelines managed under Shoreline Management Guidelines: requiring valid access lease agreement and permit prior to any construction, renovation, tree removal, land disturbance, or dredging; protecting vegetative buffers and enhancing scenic, recreational, and environmental qualities of reservoir.	Continued implementation of Shoreline Management Guidelines under a Shoreline Management Plan; implementation of a Recreation and Land Use Plan that includes management of submerged timber and maintenance of buffer areas associated with lands reserved for future recreation development.
Cultural Resources	Annual monitoring of seven archaeological sites within area of potential effects.	PA and HPMP providing for preservation and long-term management of historic properties. Wallace Dam Project, as it turns 50 years old, to become eligible for listing on NRHP.

Note: The Proposed Action (Georgia Power's proposal) is summarized in Section 2.2 and evaluated by resource area in detail in Section 3.3.

TABLE 22

List of Stakeholders Consulted During Development of the Wallace Dam Project Exhibit E

Stakeholder	Contact Name	Title	Street Address	City	State	Zip Code
American Rivers	Mr. Ben Emanuel	Associate Director Southeast Region	108 East Ponce de Leon Ave. Suite 212	Decatur	GA	30030
Altamaha Riverkeeper	Mr. Brian Lucy	CEO/Riverkeeper	P.O. Box 2642	Darien	GA	31305
Baldwin County	Chairman Sammy Hall	Baldwin County Commissioners	220 County Line Church Rd., SW	Milledgeville	GA	31601
Blue Springs Marina	Mr. Benjamin Smith	Owner	1560 Shakerag Road	Buckhead	GA	30625
Bone Island Grill	Mr. John Jansen	Owner Operator	1720 Epps Bridge Parkway	Athens	GA	30606
Rep. Mickey Channell	Mr. Mickey Channell	State Representative	P.O. Box 839	Greensboro	GA	30642
Cherokee Nation of Oklahoma	Mr. Bill John Baker	Principal Chief	P.O. Box 948	Tahlequah	OK	74465
Cuscowilla	Ms. Lori Morgan	HOA Chair	126 Cuscowilla Drive	Eatonton	GA	31024
Ducks Unlimited	Mr. Jamie Rader					
Eastern Band of Cherokee Indians	Mr. Russell Townsend	THPO	P.O. Box 455	Cherokee	NC	28719
City of Eatonton	Mr. John Reid	Mayor, City of Eatonton	103 Beech Ave.	Eatonton	GA	31204
EPA Region 4	Jamie Higgins	NEPA Program Office	61 Forsyth St., SW	Atlanta	GA	30303
EPA Region 4	Mr. Dan Holliman	NEPA Program Office	61 Forsyth St., SW	Atlanta	GA	30303
EPA Region 4	Mr. Stephen Maurano	NEPA Program Office	61 Forsyth St., SW	Atlanta	GA	30303
Georgia Bass Federation	Mr. Robert Phillips	Conservation Director				
Georgia Department of Natural Resources - Environmental Protection Division	Mr. Jeremy Smith	Watershed Monitoring Unit-North	7 MLK, Jr. Dr., Suite 450	Atlanta	GA	30334
Georgia Department of Natural Resources - Environmental Protection Division	Dr. Elizabeth Booth	Watershed Planning and Monitoring Program	2 MLK, Jr. Dr. S.W., Suite 1152	Atlanta	GA	30334

TABLE 22

List of Stakeholders Consulted During Development of the Wallace Dam Project Exhibit E

Stakeholder	Contact Name	Title	Street Address	City	State	Zip Code
Georgia Department of Natural Resources - Environmental Protection Division	Ms. Jennifer Welte	Environmental Program Manager	2 MLK, Jr. Dr. S.W., Suite 1152	Atlanta	GA	30334
Georgia Department of Natural Resources - Environmental Protection Division	Mr. Paul Lamarre	Environmental Engineer	2 MLK, Jr. Dr. S.W., Suite 1152	Atlanta	GA	30334
Georgia Department of Natural Resources - Environmental Protection Division	Dr. Wei Zeng	Hydrology Unit				
Georgia Department of Natural Resources - Environmental Protection Division	Mr. Jeff Larson	Asst. Branch Chief	4420 International Pkwy, Suite 101	Atlanta	GA	30354
Georgia Department of Natural Resources - Environmental Protection Division	Ms. Katherine Zornig	Wetlands Unit				
Georgia Department of Natural Resources - Environmental Protection Division	Ms. Melissa Letosky	Wetlands Unit				
Georgia Department of Natural Resources - Wildlife Resources Division	Mr. Chris Nelson	Fisheries Biologist	2123 U.S. Highway 278, S.E.	Social Circle	GA	30025
Georgia Department of Natural Resources - Wildlife Resources Division	Mr. Steve Schleiger	Regional Supervisor	1014 Martin Luther King Jr. Dr.	Fort Valley	GA	31030
Georgia Department of Natural Resources - Wildlife Resources Division	Mr. Matt Thomas	Asst. Chief of Fisheries	2070 U.S. Highway 278, S.E.	Social Circle	GA	30025

TABLE 22

List of Stakeholders Consulted During Development of the Wallace Dam Project Exhibit E

Stakeholder	Contact Name	Title	Street Address	City	State	Zip Code
Georgia Department of Natural Resources - Wildlife Resources Division	Mr. John Biagi	Chief of Fisheries	2070 U.S. Highway 278, S.E.	Social Circle	GA	30025
Georgia Department of Natural Resources - Wildlife Resources Division	Mr. Thom Litts	Special Project Operations Manager, Fisheries	2070 U.S. Highway 278, S.E.	Social Circle	GA	30025
Georgia Department of Natural Resources - Wildlife Resources Division	Mr. Drew Larson		2070 U.S. Highway 278, S.E.	Social Circle	GA	30025
Georgia Department of Natural Resources - Wildlife Resources Division	Mr. Brett Albanese	Sr. Nongame Aquatic Biologist	2065 U.S. Highway 278, S.E.	Social Circle	GA	30025
Georgia Department of Natural Resources - Wildlife Resources Division	Mr. Jason Wisniewski	Aquatic Biologist	2065 U.S. Highway 278, S.E.	Social Circle	GA	30025
Georgia Department of Natural Resources - Wildlife Resources Division	Mr. Jon Ambrose	Chief of Nongame Conservation	2070 U.S. Highway 278, S.E.	Social Circle	GA	30025
Georgia Department of Natural Resources - Wildlife Resources Division	Mr. Don McGowan	Region Operations Manager - Game Management Section	2070 U.S. Highway 278, S.E.	Social Circle	GA	30025
Georgia Department of Natural Resources	Capt. Mark Padgett		142 Bob Kirk Road	Thomason	GA	30824
Georgia Department of Natural Resources - Oconee Wildlife Management Area	Mr. Lee Taylor	Region III Supervisor	142 Bob Kirk Road	Thomson	GA	30824

TABLE 22

List of Stakeholders Consulted During Development of the Wallace Dam Project Exhibit E

Stakeholder	Contact Name	Title	Street Address	City	State	Zip Code
Georgia Department of Natural Resources - Oconee Wildlife Management Area	Mr. Nick Holbrooks		142 Bob Kirk Road	Thomson	GA	30824
Georgia Forestry Commission	Mr. Troy Clymer	District Forester	119 Hwy. 49	Milledgeville	GA	31061
Georgia Forestry Commission	Mr. Tom Wooten	Chief Ranger	220 Centennial Church Rd.	White Plains	GA	30678
Georgia Soil and Water Conservation District Region IV	Mr. Andy Dyar		3014 Heritage Road, Suite 1	Milledgeville	GA	31061
Boathouse at Harbor Club	Mr. Brandon Matney	Owner	1111 Polo Circle, Suite 101	Greensboro	GA	30642
Greene County	Mr. Byron Lombard	Manager	1034 Silver Dr, Suite 201	Greensboro	GA	30642
Greene County	Mr. Ed Bullard	Chairman, Greene County Board of Commissioners	1034 Silver Dr, Suite 201	Greensboro	GA	30642
Greene County Chamber	Mrs. Becky Cronic	President	111 North Main St. PO Box 741	Greensboro	GA	30642
Greene County Sheriff	Mr. Chris Houston	Sheriff	1201 S. Industrial Blvd.	Greensboro	GA	30642
City of Greensboro	Mr. Glenn Wright	Mayor, City of Greensboro	P.O. Box 362	Greensboro	GA	30642
Georgia Department of Natural Resources - Historic Preservation Division	Dr. David Crass	Division Director/Deputy SHPO	254 Washington Street, SW Ground Level	Atlanta	GA	30334
Georgia Department of Natural Resources - Historic Preservation Division	Ms. Christine Quinn		254 Washington Street, SW Ground Level	Atlanta	GA	30334
Hancock County	Mrs. Helen G. Hudson	Chairwoman, Hancock County Board of Commissioners	12630 Broad St.	Sparta	GA	31087

TABLE 22

List of Stakeholders Consulted During Development of the Wallace Dam Project Exhibit E

Stakeholder	Contact Name	Title	Street Address	City	State	Zip Code
HOA - Harbor Club	Mr. John Crouse	HOA Chair	1039 Lakeside Court	Greensboro	GA	30642
HOA - Rock Island Cove	Mr. Wilbur Williams	HOA Chair	120 Winding River Road	Eatonton	GA	31024
HOA - Sugar Bend	Mr. Henry Wheaton	HOA Chair	1080 Carpenter Lane	Buckhead	GA	30625
HOA - Double Branches	Ms. Ray Deaton	HOA Chair	1731 White Oak Drive	White Plains	GA	30678
HOA - Oconee Heights	Ms. Sheila Lackey	HOA Chair	1030 Edgewater Court	Greensboro	GA	30642
HOA - Salem Plantation	Ms. Ruth Langevin	HOA Chair	1400 Plantation Drive	Greensboro	GA	30642
HOA - Parks Mill Crossing	Ms. Sara Folk	HOA Chair	1700 Parks Mill Drive	Greensboro	GA	30642
HOA - Sebastian Cove	Mr. Harley Wood	HOA Chair	188 Whitney Street	Eatonton	GA	31024
HOA - Indian Hills Estate	Mr. Leonard Blount	HOA Chair	106 Lancaster Point	Statesboro	GA	30458
HOA - Pioneer Woods	Mr. Leonard Blount	HOA Chair	106 Lancaster Point	Statesboro	GA	30458
HOA - Stoneridge	Mr. Leonard Blount	HOA Chair	106 Lancaster Point	Statesboro	GA	30458
HOA - The Pointe	Mr. Robert Self	HOA Chair	6325 Oak Valley Drive	Cumming	GA	30040
HOA - Waters Edge	Mr. Lou Benjamin	HOA Chair	127 Blue Heron Drive	Eatonton	GA	31024
Harbor Club	Mr. Brandon Matney	Owner	1111 Polo Circle, Suite 101	Greensboro	GA	30642
Sen. Burt Jones (REP)	Mr. Burt Jones	State Senator	407 East Second St.	Jackson	GA	30233
Rep. Rusty Kidd	Mr. Rusty Kidd	State Representative	102 S. Wayne Street	Milledgeville	GA	31061
Lake Country Board of Realtors	Ms. Angela Ferguson	Chairman	1041 Village Park Dr, St 103	Greensboro	GA	30642
Lake Oconee Anglers	Mr. Bill Boughner					
Lake Oconee Bass Club	Mr. Wayne Barr	President	971 Madison Road	Eatonton	GA	31024
Lake Oconee Water Watch	Ms. Janet Pearson	President	117 Horseshoe Circle	Eatonton	GA	31024
The Lodge at Lake Oconee			111 Stonemark Lane, St 202	Columbia	SC	29210

TABLE 22

List of Stakeholders Consulted During Development of the Wallace Dam Project Exhibit E

Stakeholder	Contact Name	Title	Street Address	City	State	Zip Code
City of Madison	Mr. Fred Perriman	Mayor	1196 Martin Luther King Dr.	Madison	GA	30650
City of Milledgeville	Mr. Richard Bentley	Mayor	119 E. Hancock St.	Milledgeville	GA	31061
Morgan County	Mr. Michael Lamar	Manager	150 E. Washington Street	Madison	GA	30650
Morgan County	Mr. Andie Ainslie	Chairman, Morgan County Board of Commissioners	150 E. Washington Street	Madison	GA	30650
Morgan County Sheriff	Mr. Robert Markley	Sheriff	1380 Monticello Rd.	Madison	GA	30650
Morgan County Chamber	Mr. Bob Hughes	President	115 East Jefferson Street	Madison	GA	30650
Muskogee (Creek) Nation	Emman Spain	THPO	P.O. Box 580 Highway 75 and Loop 56	Okmulgee	OK	74447
Oconee Outdoors Marina	Mr. Bill Jones	Owner	P.O. Box 933	Jackson	GA	30233
U.S. Department of Agriculture - Oconee River Resource Conservation & Development Office	Mr. Tim Savelle		P.O. Box 247	Watkinsville	GA	30677
Rep. Butch Parish	Mr. Butch Parish	State Representative	132 Victory Drive	Swainsboro	GA	30401
Putnam County	Mr. Stephen J. Hersey	Chairman, Putnam County Board of Commissioners	117 Putnam Drive, Suite A	Eatonton	GA	31204
Putnam County	Mr. Paul Van Haute	Manager	117 Putnam Drive, Suite A	Eatonton	GA	31024
Putnam County Sheriff	Mr. Howard Sills	Sheriff	111 Ridley Drive	Eatonton	GA	31024
Putnam County Chamber	Mrs. Roddie Anne Blackwell	President	305 North Madison Ave. PO Box 4088	Eatonton	GA	31024
Reynolds Plantation	Mr. Rabun Neal	President	1000 Vista Drive, Suite 106	Greensboro	GA	30642

TABLE 22

List of Stakeholders Consulted During Development of the Wallace Dam Project Exhibit E

Stakeholder	Contact Name	Title	Street Address	City	State	Zip Code
Ritz Carlton	Mr. Ralph Vick	Manager	1 Lake Oconee Trail	Greensboro	GA	30642
City of Sparta	Mr. William Evans	Mayor	12630 Broad St.	Sparta	GA	31087
Sugar Creek Marina	Mr. William Clark	Owner	353 Parks Mill Drive	Eatonton	GA	31024
United Keetoowah Band of Cherokee	Chief George Wickliffe		P.O. Box 746	Tahlequah	OK	74464
U.S. Department of Agriculture Forest Service- Southern Region	Mr. Jim Twaroski	Realty Specialist	1720 Peachtree Rd. NW, Suite 7928	Atlanta	GA	30309
U.S. Department of Agriculture Forest Service, Chattahoochee-Oconee Nat. Forests	Ms. Betty Jewett	Forest Supervisor	1755 Cleveland Highway	Gainesville	GA	30501
U.S. Department of Agriculture Forest Service, Chattahoochee-Oconee Nat. Forests	Mr. Alan Polk	Staff Officer for Lands, Recreation, Engineering, Wilderness, Cultural Resources	1755 Cleveland Highway	Gainesville	GA	30501
U.S. Department of Agriculture Forest Service, Chattahoochee-Oconee Nat. Forests	Ms. Judy Lovell	Realty Supervisor	1755 Cleveland Highway	Gainesville	GA	30501
U.S. Department of Agriculture Forest Service, Chattahoochee-Oconee Nat. Forests	Mr. Thomas Dozier	Oconee District Ranger	1199 Madison Rd.	Eatonton	GA	31024
U.S. Department of Agriculture Forest Service, Chattahoochee-Oconee Nat. Forests	Mr. Jeff McDonald	Biologist	1199 Madison Rd.	Eatonton	GA	31024
U.S. Fish and Wildlife Service	Ms. Alice Lawrence	Biologist and FERC Projects	105 Westpark Dr.	Athens	GA	30606

TABLE 22

List of Stakeholders Consulted During Development of the Wallace Dam Project Exhibit E

Stakeholder	Contact Name	Title	Street Address	City	State	Zip Code
U.S. Fish and Wildlife Service	Ms. Tamara Johnson	Biologist and FERC Projects	105 Westpark Dr.	Athens	GA	30606
U.S. Fish and Wildlife Service	Dr. Don Imm	Field Supervisor	105 Westpark Dr.	Athens	GA	30606
Waterfront Marina	Ms. Jennifer Shelton	Office Manager	144 Collis Marina Road	Eatonton	GA	31024
FERC	Mr. Allan Creamer	Project Manager	888 First Street, NE	Washington	DC	20426
Lake Oconee Homeowner	Henry and JoAnn Aldridge		5042 Village Green Drive	Mason	OH	45040
Lake Oconee Homeowner	Mr. Ted Baker		1320 Plantation Drive	Greensboro	GA	30642
Lake Oconee Homeowner	James and Lisa Berardicurti		153 East River Bend Dr.	Eatonton	GA	31024
Lake Oconee Homeowner	Denise Bergeland		1100 Eagle Bluff Ct.	Greensboro	GA	30642
Lake Oconee Homeowner	Rick and Lynn Brantley		102 Waters Edge Lane	Eatonton	GA	31024
Lake Oconee Homeowner	Bryan C.W. Tate		5035 Old Branch Court	Dunwoody	GA	30338-4012
Lake Oconee Homeowner	Mr. Rick Cook		1070 Plantation Point Drive	Greensboro	GA	30642
Lake Oconee Homeowner	Mr. Harold Culp		1840 Parks Mill Drive	Greensboro	GA	30642
Lake Oconee Homeowner	Neal Kenneth Daniel		1071 Horseshoe Dr.	Greensboro	GA	
Lake Oconee Homeowner	Ms. Julia A. Davis					
Lake Oconee Homeowner	Joseph E. DeJunco					
Lake Oconee Homeowner	Mr. George Dissmeyer		145 Lake Forest Drive, NE	Eatonton	GA	31061
Lake Oconee Homeowner	Mr. Belger Dockery					
Lake Oconee Homeowner	Aggie Pat Dockery		1006 Pine Tree Circle	Douglas	GA	31533
Lake Oconee Homeowner	J.E. Dukes		258 N Rock Island Drive	Eatonton	GA	31024

TABLE 22

List of Stakeholders Consulted During Development of the Wallace Dam Project Exhibit E

Stakeholder	Contact Name	Title	Street Address	City	State	Zip Code
Lake Oconee Homeowner	Michael A. Dull		230 Cobblestone Ln.	McDonough	GA	30252
Lake Oconee Homeowner	Ms. Maria Foster					
Lake Oconee Homeowner	Mr. Chuck Foster					
Lake Oconee Homeowner	Mr. Herman Frix		3430 Highway 138 N. E.	Conyers	GA	30013
Lake Oconee Homeowner	Ellwood and Connie Hanson		1031 Holmes Drive	White Plains	GA	30678
Lake Oconee Homeowner	Kenneth Harris		125 Forest Ridge Cir	Eatonton	GA	31024
Lake Oconee Homeowner	Ms. Ruth Hendrix					
Lake Oconee Homeowner	Mr. Bob Hess		104 Water's Edge Lane	Eatonton	GA	31061
Lake Oconee Homeowner	Mr. Mac Hess					
Lake Oconee Homeowner	Mike and Jane Hillier		101 N. Sugar Creek Road	Buckhead	GA	30625
Lake Oconee Homeowner	Cliff and Carol Holbert		2573 Swords Road	Greensboro	GA	30642
Lake Oconee Homeowner	Bryant Isaacs					
Lake Oconee Homeowner	Fran and Wayne Jones		805 Scenic Rt.	Cordele	GA	
Lake Oconee Homeowner	Mike and Caroline King		138 Forest Ridge Dr.	Eatonton	GA	31024
Lake Oconee Homeowner	Ms. Robin Larson		4730 Bryson Cove	Lilburn	GA	30047
Lake Oconee Homeowner	Ms. Susan Larson		4731 Bryson Cove	Lilburn	GA	30047
Lake Oconee Homeowner	William Ledford					
Lake Oconee Homeowner	Mr. Arthur Lightsey					
Lake Oconee Homeowner	Mr. Steve Mallinson		109 East River Bend Drive NE	Eatonton	GA	31024
Lake Oconee Homeowner	Larry and Diane McElroy		107 Lakeside Dr.	Buckhead	GA	30625

TABLE 22

List of Stakeholders Consulted During Development of the Wallace Dam Project Exhibit E

Stakeholder	Contact Name	Title	Street Address	City	State	Zip Code
Lake Oconee Homeowner	Ms. Diane McElroy		107 Lakeside Drive	Buckhead	GA	30624
Lake Oconee Homeowner	Mr. Fred Mohr		1102 Elk River Court	Greensboro	GA	30642
Lake Oconee Homeowner	Ms. Lori Morgan					
Lake Oconee Homeowner	Terry Mullery					
Lake Oconee Homeowner	Kevin Mullins		1450 Choo Choo Dr.	Greensboro	GA	30642
Lake Oconee Homeowner	Mr. Rabun Ned					
Lake Oconee Homeowner	Mr. Bruce A. Paige		105 Pine Circle	Eatonton	GA	31024
Lake Oconee Homeowner	Ms. Donna H. Paige		105 Pine Circle	Eatonton	GA	31024
Lake Oconee Homeowner	Mr. Walt Parrish					
Lake Oconee Homeowner	Lisa Petersen					
Lake Oconee Homeowner	Harvey A. Phlegar		1490 Plantation Dr.	Greensboro	GA	
Lake Oconee Homeowner	Thomas and Diane Pierce		151 Lakemore Dr	Eatonton	GA	31024
Lake Oconee Homeowner	Gregory Pitts					
Lake Oconee Homeowner	Milburn Poston		3533 Roxboro Rd. #8	Atlanta	GA	30326
Lake Oconee Homeowner	Merrill and Wayne Rosen		1290 Bennett Springs Drive	Greensboro	GA	30642
Lake Oconee Homeowner	Mr. Fred Ruohr					
Lake Oconee Homeowner	Ms. Geraldine Sable		1371 Grayson Point Drive	Buckhead	GA	30625
Lake Oconee Homeowner	Mr. Leo Sauer		1090 Eagle Bluff Court	Greensboro	GA	30642
Lake Oconee Homeowner	Mr. Arthur Schafer		150 Riverside Drive, N. E.	Eatonton	GA	31024
Lake Oconee Homeowner	Mr. Joe Schneider		2270 Brookmont Trace	Marietta	GA	30064

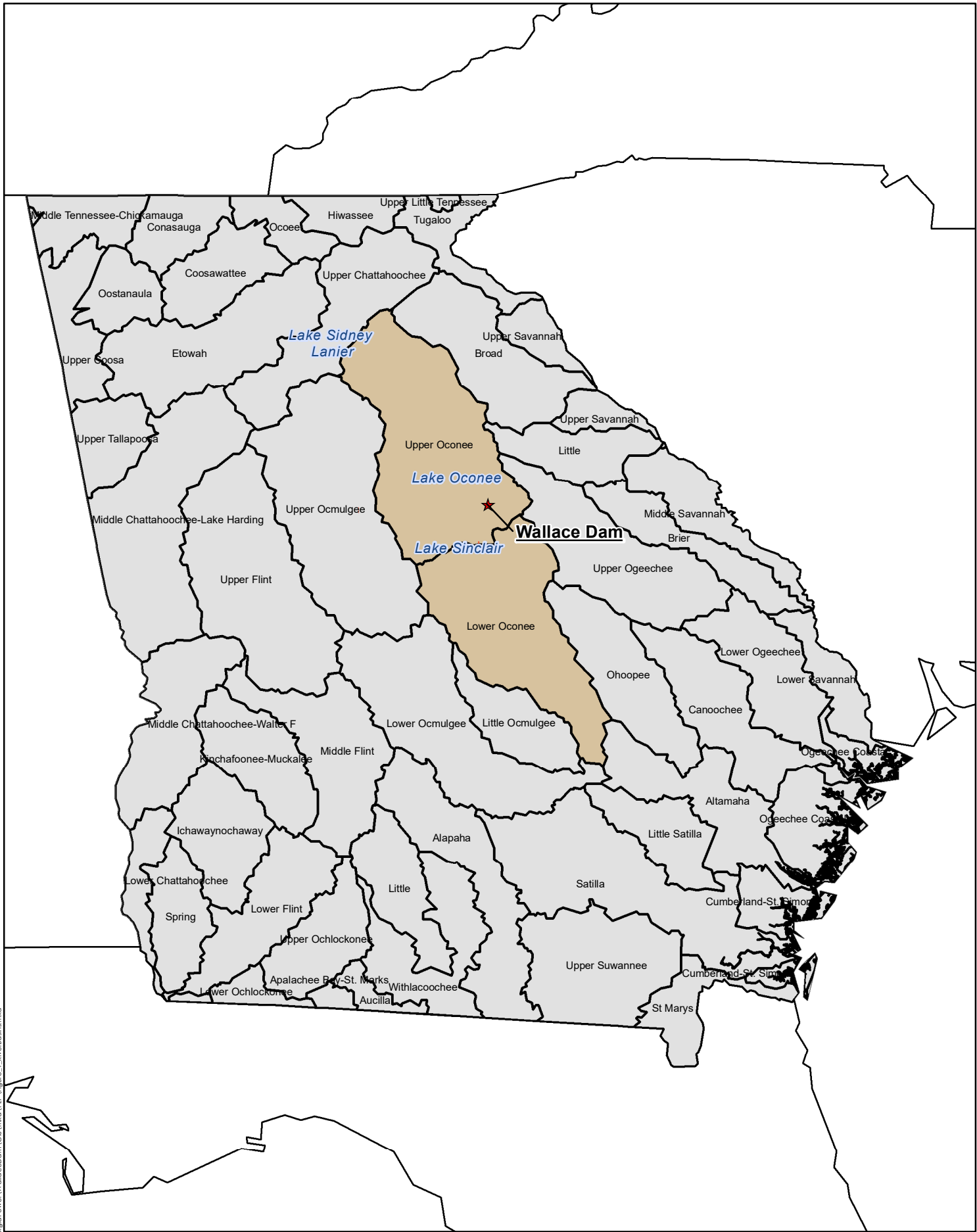
TABLE 22

List of Stakeholders Consulted During Development of the Wallace Dam Project Exhibit E

