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November 24, 2015

Wallace Dam Project, FERC Project Number 2413-117

Wallace Dam Relicensing Revised Study Plan

Ms. Kimberly D. Bose, Secretary Federal Energy Regulatory Commission 888 First Street, N. E. Washington, D. C. 20426

Dear Ms. Bose:

On behalf of Georgia Power Company, Southern Company is filing this letter to provide the Revised Study Plan for relicensing the Wallace Dam Hydroelectric Project, in compliance with Federal Energy Regulatory Commission Integrated Licensing Process regulations at 18 C.F.R. Part 5 \$5.13(a). If you require further information, please contact me at 404.506.7219.

Sincerely,

Courtenay R. O'Mara, P.E.

Hydro Licensing & Compliance Supervisor

Courtinay R. O'Mara

Enclosure

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WALLACE DAM



Revised Study Plan

Wallace Dam Hydroelectric Project FERC Project Number 2413

Prepared with:

Southern Company Generation Hydro Services

and



November 2015



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Appendix A Georgia Power Responses to Comments on the Proposed Study Plan



ACRONYMS AND ABBREVIATIONS

APE Area of potential effect

CFR Code of Federal Regulations

Commission Federal Energy Regulatory Commission

DO dissolved oxygen

EPA U.S. Environmental Protection Agency FERC Federal Energy Regulatory Commission

FS U.S. Forest Service

ft feet

FWS U.S. Fish and Wildlife Service

GDNR Georgia Department of Natural Resource GEPD Georgia Environmental Protection Division

Georgia Power Georgia Power Company
GPS Global Positioning System
HPD Historic Preservation Division

HPMP Historic Properties Management Plan

HUC Hydrologic Unit Code

Hwy Highway I-20 Interstate 20

ILP Integrated Licensing Process

mg/L milligrams per liter

National Register National Register of Historic Places
NEPA National Environmental Policy Act
NERC North American Reliability Corporation

NF National Forest

NTU Nephelometric turbidity units NWI National Wetlands Inventory PAD Pre-Application Document

PD plant datum

PLP Preliminary Licensing Proposal

PSP Proposed Study Plan

ROW right-of-way

RSP Revised Study Plan

RTE rare, threatened, and endangered

Geosyntec consultants

SCORP State Comprehensive Outdoor Recreation Plan

SD1 Scoping Document 1

SWAP State Wildlife Action Plan

TVM Transmission Vegetation Management

UGA University of Georgia

USACE U.S. Army Corps of Engineers
WMA Wildlife Management Area
WRD Wildlife Resources Division

1.0 INTRODUCTION

Georgia Power Company (Georgia Power) is filing with the Federal Energy Regulatory Commission (FERC or Commission) its Revised Study Plan (RSP) as part of the relicensing of the existing 321.3-megawatt Wallace Dam Hydroelectric Project (FERC No. 2413) (Wallace Dam Project, the Project). The Wallace Dam Project is a pumped storage project consisting of Wallace Dam, a powerhouse, and Lake Oconee and is located on the Oconee River in Hancock, Putnam, Greene, and Morgan Counties, Georgia (Figure 1-1). The Wallace Dam Project operates using Lake Oconee as the upper reservoir. Lake Sinclair, located immediately downstream, serves as the lower reservoir and is operated by Georgia Power as the separately licensed Sinclair Hydroelectric Project (Sinclair 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 370 acres of U.S. Forest Service (FS) lands within the Oconee National Forest (NF), and which also abuts Lake Oconee's northernmost reaches. The current license expires May 31, 2020.

Pursuant to FERC's Integrated Licensing Process (ILP) (18 Code of Federal Regulations [CFR] Part 5), Georgia Power filed its Pre-Application Document (PAD) with FERC on February 18, 2015. The PAD describes the existing facilities and current operation of the Wallace Dam Project; characterizes the affected environment and potential resource impacts of continued operation; and sets forth a Process Plan and Schedule for all pre-application activities and stakeholder participation. The PAD is available on Georgia Power's Wallace Dam Relicensing Website at:

http://www.georgiapower.com/about-energy/energy-sources/hydro-power/hydro-projects/wallace/home.cshtml

FERC issued Scoping Document 1 (SD1) on April 17, 2015, and held National Environmental Policy Act (NEPA) scoping meetings and a site visit on May 19-20, 2015. Relicensing stakeholders subsequently filed their comments on the PAD and SD1, as well as study requests, by June 19, 2015. FERC requires that any study requests and modifications address the content criteria established at 18 CFR § 5.9(b).

Georgia Power filed its Proposed Study Plan (PSP) with FERC on July 27, 2015 for review and comment by relicensing stakeholders, who had until October 26, 2015, to file their comments. Georgia Power has prepared this RSP to address and incorporate stakeholder comments made during the Study Plan Meetings held on August 25 and 26, 2015, and the written comments filed during the PSP comment period. The RSP is intended to resolve differences over the proposed studies, as described in Section 1.2 below. FERC will issue a Study Plan Determination by December 24, 2015, which Georgia Power will use to implement studies.

1.1 <u>Document Organization</u>

Study Plans for each of seven resource areas are provided in Sections 2 through 8. Each Study Plan follows the content requirements at 18 CFR § 5.11(d), including goals and objectives, study background, study area, methodology, reporting, and schedule. The seven Study Plans are:

- Section 2 Geology and Soils
- **Section 3** Water Resources
- **Section 4** Fish and Aquatic Resources
- **Section 5** Terrestrial Resources (wildlife and botanical resources, and wetlands, riparian, and littoral habitats)
- Section 6 Rare, Threatened, and Endangered Species
- **Section 7** Recreation and Land Use
- **Section 8** Cultural Resources

1.2 <u>Stakeholder Consultation</u>

During the 90-day comment period for the PSP, Georgia Power consulted with resource agencies and other participants in two Study Plan Meetings on August 25 and 26, 2015. The goal of these meetings was to discuss information gathering needs relevant to agencies' jurisdiction over the resource areas and resolve any outstanding differences between the PSP and the initial study requests filed by stakeholders in June 2015.

Stakeholders filed their comments on the PSP by October 26, 2015. The following stakeholders filed comments on the dates indicated below, and their letters are provided in Appendix A with Georgia Power's responses:

- FERC October 23, 2015
- U.S. Fish and Wildlife Service (FWS) October 26, 2015
- Georgia Department of Natural Resources (GDNR), Wildlife Resources Division (WRD) – October 26, 2015
- U.S. Environmental Protection Agency (EPA) October 26, 2015

Georgia Power's responses in Appendix A also provide explanations as to why certain study requests or study request modifications were not adopted in reference to the study request criteria set forth in 18 CFR § 5.9(b).

1.3 Master Schedule for Study Implementation

The master schedule in Table 1-1 provides the estimated start and completion dates of all proposed field studies, deadlines for filing Progress Reports and Study Reports, and the dates for Study Results Meetings. The majority of the proposed field work will be completed during the 2016 study season. Progress Reports for each resource area will be filed as one report by August 31, 2016, and Initial Study Reports will be filed as a complete package by November 18, 2016.

Because Georgia Power proposes that field studies be completed in 2016, with the exception of tailrace water quality monitoring for the Water Resources Study, which will be completed in 2017, the Progress Reports will be prepared at the level of detail of an Initial Study Report as described at 18 CFR § 5.15(c). The Progress Reports will describe overall progress in completing the study activities, summarize preliminary findings as available, and explain any variance from the FERC-approved Study Plan and schedule.

Since the Initial Study Reports will be completed within 1 year of FERC's Study Plan determination (December 24, 2015), they will be considered final study reports unless, as a result of stakeholder study review and the Study Results Meetings, FERC determines that modifications to the Study Plan are necessary. The exception to this is the Water Resources Study, which is now proposed as a two-year study. An updated Study Report is shown in the master schedule for Water Resources.

Georgia Power will communicate with all participants by e-mail, mail, or other available electronic means to ensure the distribution of the Progress Reports and Study Reports in a timely and efficient manner. Upon filing with FERC, the Progress Reports and Study Reports will be made available electronically for stakeholder review on the Internet at both FERC's website (using the eLibrary feature) and Georgia Power's Wallace Dam Relicensing Website:

http://www.ferc.gov/docs-filing/elibrary.asp

http://www.georgiapower.com/about-energy/energy-sources/hydro-power/hydro-projects/wallace/home.cshtml

TABLE 1-1
Master Schedule for Study Implementation for the Wallace Dam Project

Activity	Start Date	Completion Date or Deadline
Conduct Field Studies		
Geology and Soils	June 1, 2016	September 30, 2016
Water Resources	October 1, 2015	September 30, 2017
Fish and Aquatic Resources	March 1, 2016	September 30, 2016
Terrestrial Resources	April 1, 2016	September 30, 2016
Rare, Threatened, and Endangered Species	March	September 30, 2016
	1, 2016	
Recreation and Land Use	March 1, 2016	September 30, 2016
Cultural Resources	April 1, 2016	September 30, 2016
File Progress Reports (All Studies)	NA	August 31, 2016
File Final Study Reports (All Studies except Water Resources, which will be an Initial Study Report)	NA	November 18, 2016
Hold Study Results Meetings	December 5, 2016	December 6, 2016
File Study Results Meeting Summary	NA	December 21, 2016
Stakeholders File any Study Results Meeting Summary Disagreements and/or Modified or New Study Requests	NA	January 20, 2017
File Response to any Study Results Meeting Summary Disagreements and/or Modified or New Study Requests	NA	February 20, 2017
FERC Resolves any Disagreements (and Modifies Study Plans if Necessary)	NA	March 22, 2017
File Updated Study Report (Water Resources)	NA	October 11, 2017
Hold Updated Study Results Meeting (Water Resources)	October 16, 2017	October 17, 2017
File Updated Study Results Meeting Summary	NA	November 10, 2017

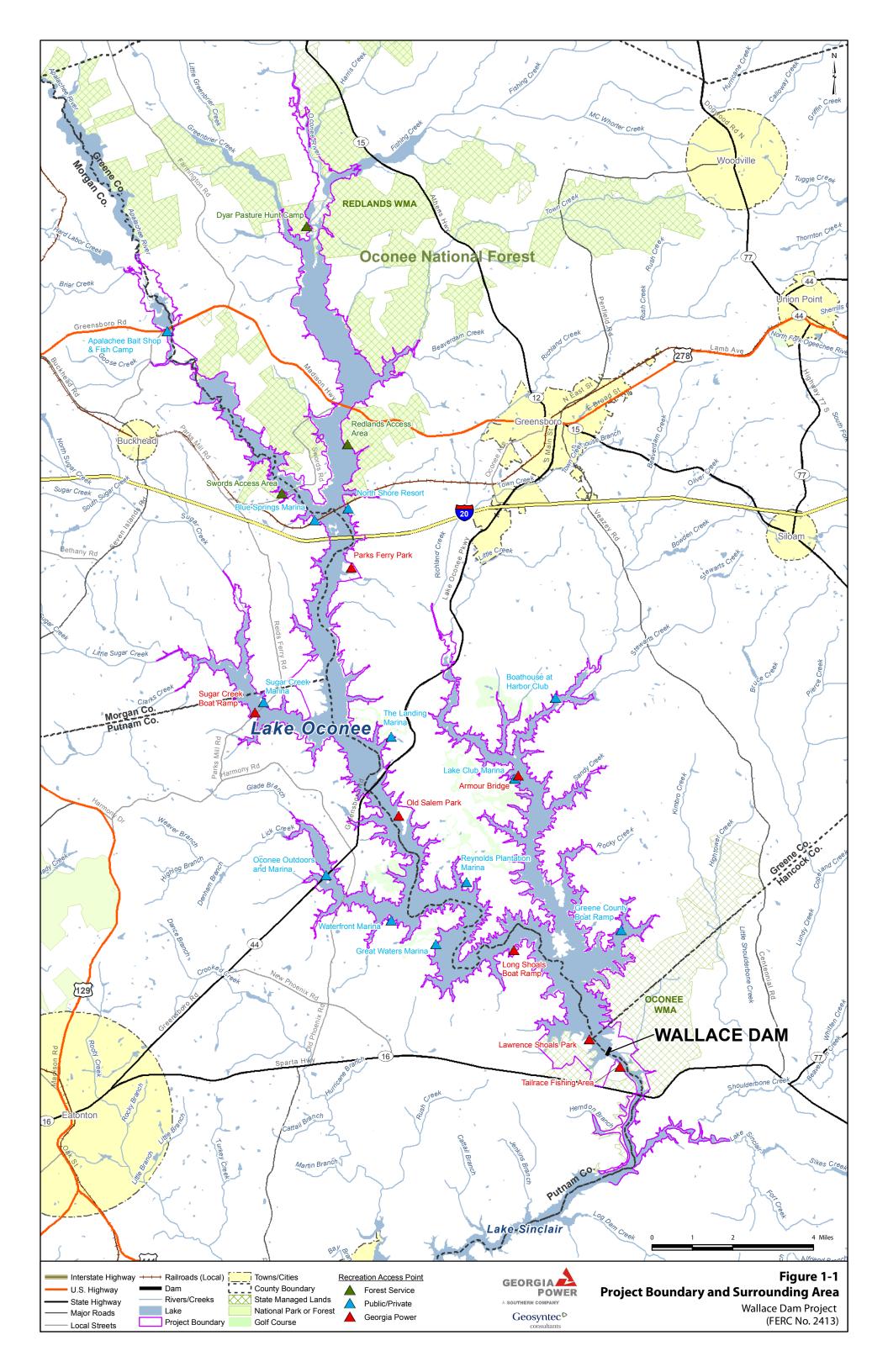
NA = not applicable.

1.4 Relationship of the Resource Studies to the License Application

Each resource study will culminate in the preparation of a Study Report (Table 1-1), which will develop information sufficient for characterizing the existing environment and evaluating the potential impacts of continued project operations in Georgia Power's Preliminary Licensing Proposal (PLP) and subsequent license application. The findings of the studies will be incorporated into the PLP, which will be filed by November 21, 2017, and made available for public comment (18 CFR § 5.16). The PLP will provide a draft environmental analysis by resource area of the impacts of the proposed action using the findings of the studies and will propose measures for the purpose of protecting, mitigating impacts to, or enhancing resources affected by the Project.

Based on comments on the PLP filed by stakeholders, Georgia Power will revise and incorporate the PLP into the license application as Exhibit E (18 CFR § 5.18). The license application will be filed by May 31, 2018. Exhibit E will include evaluation of reasonable and feasible alternatives to the proposed action, address cumulative impacts, and include measures as appropriate for enhancing environmental resources affected by the project proposal.

Under the ILP, FERC's NEPA document, which is also issued for public comment, will include FERC's determination regarding reasonable and feasible alternatives and cumulative impacts as part of its NEPA analysis.



2.0 GEOLOGY AND SOILS

2.1 Introduction

Georgia Power proposes to conduct a study characterizing existing erosion and sedimentation conditions within the Wallace Dam project boundary and evaluating the potential impacts of continued project operation and project-related recreation on erosion and sedimentation in the project area. This will be accomplished through a combination of a shoreline survey within the project boundary and review of existing information and data to analyze erosion and sedimentation as well as the effects of shoreline structural stabilization practices on littoral-zone aquatic habitats.

2.2 Goals and Objectives

The goal of this study is to develop information for: (1) characterizing existing shoreline conditions with respect to erosion and sedimentation in Lake Oconee and the Wallace Dam tailrace and (2) evaluating the Geology and Soils resource issues identified during FERC's public scoping process pursuant to NEPA that have a nexus with project operations.

The specific objective of the study is to characterize the distribution and sources of erosion and sedimentation within the FERC project boundary based on a shoreline field reconnaissance survey and review and analysis of existing information.

2.3 Study Background

This study will develop information needed to evaluate potential impacts of continued project operation in the PLP and license application in consideration of: (1) the geology and soils resource issues identified during NEPA scoping; (2) the studies and study modifications requested by resource agencies; (3) the known resource management goals of the agencies with jurisdiction over resources related to geology and soils; (4) existing information available for the Oconee River as summarized in the PAD; and (5) the requirement that there be a nexus between project operations and effects on the resources being evaluated.

2.3.1 Issues Identified

The Commission identified in SD1 the following resource issue pertaining to geologic and soils resources:

• Effects of continued project operation and project-related recreation on reservoir and tailrace shoreline erosion and sedimentation.

2.3.2 Study Requests

Georgia Power proposed in the PAD (Section 5.2.1, Preliminary Studies List) to conduct a study to characterize the distribution and sources of erosion and sedimentation within the project boundary, based on a shoreline field reconnaissance survey, as well as review and analysis of existing information and aerial photography. A shoreline survey would be conducted within the project boundary, including a shoreline aquatic habitat survey, and a literature review and analysis would be conducted on the effects of shoreline stabilization structures on littoral-zone aquatic habitat.

SD1 listed the proposed study as Study No. 1, Geology and Soils, with the shoreline habitat survey element of the proposed study listed separately as Study No. 3, Fish and Aquatic Resources. Georgia Power proposes to include the shoreline aquatic habitat survey as part of this Geology and Soils Study because the survey will be conducted concurrently with the reconnaissance survey for erosion and sedimentation (using the same field data form) and will be integral to the analysis of shoreline conditions and the effects of continued project operations and project-related recreation. The findings of the aquatic habitat survey portion of the field reconnaissance survey also will be cross-referenced in the Fish and Aquatic Resources Study as appropriate (Section 4.0).

No study requests pertaining to geology and soils were filed by stakeholders following the study criteria under 18 CFR § 5.9(b). In its PAD and SD1 comments letter dated June 15, 2015, WRD requested that additional objectives be incorporated into the shoreline habitat survey (Fish and Aquatic Resources Study No. 3). These include providing maps and information on the proportion of developed and undisturbed shoreline areas in the project reservoir and incorporating a literature review on the effects of shoreline development on sport fish species such as largemouth bass, black crappie, and sunfish. In the Study Plan Meetings held August 25-26, 2015, FERC staff commented that the shoreline habitat survey should differentiate between project related and non-project related causes of erosion.

In its PSP comments letter dated October 26, 2015, WRD expressed concern about the degree to which variation would be reduced by the proposed number of shoreline survey sites and recommended that Georgia Power consult a statistician to develop a sound survey approach.

Georgia Power proposes to survey shoreline aquatic habitat using a stratified random selection of sites to develop information on the proportions of natural versus modified shoreline with respect to vegetative buffer zone condition, bank stability and vegetative protection, proportions of shoreline with structural stabilization practices, potential causes of shoreline erosion/sedimentation and whether or not they are project-related, and sources of littoral-zone fish cover and habitat. As requested by WRD, the study will also provide a literature review on the relationship between shoreline structural stabilization practices and

littoral-zone fish habitat. To address WRD concerns about shoreline survey sample size, the number of proposed shoreline survey sites has been increased from 106 to 146 total sites.

2.3.3 Resource Management Goals

GDNR and FWS are the primary state and federal resource agencies having jurisdiction along the Oconee River pertaining to the protection of land and water resources. Relevant resource management goals of these agencies generally include the maintenance and protection of native shoreline vegetation, water quality and littoral-zone habitats for fish and aquatic species.

2.3.4 Existing Information

The Wallace Dam Project is located in the Southern Outer Piedmont ecoregion. This ecoregion is characterized by 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. The Lake Oconee shoreline is characterized by gently sloping topography in most areas. Rock outcroppings occur along the shoreline in several areas, particularly in the lower end of the reservoir around the confluence of the Oconee River and Richland Creek. Significant stretches of undeveloped, forested shoreline occur in the lower end of the reservoir in association with Georgia Power's Lawrence Shoals Park, which includes an area with a moderately sloping granite outcrop above the shoreline, Oconee WMA, and other areas reserved as natural areas or future recreation development. Natural vegetative shoreline cover is prevalent in many areas throughout the reservoir, including adjacent tracts of the Oconee NF in the upper end of the reservoir. Much of the shoreline in the more developed central and southern portions of Lake Oconee has shoreline stabilization structures in place, which may include riprap, a seawall, or a seawall with riprap at the base.

Sites with the greatest potential for active shoreline erosion typically include public recreation access sites where shoreline activity may contribute to localized bank instability, and small undeveloped islands within the reservoir susceptible to wave action from boats.

2.3.5 Nexus between Project Operations and Effects

Georgia Power operates the Wallace Dam Project as a pumped storage development. Lake Oconee is normally operated between elevations 433.5 and 435 feet (ft) plant datum (PD),¹ with average daily fluctuations of about 1.5 ft. Wallace Dam releases water downstream during peak power demand hours and pumps water back up into Lake Oconee at night for

¹ Plant datum = mean sea level (NAVD88) - 0.20 feet (+/- 0.01 feet).

reuse in the next day's generation cycle. Wallace Dam discharges directly into the backwaters of Lake Sinclair, with no intervening riverine reach or bypassed reach.

The FERC project boundary encompasses the normal full pool elevation of Lake Oconee 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 100 to 200 ft across the reservoir from certain recreation areas. Larger land parcels define the project boundary in 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 (Figure 1-1).

2.4 Study Area

For the purposes of the Geology and Soils Study, the proposed shoreline survey area includes the FERC project boundary around Lake Oconee and the tailrace area downstream of Wallace Dam. Literature review and analysis of existing information and data will extend to adjacent lands and watersheds upstream of the project boundary.

2.5 <u>Methodology</u>

Georgia Power's proposed approach for completing the Geology and Soils Study consists of the following study elements.

2.5.1 Shoreline Reconnaissance Survey

A single shoreline reconnaissance survey of Lake Oconee and the Wallace Dam tailrace area will be conducted in 2016 to inventory and characterize existing sources of erosion and sedimentation within the project boundary and to characterize physical aquatic habitat and available sources of littoral-zone cover for fish. Representative shoreline sites within the project boundary will be selected and visually evaluated in the field as described below.

Site Selection

A geographic information system shapefile will be prepared defining 500-ft shoreline segments for the entire project reservoir and tailrace area within the project boundary. The study area will be partitioned into five sections (Figure 2-1) for stratified random selection of 500-ft shoreline segments for the reconnaissance survey as follows:

• Upper reservoir (UR) – the upstream portion of Lake Oconee north of Interstate 20 (I-20), including the Oconee River and Apalachee River embayments.

- Middle reservoir (MR) the middle portion of Lake Oconee on the mainstem river between Georgia Highway (Hwy) 44 and I-20, and including the Sugar Creek embayment.
- Richland Creek (RC) the Richland Creek embayment of Lake Oconee in the downstream eastern portion of the reservoir.
- Lower reservoir (LR) the downstream portion of Lake Oconee on the mainstem river from Wallace Dam upstream to the Georgia Hwy 44 bridge and including the Lick Creek embayment.
- Tailrace Area (TR) the Wallace Dam tailrace area extending downstream to the Georgia Hwy 16 bridge.

A total of 146 shoreline segments, or sites, will be selected for the reconnaissance survey. Thirty-five sites will be selected in each of the four reservoir sections (UR, MR, RC, LR) for a total of 140 on Lake Oconee. Six sites will be selected in the tailrace area section (TR). The stratified random selection will occur as follows:

- One site will be selected at each of the seven project recreation facilities (Figure 2-1).
 These facilities include two in reservoir section MR (Parks Ferry Park and Sugar Creek Boat Ramp), three in reservoir section LR (Old Salem Park, Long Shoals Boat Ramp, Lawrence Shoals Park), one in reservoir section RC (Armour Bridge), and one in stratum TR (Tailrace Fishing Area).
- One site will be selected at each of the three FS recreation areas in reservoir section UR (Dyar Pasture, Redlands, and Swords Recreation Areas).
- One site will be selected at each of the nine undeveloped areas within the project boundary reserved for future recreational development, as designated in the current project Recreation Plan. These areas will be depicted on a map in the Geology and Soils Study Report and will also be mapped and described in the Recreation and Land Use Study Report.
- In addition, one site will be selected in the tailrace area along the shoreline next to Pond 2, a waterfowl impoundment in the Oconee Wildlife Management Area (WMA) identified by WRD (PAD, Appendix B) as exhibiting active streambank erosion of the dike creating the impoundment.
- The remaining 126 survey sites will be randomly selected to total 35 sites in each of the four sections of the reservoir (LR, RC, MR, and UR) and six sites in the tailrace area (TR), three on each side of the river.

The geographic coordinates of the midpoint of each selected shoreline site will be determined and tabulated and mapped in the study report.

Field Survey

The shoreline survey will consist of visual observation and assessment of each shoreline segment in summer 2016 during dry weather and normal project operating conditions. The assessment sites will be surveyed from a boat.

Survey teams of at least three investigators each will complete the visual shoreline assessment using the field data form provided in Figure 2-2. The teams will be led by boat captains from Georgia Power's Oconee/Sinclair Land Management Office who have extensive familiarity with Lake Oconee. At each site, the survey team will inventory and rate the following shoreline attributes:

- Vegetative buffer zone condition;
- Adjacent land uses;
- Bank stability and vegetative protection;
- Shoreline structural stabilization practices (e.g., seawalls, riprap);
- Potential causes of erosion (project related and non-project related); and
- Sources of littoral-zone fish cover.

These shoreline attributes will be discussed and jointly rated by the survey team. The inventory of shoreline structural stabilization structures in place will include visual estimates of the proportional length of seawalls, riprap, a combination of seawalls with riprap at the base, and any other forms of non-vegetated armoring. Proportional length of the various sources of fish cover/habitat available will also be visually estimated for each site. Documentation will include digital photographs of representative shorelines, including any active erosion problem areas as well as least-disturbed shoreline conditions.

The visual assessment protocol (Figure 2-2) has been customized for use on this project. Similar visual habitat and waterbody assessment protocols are widely used by water resource agencies, including EPA (Barbour et al., 1999; EPA, 2002), GDNR (2007), and Natural Resources Conservation Service (1998), to evaluate the condition of freshwater ecosystems. Thus, the proposed survey methodology is generally consistent with accepted practice in the scientific community.

2.5.2 Analysis of Existing Information and Data

The effects of continued project operation on shoreline erosion and sedimentation within the project boundary will be evaluated using: (1) findings of the shoreline reconnaissance survey; (2) aerial photography review of temporal change occurring at sites with documented active erosion problems; and (3) operational data characterizing Wallace Dam daily maximum and minimum reservoir fluctuations during normal, dry, and wet inflow periods.

The results of the shoreline survey will be presented in a variety of tables and graphs and will include photographs of representative survey sites. The shoreline survey will document current active erosion problem areas and their potential causes. Aerial photography review of these sites may reveal trends in erosion and sedimentation patterns related to various shoreline uses and help to determine whether the condition is project related, non-project related, or a combination of both. Project related erosion is defined as erosion caused primarily by daily reservoir fluctuations or downstream flow fluctuations from project operation, or by shoreline activities at project recreation sites. Non-project related sources of erosion may include flood flows, wind-driven wave action, stormwater run-off from steep terrain, loss of vegetation due to natural causes, and other factors not attributable to project operation. The survey results will also be used to characterize current shoreline and littoral-zone habitat conditions for fish and other aquatic organisms.

