WALLACE DAM

Lake Oconee

Study Report

Terrestrial Resources

Wallace Dam Hydroelectric Project
FERC Project No. 2413

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EXECUTIVE SUMMARY

This Terrestrial Resources Study Report provides descriptions of terrestrial wildlife and botanical resources, wetland resources, and littoral habitats, and identifies invasive species in these habitats. The study develops information needed to evaluate the potential impacts of continued project operation for the Federal Energy Regulatory Commission (FERC) relicensing of Georgia Power Company's Wallace Dam Hydroelectric Project (Wallace Dam Project, FERC No. 2413).

The study area is defined as the FERC Project boundary, which generally encompasses Wallace Dam and the reservoir (Lake Oconee), a narrow strip of land beginning at the dam's tailrace and continuing on the shoreline approximately 4.0 river miles downstream of the dam, portions of adjacent public lands, including three sites in the Redlands Wildlife Management Area (WMA), which is located in the Oconee National Forest, a number of Georgia Power recreation areas lands, a 15.67-mile transmission line right-of-way (ROW) that begins near the dam and continues westward until terminating at a switching station southwest of Eatonton, Georgia.

Dominant vegetative community types observed within the study area include mature, mixed pine/hardwood forest, pine plantation, and floodplain/riparian forest. Additional habitat types observed include mesic slope hardwood forest, dry oak/pine forest, granite/rock outcrops, wetlands, and landscaped/developed areas (including utility easements, roads, park facilities, and residential lawns). A total of 410 species of plants were observed within the Wallace Dam study area.

The mosaic of vegetative communities within the study area provides habitat for abundant and diverse wildlife. Ten amphibian species and 12 reptile species were observed. White-tailed deer (*Odocoileus virginianus*) were abundant, and a total of 15 mammal species or their sign were observed. A diversity of bird taxa were detected during the field study, including (but not limited to) waterfowl, shorebird/wading birds, neo-tropical migrants, raptors, and woodpeckers. A total of 115 avian species were observed within the Wallace Dam study area.

A number of wetlands occur within the Project boundary: these wetlands are influenced by the impoundment of Lake Oconee (north of Wallace Dam) and Lake Sinclair (south of Wallace Dam) and by the Oconee and Apalachee Rivers. Drainages of larger stream systems in the central and southern portion of the Project also contain wetlands at their confluence with Lake Oconee.

Littoral habitat along Lake Oconee includes standing timber and shallow emergent wetlands along the lake fringe. Several large areas of remnant standing timber can be found in Lake Oconee; these reflect historical stands of timber that existed prior to the impoundment of the river and were left in place for wildlife habitat purposes during Project construction. Occasional littoral/lake fringe wetlands also exist in Lake Oconee, particularly within small embayments and coves at the confluence of smaller stream drainages and the reservoir.

Invasive species were notably sparse across a majority of the study area. One exception included the presence of dense mats of alligator weed (*Alternanthera philoxeroides*) within the Dyar Pasture Recreation Area which is located in the Redlands WMA. Alligator weed also was present in scattered, shallow coves along the northern portion of the study area. Dense stands of Chinese privet (*Ligustrum sinense*) were present along the northern portion of the study area, particularly within the floodplain on the east and west sides of the Oconee River and within the Redlands WMA. A total of 23 invasive/exotic plant species were observed within the Project boundary.

1.0 INTRODUCTION

The Wallace Dam Hydroelectric Project (Wallace Dam Project, FERC No. 2413) consists of an existing 321.3-megawatt hydroelectric pump storage facility, which operates along the Oconee River and uses Lake Oconee as the upper reservoir. Lake Sinclair, which is located immediately downstream, serves as the lower reservoir and is operated by Georgia Power as the separately licensed Sinclair Hydroelectric Project. The Project boundary includes lands located within Hancock, Putnam, Greene, and Morgan Counties, Georgia (Figure 1). The Project currently occupies approximately 370 acres of U.S. Forest Service (USFS) lands within the Oconee National Forest, which abuts Lake Oconee's northernmost reaches. The current license expires May 31, 2020.

Georgia Power has completed a study to characterize existing terrestrial resources, including vegetative communities, wildlife, wetlands, riparian corridors, and littoral habitats, at the Wallace Dam Project for use in analyzing the potential effects of continued Project operation. The study was conducted according to the Revised Study Plan for the Wallace Dam Project, which was filed with FERC on November 24, 2015 and approved by FERC on December 17, 2015. The information generated by this study and presented herein will be used by Georgia Power to evaluate the environmental effects of its proposed action in the Preliminary Licensing Proposal (PLP), to be filed with FERC by November 21, 2017.