Stakeholder	Contact Name	Title	Street Address	City	State	Zip Code
Lake Oconee Homeowner	Bill Schwanebeck		117 Chantilly Dr.	Warner Robins	GA	31088
Lake Oconee Homeowner	Tom and Sheila Shalin		1021 Augusta National Court	Greensboro	GA	30642
Lake Oconee Homeowner	Lester and Gloria Sheppard		1081 Flemings Knoll	Greensboro	GA	30642
Lake Oconee Homeowner	Ann M. Smith		127 Carolyn Dr.	Eatonton	GA	31024
Lake Oconee Homeowner	Geraldine Carolan and Barry Tolbert		1000 Cottonwood Lane	White Plains	GA	
Lake Oconee Homeowner	Mr. William Tietjen					
Lake Oconee Homeowner	Ms. Barbara Tyson					
Lake Oconee Homeowner	Tom O. Wagoner		515 Mulberry Street, Suite 300	Macon	GA	31201
Lake Oconee Homeowner	Mr. Henry Walker					
Lake Oconee Homeowner	Mr. Pete Wardlaw		2319 Arabian Drive, NE	Marietta	GA	30062
Lake Oconee Homeowner	Mr. Ron Williams		1091 Whatleys Mill Lane	Greensboro	GA	30642
Lake Oconee Homeowner	Keith Woodall					
Lake Oconee Homeowner	Phyllis and Chip					

Note: If street address is blank, only an email address was provided, and Georgia Power communicated with these stakeholders via email

FIGURES



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Figure 1
Project Location in the Oconee River Basin

Wallace Dam Project
(FERC No. 2413)

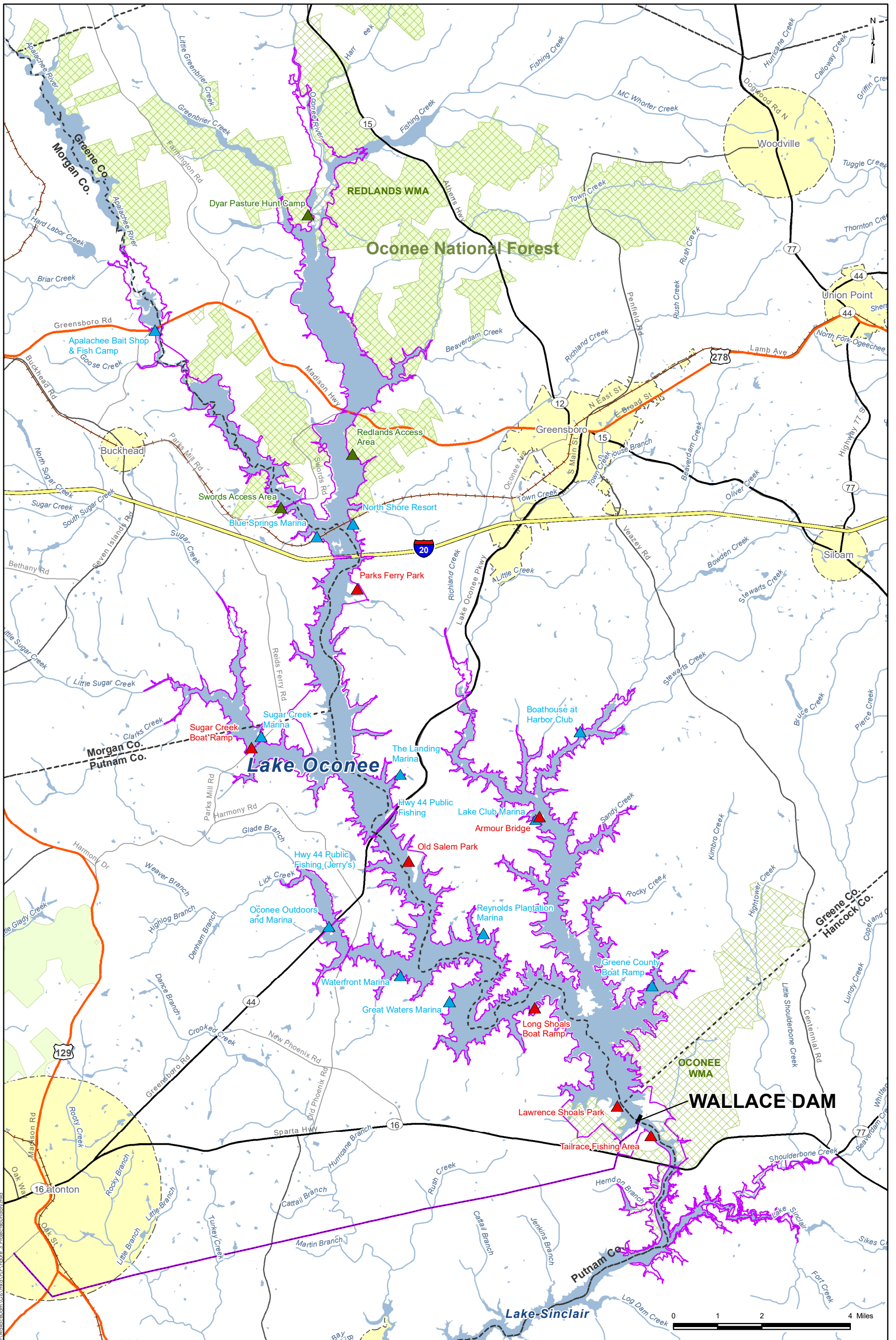
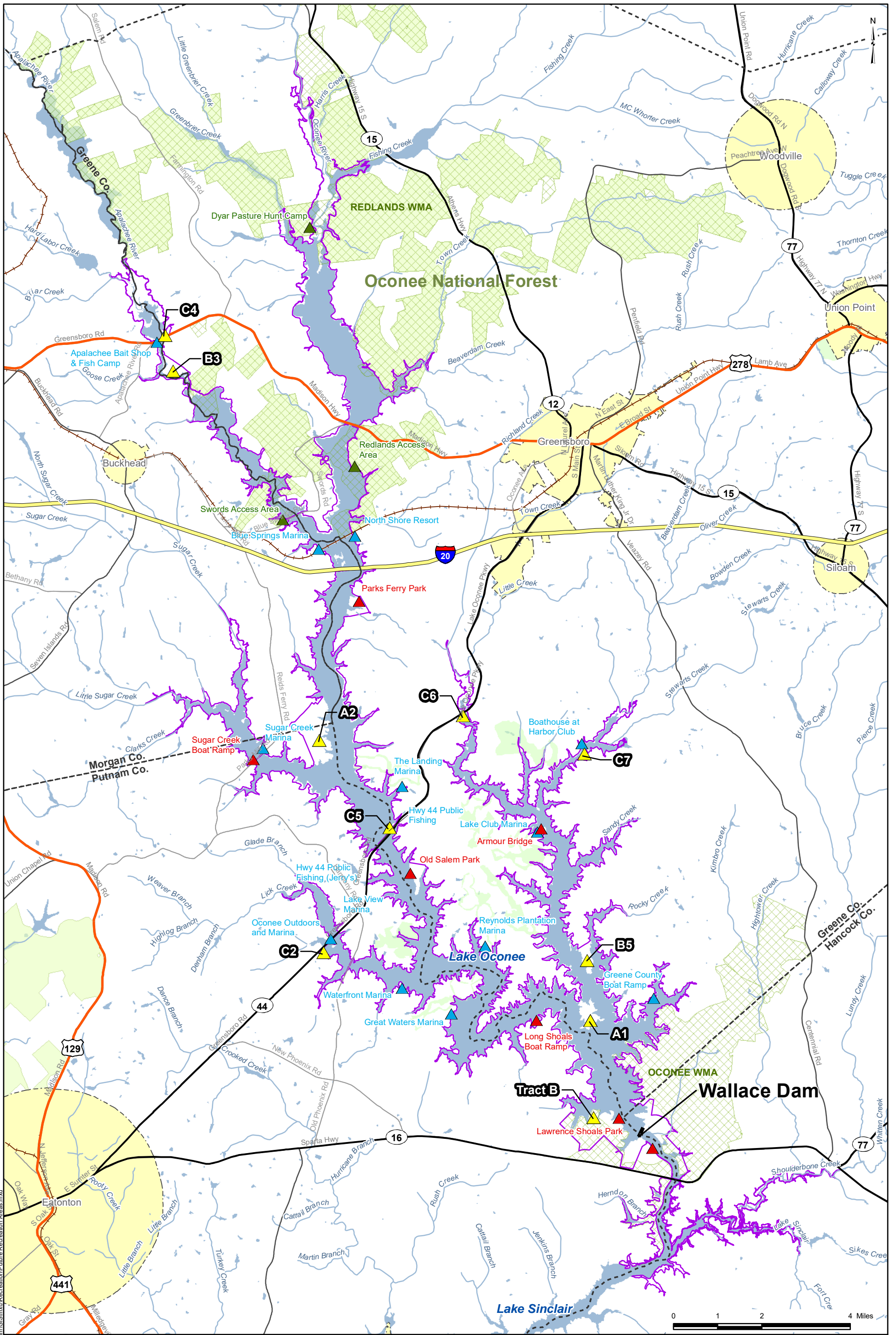


Figure 3
Project Boundary and Surrounding Area
 Wallace Dam Project
 (FERC No. 2413)

- | | | | |
|--------------------|-------------------|-------------------------|-------------------------|
| Interstate Highway | Railroads (Local) | Towns/Cities | Recreation Access Point |
| U.S. Highway | Dam | County Boundary | Forest Service |
| State Highway | Rivers/Creeks | State Managed Lands | Public/Private |
| Major Roads | Lake | National Park or Forest | Georgia Power |
| Local Streets | Project Boundary | Transmission Line | |





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- | | | | |
|--|--|--|--|
| <ul style="list-style-type: none"> Interstate Highway U.S. Highway State Highway Major Roads Local Streets | <ul style="list-style-type: none"> Railroads (Local) Dam Rivers/Creeks Project Boundary Towns/Cities | <ul style="list-style-type: none"> State Managed Lands National Park or Forest County Boundary | <p>Recreation Access Point</p> <ul style="list-style-type: none"> Forest Service Georgia Power Public/Private Future Recreation Areas |
|--|--|--|--|



Figure 4
Project Lands Reserved for Future
Recreational Use
 Wallace Dam Project
 (FERC No. 2413)



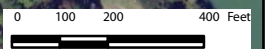
Lake Oconee

Power House

Spillway

Lake Sinclair

Tailrace Fishing Platform




 Project Boundary



Figure 5
Project Facilities
Wallace Dam Project
(FERC No. 2413)

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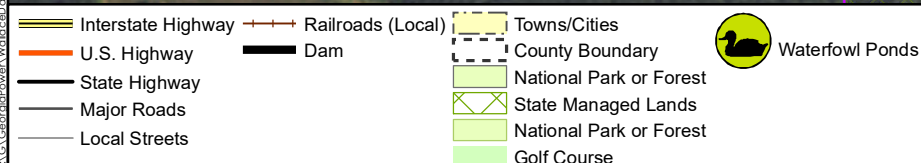
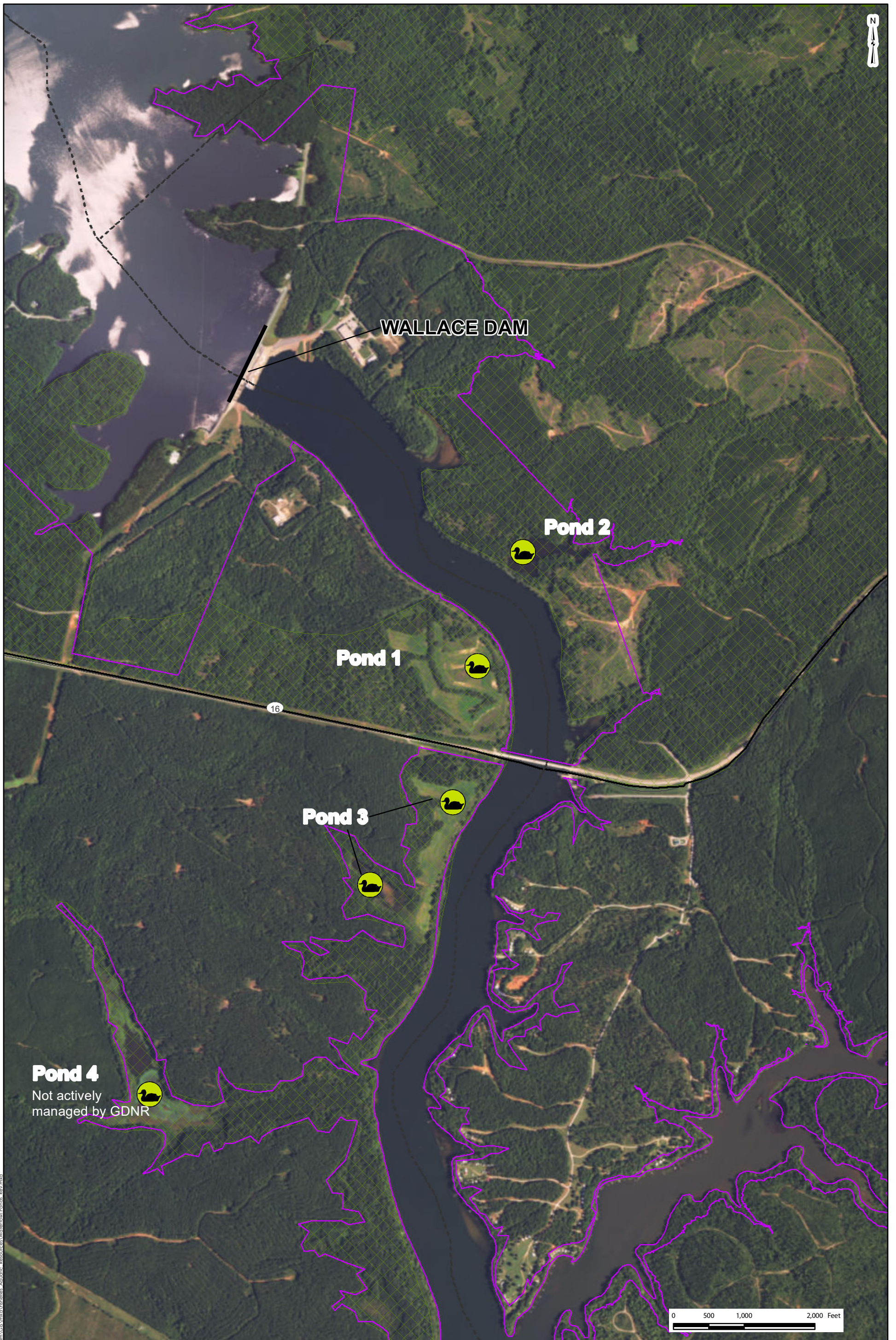
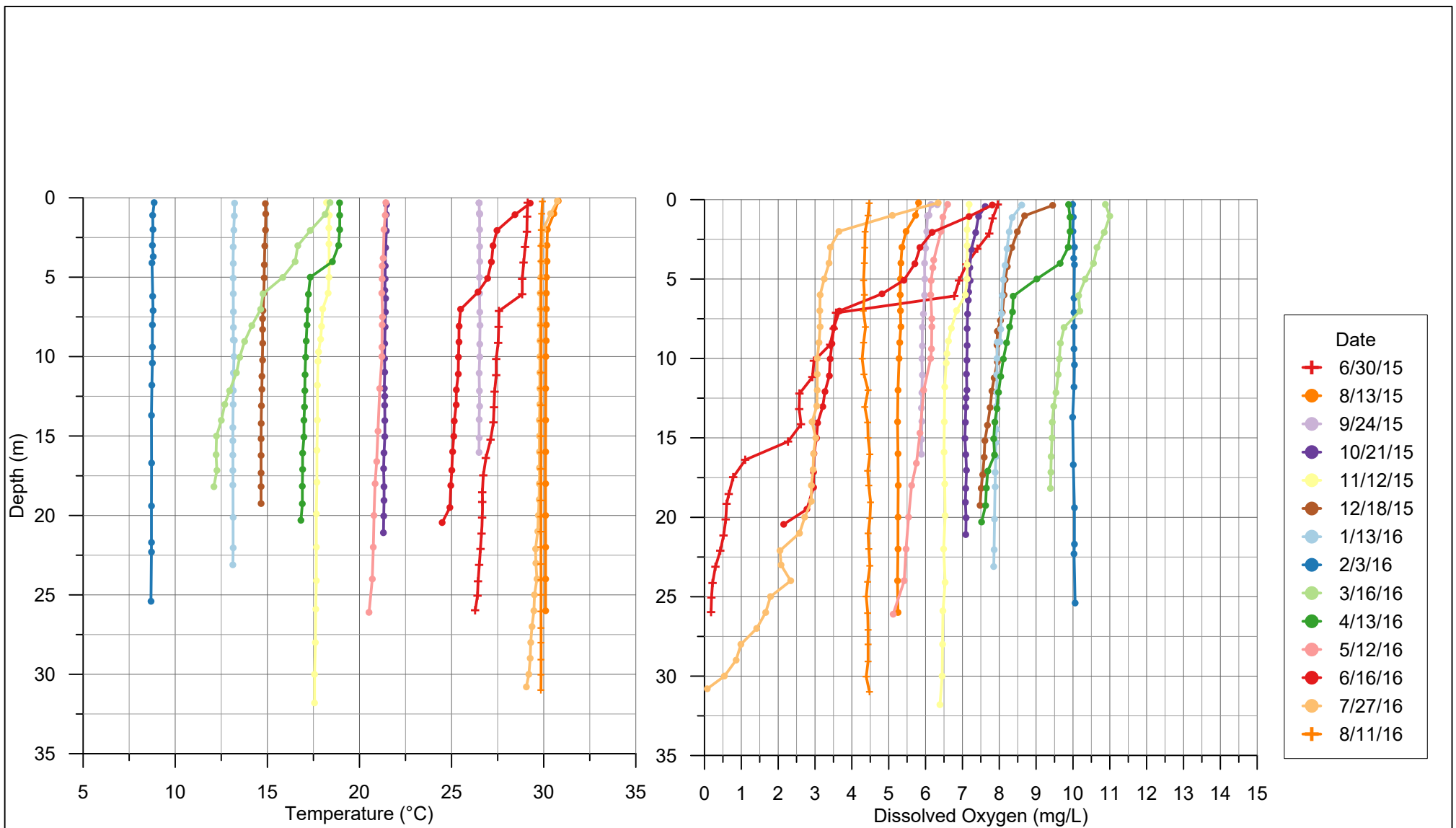
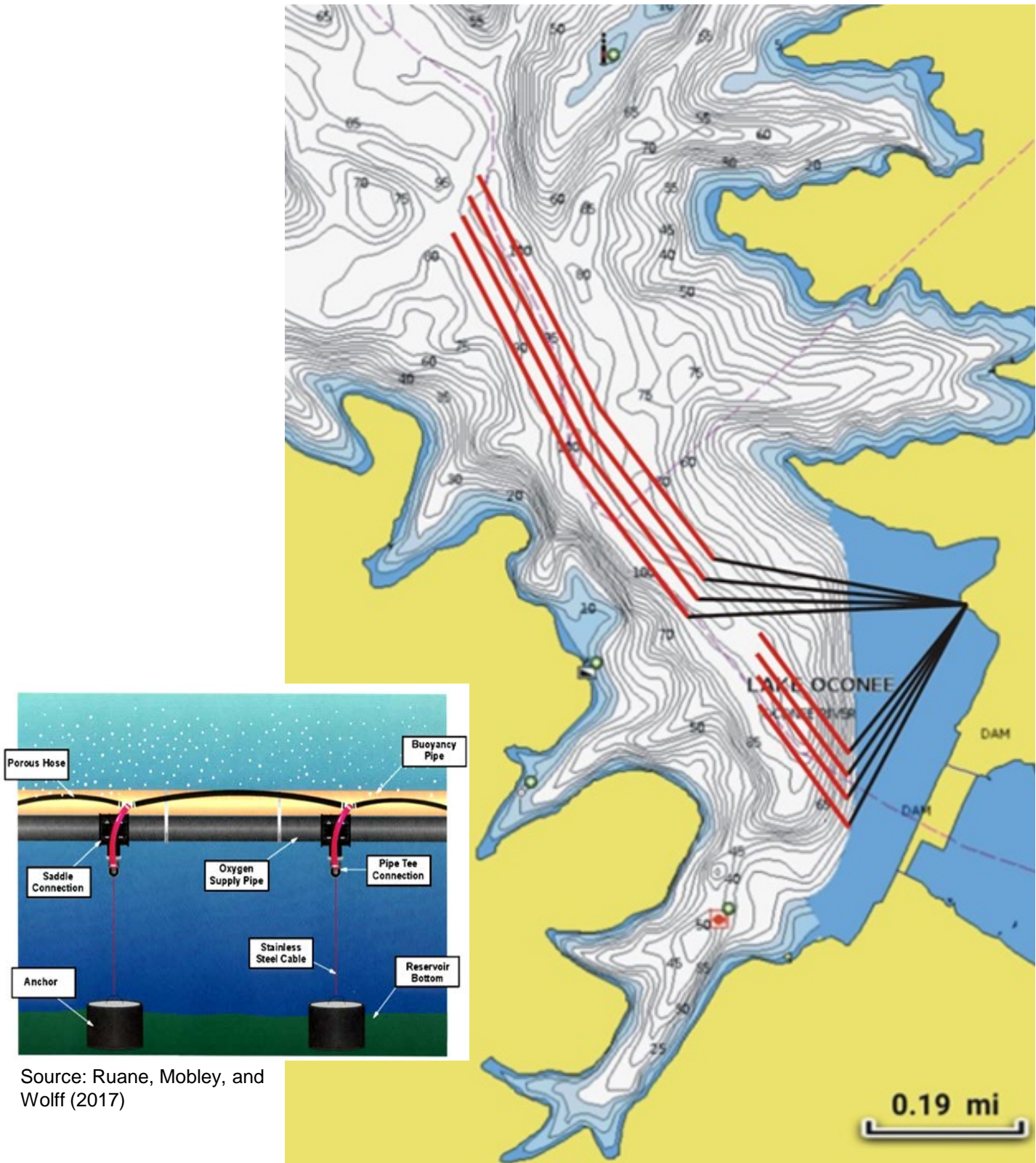


Figure 6
Waterfowl Impoundments in Oconee WMA
 Wallace Dam Project
 (FERC No. 2413)

A:\CS\GeorgiaPower\Wallace\GIS\mxd\Fisheries_Aquatics_Resources\Waterfowl_Ponds_Rev.mxd





Source: Ruane, Mobley, and Wolff (2017)

Figure 8
Conceptual Design of Forebay Oxygen Line Diffuser System
 Wallace Dam Project
 (FERC No. 2413)

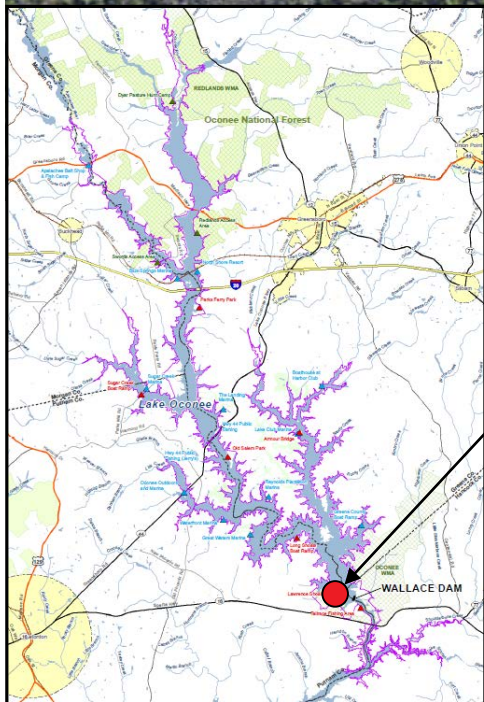


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- Liquid Oxygen Facility
- Project Boundary

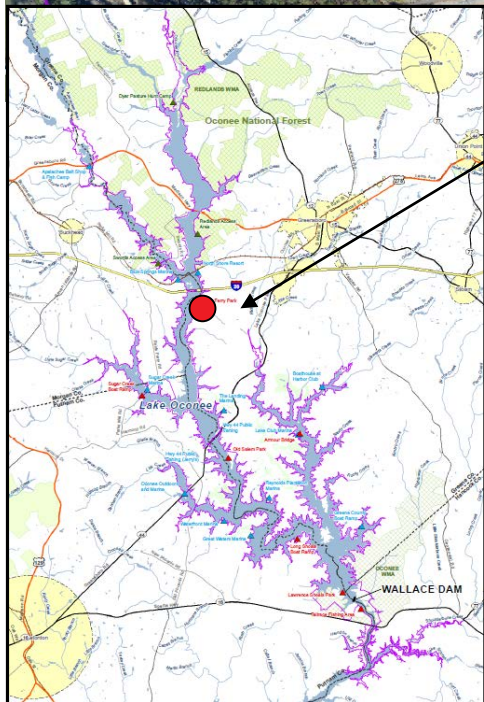


Figure 9
Liquid Oxygen Facility
 Wallace Dam Project
 (FERC No. 2413)