In addition, a literature review will be conducted on shoreline structural modifications associated with shoreline development, including seawalls/bulkheads, rock riprap, and combinations of seawalls with riprap at the base, and their effects on littoral-zone aquatic habitats as reflected in fish species composition, diversity, and abundance. The literature review will include studies conducted at southeastern hydropower reservoirs in North and South Carolina (Barwick, 2004) and Alabama (Purcell et al., 2010), and other relevant scientific literature dealing with shoreline structural stabilization practices.

2.6 Reporting

In accordance with 18 CFR § 5.15(b), a Geology and Soils Study Progress Report will be prepared and provided to participants prior to the completion of the study. The progress report will describe overall progress in completing the proposed shoreline reconnaissance survey, summarize preliminary findings as available, and explain any variance from the study plan and schedule.

In accordance with 18 CFR § 5.15(c)(1), a Geology and Soils Study Report will be prepared and provided to participants for review and comment at the conclusion of the study. The study report will compile the data gathered from the shoreline survey and present the analyses developed through the use of existing information and data.

2.7 Schedule

In accordance with the Wallace Dam Process Plan and Schedule and the master schedule provided in Section 1.4, the Geology and Soils Study will be completed according to the milestones listed in Table 2-1 below.

TABLE 2-1
Schedule for Conducting the Geology and Soils Study

Activity	Deadline
Begin Field Studies and Literature-Based Review	June 1, 2016
File Progress Report	August 31, 2016
Complete Field Studies and Literature-Based Review	September 30, 2016
File Final Study Report	November 18, 2016

2.8 References

- Barbour, M. T., J. Gerritsen, B. D. Snyder, and J. B. Stribling. 1999. Rapid bioassessment protocols for use in streams and wadeable rivers: periphyton, benthic macroinvertebrates and fish, second edition. EPA 841-B-99-002. U.S. Environmental Protection Agency, Office of Water, Washington, D.C.
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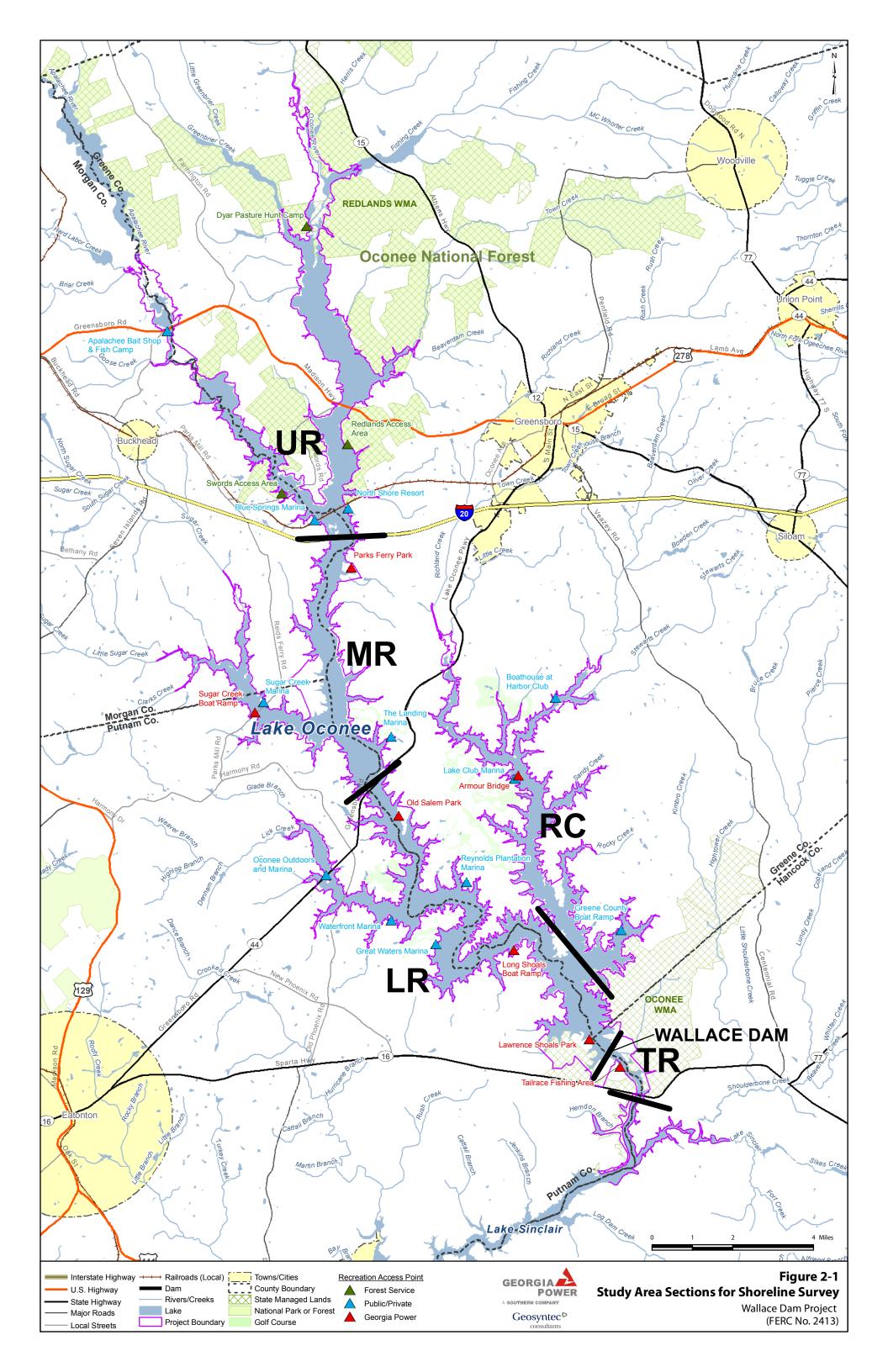


Figure 2-2. Shoreline Reconnaissance Survey Form – Wallace Dam Project (FERC No. 2413) Georgia Power Company

Site ID No.:					Date:				Time:			
Waterbody:La	ke Oconee	Tailrace	Co	unty:	_Green	eHanco	ck	MorganPutnam				
Site Description:								GPS?:	Yes	No		
Adjacent Land Owne	rship:	GPC	Residentia	alCo	mmerci	alUSFS	W	MA	_Other			
Weather:					Re	servoir Pool Le	evel:	Full	_Medium	Low		
Investigators:							Photos	Taken?:	Yes	No		
Length of Assessme	nt Site:	500 feet _	Other:	:feet	Activ	e Erosion Prol	olem Pres	ent?: _	Yes	No		
Shoreline	Natur	al: heavily vege	etated, les	s than 20 pe	rcent of	natural vegetat	ion remov	ed				
Vegetative Buffer Zone Condition:	Lands	Landscaped-Natural: disturbed and cleared up to 50 percent; some trees & understory remaining										
	Lands	caped: cleared	d of more t	han 50 perc	ent natu	ural vegetation o	r underbru	ısh compl	etely remo	ved		
Land Uses Adjacent	to Shorelin	e (check all th	at apply):									
Residential		Forested	Golf	Course		Open	Tr	ansportat	ion			
Recreation/acces	s	Agricultural	Con	nmercial		_ogging	0	ther:				
Bank Stability:	Sta	ble; minimal ero	osion; <5%	affected by	erosior	n; low potential f	or future p	roblems				
	Mod	derately stable;	5-30% aff	ected by erd	sion or	slumping; slight	erosion p	otential du	uring floods	3		
	Mod	derately unstab	le; 30-70%	affected by	erosion	n or slumping; hi	gh erosior	n potentia	l during flo	ods		
	Uns	stable; >70% af	fected by e	erosion or sl	umping	mass erosion a	ınd bank f	ailure evic	dent			
Bank Vegetative	>90	% of bank surfa	aces cover	red by healt	ny, living	g vegetation						
Protection:	70-	90% of bank co	vered by v	ariety of ve	getation	; some open are	as with di	sruption e	vident			
	50-	70% of bank co	vered by v	egetation;	cattered	d shrubs, grasse	s, and for	bs; bare s	pots visible	Э		
	<50	% of bank with	vegetative	e cover; any	shrubs	or trees are wid	ely scatter	ed; many	bare spots	3		
Shoreline Structural	Stabilizatio	n Practices Pi	resent?	Yes	No	(check all th	nat apply)	:				
Seawall/bulkhead	l only (% of site)		Seawa	ıll/bulkh	ead and riprap o	ombined ((%	of site)			
Riprap or other la	rge stone o	nly (%	of site)	Other	Other armoring: (% of site)							
Potential Sources of	Active Sho	reline Erosion	(check a	II that apply	/):							
Land-disturbing a	ctivity _	Residential	landscape	Res	ervoir fl	uctuations	Wav	_Wave action from watercraft/wind				
Impervious surface	ces _	Roads and b	oridges	Lac	k of buf	fer vegetation	Trib	_Tributary inflow				
Stormwater runoffRecreation/access				Live	stock a	ctivity	Othe	ər:				
Sources of Shoreline	Fish Cove	r/Habitat to 50	feet from	Shoreline	(check	all that apply):						
Docks/piers/boatslips (% of shoreline length)Overhanging vegetation (% of									oreline lenç	gth)		
Riprap (% of shoreline length)Large woody debris (ne length)			
Bedrock and boulders (% of shoreline length)Standing timber (% of shoreline length)												
Emergent vegeta	tion (_% of shoreline	length)		Other: (% of shorel				of shoreline	e length)		
Submersed vege	tation (% of shoreling	ne length)		Other	·	(_	%(of shoreline	e length)		
Other Observations	and Aquati	c Habitat Note	s:									

3.0 WATER RESOURCES

3.1 Introduction

Georgia Power proposes to conduct a study characterizing existing water resources in the Oconee River at the Wallace Dam Project, including water use, availability, and water quality, and evaluating potential impacts to water resources associated with continued project operation. A principal element of the study will be an evaluation of the effects of continued project operation on water quality, particularly dissolved oxygen (DO) levels and water temperature in Lake Oconee and in the tailrace area downstream of the dam. This study will be accomplished through a combination of new water quality monitoring within the project boundary and compilation and analysis of existing water resources information and data.

3.2 Goals and Objectives

The goal of this study is to develop information for characterizing existing water resources in the project area and evaluating the water resource issues identified during FERC's public scoping process pursuant to NEPA that have a nexus with project operations.

The specific objectives of the study are to:

- Characterize water use, availability, and water quality in the Wallace Dam Project study area.
- Characterize the effects of continued project operation on water quality in Lake Oconee and the tailrace area within the project boundary.
- Document the extent of mixing that occurs in Lake Oconee as a result of the pump-back/generation cycles. This information will also be used to assess (in the Fish and Aquatic Resources Study [Section 4.0]) how project operations affect habitat conditions for fish, including sport fish species, and other aquatic organisms in Lake Oconee and the Wallace Dam tailrace.
- Review the substantial amount of water resources information and data available for the Oconee River, along with the findings of Georgia Power's water quality monitoring in the project waters, to evaluate the effects of continued project operation on water quality, including water temperature and DO concentrations, in Lake Oconee and the tailrace area.

3.3 Study Background

This study will develop information needed to evaluate potential impacts of continued project operation on aquatic resources in the PLP and license application in consideration of: (1) the water resource issues identified during NEPA scoping; (2) the studies and modifications to studies requested by resource agencies; (3) the known resource management goals of the agencies with jurisdiction over the water resources; (4) the substantial amount of existing information available for the Oconee River as summarized in the PAD; and (5) the requirement that there be a nexus between project operations and effects on the resources being evaluated.

3.3.1 Issues Identified

The Commission identified in SD1 the following resource issue pertaining to water resources:

• Effects of continued project operation on water quality, including water temperature and DO concentrations, in Lake Oconee and the tailrace area.

3.3.2 Study Requests

Georgia Power proposed in the PAD (Section 5.2.1, Preliminary Studies List) to conduct a study to characterize water use, availability, and water quality in the project area; and to characterize the effects of project operations on water quality in the project reservoir and tailrace area immediately downstream of the dam. Seasonal water quality monitoring would be conducted in the project reservoir through 2016, including vertical profiles and water chemistry. DO and water temperature would be continuously monitored in the project tailrace through 2016, and a literature-based analysis would be conducted for water quantity and quality.

SD1 listed the proposed study as Study No. 2, Water Resources. Although no study requests pertaining to water resources were filed by stakeholders following the study criteria under 18 CFR § 5.9(b), resource agencies have made the following requests and recommendations for modifying Georgia Power's proposed study.

Water Quality Monitoring

In its PAD and SD1 comments letter dated June 15, 2015, WRD presented select summer DO values recorded by the GDNR Environmental Protection Division (GEPD) in Lake Oconee. WRD expressed concern about prolonged elevated water temperatures and suppressed DO concentrations in the Wallace Dam pool area (between Wallace Dam and Georgia Hwy 44) and their potential effects on growth and health conditions for sport fish species such as

largemouth bass, striped bass, and black crappie. WRD requested that additional objectives be incorporated into the Water Resources study, including: expanding the reservoir water quality monitoring efforts to weekly full water-column samples in July-September and monthly full water-column samples in October-June; and conducting continuous DO and temperature monitoring in the forebay and tailrace areas in July-September. WRD believes these efforts are needed to better define how water quality conditions change as a result of project operations and better assess existing habitat conditions for fish species.

In its PSP comments letter filed October 26, 2015, WRD continued to recommend weekly vertical profile measurements in summer and continuous DO and temperature monitoring in the forebay to further assess summer habitat conditions for sport fish species, and to better define how water quality conditions change in Lake Oconee as a result of operations. WRD also recommended that more than one hourly vertical profile sampling event during summer pumpback/generation operations be conducted to provide replication and further insight into water quality changes as a result of operations. Georgia Power proposed in the PSP one hourly vertical profile monitoring event of summer pumpback/generation instead of weekly profile measurements during summer to characterize how water quality conditions may change over the course of a normal cycle of pumpback and generation operations.

In its PAD, Study Requests, and Study Requests Modification letter dated June 18, 2015, FWS expressed concern about existing continuous DO monitoring data for the tailrace being dated and including low DO values. FWS recommends that continuous water quality data be collected in the tailrace over a two-year period instead of one year and be correlated with factors that likely influence water quality results. The PSP outlined Georgia Power's plans for one year of monitoring. In its PSP comments letter dated October 20, 2015 (filed October 26, 2015), FWS continued to recommend that continuous water quality data be recorded for two years and correlated with factors that likely influence water quality results.

In its comments on the proposed studies in SD1 filed June 18, 2015, EPA recommended that nutrient sampling be conducted consistent with criteria expression in Georgia's Water Quality Standards at Section 391-3-6-.03(17) by collecting monthly photic zone composite samples from April through October. EPA also recommends coordinating with GEPD to obtain any available information regarding the likely development of water quality standards for nutrients for Lake Oconee. While the PSP included nutrient sampling, it did not adopt monthly photic zone composite sampling. In its PSP comments letter dated October 26, 2015, EPA continued to recommend nutrient sampling based on monthly photic zone composite samples. EPA also stated that DO conditions in the tailrace may be highly variable and also supports DO monitoring beyond the one year proposed in the PSP.

Georgia Power has collected a substantial amount of vertical profile and water chemistry data for Lake Oconee representing the full length of the main-stem reservoir and major tributary coves, as summarized in the PAD (Section 4.3.1). Table 3-1 indicates the months in which vertical profile and water chemistry data have been collected since 1995. Georgia Power proposes herein to conduct one year of monthly vertical profile measurements and quarterly water chemistry sampling at the same nine stations throughout Lake Oconee to supplement the existing data, and two years of continuous DO and water temperature monitoring in the project tailrace. Georgia Power believes that the proposed monitoring, analyzed in conjunction with over 20 years of seasonal or monthly vertical profiles, will represent water quality changes occurring over the course of the summer, including normal, dry, and wet years. Georgia Power has not proposed weekly vertical profile measurements in July-September, as requested by WRD, because the existing data include most years since project construction, cover different weeks across July-September in multiple years, and are adequate for evaluating summer habitat suitability for sport fishes based on published temperature and DO tolerance information. WRD has not addressed the 18 CFR § 5.9(b) study request criteria, and in particular, has not explained why the existing profile data for numerous summers, combined with the proposed monthly vertical profile monitoring in 2015-2016 and proposed hourly vertical monitoring of pumpback/generation in summer 2016, would not be sufficient to analyze summer habitat suitability of sport fishes, and therefore, has not justified the need for weekly summer vertical profile monitoring (18 CFR § 5.9(b)(4)).

TABLE 3-1 Lake Oconee Water Quality Sampling Dates, 1995-2015

		Winter			Spring			Summer	•		Fall	
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1995		•	•	•	•	•	•	•	•	•	•	•
1996	•	•	•	•	•	•	•	•	•	•	•	•
1997			•			•		•			•	
1998	•		•		0		•			•		
1999		•			•			•			•	
2000			•			•			•			+
2001		•			*		•			•		
2002		•			•			•		•		
2003		•			•			•		•		
2004		•			•			•		•		
2005		•			•			•		•		
2006		•			•			•		•		
2007		•			0			0		0		
2008		•			•			•		•		
2009		•			•			•		•		
2010		•					•	•		•		

TABLE 3-1 Lake Oconee Water Quality Sampling Dates, 1995-2015

		Winter		Spring			Summer			Fall		
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2011		•			•			•			•	
2012		•			•			•			•	
2013		•			•			•		•		
2014		•			•		•				•	
2015		•			•	0		•	A	A	A	A
2016	A											

- = profile and chemistry data for nine stations
- o = profile only data for nine stations
- ♦ = chemistry data only
- ▲ = proposed sampling; profiles monthly, water chemistry quarterly

Georgia Power proposes to conduct hourly monitoring of reservoir vertical profiles and tailrace transects for DO and water temperature over the course of a summer day during two events to represent normal cycles of pumpback and generation operations. Georgia Power believes that while weekly sampling in July-September is unnecessary, the proposed hourly monitoring will be informative with respect to characterizing how water quality changes over the course of a pumpback/generation cycle. To address WRD concerns regarding replication, a second hourly vertical profile monitoring event was added and both events are proposed for July-August 2016.

To address FWS and EPA concerns regarding tailrace monitoring of DO, Georgia Power has adopted the recommendation to conduct continuous tailrace water quality monitoring for a period of two years in order to represent inter-annual variation in water quality conditions and its relationship to project operations.

WRD recommended that continuous DO and temperature monitoring also be conducted in the dam forebay but this modification has not been adopted because the dam forebay remains vertically well mixed during the critical summer period. Hence, the tailrace continuous monitoring will adequately reflect the quality of water being exchanged daily between the forebay and tailrace during generation and pumpback. The hourly vertical profile monitoring proposed for two summer events will further characterize how water quality conditions change as a result of operations. WRD has not explained the need for continuous monitoring in the forebay and why the existing vertical profile data and proposed monitoring would not be sufficient to characterize the effects of project operation on water quality in Lake Oconee, as required by 18 CFR § 5.9(b)(4), or otherwise addressed the study request criteria.

Georgia Power proposes to conduct nutrient sampling in Lake Oconee as part of its quarterly water chemistry monitoring based on surface grab samples, consistent with its historical water quality monitoring program. Monthly photic zone composite sampling of nutrients, as recommended by EPA, has not been proposed for the following reasons. First, Georgia Power has previously coordinated with GEPD to provide nutrient sampling data supporting calibration of the agency's lake model for Lake Oconee. GEPD has been conducting photic zone composite sampling of nutrients during the growing season in Lake Oconee at three locations (forebay, Georgia Hwy 44, and Richland Creek) since 2009. Second, nutrient loading into Lake Oconee results from point sources and nonpoint source runoff in the upstream watershed, which covers an extensive area of diverse land uses, including urbanized lands, forested lands, and livestock, poultry production, and dairy operations, as described in the PAD. While nutrients are of water quality concern in the Oconee River basin, they were not identified during the NEPA scoping process as an issue having a nexus with Wallace Dam operations. Moreover, site-specific nutrient criteria have not yet been adopted for Lake Oconee under Georgia's latest EPA-approved Rules and Regulations for Water Quality Control, Chapter 391-3-6 (GEPD, 2013), and therefore, the nutrient criteria expression in the water quality standards does not apply to Lake Oconee. Finally, EPA has not addressed the study criteria, which requires an explanation of the need for additional nutrient sampling information (18 CFR § 5.9(b)(4)) and how the results would inform the development of license requirements (18 CFR § 5.9(b)(5)).

The existing and newly collected water quality data will be analyzed to characterize the extent of mixing that occurs in Lake Oconee as a result of the pumpback and generation cycles. This information, combined with the results of the fisheries analysis (Section 4.0) and review of existing information and data will be used to analyze the effects of project operations on water quality and habitat conditions for fish species and other aquatic organisms inhabiting Lake Oconee and the Wallace Dam tailrace.

Algal Blooms

In its comments on SD1, EPA recommended that the Water Resources Study analyze data on algal species in the reservoir, including whether any occurrences of nuisance algal blooms, harmful algal blooms, algal toxins, or fish kills may be affected by Wallace Dam operations. Although not recommending a specific study modification, FWS expressed concern that several blue-green algal blooms have been documented in Lake Oconee in recent years, likely due to nutrient loading in the reservoir, and that toxins produced by certain cyanobacteria can be harmful to wildlife.

Georgia Power proposes to include in the Water Resources Study a literature review and analysis of the occurrences of cyanobacteria blooms in Lake Oconee, the factors that could lead to harmful algal blooms, and their relationship, if any, to project operations.

3.3.3 Resource Management Goals

GDNR is the primary resource agency having jurisdiction over water resources in the project area. GEPD (2013) classifies the water use of Lake Oconee and the upstream end of Lake Sinclair within the Wallace Dam project boundary as Recreation and Drinking Water. The Fishing use classification also applies to the project waters.

3.3.4 Existing Information

As described in the PAD, a substantial amount of existing information and data are available for characterizing water use and water quality in the vicinity of the Wallace Dam Project. Georgia Power will review and apply this information as appropriate to evaluating the potential effects of continued project operation on water resources in the Oconee River. Key sources of this information include but are not limited to:

- Georgia Power seasonal water quality data collected in Lake Oconee at multiple reservoir locations, typically on a quarterly basis, from 1979 to the present. These data include vertical profile measurements and water chemistry analyses of grab samples from nine stations distributed longitudinally in the main-stem reservoir and in the major tributary coves.
- Georgia Power's two-year intensive study conducted in 1995-1996 to evaluate environmental factors related to DO variability in Lake Oconee, including inflow, nutrient loading, and pumpback/generation (Georgia Power, 1997).
- Scientific literature and technical papers assessing nutrient loading sources and land use practices upstream of Lake Oconee and their potential influences on nutrient concentrations and algal abundance in the reservoir.
- Monitoring data and research publications on algal species composition in Lake Oconee, Lake Sinclair, and other Georgia reservoirs, and factors that could contribute to harmful cyanobacteria blooms.
- Oconee River basin management plans developed as part of the Georgia State-wide Water Management Plan (CH2M HILL, 2011) and by GEPD (1998).
- Georgia 305(b)/303(d) list documents (GEPD, 2012, 2014), which assess whether surface water bodies in the project area and upstream are supporting their designated uses.

3.3.5 Nexus between Project Operations and Effects

Georgia Power operates the Wallace Dam Project as a pumped storage development. Wallace Dam generates during peak power demand hours to meet the electrical system demand. Some of this released water 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 at night, when electrical system demand is low (i.e., off-peak electrical hours) and therefore the cost of power is lower. The average daily fluctuation of Lake Oconee is approximately 1.5 ft.

Wallace Dam discharges directly into Lake Sinclair, with no intervening riverine reach or bypassed reach of river. Although there is no instantaneous discharge requirement at Wallace Dam, Georgia Power operates the Wallace Dam Project to support the minimum flow requirements of the Sinclair Project during drought.

3.4 Study Area

For the purposes of water resources, the proposed study area includes Lake Oconee and the Wallace Dam tailrace area within the project boundary, the Oconee River upstream of the Project to Athens-Clarke County, tributary watersheds to Lake Oconee, and the Oconee River arm of Lake Sinclair downstream to the Wallace Dam project boundary at the Georgia Hwy 16 bridge. New water quality monitoring field studies are proposed in the project reservoir and tailrace area within the project boundary.

Regarding water quality and site-specific effects downstream of the Wallace Dam project boundary, Georgia Power fully evaluated water quality in Lake Sinclair as part of the previously completed relicensing of the separately licensed Sinclair Project. Georgia Power believes that existing site-specific studies and data characterizing water quality in Lake Sinclair are sufficient for evaluating downstream water quality effects. Georgia Power will use existing information in analyzing site-specific and cumulative water quality effects downstream of the Project in the PLP and license application for Wallace Dam.

3.5 Methodology

Georgia Power's proposed approach for completing the Water Resources Study consists of the following study elements.

3.5.1 Water Quality Monitoring in Lake Oconee

Monthly Vertical Profiles and Quarterly Water Chemistry

Georgia Power will conduct monthly monitoring by boat for one year at nine locations to characterize water quality in Lake Oconee on a more frequent basis than in past quarterly sampling. Monthly sampling began in August 2015 and will continue through July 2016. Georgia Power believes that these data along with quarterly data collected by Georgia Power in most years since 1995 will provide a robust water quality dataset for assessing water quality and the extent of mixing that occurs in Lake Oconee as a result of pumpback and generation operations. The nine monitoring locations represent the longitudinal change in water quality occurring through the mainstem reservoir as well as in major tributary coves. Data will be collected at the nine locations shown in Figure 3-1 and described below:

- Lower pool of reservoir next to Wallace Dam (forebay) (Station OC1);
- Richland Creek embayment (Station OC2);
- Mainstem reservoir between Richland Creek and Lick Creek (Station OC3);
- Lick Creek embayment (Station OC4);
- Mainstem reservoir at Georgia Hwy 44 between Lick Creek and Sugar Creek (Station OC5);
- Mainstem reservoir at I-20 downstream of the Oconee River and Apalachee River confluence (Station OC6);
- Apalachee River embayment in upstream end of reservoir (Station OC7);
- Oconee River embayment in upstream end of reservoir (Station OC8); and
- Sugar Creek embayment (Station OC9).

Data collection at all nine locations on a monthly basis will consist of vertical profile measurements of water temperature (°C), DO, pH (standard units), specific conductance (micromhos per centimeter), and turbidity (Nephelometric turbidity units [NTU]) taken at 1-meter intervals, along with Secchi disc transparency.

In addition, 11 water chemistry parameters, including nutrients, will be analyzed in surface grab samples (1-meter depth) collected at six of the locations on a quarterly basis (Table 3-2). The six locations will include Stations OC1, OC2, OC4, OC7, OC8, and OC9 (Figure 3-1). These are the same stations Georgia Power has sampled historically for water chemistry, as summarized in the PAD. All water chemistry analyses will be performed by Georgia Power, which operates a laboratory accredited by the National Environmental Laboratory Accreditation Program and recognized by GEPD. The parameters chlorophyll *a* and total phosphorus will be used to calculate a trophic state index following Carlson (1977).

TABLE 3-2List of Quarterly Water Chemistry Parameters and Analytical Methods

Parameter	Analytical Method ^a
Alkalinity (mg/L)	EPA 310.1
Turbidity (NTU)	EPA 180.1
Hardness (mg/L as CaCO ₃)	SM2340
Total Phosphorus (mg/L)	EPA 365.1
Nitrate (mg/L)	EPA 300
Nitrite (mg/L)	EPA 300
Ammonia (mg/L)	EPA 350.3
Chlorophyll a (mg/L)	EPA 670/4-73-001
Fecal Coliform Bacteria (MPN colonies/100 ml)	EPA 600/8-78-017
Biochemical Oxygen Demand (mg/L)	EPA 405.1
Chemical Oxygen Demand (mg/L)	EPA 410.4

^a EPA, Methods for Chemical Analysis of Water and Wastes; EPA SW-846, Test Methods for Evaluating Solid Waste – Physical/Chemical Properties; APHA-AWWA-WEF, Standard Methods (SM) for the Examination of Water and Wastewater. mg/L = milligrams per liter; ml = milliliter.

The monthly vertical profiles and quarterly water chemistry data from 2015-2016 will be compared with the abundant seasonal data collected by Georgia Power and GEPD since 1995 to document the extent of summer mixing in Lake Oconee and to assess how water quality conditions are influenced by project operations.

Hourly Vertical Profiles of Summer Pumpback/Generation

Georgia Power proposes to conduct two diel (day-night) sampling events in summer 2016 (July-August) that measure hourly vertical profiles of DO and water temperature at each of seven of the project reservoir monitoring locations over the course of a single day to represent a normal summer cycle of pumpback and generation operations. These data will support the analysis of summer habitat conditions for sport fish species as described in the Fish and Aquatic Resources Study Plan (Section 4.0).

The seven monitoring locations for hourly vertical profiles will include four stations on the mainstem reservoir (OC1, OC3, OC5, and OC6) spanning a distance of 20 river miles from the Wallace Dam forebay to the I-20 bridge, and three stations on the major tributary coves to this reach (OC2, OC4, and OC9) (Figure 3-1). Upstream Stations OC7 and OC8 in the Apalachee River and Oconee River embayments, respectively, will not be monitored for hourly vertical profiles because they exhibit similar summer vertical profile patterns as Station OC6, which is located a short distance downstream.

DO and water temperature vertical profiles will be measured in the field on an hourly basis to represent pumpback and generation cycles. Measurements will be taken for the entire water

column at 1-m intervals, and the depth will be recorded. The hourly profile sampling event will be conducted in collaboration with WRD biologists.

Continuous measurements of DO and water temperature in the tailrace area during the sampling event will be recorded by the probe at Station OCTR. Hourly vertical profiles are not proposed for Station OCTR because of the relatively shallow depth and daily mixing of the water column from Wallace Dam pumpback and generation cycles.

3.5.2 Water Quality Monitoring in the Tailrace

Continuous Monitoring of DO and Water Temperature

Georgia Power proposes to conduct continuous DO and water temperature monitoring in the Wallace Dam tailrace beginning in October 2015. The Station OCTR monitoring location is in the tailrace within the direct influence of generation and pumpback flows where the channel cross section is relatively uniform in depth and the water is well mixed. Georgia Power proposes to collect data at the tailrace location for a period of two years to represent inter-annual variation in water quality conditions.

An electronic multi-parameter water quality measurement sonde and data recorder will be deployed to continuously record DO concentration, pH, specific conductance, water temperature, and turbidity in the Wallace Dam tailrace. Water quality data will be recorded every 60 minutes. The sonde will be installed on a buoy-mounted system at a depth of approximately 1 meter, consistent with the application of Georgia Environmental Protection Division DO criteria as set forth in Rules and Regulations for Water Quality Control (Chapter 391-3-6). Routine maintenance and necessary equipment calibration will be performed monthly throughout the monitoring period.

Georgia Power will compile continuous DO and water temperature data collected from the tailrace monitoring location and align these data with real-time project operational data for the same periods, which indicate how the turbines were being operated (units, pumpback, generation, etc.). DO levels and water temperatures documented during these periods also will be correlated with vertical profile data collected from the same month in Lake Oconee to evaluate the likely depth of the source water in the reservoir.

Hourly Transect Monitoring of Summer Pumpback/Generation

In addition, Georgia Power proposes to conduct hourly measurements of DO and water temperature across five transects in the tailrace area over the course of a summer day during two events in 2016 (July-August) to characterize variation in tailrace water quality during a normal cycle of pumpback and generation operations. These data will also support the analysis of summer habitat conditions for sport fish species as described in the Fish and Aquatic Resources Study Plan (Section 4.0). Five representative cross-sectional transects

will be located in the tailrace area extending downstream to the end of the project boundary at the Georgia Hwy 16 bridge. Transect selection and field data collection will be conducted in collaboration with WRD biologists. In addition, vertical profiles of the reservoir forebay will be measured on the same day as the tailrace transect monitoring event.

3.5.3 Analysis of Information and Data

Data gathered during the monthly water quality monitoring of Lake Oconee will be compiled and summarized in tables and graphs for comparison and analysis with similar data previously collected since 1995. Monthly vertical profiles of temperature and DO in Lake Oconee will be plotted to depict vertical stratification patterns. Summer vertical profile data also will be graphed as monthly isopleths showing the variation in patterns of vertical stratification over the entire length of the reservoir, and these data will be used to evaluate the availability of suitable habitat for sport fish species as part of the Fish and Aquatic Resources Study (Section 4.0).

Continuous temperature and DO data collected in the tailrace will be summarized in tables and graphs, and combined with plots of corresponding turbine operations. Data will be plotted to demonstrate the effects of pumpback/generation operations during summer critical conditions.

Monitoring trends and data, and abundant existing information and literature on water use, quantity, quality, and cyanobacteria occurrence and blooms in Lake Oconee and the Oconee River will be used to evaluate the water resource issues identified during scoping. The review of cyanobacteria blooms in Lake Oconee will include the factors that could lead to harmful algal blooms, and their relationship, if any, to project operations. Literature review of cyanobacteria occurrence will include the following sources:

- Scientific literature on factors potentially influencing algal abundance in Lake Oconee.
- Georgia Power algal research information.
- Research program of phycologist Dr. Kalina Manoylov of Georgia College and State University pertaining to Lake Oconee.
- GEPD cyanobacteria sampling project (2012-2014).
- University of Georgia (UGA), Georgia Water Resources Project bloom monitoring using Landsat 8 sensors to detect phycocyanin reflectance patterns.

• UGA, CyanoTracker Project – blooms reported by public as trigger for remote sensing estimation of cyanobacteria concentration.

Evaluation of the effects of continued project operation on aquatic habitat in the project reservoir and tailrace will be provided in the separate Fish and Aquatic Resources Study.

3.6 Reporting

In accordance with 18 CFR § 5.15(b), a Water Resources Study Progress Report will be prepared and provided to participants prior to the completion of the study. The progress report will describe overall progress in completing the proposed monitoring and analysis, summarize preliminary findings as available, and explain any variance from the study plan and schedule.

In accordance with 18 CFR § 5.15(c)(1), a Water Resources Study Report will be prepared and provided to participants for review and comment at the conclusion of the 1-year study. The study report will compile the water quality monitoring data and present the analyses developed through the use of existing information and data. An Updated Study Report will be filed at the conclusion of the second year of tailrace water quality monitoring.

3.7 Schedule

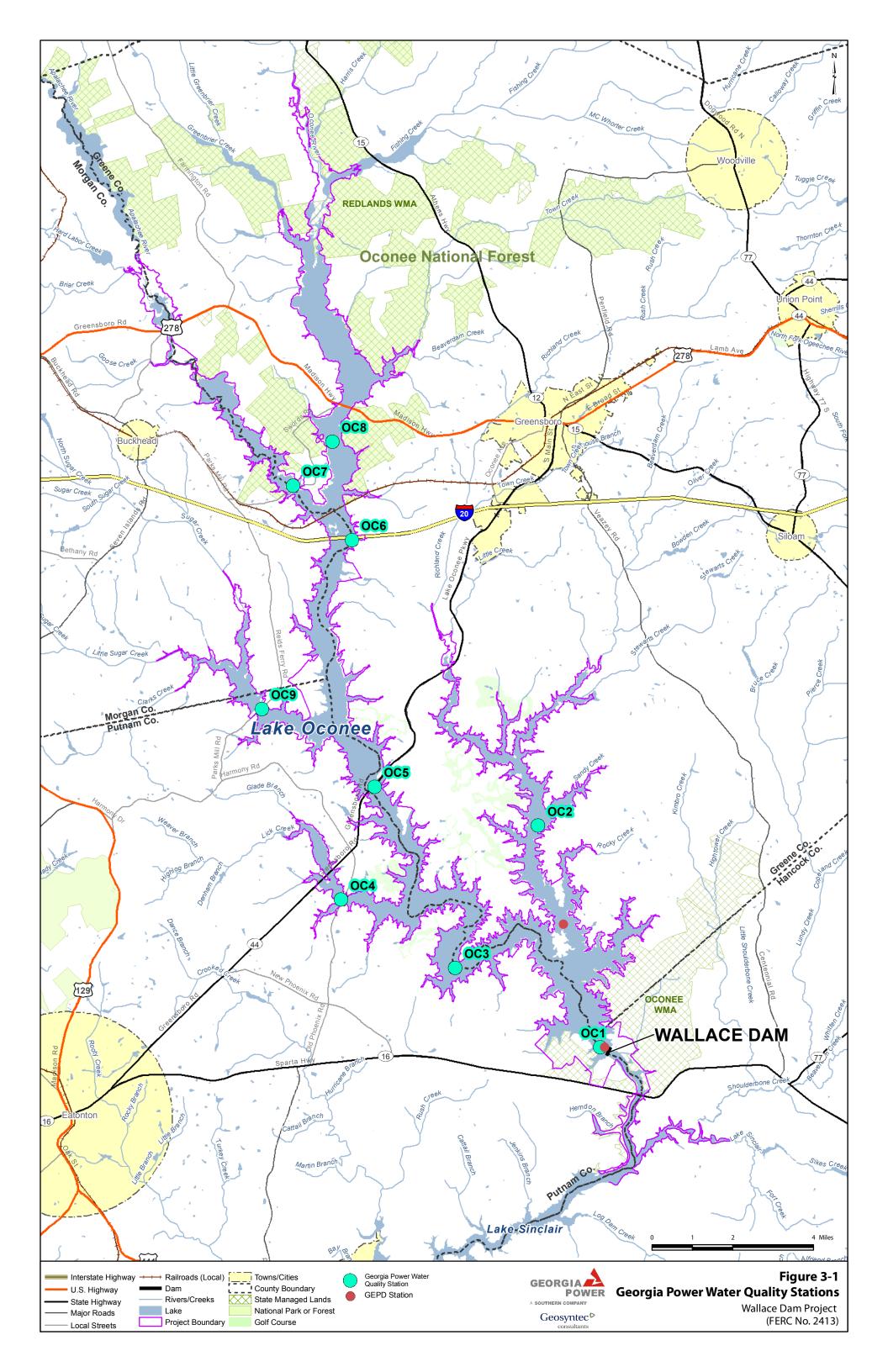
In accordance with the Wallace Dam Process Plan and Schedule and the master schedule provided in Section 1.4, the Water Resources Study will be completed according to the milestones listed in Table 3-3 below.

TABLE 3-3
Schedule for Conducting the Water Resources Study

Activity	Deadline	
Begin Field Studies and Literature-Based Review	October 1, 2015	
File Progress Report	August 31, 2016	
Complete Field Studies and Literature-Based Review	September 30, 2016	
File Initial Study Report	November 18, 2016	
Complete Second Year of Tailrace Monitoring Field Study	September 30, 2017	
File Updated Study Report	October 11, 2017	

3.8 References

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- Georgia Environmental Protection Division. 2013. Rules and regulations for water quality control, Chapter 391-3-6. Effective October 22, 2013. Georgia Department of Natural Resources, Atlanta, Georgia.
- Georgia Environmental Protection Division. 2014. Draft Georgia 2014 305(b)/303(d) List Documents. https://epd.georgia.gov/georgia-305b303d-list-documents. Georgia Department of Natural Resources, Atlanta.
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4.0 FISH AND AQUATIC RESOURCES

4.1 <u>Introduction</u>

Georgia Power proposes to conduct a study characterizing the existing fish and aquatic resources in the Wallace Dam Project waters and developing aquatic resource information for evaluating the potential impacts of continued project operation on the fish and aquatic resources of the Oconee River. This will be accomplished through a combination of: analyzing existing fisheries survey data; applying existing and newly collected water quality monitoring data from the Water Resources Study; a shoreline habitat survey conducted during the shoreline reconnaissance survey for the Geology and Soils Study; a freshwater mussel survey; and review of existing fisheries and water quality information and data.

4.2 Goals and Objectives

The goal of this study is to develop information for characterizing the existing aquatic environment and evaluating the fisheries-related aquatic resource issues identified during FERC's public scoping process pursuant to NEPA that have a nexus with project operations.

The specific objectives of the study are to:

- Characterize representative shoreline and littoral-zone aquatic habitats occurring throughout the reservoir.
- Evaluate the occurrence of Altamaha shiner, a Georgia threatened fish species, and other rare, threatened, or endangered (RTE) aquatic species within the project boundary based on review of existing information and data.
- Conduct a freshwater mussel survey within the project boundary characterizing the occurrence, distribution, relative abundance, species richness, and population status of the native freshwater mussel community, especially RTE species of mussels.
- Evaluate the effects of continued project operations on summer reservoir water quality and habitat for sport fish species such as largemouth bass and striped bass.
- Evaluate the potential for fish entrainment and turbine-induced mortality by applying trends and data from entrainment studies completed at other hydroelectric projects to the physical, operational, and fisheries characteristics of the Wallace Dam Project.

4.3 **Study Background**

This study will develop information needed to evaluate potential impacts of continued project operation on fish and aquatic resources in the PLP and license application in consideration of:

(1) the aquatic resource issues identified during NEPA scoping; (2) the studies and modification to studies requested by resource agencies; (3) the known resource management goals of the agencies with jurisdiction over the aquatic resources; (4) the substantial amount of existing information available for the Oconee River as summarized in the PAD; and (5) the requirement for there being a nexus between project operations and effects on the resources being evaluated.

4.3.1 Issues Identified

The Commission identified in SD1 the following list of aquatic resource issues pertaining to fisheries:

- Effects of continued project operation, non-project use of project lands (e.g., water supply intakes) and shoreline permitting (e.g., docks, seawalls, etc.) on fish habitat and aquatic resources in Lake Oconee.
- Effects of continued project operation on summer habitat for sport fish species, including largemouth bass and stocked striped bass, in Lake Oconee.
- Effects of continued project operation on tributary riverine fish and mussel habitat.
- Effects of continued project operation on aquatic habitat in the project tailrace area.
- Effects of continued project operation on fish entrainment and turbine-induced mortality.
- Aquatic non-native invasive species and their effects on native flora and fauna within the project boundary.
- Effects of continued project operation on state species of concern in the vicinity of the proposed project.

4.3.2 Study Requests

Georgia Power proposed in the PAD (Section 5.2.1, Preliminary Studies List) to conduct a study to characterize existing fish and aquatic resources in the project area and evaluate the effects of continued project operations on fish and aquatic resources inhabiting Lake Oconee and the Wallace Dam tailrace. The study would include the following key elements: (1) a shoreline habitat survey to characterize representative shoreline and littoral-zone aquatic habitats in the reservoir, conducted concurrently with the reconnaissance survey for shoreline erosion and sedimentation in the Geology and Soils Study; (2) evaluation of the occurrence of Altamaha shiner and native mussels within the project boundary; (3) evaluation of the effects

of continued project operations on summer reservoir water quality and habitat for sport fish species such as largemouth bass and striped bass; and (4) evaluation of the potential for fish entrainment and turbine-induced mortality.

FERC listed Georgia Power's proposed study in SD1 according to the four key study elements as follows:

- Study No. 3, Fish and Aquatic Resources shoreline habitat survey;
- Study No. 4, Fish and Aquatic Resources distribution of Altamaha shiner and native mussels;
- Study No. 5, Fish and Aquatic Resources summer reservoir water quality and habitat for largemouth bass and striped bass; and
- Study No. 6, Fish and Aquatic Resources fish entrainment and mortality.

Resource agencies made the following requests and recommendations for modifying Georgia Power's proposed study with reference to the numbered study elements above. This proposed study plan incorporates all the major study elements into a single Fish and Aquatic Resources Study, with the exception of the shoreline habitat survey, which will be implemented concurrently with the shoreline reconnaissance survey for erosion and sedimentation as part of the Geology and Soils Study Plan (Section 2.0).

Shoreline Habitat Survey

In its PAD and SD1 comments letter dated June 15, 2015, WRD requested that additional objectives be incorporated into the Fish and Aquatic Resources Study No. 3. These include providing maps and information on the proportion of developed and undisturbed shoreline areas in the project reservoir and incorporating a literature review on the effects of shoreline development on sport fish species such as largemouth bass, black crappie, and sunfish.

Georgia Power proposes to survey shoreline aquatic habitat and perform a literature review and analysis of the effects of shoreline development, including shoreline stabilization structures, as part of the shoreline reconnaissance survey included in the Geology and Soils Study Plan (see Section 2.0). The survey design will use a stratified random selection of shoreline segments. Shoreline conditions will be inventoried at each segment, including the proportions of shoreline structural stabilization practices in use (e.g., seawalls, riprap), and sources of littoral-zone fish cover. In response to WRD comments on the number of shoreline survey sites proposed in the PSP, the number of sites has been increased from 106 to 146 total sites. The results of the shoreline survey will be provided in the Geology and

Soils Study Report along with a literature review on the relationship between shoreline structural stabilization practices and littoral-zone fish habitat.

In its comments on the PSP, WRD also recommended that a map be prepared of land adjacent to the Project showing Georgia Power's land holdings with distinct representation for leased and non-leased lands. To address WRD's comments, Georgia Power proposes to develop a map showing the requested information as part of the Recreation and Land Use Study.

Summer Reservoir Water Quality and Habitat for Sport Fish Species

In its PAD and SD1 comments, WRD requested that additional objectives be incorporated into Fish and Aquatic Resources Study No. 5. These include weekly full water-column sampling in July-September at multiple sites along the length of the project reservoir; isopleth graphs of water temperature and DO data over the entire reservoir; and delineating the reservoir areas that vertically stratify in summer, characterizing water quality (water temperature and DO levels) and growth of largemouth bass and striped bass (length increments and/or condition factors) in these areas, and comparing them to water quality and growth in areas of the reservoir that do not undergo summer vertical stratification.

Georgia Power proposes to conduct monthly vertical profile measurements at nine locations in Lake Oconee as part of the Water Resources Study Plan (Section 3.0). These data will be analyzed in conjunction with existing quarterly vertical profiles from the same locations to document trends in the spatial and seasonal extent of summer mixing in Lake Oconee across many years. In addition, Georgia Power proposes to conduct hourly monitoring of reservoir vertical profiles over the course of a summer day during two events to represent a normal cycle of pumpback and generation operations and its effects on water column mixing (Section 3.0). WRD's request to conduct weekly sampling in July-September has not been adopted because Georgia Power believes the proposed monthly sampling data, analyzed in conjunction with over 20 years of seasonal and monthly profiles (Table 3-1) will be adequate to characterize how water quality changes over the course of the summer. In addition, the proposed hourly monitoring during two summer events will characterize how water quality changes over the course of a pumpback/generation cycle. Georgia Power believes this approach will develop water quality information sufficient for evaluating the effects of continued project operation on sport fish populations in Lake Oconee. Further explanation as to why weekly vertical profile monitoring was not adopted is provided in the Water Resources Study Plan in reference to the study request criteria at 18 CFR § 5.9(b).

Freshwater Mussel Survey

In its PAD, Study Requests, and Study Requests Modification letter dated June 18, 2015, FWS requested a study to characterize the freshwater mussel populations in the project area. The objectives of the study would be to determine the presence/absence, distribution, relative abundance, species richness, and population status of the native freshwater mussel community, especially imperiled species. FWS also identified the recently documented occurrence (by GDNR) of the inflated floater (*Pyganodon gibbosa*) within Lake Oconee. This species is endemic to the Altamaha River basin and is currently under review by FWS for federal listing under the Endangered Species Act.

Georgia Power proposes herein to conduct a freshwater mussel survey in potentially suitable habitats in Lake Oconee and in the Wallace Dam tailrace area within the project boundary. In its comments on the PSP, FWS requested that Georgia Power remain in close coordination with FWS and GDNR as the survey methodology and planning details are formulated. In conjunction with the Study Plan Meetings, WRD's Nongame Conservation Section provided comments on the mussel survey design for the Wallace Dam relicensing (Wisniewski, 2015). Since the Study Plan Meetings, Georgia Power has been coordinating with both agencies on the survey methods, search locations, and schedule for conducting the surveys. The survey methodology will follow survey design guidelines and search approaches as recommended by FWS and GDNR through ongoing consultation.

Altamaha Shiner Survey

No study requests pertaining to the state threatened Altamaha shiner (*Cyprinella xaenura*) were filed by stakeholders with their comments on the PAD. Georgia Power proposed in the PSP to evaluate the occurrence and distribution of Altamaha shiner in the project area based on review of existing information and data, including consultation with WRD's Stream Survey Team. In its comments on the PSP, FWS recommended that updated surveys for the Altamaha shiner be conducted within the Project's upper riverine locations to assess whether the species is found within the project boundary. The Altamaha shiner has been petitioned for federal listing under the Endangered Species Act. FWS did not address the study request criteria at 18 CFR § 5.9(b).

Georgia Power proposes to evaluate the occurrence of Altamaha shiner relative to the project boundary based on review of existing information and data. Information updated by the Nongame Conservation Section in January 2014 documents the occurrence of Altamaha shiner in stream habitats upstream of the project boundary in the Oconee River, Apalachee River, Hard Labor Creek, and Richland Creek (GDNR, 2014). The species inhabits small tributaries and rivers with rocky to sandy substrates and is not known to occur in impounded habitats (Freeman, 2009). Georgia Power has not adopted field surveys as part of its study

approach because FWS has not explained any nexus between project operations and effects on free-flowing habitat upstream of the reservoir, and how the survey results would inform the development of license requirements (18 CFR § 5.9(b)(5)).

4.3.3 Resource Management Goals

GDNR and FWS are the primary resource agencies having jurisdiction over fish and aquatic resources in Lake Oconee and the Oconee River.

GEPD (2013) classifies the water use of Lake Oconee and the upstream end of Lake Sinclair within the Wallace Dam project boundary as Recreation and Drinking Water, which includes the Fishing use classification.

In its comments letter dated June 15, 2015, WRD states that it manages the project waters to provide a quality outdoor recreational experience. From a fisheries standpoint, two important components of this effort include: (1) quality public access to the natural resource; and (2) implementing statewide fish harvest regulations to help manage and conserve sport fish populations.

FWS, in its letter dated June 18, 2015, related additional resource management goals of protecting the aquatic community in the project area, including native freshwater mussels, especially imperiled species.

4.3.4 Existing Information

A substantial amount of existing information and data are available for characterizing the fish and aquatic resources in the vicinity of the Wallace Dam Project and evaluating the potential resource impacts of continued project operation. Key sources of this information include but are not limited to:

- WRD standardized fishery surveys of Lake Oconee conducted annually since 2002;
 WRD uses these data to understand population characteristics and associated fishing trends, make fisheries management decisions, and characterize angler prospects.
- The Fishes of Georgia Website (Straight et al., 2009), cooperatively funded by FWS, GDNR Nongame Conservation Section, and Georgia Museum of Natural History, which provides an online distributional atlas of freshwater fishes in Georgia based on historical and recent collection data.
- Online species accounts and occurrence maps by Hydrologic Unit Code (HUC) 10 watershed for fish species of conservation concern, prepared by GDNR's Nongame Conservation Section.

- Fish species distribution, habitat use, and conservation information available in the scientific literature and through NatureServe Explorer, an online database providing in-depth coverage for rare and endangered species.
- The Georgia Bass Chapter Federation, which has gathered and compiled angler catch data annually for Lake Oconee and numerous other Georgia reservoirs from bass tournaments that has established a long-term dataset of catch statistics for detecting changes in the largemouth bass fishery over time.
- Research studies on the use of standing timber by fish populations in Lake Oconee (Van Den Avyle and Petering, 1988) and the rapidly expanding, introduced blue catfish population (Homer and Jennings, 2011).
- Scientific literature on the distribution of sensitive species of fish in the Oconee NF (Nuckols and Roghair, 2004), community structure of floodplain fishes in the Altamaha River basin (Garnett and Batzer, 2014), and suitable host fishes for freshwater mussels from the Altamaha River basin (Johnson et al., 2012).
- The final environmental impact statement for the FS' Land and Resource Management Plan for the Chattahoochee-Oconee National Forests (FS, 2004a, b), which provides information on fish and mussels inhabiting streams on Oconee NF.
- Georgia Power fisheries survey data from Lake Sinclair, 2003-2005.

4.3.5 Nexus between Project Operations and Effects

Georgia Power operates the Wallace Dam Project as a pumped storage development. Wallace Dam generates during peak power demand hours to meet the electrical system demand. Some of this released water 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. Generation occurs during the day, and pumpback operations occur at night. The average daily fluctuation of Lake Oconee is approximately 1.5 ft. There is no intervening riverine reach or bypassed reach of river between Wallace Dam and Lake Sinclair and no instantaneous discharge requirement at Wallace Dam.

Wallace Dam is one of two major dams located on the mainstem Oconee River. Sinclair Dam is located about 30 miles downstream. Downstream of Sinclair Dam, the Oconee River flows 143 miles south to its confluence with the Ocmulgee River to form the Altamaha River. The Altamaha River flows 137 miles southeast to the Atlantic Ocean.