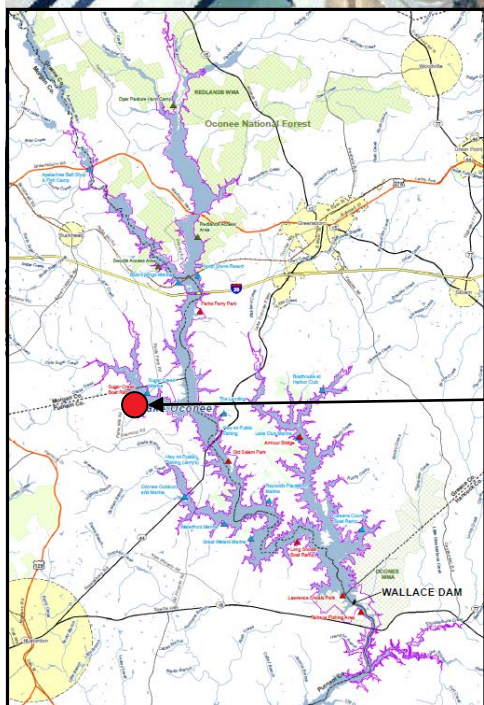
Location of project facility

Figure 10
Conceptual Layout of Recreational Improvements
Lawrence Shoals Park
 Wallace Dam Project
 (FERC No. 2413)



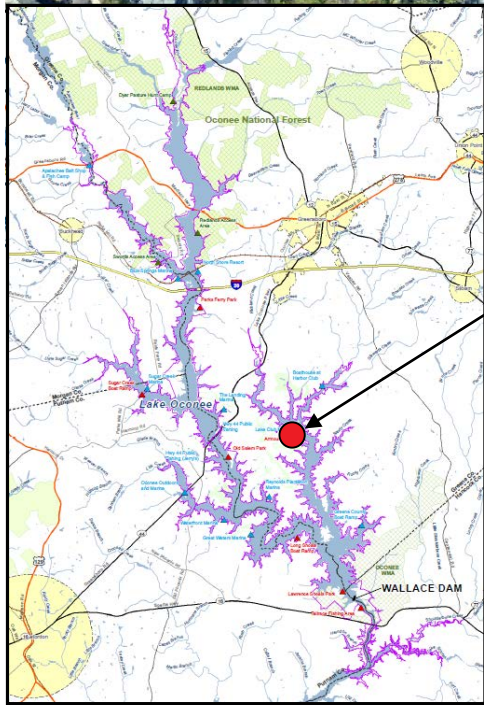
Location of project facility

Figure 12
Conceptual Layout of Recreational Improvements
Parks Ferry Park
 Wallace Dam Project
 (FERC No. 2413)



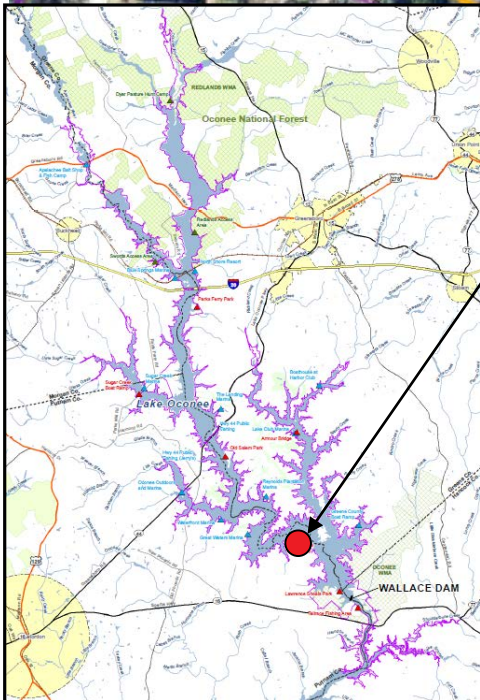
Location of project facility

Figure 13
Conceptual Layout of Recreational Improvements
Sugar Creek Boat Ramp
Wallace Dam Project
(FERC No. 2413)



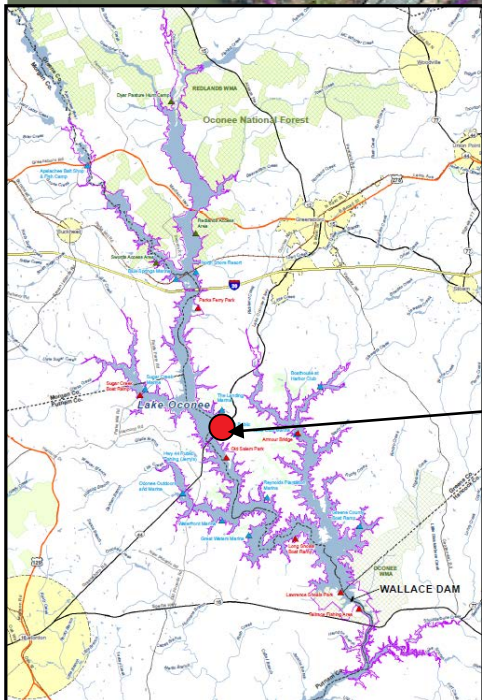
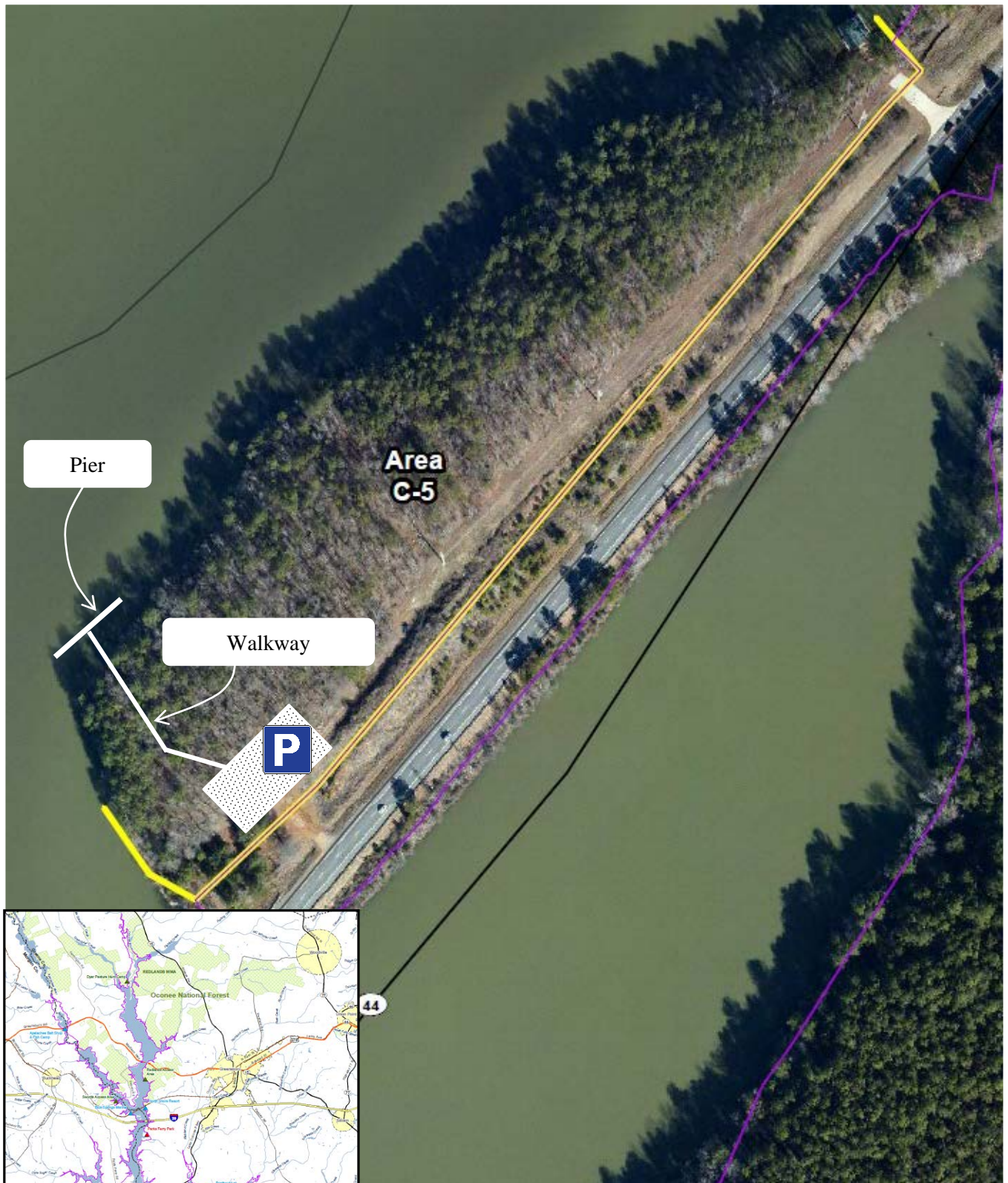
Location of project facility

Figure 14
Conceptual Layout of Recreational Improvements
Armour Bridge Boat Ramp
Wallace Dam Project
(FERC No. 2413)



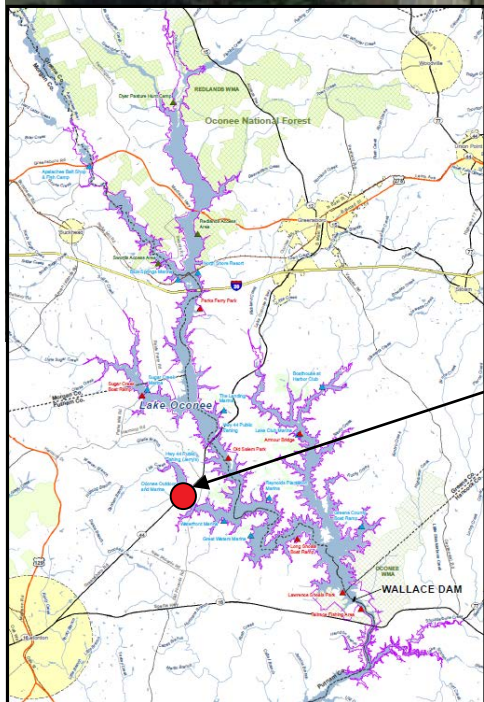
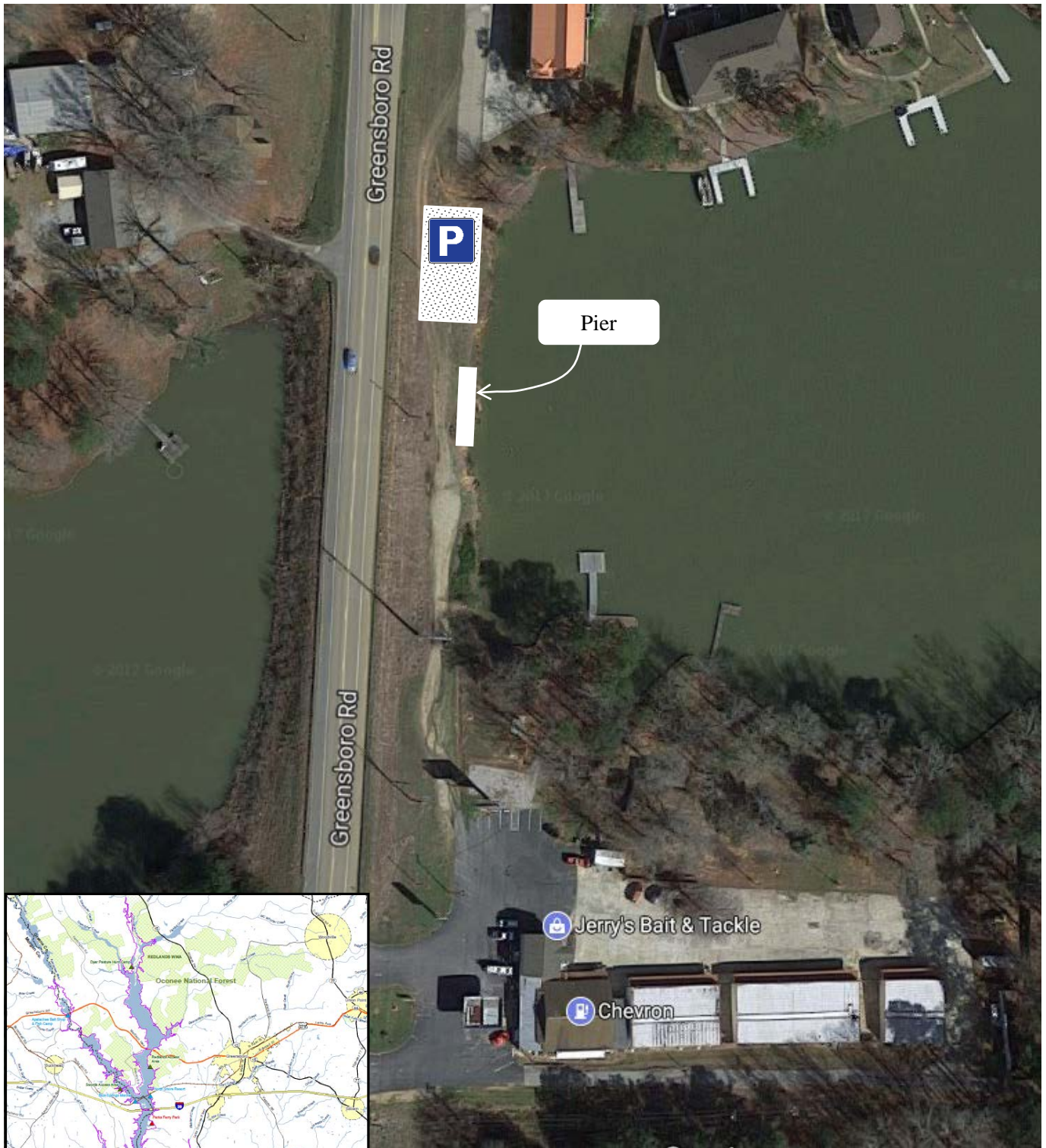
Location of project facility

Figure 15
Conceptual Layout of Recreational Improvements
Long Shoals Boat Ramp
Wallace Dam Project
(FERC No. 2413)



Location of project facility

Figure 16
Conceptual Layout of Recreational Improvements
Area C-5
Wallace Dam Project
(FERC No. 2413)



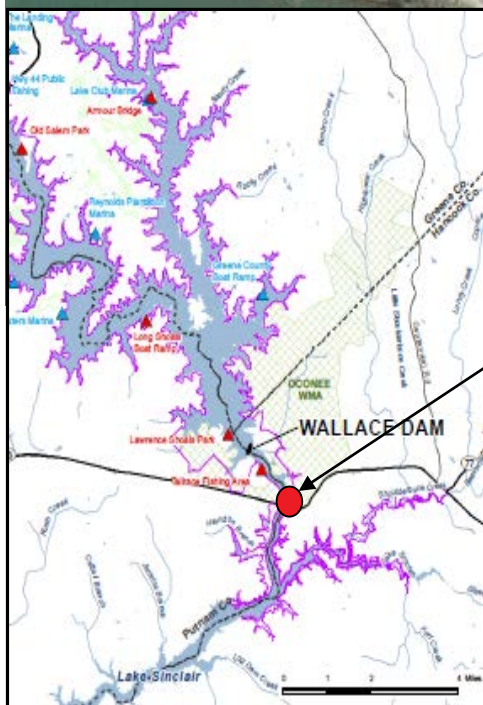
Location of project facility

Figure 17
Conceptual Layout of Recreational Improvements
Jerry's Hwy 44
Wallace Dam Project
(FERC No. 2413)



Pier

P

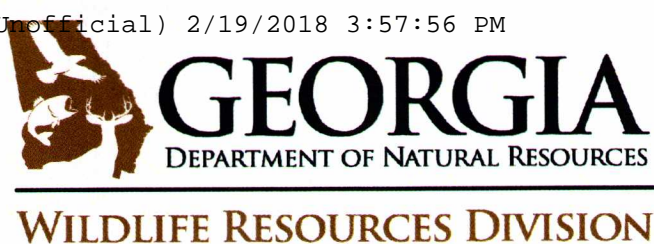


Location of project facility

Figure 18
Conceptual Layout of Recreational Improvements
Hwy 16 Bridge Boat Ramp
Wallace Dam Project
(FERC No. 2413)

APPENDIX A

Georgia Power Responses to Comments on the Preliminary Licensing Proposal



MARK WILLIAMS
COMMISSIONER

RUSTY GARRISON
DIRECTOR

February 19, 2018

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E., Room 1A
Washington, DC 20426

RE: Comments on Preliminary Licensing Proposal
Wallace Dam Pumped Storage Project (2413-117)

Dear Secretary Bose:

We appreciate the opportunity to review the Preliminary Licensing Proposal for the Wallace Dam Pumped Storage Project (2413-117). We recognize that this project has impacts to the water quality, aquatic habitat, fisheries resources, and recreational opportunities within, upstream and downstream of the project area. We would like to acknowledge and thank Georgia Power Company for their efforts regarding the Preliminary Licensing Proposal. We anticipate that, when fully implemented, this proposal will substantively enhance fishing and boating access opportunities at Lake Oconee and address the project's water quality issues. Attached are our comments on the Preliminary Licensing Proposal.

Sincerely,

A handwritten signature in blue ink that reads "Matt Thomas".

Matt Thomas

cc. Steve Schleiger
Chris Nelson

Preliminary Licensing Proposal Comments

Fish & Aquatic Resources

Environmental Impacts & Recommendations (4.3.3.2) - Fish Entrainment & Turbine-Induced Mortality

Georgia Department of Natural Resources – Wildlife Resources Division (WRD) considers entrainment at Wallace Dam to potentially be significant based upon several factors: visual observations of turbine passage mortality, evidence and experience with the movement of *Morone* species between reservoirs, frequency and duration of generation and pumpback cycles, estimated biomass of fish (kg fish/acre) residing in the reservoirs and the trash rack bar sizes of the upstream intakes and downstream draft tubes. WRD expends numerous resources at both reservoirs on an annual basis regarding the management, propagation and stocking of fish. In its letter (J. Biagi, GA DNR, January 20, 2017 letter to K.D. Bose, Federal Energy Regulatory Commission), WRD requested that additional evaluation was needed to accurately define the impacts that entrainment has on the resources in the project area.

To estimate the magnitude of annual and seasonal entrainment occurring at Wallace Dam, Georgia Power Company (GPC) used the Jocassee Project site in South Carolina as a model for entrainment extrapolation. The entrainment extrapolation assumed that the pelagic fish community at Wallace Dam was dominated by shad and was similar in density and susceptibility to entrainment as the pelagic fish community at the Jocassee site. Based on the current extrapolation and its assumptions, GPC's estimate for total entrainment at the Wallace Dam Project during 2016-2017 was on the order of 2.4 million fish (787K fish during generation and 1.6 million fish during pumpback). Although similar operational characteristics exist (number of pumpback units and generation and pumpback hydraulic capacities) between the Jocassee and Wallace Dam sites, the morphology of the two waterbodies themselves are much different. For example, Lake Jocassee is a relatively small (7,500 acres) oligotrophic mountain reservoir consisting of deep-cool water, whereas Lake Oconee is a larger (19,000 acres) more productive eutrophic reservoir containing shallower-warmer water and an overall higher biomass of fish (Duke Energy 2013 & WRD Standardized Fish Sampling Data).

The Richard B. Russell site on the Savannah River also has very similar operational characteristics as Wallace Dam (number of pumpback units, generation and pumpback hydraulic capacities and generation and pumping hours per year), these waterbodies are both piedmont-river impoundments that are very similar in size and they contain similar fish assemblages. For instance, Lake Russell is a 26,000-acre pump storage impoundment that contains similar fish species (largemouth bass, striped bass, hybrid-striped bass and black crappie) to Lake Oconee. In 2017, the Richard B. Russell site entrained approximately 14.2 million fish during 5,908 hours of pumpback operation and entrained an estimate of 8.3 million fish through 9,480 hours of conventional generation (USACE 2017). These entrainment estimates are substantially higher

Comments on Preliminary Licensing Proposal – Wallace Dam Pumped Storage Project (2413-117)

than GPC’s extrapolated estimates of 1.6 million fish during 6,031 hours of pumpback operation and 787,057 fish through 6,487 hours of conventional generation in 2016-2017. Given the very similar operational and morphological characteristics of both sites, the estimates of total entrainment from the Richard B. Russell site and the fact that Lake Oconee contains an overall higher density of fish than Lake Richard B. Russell (WRD Standardized Fish Sampling Data), WRD contends that the total estimated number of 2.4 million fish being entrained during 2016-2017 at the Wallace Dam site is significantly underestimated. Extrapolating entrainment using model inputs from the Richard B. Russell site, rather than Jocassee, would result in a more accurate depiction of entrainment at Wallace.

...1

Entrainment impacts on larger game fish species are highly important to fisheries managers and anglers. As such, WRD requested GPC provide information (existence and size) of the trash bar racks installed on the downstream draft tubes at the Wallace site and how structures compare (size and numbers of fish entrained) to the two pump-back facilities mentioned during the current evaluation. Currently, the Wallace Dam site contains steel trash racks in front of the downstream draft tubes consisting of vertical bars with clear spacing between bars of 10.5 inches, with openings at each end being 16.5 inches. GPC states that reducing the trash rack bar size spacing at the Wallace Dam Project would not substantially affect the size distribution of entrained fish, as smaller fish would continue to be the most susceptible. However, in 1993, veneer with 2-inch spacing was installed on the downstream draft tubes at the Richard B. Russell site resulting in significantly lower entrainment rates of larger fishes. Post veneer installation, entrainment rates for fish >14.5 inches dropped from highs near 200 fish, to highs of approximately 10 fish, per 6-hour pump. Similarly, entrainment rates for fishes greater than 8.5-inches decreased significantly from highs near 1,600 fish, to highs near 50 fish, per 6-hour pump (USACE 1995).

2

Finally, WRD request that additional entrainment consideration and monitoring may be needed following the installation of the proposed forebay oxygen line diffuser system. The potential exists for this area to attract additional fish species given the proposed water quality improvements the system will provide.

3

Recreation and Land Use

Environmental Impacts and Recommendations (4.3.6.2) – Recreational Improvements

Boating Access – WRD greatly appreciates GPC’s proposed recreational improvements to the project area and anticipates that once fully implemented, the proposal will enhance boating access opportunities. However, WRD continues to recommend that a public boating access facility to support fishing events with >75 boats is needed during the proposed licensed term. Numerous fishing events, often large in size (>75 boats), take place at the reservoir year-round and adequate accommodations these larger events are limited to one private boating access site. There is no assurance that this private boating access facility will remain open to the public year-round or throughout the license period. Therefore, a larger, public boating access facility needs to be developed to ensure that appropriate accommodations are available year-round. WRD suggests that a larger public boating access facility include at least three boat ramps, a courtesy dock and parking for at least 100 vehicles/boat trailers.

4

Comments on Preliminary Licensing Proposal – Wallace Dam Pumped Storage Project (2413-117)

WRD and GPC have discussed several potential options to enhance boating access for larger fishing events. These options range from developing a new facility to adding a ramp lane and additional parking at the Sugar Creek Boating Access Facility and/or similar enhancements at Parks Ferry Boating Access Facility (T. Litts, GA DNR, November 7, 2017 email to C.R. O’Mara, Southern Company Generation). We continue to recommend that a boating access facility with capacity to support larger fishing events is needed and are willing to partner with GPC to develop a solution that supports these events during the upcoming license term.

...4

Bank Fishing Access – WRD greatly appreciates GPC’s proposed recreational improvements to the project area and anticipates that once fully implemented, the proposal will enhance bank fishing opportunities. To further enhance these opportunities, WRD requests that proposed fishing piers are fabricated to house fish attractor lighting. Lastly, WRD recognizes value in enhancing bank fishing opportunities at areas such as Armour Bridge, Parks Ferry, Long Shoals and Lawrence Shoals. Should the opportunity arise in license contingency planning, implementation or otherwise, WRD recommends installation of fishing piers at these facilities, as well as those proposed.

5

Literature Cited

Duke Energy. 2013. Keowee-Toxaway Relicensing. FERC Project No. 2503. Fish Community Assessment Study FERC Required Fish Entrainment Modification.

U.S. Army Corps of Engineers (USACE). 1995. Richard B. Russell Phase II Competition Report: Impacts of Two-unit Pumpback Operation. February 1995.

U.S. Army Corps of Engineers (USACE). 2017. Richard B. Russell Hydroacoustic Sampling. 2017 Annual Report. Prepared by Aquacoustics. January 2018.

Response to Letter from Georgia Department of Natural Resources Dated February 19, 2018

Response 1

Georgia Power acknowledges Georgia Department of Natural Resources' (GDNR's) concern regarding fish entrainment and turbine-induced mortality at the Wallace Dam Project and its potential effects on sport fishes managed by the agency in the project waters. Regarding visual observations of turbine passage mortality, Georgia Power is unaware of documented evidence of fish kills at Wallace Dam attributed specifically to turbine mortality. We understand that GDNR has observed localized fish-kill events in Lake Oconee during hot summer months over a number of years (Booth and Adams, 2018, Lakes Oconee and Sinclair, Proposed Criteria Technical Support Document), but these events could have been related to warm water temperatures and lack of thermal refuge for striped bass, and/or dissolved oxygen (DO) depressions in the forebay of Wallace Dam occurring as a result of pumpback operations. Pumpback can cause complete mixing of the forebay water column during the summer.

Regarding the entrainment analysis in the Preliminary Licensing Proposal (PLP), we used the Jocassee site for the entrainment extrapolation because it shares operational and fisheries characteristics with Wallace Dam and had a robust entrainment dataset available that included monthly generation and pumping data and associated monthly entrainment rates derived from hydroacoustic sampling (Degan and Mueller, 2013). Georgia Power agrees with GDNR that the Wallace Dam and Richard B. Russell sites are also similar in their operational and fisheries characteristics and physiographic setting, but monthly data of comparable quality for extrapolation could not be readily extracted from the Phase III monitoring report of pumpback entrainment at Richard B. Russell using recovery netting (Nestler et al., 1999). However, since Georgia Power filed the PLP in November 2017, GDNR has provided a newly available entrainment dataset for the Richard B. Russell site using hydroacoustic sampling from 2015-2017 that was prepared in January 2018 (Aquacoustics, 2018).

To address GDNR's request for use of the newly available Richard B. Russell entrainment sampling data, the Wallace Dam entrainment extrapolation in Section 3.3.3.2 of Exhibit E applies monthly operational and entrainment data from the Richard B. Russell site for 2015-2017. Although the sites are similar, they differ in important respects. Wallace Dam has a much smaller total reservoir area; the downstream reservoir at Richard B. Russell supports large threadfin shad and blueback herring populations, while Wallace Dam lacks a blueback herring population; and the Richard B. Russell tailrace provides a summer thermal refuge that attracts large numbers of fish and increases their susceptibility to entrainment, while the Wallace Dam tailrace does not provide thermal refuge. These factors are considered in presenting the range of potential entrainment predicted by data extrapolation from both the Richard B. Russell and Jocassee sites.

Response 2

Regarding GDNR's concern for entrainment impacts on larger game-fish species, the analysis of turbine passage mortality in Section 3.3.3.2 of Exhibit E considers the 2-inch veneer installed on the downstream draft tubes at Richard B. Russell and the important difference in tailrace summer water temperature between Richard B. Russell and Wallace Dam. The cooler releases in the Richard B. Russell tailrace attract fish toward the draft tubes, whereas the warm-water releases at Wallace Dam do not provide a similar refuge. In addition, existing studies reviewed in the fish entrainment evaluation found no clear associations between trash rack spacing and the size of entrained fish. Field studies across a wide range of trash rack spacing indicate the majority of entrained fish to be much smaller than the length of fish that would be physically excluded from passing through the trash racks, indicating the greater abundance and higher susceptibility of small fish to entrainment. Thus, our analysis concludes that reducing bar spacing in front of the downstream draft tubes at Wallace Dam would be expected to provide only small, incremental reductions in the entrainment of larger game fish, while introducing a risk of impingement.

Response 3

The analysis of the forebay oxygen line diffuser system in Section 3.3.3.2 of Exhibit E evaluates the potential for the proposed DO improvements to attract additional fish to the forebay and tailrace area during summer, potentially increasing the magnitude of fish entrainment. Although DO concentrations would increase in habitats upstream and downstream of the dam, summer water temperatures would remain warm throughout the water column, and therefore, the DO improvements would not be expected to concentrate fish near the intake in the reservoir or the draft tubes in the tailrace. In addition, evidence is lacking to suggest that existing levels of fish entrainment result in significant adverse effects to the fish community. Therefore, Georgia Power does not propose entrainment monitoring following deployment of the aeration system.

Response 4

Georgia Power recognizes GDNR's interests in ensuring public boating access opportunities to accommodate tournament fishing events during the new license term. As described in Section 3.3.6.2 of Exhibit E, Georgia Power proposes a variety of measures at three of its existing boat ramps centrally located within Lake Oconee that will enhance tournament-fishing access. At Sugar Creek Boat Ramp, which tournament anglers use regularly in conjunction with the private marina across the Sugar Creek embayment, public access will be enhanced by upgrading the courtesy boat dock; adding a fishing pier, which will provide separation and reduce use conflicts between boaters and bank fishers; upgrading the restroom; and installing improved lighting. Boat-fishing and tournament-fishing access will also be enhanced by reconfiguring the entrance gates at Old Salem Park and Parks Ferry Park to provide for year-round operation of the boat ramps, replacing the courtesy boat docks and installing improved lighting at both parks, and replacing the boat dock restroom at Old Salem Park.

Should the private marina on the Sugar Creek embayment close to the public in the future and/or demand for public boating access begin to regularly exceed the capacity of existing facilities, Georgia Power will consult with GDNR to develop a plan to ensure that appropriate public boating access for fishing tournaments remains available year-round. Georgia Power has consulted with GDNR on a range of future options, including adding ramp lanes and parking at Sugar Creek Boat Ramp and/or Parks Ferry Park.

Response 5

Regarding bank fishing access and GDNR's request for fish attractor lighting, Georgia Power proposes in Section 3.3.6.2 of Exhibit E to install new fishing piers at four existing and proposed project recreation facilities (Area C-5, Jerry's Hwy 44, Sugar Creek Boat Ramp, and Georgia Hwy 16 Boat Ramp). Georgia Power's proposal does not include installing fish attractor lighting on the new piers; however, Georgia Power will consult with GDNR prior to fabricating the piers so they can be designed to accommodate fish attractor lighting in the future, as appropriate, after balancing stakeholder interests, aquatic habitat features, target area of illumination, boat traffic, safety, and law enforcement considerations.

P. 2413

JODY B. HICE
10TH DISTRICT, GEORGIA
HICE.HOUSE.GOV

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WASHINGTON, DC 20515
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THOMSON, GA 30624
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Congress of the United States
House of Representatives
Washington, DC 20515-1010

COMMITTEE ON OVERSIGHT
AND GOVERNMENT REFORM
SUBCOMMITTEES:
HEALTH CARE, BENEFITS, AND
ADMINISTRATIVE RULES
NATIONAL SECURITY
COMMITTEE ON NATURAL RESOURCES
SUBCOMMITTEES:
ENERGY AND MINERAL RESOURCES
FEDERAL LANDS
OVERSIGHT AND INVESTIGATIONS
POLICY COMMITTEE

December 12, 2017

Mr. Jehmal Hudson
Congressional Liaison
Federal Energy Regulatory Commission
888 1st St NE Rm 11H
Washington, DC 20426-0001

Dear Mr. Hudson:

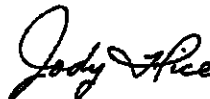
I am writing on behalf of Ms. Barbara B. Tyson of Buckhead, Georgia. Ms. Tyson has contacted me for assistance in a matter concerning the Federal Energy Regulatory Commission.

Enclosed are the Privacy Act Release Form and any additional correspondence that I have received from Ms. Tyson. I would greatly appreciate your assistance in reviewing this matter and providing any assistance possible.

Thank you in advance for your assistance with this matter. If you or your staff is in need of any additional information, please contact Spencer Hogg in my Monroe District Office via mail at Post Office Box 728, Monroe, Georgia 30655 or by phone at 770-207-1776 or email at spencer.hogg@mail.house.gov. Also, please be so kind as to contact my office promptly when any development occurs.

I appreciate your help.

Sincerely,



Jody Hice
Member of Congress

JH/SH

OFFICE OF
EXTERNAL AFFAIRS
2017 DEC 12 P 3:15
FEDERAL ENERGY
REGULATORY COMMISSION

2017-00139

Case #: _____ Name: _____



OFFICE OF
CONGRESSMAN JODY HICE
10TH DISTRICT OF GEORGIA

Post Office Box 728
Monroe, Georgia 30655
(770) 207-1776 Office
(770) 266-6751 Fax

PRIVACY ACT RELEASE

Contact Information: Please provide your mailing address. If either your physical or mailing address is located outside the 10th Congressional District of Georgia, please explain in your statement below.

PREFERRED TITLE: MR. MS. MRS. DR. OTHER: _____

NAME: Barbara B. Tyson

ADDRESS: 1200 Oconee Rd. COUNTY: _____

CITY: Backhead STATE: GA ZIP: 30625

DAYTIME PHONE: 706 342 0790 MOBILE PHONE: 706 318 9984

FAX: NA EMAIL: NA

Alternate Contact: If you would like to authorize another person to communicate with us in reference to your case, you must state his or her name and phone number. If an attorney represents you, please note here.

ALTERNATE CONTACT PERSONS: _____

Identification: Not all the following identification pertains to your concerns. Please provide your social security number, date of birth and any other identification relevant to your case.

SOCIAL SECURITY NUMBER: 1676 DATE OF BIRTH: 5-28-36

VA FILE NUMBER: _____ CLAIM NUMBERS: _____

USCS RECEIPT NUMBER: _____ OTHER: _____

Federal Agency: Please specify which branch of the United States Government is involved in your particular case.

AGENCY OR DEPARTMENT: Federal Energy Regulatory Commission

Your Statement: Below or in an attached letter, please provide a statement regarding the nature of your problem and the assistance you need from this office. Please attach copies of any documents important to your case.

STATEMENT: see attached

Pursuant to the requirements of the Privacy Act, PL 93-579, I hereby authorize Congressman Jody Hice and his staff to access my records And I respectfully request their assistance in resolving my case.

SIGNATURE: _____ DATE: _____

Secretary-Kimberly D. Bose

Federal Energy Regulatory Commission

FERC # 2413 117

888 First Street, NE

Washington, DC 20426

Dear Secretary Bose:

In 1974 Georgia Power used eminent domain to take 176.8 acres of my mother's land for a future Georgia State park which has never come to fruition in 41 years. She was told that the FERC required them (Georgia Power) to take this land for a park to satisfy their application for Wallace Dam.

Lake Oconee has more public parks, camp sites, and boat ramps than are needed. Three parks are currently operated for the public by Georgia Power on Lake Oconee – Parks Ferry, Old Salem, and Lawrence Shoals. Though these are well maintained, they are grossly underutilized. The US Forestry Service has two parks with boat ramps on Lake Oconee in close proximity to this proposed future state park. Also, Hard Labor Creek State Park of 5,804 acres is in Morgan County and Charlie Elliott State Park of 6,800 acres is in nearby Newton County – both of these large state parks are off Interstate 20 between Atlanta and Lake Oconee. The state of Georgia is closing state parks and cutting park services.

Originally, my mother was informed that Georgia Power would need 169 acres of her land on the Oconee River and Sugar Creek that would be under water when Lake Oconee was developed. She accepted this idea "because it was for the good and necessary for her fellow man". But then Georgia Power returned to inform her that they would use eminent domain to take another 176.8 acres for a future state park. She was told that the federal government required this to license the Wallace Dam.

In closing, Georgia Power took, by eminent domain, land that is unused and is likely to remain so for the next 50 years. The state of Georgia is unlikely to have the will or the means to develop this as a state park for public use.

My sister and I would like this 176.8 acres returned to us. We have been good stewards of adjacent land by maintaining good forestry practices and protecting wild life and watershed. We are the two descendants who were slated to receive this land in our mother's will.

Sincerely,



Barbara Bell Tyson

To Rep. Jody Hice

Regarding Relicensing Wallace Dam
of Lake Oconee by Federal Energy
Regulator Commission FERC # 2413 117

Barbara Bell Iyer and Miriam Bell Foster,
descendants of Dorothy D. Bell (deceased),
are asking for a return of 176.8 acres
on Woods Rd, Buckhead, Morgan Co., Georgia
that was taken in 1974 (43 years ago) by
eminent domain for a future Georgia
State Park which has never come to fruition.

Would you please give your attention
to this matter for justice to those you
represent?

Thank you for representing us!

Barbara Bell Iyer
1200 Oconee Rd,
Buckhead, Ga. 30625

attached is a letter to FERC.

**Response to Letter from Congressman Jody Hice
on behalf of Ms. Barbara Bell Tyson
Dated December 12, 2017**

Georgia Power acknowledges the concerns expressed by Ms. Barbara Bell Tyson about the acquisition of her mother's land for project purposes prior to construction of the Wallace Dam Project. Georgia Power purchased the property rights for this land pursuant to Article 5 of its original license for the Project, which requires Georgia Power to obtain for use in perpetuity all lands necessary or appropriate for the construction, maintenance, and operation of the project, including recreation. Those license requirements were determined pursuant to Section 10(a)(1) of the Federal Power Act, which require the Commission to ensure that license projects be best adapted to the comprehensive development of the waterway, considering all beneficial uses, including recreation.

Section 3.3.6.2 of Exhibit E (Future Recreational Development) analyzes the continued project-related need for Area A-2, which was designated in the current license for future recreation development as a state park. The recreational analysis provided in the Recreation and Land Use Study (Georgia Power, 2016f) predicts that overall recreational use at the Project will increase on the order of 33 percent by 2050. Although Area A-2 has yet to be developed, GDNR has expressed continued interest in the development of a state park on Lake Oconee. Area A-2 is the largest reserved tract centrally located on the reservoir in proximity to I-20. For these reasons, Georgia Power proposes to continue to reserve Area A-2 within the project boundary for future recreational development as a state park.



United States Department of the Interior



Fish and Wildlife Service
RG Stephens, Jr. Federal Building
355 East Hancock Avenue, Room 320
Athens, Georgia 30601

May 21, 2018

West Georgia Sub Office
P.O. Box 52560
Ft. Benning, Georgia 31995-2560

Coastal Sub Office
4980 Wildlife Drive
Townsend, Georgia 31331

Ms. Kimberly D. Bose
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

Subject: Endangered Species Act concurrence for the Wallace Dam Hydroelectric Project, FERC No. 2413-117

Dear Ms. Bose,

On November 10, 2017, Georgia Power Company (GPC) filed with the Federal Energy Regulatory Commission (FERC) the Wallace Dam relicensing study results meeting summary for the second season of study in compliance with the FERC's Integrated Licensing Process (ILP) regulations at 18 CFR 5.15(c)(1). These studies were a continuation of the surveys done at the project site the year before. The Fish and Wildlife Service (Service) submits the following comments under provisions of the Migratory Bird Treaty Act (MBTA) (16 U.S.C. 703, et seq.), the Bald and Golden Eagle Protection Act (BGEPA) (16 U.S.C. 668, et seq.), and the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. 1531, et seq.).

Based on the results of the two-year ILP studies, we concur that Wallace Dam current operations are not likely to adversely affect federally-listed species or critical habitat under the ESA. However, if new information or changes in the project involve federally-listed species as a result of future operational changes or enhancement measures made through the relicensing process, further consultation with the Service will be required. Please refer to the January 20, 2017 letter to FERC that addressed the species potentially found on site.

We appreciate the opportunity to comment during the planning stages of your project. If you have any questions, please contact staff biologist Tamara Johnson at (706) 613-9493 ext. 48510.

Sincerely,

Donald Imm
Field Supervisor

cc: C. Willis, USFWS, Atlanta, GA
W. Laney, USFWS, Raleigh, NC
A. Creamer, FERC, Washington, DC
J. Wisniewski, GDNR, Social Circle, GA

**Response to Letter from U.S. Fish and Wildlife Service
Dated May 21, 2018**

Georgia Power Company (Georgia Power) appreciates receiving the U.S. Fish and Wildlife Service (FWS) letter concurring that continued operation of the Wallace Dam Project is not likely to adversely affect federally-listed species or critical habitat under the Endangered Species Act. If new information becomes available or material changes to project operations are implemented, Georgia Power will consult further with FWS.

APPENDIX B

Proposed Shoreline Stabilization Plan

PROPOSED SHORELINE STABILIZATION PLAN, WALLACE DAM PROJECT (FERC NO. 2413)

Introduction

Georgia Power Company (Georgia Power) proposes to install shoreline stabilization in the form of riprap bank protection at several locations within the Wallace Dam Project at project recreation facilities along the shoreline of Lake Oconee. In addition, shoreline stabilization measures will be installed to repair eroded shoreline near Pond 2 in the Wallace Dam tailrace area within the project boundary. Pond 2 is a small waterfowl impoundment in the floodplain adjacent to the east side of the tailrace channel within the Oconee Wildlife Management Area (WMA).

This plan describes the specific measures to be implemented and provides a schedule for the installation of the measures. Georgia Power consulted with Georgia Department of Natural Resources (GDNR) in developing this plan as part of the license application for the Wallace Dam Project.

Specific Measures

Georgia Power will install shoreline stabilization consisting of riprap at four locations to protect the sites from further erosion. Protection of these sites would conserve soil resources, maintain bank fishing and other shoreline recreational uses, reduce sedimentation and turbidity in adjacent waters, and enhance littoral-zone aquatic habitat. The sites are listed below and shown in Figures B-1 through B-4.

Schedule for Implementation of the Shoreline Stabilization Plan

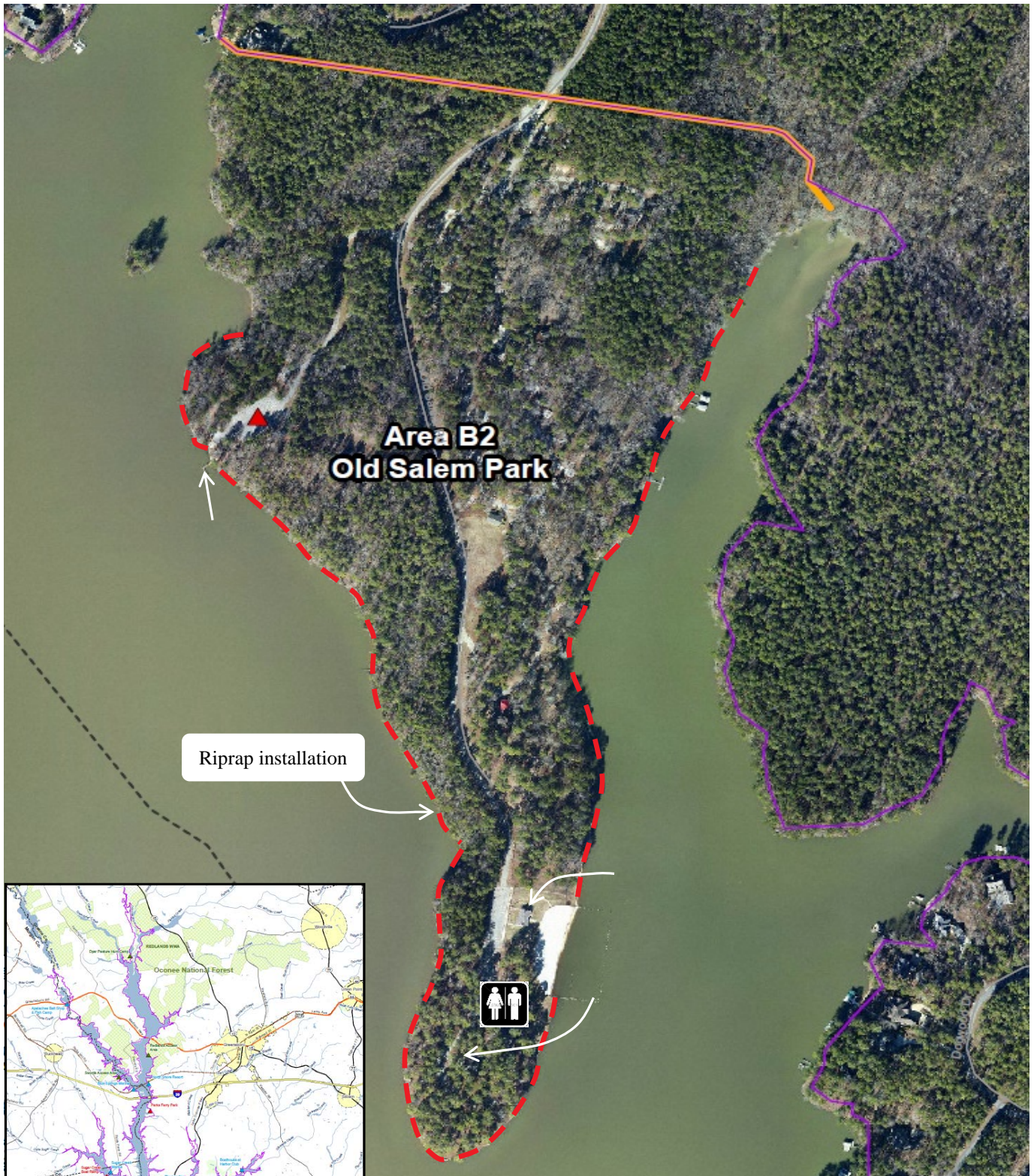
Location	Length of Riprap to be Installed (feet)	Completion Date or Deadline
Old Salem Park	5,100	12/31/2023
Parks Ferry Park	6,000	12/31/2023
Long Shoals Boat Ramp	2,000	12/31/2023
Armour Bridge	3,400	12/31/2023

Georgia Power proposes to install riprap along approximately 5,100 feet (ft) of shoreline at Old Salem Park, 6,000 ft of shoreline at Parks Ferry Park, 2,000 ft of shoreline at Long Shoals Boat Ramp, and 3,400 ft of shoreline at Armour Bridge. These areas will be monitored to ensure that the stabilization measures are effective over time and riprap will replenished as needed to ensure adequate shoreline protection.

To address an active erosion problem area documented in the tailrace area, Georgia Power proposes to repair the eroded shoreline next to Pond 2 (see Figure B-5) and inspect the water level control structure for the waterfowl refuge in cooperation with GDNR. During pre-filing consultation, GDNR raised concerns about the streambank erosion occurring at this site.

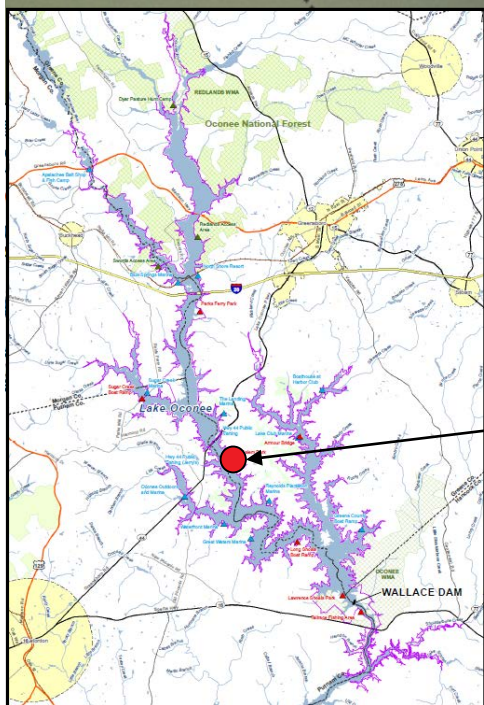
Georgia Power viewed the site from land in February 2015 and noted that the erosion cut is located on the dike creating the pond at the location of the water level control structure for the waterfowl refuge area. The dike is very steep along its entire length. In addition, the dike slopes are covered by various species of trees and other vegetation having the potential to compromise the integrity of the dike. Implementing the proposed measures in cooperation with GDNR will repair the bank undercutting that is currently taking place next to the Pond 2 dike. Furthermore, it will conserve soil resources, assist GDNR in identifying needed repairs to the water level control structure, maintain waterfowl refuge habitat within Oconee WMA, and protect water quality and aquatic habitat in the tailrace area.