4.4 Study Area

For the purposes of fish and aquatic resources, the proposed study area includes: the FERC project boundary extending around the reservoir upstream of the dam; the lower free-flowing reaches of larger tributaries to Lake Oconee within the project boundary; and the Wallace Dam tailrace area within the project boundary downstream of the dam. New field studies are proposed for Lake Oconee, the lower free-flowing reaches of larger tributaries within the project boundary, and the Wallace Dam tailrace area.

4.5 Methodology

Georgia Power's proposed approach for completing the Fish and Aquatic Resources Study consists of the following study elements.

4.5.1 Shoreline Habitat Survey

Georgia Power proposes to conduct a shoreline habitat survey that will characterize representative shoreline and littoral-zone aquatic habitats occurring throughout the project reservoir. Section 2.0 (Geology and Soils) describes the methodology for the shoreline habitat survey to be conducted concurrently with the shoreline reconnaissance survey for erosion and sedimentation.

4.5.2 Occurrence and Distribution of Altamaha Shiner

The occurrence and distribution of Altamaha shiner and other aquatic RTE species will be assessed by reviewing existing sources of information and data and updating the distributional information summarized in the PAD. The analysis will focus on the Altamaha shiner's documented habitat use, its recent occurrence records in rivers and tributaries that enter Lake Oconee, and the potential for the species to occur within the project boundary. Key sources of information and data will include recent occurrence records maintained by the GDNR Nongame Conservation Section and the FWS Ecological Services Field Office in Athens, Georgia, the Fishes of Georgia website, technical reports, and scientific publications. The findings of this review will be presented in the RTE Species Study Report (Section 6.0).

4.5.3 Freshwater Mussel Survey

A freshwater mussel survey will be conducted within the Wallace Dam project boundary to characterize the occurrence, distribution, relative abundance, and species richness of the native freshwater mussel community, focusing on habitats having the greatest potential to support RTE species of mussels. The mussel surveys will be conducted in representative areas containing potentially suitable habitat.

Mussel surveys will include representative shoreline habitats and tributary embayments in Lake Oconee, larger free-flowing tributaries entering the reservoir within the project boundary, and the Wallace Dam tailrace area within the project boundary.

Lake Oconee

A mussel survey will be conducted in representative habitats of Lake Oconee in late spring-summer 2016. Up to 20 to 30 sites throughout the reservoir will be searched for native mussels using the occupancy-based sampling design recommended by the WRD Nongame Conservation Section. Surveys will be conducted at about 20 sites within coves and tributaries to the reservoir, with about half located upstream of I-20, including around islands, where habitat is potentially most suitable. The remaining 10 survey sites will be located along the margins of the reservoir or in association with historic river channel. The survey will be conducted during daylight under normal project operations; seasonal drawdowns for dam maintenance and/or maintenance of homeowner's docks and seawalls are not conducted at the Wallace Dam Project.

Georgia Power will contract a qualified mussel expert and dive team to lead the field survey effort and survey reporting. The mussel expert will hold a Federal Endangered Species Permit allowing the team to handle live and dead federally-listed species of mussels and to retain dead shells for a voucher collection. Georgia Power also will seek volunteer participation of experienced biologists from the FWS, WRD Nongame Conservation Section, and other interested agencies to increase the number of surveyors in shallow habitats. Surveys will be conducted by teams of three or more biologists experienced in mussel collection. One to two person hours will be spent searching for native mussels at each site, with the amount of time spent closely monitored to ensure the resulting data conforms to the needs of the model. In addition, the search effort and capture efficiency of each individual searcher will be tracked separately. Survey methods will include visual observations while walking shorelines and wading shallows, hand grubbing, and in non-wadeable search areas, the use of skin-diving gear (mask and snorkel) in shallow areas, and self-contained underwater breathing apparatus (SCUBA) or surface-supplied air in deeper water. Divers will follow all applicable safety regulations.

Because Lake Oconee has 374 miles of shoreline, the mussel survey effort will target areas containing potentially suitable mussel habitat and habitats previously documented to harbor native mussels, rather than all available habitats. Native mussels such as inflated floater, Altamaha arcmussel (*Alasmidonta arcula*), and Savannah lilliput (*Toxolasma pullus*) are most commonly found in shallow water with fine sand, silty sand, or soft mud substrates. Survey effort will prioritize these types of habitats.

The mussel survey will record observations of live mussels and shells of dead mussels. All occurrences of RTE species of mussels will be located in the field using hand-held Global Positioning System (GPS) units. Digital photographs will be taken of representative specimens. All live mussels will be returned to source habitats. Survey observations will be recorded as field notes to include date and time of survey; flow and velocity conditions; water clarity; depth and substrate composition; and bank and riparian zone condition.

Wallace Dam Tailrace Area

Georgia Power also proposes to conduct a freshwater mussel survey in potentially suitable mussel habitat in the Wallace Dam tailrace area. The search area will include the upstream end of Lake Sinclair extending from Wallace Dam approximately 1.3 river miles downstream to the end of the project boundary at the Georgia Hwy 16 bridge. At the time this RSP was being prepared, Georgia Power had been coordinating with WRD Nongame Conservation Section and FWS to conduct the tailrace mussel survey during a planned maintenance drawdown of Lake Sinclair in November-December 2015. However, heavy rainfall, high flows, and oncoming cold weather led to the survey being postponed. The survey will be conducted in late spring-summer 2016 under non-drawdown conditions.

The tailrace mussel survey will be conducted according to the following methods:

- A survey team of experienced mussel surveyors having knowledge of the mussel fauna of the Altamaha River basin, the ability to identify freshwater mussel species in the Oconee River, and holding a Federal Endangered Species Permit will conduct the survey.
- The survey will begin with a reconnaissance of benthic substrates in the tailrace area. Best professional judgment will be applied in identifying habitats containing potentially suitable substrates for native mussels. It is anticipated that between six and ten areas will be searched for native mussels.
- The survey team will consist of searchers equipped with skin-diving gear for shallow areas, and SCUBA or surface-supplied air for deeper water. At least two searchers will be dedicated to examining shoreline and shallow-water habitats while wading. The survey will be conducted during daylight hours during off-peak or non-generation periods, when flow velocity and turbulence are at a minimum.
- One to two person hours will be spent searching for native mussels at each location, consistent with the occupancy-based survey design recommended by the WRD Nongame Conservation Section. In addition, the search effort and capture efficiency of each individual searcher will be tracked separately. The field team will use a variety of search methods tailored to site-specific conditions of depth, accessibility,

and water clarity, to search for live mussels and dead shells where potentially suitable habitat is encountered.

- All occurrences of RTE mussel species will be located in the field using hand-held GPS units. Digital photographs will be taken of representative live specimens of each native mussel species collected. All mussels will be returned unharmed to appropriate habitats in the area of collection.
- The surveyors will record field notes and general information about the survey area to include such information as the date and time of survey; flow and velocity conditions; water clarity; depth and substrate composition; and bank and riparian zone condition.

4.5.4 Summer Habitat for Sport Fish Species

Lake Oconee

The availability of suitable summer water quality for sport fish species in Lake Oconee, including largemouth bass and striped bass, will be assessed using reservoir water quality data collected annually by Georgia Power, standardized fisheries survey data for primary sport fishes collected annually by GDNR, and largemouth bass and striped bass temperature and DO preference criteria reported in the scientific literature. Georgia Power has collected seasonal water quality data in Lake Oconee on an annual basis since 1995, including vertical profile measurements of water temperature and DO at multiple locations. These existing data and vertical profile data proposed for collection in 2016 (Section 3.0) will provide the basis for characterizing summer reservoir water quality and habitat for largemouth bass and striped bass as two popular sport fisheries in the reservoir.

Summer vertical profile data collected at multiple locations oriented longitudinally in the mainstem reservoir and in major tributary embayments will be compiled and analyzed, including:

- Summer vertical profiles collected at up to nine stations annually from 1995 to 2014.
- Monthly vertical profiles collected at nine stations in 2015-2016, as proposed in the separate Water Resources Study Plan.
- Hourly vertical profiles collected over the course of a single day during two events in July-August 2016 to represent a normal cycle of summer pumpback and generation operations, as proposed in the Water Resources Study Plan.

Vertical profile data for the warmest months, including April through September, will be depicted in graphs of depth versus water temperature and depth versus DO concentration to

characterize the spatial and temporal extent of mixing that occurs in Lake Oconee as a result of the pumpback and generation cycles. In addition, data will be graphed as monthly isopleths showing the variation in water temperature and DO over the entire length of the reservoir. This analysis will be used to delineate those areas of the reservoir which tend to mix during the summer as a result of project operations, and those areas which tend to undergo summer vertical stratification more typical of southeastern reservoirs.

Existing fisheries survey data for Lake Oconee will then be analyzed to compare growth characteristics of largemouth bass and striped bass in areas of the reservoir that vertically stratify in the summer to the growth characteristics of these species in areas of the reservoir that tend to vertically mix as a result of project operations. These different areas of the reservoir, as represented by the various water quality monitoring stations (Figure 3-1), will be aligned with the WRD fisheries survey locations (Figure 4-1) to segregate the fisheries data for comparative analysis. Data available from the standardized fisheries survey database include sampling procedures and effort information, species abundance, length, weight, and other sampling or reservoir specific details. Georgia Power will coordinate with WRD at the outset of the study to obtain the most updated version of the database and associated metadata defining station locations, parameters, units, species-specific weight-length relationships used as the basis for relative condition factors, and other relevant data fields.

The fisheries data will be analyzed between stratified and mixed areas of the reservoir to characterize the abundance and well-being and condition of largemouth bass and striped bass as a potential result of chronic water quality stress related to pumped storage operations. Population attributes to be compared may include length-frequency distribution, relative condition factors, species numerical abundance, catch per unit effort, and other descriptive statistics.

In addition, habitat suitability for largemouth bass and striped bass between different areas of the reservoir will be 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. For largemouth bass, which is a habitat-generalist species, areas will be compared as to the ranges and stability of summer water quality conditions. Documented temperature and DO habitat suitability criteria for adult striped bass will be compared to the summer vertical profiles and isopleths to identify and approximate the areas of the reservoir providing suitable habitat under representative summer conditions. Rather than measuring precise volumes or areas, this approach will characterize variation in habitat suitability for striped bass occurring around each water quality station in the reservoir.

Wallace Dam Tailrace

The suitability of summer water temperatures and DO concentrations for fish and other aquatic organisms in the Wallace Dam tailrace will be evaluated using a combination of existing and newly collected water quality monitoring data and literature review. The following sources of data will provide a sufficient basis for characterizing spatial and temporal variation in summer DO and water temperature conditions in the tailrace area as they relate to habitat suitability criteria for representative species as determined from literature sources:

- Continuous DO and temperature monitoring data collected in the Wallace Dam tailrace area in 2015-2016, as proposed in the Water Resources Study Plan (Section 3.0).
- Existing summer vertical profile data and proposed monthly vertical profile data collected in the forebay of Lake Oconee (Station OC1 in Figure 3-1) in summer 2016.
- Hourly DO and water temperature data collected across multiple transects in the tailrace area over the course of a single day during two events in summer 2016 to represent a normal cycle of pumpback and generation operations as proposed in the Water Resources Study Plan (Section 3.0). Cross-sectional transects will be spaced over the length of the tailrace between the dam and the downstream end of the project boundary.

4.5.5 Fish Entrainment Evaluation

The potential for fish entrainment and turbine-induced mortality at the Wallace Dam Project will be evaluated using a literature-based approach that draws upon entrainment field studies completed at numerous other hydroelectric projects east of the Mississippi River, including several in the southeastern U.S. and other pumped storage facilities. Common trends and data from these other studies will be applied with consideration of the site-specific physical, operational, and fisheries characteristics of the Wallace Dam Project.

The primary source of turbine entrainment field study information will be the database prepared by the Electric Power Research Institute (EPRI, 1997). The EPRI database includes test data from 43 hydroelectric sites and provides detailed information on the species and size classes of fish collected in monthly entrainment samples. All of these sites are located east of the Mississippi River, and seven are located in the southeastern U.S. (South Carolina, Georgia, and Virginia).

Other sources of turbine entrainment information and data will include comprehensive reviews prepared by EPRI (1992) and FERC (1995a). The FERC (1995a) review provides

information for two additional sites in South Carolina and Georgia. Entrainment sampling data for the Stevens Creek Project (Dames and Moore, 1993; FERC, 1995b) and the Richard B. Russell Pumped Storage Project (U.S. Army Corps of Engineers [USACE], 1999) on the Savannah River also will be examined for species composition, relative abundance, and size distribution trends.

The primary source of turbine mortality field study information will be the turbine passage survival database prepared by EPRI (1997). The database includes test data from studies conducted at 51 difference turbines (41 hydroelectric sites), including Francis turbines.

Common trends and data from field studies completed at other hydroelectric sites will be applied to the Wallace Dam Project to:

- Characterize potential turbine entrainment that could be occurring at the Project, including fish size distribution, species composition, and seasonal variation in entrainment rates.
- Evaluate potential mortality rates of fish passing through the turbines based on turbine survival tests conducted at other projects with head and turbine design characteristics similar to those in use at Wallace Dam.
- Characterize relative differences in entrainment and mortality potential between the generation and pumpback cycles based on the design differences between the reversible pump turbines (Francis type) and conventional turbines (modified propeller type), the times of day they operate, and other relevant factors.

The potential impacts of losses of fish due to entrainment mortality will be assessed based upon fishery survey data for the project reservoir, intake location and related factors in the reservoir forebay and in the tailrace, natural mortality rates of young fish, and other relevant factors.

4.6 Reporting

In accordance with 18 CFR § 5.15(b), a Fish and Aquatic Resources Study Progress Report will be prepared and provided to participants prior to the completion of the study. The progress report will describe overall progress in completing the proposed mussel survey and fisheries analyses, summarize preliminary findings as available, and explain any variance from the study plan and schedule.

In accordance with 18 CFR § 5.15(c)(1), a Fish and Aquatic Resources Study Report will be prepared and provided to participants for review and comment at the conclusion of the 1-year

study. The study report will compile the data gathered from the mussel survey and present the analyses developed through the use of existing information and data.

4.7 Schedule

In accordance with the Wallace Dam Process Plan and Schedule and the master schedule provided in Section 1.4, the Fish and Aquatic Resources Study will be completed according to the milestones listed in Table 4-1 below.

TABLE 4-1Schedule for Conducting the Fish and Aquatic Resources Study

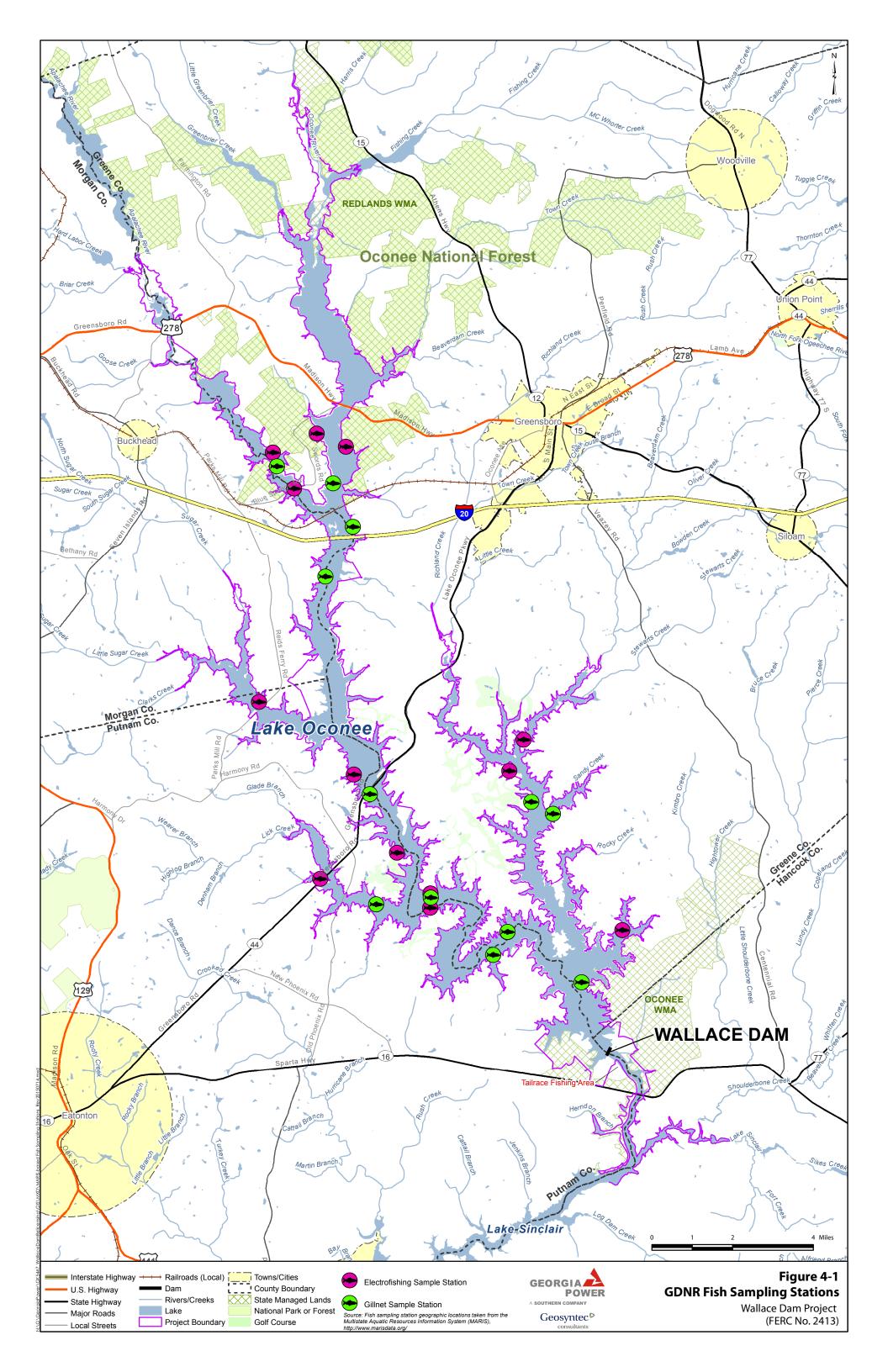
Activity	Deadline
Begin Field Studies and Literature-Based Review	March 1, 2016
File Progress Report	August 31, 2016
Complete Field Studies and Literature-Based Review	September 30, 2016
File Final Study Report	November 18, 2016

4.8 References

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5.0 TERRESTRIAL RESOURCES

5.1 Introduction

Georgia Power proposes to characterize existing terrestrial resources at the Wallace Dam Project through a field reconnaissance survey and the use of existing information and data. For the purposes of this study, terrestrial resources include wildlife and botanical resources as described in Section 4.5 of the PAD, and wetlands, riparian, and littoral habitat as described in Section 4.6 of the PAD.

5.2 Goals and Objectives

The goal of the study is to characterize existing terrestrial resources for evaluating the terrestrial resource issues identified during FERC's public scoping process pursuant to NEPA that have a nexus to project operations.

The specific study objectives are to:

- Describe terrestrial wildlife and botanical resources occurring in the Wallace Dam Project area, including providing lists of representative plant and animal species that use representative upland habitats, and to identify invasive species in these habitats.
- Describe the floodplain, wetlands, and riparian habitats occurring in the project area, including lists of representative plant and animal species that use representative habitats, to identify invasive species, and to prepare a map delineating wetland, riparian, and littoral habitat.

Information compiled in the PAD substantially meets these objectives.

5.3 Study Background

This study will develop information needed to evaluate potential impacts of continued project operation in consideration of the terrestrial resource issues identified during scoping, known resource management goals of the agencies with jurisdiction over terrestrial resources, the availability of existing relevant information as to plant and animal species using upland and wetland, riparian, and littoral habitats in the project area, and the requirement that there be a nexus between project operations and effects on terrestrial resources.

5.3.1 Issues Identified

The Commission identified in SD1 the following list of resource issues pertaining to terrestrial resources:

- Upland non-native invasive species and their effects on native flora and fauna within the project boundary.
- Effects of continued project operation, maintenance, project-related recreation, and non-project use of project lands (e.g., boat docks) on upland habitat, reservoir wetland and littoral habitats, and associated wildlife.
- Effects of continued project operation, maintenance, and project-related recreation on state species of concern in the vicinity of the proposed project, including bald eagle.

5.3.2 Study Requests

Georgia Power proposed in the PAD (Section 5.2.1, Preliminary Studies List) to conduct separate studies for wildlife and botanical resources and for wetlands, riparian, and littoral habitat. The studies would describe terrestrial wildlife and botanical resources and floodplain, wetlands, riparian, and littoral habitats occurring in the study area based on a field reconnaissance survey conducted concurrently for both studies and through the review of existing information and data as summarized in the PAD.

In SD1, the Commission lists these proposed studies as Study No. 7, Terrestrial Resources (wildlife and botanical resources), and Study No. 8, Terrestrial Resources (wetlands, riparian, and littoral habitat. Georgia Power proposes herein to combine these two studies into a single Terrestrial Resources Study Plan because of their common field survey element and to consolidate into a single report all relevant information and analysis concerning the terrestrial resource issues identified in SD1. A separate study plan is also proposed for RTE species in Section 6.0 evaluating RTE species known to occur in the project area, and it also will incorporate relevant findings from the terrestrial resources field reconnaissance survey.

In its Study Requests, Comments on Preliminary Study Plan, and Requests for Additional Information letter dated June 18, 2015, and comments during the Study Plan Meetings, FERC staff requested that the field surveys for terrestrial resources include certain study elements. These include: quantitatively describing and mapping vegetation cover types, wildlife, and an RTE species in areas where project-related disturbances would occur; delineating, quantitatively describing, and mapping all wetlands, bald eagle nests, and wading bird nests known to occur within the project boundary; and quantitatively describing the extent of any occurrences of terrestrial or aquatic non-native invasive species. Sensitive information pertaining to RTE species locations would be separated out and marked as "privileged"

information upon filing the study results. Georgia Power has incorporated these elements in this Terrestrial Resources Study Plan.

In its PAD and SD1 comments, WRD requested that Georgia Power develop an aquatic vegetation plan for the project reservoir, which should outline all principles and practices as they relate to aquatic vegetation in the project reservoir and include notifying WRD of aquatic nuisance vegetation treatment in the project area. Georgia Power proposes to develop these types of aquatic invasive species management information in the Terrestrial Resources Study.

5.3.3 Resource Management Goals

GDNR, FWS, and FS are the primary state and federal resource agencies having jurisdiction along the Oconee River pertaining to the protection of terrestrial resources.

GDNR has developed and implemented a Comprehensive Wildlife Conservation Strategy, also referred to as the State Wildlife Action Plan (SWAP), to conserve populations of Georgia's native wildlife species and their natural habitats before they become rarer and more costly to protect. The plan involves proactive measures emphasizing voluntary and incentive-based programs on private lands, habitat restoration and management by public agencies and private conservation organizations, rare species survey and recovery efforts, and environmental education and public outreach activities. The plan is currently undergoing comprehensive review and revision to incorporate new information and address changing conditions. The SWAP revision process involves staff within GDNR, representatives of private and public conservation organizations, and land managers and owners in Georgia.

While no specific resource management goals have been developed for the Wallace Dam project area in the SWAP, the intent is to maintain viable habitat for the native plant and animal species that would typically occur in the region and not to contribute to the loss of native species in the region.

The Project currently occupies about 370 acres of FS lands within the Oconee NF, which abuts Lake Oconee's northernmost reaches (Figure 1-1). FS manages lands within the Oconee NF according to the direction provided in the Chattahoochee-Oconee NF Land and Resource Management Plan (FS, 2004). The Forest Plan guides all natural resource management activities and sets management standards. It describes resource management practices, levels of habitat production, protection, and management, and the availability and suitability of lands for resource management.

5.3.4 Existing Information

The Wallace Dam Project is located in the Southern Outer Piedmont ecoregion. Major forest types in the Southern Outer Piedmont ecoregion include loblolly-shortleaf pine, oak-hickory, and oak-pine forests. The PAD describes dominant native vegetation and other natural community types in the region and lists the Georgia invasive plant species posing the most serious problems or potential to become serious problems in the four counties occupied by the Project.

The wildlife community in the project area includes many terrestrial mammal species, a wide variety of birds using diverse, wetland, upland, and open-water habitats in the project vicinity, as well as diverse reptile and amphibian communities. The bald eagle, a Georgia threatened species, occurs year-round within the project area and nests on Lake Oconee within or near the project boundary. The PAD describes and lists the wildlife species occurring in the project area based on an extensive amount of existing information and data.

The wetlands surrounding the Wallace Dam Project are primarily palustrine forested, scrubshrub, and emergent wetlands associated with Lake Oconee. There are approximately 2,360 acres of wetlands within the project boundary; forested/shrub wetlands are the dominant type. The wetlands and riparian areas provide diverse habitat for wildlife, including birds, reptiles, amphibians, and small mammals. The wetlands, riparian, and littoral habitats within and adjacent to Lake Oconee provide a variety of habitats preferred by waterfowl and wading birds. Important habitats in the project area include waterfowl impoundments downstream of Wallace Dam on Georgia Power land and in Oconee WMA, and Dyar Pasture Recreation Area at the upstream end of Lake Oconee (Figure 1-1).

Natural shoreline vegetation and riparian habitat exist within the floodplains along with residential developments and golf courses, resorts, and other businesses around the reservoir. The shoreline has been stabilized in many areas with seawalls and/or riprap. Georgia Power has occasionally documented small occurrences of nuisance invasive aquatic vegetation and cyanobacteria in Lake Oconee, and in a few instances has applied spot herbicide treatments.

Georgia Power manages all project lands within the transmission line right-of-way (ROW) under Southern Company's Transmission Vegetation Management (TVM) Program. The 230-kilovolt transmission line ROW is also subject to the requirements of North American Reliability Corporation (NERC) Standard FAC-003-3, known as the National Standard for Transmission Vegetation Management.

5.3.5 Nexus between Project Operations and Effects

Lake Oconee is normally operated between elevations 433.5 and 435 ft PD, with average daily fluctuations of about 1.5 ft. Wallace Dam releases water downstream during peak

power demand hours and pumps water back up into Lake Oconee at night for reuse in the next day's generation cycle. Wallace Dam discharges directly into the backwaters of Lake Sinclair, with no intervening riverine reach or bypassed reach.

The FERC project boundary encompasses the normal full pool elevation of Lake Oconee 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 100 to 200 ft across the reservoir from certain recreation areas. Larger land parcels define the project boundary in 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 upper reach of Lake Sinclair (Figure 1-1).

5.4 Study Area

The proposed study area includes the project boundary around Lake Oconee including the project recreation facilities, the project lands adjacent to Wallace Dam, the project boundary around the Wallace Dam tailrace area, and the project transmission line ROW.

For the purposes of mapping vegetative cover types and wetlands, the study area will also include a zone extending to 2,000 ft beyond the project boundary around Lake Oconee to encompass a conservatively large area for characterizing the existing environment.

5.5 Methodology

Georgia Power's approach for completing the Terrestrial Resources Study consists of the following elements.

5.5.1 Review of Existing Information

Descriptions of existing terrestrial resources in the project study area (wildlife and botanical resources, and wetlands, riparian, and littoral habitat) will be based on review of existing information sources summarized in the PAD, inspection of existing aerial photography and National Wetlands Inventory (NWI) maps, and a field reconnaissance survey for observing habitat and specific plant and wildlife species occurrences and verifying approximate wetland boundaries and locations of significant beds of submerged aquatic vegetation (see below).

Terrestrial habitats will be quantitatively described and mapped in areas where project-related disturbances would occur. A map of vegetative cover types, including approximate wetland boundaries, will be prepared for the project boundary around Lake Oconee. Available habitat types will be compared against habitat requirements of wildlife known from the region to

refine the list of species most likely to occur within the project area. Wildlife and plant species lists will be compiled for the common species found in the project area.

Wetlands, bald eagle nests, and wading bird nesting areas that occur within the project boundary will be approximately delineated, quantitatively described, and mapped. The extent to which these habitats may extend beyond the project boundary will also be described. Wildlife and plant species lists will be compiled for the common species found in the project area, and the extent of any known occurrences of terrestrial and aquatic non-native invasive plant species within the project boundary will be quantitatively described. Potentially sensitive information pertaining to bald eagle nesting and other RTE species locations will be separated out and marked as "privileged" information upon filing the study results.

In addition, Georgia Power will describe its invasive vegetation monitoring and management activities for Lake Oconee and project lands, including the species of invasive plants previously reported from within the project boundary around Lake Oconee and the tailrace area, species and acreage treated, management techniques and frequency of maintenance applications, and guidance and best management practices used by Georgia Power in invasive vegetation management.

Descriptions of existing terrestrial resources in the project transmission line ROW will be based on review of existing aerial photography, NWI maps, scientific literature, GDNR and FWS resource information, and other relevant sources. In addition, Georgia Power will describe the vegetation management activities occurring with the transmission line ROW under the Southern Company TVM and NERC National Standard.

5.5.2 Field Reconnaissance Survey

A field reconnaissance survey of the study area, concentrating mainly on lands and waters within the project boundary around Lake Oconee, will be conducted in spring/early summer 2016 to observe representative terrestrial communities and associated wildlife habitat and to characterize wetland, riparian, and littoral habitats.

- Field biologists will inspect existing, recent aerial photography prior to and during the survey to identify signatures of representative upland, wetland, and riparian vegetation community types for reconnaissance.
- The survey will consist primarily of teams of biologists each visually assessing upland, wetland, and riparian communities around and above the Lake Oconee and Wallace Dam tailrace shoreline from a boat and/or walking on Georgia Power and public lands. The field survey will include waterfowl ponds located in the Dyar Pasture Recreation Area and in the Oconee WMA downstream within the project

boundary. Areas inaccessible by boat or public lands will be evaluated by inspecting existing, recent aerial photography.

- Field notes will be recorded and aerial photographs annotated as to dominant vegetative cover classes including wetlands, unique or unusual habitat types, observations of bird, reptile, amphibian, and mammal species, evidence of wildlife (nests, burrows, etc.), and locations of invasive pest plant species.
- A community evaluation form will be completed for each vegetative community observed (Figure 5-1). The form will be standardized for the survey to include a general habitat description, including moisture regime, and will document common species, invasive pest plant species, and any animal observations.
- Each wetland area, including submerged aquatic beds, will be documented on the community evaluation form (Figure 5-1), including common species, invasive pest plant species, and any animal observations. Each wetland will be characterized according to the FWS classification system (Cowardin et al., 1979).
- Where non-native invasive pest plant species are observed, biologists will estimate
 the size of the infestation and note whether the species appears to be actively
 spreading.
- Aerial photography and NWI maps will be used to help locate and verify approximate
 wetland boundaries for mapping purposes. Mapping will include ground-truthing of
 NWI wetland boundaries and annotating aerial photographs to update approximate
 wetland boundaries. Soils, hydrology, and plant composition will be evaluated
 consistent with the USACE (1987) three-parameter approach, but wetland boundaries
 will not be formally delineated.

The field reconnaissance survey would likely be completed within 10 to 15 field days by three teams of biologists. Additional logistical support, such as boat operators or drivers, may be necessary. The field reconnaissance will not include a delineation of boundaries of wetlands suitable for a USACE jurisdictional determination, but will verify approximate boundaries of existing wetlands.

Mapping of vegetative cover types including wetlands, wading bird nesting areas, and RTE species locations will be developed in a GIS database. Tables will be generated showing acreages of each vegetative community type, including wetlands, within the project boundary and within a zone extending 2,000 ft beyond the project boundary around Lake Oconee. Descriptions of the waterfowl ponds located within the project boundary will also be developed.

5.6 Reporting

In accordance with 18 CFR § 5.15(b), a Terrestrial Resources Study Progress Report will be prepared and provided to participants prior to the completion of the study. The progress report will describe overall progress in completing the field survey, summarize preliminary findings as available, and explain any variance from the study plan and schedule.

In accordance with 18 CFR $\S 5.15(c)(1)$, a Terrestrial Resources Study Report will be prepared and provided to participants for review and comment at the conclusion of the study. The study report will compile the information gathered from the field survey and the review of existing information and data.

5.7 Schedule

In accordance with the Wallace Dam Process Plan and Schedule and the master schedule provided in Section 1.4, the Terrestrial Resources Study will be completed according to the milestones listed in Table 5-1 below.

TABLE 5-1
Schedule for Conducting the Terrestrial Resources Study

Activity	Deadline	
Begin Field Studies and Literature-Based Review	April 1, 2016	
File Progress Report	August 31, 2016	
Complete Field Studies and Literature-Based Review	September 30, 2016	
File Final Study Report	November 18, 2016	

5.8 References

- Cowardin, L. M., V. Carter, F. C. Golet, and E. T. LaRoe. 1979. Classification of wetlands and deepwater habitats of the United States. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. 131 pp.
- U.S. Army Corps of Engineers. 1987. 1987 Wetland Delineation Manual. Wetlands Research Program Technical Report Y-87-1. U.S. Army Corps of Engineers Waterways Experiment Station Environmental Laboratory.
- U.S. Forest Service. 2004. Chattahoochee-Oconee National Forest land and resource management plan. U.S. Department of Agriculture, Forest Service Southern Region, Atlanta, GA. Management Bulletin R8-MB 113A. January 2004.

Figure 5-1 Community Evaluation Form – Wallace Dam Project (FERC No. 2413) Georgia Power Company

Community ID#:		Date:	
General Community Description			
	T		
Common Species	Canopy	Subcanopy	Ground Cover
IDD Spacios Observations			Ground
IPP Species Observations Species	Canopy	Subcanopy	Ground Cover
IPP Species Observations Species	Canopy	Subcanopy	
IPP Species Observations Species	Canopy	Subcanopy	
IPP Species Observations Species	Canopy	Subcanopy	
IPP Species Observations Species	Canopy	Subcanopy	
IPP Species Observations Species	Canopy	Subcanopy	
IPP Species Observations Species	Canopy	Subcanopy	
IPP Species Observations Species Wildlife Observations	Canopy	Subcanopy	
Species	Canopy	Subcanopy	

6.0 RARE, THREATENED, AND ENDANGERED SPECIES

6.1 Introduction

Georgia Power proposes to conduct a study to characterize existing federal and state RTE species of plants and wildlife that may be present in the Wallace Dam Project area through review of existing information and field surveys.

6.2 Goals and Objectives

The goal of the study is to characterize existing RTE species, including candidate and special concern species, that may be present in the project area for evaluating significant issues identified during FERC's public scoping process conducted pursuant to NEPA that have a nexus to project operations. The specific study objectives are to:

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

Information compiled in the PAD will be analyzed and updated for this study based on the findings of field surveys and other new information.

6.3 Study Background

The Commission's ILP requires an assessment of potential effects of continued project operation on RTE species in the license application (18 CFR § 5.18). This study will develop information needed to evaluate potential effects in consideration of resource issues identified during scoping, known resource management goals of agencies with jurisdiction over RTE species, the availability of existing information as to known occurrences of RTE species in the project area, and the requirement that there be a nexus between project operations and effects on RTE species.

6.3.1 Issues Identified

The Commission identified in SD1 the following resource issue pertaining to RTE species:

• Effects of continued project operation, maintenance, and project-related recreation on federally threatened or endangered species and their habitat in the vicinity of the

proposed project, including the endangered black-spored quillwort, mat-forming quillwort, harperella, and red-cockaded woodpecker, and the threatened pool sprite.

6.3.2 Study Requests

Georgia Power proposed in the PAD (Section 5.2.1, Preliminary Studies List) to conduct a study evaluating federal and state RTE plant and animal species with known occurrence records near the Project. The study would identify habitat requirements and describe distributions and habitat use of RTE species presently occurring near the Project. Information compiled in the PAD would be reconsidered and updated based on the findings of field surveys, consultation with resource agencies, and other new information. FERC listed the proposed study in SD1 as Study No. 9, Threatened and Endangered Species.

In its PAD, Study Requests, and Study Requests Modification letter dated June 18, 2015, FWS recommended that Georgia Power also consider species for which FWS has recently been petitioned to list under the Endangered Species Act and has subsequently issued a partial 90-day finding that listing may be warranted (Federal Register 76:59836). One such example is the inflated floater, a mussel species recently found in Lake Oconee. Georgia Power proposes to include the inflated floater and other petitioned aquatic species in its evaluation of RTE species.

In its comments on the PSP, FWS recommended that Michaux's Sumac (*Rhus michauxii*), a federally endangered flowering shrub species, be added to the list of RTE species that may be present in the project area for evaluation during the terrestrial field reconnaissance survey. The species has been added to Table 6-1 for evaluation.

6.3.3 Resource Management Goals

FWS and GDNR are the resource agencies having jurisdiction over federal and state RTE species. While no specific resource management goals have been developed for RTE species in the Wallace Dam project area, the intent is to maintain viable habitat for the RTE species that may occur in the project area.

6.3.4 Existing Information

Information on historic or present element of occurrences on RTE species potentially occurring in the upper Oconee River basin of Greene, Hancock, Morgan, and Putnam Counties, Georgia was retrieved from the following sources for the preparation of the PAD:

- GDNR Nongame Conservation Section rare species databases;
- FWS Environmental Conservation Online System;

- NatureServe (2014);
- Manuals on Georgia's rare plants (Patrick et al., 1995; Chafin, 2007); and
- Recovery plans and recent species evaluations completed by FWS for federally listed species.

Based on known element of occurrence records (historic or present) and species range and habitat data, six federally protected species of plants and wildlife potentially occur in the vicinity of the Wallace Dam Project. Seven other Georgia-listed plant species, seven state protected wildlife species, and an additional 18 species tracked by GDNR as species of special concern potentially occur in the project vicinity. Additionally, several nesting pairs of bald eagles are known to occur near Lake Oconee. Table 6-1 lists all of these species and briefly describes their known habitat.

Federal Listed Species

Five federally threatened and endangered species potentially occur within the 4-county project vicinity (Table 6-1). These include 4 plant species and 1 bird species:

- Pool sprite (or little amphianthus) (*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; and
- Red-cockaded woodpecker (*Picoides borealis*) endangered.

Brief accounts of five of the federally protected species are provided in the PAD; Michaux's sumac has since been added for evaluation. Critical habitat has not been designated for any of these species. Two of the plant species, pool sprite and mat-forming quillwort, presently occur in vernal pools on a granite outcrop adjacent to, but outside, of the Wallace Dam project boundary in Putnam County. There are no known occurrences of the other four federally protected species within the project boundary.

State Protected Plant Species

Seven other Georgia listed plants potentially occur in the project vicinity, including one listed as endangered, three as threatened, two as rare, and one as unusual (Table 6-1). Based on

reasonably available information, it is unknown whether these species occur within the project boundary. Two of the state-protected plant species, dwarf hatpins (endangered) and granite stonecrop (threatened), inhabit granite outcrops and could occur on the granite outcrop in the Oconee WMA near Wallace Dam.

State Protected Wildlife Species

Seven state protected wildlife species potentially occur in the project vicinity, including one mussel, three fish, one reptile, and two birds (Table 6-1). The mussel species (Atlantic pigtoe) does not occur in the Oconee River basin; it inhabits the adjacent Ogeechee River basin, and therefore, does not occur in the project vicinity. Of the three fish species, only the Altamaha shiner presently occurs in the Oconee River basin upstream of Wallace Dam. The Altamaha shiner has been reported from relatively recent collections in tributary streams upstream of Lake Oconee, including the Oconee River, Apalachee River, Hard Labor Creek, and Richland Creek (GDNR, 2014; Straight et al., 2009; Nuckols and Roghair, 2004b). Altamaha shiners inhabit small streams and rivers, where they are most often found in small pools with rocky and sandy substrates (Freeman, 2008).

Several established nesting pairs of bald eagles occur along Lake Oconee, either within or immediately adjacent to the project boundary. The species is protected under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act.

Based on reasonably available information, it is unknown whether the spotted turtle and Bachman's sparrow have been documented as occurring within the project boundary.

Species of Concern

An additional 18 species tracked by GDNR as species of special concern potentially occur in the project vicinity (Table 6-1). These include nine plants, one mussel, one fish, two amphibians, four birds, and one bat. The mussel species (Carolina slabshell) does not occur in the Oconee River basin, but rather inhabits the adjacent Ogeechee River basin. The fish species, brassy jumprock, has been reported from Lake Oconee and inhabits the Oconee River and three other tributaries to Lake Oconee upstream of the project boundary.

6.3.5 Nexus between Project Operations and Effects

Lake Oconee is normally operated between elevations 433.5 and 435 ft PD, with average daily fluctuations of about 1.5 ft. Wallace Dam releases water downstream during peak power demand hours and pumps water back up into Lake Oconee at night for reuse in the next day's generation cycle. Wallace Dam discharges directly into the backwaters of Lake Sinclair, with no intervening riverine reach or bypassed reach.

TABLE 6-1
Rare, Threatened, and Endangered Species with Known Records of Occurrence in the Wallace Dam Project Vicinity^a

Scientific Name	Common Name	Federal Status ^b	Georgia Status ^c	Global Rank ^d	Habitat ^e	County
PLANTS:						
Amorpha schwerinii	Schwerin indigo-bush			G3G4	Rocky river bluffs and upland woods.	Greene
Amphianthus pusillus	Pool sprite	LT	Т	G2	Shallow, flat-bottomed depressions (solution pits, vernal pools) on granite outcrops, with thin gravelly soils and winter-spring inundation.	Greene Putnam Hancock
Cypripedium acaule	Pink ladyslipper		U	G5	Upland pine and mixed pine-hardwood forests with acidic soils; in the mountains, near edges of rhododendron thickets and mountain bogs.	Morgan
Eriocaulon koernickianum	Dwarf hatpins		E	G2	Seepage areas and wet depressions on granite outcrops, often with horned bladderwort.	Greene Hancock
Eurybia avita	Alexander rock aster			G3	Granite outcrops; rooted in shallow soils of moist depressions in light shade.	Hancock
Eurybia jonesiae	Piedmont bigleaf aster			G3?	Rich deciduous forests bordering rivers and streams; moist ravines.	Morgan
Fimbristylis brevivaginata	Flatrock fimbry			G2	Sunny, wet areas on granite outcrops, such as around pools or along wet cracks in the rock.	Hancock
Isoetes melanospora	Black-spored quillwort	LE	E	G1	Shallow, temporarily flooded, flat-bottomed pools formed by natural erosion on granite outcrops.	Greene
Isoetes tegetiformans	Mat-forming quillwort	LE	E	G1	Shallow pools formed by natural erosion on granite outcrops.	Greene Putnam Hancock
Lindera subcoriacea	Bog spicebush			G2G3	Shrubby, seepage wetlands with peaty-mucky soils, such as hillside bogs and stream-heads.	Hancock
Ludwigia spathulata	Creeping smallflower seedbox			G2	Exposed shores and bottoms of cypress-gum ponds, sink-hole ponds; granite outcrop pools.	Hancock
Panax quinquefolius	American ginseng			G3G4	Rich, cool, moist but not extremely wet woods,	Greene

TABLE 6-1
Rare, Threatened, and Endangered Species with Known Records of Occurrence in the Wallace Dam Project Vicinity^a

Scientific Name	Common Name	Federal Status ^b	Georgia Status ^c	Global Rank ^d	Habitat ^e	County
					under a closed canopy.	
Pilularia americana	American pillwort			G5	Granite outcrops, seasonally exposed muddy shores.	Greene Hancock
Ptilimnium nodosum	Harperella	LE	E	G2	Granite outcrop seeps.	Greene Putnam Hancock
Quercus oglethorpensis	Oglethorpe oak		Т	G3	Wet clay soils of upland seepage swamps, stream terraces, and moist hardwood forests.	Greene Putnam
Rhus michauxii	Michaux's sumac (or Dwarf sumac)	LE	E	G2G3	Dry, open, rocky, or sandy woodlands over mafic bedrock; often on ridges and river bluffs	Newtonf
Schisandra glabra	Bay star-vine		Т	G3	Moist, deciduous hardwood forests on lower slopes, stream terraces, and floodplains.	Morgan
Scutellaria nervosa	Bottomland skullcap			G5	Rich floodplain forests and mesic to dry upland forests, generally over mafic or calcareous rocks.	Putnam
Sedum pusillum	Granite stonecrop		Т	G3	Granite outcrops, usually in mats of moss beneath red cedar trees.	Greene
Stewartia malacodendron	Silky camellia		R	G4	Rich ravine and slope forests; lower slopes of sandhills above bogs and creek swamps.	Hancock
Waldsteinia lobata	Piedmont barren strawberry		R	G2G3	Stream terraces, floodplain forests, and rocky, lower slopes with oak-hickory-pine forest.	Morgan
MUSSELS:						
Elliptio congaraea	Carolina slabshell			G3	Sandy substrates in rivers and small streams; occurs in Ogeechee River but not Oconee River.	Hancock
Fusconaia masoni	Atlantic pigtoe		E	G2	Sand and gravel in large creeks and rivers; occurs in Ogeechee River but not Oconee River.	Hancock

TABLE 6-1
Rare, Threatened, and Endangered Species with Known Records of Occurrence in the Wallace Dam Project Vicinity^a

Scientific Name	Common Name	Federal Status ^b	Georgia Status ^c	Global Rank ^d	Habitat ^e	County
FISH:						
Cyprinella xaenura	Altamaha shiner		Т	G2G3	Small tributaries and rivers; often found in small pools with rocky to sandy substrates.	Greene Morgan Putnam
Etheostoma parvipinne	Goldstripe darter		R	G4G5	Small streams, spring seeps, and runs with aquatic vegetation; occurs below the Fall Line.	Hancock
Moxostoma robustum	Robust redhorse		E	G1	Medium to large rivers, shallow riffles to deep flowing water; moderately swift current.	Putnam
Moxostoma sp. 4	Brassy jumprock			G4	Silty to rocky pools and slow runs of large creeks; small to medium rivers; impoundments.	Morgan Hancock Putnam
AMPHIBIANS:						
Hemidactylium scutatum	Four-toed salamander			G5	Under objects or among mosses in swamps, boggy streams, and wet areas near quiet pools.	Greene Morgan Hancock Putnam
Necturus punctatus	Dwarf waterdog			G4	Sluggish streams with substrate of leaf litter or woody debris.	Hancock
REPTILE:						
Clemmys guttata	Spotted turtle		U	G5	Heavily vegetated swamps, marshes, bogs, and small ponds in soft, mucky substrates.	Hancock
BIRDS:						
Peucaea aestivalis	Bachman's sparrow		R	G3	Open pine or oak woods, clear-cuts, utility rights-of-way, old fields, and brushy areas.	Hancock
Haliaeetus leucocephalus	Bald eagle		Т	G5	Almost always nest near open water (rivers, lakes, coastal waters, wetlands). Usually found	Greene Morgan

TABLE 6-1
Rare, Threatened, and Endangered Species with Known Records of Occurrence in the Wallace Dam Project Vicinity^a

Scientific Name	Common Name	Federal Status ^b	Georgia Status ^c	Global Rank ^d	Habitat ^e	County
					in large, open-topped pines near open water.	Hancock Putnam
Laterallus jamaicensis	Black rail			G4	Freshwater marshes, salt marshes.	Greene
Limnothlypis swainsonii	Swainson's warbler			G4	Rich, damp, deciduous floodplain and swamp forests in areas with dense undergrowth.	Greene
Picoides borealis	Red-cockaded woodpecker	LE	E	G3	Large expanses of mature, open pine forest, particularly longleaf, slash, or loblolly pine. Nests in old living pines.	Putnam
Rallus elegans	King rail			G4	Freshwater to brackish marshes, marsh edges, rice fields, flooded farmlands, shrub swamps.	Greene
Tyto alba	Barn owl			G5	Nests in large hollow trees or old barns in areas with pasture, grassland, or open marsh.	Morgan
MAMMAL:						
Myotis austroriparius	Southeastern myotis			G3G4	Buildings and other structures, mines, and hollow trees for spring and summer roosts; also found in small number of caves in Georgia.	Greene

Sources:

^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.

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

d Global ranks: **G1** = critically imperiled, at very high risk of extinction due to extreme rarity; **G2** = imperiled, at high risk of extinction due to very restricted range; **G3** = vulnerable, at moderate risk of extinction due to restricted range; **G4** = apparently secure, uncommon but not rare; **G5** = secure – common, widespread, abundant; **?** = denotes inexact numeric rank.

^e Habitat descriptions from GDNR (2013), Chafin (2007), NatureServe (2014).

f Added to species list based on request of FWS; nearest known element of occurrence record in Newton County (Chafin, 2007).

The FERC project boundary encompasses the normal full pool elevation of Lake Oconee 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 100 to 200 ft across the reservoir from certain recreation areas. Larger land parcels define the project boundary in 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 upper reach of Lake Sinclair (Figure 1-1).

6.4 Study Area

The proposed study area includes the area located inside the project boundary around Lake Oconee and the Wallace Dam tailrace area, and project lands adjacent to Wallace Dam, the project recreation facilities, FS recreational access to Lake Oconee, and the project transmission line ROW. Literature review and analysis of existing information and data will extend to the upper Oconee River basin and the four counties occupied by the Project (Greene, Hancock, Morgan, and Putnam Counties).

6.5 Methodology

Georgia Power's approach for completing the RTE Species Study consists of the following elements.

6.5.1 Review of Existing Information

The review will result in a tabular listing of RTE species with known records of occurrence in and near the Wallace Dam Project, their federal or state status (or that they have been petitioned for federal listing), their global and state ranks, their habitat requirements, and county of known occurrence. The listing will be prepared based on review of existing information sources listed above and contacts with the GDNR Nongame Conservation Section and FWS.

This activity will update and refine the listing of RTE species in Table 6-1 (reproduced from the PAD). RTE species with known records of occurrence in the project vicinity will be identified with respect to their historic and present distributions, their habitat use, and the potential availability of such habitats in the study area. Species potentially occurring in the project area will be characterized further as to their documented occurrences within the study area (upper Oconee River basin; and Greene, Hancock, Morgan, and Putnam Counties). Any present occurrences of RTE species within the project boundary will be identified. Information on species being tracked by GDNR as species of concern and species petitioned for federal listing (e.g., inflated floater) will also be summarized.

The following sources of existing information will be reviewed in completing this RTE Species Study:

- The GDNR Nongame Conservation Section on-line databases providing inventory data by county, quarter quad sheet, and watershed (HUC 10) for protected species and species of concern in Georgia.
- The FWS Environmental Conservation Online System and associated listing information, critical habitat designations, recovery plans, and status reviews; and the FWS Georgia Ecological Services Field Offices website, which provides links to endangered species information and facilitates requests for county listings of species.
- The freshwater mussel survey planned as part of Fish and Aquatic Resources Study described in Section 4.5.3.
- NatureServe compilation of species information for the Lake Oconee region.
- Research publications, regional texts, and other technical reports, including Field Guide to Protected Plants of Georgia (Chafin, 2007) and GNHP's protected plants (Patrick et al., 1995) and protected animals (GDNR, 1999) manuals for Georgia.

A description of RTE species potentially occurring within the project transmission line ROW (located within Putnam County) will be based on review of GDNR Nongame Conservation Section and FWS databases, scientific literature, regional texts, and technical reports. No RTE species are presently known to occur within the Wallace Dam transmission line ROW.

6.5.2 Field Surveys

A field survey for freshwater mussel species is proposed under the Fish and Aquatic Resources Study Plan in Section 4.5.3.

Georgia Power proposes to conduct a field reconnaissance survey that will identify potentially suitable habitats for RTE species of plants and wildlife within the study area around Lake Oconee. This survey will be conducted concurrently with the survey of wildlife, botanical, wetlands, riparian, and littoral habitats proposed in the Terrestrial Resources Study Plan (Section 5.5). As described in Section 5.5.2, the field work would likely be completed in about 10 to 15 field days by three teams of biologists.

Field surveys will be conducted according to the following methods:

- Existing topographic maps, NWI maps, and recent aerial photography will be inspected prior to the survey to identify areas of potentially suitable habitat for protected species of interest.
- Surveys will be conducted by biologists visually assessing habitats along and above the shoreline from a boat and/or walking on public lands during spring or early summer to coincide with flowering times of RTE plants having the greatest potential to occur in the study area.
- Observations of federally protected or state-protected species will be recorded on the appropriate GDNR Nongame Conservation Section reporting forms available for special concern plants and animals (Figures 6-1 and 6-2).
- Areas inaccessible by boat or public lands relevant to the project area will be evaluated by inspecting existing aerial photography.
- Particular attention will be given to any areas of previously documented sensitive
 plant occurrences, including granite outcrop habitats located in the Oconee WMA
 within the project boundary, mature coniferous forests relative to the red-cockaded
 woodpecker, or other areas of potentially suitable habitat as determined by field
 observation.
- Occurrences of RTE plants will be recorded as either an area polygon containing many plants, or a point for a single plant or a few plants, using a GPS unit. Habitat and demographic information will be recorded for the occurrence.