FIGURES



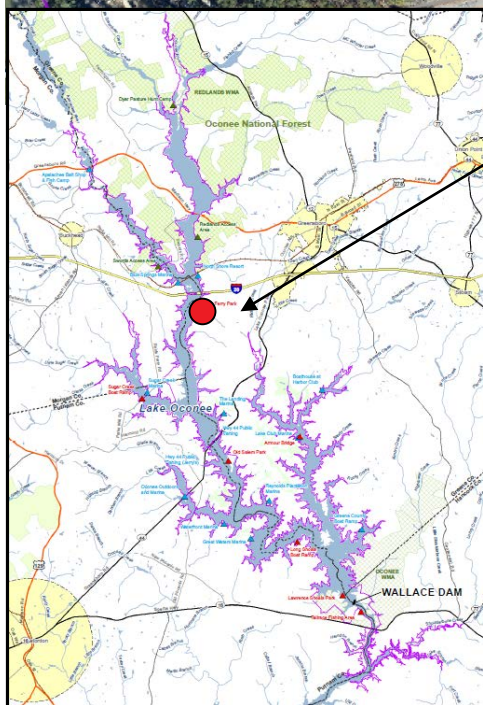
**Area B2
Old Salem Park**

Riprap installation



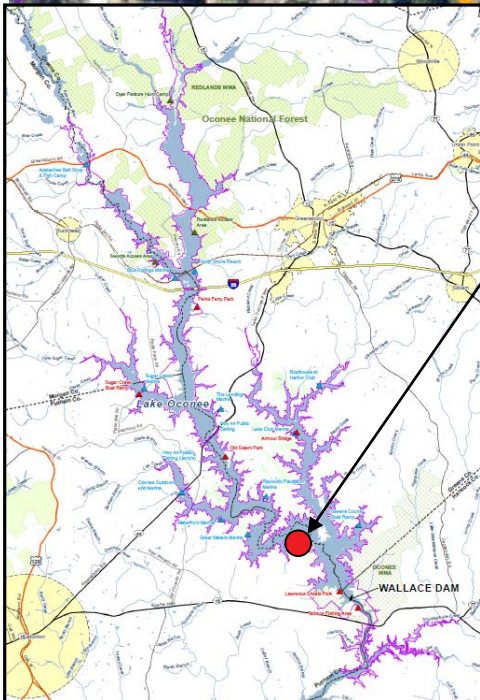
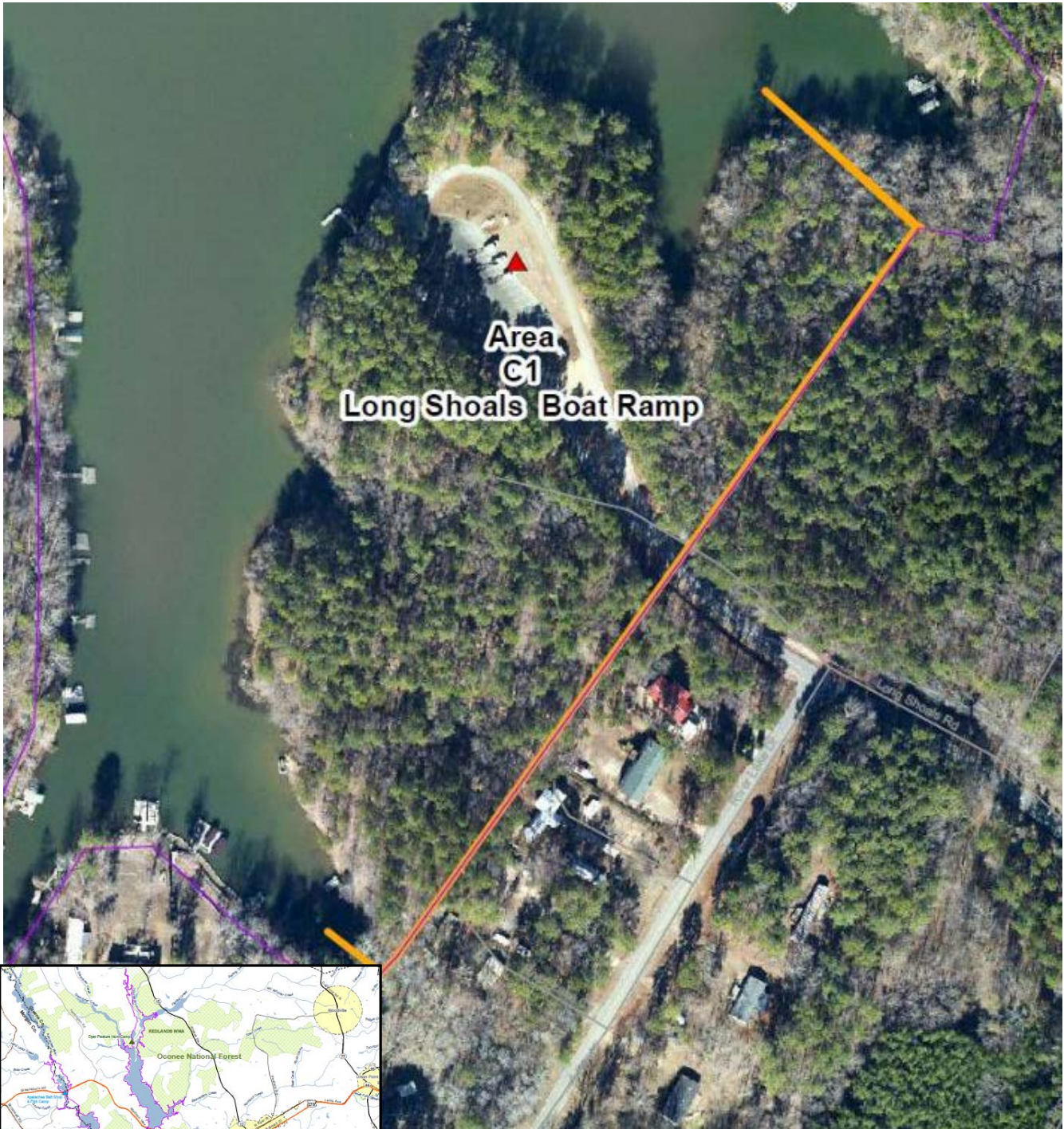
Location of project facility

Figure B-1
Shoreline Stabilization
Old Salem Park
Wallace Dam Project
(FERC No. 2413)



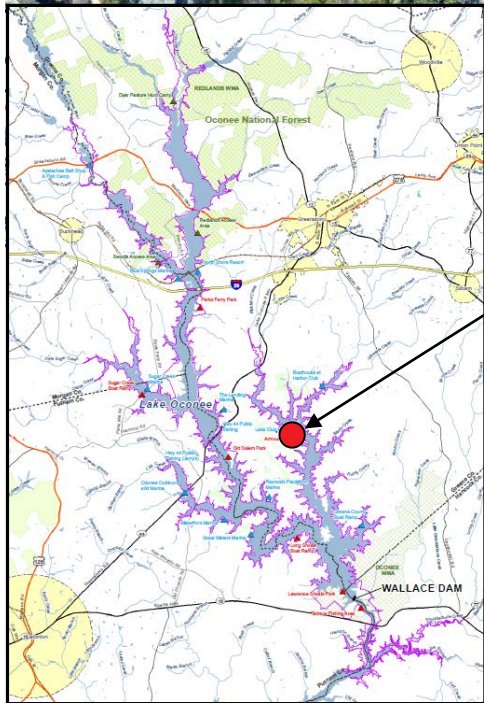
Location of project facility

Figure B-2
Shoreline Stabilization
Parks Ferry Park
Wallace Dam Project
(FERC No. 2413)



Location of project facility

Figure B-3
Shoreline Stabilization
Long Shoals Boat Ramp
Wallace Dam Project
(FERC No. 2413)



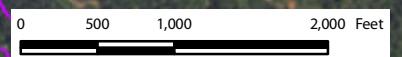
Location of project facility

Figure B-4
Shoreline Stabilization
Armour Bridge Boat Ramp
Wallace Dam Project
(FERC No. 2413)



WALLACE DAM

Pond 2




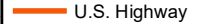
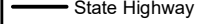
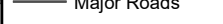
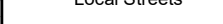

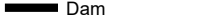
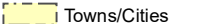
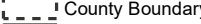
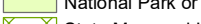
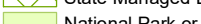
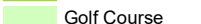


-  Interstate Highway
-  U.S. Highway
-  State Highway
-  Major Roads
-  Local Streets
-  Railroads (Local)
-  Dam
-  Towns/Cities
-  County Boundary
-  National Park or Forest
-  State Managed Lands
-  National Park or Forest
-  Golf Course
-  Waterfowl Ponds



Figure B-5
Waterfowl Impoundments in Oconee WMA
 Wallace Dam Project
 (FERC No. 2413)

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APPENDIX C

Proposed Recreation Enhancement Measures Plan

PROPOSED RECREATION ENHANCEMENT MEASURES PLAN, WALLACE DAM PROJECT (FERC NO. 2413)

Introduction

Georgia Power Company (Georgia Power) proposes to implement the following recreation enhancement measures at the Wallace Dam Project to increase recreational access and improve recreational resources. This plan describes each of the specific measures for enhancing recreation and provides an implementation schedule for the term of the new license. Georgia Power consulted with the Georgia Department of Natural Resources (GDNR) in developing this plan as part of the license application for the Wallace Dam Project.

Specific Measures

Georgia Power will improve recreational access and resources by implementing the following specific measures on Georgia Power lands within the project boundary.

Lawrence Shoals Park

Enhancements at Lawrence Shoals Park will consist of constructing new facilities to replace two campground restrooms, a beach house, a boat ramp restroom, a courtesy dock at the boat ramp, a pavilion and dedicated pavilion restroom, and a guest relations gate house. In addition, Georgia Power will install improved lighting at the boat ramp and upgrade the current well system that supplies water to park facilities and customers. These improvements would continue to support quality recreation opportunities. Figure C-1 shows the locations of these enhancement measures.

Old Salem Park

Georgia Power will enhance recreation amenities at Old Salem Park by constructing new facilities to replace two group docks (and add a third group dock), a pavilion and dedicated pavilion restroom, a boat ramp restroom, a courtesy dock at the boat ramp, a beach house, and a guest relations gate house. In addition, Georgia Power will install improved lighting at the boat ramp, upgrade the current well system that supplies water to park facilities and customers, and reconfigure the park entrance and gate house to reduce single-lane traffic congestion and allow for year-round operation of the boat ramp. These improvements would continue to support quality recreation opportunities and enhance year-round boat-fishing and tournament-fishing access to Lake Oconee. Figure C-2 shows the locations of these enhancement measures.

Parks Ferry Park

Recreation amenities at Parks Ferry Park will be enhanced by constructing new facilities to replace two campground restrooms, a beach house, a courtesy dock at the boat ramp, and a pavilion and dedicated pavilion restroom. In addition, Georgia Power will install improved

lighting at the boat ramp, upgrade the current well system that supplies water to park facilities and customers, replace the underground water and electrical service, and reconfigure the entrance gate and gate house to reduce single-lane traffic congestion and allow for year-round operation of the boat ramp. Reconfiguring the park entrance will benefit multiple users, including those wanting to access the northern extent of Lake Oconee for later winter/early spring fishing. These improvements would continue to support quality recreation opportunities and enhance year-round boat-fishing and tournament-fishing access to Lake Oconee. Figure C-3 shows the locations of these enhancement measures.

Sugar Creek Boat Ramp

Georgia Power will enhance recreation amenities and increase bank fishing access at Sugar Creek Boat Ramp by adding a new barrier-free fishing pier. In addition, Georgia Power will upgrade the vault toilet with a flush toilet, upgrade the existing courtesy dock at the boat ramp, and install improved lighting. Figure C-4 shows the locations of these enhancement measures.

Armour Bridge

Recreation amenities at Armour Bridge will be enhanced by upgrading the existing courtesy dock at the boat ramp, replacing the vault toilet with a flush toilet, and installing improved lighting at the facility. The locations of these enhancements are shown in Figure C-5.

Long Shoals Boat Ramp

Georgia Power will enhance recreation amenities at Long Shoals Boat Ramp by upgrading the courtesy dock, trimming existing vegetation to provide additional shoreline access to bank fishing sites, and installing improved lighting. The locations of these enhancements are shown in Figure C-6.

Proposed Area C-5 Bank Fishing Access

Georgia Power will add a new bank fishing access development at the Area C-5 tract to provide additional bank fishing opportunities on Lake Oconee. The proposed amenities include a barrier-free fishing pier, a gravel parking area, and new or improved lighting. Figure C-7 shows the proposed locations of the new amenities.

Proposed Jerry's Hwy 44 Bank Fishing Access

Georgia Power will increase bank fishing access on Lake Oconee by providing a new bank fishing access development at Jerry's Hwy 44 within the project boundary. The proposed amenities include a barrier-free fishing pier, a gravel parking area, and new or improved lighting. Figure C-8 shows the proposed locations of the new amenities.

Georgia Hwy 16 Bridge Boat Ramp (Tailrace)

Georgia Power will enhance recreation amenities and improve tailrace bank fishing access at the Georgia Hwy 16 Bridge Boat Ramp downstream of Wallace Dam by providing a new, barrier-free tailrace fishing pier, installing a vault toilet, and installing improved lighting. The new fishing pier would replace the existing bank fishing access provided at the Tailrace Fishing Area, which would be closed due to its limited public use and for security of Wallace Dam's adjacent equipment yard. Figure C-9 shows the locations of these enhancement measures.

Schedule

Recreation enhancement measures will be implemented according to the following schedule:

Schedule for Implementation of the Recreation Enhancement Measures Plan	
Activity	Completion Date or Deadline ^a
Lawrence Shoals Park	
Replace two campground restrooms	12-31-2022
Replace existing courtesy dock and restroom at boat ramp	12-31-2022
Replace existing guest relations gate house	12-31-2022
Replace existing pavilion and dedicated pavilion restroom	12-31-2022
Replace existing beach house	12-31-2022
Install improved lighting	12-31-2022
Upgrade well system that supplies water to park facilities and customers	12-31-2022
Old Salem Park	
Replace two existing group docks and install a third group dock	12-31-2021
Replace existing courtesy dock and restroom at boat ramp	12-31-2021
Replace existing guest relations gate house and reconfigure park entrance	12-31-2021
Replace existing pavilion and dedicated pavilion restroom	12-31-2021
Replace existing beach house	12-31-2021
Install improved lighting	12-31-2021
Upgrade existing well system that supplies water to park facilities and customers	12-31-2021
Provide for year-round operation of the boat ramp	12-31-2021
Parks Ferry Park	
Replace two existing campground restrooms	12-31-2023
Replace existing courtesy dock at boat ramp	12-31-2023

Schedule for Implementation of the Recreation Enhancement Measures Plan

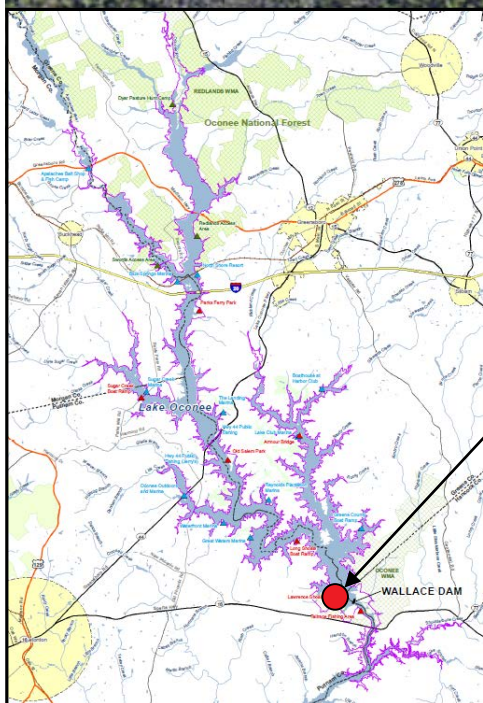
Activity	Completion Date or Deadline ^a
Replace existing guest relations gate house and reconfigure park entrance	12-31-2023
Replace existing pavilion and dedicated pavilion restroom	12-31-2023
Replace existing beach house	12-31-2023
Install improved lighting	12-31-2023
Upgrade existing well system that supplies water to park facilities and customers	12-31-2023
Replace existing underground water and electrical service	12-31-2023
Provide for year-round operation of the boat ramp	12-31-2023
Sugar Creek Boat Ramp	
Construct new barrier-free fishing pier	12-31-2021
Upgrade existing courtesy dock	12-31-2021
Replace existing vault toilet with a flush toilet	12-31-2021
Install improved lighting	12-31-2021
Armour Bridge	
Upgrade existing courtesy dock	12-31-2022
Replace existing vault toilet with flush toilet	12-31-2022
Install improved lighting	12-31-2022
Long Shoals Boat Ramp	
Upgrade existing courtesy dock	12-31-2023
Trim vegetation along shoreline to provide additional bank fishing access	12-31-2023
Install improved lighting	12-31-2023
Proposed Area C-5 Bank Fishing Access	
Construct new barrier-free fishing pier	12-31-2021
Construct new gravel parking area	12-31-2021
Install new or improved lighting	12-31-2021
Proposed Jerry's Hwy 44 Bank Fishing Access	
Construct new barrier-free fishing pier	12-31-2021
Construct new gravel parking area	12-31-2021
Install new or improved lighting	12-31-2021
GA Hwy 16 Bridge Boat Ramp (Tailrace)	
Construct new barrier-free fishing pier	12-31-2021
Install a vault toilet	12-31-2021

Schedule for Implementation of the Recreation Enhancement Measures Plan

Activity	Completion Date or Deadline^a
Install improved lighting	12-31-2021
Tailrace Fishing Area	
Close existing facility	12-31-2021

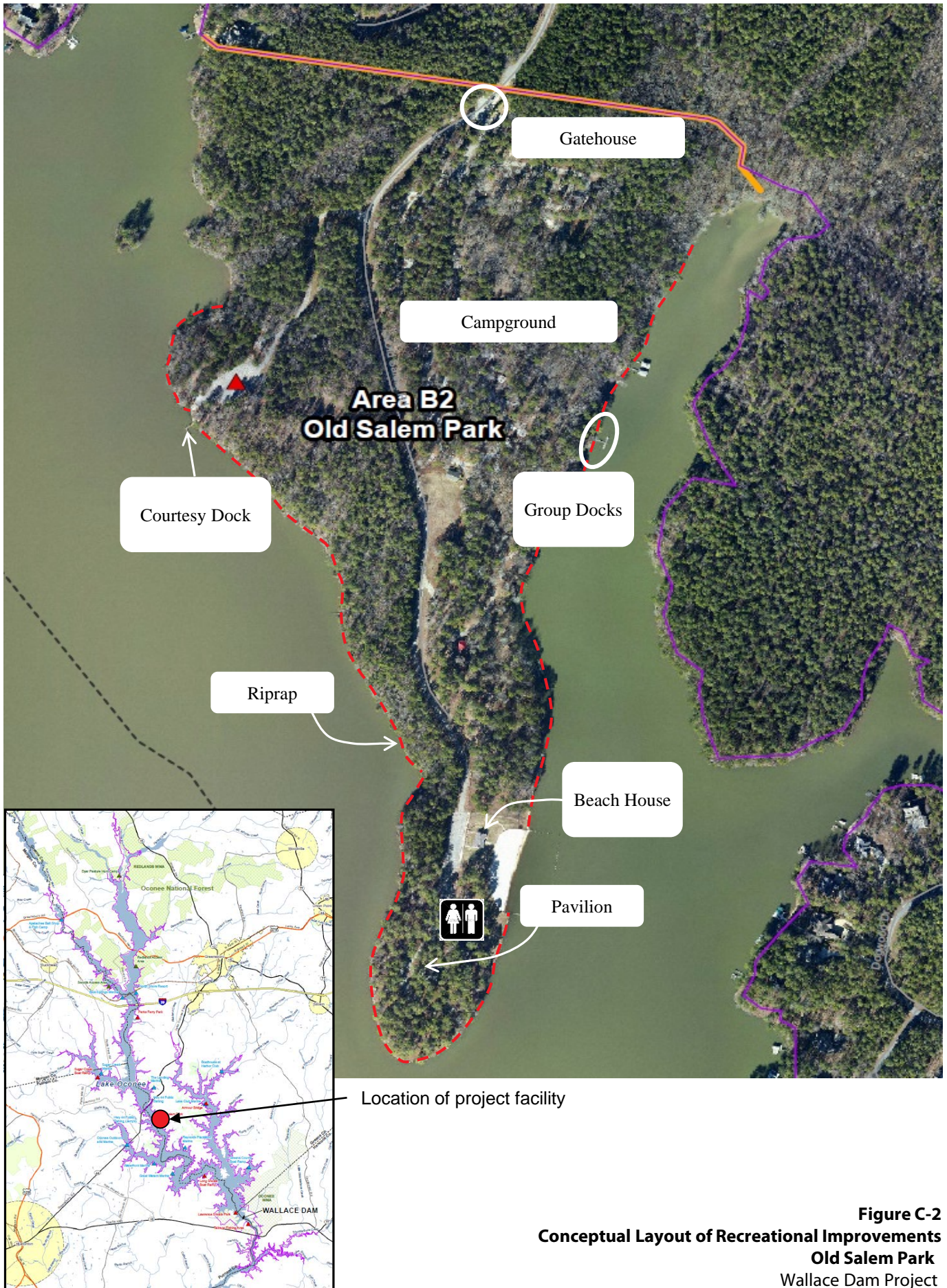
^a Completion dates assume license issuance by May 31, 2020.

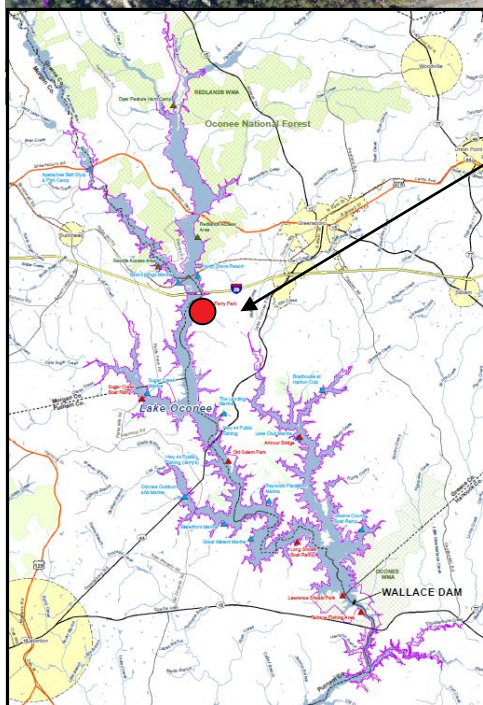
FIGURES



Location of project facility

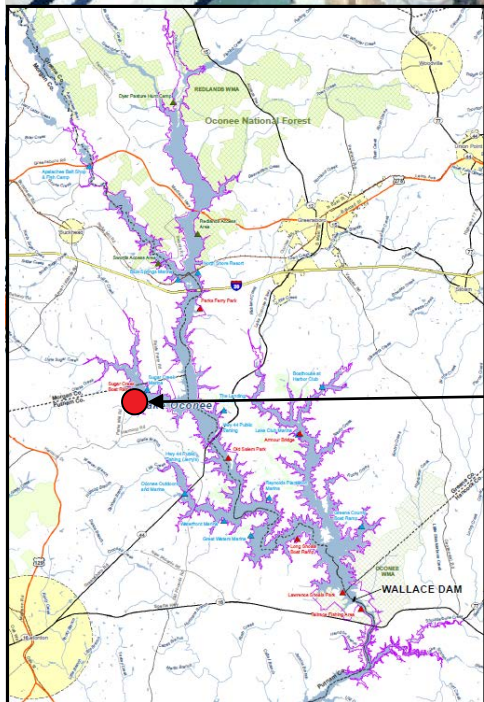
Figure C-1
Conceptual Layout of Recreational Improvements
Lawrence Shoals Park
 Wallace Dam Project
 (FERC No. 2413)





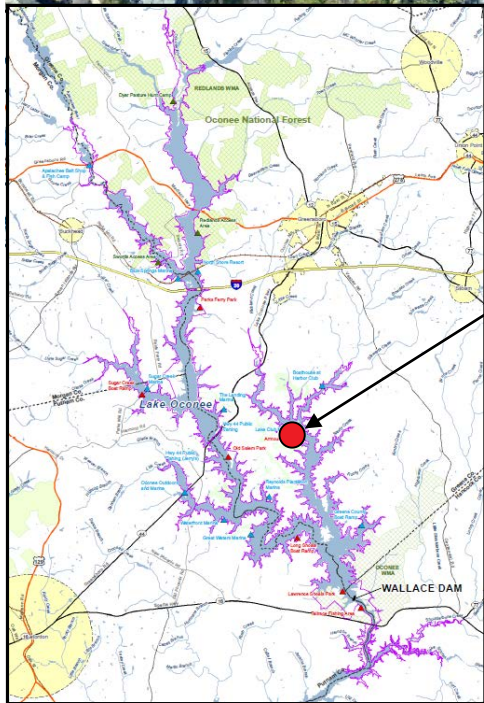
Location of project facility

Figure C-3
Conceptual Layout of Recreational Improvements
Parks Ferry Park
Wallace Dam Project
(FERC No. 2413)



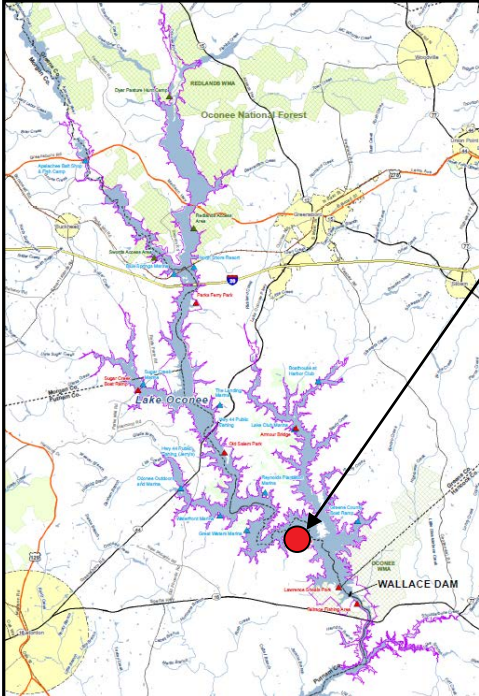
Location of project facility

Figure C-4
Conceptual Layout of Recreational Improvements
Sugar Creek Boat Ramp
Wallace Dam Project
(FERC No. 2413)



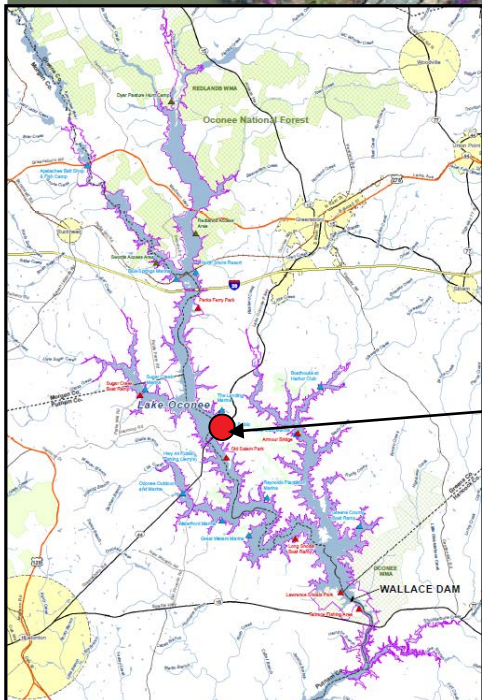
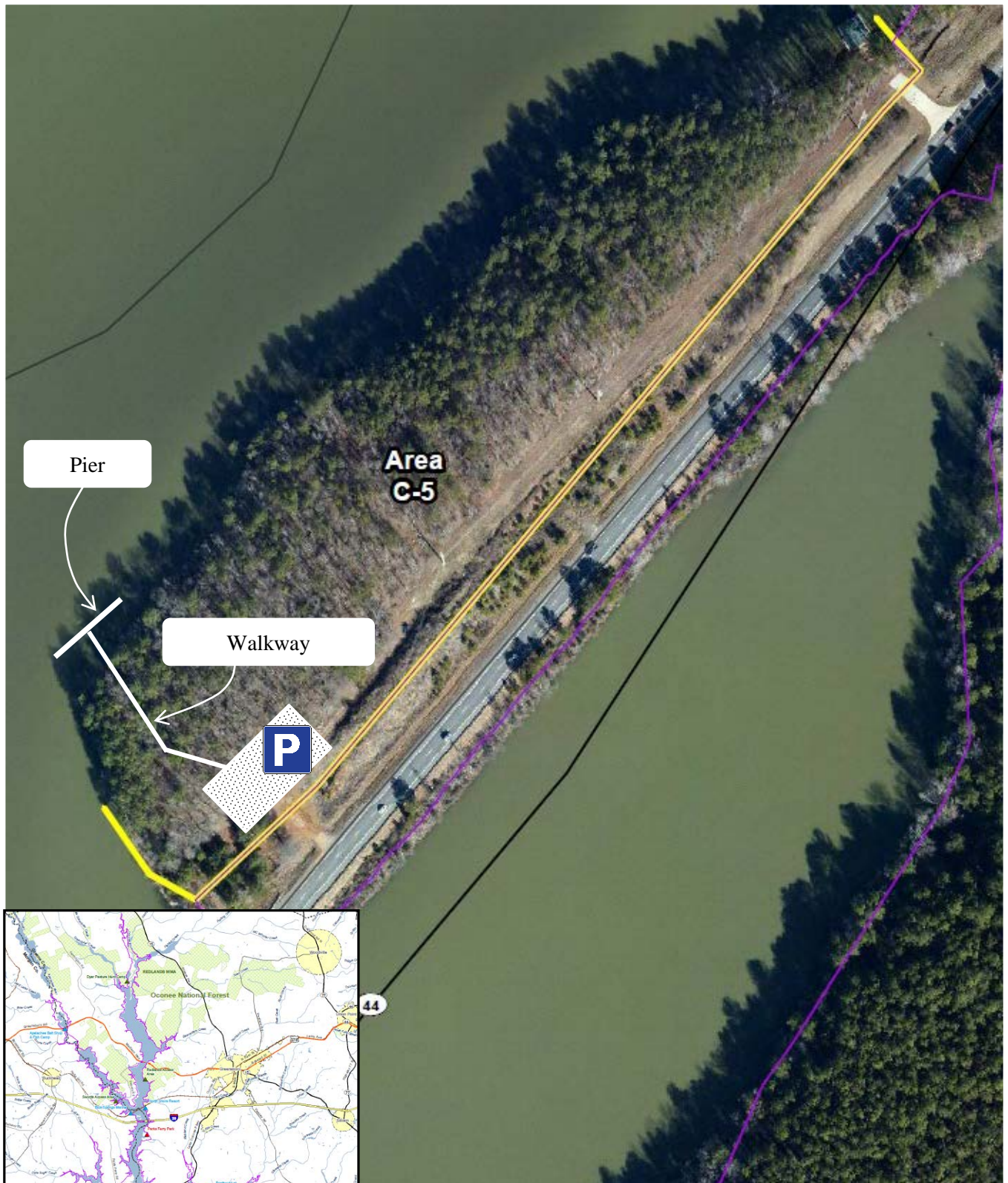
Location of project facility

Figure C-5
Conceptual Layout of Recreational Improvements
Armour Bridge Boat Ramp
Wallace Dam Project
(FERC No. 2413)



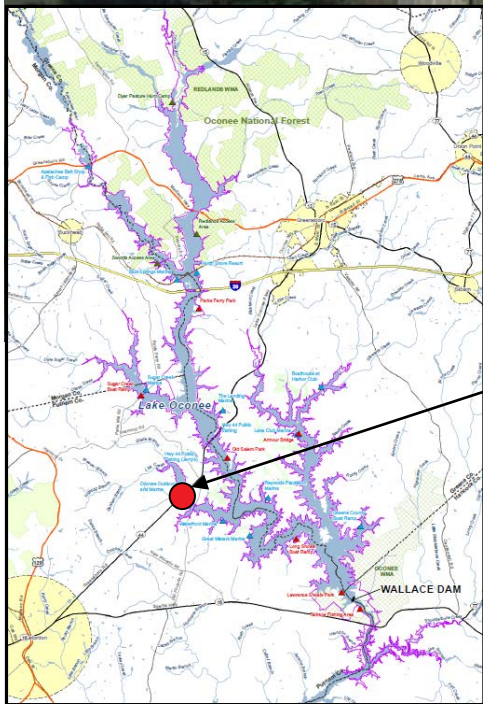
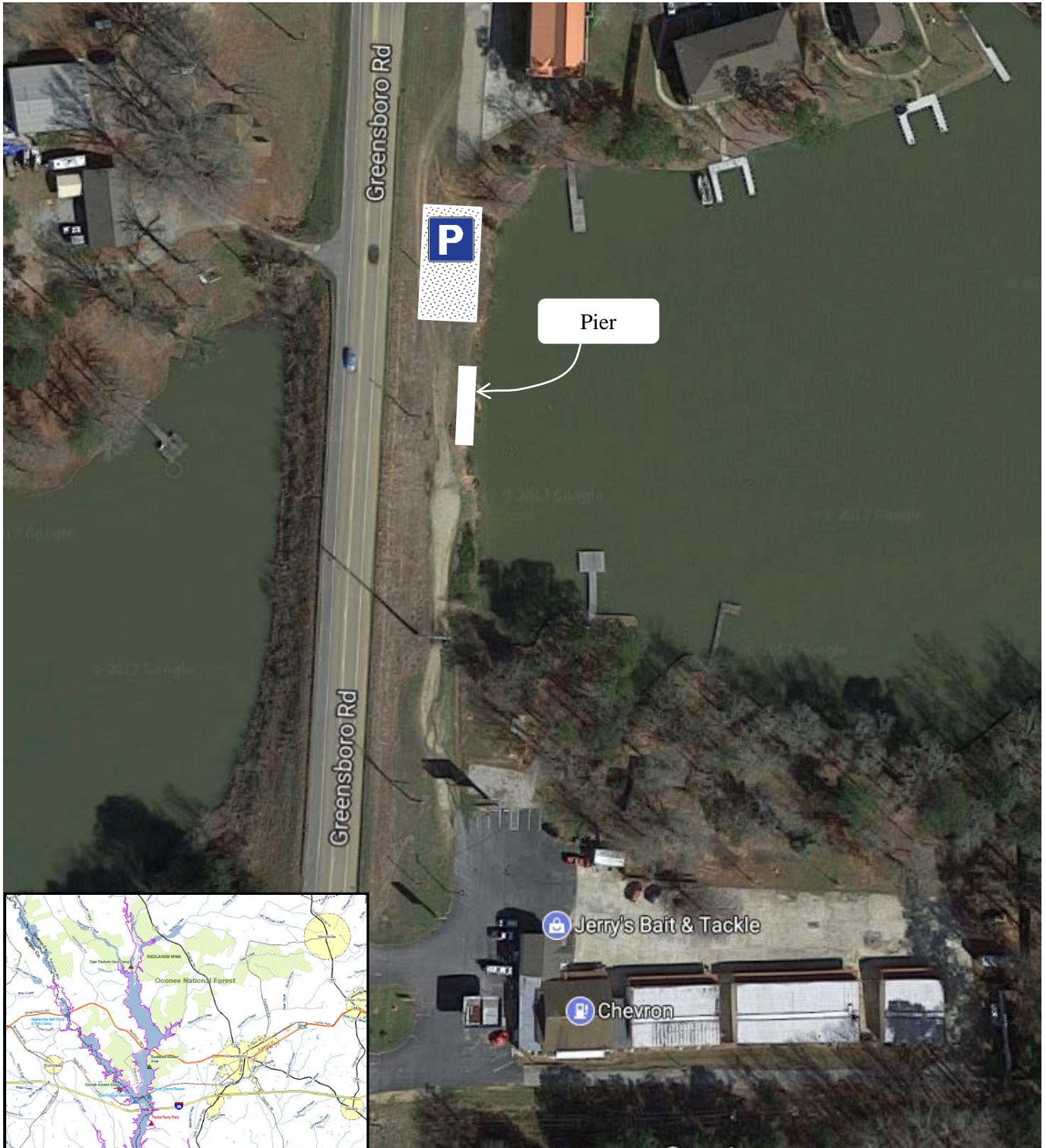
Location of project facility

Figure C-6
Conceptual Layout of Recreational Improvements
Long Shoals Boat Ramp
Wallace Dam Project
(FERC No. 2413)



Location of project facility

Figure C-7
Conceptual Layout of Recreational Improvements
Area C-5
Wallace Dam Project
(FERC No. 2413)



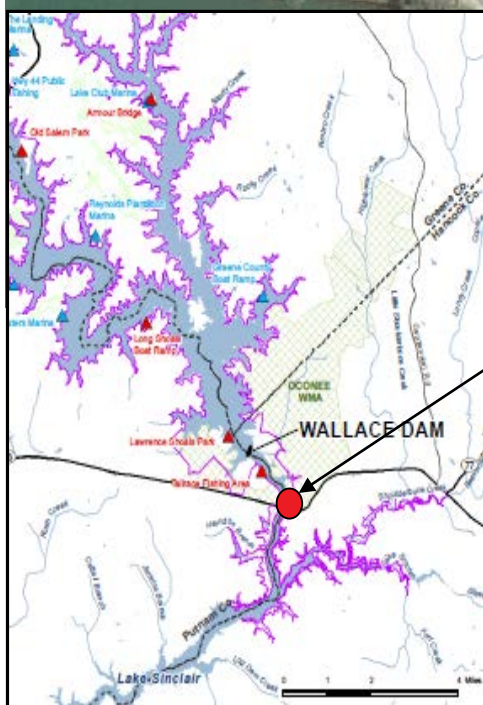
Location of project facility

Figure C-8
Conceptual Layout of Recreational Improvements
Jerry's Hwy 44
 Wallace Dam Project
 (FERC No. 2413)



Pier

P



Location of project facility

Figure C-9
Conceptual Layout of Recreational Improvements
Hwy 16 Bridge Boat Ramp
Wallace Dam Project
(FERC No. 2413)

APPENDIX D

Proposed Shoreline Management Plan

PROPOSED SHORELINE MANAGEMENT PLAN, WALLACE DAM PROJECT (FERC NO. 2413)

Introduction

Georgia Power Company (Georgia Power) has developed this Shoreline Management Plan for the Wallace Dam Project to incorporate the policies and guidelines of its well-established Shoreline Management Program.

This plan provides guidelines for activities such as dredging and tree removal, as well as shoreline construction (e.g., docks, boatslips, seawalls) on Wallace Dam project lands. Georgia Power's Oconee Land Management Office will use this document for permitting and regulating these activities and will review the plan every ten years, in accordance with the Federal Energy Regulatory Commission (FERC, or the Commission) Guidance for Shoreline Management Planning at Hydropower Projects (FERC 2012), to determine any need for modifications or updates to ensure its adequacy in meeting its objectives.

This Shoreline Management Plan also incorporates a Shoreline Buffer Zone Management Plan as Attachment D-1, which pertains to certain lands adjoining the Project that were involved in an approved land exchange between Georgia Power and a private developer in 1996.

The Wallace Dam Project is located on the Oconee River in east-central Georgia (Figure D-1). Wallace Dam is located at river mile 172.7, about 13.4 air miles east of the city of Eatonton in Putnam County and about 15.4 air miles south of the city of Greensboro in Greene County. Wallace Dam is located about 12 air miles northwest of the city of Sparta in Hancock County, 19 air miles north of the city of Milledgeville in Baldwin County, and about 25 air miles southeast of the city of Madison in Morgan County. The Wallace Dam powerhouse is situated on the east side of the river, mostly within Hancock County. The spillway portion of the dam is located on the west side of the river within Putnam County.

The Wallace Dam project reservoir, known as Lake Oconee, covers 19,050 acres, has 374 miles of shoreline, and extends about 39 river miles upstream on the Oconee River. Lands and waters within the FERC project boundary are located within Hancock, Putnam, Greene, and Morgan Counties (Figure 3). The normal full pool elevation of Lake Oconee is 435 feet (ft) plant datum. The project boundary extends around the reservoir upstream of the dam. It encompasses the normal full pool elevation and a fee-simple strip of land owned by Georgia Power around the entire shoreline. The shoreline strip is generally 25-ft wide, with the exception of lands comprising the Oconee NF, and expands to widths of 200 ft across the reservoir from certain recreation areas (Georgia Power, 1971). The project boundary is measured as metes and bounds or elevation contour, depending on location around the reservoir. Larger land parcels define the project boundary in the areas of the project works, Georgia Power's public recreation facilities, and other areas reserved for recreation development. The project boundary extends downstream of Wallace Dam about 4.0 river miles as thin strips of land along each side of the narrow upper reach of Lake Sinclair. The project

boundary downstream of Wallace Dam also encompasses three small waterfowl impoundments in the floodplain adjacent to the channel within the Oconee Wildlife Management Area.

Background

Georgia Power's Shoreline Management Program was first formalized in January 1985, when the Shoreline Management Policy was adopted. The Shoreline Management Policy governs erosion control, facility construction along shorelines, shoreline clearing, excavations, effluent control, public landings and marinas, shoreline and reservoir hazards, and miscellaneous uses of the reservoir. In addition to the policy, a shoreline permitting program was adopted that outlines procedures for obtaining permits from Georgia Power for construction on leased properties and flood right areas. The program outlines guidelines for construction and procedures for obtaining permits for structures, grading and clearing, seawalls, boatslips, boat lifts, and docks.

Georgia Power continues to preserve the scenic, environmental, and recreational value of the Wallace Dam Project through its current Shoreline Management Guidelines and permitting program, which derive much of their authority from the Standard Land Use Article (SLUA). They provide procedures and specifications for supervising and controlling development activities within the FERC project boundary and on residential lease lots at Georgia Power hydroelectric reservoirs.

Shoreline Management Plan

General Guidelines

A valid lease agreement (Georgia Power lots and access lots) or license (deeded lots) is required in order to receive permits for construction on Georgia Power lakes and property. A current survey and/or deed are required before Georgia Power will issue any new agreement (lease or license).

A Georgia Power permit must be applied for and issued before beginning any construction, renovation, clearing, tree removal, grading, etc., on Georgia Power land. Each permit request is handled on a case-by-case basis at the discretion of the Georgia Power Land Management Office. Once issued, the permit should be posted and be visible from the lake and/or road. Failure to post the permit could result in work stoppage.

All permits will have an approval date and a completion date. These dates are recognized as the starting date of the project and the expiration date of the permit. If construction is to continue past the permitted completion date, Georgia Power must review and approve any extension requests. Any change in plans, after initial approval of construction, must be reviewed and approved by Georgia Power before the change is executed.

To protect the vegetative buffer surrounding the lake, no clearing shall be permitted within 25 ft of the shoreline or county setbacks, whichever is greater, without prior consent. Any ground disturbing activities shall require the proper installation of silt screen at least 26 ft from the shoreline or as determined by the Georgia Power Land Management Office and local county ordinances.

Generally, older structures that do not conform to current policies or guidelines may be maintained, but not expanded or replaced. Georgia Power may require modification of these older structures to conform with current policies or guidelines prior to transfer or renewal of a lease/license agreement or approval of other construction activities.

It is the responsibility of the homeowner to properly dispose of any shoreline structure(s) that have been replaced or removed.

All construction adjacent to or within Georgia Power lakes shall be maintained in a good state of repair and shall comply with any and all federal, state, and local health, environmental, and safety regulations as now or hereafter enacted.

Dumping, burying, or otherwise disposing of any portion of a downed tree on Georgia Power property or into the lake is prohibited. The disposal of leaves and lawn clippings into the lake is also prohibited.

Unauthorized Construction/Activities

Unauthorized construction activities or failure to comply with Georgia Power's permitting process may result in construction delays, removal of the unauthorized project, removal of all shoreline structures associated with the property, termination of the lease/license, and/or legal action.

Dredging

In 1993, the Commission issued an Order (June 28, 1993) approving Georgia Power's permitting program for minor dredging activities. Georgia Power is authorized to permit dredging of up to 500 cubic yards per lot. Greater amounts will require approval from U.S. Army Corps of Engineers, FERC, and additional agencies. Dredging plans must be submitted and approved before work begins. Applicants must provide the volume of material to be removed, which should be determined by a qualified engineer or surveyor. An estimate sheet is to be attached to the permit request.

By obtaining a dredging permit from Georgia Power, the permittee agrees to abide by all governmental rules, laws, regulations, directives and statutes. Removal of original lake/river bottom is prohibited. The sole purpose of dredging is to remove sediment that has accumulated over time. All material removed will be disposed of in an upland area to prevent reentry into lake.

Tree Removal

Tree removal is prohibited without a written permit from Georgia Power. Additional local permits may be required for tree removal and associated land disturbance.

Commercial Structures

Any commercial buildings or structures in the project (excluding those permitted in SLUA, Paragraph d(5)), will be submitted to the Commission as a non-project use of project lands for approval.

Shoreline Structures

SLUA Paragraph b allows Georgia Power to permit landscape plantings, non-commercial piers, landings, boat docks, or similar structures that can accommodate no more than 10 watercraft and that are intended to serve single-family type dwellings, as well as embankments, bulkheads, and retaining walls, without prior Commission approval. Paragraph d(5) of SLUA states that Georgia Power can permit private or public marinas that can accommodate no more than 10 watercraft at a time and are located at least one-half mile (measured over project waters) from any other private or public marina, provided all necessary approvals have been obtained and that Georgia Power notifies the Commission in writing at least 60 days prior to construction.

Georgia Power has developed a robust set of Shoreline Management Guidelines, including specifications on materials, setbacks, and dimensions, for permitting docks, wharves, boatslips, boat lifts, personal watercraft lifts, and seawalls.

Docks

Docks may be floating or stationary or a combination of both. Only approved encapsulated flotation will be permitted for use with floating docks. Metal drums, plastic barrels, modified pontoon boats and other such items or materials are prohibited.

The stationary platform of a dock, which is adjacent to the shoreline, may be covered; however, screening or enclosing the structure is prohibited. Plumbing other than water spigots and pumps is not permitted.

Seawalls

Georgia Power must first inspect the site of the proposed construction. Georgia Power will determine that the proposed construction is needed and would not change the basic contour of the impoundment shoreline and consider whether the planting of vegetation or the use of riprap would be adequate to control erosion at the site.

All applicable federal, state, and local permits and variances must be obtained before constructing a new seawall. Seawall construction will require proper erosion and sedimentation controls.

Prior to receiving a permit from Georgia Power, the applicant must submit a plan including the length of shoreline to be fronted, the type and depth of foundation, materials to be used for construction, and a landscape plan for revegetating impacted shoreline.

The distance between the proposed seawall and the existing shoreline shall not exceed 2 ft (measured horizontally from existing shoreline). Riprap must be placed at the base of the seawall to reduce undermining and enhance shoreline habitat.

Shoreline Buffer Zone Management Plan

On September 16, 1996, FERC approved a land exchange between Georgia Power and Reynolds Corporation involving several parcels. In order to approve the exchange, FERC ordered Georgia Power to retain possession of a 65-ft wide shoreline conservation buffer zone along the shoreline of the property to be conveyed to Reynolds Corporation and to include that area within the project boundary. This 65-ft buffer zone is subject to a Shoreline Buffer Zone Management Plan included as Attachment D-1 to this plan; the area is shown in Figure D-2. The area shall be available to be used for access to the lake and the shoreline, without exclusive use rights of any party, for the purpose of providing recreation access to all persons. The buffer zone management plan includes provisions for vegetation management regarding removal of trees and undergrowth, plantings and types of species to be planted, and general disturbance of the shoreline. The plan allows for certain processes for access clearing, types of walkways, and existence of wetland areas. The plan outlines the use of retaining walls, backfill, riprap, and the construction of docks.

Review and Revision

There are currently a Lake Resources Manager, two dedicated shoreline specialists, and other support staff stationed at the Oconee Land Management office that administer the permitting program and monitor the shoreline of Lake Oconee. Additionally, Georgia Power maintains an active Shoreline Committee, comprised of shoreline specialists from each of its FERC-licensed projects. This group meets periodically to review the Shoreline Management Program and discuss best practices at all of Georgia Power reservoirs. Wallace Dam shoreline staff and management will review the plan every ten years, in accordance with the Commission's Guidance for Shoreline Management Planning at Hydropower Projects (FERC 2012) to determine any need for modifications or updates that may be necessary to ensure its adequacy in meeting its objectives. Any needed modifications so identified will be submitted to Commission staff in the form of an updated Shoreline Management Plan.

Reference

Federal Energy Regulatory Commission (FERC). 2012. Guidance for Shoreline Management Planning at Hydropower Projects. Office of Energy Projects. July 2012.

FIGURES

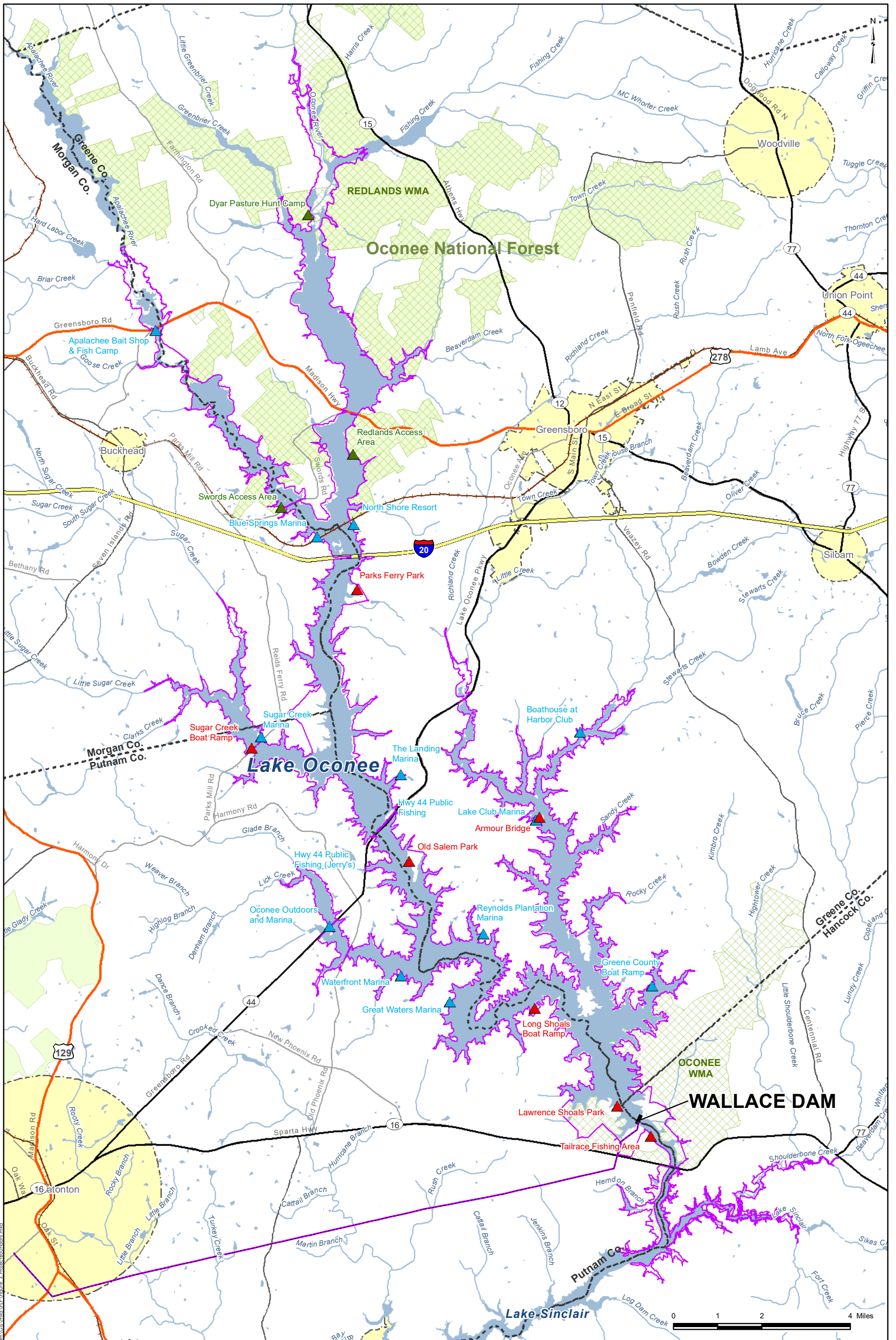


Figure D-1
Project Boundary and Surrounding Area
 Wallace Dam Project
 (FERC No. 2413)