Should potentially suitable habitat be found within the project boundary for pool sprite, black-spored quillwort, mat-forming quillwort, harperella, or Michaux's sumac, additional surveys could be required to determine whether these species occur. Any additional surveys would be timed to occur during the optimum time for identifying each species.

6.5.3 Analysis of Information and Data

Existing, relevant, and reasonably available information and data gathered during the RTE surveys in the form of log books, notes, and field data sheet entries will be compiled into electronic tabular and narrative form to describe existing and likely occurrences of RTE species in and near the Project. The results of the freshwater mussel survey conducted separately will be incorporated into this analysis. Maps or graphical illustrations will be used as appropriate to complement the narrative. Potentially sensitive information pertaining to RTE species locations will be separated out and marked as "privileged" information upon filing the study results. This body of information will ultimately be used to evaluate the effects of continued project operations on RTE species in the project area.

6.6 Reporting

In accordance with 18 CFR § 5.15(b), an RTE Species Study Progress Report will be prepared and provided to participants prior to the completion of the study. The progress report will describe overall progress in completing the field survey, summarize preliminary findings as available, and explain any variance from the Study Plan and schedule.

In accordance with 18 CFR § 5.15(c)(1), an RTE Species Study Report will be prepared and provided to participants for review and comment at the conclusion of the study year. The study report will summarize current presence or absence of RTE species within the project area and, if RTE species are present, discuss any potential effects associated with continued project operations.

6.7 Schedule

In accordance with the Wallace Dam Process Plan and Schedule and the master schedule provided in Section 1.4, the RTE Species Study will be completed according to the milestones listed in Table 6-2 below.

TABLE 6-2
Schedule for Conducting the RTE Species Study

Activity	Deadline
Begin Field Studies and Literature-Based Review	March 1, 2016
File Progress Report	August 31, 2016
Complete Field Studies and Literature-Based Review	September 30, 2016
File Final Study Report	November 18, 2016

6.8 References

- Chafin, L.G. 2007. Field guide to the rare plants of Georgia. The State Botanical Garden of Georgia. Athens, Georgia.
- Freeman, B. J. 2008. Species profile for Altamaha shiner, *Cyprinella xaenura*. Georgia Department of Natural Resources. Accessed December 22, 2014. Available online at www.georgiawildlife.com/conservation.
- Georgia Department of Natural Resources. 1999. Protected animals of Georgia. Wildlife Resources Division. Nongame Wildlife Natural Heritage Section, Social Circle, GA.

- Georgia Department of Natural Resources. 2014. Occurrences by HUC 10 watershed of the Altamaha shiner (*Cyprinella xaenur*a) and recent aquatic survey locations. Map created January 10, 2014. Wildlife Resources Division, Nongame Conservation Section. http://www.georgiawildlife.com/sites/default/files/uploads/wildlife/nongame/images/status_maps/aquatic/fishes/csam_cyprinella_xaenura.jpg.
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- Nuckols, D.R., and C.N. Roghair. 2004. Presence of Altamaha shiner (Cyprinella xaenura) and Ocmulgee shiner (Cyprinella callisema) within several Chattahoochee-Oconee National Forest streams, September 2003. U.S. Forest Service Southern Research Station, Blacksburg, Virginia.
- Patrick, T.S., J.R. Allison, and G.A. Krakow. 1995. Protected plants of Georgia. Georgia Department of Natural Resources, Wildlife Resources Division. 246 pp.
- Straight, C.A., B. Albanese, and B.J. Freeman. 2009. Fishes of Georgia Website, Georgia Museum of Natural History, updated March 25, 2009. Accessed December 14, 2014 at: http://fishesofgeorgia.uga.edu/.



Nongame Conservation Section 2065 US Hwy 278 SE Social Circle, GA 30025 Phone: (770) 918-6411

SPECIAL CONCERN ANIMAL OBSERVATION AND COLLECTION DATA SHEET

Species Scientific Name:		
Date Observed / Collected:	County:	
Method of Observation/Capture:		
Observer / Collector:		
Affiliation / Address:		
Field Collection Number:		
Museum & Accession Number:		
Site Name:	Topographic Quad:	
Directions To Site From Known Landmark:		
General Description of Habitat:		
Specimen Data:		
Weight:	Sex:	

Attach a photocopy from a 7.5-minute U.S.G.S. topographic map showing the location of the observation or collection site. Please mark the precise location of the site.

Send to: Katrina Morris, Wildlife Biologist

Georgia Department of Natural Resources

Wildlife Resources Division Nongame Conservation Section 2065 U.S. Hwy. 278, SE Social Circle, Georgia 30025



Nongame Conservation Section 2065 US Hwy 278 SE Social Circle, GA 30025 Phone: (770) 918-6411

SPECIAL CONCERN PLANT DATA SHEET

Species Scientific Name:			
Date Observed / Collected:		County:	
Observer / Collector:			
Affiliation / Address:			
Was a Voucher Specimen Collected?	Yes	No	
Where Will specimen Be Deposited	d?		
Was a Photo Taken? Yes	_ No _		
Where Will Photo Be Located?			
Was live material collected? Yes _		_ No	
Where will specimen be grown? _			
Site Name:		_ Topographic Quad:	
Directions To Site From Known Landmark:			
General Description of Habitat:			
Landowner information:			
Additional Notes (size of population, vigor,	flowering	g, fruiting, etc.):	

Attach a photocopy from a 7.5-minute U.S.G.S. topographic map showing the location of the observation/collection site. Please mark the precise location of the site.

Send to: Greg Krakow, Data Manager

Georgia Department of Natural Resources

Wildlife Resources Division Nongame Conservation Section 2065 U.S. Hwy. 278, SE Social Circle, Georgia 30025

7.0 RECREATION AND LAND USE

7.1 <u>Introduction</u>

Georgia Power proposes to conduct a study characterizing existing recreational use and land use at the Wallace Dam Project and to evaluate the potential impacts of continued project operation on these resource areas. This study will be accomplished through the compilation and analysis of abundant existing recreational use information, including the results of recent field monitoring and surveys conducted at project recreation facilities to determine recreation usage trends and demand.

7.2 Goals and Objectives

The goal of this study is to develop information for characterizing existing recreation and land use at the Project and evaluate recreation and land use issues identified during FERC's public scoping process pursuant to NEPA that have a nexus with project operations.

The specific objectives of this study are to:

- Review existing information to describe existing recreation and land use in the Wallace Dam project area.
- Characterize the effects of continued project operation on recreational opportunities at the Project.
- Characterize existing recreational capacity and usage on Lake Oconee and in the Wallace Dam tailrace area.
- Evaluate the adequacy of existing recreational facilities to meet current and future recreational demand, including fishing tournaments at the Project.
- Evaluate the adequacy of the existing Shoreline Management Program to address land use practices, including erosion, and protect environmental resources within the project boundary.

7.3 Study Background

This study will develop information needed to evaluate potential impacts of continued project operation in the PLP and license application in consideration of: (1) the recreation and land use issues identified during NEPA scoping; (2) the studies requested by resource agencies; (3) the known resource management goals of the agencies with jurisdiction over recreation and land use; (4) existing information and data concerning recreation and land use in the

project area; and (5) the requirement for there being a nexus between project operations and effects on the resources being evaluated.

The PAD described the existing recreation facilities providing access to Lake Oconee and the Wallace Dam tailrace area in detail (Figure 1-1). Table 7-1 summarizes the operational responsibility, type of use, and amenities for each access point. Seven Georgia Power project recreation facilities, three FS facilities, and 14 privately owned facilities provide direct access to the Wallace Dam project area. Additionally, there are numerous "unofficial" locations that are popular spots for bank fishing along highways and bridge crossings.

7.3.1 Issues Identified

The Commission identified in SD1 the following list of resource issues pertaining to recreation and land use:

- Effects of the average daily 1.5-ft fluctuation of Lake Oconee on recreational opportunities at the Project, including use of existing boat launches.
- Effects of continued project operation on downstream recreational use in the project tailrace fishing area.
- Adequacy of existing public access and recreational facilities in the project boundary to meet current and future recreation demand, including special events (e.g., fishing tournaments) at the project.
- Adequacy of the existing Shoreline Management Program to address land use practices, including erosion, and protect environmental resources within the project boundary.

7.3.2 Study Requests

Georgia Power proposed in the PAD (Section 5.2.1, Preliminary Studies List) to conduct a study to characterize existing recreational use and land use at the Project and to evaluate the need for additional recreational access or facilities at Lake Oconee. FERC listed Georgia Power's proposed study in SD1 as Study No. 10, Recreation and Land Use. The study would review existing information to describe recreation, land use, and visual aesthetic qualities in the Wallace Dam Project area; characterize current types and levels of recreational use on the reservoir and in the tailrace area; and evaluate the need for additional recreational access or facilities at the project. The study effort would include: (a) review and analysis of campground surveys and use information; (b) compilation and analysis of the Licensed Hydropower Development Recreation Report (Form 80) data; (c) review and analysis of fish tournament data and FS use data; and (d) an assessment of the adequacy of existing facilities.

TABLE 7-1
Recreation Facilities Providing Access to the Wallace Dam Project

Park/Facility	County	Acreage	Address	Amenities
Georgia Power Owned	and Operate	d Facilities (located v	within Project Boundary):	
Armour Bridge	Greene	11	Brown's Ford Road, Greensboro	1 Boat Ramp (2 lanes), 30 parking slots, Barrier Free, Fishing, Picnic, Restrooms, Public Access within Reynolds Plantation
Lawrence Shoals Park	Putnam	81	123 Wallace Dam Road, Eatonton	1 Boat Ramp (2 lanes), 68 parking slots, 3 Docks, Full Service Campground, Primitive Campsites, Nature Trails, Swimming Beaches, Restrooms, Picnic Pavilion, Playground
Long Shoals Boat Ramp	Putnam	6	Long Shoals Road, Eatonton	1 Boat Ramp (2 lanes), 30 parking slots, 1 Dock, Barrier Free, Picnic
Old Salem Park	Greene	105	1530 Old Salem Road, Greensboro	1 Boat Ramp (2 lanes), 123 parking slots, 3 Docks, Full Service Campground, Primitive Campsites, Swimming Beaches, Restrooms, Picnic Pavilion, Playground
Parks Ferry Park	Greene	122	1491 Parks Mill Road NE, Greensboro	1 Boat Ramp (2 lanes), 74 parking slots,1 Dock, Full Service Campground, Primitive Campsites, Swimming Beaches, Restrooms, Picnic Pavilion, Playground
Sugar Creek Boat Ramp	Putnam	9	Parks Mill Road, Buckhead	1 Boat Ramp (2 lanes), 37 parking slots, Barrier Free
Tailrace Fishing Area	Putnam	1	Wallace Dam Road West	Fishing Platform and Parking.
FS Owned and Operate	d Facilities:			
Dyar Pasture Recreation Area	Greene	36	USFS Road 1276 at Copeland Road, Greensboro	Boat Ramp (2 lanes), Fishing, Nature Trail, Picnic Facilities and Restroom
Redlands Recreation Area	Greene	8	USFS Road 1255 at US Hwy 278, Greensboro	Paved Boat Ramp (3 lanes), 2 picnic tables and Grill, Restrooms (No Water), 100 parking slots
Swords Recreation Area	Morgan	7	Blue Springs Road, Buckhead	Paved Boat Ramp (3 lanes), Courtesy Boat Dock, Restrooms, 100 parking slots
Privately Owned and O	perated Faci	lities:		
Apalachee Bait Shop & Fish Camp	Morgan		1010 Apalachee River Rd, Madison	Boat Launch, Primitive Campsites, Restrooms
Blue Springs Marina	Morgan		1291 Blue Springs Drive, Buckhead	Food, Gas, Restaurant, Marina, Restrooms
Boathouse at Harbor Club	Greene		3991 Walker Church Road, Greensboro	Food, Full Service Campground, Gas, Marina, Picnic, Restrooms
Greene County Boat	Greene		SE End of Howard Lewis Road,	

TABLE 7-1
Recreation Facilities Providing Access to the Wallace Dam Project

Park/Facility	County	Acreage	Address	Amenities
Ramp			White Plains	
Great Waters Marina	Putnam		154 Oakton South, Eatonton	Reynolds Plantation
Hwy 44 Public Fishing	Greene		136 Clack Cir, Eatonton	Shoreline Fishing
Hwy 44 Public Fishing (Jerry's)	Putnam		1054 Greensboro Rd, Eatonton	Gas, Store
Lake Club Marina	Greene		Brown's Ford Road, Greensboro	Reynolds Plantation - Indoor/Outdoor Pools, Food, Children's Area, Beach Access, Boat Ramps and Docks
The Landing Marina	Greene		1021 Long Cove Drive, Greensboro	Reynolds Plantation - Boat Ramps and Docks
North Shore Resort	Greene		2541 Carey Station Road, Greensboro	Full RV accommodations, Rental Units, Picnic Pavilions, Two Swimming Pools, Fishing, Swimming, Boat Ramp, Game Courts, Playground, RV Storage
Oconee Outdoors and Marina	Putnam		891 Greensboro Road, Eatonton	Full Service Marina with Dry Storage, Fishing and Boat Ramps
Reynolds Plantation Marina	Greene		100 Linger Longer Road, Greensboro	Reynolds Plantation - Boat Ramps and Docks
Sugar Creek Marina	Putnam		353 Parks Mill Road, Buckhead	Gas, Marina, Picnic, Restrooms
Waterfront Marina	Putnam		144 Collis Marina Road, Eatonton	Food, Full Service Campground, Gas, Marina, Picnic, Restrooms

Recreation Use/Needs Study

WRD is the only agency that provided a specific study request related to recreation. In its PAD and SD1 comments letter dated June 15, 2015, WRD requested a recreational use/needs study to determine the adequacy of the existing recreational facilities to meet the current and future recreational demand. The objectives of the study would be to: determine whether existing recreational facilities are adequate to meet public demand; determine accurate use data and recreational demand over the life of the license; determine options for providing boating access areas large enough to accommodate fishing tournaments; and determine options to increase access for bank anglers.

In reference to the recreational use estimates included in the PAD from the FERC Licensed Hydropower Development Recreation Report (Form 80) from 2009, WRD questioned how these statistics were calculated and expressed concern about the difficulty assessing the accuracy of the recreational use and capacity data. WRD requested that Georgia Power evaluate its project recreational facilities as to the adequacy of existing boating access and believes that multiple-lane fishing tournament boat ramps and additional bank fishing facilities are needed to accommodate all anglers and should be considered.

In its comments on the PSP, WRD recommended including additional analysis of bank angling use relative to capacity, the capacity of boat launch areas and parking relative to demand, and boater/fisherman satisfaction on the reservoir as to the adequacy of facilities, capacity, and user recreational experience. WRD recommended the use of techniques including aerial surveys, on-site use surveys, traffic counters, discussions with knowledgeable persons, and the use of existing data.

Georgia Power proposes herein to conduct a recreation study that will address the interests of WRD for assessing the adequacy of the existing recreational facilities to meet the current and future recreational demand and evaluating the need for additional facilities. The proposed study approach incorporates analysis of Georgia Power's 2014 field data collection for the 2015 Form 80, which included the use of traffic counters and trail cameras, attendance records, staff observation, visitor counts or surveys, and estimates of recreational use; interviews with user groups, facility providers, and other stakeholders; campground and shoreline customer surveys; reconnaissance and mapping of bank fishing locations; and estimates of future visitation based on population forecasts and comparison to existing facility capacity. In response to WRD concerns, on-site recreational user surveys have been added to assess the adequacy of existing project recreation facilities and user satisfaction.

Recreation and Land Use Study Comments

In its Study Requests, Comments on Preliminary Study Plan, and Requests for Additional Information letter dated June 18, 2015, and comments made during the Study Plan Meetings, FERC staff requested that the Recreation and Land Use Report describe for any lands designated for future recreation development Georgia Power's use of such tract(s), including but not limited to the original intended use, the historical use, and plans for future use. FERC also requests that Georgia Power's results of the Licensed Hydropower Development Recreation Report (Form 80) from 2015 be included for use and analysis in the Recreation and Land Use Study, and that the 2009 Form 80 results also be summarized for comparison.

Georgia Power proposes to present and analyze the recreational use information data used to compile the 2015 Form 80. Data gathered at the project recreation facilities includes car counters, cameras, and visual observations, as well as the campground customer satisfaction surveys performed in 2011 and 2014 as the most up-to-date recreational data for the study.

7.3.3 Resource Management Goals

WRD and FS are the primary resource agencies having jurisdiction over recreation resources on Lake Oconee and the Oconee River.

WRD has the goal of managing the project waters to provide a quality outdoor recreational experience, including components related to quality public access to the natural resource as well as implementing statewide fish harvest regulations to help manage and conserve sport fish populations.

FS manages lands within the Oconee NF according to the direction provided in the Chattahoochee-Oconee NF Land and Resource Management Plan (FS, 2004). Recreational goals established in the Forest Plan include providing a spectrum of high quality, nature-based recreation settings and opportunities that reflect the unique or exceptional resources of the Forest and the interests of the recreating public on an environmentally sustainable, financially sound, and operationally effective basis.

7.3.4 Existing Information

The following sources of existing information, described further in the PAD, will be evaluated in completing the Recreation and Land Use Study:

- Form 80 Licensed Hydropower Development Recreation Report from 2015 and supporting data collection in 2014;
- Form 80 data from 2009;

- Campground Customer Satisfaction Surveys from 2011 and 2014 and shoreline customer survey information from the same time period;
- Campground use data;
- Available Georgia Bass Chapter Federation and other fishing tournament information;
- The Statewide Comprehensive Outdoor Recreation Plan (SCORP) for Georgia;
- Chattahoochee-Oconee NF Land and Resource Management Plan (FS, 2004) and associated recreation and land use information:
- Regional Recreation Plans (Northeast Georgia Plan, Central Savannah River Area Plan);
- Georgia Power Shoreline Management Guidelines; and
- Population and employment projections developed by the University of Georgia for the Georgia state-wide water planning process.

7.3.5 Nexus between Project Operations and Effects

Georgia Power operates the Wallace Dam Project as a pumped storage development. Wallace Dam generates during peak power demand hours to meet the electrical system demand. Some of this released water 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. Generation occurs during the day, and pumpback operations occur at night. The average daily fluctuation of Lake Oconee is approximately 1.5 ft. There is no intervening riverine reach or bypassed reach of river between Wallace Dam and Lake Sinclair and no instantaneous discharge requirement at Wallace Dam.

The FERC project boundary encompasses the normal full pool elevation of Lake Oconee 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 100 to 200 ft across the reservoir from certain recreation areas. Larger land parcels define the project boundary in 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 (Figure 1-1).

7.4 Study Area

For the purposes of recreation and land use resources, the proposed study area includes: the project boundary extending around Lake Oconee and the Wallace Dam tailrace area, including the project recreation facilities and FS recreational access to Lake Oconee; and the four counties directly adjacent to the Project (Hancock, Putnam, Greene, and Morgan Counties) for future recreational demands analysis based on forecasted population growth.

The land use assessment will also include a zone extending to 2,000 ft beyond the project boundary to encompass a conservatively large area for characterizing existing land use around the Project, including the preparation of a land use map.

7.5 <u>Methodology</u>

Georgia Power's study approach for completing the Recreation and Land Use Study will analyze existing information and data to identify recreational usage trends and recreation demand. Existing recreation and land use in the project study area will be described based on: review of existing information sources listed in Section 7.3.4; analysis of the most recent recreational use information gathered by Georgia Power in 2014 for the 2015 Form 80 and in campground customer satisfaction surveys and shoreline customer surveys; interviews with recreation managers and user groups; and review of available fishing tournament information and FS recreational use data.

The seven project recreation facilities and the three FS recreation access facilities will be delineated as to their associated acreage within the project boundary, and inventoried and described in terms of numbers of boat ramps, picnic tables, grills, picnic shelters, benches, restrooms, fishing docks, playgrounds, improved versus unimproved camp sites, hiking/nature trails, and car and boat trailer parking areas. The barrier-free characteristics of these facilities will be noted as well as their ability to provide access to persons with physical disabilities. Private entities operating facilities and providing access, equipment, or storage for boating or sailing on the project waters will also be described. In addition, existing data on boat launch elevations will be used to assess the effects of average daily reservoir fluctuations of 1.5 ft on recreational opportunities at the Project.

Georgia Power will review current and future recreation needs identified in the SCORP, applicable plans, comprehensive plans, and resource management plans, as identified in the PAD (Sections 4.8, and 5.3).

7.5.1 Interviews with User Groups, Facility Providers, and Other Stakeholders

Georgia Power will seek additional land use and recreational use information for the Wallace Dam Project from:

- Interviews with FS, which operates three recreation sites within the project area in the Oconee NF, including (as named on the FS website) the Swords Recreation Area, Redlands Recreation Area, and Dyar Pasture Recreation Area (Table 7-1).
- Interviews with GDNR Law Enforcement.
- Interviews with the park hosts that operate the camping facilities at three Georgia Power recreation facilities.
- Interviews with operators of private recreation facilities on Lake Oconee.
- Interviews with Lake Oconee Anglers, Lake Oconee Bassmasters, and other fishing clubs that regularly use Lake Oconee for fishing tournaments.
- Interviews with the Chambers of Commerce for Putnam, Morgan, and Greene Counties.
- Interviews with resorts, homeowners associations, and other stakeholders regarding use of the reservoir and recreation facilities.
- Organizations that organize or compile information on fishing tournaments on Lake Oconee.
- Campground use data at Lawrence Shoals, Old Salem, and Parks Ferry Parks, which will be provided by Georgia Power.
- Consultation with Hancock, Putnam, Greene, and Morgan Counties to obtain the most recent land use and zoning information.

A regional recreation overview and assessment of major recreation destinations within a 60-mile (1-hour) driving radius of the project boundary will also be developed. Summary descriptions of regional recreational facilities (including capacity, if available), trends and preferences will be developed from reasonably available information.

7.5.2 Recreation Assessment

2015 Form 80 Data Analysis

Annual recreation use of the project reservoir will be estimated by analyzing data collected in 2014 for the development of the 2015 Form 80. In completing Form 80, Georgia Power utilized a variety of recreational use sampling methods including trail cameras, traffic counters, attendance records, staff observations, visitor counts/surveys, and estimation. Sampling was conducted according to a planned schedule to target both winter and summer

seasons, as well as to capture all the summer "peak" weekends (Memorial Day, Independence Day, and Labor Day).

The methods used in developing Form 80 values are described here. Trail cameras were installed in high-use areas to allow for observations of boat ramps and parking lots. Photographs were reviewed to count the number of axles and vehicles. Axle count was used to determine the number of vehicles and trailers recorded on traffic counters. Attendance records at campgrounds were collected by park hosts in Georgia Power owned facilities. Visitor counts and surveys were completed by operators of non-Georgia Power facilities to gather use information at these locations. The raw data for Form 80 will be analyzed in detail for the Wallace Dam recreation assessment.

The Wallace Dam Project 2009 Form No. 80 Report, although based on less rigorous data collection methods than the 2015 Form 80, will also be summarized for comparison.

Campground Customer Satisfaction Surveys and Shoreline Customer Surveys

The results of Georgia Power customer satisfaction surveys of its campground customers in 2011 and in 2014 will be summarized and evaluated. Customer comments from the campground surveys are tracked, evaluated for feasibility and cost, and acted upon by the Georgia Power Parks Committee and the respective office managers on an ongoing basis. Follow-up actions may include construction, maintenance, and other capital or operational improvements to enhance the quality of the experience. Shoreline customer surveys were conducted during the same time period.

Recreation Field Surveys

To supplement the 2015 Form 80 data collection at Armour Bridge, Long Shoals Boat Ramp, and Sugar Creek Boat Ramp, recreation surveys will be conducted at these three locations on five days in 2016. The purpose of these on-site surveys will be to assess recreational user satisfaction and to further characterize user trends, carrying capacity, competing uses, and the adequacy of existing recreation facilities. Two survey instruments, a Recreational Survey Form (Figure 7-1) and a Recreation User Count Form (Figure 7-2), will be used to collect project-related information. The campgrounds will not be surveyed because campground use data and the customer satisfaction surveys are adequate for estimating annual use and assessing user satisfaction.

The access point surveys will be administered on two weekdays, two weekend days, and a holiday weekend day during the spring and summer seasons. All survey events will be targeted toward fair-weather conditions to maximize the return of user surveys for the effort spent. Each survey event will last approximately 8 to 10 hours. Surveyors will interview users with a prepared questionnaire. The questionnaire will solicit information on group size,

county of residence, age groups of visitors, frequency and duration of visits, reasons for visit, species fished for (if fishing), and qualitative ratings of existing facilities, including parking, boat ramps, docks, bank fishing access, restrooms, and facility cleanliness. Open-ended questions will solicit feedback on specific improvements needed and other comments and suggestions. The interviews will also include general creel-related questions to provide information on fishing.

Two teams of surveyors will administer the surveys during each event on a rotating basis between the access points, depending on use. The surveyors also will periodically count parked vehicles, trailers, boats, bank anglers, and other users, and record notes about recreation activities. Any congestion at the access points will be noted as well. Roving recreation surveys also will be administered to interview bank anglers at informal recreation access points located elsewhere within the project boundary.

User response trends and other findings of the access point surveys will be summarized in tabular format. The information obtained during the access point surveys will be used to supplement the recreational use information collected in 2014 for the 2015 Form 80 and to refine annual use estimates.

Mapping of Bank Fishing Locations

A map of popular bank fishing locations within the project boundary will be developed based on observations of Georgia Power shoreline management staff and park operations staff, roving recreation surveys administered to bank anglers during the five recreation survey events, and interviews with GDNR Law Enforcement and other stakeholders. The map will depict the most heavily used areas for evaluation of potential bank fishing improvements.

Wildlife Management Areas

Information regarding recreational use of WMAs located within the project boundary will also be evaluated. GDNR recently commissioned a study of the Georgia WMAs to estimate county-level and statewide activity and to determine the contribution that select sportsman-related visitation activity makes to the economy. Drawing from license sales records of hunters with WMA privileges and Georgia Outdoor Recreation Pass holders, it assessed use at three of the WMA units around Lake Oconee: Dyar Pasture, Oconee, and Redlands. It found that approximately 147 participants spent 1,061 visitor days at Dyar Pasture Recreation Area, 6,025 visitors spent 71,329 visitor days at the Oconee WMA, and 8,880 visitors spent 94,387 visitor days at the Redlands WMA (Southwick Associates, Inc. and Responsive Management, 2014).

The Recreation and Land Use Study Report will provide maps showing the project recreation sites, the FS recreational areas, and privately operated recreation access facilities and tables

of their associated acreage in relation to the project boundary. In addition, maps will be provided showing the project lands designated in the current project Recreation Plan for future recreation development. Descriptions will include acreage, original intended use, the historical use, and plans for future use.