- | | | | |
|---|---|--|--|
| <ul style="list-style-type: none"> — Interstate Highway — U.S. Highway — State Highway — Major Roads — Local Streets | <ul style="list-style-type: none"> — Railroads (Local) — Dam — Rivers/Creeks — Lake — Project Boundary | <ul style="list-style-type: none"> — Towns/Cities — County Boundary — State Managed Lands — National Park or Forest — Transmission Line | <ul style="list-style-type: none"> ▲ Recreation Access Point <ul style="list-style-type: none"> ▲ Forest Service ▲ Public/Private ▲ Georgia Power |
|---|---|--|--|



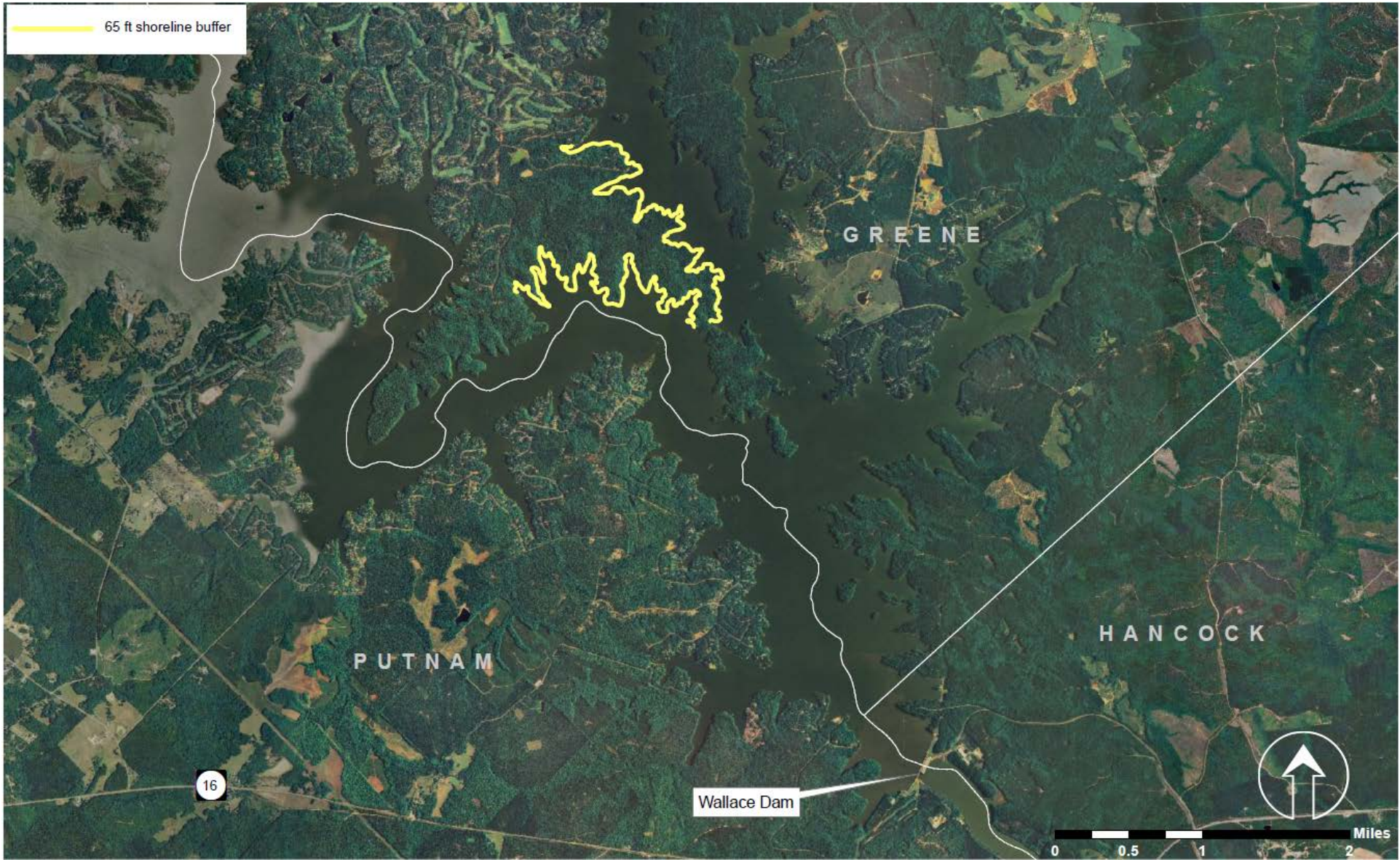


Figure D-2
65-ft Shoreline Shoreline Conservation Buffer
Wallace Dam Project
(FERC No. 2413)

Attachment D-1

Shoreline Buffer Zone Management Plan

SHORELINE BUFFER ZONE MANAGEMENT PLAN
For CERTAIN LANDS ADJOINING the
WALLACE DAM PROJECT, FERC PROJECT # 2413-026

INTRODUCTION

On September 16, 1996, the Federal Energy Regulatory Commission (FERC) issued an order amending the license for the Project which approved a land exchange between Georgia Power Company (Georgia Power) Georgia Power and a Reynolds corporation (Reynolds), a private developer. The exchange involved a portion of an 800-acre tract belonging to Georgia Power, hereafter referred to as Tract A and containing approximately 560 acres, and a 421-acre parcel belonging to Reynolds.

In the order approving the exchange, FERC required Georgia Power to retain possession of a 65-foot-wide shoreline buffer zone (Shoreline Buffer Zone) along the shoreline of the property to be conveyed. FERC also required that the Shoreline Buffer Zone be included in the FERC project boundary. The order further required that Georgia Power develop a Shoreline Buffer Zone Management Plan that strictly governs activities that may occur within the Shoreline Buffer Zone.

This Shoreline Buffer Zone Management Plan (Plan) provides valuable protection to the natural shoreline in the affected area. The Plan also includes measures that address management issues within the Shoreline Buffer Zone that will help Georgia Power better fulfill our mission to protect the scenic, environmental, and recreation values of the project.

GENERAL USE

Similar to all shoreline on Lake Oconee, the area of land encompassed by the Shoreline Buffer Zone shall be available to be used for access to the lake and shoreline, without exclusive use rights of any party or parties, for the purpose of providing recreation access to all persons. The use of the Shoreline Buffer Zone property is to be regulated entirely by this Plan, and any other agreements, oral or written, are invalid. Failure to comply with the terms and conditions of this Plan and those contained in the permits issued in contemplation of the Plan, or unauthorized alterations to the buffer zone by adjacent landowners or other parties, will result in the restoration of the area, and the cost of that restoration will be performed at the expense of the party causing the unauthorized alteration to occur, either intentionally or by mistake. To assist in communicating this Plan to adjacent property owners, Reynolds will give a copy of the Plan to the initial purchaser of the property and will reference the Plan in its covenants.

SPECIFIC USES

VEGETATION MANAGEMENT

1. Removal of Trees – Any and all tree removal, limbing, brushing, ground work or planting is prohibited without a permit from Georgia Power. All permit applications for ground work, including brushing, tree removal, or planting must be accompanied by detailed work/landscape plan that includes a tree survey. Georgia Power's minimum tree save ratio is 75% in buffer area. Re-vegetation may be required and Georgia Power promotes a 1 for 1 tree replacement policy, encouraging native trees and hardwoods.

Removal of Undergrowth — With a permit from Georgia Power, undesirable plants and noxious undergrowth such as briars, kudzu, and poisonous plants may be removed from the Shoreline Buffer Zone.

No burning or herbicides will be allowed within the Shoreline Buffer Zone. Only hand tools may be used for undergrowth removal.

Georgia Power's permit review process contemplates the long-term viability of trees/shrubs proposed for modification relative to the value of replacing those trees/shrubs with native vegetation. For example, in areas dominated by dense stunted pine stands, tree removal may be allowed followed by replacement with native hardwoods and shrubs.

2. Plantings – Any planting within the Shoreline Buffer Zone is prohibited without a permit from Georgia Power. All permit applications for ground work, including planting, must be accompanied by a detailed work/landscape plan that considers native species (refer to University of Georgia Extension Service web-site www.extension.uga.edu/publications for a list of suggested native plant species. To improve sustainability and availability, cultivars of the native species may be used as a substitute for native species. No turf grass will be permitted within fifty (50) feet of the shoreline.
3. Certain species of plants may be encouraged for planting along the shoreline and in the adjacent waters to aid in erosion control along the shoreline. These plantings help to reduce turbidity and bank erosion due to the actions of waves around the shoreline. Emergent and submergent plants can improve water quality, as well as provide cover for aquatic life and wildlife.

Existing aquatic plants growing both along the shoreline and in the lake may not be removed by adjoining owners without a permit from Georgia Power.

4. If it is determined that timber left standing inside the lake presents a navigational or other hazard, Georgia Power will permit the removal of timber with the following conditions: Only timber within 100 feet of the shoreline may be

removed and any removal will be permitted ONLY after consultation with WRD fisheries.

SHORELINE ACCESS

1. Clearing for Access – Any clearing in the Shoreline Buffer Zone that takes place for shoreline access will require a Georgia Power permit and will be subject to the same restrictions identified under “Vegetation Management” above.
2. Walkways – Walkways should follow the contour of the land and may use wood chips, flagstone (non-mortared), or natural stone. No impervious surfacing may be placed within the Shoreline Buffer Zone. Wood chips may be placed on the ground for use as surfacing over the access area. Boardwalks and wood steps may be utilized to access docks in special situations such as steep terrain.
3. Wetland Areas – If wetland areas are encountered within the access area to be used as a walk area, the wetland area should be bridged using a wooden walkway that must be supported on wooden pilings.
4. Dredging – Up to 500 cubic yards may be dredged within the Shoreline Buffer Zone, per standard Georgia Power guidelines, after obtaining a permit from Georgia Power.

SHORELINE FACILITIES

General

1. The use of the shoreline for private docks is only allowed by a permit obtained from Georgia Power, which may be revoked for failure to comply with the conditions and terms contained in this Plan. Permit revocation will require removal of the dock.
2. Construction - Except for boat docking, mooring structures, and necessary retaining walls, no structures of any type may be placed within or along the Shoreline Buffer Zone. Facilities that have been permitted in accordance with Georgia Power’s standard shoreline permitting policies may be constructed in the Shoreline Buffer Zone.
3. Facilities constructed of wood which are proposed to be located along the shoreline of the Shoreline Buffer Zone must be treated with preservatives which have been shown not to be harmful to the aquatic environment.
4. The location of facilities to be placed along the shoreline must be approved in writing by Georgia Power and defined as a condition of the permit. Factors which may determine the type and location of permitted facilities are: 1) prior location

of nearby facilities, 2) shoreline configuration and slope, and 3) type and size of facilities being proposed for construction.

Specific Facilities

1. Retaining walls - Retaining walls will only be considered where other means of controlling shoreline erosion would not be effective or feasible. Plans for the proposed construction of these structures must be submitted to Georgia Power for approval. Retaining walls will be approved only for preventing erosion of the shoreline, but cannot be utilized to create additional shoreline area or to elevate the shoreline. Retaining walls may be placed into the lake to restore the original shoreline in eroded areas. The height of the retaining wall should not normally exceed the elevation of the projected slope of the adjoining land. No retaining walls will be permitted in areas that might be classified as a wetland or would alter the natural movement of water over an area.

Backfill will be permitted only to the extent of meeting the natural slope of the land behind the retaining wall. Back-filled areas should be planted with native species (refer to University of Georgia Extension Service web-site www.extension.uga.edu/publications for a list of suggested native plant species). To improve sustainability and availability, cultivars of the native species may be used as a substitute for native species. No turf grass will be permitted in the Shoreline Conservation Buffer Zone within fifty (50) feet of the shoreline.

Riprap is required to be placed along the length of the base of the retaining wall to prevent undermining of the foundation and erosion from behind the wall.

2. Docks - Georgia Power must approve and issue a permit for the location of all docks to be placed along the shoreline prior to beginning construction. For a dock to be permitted, the lot must have at least 100 feet of shoreline and must be set back at least 15 feet from either side lot line. It is possible that lots with narrow widths along the water may not qualify for a dock.
3. Wharves - Wharves may be approved for use after plans have been submitted to Georgia Power for approval. Linear wharves may not be wider than 10 feet and not longer than 30 feet. Georgia Power Company must approve and issue a permit for the location of the wharf. Wharves may not have seating benches constructed as part of the structure.
4. Only one mooring facility, either a dock or wharf, will be permitted for an adjoining property. The two facilities may not be merged into a single structure.

OTHER USES

PUBLIC USES

1. Similar to all other shoreline on Lake Oconee, the area encompassed by the Shoreline Buffer Zone may be used by the public for general recreation purposes, such as fishing, swimming, and picnicking, during daylight hours. No overnight camping will be permitted within the Shoreline Buffer Zone.
2. Community dock facilities may be permitted along the shoreline of the Shoreline Buffer Zone. These facilities, which may contain a maximum of ten (10) boat slips, will provide docking facilities for individuals who are not eligible for an individual dock. The location of these facilities must be approved by Georgia Power and will be permitted to the developer, or owners association, who shall be responsible for the management and maintenance of the facilities.

APPENDIX E

Proposed Recreation and Land Use Plan

PROPOSED RECREATION AND LAND USE PLAN, WALLACE DAM PROJECT (FERC NO. 2413)

Introduction

Georgia Power Company (Georgia Power) proposes to operate and maintain project recreation facilities and manage Georgia Power-owned lands within the project boundary for recreation, environmental quality, and visual aesthetic purposes for the term of the new license. This plan describes the specific project recreation facilities, lands reserved for future recreation development, and shoreline buffer areas for protecting scenic, environmental, and recreation values of the Project. This proposed plan updates and supersedes the revised Recreation Plan (Exhibit R) approved under the original license order (February 3, 1975).

Project Recreation Facilities

Numerous public and private facilities provide direct access to the Wallace Dam Project. Under Georgia Power's licensing proposal, the number of project recreation facilities owned and operated by Georgia Power would increase from seven to nine facilities. Georgia Power proposes to operate and maintain these facilities for recreation purposes for the term of the new license. The project recreation facilities include (Figure E-1):

- Lawrence Shoals Park: an 83.6-acre facility located on Lake Oconee in Putnam County approximately 0.5 river miles upstream of Wallace Dam. The park is located entirely within the project boundary and provides a campground, day-use area, boat ramp, swimming beach, restrooms, picnic pavilions, picnic tables, nature trails, and parking.
- Old Salem Park: an 83.3-acre facility located on Lake Oconee, south of Hwy 44 in Greene County. The park is located entirely within the project boundary and provides a campground, day-use area, boat ramp, boat docks, swimming beach, restrooms, picnic pavilion, picnic tables, and parking.
- Parks Ferry Park: a 91.0-acre facility located on Lake Oconee just south of Interstate 20 (I-20) in Greene County. The park is located entirely within the project boundary. It consists of a campground, day-use area, playground, boat ramp, swimming beach, restrooms, picnic pavilion, picnic tables, and parking.
- Sugar Creek Boat Ramp: a 10.4-acre boat ramp facility located on the Sugar Creek embayment of Lake Oconee in Putnam County. The facility is located entirely within the project boundary. This facility provides a boat ramp, boat dock, shoreline fishing access, picnic tables, restroom, and parking. Under Georgia Power's licensing proposal, the facility will also include a new barrier-free fishing pier.
- Armour Bridge: a 10.7-acre boat ramp facility located on the Richland Creek embayment of Lake Oconee. The facility is located entirely within the project

boundary and consists of a boat ramp, boat dock, shoreline fishing access, picnic tables, restroom, and parking.

- Long Shoals Boat Ramp: a 12.1-acre facility on the southern main-stem portion of Lake Oconee in Putnam County and located entirely within the project boundary. The facility provides a boat ramp, boat dock, shoreline fishing access, picnic tables, restroom, and parking.
- Area C-5 Bank Fishing Access (new facility): a 10-acre tract on Lake Oconee along Hwy 44 within the project boundary in Greene County. The site was previously reserved for future recreation. Georgia Power proposes to develop the site under its licensing proposal to provide a fishing pier, parking, and lighting.
- Jerry's Hwy 44 Bank Fishing Access (new facility): a 0.69-acre tract on Lake Oconee along Hwy 44 within the project boundary in Putnam County. Georgia Power proposes to develop the site under its licensing proposal to provide a fishing pier, parking, and lighting.
- Georgia Hwy 16 Bridge Boat Ramp: a 2-acre existing access boat ramp facility in the Wallace Dam tailrace area in Hancock County. Under its licensing proposal, Georgia Power proposes to enhance development of the site to also include a fishing pier, vault toilet, and improved lighting.

All nine facilities would include a day-use area and provide bank fishing access and improved lighting. Bank fishing amenities would include barrier-free piers at four facilities. Seven of the facilities would provide boat ramps and restrooms, with year-round boat-fishing and tournament fishing access available at all six boat ramps on Lake Oconee. Three facilities would continue to provide full-service, seasonal campgrounds and swimming beaches.

Project Lands Reserved for Future Recreational Use

Georgia Power also owns and manages specific land parcels within the project boundary that are reserved for future recreational development. Based on the results of the Recreation and Land Use Study and stakeholder consultation, Area C-5 is proposed for development as a bank fishing access area under Georgia Power's licensing proposal.

Georgia Power's proposed Recreation and Land Use Plan for the Wallace Dam Project would reserve the following nine areas within the project boundary for future recreation development (Figure E-2):

- Area A-1: a heavily forested 138-acre tract located on a peninsula formed by the confluence of Richland Creek and the Oconee River in Greene County.

- Area A-2: a heavily forested 465-acre tract located at the confluence of Sugar Creek and the Oconee River in Putnam and Morgan Counties.
- Tract B: a 561-acre area next to Lawrence Shoals Park in Putnam County that Georgia Power owned and subsequently conveyed to the State of Georgia. The area includes undeveloped shoreline and associated buffer and a unique granite outcropping (Eatonton Outcrop) that supports two federally protected plant species. It also contains several miles of multi-use and foot trails that connect with Lawrence Shoals Park and the Rock Hawk Effigy and trail system located outside of, and partly inside of, the project boundary.
- Area B-3: a heavily forested 107-acre tract located on the Apalachee River in Greene County approximately 0.5 river miles below U.S. Hwy 278.
- Area B-5: a heavily forested 106-acre tract located on a peninsula formed by the confluence of Richland Creek and Rocky Creek tributaries in Greene County.
- Area C-2: a 9-acre tract located on Lick Creek at Georgia Hwy 44 in Putnam County.
- Area C-4: a moderately forested 8-acre tract located on the Apalachee River in Greene County.
- Area C-6: a 5-acre tract located on Richland Creek at Georgia Hwy 44 in Greene County.
- Area C-7: a 9-acre site located on Beaverdam Creek approximately 2 miles above its confluence with Richland Creek in Greene County.

These lands were set aside in the Project's original Recreation Plan and categorized for various recreational uses. The A tracts were reserved for future development of state parks. Based on our consultation with Georgia Department of Natural Resources (GDNR), that remains the intended purpose of Area A-2, as well as Tract B. Tract B was acquired during a land exchange involving the original A-1 tract (see below). Areas B-3 and B-5 were originally reserved for future day and overnight users, while the C tracts were reserved for future lake access sites. Georgia Power proposes to reserve these lands for future recreation and continue to manage these lands under the new license in a manner consistent with our mission of preserving the scenic, environmental, and recreational values of Lake Oconee.

Future recreation needs were assessed in the Recreation and Land Use Study by examining population trends in the 24 counties representing the majority (89 percent) of the recreation users interviewed in the recreation surveys. The population of these counties is projected to grow by 5 percent (2015-220), 10 percent (2020-2030), 8 percent (2030-2040), and 7 percent (2040-2050). Recreation use at the Project is forecasted to increase by 33 percent between 2015 and 2050. While the 2016 recreation survey indicates that parking capacity at each of

Georgia Power's existing recreation facilities would likely be adequate through the term of the new license, Georgia Power stands ready to respond to demonstrated increased recreation demand by retaining tracts set aside in the original project license for future recreational development as appropriate.

Area A-1 Land Exchange

Georgia Power's revised Exhibit R (approved by Order issued February 3, 1975) designated Area A-1, an approximately 800-acre peninsula formed by the confluence of the Oconee River and Richland Creek, for future use as a state park. In 1996, the Commission approved the exchange of 558 acres of Area A-1 for a 421-acre parcel of non-project lands, which became Tract B. To offset the difference in area between the two parcels, the Commission required Georgia Power to add two supplemental parcels totaling about 135 acres to Tract B. Tract B was then placed in the project boundary and reserved for a future state park.

The remainder of Area A-1 stayed in the project boundary as land reserved for future recreational use, per the revised Exhibit R (approved by Order issued March 14, 2002).

U.S. Forest Service Recreation Areas

The U.S. Forest Service (FS) Oconee Ranger District owns and operates three recreation areas on Oconee National Forest (NF) lands north of I-20. They are located within the Redlands Wildlife Management Area (WMA) and provide direct access to the northern-most reaches of Lake Oconee. The three FS recreation areas are (Figure E-1):

- **Dyar Pasture Recreation Area:** a 241.1-acre site located off Copeland Road in Greene County. Approximately 84.93 acres of the recreation area are located within the project boundary. The recreation area inside of the project boundary includes a boat ramp, boat dock, shoreline fishing access, and 49.26-acre waterfowl conservation area. Parking, picnic facilities, a restroom, and nature trails are outside of the project boundary.
- **Redlands Recreation Area:** a 1,393.7-acre site located off U.S. Hwy 278 in Greene County. Only a portion of the recreation area, 8.03 acres, is located within the project boundary. Recreation amenities inside the project boundary include a boat ramp, boat dock, and shoreline fishing access. A large parking lot, picnic facilities, and a restroom are outside of the project boundary.
- **Swords Recreation Area:** a 314.9-acre site located off Blue Springs Road in Morgan County. Only 7.23 acres are within the project boundary. Recreation amenities inside the project boundary include a boat ramp, boat dock, and shoreline fishing access. A large parking lot, picnic facilities, and a restroom are outside of the project boundary.

FS manages these recreation areas under the Land and Resource Management Plan for the Chattahoochee-Oconee National Forests (FS, 2004). GDNR assists FS in managing the waterfowl conservation area at the Dyar Pasture Recreation Area.

Buffer Areas

Article 40 of the original license required Georgia Power to acquire all privately-owned lands within 100 horizontal feet (ft) from the normal operating pool (435 ft msl) for a distance of approximately 20 miles, generally across the reservoir from the 800-acre Area A-1 (original size), which was reserved for a future state park (original Area A-1) (Figure E-3). The article also required Georgia Power to acquire all lands within 200 horizontal ft of the normal operating pool generally across the reservoir from the 500-acre Area A-2, also reserved for a future state park and FS lands (Figure E-2). To achieve this, Georgia Power acquired additional 100-ft buffer strips (about 8 miles in length) along the mainstem of the reservoir in the vicinity of Area A-1 in addition to the shoreline it already owned along the Oconee WMA lands, Area B-5, and Area C-1. The requisite 200-ft buffer strips were also acquired across from Area A-2 tract and FS lands.

As previously noted, Area A-2 is still being reserved for a future state park, so the 200-ft buffer will be maintained in that area, as well as those areas across the reservoir from lands currently owned by FS. Area A-1 is no longer slated as a future state park; therefore, there is no need to maintain a 100-ft buffer in the vicinity (Figure E-3). Georgia Power will maintain those 100-ft strips, along with lands included in the Oconee WMA, Area B-5, and Area C-1 in a manner consistent with our mission to protect the scenic, environmental, and recreation values of Lake Oconee.

Submerged Timber Management Plan

The original license required that a total of 1,250 acres of timber be left uncut in Lake Oconee for fish and wildlife habitat (Figure E-4). Other areas of submerged timber were designated for fish habitat (fish plots), totaling 235 acres, but there were no acreage requirements. These standing timber areas are marked with signage and buoys and identified on maps used by anglers. Forty years after impoundment, much of the standing timber that was intended for wildlife habitat has decayed to the point that it is below the waterline and the timber that remains will continue to decay. In addition to no longer being available for waterfowl and other wildlife, that submerged timber has the potential to create a boating hazard. Georgia Power will, therefore, adapt its management focus to reflect current conditions.