The proposed recreation assessment approach will develop the information required for the FERC license application as set forth at 18 CFR § 5.18(b) and will be consistent with guidance provided by FERC (1996) on recreation development at hydropower projects. The recreation survey methodology and level of effort proposed are consistent with generally accepted practice at FERC-licensed projects, employing field reconnaissance, traffic/trail cameras, vehicle counts, discussions with user groups, and the use of existing data.

Future Recreation Demands

Future annual visitation to the Wallace Dam Project will be estimated based on review of existing population forecasts. This information will be evaluated, along with information from the SCORP and other relevant sources, to estimate future demand for recreation facilities in the project study area. Future demand will be compared to the estimated carrying capacity of existing facilities on Lake Oconee to characterize future facility needs. Campground surveys discussed above will also be reviewed for indications of future recreation demand.

Land Use Assessment

Land use information collected for the PAD will be augmented by reasonably available land use and zoning information from adjacent local governments, literature review, as well as observations from the shoreline reconnaissance survey described in the Geology and Soils Study Plan (Section 2.0). This information will be used to characterize and evaluate the existing shoreline management and shoreline and buffer zone within the Project. A land use map will also be prepared that incorporates field observations from the terrestrial resources reconnaissance survey (Section 5.0). The mapping will be developed in a GIS database. Tables will be generated showing acreages of each land use classification within the project boundary and a zone extending 2,000 ft beyond the project boundary around Lake Oconee. The land use map will delineate developed and undeveloped lands within the project boundary, as well as any Georgia Power-owned lands adjacent to, and within 2,000 ft of, the project boundary. The study will also evaluate the consistency of the Project with federal, state, regional, and local ordinances and resource management plans.

7.6 Reporting

In accordance with 18 CFR § 5.15(b), a Recreation and Land Use Study Progress Report will be prepared and provided to participants prior to the completion of the study. The progress

report will describe overall progress in summarizing preliminary findings as available, and explain any variance from the study plan and schedule.

In accordance with 18 CFR § 5.15(c)(1), a Recreation and Land Use Study Report will be prepared and provided to participants for review and comment at the conclusion of the study. The study report will characterize existing recreation and land use, and evaluate the need for additional recreational access or facilities.

7.7 <u>Schedule</u>

In accordance with the Wallace Dam Process Plan and Schedule and the master schedule provided in Section 1.4, the Recreation and Land Use Study will be completed according to the milestones listed in Table 7-2 below.

TABLE 7-2
Schedule for Conducting the Recreation and Land Use Study

Activity	Deadline
Begin Literature-Based Review and Field Survey Work	March 1, 2016
Complete Literature-Based Review and Field Surveys	August 31, 2016
File Progress Report	September 30, 2016
File Final Study Report	November 18, 2016

7.8 <u>References</u>

Southwick Associates, Inc. and Responsive Management, 2014

Figure 7-1 Recreational Survey Form

Georgia Power Company Wallace Dam Project Recreation Use Survey

Georgia Power Company is conducting this survey to learn about recreational use at Lake Oconee, user satisfaction with existing recreation facilities, and whether facility improvements may be needed. Please take a few minutes to answer some questions about your visit today. Thank you for your participation.

Location:		Date: Time:					
Weather:	Clear	Partly Cloudy	Cloudy	Rainy	Temperatu	re:	
Investigator:	nvestigator:						
1. What is yo	ur county and stat	e of residence? Count	ty:		State:		
2. How many	. How many people (including you) are in your group today?people						
3. What is yo	ur age? (check on	e) 18-24	25-34	35-44	45-54	55+	
4. If you cam	If you came with others, what are their age groups? (check all that apply)						
Childre	en (infants-12)	Youth (13-17)	Ad	ults (18-55)	Senior A	dults (over 55)	
5. How many	hours will you have	ve spent here today?	hours				
6. How many	times (including t	oday) have you visited La	ake Oconee or its	parks in the last 30	days?	times	
7. How many	times do you visit	Lake Oconee annually?	times				
8. Do you us	e the reservoir at n	ight?Yes _	No If "yes"	, how many times μ	per year?	times	
9. Are the pa	rks at this reservo	ir your primary destination	on for outdoor reci	reation activities?	Yes	No	
10. What othe	r parks and lakes i	n the area do you frequer	nt for recreation?	(list below)			
11. What is the	e primary reason fo	or your visit today? (chec	ck all that apply)				
Boat fishin	g	Pontoon boating	Canoein	g/kayaking	Hiking/wa	king	
Bank fishir	ng	Sail boating	Sailboar	ding	Shoreline	relaxation	
Tourname	nt fishing	Water skiing	Picnickir	ng/playing	Other (list	below):	
Pleasure b	oating	Jet skiing	Swimmir	ng/wading			
12. If you cam	e to fish today, wh	at were you fishing for?	(check all that app	oly)			
Largemout	h bass	Striped bass	Channel	catfish	Other (list below):		
Crappie		Hybrid bass	Blue cat	fish			
Sunfish/bre	eam	White bass	Flathead	catfish			
13. Please rate	13. Please rate the quality of the existing facilities at this access area. (choose one description for each)						
Parking:	Goo	dFairPo	oor Restrooms:	G	oodF	airPoor	
Boat ramp:	Goo	dFairPo	oor Cleanliness:	G	oodF	airPoor	
Dock:	Goo	dFairPo	oor Bank fishing	access:G	GoodF	airPoor	
14. List any specific improvements you would like to see at this access area, and any other comments or suggestions.							

FIGURE 7-2 Recreation User Count Form

Wallaca Dam Dualact	Loc	Location:						
Wallace Dam Project		Investigator:						
User Count Form								
Date:								
Time:								
Weather:								
# of Vehicles with Trailers								
# of Vehicles without Trailers								
# of Boats Visible on Reservoir:				ı	1	T	T	
Fishing Boats								
Canoes/Kayaks								
Pontoon Boats								
Power Boats								
Sail Boats								
Rowing Boats/Sculls								
# of Bank Fishers in Observed								
Fill in Location:								
Rec. Area Name, Tailrace, road name								
# of Parties using other facilities and list (e.g., beaches)								
# of Parties using Camp Grounds								
# of Parties Using or Waiting to Use Picnic Tables								
# of Parties Using or Waiting to Use Boat Lanes								
Other Activities Observed – (list recreation	on activity and	number	of persons	participatin	g):		•	
]			
# of Vehicles with County Tag from:	<u> </u>					<u> </u>	<u> </u>	
Greene Co., GA								
Putnam Co., GA								
Morgan Co., GA								
Hancock Co., GA								
Hancock Co., GA Co., GA								
Hancock Co., GA Co., GA Co.,								
Hancock Co., GA Co., GA Co., Co.,								
Hancock Co., GA Co., GA Co.,								

8.0 CULTURAL RESOURCES

8.1 Introduction

Georgia Power proposes to conduct a cultural resources study of the Wallace Dam Project to identify and evaluate archaeological and historical resources within the area of potential effect (APE). The study will consist primarily of review of available information on known archaeological and historical sites in the project area, including extensive cultural resources assessments conducted before and after project construction as summarized in the PAD, and annual archaeological monitoring of selected sites since 1990. In addition, limited new field testing will be conducted of previously recorded archaeological sites within the project boundary recommended as potentially eligible for the National Register of Historic Places (National Register). The results of this work will be provided in a report describing the archaeological and historical resources at the Wallace Dam Project.

8.2 Goals and Objectives

The goal of this study is to identify and document historic properties located within the project boundary and immediately adjacent areas that could be affected by the continued operation and maintenance of the Project. This information will be used to develop a Historic Properties Management Plan (HPMP) based upon the guidelines established by the Advisory Council on Historic Preservation and FERC.

Specific objectives of this study are to:

- Identify and delineate the APE.
- Identify known historic resources through literature and site file review.
- Determine if any historic properties are eligible for listing on the National Register.
- Evaluate the potential for effects upon historic resources by the operation and maintenance of the Project or by activities conducted along the shoreline of the project reservoir.

8.3 **Study Background**

8.3.1 Issues Identified

The Commission identified in SD1 the following resource issues pertaining to cultural resources:

- Effects of continued project operation and maintenance on properties that are included in or eligible for inclusion in the National Register.
- Effects of continued project operation and maintenance on archaeological and historic resources at the Project.

8.3.2 Study Requests

Georgia Power proposed in the PAD (Section 5.2.1, Preliminary Studies List) to conduct a cultural resources study. The study would identify known historic resources through literature site file review, determine if any historic properties are eligible for listing on the National Register, and evaluate the potential for effects upon historic properties by the continued operation of the Project or by activities conducted along the project reservoir. The study effort would entail further assessments of sites being monitored by Georgia Power to assess effectiveness of the current management plan and provide photographic documentation of the project dam, powerhouse, and associated equipment. FERC listed Georgia Power's proposed study in SD1 as Study No. 11, Cultural Resources.

In its Study Requests, Comments on Preliminary Study Plan, and Requests for Additional Information letter dated June 18, 2015, FERC identified that the study area for cultural resources will include the APE, which will be defined by a Cultural Resources Work Group that will include FERC staff. No other requests for specific studies or study modifications have been received.

8.3.3 Resource Management Goals

The GDNR Historic Preservation Division (HPD) is Georgia's State Historic Preservation Office. *Georgia's State Historic Preservation Plan 2012-2016: Partnering for Preservation* is the guiding document for the state historic preservation program administered by HPD. Resource management goals consistent with this plan and applicable to the relicensing of the Wallace Dam Project include preventing the unintentional disturbance of historic properties by planning for the use of protective measures in activities that may cause a disturbance of the site, and preserving the integrity of any historical structures of the Project's dam and powerhouse and the historical information regarding the development of the Project.

8.3.4 Existing Information

The Wallace Dam project area was used for thousands of years before European settlers arrived at the Oconee River. Cultural resources studies were conducted on Oconee NF lands and lands adjacent to the Project which have helped to develop an overall cultural context for the project area. Because Wallace Dam was constructed relatively recently (1970's), extensive archaeological investigations occurred prior to construction.

The cultural resources of the Wallace Dam project area have been well-studied through a variety of survey methodologies and for various project purposes. Gresham (1987) provides a thorough description and evaluation of the cultural resources known from the Wallace Dam project area prior to 1987 in "The Wallace Mitigation Survey: An Overview". Prior to the large-scale, full-coverage mitigation survey (initiated in 1974), the majority of known cultural resources were the result of reports obtained from avocational archaeologists, arrowhead collectors, thematic or spatially targeted archaeological surveys, or from anonymous reports (Gresham, 1987). The archaeological record for the project area spans 10,800 years. There were eight known cultural resource records documented in the project area prior to the survey work that was completed for the Wallace Reservoir (Lake Oconee).

Wallace Reservoir site discovery activities resulted in a significant number of new finds bringing the cumulative totals to 1,385 sites and 3,108 occurrences (Gresham, 1987). Approximately 74 percent of the land area within the project boundary was evaluated (an area encompassing approximately 5,289 ha) during the cultural resource assessment activities. Specific locations within the project boundary that were evaluated included the Wallace Reservoir impoundment area (7,690 ha), the greater reservoir area (20,934 ha), the proposed tailrace location (Wood, 1977), and several bridge and road widening areas (Wood, 1975). Cultural resources data evaluated for the mitigation survey revealed a higher percentage of findings occurring at upland sites, at around 72.4 percent of all sites, compared to the 17.7 percent of findings that occurred at floodplain sites (Gresham, 1987).

In 1988, Brockington and Associates (Brockington) performed a cultural resource inventory and evaluation study of a 770-acre recreational tract of land located within the Wallace Dam Project, in Greene County. The Brockington study found a total of 52 cultural resources representing seven major types of cultural property (1988). The greatest frequency observed was 21 examples of prehistoric/protohistoric open property (e.g. open air, overhang, and quarry loci). The other major types of properties included prehistoric overhang, prehistoric quarry, Lamar open, Lamar overhang, historic sheet midden, and historic structural ruins (Brockington et al., 1988). Ten of the 52 newly located properties were recommended eligible for the National Register. This group of properties included one prehistoric quarry, six Lamar open properties, one Lamar overhang, and two historic structural ruins (Brockington et al., 1988).

In 1995, Brockington and Associates performed a cultural resources re-verification study in order to evaluate 33 previously recorded sites within the project boundary. The information gained from the review was used to update the site monitoring component of the Georgia Power Cultural Resource Management Program. The re-verification assessment resulted in 28 of 33 sites being re-verified; three of which were recommended for continued monitoring as they are either eligible or recommended potentially eligible for the National Register (Brockington, 1996). One additional unverified site was recommended for continued monitoring due to an inability to access the mapped location to verify the site. The remaining sites of the original 33 were found to be inundated, located outside of the FERC project boundary, to have been destroyed, originally mis-located, or lacked appropriate type and affiliation to be verified; these sites were removed from the monitoring list (Brockington, 1996).

Southeastern Archaeological Services, Inc. (SAS) performed an archaeological survey of the undeveloped property for Reynolds Plantation. The 1860-acre property, located in Greene and Putnam Counties, was surveyed by 4 to 6 person crews using shovel tests (Ledbetter et al., 1998). The SAS survey documented 161 field sites and 41 low density artifact occurrences that depict an area that was intensively utilized and represented a range from 9000 B.C. to A.D. 1600 (Ledbetter et al., 1998). The majority of the sites were determined ineligible for the National Register, however, two sites were recommended eligible and 29 sites were determined to be potentially eligible and warranting further assessment. The eligible sites were primarily old home sites and habitation sites, while the majority of the potentially eligible sites were old home sites, lithic or pottery scatters, and one old sawmill site (Ledbetter et al., 1998). The remaining sites were determined to be ineligible for listing on the National Register.

In 2001, SAS performed an archaeological survey on a 610-acre tract known as the Lake Oconee Village, located in Greene County and additional testing on five Reynolds Plantation sites (Ledbetter et al., 1998) to firmly establish eligibility for the National Register. The survey resulted in the discovery of 25 archaeological sites, 11 low density scatters, and three of the five Reynolds Plantation sites being recommended as eligible for the National Register (Ledbetter et al., 2003).

Since 1990, Georgia Power has conducted archaeological monitoring of selected sites at the Wallace Dam Project. Current monitoring efforts for Wallace Dam include one determined eligible prehistoric artifact/shell scatter, and six recommended eligible sites consisting of prehistoric artifact/ shell scatters, prehistoric Indian lithic scatters, and rock piles. Results from the 2014 monitoring activities found no changes in status or indications of new disturbances for any of the Wallace Dam Project cultural resources (Georgia Power, 2014).

No historic or archaeological sites listed or recommended for inclusion in the National Register 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 of the line, 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 National Register and none of the finds warranted further research.

The Rock Hawk effigy is located in the uplands adjacent to Lake Oconee and serves as the centerpiece of the Rock Hawk Effigy and Trails system (PAD Figure 18). Although the trails and interpretive signage are maintained by Georgia Power, the effigy itself is not in the Wallace Dam project boundary.

8.3.5 Nexus between Project Operations and Effects

Georgia Power operates the Wallace Dam Project as a pumped storage development. Lake Oconee is normally operated between elevations 433.5 and 435 ft PD, with average daily fluctuations of about 1.5 ft. Wallace Dam releases water downstream during peak power demand hours and pumps water back up into Lake Oconee at night for reuse in the next day's generation cycle. Project operations and shoreline activities within the FERC project boundary could affect exposure of sub-surface archeological resources.

8.4 Study Area

The study area for cultural resources will include the area between the low daily Lake Oconee pool elevation of 433.5 ft PD and the project boundary. Other areas immediately adjacent to the project boundary may be added to the area evaluated, provided adjoining ownership is willing for cultural resource specialists to be present on adjoining property. Georgia Power proposes that this study area be considered the APE for archaeological resources. The study area for hydro-engineering resources evaluation will include the area immediately around the dam, powerhouse, and operations areas (i.e., the project works) within the project boundary. Georgia Power proposes that this study area be considered the APE for documentation of hydro-engineering resources.

8.5 Methodology

Georgia Power will contract the services of a professional cultural resources consultant who will use currently accepted practices as defined under Section 106 of the Historic Preservation Act of 1966 (as amended), and implementing regulations (36 CFR 800) for the identification and evaluation of historic properties. Specific field methods will conform to applicable state guidelines such as HPD's *Archaeological Assessment Reports Components and Guidelines* (2004).

The study will begin with review of available literature and data on file at the Georgia Archaeological Site File, as well as reports and other documents on file at Georgia Power as summarized above. These materials will provide information on site type, frequency, and location that will aid in reviewing and evaluating which archaeological sites should be proposed for monitoring by Georgia Power under the new license. The review will aid in developing a field survey consisting of evaluation (Phase II) testing, as appropriate, of up to three archaeological sites within the project boundary previously recommended as potentially eligible to determine whether they meet defined criteria for inclusion on the National Register as set forth in 36 CFR Part 60.4. The evaluation testing will provide the basis for a definitive determination as to their eligibility and whether or not they warrant continued monitoring. The evaluation testing will be conducted in consultation with HPD and in accordance with the *Georgia Standards and Guidelines for Archaeological Surveys* (Georgia Council of Archaeologists, 2014).

Photographic documentation of the dam structure, powerhouse, and equipment will be undertaken and may be used for future assessment of eligibility for the National Register. Because construction of the project works was completed in 1979 and they are not yet 50 years old, a historic hydro-engineering evaluation of the Project is not proposed. The project facilities will attain an age of 50 years during the term of the new license.

For any human remains accidentally or inadvertently exposed or discovered as part of the cultural resources field evaluation, Georgia Power personnel will:

- Stop all activity leading to the discovery or exposure of the human remains; secure the area from public access, protect and treat the remains respectfully, and notify the project manager.
- Notify the local law enforcement agency and other agencies (HPD, FERC) as appropriate of the discovery or exposure, and schedule a site visit to occur within 24 hours.

The study will culminate in the development of a HPMP for the Wallace Dam Project.

8.6 Reporting

In accordance with 18 CFR § 5.15(b), a Cultural Resources Study Progress Report will be prepared and provided to participants prior to the completion of the study. The progress report will describe overall progress in completing data collection and explain any variance from the study plan and schedule.

In accordance with 18 CFR § 5.15(c)(1), a Cultural Resources Study Report will be prepared and provided to participants for review and comment at the conclusion of the studies.

8.7 <u>Schedule</u>

In accordance with the Wallace Dam Process Plan and Schedule and the master schedule provided in Section 1.4, the Cultural Resources Study will be completed according to the milestones listed in Table 8-1.

TABLE 8-1
Schedule for Conducting the Cultural Resources Study

Activity	Deadline
Begin Field Studies and Literature-Based Review	April 1, 2016
File Progress Report	August 31, 2016
Complete Field Studies and Literature-Based Review	September 30, 2016
File Final Study Report	November 18, 2016

8.8 References

- Brockington and Associates. 1988. Cultural Resource Management Wallace Dam Project (Lake Oconee), Greene County, Georgia. Recreation Area A-1: Resource Inventory II Documentation. Brockington and Associates, Atlanta, Georgia. 91pp.
- Brockington and Associates. 1996. Verification of 33 Archaeological Sites, Lake Oconee Project (FERC # 2413), Greene, Hancock, Morgan, and Putnam Counties, Georgia. Brockington and Associates, Atlanta, Georgia. 183pp.Georgia Power, 2014
- Gresham, T.H. 1987. The Wallace mitigation survey: an overview. Wallace Reservoir Project Contribution Number 32, University of Georgia, Department of Anthropology, Laboratory of Archaeology Series, Report Number 57. 47pp.Ledbetter et al., 1998
- Ledbetter, R.J., Schoettmer, R. and M. Wyman. 1998. Intensive archeological survey of the undeveloped portions of Reynolds Plantation, Greene and Putnam Counties, Georgia. Southeastern Archaeological Services, Inc. Athens, Georgia, 406pp. (Georgia Archaeological Site File Report No. 518).
- Ledbetter, R.J., Schoettmer, R. and M. Wyman. 2003. Archeological and historical investigations on the Lake Oconee Village Tract, Greene County, Georgia. Southeastern Archaeological Services, Inc. Athens, Georgia, 406pp. (Georgia Archaeological Site File Report No. 3593). Wood, 1975

- Wood, W.D. 1975. An archeological survey of Highway Relocation Project #27 of Georgia Power Company's Wallace Reservoir. Ms. 60, Department of Anthropology, University of Georgia, Athens.
- Wood, W.D. 1977. An archaeological survey of the Wallace Dam Tailrace. Ms. 67, Department of Anthropology, University of Georgia, Athens.

APPENDIX A

Georgia Power Responses to Comments on the Proposed Study Plan

INTRODUCTION

Georgia Power has reviewed all comments on the Wallace Dam Proposed Study Plan (PSP) filed by relicensing participants pursuant to 18 Code of Federal Regulations (CFR) § 5.12. Revised study requests and proposed modifications to the PSP have been considered in light of the Study Plan Meetings held on August 25-26, 2015 and Georgia Power's subsequent discussions with stakeholders concerning their interests relative to the Study Plan.

In accordance with 18 CFR § 5.13(a), this section further describes Georgia Power's efforts to resolve differences over study requests by either: (1) describing how the Study Plan was revised to address particular comments; or (2) explaining why the request or proposed modification was not adopted in reference to the criteria set forth at § 5.9(b).

The PSP comment letters, and Georgia Power's responses, are presented in the following order:

- Federal Energy Regulatory Commission (FERC) filed October 23, 2015
- U.S. Fish and Wildlife Service (FWS) filed October 26, 2015 (dated October 20, 2015)
- Georgia Department of Natural Resources (GDNR), Wildlife Resources Division (WRD) filed October 26, 2015
- U.S. Environmental Protection Agency (EPA) filed October 26, 2015

FEDERAL ENERGY REGULATORY COMMISSION

WASHINGTON, D.C. 20426 October 23, 2015

OFFICE OF ENERGY PROJECTS

Project No. 2413-117 – Georgia Wallace Dam Pumped Storage Project Georgia Power Company

Courtenay R. O'Mara, P.E. Wallace Dam Hydro Relicensing Manager Southern Company Generation Bin 10193 241 Ralph McGill Boulevard NE Atlanta, GA 30308-3374

Reference: Staff Comments on Proposed Study Plan for Wallace Dam Pumped Storage Project No. 2413

Dear Ms. O'Mara:

We reviewed Georgia Power Company's (Georgia Power) proposed study plan for the Wallace Dam Pumped Storage Project (Wallace Dam Project), filed July 27, 2015, pursuant to 18 C.F.R. § 5.12 of the Federal Energy Regulatory Commission's regulations. We provided verbal comments on the proposed study plan during the August 25 and 26, 2015 study plan meeting(s), and expect Georgia Power to take those comments into consideration during development of the revised study plan, which is due to be filed on November 24, 2015. We have no further comments on the proposed study plan at this time.

We appreciate the opportunity to comment on your proposed study plan for the Wallace Dam Project. If you have any questions, please contact Allan Creamer at (202) 502-8365, or at allan.creamer@ferc.gov.

Sincerely,

Stephen Bowler, Chief South Branch Division of Hydropower Licensing

cc: Mailing List Public Files

RESPONSE TO LETTER FROM FEDERAL ENERGY REGULATORY COMMISSION, DATED OCTOBER 23, 2015

Georgia Power appreciates the comments of FERC staff on the Wallace Dam PSP. Georgia Power noted the staff's verbal feedback on the Study Plan during the Study Plan Meetings and has addressed those comments in the Revised Study Plan (RSP).



United States Department of the Interior Fish and Wildlife Service 105 West Park Drive, Suite D Athens, Georgia 30606

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

Coastal Sub Office 4980 Wildlife Dr. Townsend, Georgia 31331

October 20, 2015

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

Subject: Comments on Proposed Study Plan for the Wallace Dam Hydroelectric Project, FERC Project Number 2413

Dear Ms. Bose:

The U.S. Fish and Wildlife Service (Service) has reviewed Georgia Power Company (GPC)'s July 27, 2015, Proposed Study Plan (PSP) and attended GPC's August 25-26, 2015 PSP meetings for the relicensing of the Wallace Dam Hydroelectric Project (WDHP). This facility, operated by GPC, is located on the Oconee River in east-central Georgia, within Hancock, Putnam, Greene, and Morgan Counties. We submit the following comments and recommendations under the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. § 1531, et seq.), the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. § 661 et seq.), and the Federal Power Act (FPA) (16 U.S.C. § 791a, et seq.).

Freshwater Mussel Surveys

GPC has included a freshwater mussel study in the PSP, as we requested in our June 18, 2015, letter to FERCWe request that GPC remain in close coordination with the Service and GDNR as they formulatemethodology and planning details.

Altamaha Shiner Surveys

On pages 4-1, 4-7, and 4-8 of the PSP, GPC stated that the occurrence and distribution of the Altamaha Shiner (*Cyprinella xaenura*) will be assessed by reviewing existing sources of information and data. This species is State Threatened and has been petitioned to be federally-listed under the ESA. Its range includes the upper Altamaha River drainage of north central Georgia, with known populations in areas upstream of the WDHP. The Service recommends conducting updated surveys for the species within the project area's upper riverine locations to assess whether the Altamaha Shiner is found within the WDHP. The Service is available to coordinate with GPC and GDNR on detailed planning and execution of these surveys.

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Michaux's Sumac

Michaux's Sumac (*Rhus michauxii*) is an endangered flowering shrub species is endemic to the southeastern United States. Michaux's Sumac grows in sandy or rocky open woods on sandy or sandy loam soils and appears to depend on disturbance to maintain the open quality of its habitat. This disturbance may be in the form of fire, wind throws, or openings such as caused by roads, railroads or utility rights of way. The Service recommends GPC include this species on their list of rare, threatened, and endangered species that may be present in the project area in the PSP, and evaluate, during terrestrial field reconnaissance surveys, if the species or suitable habitat for the species is present.

Dissolved Oxygen Monitoring

In our June 18, 2015, letter to FERC, we addressed the proposed water resources study outlined in the PAD, specifically the single year of dissolved oxygen (DO) monitoring proposed for 2016. The PSP also outlines GPC's plans for one year of monitoring (pages 3-3 and 3-8). As seen in the DO data in the Wallace Dam tailrace that has been presented in the PAD, variation among years at a given project can be quite different. We continue to recommend that continuous water quality data be recorded for two years and correlated with factors that likely influence water quality results.

Shoreline Development

As a result of the studies that are produced during this relicensing process, the Service requests that the areas within the WDHP project boundary, as well as any adjacent GPC-owned lands, be delineated as currently developed versus undeveloped. This will assist the Service in our review of the WDHP and our formulation of conservation recommendations as the relicensing process moves forward.