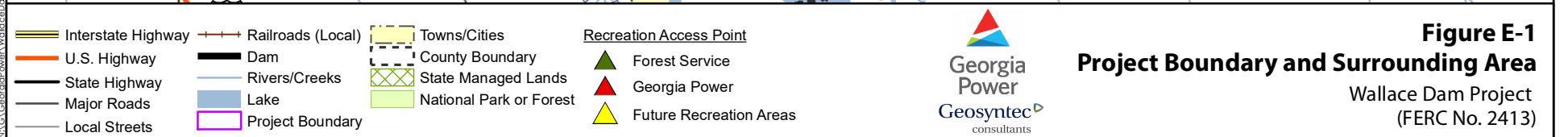
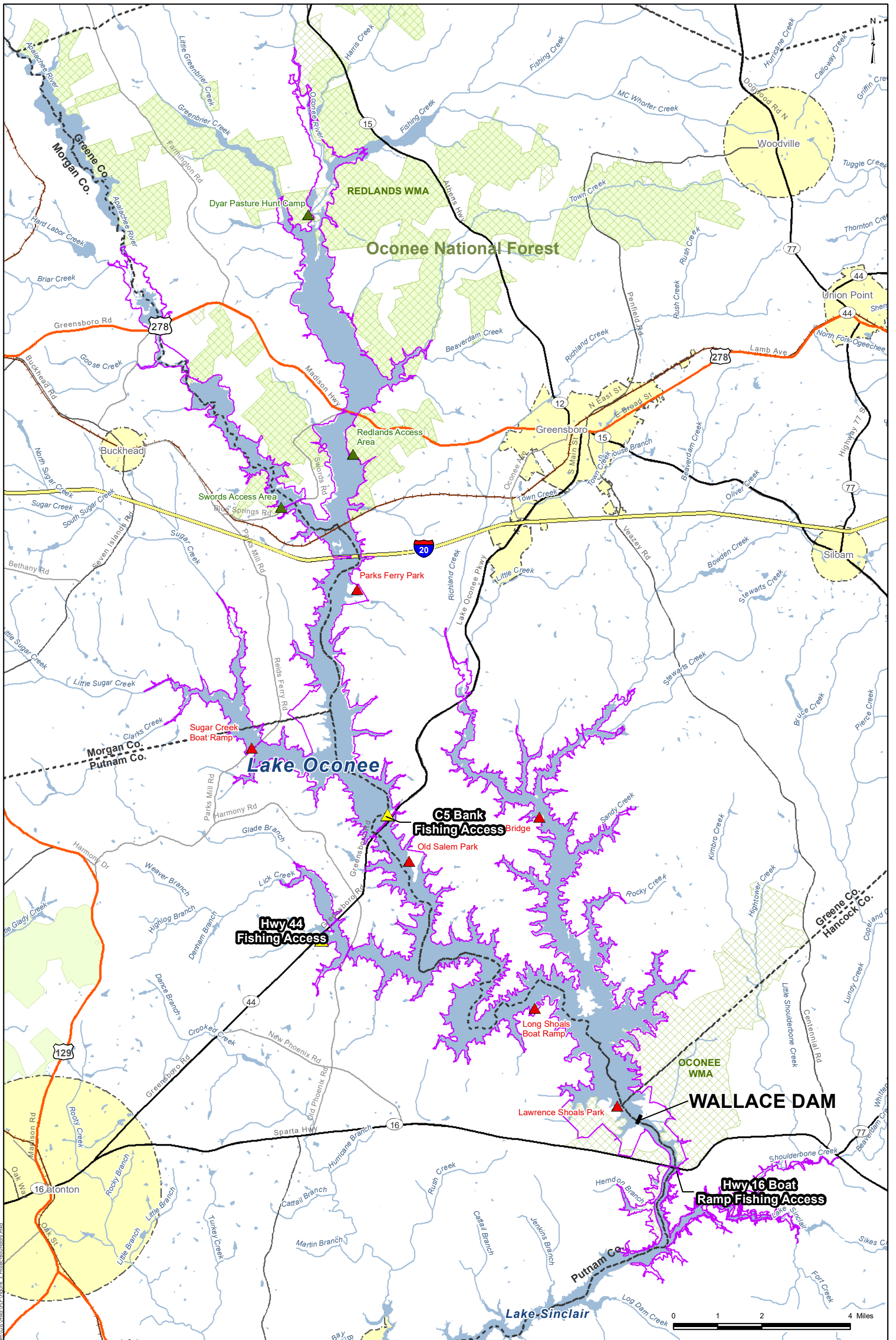
Over the course of the original license, Georgia Power worked with the Commission and the Georgia Department of Natural Resources (GDNR) Wildlife Resources Division and Law Enforcement Division to cut timber in areas that posed boating hazards. Using this process as a model, Georgia Power has developed a plan for managing these areas for fish habitat and public safety. If a hazard is identified, Georgia Power will consult with GDNR to determine the area(s) to be cut. Once these areas have been clearly delineated, the trees will be cut to a

depth of 10 ft below the surface of the water. Ideally, the cut logs will sink and form a complex bottom habitat; however, those logs that float will be removed from the water.

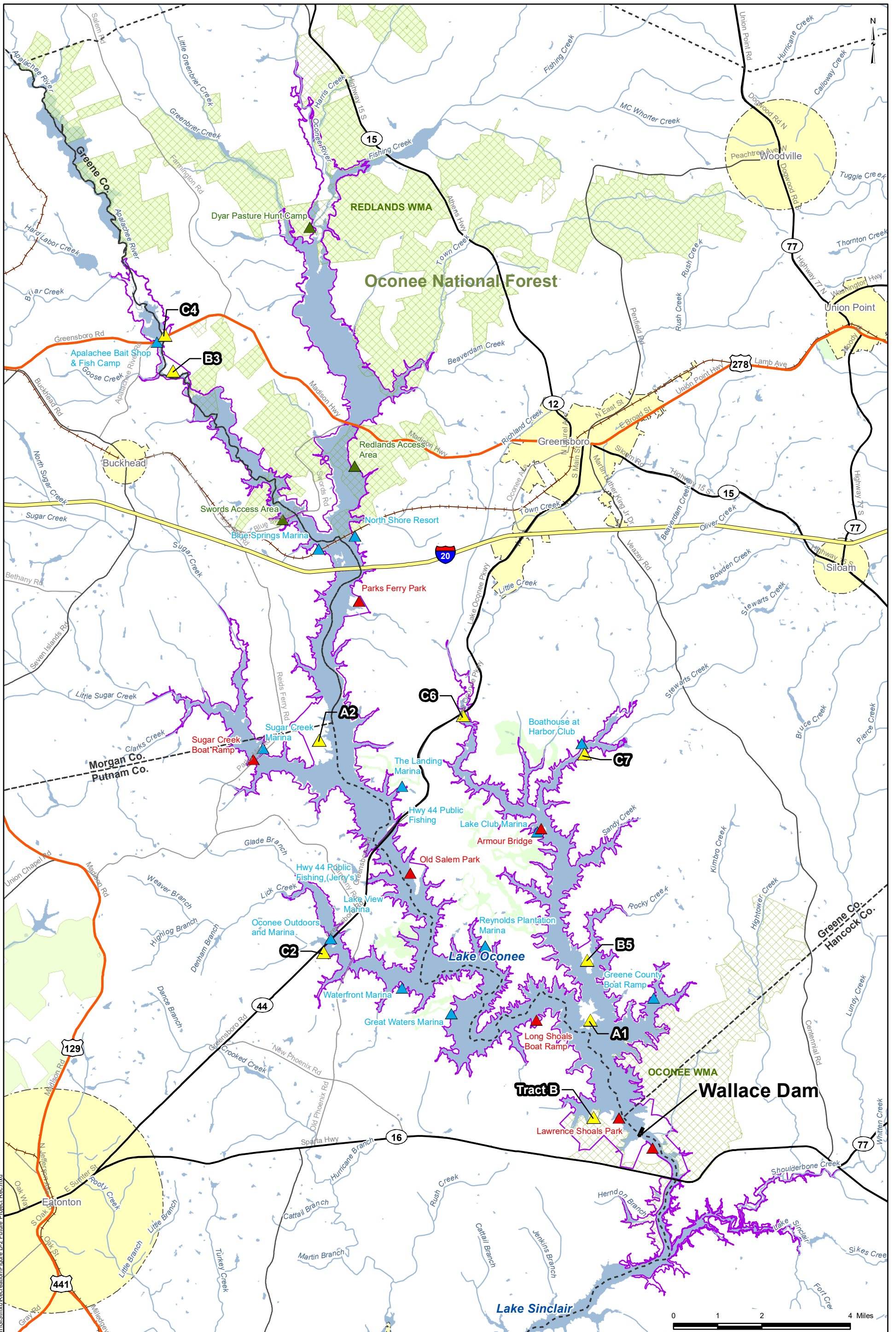
Reference

U.S. Forest Service (FS). 2004. Land and resource management plan, Chattahoochee-Oconee National Forests. U.S. Department of Agriculture, Forest Service Southern Region, Atlanta, GA. Management Bulletin R8-MB 113A. January 2004.

FIGURES



A:\CS\GeorgiaPower\WallaceDam\GIS\mxd\FPA\Figure_3_ProjectBoundary.mxd



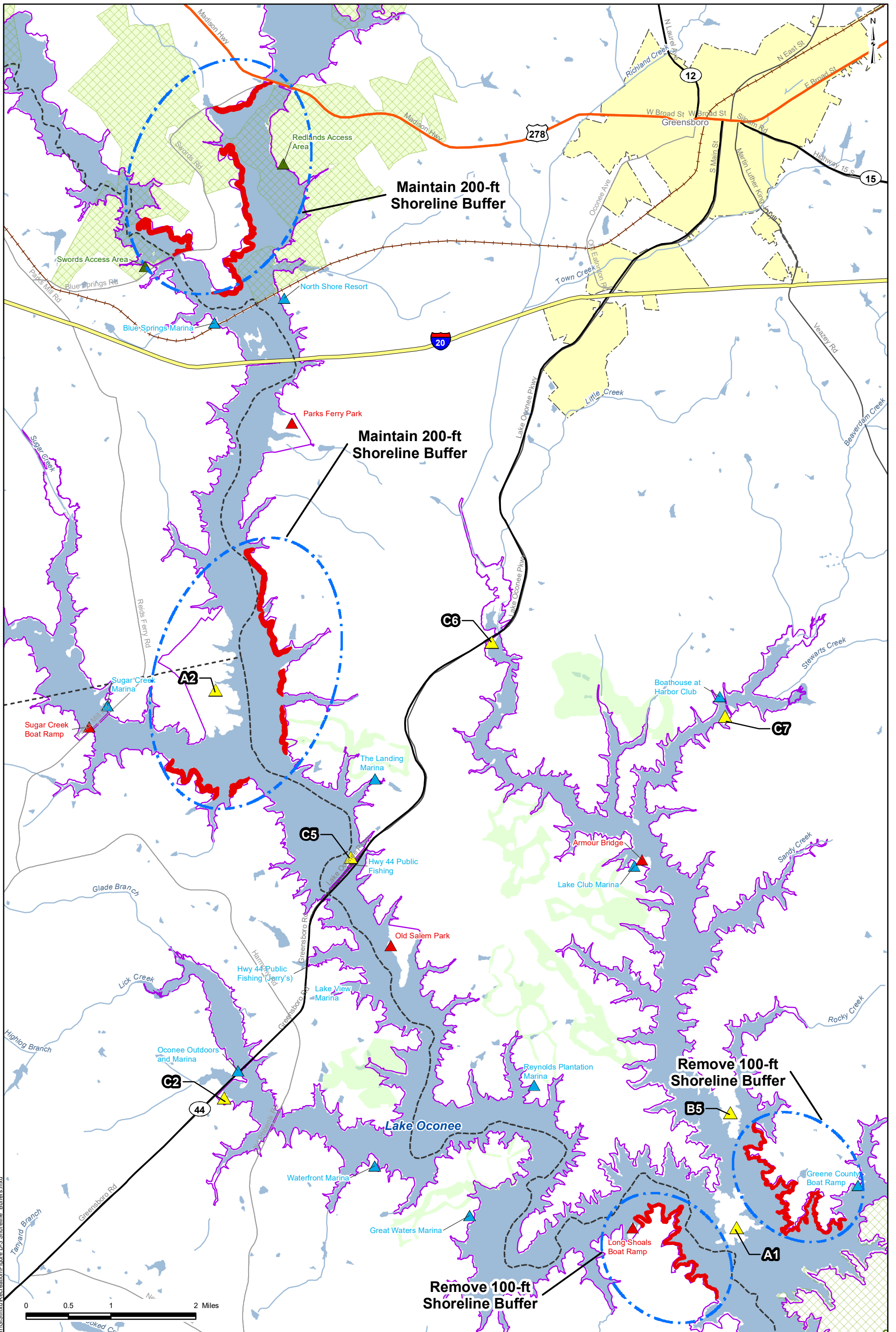
M:\Georgiapower\WallaceDam\GIS\mxd\Recreation\Figure D-2 Future Project Recre.mxd

- | | | | |
|--------------------|-------------------|-------------------------|--------------------------------|
| Interstate Highway | Railroads (Local) | State Managed Lands | Recreation Access Point |
| U.S. Highway | Dam | National Park or Forest | Forest Service |
| State Highway | Rivers/Creeks | County Boundary | Georgia Power |
| Major Roads | Project Boundary | | Public/Private |
| Local Streets | Towns/Cities | | Future Recreation Areas |



Figure E-2
Future Recreation Areas

Wallace Dam Project
(FERC No. 2413)



Maintain 200-ft Shoreline Buffer

Maintain 200-ft Shoreline Buffer

Remove 100-ft Shoreline Buffer

Remove 100-ft Shoreline Buffer

- | | | | |
|--|--|--|--------------------------------|
| | | | Recreation Access Point |
| | | | |
| | | | |
| | | | |
| | | | |



Figure E-3
Shoreline Buffers Changes

Wallace Dam Project
(FERC No. 2413)

M:\Georgiapower\WallaceDam\GIS\mxd\Recreation\Figure D-3 Shoreline Buffers.mxd

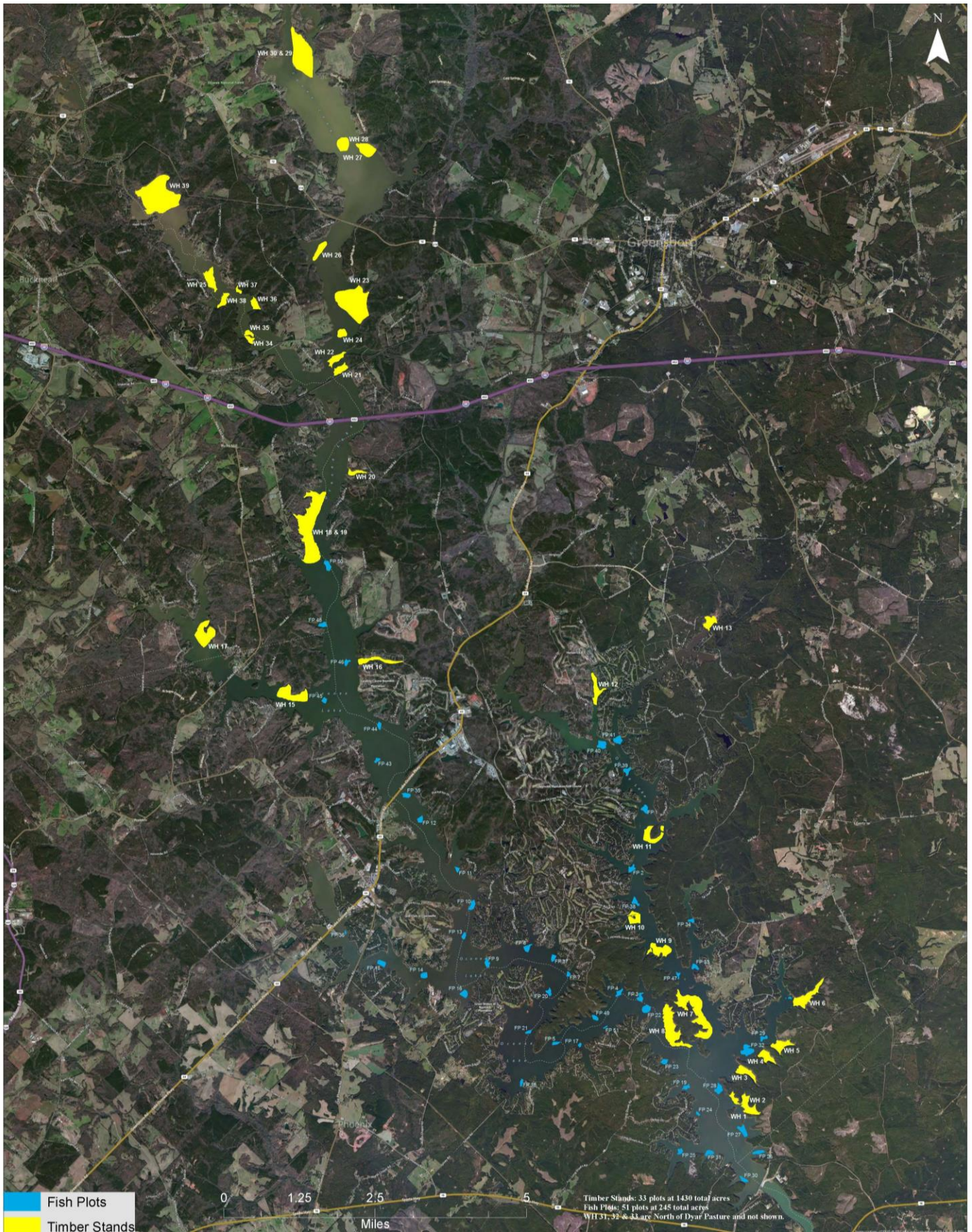


Figure E-4
Standing and Submerged Timber Stands
 Wallace Dam Project
 (FERC No. 2413)

APPENDIX F

Draft License Articles for the Wallace Dam Project

**DRAFT LICENSE ARTICLES
WALLACE DAM PROJECT (FERC NO. 2413)**

Introduction

Georgia Power Company (Georgia Power) anticipates that upon issuing a new license for the Wallace Dam Project the Federal Energy Regulatory Commission (FERC, the Commission) will replace Articles 1 through 57 of the current license with the Commission's current standard license articles. In addition to the standard articles, Georgia Power proposes the following project-specific license articles pertaining to public safety, project operations and compliance monitoring, tailrace water quality enhancement and monitoring, submerged timber management, recreation enhancements, shoreline management, and historic properties management.

Draft License Articles for the Wallace Dam Project

Article 401. Project Operations.

Article 401(a). Fluctuation Limits. The licensee will operate the Wallace Dam Project to limit the daily fluctuation of Lake Oconee to 2 feet (ft).

Article 401(b). Drawdowns. In the event of a planned, non-emergency drawdown that would reduce the reservoir elevation below 433 ft plant datum (PD), the licensee must consult with the Georgia Department of Natural Resources (GDNR). When non-emergency drawdowns are scheduled with GDNR, the licensee shall report the schedule to the U.S. Fish and Wildlife Service (FWS), the Commission, and the Commission's Atlanta Regional Office at least 10 days prior to the non-emergency drawdown. In the case of an emergency drawdown, the licensee must notify GDNR, FWS, the Commission, and the Commission's Atlanta Regional Office within 10 days after each such incident.

Article 401(c) Coordinated Operations. The operation of the Wallace Dam Project (P-2413) shall be coordinated with the operation of the Sinclair Project (P-1951), so that the licensee for P-2413 is authorized to utilize the Sinclair Reservoir as a source of water at no cost and as a lower pool for the operation of the pumped-storage facilities of the Wallace Dam Project when operating under this license. During extended low flow conditions in the basin, the Wallace Dam Project supplements flows to support the downstream Sinclair Project minimum flow requirements. When calculated inflow at the Sinclair Project falls below 250 cubic feet per second (cfs), water will be released from Lake Oconee to supplement the release downstream of Lake Sinclair.

Article 402. Project Operation Compliance Monitoring.

The licensee must monitor project operation and reservoir elevations to ensure compliance with the operational requirements of Article 401 of this license. The licensee must monitor the

hourly headwater elevations, which are recorded at the plant electronically, and maintain such records for periodic review. These data must be made available to the Commission at any time upon request. In addition, the licensee must document annually in a report, compliance with the fluctuation requirements of Article 401. The report must be filed with the Commission and GDNR by March 1 of the year following the monitoring.

Article 403. Tailrace Water Quality Enhancement.

Within 2 years of the issuance of the license, the licensee shall install and operate a dissolved oxygen (DO) enhancement system to improve summer DO concentrations in the Wallace Dam tailrace area. The licensee must operate the DO enhancement system as needed during the period May 1 through October 31 each year. The DO enhancement system must be in place throughout the period May-October, unless the DO monitoring required by Article 404 shows that a longer time period is needed to enhance DO in the tailrace.

The use of the DO enhancement system may be temporarily modified if required by operating emergencies beyond the control of the licensee, or for short periods upon mutual agreement among the licensee and GDNR. In the event of a planned modification, the licensee must notify the Commission at least 10 days in advance.

In the event of an emergency modification to the DO enhancement system, the licensee must notify the Commission and GDNR no later than 10 days after each such incident.

Article 404. Tailrace Water Quality Monitoring.

The licensee shall monitor DO and water temperature in the Wallace Dam tailrace area during the period May 1 through October 31 each year monitoring is to occur following the installation and deployment of the DO enhancement system. Monitoring shall be conducted using an automatic probe recording measurements at 60-minute intervals at Station OCTR, or other representative location. The licensee shall prepare a monitoring report annually for each of the first 3 years of monitoring, with the annual report due by January 31 of the following calendar year.

In addition, the licensee will file a 3-year monitoring report with FERC, due by April 30 of the calendar year following the third year of monitoring. The 3-year monitoring report must include:

1. The DO data collected during the 3-year monitoring effort;
2. A discussion of the effectiveness of the DO enhancement system;
3. Any recommendations for modifying the DO enhancement system or monitoring effort; and

4. Documentation of consultation with GDNR, copies of the agency's comments and recommendations on the completed report after it has been prepared and provided to the agency for review, and specific descriptions of how the agency's comments are addressed in the report. The licensee must allow a minimum of 30 days for the agencies to comment and to make recommendations before filing the report with FERC. If the licensee does not adopt a recommendation, the filing must include the licensee's reasons, based on project-specific reasons.

The approved Tailrace Water Quality Monitoring Program must not be amended without prior FERC approval. FERC reserves the right to require changes to the program, based on the information provided in the 3-year monitoring report.

Article 408. Shoreline Stabilization Plan.

The Shoreline Stabilization Plan, filed on May 31, 2018, as Appendix B of Exhibit E, is approved and must be implemented, according to the schedule included in the plan.

Within 180 days of completion of all the shoreline stabilization required by the plan, the licensee must file for Commission approval, as-built drawings that show the location of all shoreline stabilization placed in relation to the Wallace Dam project boundary.

Article 409. Recreation and Land Use Plan.

The Recreation and Land Use Plan, filed on May 31, 2018, as Appendix E of Exhibit E, is approved. The approved Recreation and Land Use Plan must not be amended without prior consultation with GDNR and approval by FERC.

Article 410. Recreation Enhancement Measures Plan.

The Recreation Enhancement Measures Plan, filed on May 31, 2018, as Appendix C of Exhibit E, is approved and must be implemented, according to the schedule included in the plan.

Within 180 days of completion of all the recreation facilities required by the plan, the licensee must file, for Commission approval, as-built drawings that show the location, type, and layout of all constructed recreation facilities in relation to the Wallace Dam project boundary.

The approved Recreation Enhancement Measures Plan must not be amended without prior Commission approval. The Commission reserves the right to make changes to any revisions filed for the Recreation Enhancement Measures Plan.

Article 411. Shoreline Management Plan.

The Shoreline Management Plan, filed on May 31, 2018, as Appendix D of Exhibit E, is approved. The approved Shoreline Management Plan must not be amended without prior

Commission approval. The Commission reserves the right to make changes to any revisions filed for the Shoreline Management Plan.

Article 412. Programmatic Agreement and Historic Properties Management Plan.

The licensee must implement the Programmatic Agreement among FERC, GDNR – Historic Preservation Division, and Advisory Council on Historic Preservation as executed by the parties. In the event the Programmatic Agreement is terminated, the licensee must continue to implement the provisions of its approved HPMP. The Commission reserves the right to require changes to the HPMP.

APPENDIX G

Overview of Exhibit E Privileged Information

Exhibit E Privileged Information contains documents that include privileged and confidential commercial, financial, and economic information that should not be released in accordance with Federal Energy Regulatory Commission regulations found at 18 C.F.R. § 88.112.

The privileged and confidential information derives economic value from not being generally known to, and not being readily ascertainable by proper means by, other persons who can obtain economic value from its disclosure or use. Additionally, the documents that contain this privileged and confidential information are subject to extensive efforts by Georgia Power Company (Georgia Power) and Southern Company to maintain their secrecy.

The privileged and confidential information contains pricing information specific to Georgia Power and Southern Company. If revealed to the public, the information would provide valuable insights into the companies' practices, allowing suppliers and competitors to price products in a manner which would negatively impact the company's competitive position in a substantial way. This would ultimately cause severe economic harm to Georgia Power and Southern Company and, significantly, their customers. The information is therefore exempt from disclosure pursuant to Section (b)(4) of the Freedom of Information Act, 5 U.S.C. § 552(b)(4).

Only select Georgia Power and Southern Company personnel and their legal counsel are granted access to these documents that contain privileged and confidential information. Those personnel receive access only on a "need to know" basis. If a party outside Georgia Power and Southern Company and their legal counsel is granted access to the documents, the party is required to sign a confidentiality agreement with respect to the documents. Additionally, access to Georgia Power and Southern Company buildings and files is restricted.

See Privileged Information Volume of this license application.



WALLACE DAM



Lake Oconee

Exhibit E

Privileged Information

Wallace Dam Hydroelectric Project

FERC Project Number 2413

Privileged
Proprietary/Confidential Information
Contains Privileged Information-Do Not Release

Prepared by
Southern Company Generation Hydro Services

May 2018

Georgia Power Company
Wallace Dam Project P-2413
Exhibit E, Privileged Information

**Contains Privileged Information
Do Not Release**

Exhibit E - Privileged Information contains Documents that include privileged and confidential commercial, financial, and economic information that should not be released in accordance with Federal Energy Regulatory Commission regulations found at 18 C.F.R. § 388.112.

The privileged and confidential information derives economic value from not being generally known to, and not being readily ascertainable by proper means by, other persons who can obtain economic value from their disclosure or use. Additionally, the Documents that contain this privileged and confidential information are subject to extensive efforts by Georgia Power Company (Georgia Power) and Southern Company to maintain their secrecy.

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See Volume 8
Exhibit E – Privileged Information