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. 239.

Sincerely,

Donald Imm Field Supervisor

cc:

W. Laney, USFWS, Raleigh, NC

T. Litts, GDNR, Social Circle, GA

C. Nelson, Social Circle, GA

J. Wisniewski, GDNR, Social Circle, GA

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RESPONSE TO LETTER FROM U.S. FISH AND WILDLIFE SERVICE, DATED OCTOBER 20, 2015

Response 1

Since the Study Plan Meetings, Georgia Power has been coordinating closely with both FWS and GDNR on the mussel survey methods, search locations, and planning details. Accordingly, the mussel survey methods have been revised in the Fish and Aquatic Resources Study Plan to incorporate the occupancy-based sampling design recommended by the WRD Nongame Conservation Section for mussel surveys in Lake Oconee and the Wallace Dam tailrace area.

Response 2

FWS recommends that updated field surveys for the Altamaha shiner, a state threatened species that has been petitioned for federal listing under the Endangered Species Act, be conducted within the Project's upper riverine locations to determine whether the species occurs within the project boundary. FWS did not request this study in its comments on the PAD and has not addressed the study request criteria at 18 CFR § 5.9(b).

Georgia Power proposes in the Fish and Aquatic Resources Study Plan to evaluate the occurrence of Altamaha shiner in the project area based on review of existing information and data, and including consultation with WRD's Stream Survey Team. Information maintained by the WRD Nongame Conservation Section documents the occurrence of Altamaha shiner in stream habitats upstream of the project boundary in the Oconee River, Apalachee River, Hard Labor Creek, and Richland Creek (GDNR, 2014). The species inhabits small tributaries and rivers with rocky to sandy substrates and is not known to occur in impounded habitats (Freeman, 2009). Georgia Power has not adopted field surveys as part of its study approach because existing data are adequate to assess the distribution of Altamaha shiner relative to the project boundary. Further, FWS has not explained any nexus between project operations and effects on free-flowing habitats that may be occupied by the species upstream of the reservoir, and how the survey results would inform the development of license requirements (18 CFR § 5.9(b)(5)).

Response 3

To address FWS' interests in Michaux's Sumac (*Rhus michauxii*), a federally endangered plant species, the Rare, Threatened, and Endangered (RTE) Species Study Plan has been revised to add the species to the list of federally listed species that may be present in the project area (Table 6-1). The terrestrial field reconnaissance survey will evaluate whether potentially suitable habitat for the species is present within the project boundary.

Response 4

To address FWS concerns regarding tailrace monitoring of DO, Georgia Power proposes in the revised Water Resources Study Plan to conduct continuous tailrace water quality monitoring for a period of two years in order to represent inter-annual variation in water quality conditions and its relationship to project operations.

Response 5

Regarding the delineation of developed versus undeveloped lands, the land use map prepared in the Recreation and Land Use Study will delineate areas within the project boundary, as well as any adjacent Georgia Power-owned lands within 2,000 feet (ft) of the project boundary, as currently developed versus undeveloped.



MARK WILLIAMS COMMISSIONER

DAN FORSTER DIRECTOR

October 26, 2015

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

RE:

Comments on Proposed Study Plan

Wallace Dam Pumped Storage Project (2413-117)

Dear Secretary Bose:

We appreciate the opportunity to review the Proposed Study Plan 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. Attached are our comments on the Proposed Study Plan.

Sincerely,

John Biagi

Proposed Study Plan Comments

Shoreline Reconnaissance Survey (PSP 2.5.1, 4.5.1)

The proposed shoreline reconnaissance survey indicates that the study area will be partitioned into five strata sections for stratified random selection of twenty-five 500-ft. shoreline segments within each. A total of 106 shoreline segments or sites will be selected for the survey. Sites will be randomly selected to include 25 total segments in each strata of the reservoir and 6 segments in the tailrace. The survey will inventory vegetative buffer zone condition, adjacent land uses, bank stability and vegetative protection, shoreline structural stabilization practices, potential causes of erosion sources, and littoral-zone fish cover. The survey will also include a literature review on the relationship between shoreline development and stabilization and littoral-zone fish habitat.

A similar shoreline characterization study of Lake Sinclair (FERC Project #1951) initially incorporated a sample design whereby a 22-mile section of the 417 miles of shoreline of Lake Sinclair (88 randomly selected quarter-mile segments; 5% of total shoreline length) would be sampled every 5 years to characterize land use and then to use changes in the percentages of the land-use categories to determine the success of stated BMP's in improving reservoir shoreline vegetation conditions. Results from that study indicated that sample size was inadequate due to high levels of variation. The Sinclair Project's shoreline characterization study was ultimately altered to include additional sample sites in an attempt to reduce variability.

Georgia Power has proposed a smaller shoreline length sample size for the Wallace Project shoreline characterization surveys (106 five-hundred feet segments; <3% of total shoreline length). WRD recognizes that a stratified random sampling protocol could reduce variation caused by any clumped distribution of sampling segments, but is uncertain to what degree variation will be reduced in this approach and recommends that Georgia Power consult with a statistician to develop a sound shoreline characterization study. WRD also recommends that Georgia Power evaluate the efficacy of desktop technologies such as Geographic Information Systems (GIS), freely available high resolution aerial photography (e.g. Google map services), existing Georgia Power permit databases, and/or other tools as potential cost saving methods to monitor and report changes in shoreline characteristics over the license term.

Results of the shoreline characterization study and literature review should be used to evaluate and adjust shoreline stabilization practices (e.g. sea walls) and develop a proactive shoreline management strategy that results in the long term conservation of select, well distributed, project lands that contain minimally or undisturbed lake buffers, shoreline, and littoral zone habitats that support sport fish and other aquatic and terrestrial wildlife. WRD recommends this strategy take the form of a comprehensive shoreline management plan to serve as an adaptive guide for future project development and includes consideration for conservation measures by developing, for example, limited development zones, protected zones (e.g. coves), habitat improvement zones and public recreation zones, amid other project demands (i.e. residential, commercial, industrial, etc.).

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In our study plan scoping comments (dated 6/15/2015) we recommend that a shoreline characteristic survey is conducted every 5 years to assess the status of project shoreline development and the impacts to aquatic resources and fish habitats. We recognize that time interval based shoreline monitoring is a reactive approach that could potentially result in the unintended impairment of a sport fish and wildlife populations, and a lessening of recreational user experiences. However, in the absence of a proactive approach to project shoreline, buffer and littoral zone management, we continue to recommend an assessment of shoreline condition every 5 years.

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A map of the land adjacent to the project showing GPC's land holdings with distinct representation for leased and non-leased lands would also be a useful product.

Water Resources (PSP 3.3)

Property adjacent to Mill Creek (Greensboro, GA), which is in close proximity to the project area, has recently been declared as a brownfield redevelopment site and is currently being managed under the Georgia Brownfields Program, over which the Georgia Environmental Protection Division (EPD) has jurisdiction. The property site contains levels of soil contamination (lead and arsenic); however, the property developer is coordinating with EPD under an approved corrective action plan to resolve. WRD is aware of the brownfield site and potential effects to the project.

Water Quality Monitoring in Lake Oconee (PSP 3.5.1)

Proposed study plan regarding hourly vertical profiles of summer pumpback/generation indicates that GPC intends to conduct one sampling event in summer 2016 (July-August) to measure hourly vertical profiles of dissolved oxygen and water temperature at each of the seven project reservoir monitoring locations over the course of a single day to represent a normal summer cycle of pumpback and generation operations.

WRD originally commented in SD1 that summer (July-September) water quality monitoring efforts should be expanded to include weekly full-water column samples of dissolved oxygen and temperature throughout the reservoir, and that continuous measurements of dissolved oxygen and temperature be conducted in the forebay to better assess habitat conditions for sport fish species. In past years, and as recent as summer 2015, WRD has documented summer striped bass mortalities in Lake Oconee resulting from prolonged exposure to excessive water temperatures, suppressed dissolved oxygen levels and/or diel mixtures of the water column. Therefore, WRD continues to recommend that more frequent water quality measurements are needed to further assess summer habitat conditions for sport fish species, and to better define how water quality conditions change in Lake Oconee as a result of operations.

WRD recommends that more than one (24-hr) sampling event in the summer of 2016 to measure hourly vertical profiles of dissolved oxygen and water temperature should be conducted. Additional samples not only would provide replication, but could provide further insight into water quality changes as a result of operations. Replicates also would potentially limit sampling bias or issues (i.e., equipment failures, untypical summer cycle, etc...).

Fish and Aquatic Resources Comments (PSP 4.3.2)

WRD concurs that language regarding fish passage be drafted for the relicensing period of this project. Implications of fish passage have direct effects on recovery efforts of American shad inside the project boundary.

Fish Entrainment Evaluation (PSP 4.5.5)

WRD concurs and supports GPC proposal to evaluate the potential for fish entrainment and turbine-induced mortality as it relates to the physical, operational and fisheries characteristics of the Wallace Dam Project; including, but not limited to, fish mortality rates, size distribution, species composition and seasonal variations.

Recreation and Land Use (PSP 7.3.2)

GPC plans to review existing information (campground surveys, Form 80 data, tournament data, Forest Service use data) to describe recreation, land use, and visual aesthetic qualities in the Wallace Dam Project area; characterize current types and levels of recreational use on the reservoir and in the tailrace area; and evaluate the need for additional recreational access or facilities at the project.

The proposed study methodology to measure recreation and land use provides no provision for measuring bank angling use relative to capacity, no provision to measure the capacity of boat launch areas and parking relative to demand, and no provisions for measuring boater/fisherman satisfaction on the reservoir as to the adequacy of facilities, capacity, and user recreational experience.

To compile comprehensive use data, several standardized techniques should be employed such as field reconnaissance, aerial survey, on-site use interviews, traffic counters, discussions with knowledgeable persons and use of existing data. This study should include different seasons, weather patterns, and days of the week, and other cyclic parameters within the one-year study period. In addition to overall reservoir data, results also should include site-specific data for comparison between recreational areas. WRD suggests a recreational user survey to measure recreational user satisfaction, either in mail-in or electronic form to assess the adequacy of facilities and satisfaction from the user end. These results should also incorporate population estimates for the current population and projected estimates over the life of the license, including at least all local counties. Examples of some of the methodology used in sampling recreational use data can be found in Boyd et al. 2006, Malvestuto 1996 and Murphey et al. 1999.

Literature Cited

Boyd, T., J. McPherson, J.Murphey, T. Bazley, B.Edwards, M. Hough and K. Skaar. 2006. Design handbook for recreational boating and fishing facilities. States Organization for Boating Access. Warren, Rhode Island.

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Georgia Wildlife Resources Division Comments on Proposed Study Plan – Wallace Dam Pumped Storage Project (2413-117)

- Malvestuto, S. P. 1996. Sampling the Recreational Creel. Pages 591-623 *in* B. R. Murphy and D. W. Willis. Editors. Fisheries Techniques. 2nd Edition. American Fisheries Society. Bethesda, Maryland.
- Murphey, J., D. Tobaben, T. Bazley, L.Nichols, L. Killien and T. Donek. 1999. Operations and Maintenance Program Guidelines for Recreational Boating Facilities. States Organization for Boating Access. Washington D.C.

RESPONSE TO LETTER FROM GEORGIA DEPARTMENT OF NATURAL RESOURCES, DATED OCTOBER 26, 2015

Response 1

Regarding GDNR's concerns over the number of shoreline survey sites, Georgia Power proposes in the revised Geology and Soils Study Plan to increase the number of shoreline sites on Lake Oconee from 100 to 140, bringing the total number of survey sites to 146 (140 on reservoir, 6 in tailrace area). The primary purpose of the shoreline survey is to inventory and characterize existing sources of erosion and sedimentation within the project boundary, and to also characterize physical aquatic habitat and available sources of littoral zone cover for fish. Shoreline segments of 500 ft in length are proposed to provide for accurate estimates of bank stability and vegetative protection, structural stabilization practices, and fish cover/habitat types (Figure 2-2). Estimates of these parameters tend to become more generalized and variable when made over longer shoreline segments including a wider variety of shoreline uses. With a minimum shoreline frontage of 100 ft per lot on Lake Oconee, each 500-ft shoreline segment represents no more than five lots, while a quarter-mile segment, as suggested by GDNR, could represent as many as 13 lots and a greater variety of adjacent land uses.

The 500-ft segments will provide for reasonably accurate estimates of shoreline parameters, and the stratified random design will ensure the representation of all project recreation facilities, nine undeveloped areas reserved for future recreational development, and a range of developed and undeveloped land uses within five different strata. Georgia Power believes this survey approach will adequately characterize existing shoreline conditions, potential sources of erosion, and active erosion problem areas for analyzing the effects of continued project operation and project-related recreation on reservoir and tailrace erosion and sedimentation.

GDNR refers to a shoreline survey conducted for Lake Sinclair at a separately licensed FERC project that has different shoreline development characteristics. The shoreline survey at Lake Sinclair was conducted for a different purpose (to evaluate the success of best management practices) and did not include as detailed of a visual assessment at each segment as proposed for the Wallace Dam shoreline survey.

Response 2

Georgia Power's proposed study approach in the revised Geology and Soils Study Plan incorporates the use of GIS and aerial photography for implementing the shoreline survey and evaluating temporal change occurring at sites with documented active erosion problems. In addition, aerial photography will be used in preparing the land use map for the Recreation and Land Use Study. The land use map will show standard land use classifications within the project boundary and on lands adjacent to the project within 2,000 ft of the project boundary

around Lake Oconee. However, Georgia Power believes it would be premature to address GDNR's recommendation for using these technologies, permit databases, and other tools to monitor and report changes in shoreline characteristics over the license term. Our proposed Geology and Soils Study and Recreation and Land Use Study, combined with existing data in those resource areas, will be used to evaluate the effects of project operations on shoreline erosion and sedimentation. Analysis of the study findings in the license application will inform the development of license requirements.

Response 3

Regarding GDNR's recommendations for using the results of the shoreline characterization study and literature review to develop a proactive shoreline management strategy, the primary purpose of the survey is to inventory and characterize existing sources of erosion and sedimentation within the project boundary and to characterize physical aquatic habitat and available sources of littoral zone cover for fish. The results of the proposed Geology and Soils Study and Recreation and Land Use Study will be used to evaluate Georgia Power's current shoreline management program, which includes an access lease and permit program, shoreline management guidelines, compliance program, and resource commitment for proactively managing activities along the shoreline.

Response 4

The purpose of the shoreline survey proposed in the Geology and Soils Study Plan is to develop information for evaluating the relevant resource issues identified during NEPA scoping. These include the effects of continued project operation and project-related recreation on reservoir and tailrace shoreline erosion and sedimentation (Geology and Soils) and the effects of continued project operation, non-project use of project lands, and shoreline permitting on fish habitat and aquatic resources in Lake Oconee (Fish and Aquatic Resources). Georgia Power is not proposing to conduct shoreline surveys during the license term at this time and believes it is premature to conclude that such surveys would be needed. The results of the resource studies and analysis provided in Georgia Power's license application will inform the development of appropriate license requirements.

Response 5

Regarding land adjacent to the project, Georgia Power will address GDNR's concerns by developing a land use map in the Recreation and Land Use Study will show developed versus undeveloped lands within the project boundary, as well as on adjacent Georgia Power-owned lands within 2,000 ft of the project boundary. It is important to note, however, that all residences are located outside of the project boundary; there are no Georgia Power residential leases within the project boundary.

Response 6

Regarding the brownfield development site located adjacent to Mill Creek in Greensboro, Georgia, Georgia Power notes that it is located in the Richland Creek watershed upstream of Lake Oconee, about 5 miles north-northeast of the Wallace Dam project boundary.

Response 7

Regarding GDNR's recommendation to include weekly vertical profile measurements of dissolved oxygen (DO) and temperature throughout the reservoir during summer (July-September), Georgia Power believes that monthly vertical profile monitoring proposed in the revised Water Resources Study Plan, when analyzed in conjunction with over 20 years of seasonal or monthly profiles, will characterize water quality changes occurring over the course of the summer, including normal, dry, and wet years. Table 3-1 shows the months in which vertical profile data have been collected since 1995. Georgia Power has not proposed weekly vertical profile measurements, as requested by GDNR, because the existing data include most years since project construction, cover various weeks across July-September in multiple years, and are adequate for evaluating summer habitat suitability for sport fishes based on published temperature and DO tolerance information. GDNR has not addressed the FERC study request criteria or explained why the existing profile data for numerous summers, combined with the proposed monthly vertical profile monitoring in 2015-2016 and proposed hourly vertical monitoring of pumpback/generation in summer 2016, would not be sufficient to analyze summer habitat suitability of sport fishes (18 CFR § 5.9(b)(4)).

GDNR's recommendation that continuous DO and temperature monitoring be conducted in the dam forebay similarly did not address the study request criteria and has not been adopted in the revised Water Resources Study Plan. This is because the dam forebay remains vertically well mixed during the critical summer period, as demonstrated previously in the PAD, and accordingly, the tailrace continuous monitoring will adequately reflect the quality of water being exchanged daily between the forebay and tailrace during generation and pumpback. The hourly vertical profile monitoring proposed for two summer events will further contribute to characterizing how water quality conditions change as a result of operations. GDNR has not explained the need for continuous monitoring in the forebay and why the existing vertical profile data and proposed monitoring would not be sufficient to characterize the effects of project operation on water quality in Lake Oconee (18 CFR § 5.9(b)(4)).

Response 8

Regarding the GDNR recommendation for more than one diel sampling event to measure hourly vertical profiles over a normal summer cycle of pumpback and generation operations, the revised Water Resources Study Plan proposes a second hourly vertical profile monitoring event for July-August 2016.

Response 9

Georgia Power acknowledges GDNR's interests relative to the recovery efforts for American shad within the Wallace Dam project boundary and Georgia Power's proposed evaluation of fish entrainment and turbine-induced mortality in the Fish and Aquatic Resources Study.

Response 10

Regarding GDNR's concerns with respect to provisions for measuring bank angling use relative to capacity, the revised Recreation and Land Use Study Plan incorporates mapping of popular bank fishing locations within the project boundary based on observations of Georgia Power shoreline management staff and park operations staff, roving recreation surveys administered to bank anglers during the five newly proposed recreation survey events, and interviews with GDNR Law Enforcement and other stakeholders. The map will depict the most heavily used areas for evaluation of potential bank fishing improvements.

Regarding provisions to measure the capacity of boat launch areas and parking relative to demand, the 2014 data collection efforts for the 2015 Form 80 developed information on capacity and demand at Armour Bridge, Long Shoals Boat Ramp, and Sugar Creek Boat Ramp. The revised Recreation and Land Use Study Plan proposes the addition of access point surveys of recreation users at these same three locations, which will be used to assess recreational user satisfaction and to further characterize user trends, carrying capacity, competing uses, and the adequacy of existing recreation facilities.

Response 11

To compile comprehensive recreational use data, GDNR recommends the use of several techniques including aerial surveys, on-site use surveys, traffic counters, discussions with knowledgeable persons, and the use of existing data. Georgia Power's proposed recreation assessment approach in the revised Recreation and Land Use Study Plan incorporates a diverse range of these techniques, including; the analysis of Georgia Power's 2014 field data collection for the 2015 Form 80, which included the use of traffic counters and trail cameras, attendance records, staff observation, visitor counts or surveys, and estimates of recreational use; interviews with user groups, facility providers, and other stakeholders; campground and shoreline customer surveys; on-site recreational user surveys to assess the adequacy of existing recreation facilities and user satisfaction; mapping of bank fishing locations; and estimates of future visitation based on population forecasts and comparison to existing facility capacity.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

October 26, 2015

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

SUBJECT:

Study Plan Comments for Relicensing of the Wallace Dam

Hydroelectric Project (FERC Project No. 2413-117)

Oconee River Georgia

Dear Secretary Bose:

The U.S. Environmental Protection Agency (EPA) received the proposed study plan dated July 2015 and the Federal Energy Regulatory Commission (FERC), requested comments and suggestions on the study plans and any potential environmental impacts that should be addressed in the Environmental Assessment (EA) being prepared as part of the integrated licensing process (ILP) for the Wallace Dam Hydroelectric Project, FERC Project No. 2413-117 (Project). The 'Project' is located on the Oconee River in Hancock, Putnam, Greene, and Morgan Counties in Georgia. The Project is owned and operated by Georgia Power Company (Georgia Power). The current license for the Project expires on May 31, 2020.

The EPA's broad statutory responsibilities in the FERC licensing process include our role of reviewing and commenting on the actions of other federal agencies in accordance with the National Environmental Policy Act (NEPA) and Section 309 of the Clean Air Act, and overall administration of the Clean Water Act (CWA), which establishes a national goal of restoring and maintaining the chemical, physical, and biological integrity of the nation's waters. The EPA's primary interests throughout this process are to protect and improve water quality in the reservoir, major tributaries, and tailrace areas, and ensure the provision of adequate instream flows to protect aquatic life. In addition, The EPA is also interested in ensuring adequate water quality and biological monitoring in the project area to determine compliance with state water quality standards. Issuance of a new FERC license for this project will require certification from the State of Georgia under Section 401 of the CWA that operation of this project complies with each State's water quality standards. Issuance of these certifications is strongly dependent upon the availability of adequate monitoring data documenting the presence or absence, nature and significance of water quality (chemical, physical, biological) impacts resulting from these actions.

The EPA has participated in multiple Integrated Licensing Process (ILP) activities including attending meetings and providing scoping comments and input on the proposed study plans. On June 18, 2015, the EPA provided specific comments on the scoping document 1 for the project

and made several recommendations regarding the Water Resources Study Plan. Specifically EPA made the following recommendations:

- (1) Conduct nutrient sampling consistent with the criteria expression in Georgia's Water Quality Standards at Section 391-3-6-.03 (17) "Specific Criteria for Lakes and Major Lake Tributaries" (http://rules.sos.state.ga.us/docs/391/3/6/03.pdf) by collecting monthly photic zone composite samples from April through October.
- (2) Analyze data on algal species in the reservoir, such as that from the laboratory of Dr. Manoylov at Georgia College and State University, and complete analyses determining if any occurrences of nuisance algal blooms, harmful algal blooms, algal toxins, or fish kills are affected by Wallace Dam operations.
- (3) Include the anticipated schedule and likely parameters from Georgia Environmental Protection Division's (GAEPD) derivation and adoption of water quality standards for nutrients for Lake Oconee. Coordinate with GAEPD to obtain and include any available information regarding the likely criteria currently under development (e.g. chlorophyll a, total nitrogen, total phosphorus, and phosphorus lake loading), likely compliance locations, and results from any preliminary watershed, hydrodynamic, and water quality modelling.

The EPA has reviewed the proposed study plans and we have the following specific comments regarding the Water Resources Study Plan dated July 2015:

1. It is stated in the Water Resources Study Plan that Georgia Power proposes one year of continuous Dissolved Oxygen (DO) monitoring in the tailrace of the project. The EPA believes that DO conditions in the tailrace may be highly variable and that one year of monitoring may not capture future critical DO conditions in the tailrace. Considering that this FERC license may be issued for up to a 50-year period, the EPA is concerned that the monitoring proposed in the current Water Resources Study Plan may not capture future low flow events resulting from droughts that could cause or contribute to non-compliance events of the DO standard. The EPA supports additional DO monitoring beyond the proposed one year. In particular, the EPA supports DO monitoring designed to capture all future low-flow events when the potential for non-compliance of the DO standard is high. Our request is consistent with the US Fish and Wildlife Service (FWS) and the GA Wildlife Resource Division's request for additional and more frequent DO monitoring than is currently being proposed.

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2. In our scoping comments provided to the FERC on June 18, 2015, the EPA recommended collecting monthly photic zone composite samples from April through October for nutrient sampling. Based on our review of the proposed Water Resources Study Plan, our recommendations for nutrient sampling were not adopted by Georgia Power. We continue to recommend nutrient sampling that includes collecting monthly photic zone composite samples from April through October.

We appreciate the opportunity to participate in the ILP for this important Project. We look forward to continued involvement in the overall process. Please contact Dan Holliman of my staff at (404) 562-9531 or by email at Holliman.dan@epa.gov to discuss the EPA's recommendations or if you have questions on our comments.

Sincerely,

Christopher A. Militscher

Chief, NEPA Program Office

Resource Conservation and Restoration

cc: Georgia Power Company

RESPONSE TO LETTER FROM U.S. ENVIRONMENTAL PROTECTION AGENCY, DATED OCTOBER 26, 2015

Response 1

To address EPA concerns regarding tailrace monitoring of DO, Georgia Power proposes in the revised Water Resources Study Plan to conduct continuous tailrace water quality monitoring for a period of two years in order to represent inter-annual variation in water quality conditions and its relationship to project operations.

Response 2

Regarding EPA's recommendation for additional DO monitoring to capture all future low-flow events during the new license term, the results of the Water Resources Study, including two years of tailrace monitoring, will inform the development of appropriate license requirements. Georgia Power believes it would be premature at this time to prescribe future monitoring until the water quality issues are analyzed in the Water Resources Study and Georgia Power's license application.

Response 3

Regarding EPA's recommendation for monthly photic zone composite sampling of nutrients from April through October, Georgia Power proposes to conduct nutrient sampling as part of its quarterly water chemistry monitoring based on surface grab samples, which is consistent with its historical water quality monitoring program. Monthly photic zone composite sampling has not been proposed in the Water Resources Study Plan for several reasons. First, Georgia Power has previously coordinated with GEPD to provide nutrient sampling data supporting calibration of the agency's lake model for Lake Oconee. GEPD has been conducting photic zone composite sampling of nutrients during the growing season in Lake Oconee at three locations (forebay, Georgia Hwy 44, and Richland Creek) since 2009. Second, nutrient loading into Lake Oconee results from point sources and nonpoint source runoff in the upstream watershed, which covers an extensive area of diverse land uses, including urbanized lands, forested lands, and livestock, poultry production, and dairy operations. While Georgia Power recognizes that nutrients are of water quality concern in the Oconee River basin, they were not identified as an issue having a nexus with project operations during the NEPA scoping process. Furthermore, site-specific nutrient criteria have not yet been adopted for Lake Oconee under Georgia's latest EPA-approved Rules and Regulations for Water Quality Control, Chapter 391-3-6 (GEPD, 2013), and therefore, the nutrient criteria expression in the water quality standards does not apply to Lake Oconee. EPA's request does not address the study request criteria at 18 CFR § 5.9(b) and Georgia Power believes that EPA has not adequately justified the need for additional nutrient sampling information (18 CFR § 5.9(b)(4)) nor explained how the results would inform the development of license requirements (18 CFR § 5.9(b)(5)).