Georgia Power proposes to continue operating the Wallace Dam Project as it is currently operated. No capacity addition or major modifications are proposed under the new license.

1.1 Objectives

The specific study objectives for the terrestrial resources study were to describe terrestrial wildlife and botanical resources and floodplain, wetlands and riparian habitats occurring in the project study area[1]. This study would subsequently provide lists of representative plant and animal species observed (or known to occur via literature review) that use these habitats, and document the presence of invasive species within the study Area.

1.2 Study Area

The Wallace Dam Project is located on the Oconee River in east-central Georgia (Figure 1). Wallace Dam is located at river mile 172.7, approximately 13.4 air miles east of the City of Eatonton in Putnam County

[1] "Areas within the Project boundary" and "Study Area" are used interchangeably within this Report to describe the areas where terrestrial resources field surveys were conducted.

and about 15.4 air miles south of the City of Greensboro in Greene County. Wallace Dam is located about 12 air miles northwest of the City of Sparta in Hancock County, 19 air miles north of the City of Milledgeville in Baldwin County, and about 25 air miles southeast of the City of Madison in Morgan County. The Hancock County-Putnam County line, which follows the Oconee River channel within the Project boundary, bisects the project dam. The Wallace Dam powerhouse is located on the east side of the river, mostly within Hancock County. The spillway portion of the dam is located on the west side of the river within Putnam County. Wallace Dam is situated 29.7 river miles upstream of Georgia Power's Sinclair Dam (river mile 143) and immediately upstream of Lake Sinclair, with no intervening riverine reach. Releases from Wallace Dam flow directly into Lake Sinclair.

The Wallace Dam Project reservoir, known as Lake Oconee, covers 19,050 acres, has 374 miles of shoreline, and extends about 39 river miles upstream on the Oconee River (Georgia Power 2015b). Lands and waters within the Project boundary are located within Hancock, Putnam, Greene, and Morgan Counties. The majority of the Project boundary, which varies in measurement from metes and bounds to elevation contour, is confined to a 25-foot strip of fee-simple land offset from the full pool elevation of 435 feet plant datum[2]. The Project boundary exceeds this width along areas surrounding the dam, Lawrence Shoals Park, Long Shoals Boat Ramp, Old Salem Park, Sugar Creek Boat Ramp, Parks Ferry Park, Redlands WMA (including the Dyar Pasture, Redlands, and Swords Recreation Areas), and other areas (Figure 2). The Project boundary extends downstream of Wallace Dam within Lake Sinclair about 1.3 river miles to the Georgia Highway 16 bridge. It also extends approximately 4.0 river miles downstream of Wallace Dam (tailrace area) on the shoreline on each side of the upper reaches of Lake Sinclair and tributaries which flow into the lake. Also located in this area are three small waterfowl impoundments (two on west side, one on east side of Lake Sinclair within the Oconee Wildlife Management Area and within the project boundary. Finally, the Project boundary includes land within the 15.67-mile transmission line right-of-way (ROW) that originates at Wallace Dam and extends westward, where it eventually terminates at a switching station near Eatonton, Georgia. Based upon the Project boundary description provided above and the boundary line developed by Georgia Power and distributed through geographic information system (GIS) shapefiles to the field survey teams, the cumulative acreage of the study area totaled 25,660 acres (including Lake Oconee). Mapping efforts extended 2,000 feet beyond the study area to facilitate the large-scale delineation of habitat types, land use classifications, and wetland resources that overlap and/or extend beyond the Project boundary.

[2] Plant datum = mean sea level (NAVD88) – 0.23 feet (+/- 0.01 feet)

2.0 STUDY METHODS

The study approach was conducted in general accordance with Section 5 of the Wallace Dam Revised Study Plan (Georgia Power 2015a). Methods for conducting the terrestrial resources study consisted of the following elements.

2.1 Review of Existing Information

Prior to conducting the field reconnaissance surveys, Georgia Power reviewed a number of existing literature and information resources to develop a foundation for understanding the current vegetative and wildlife communities that may occur within the Project boundary. These publically available data sources include, but are not limited to, the following:

- Revised Study Plan for Relicensing the Wallace Dam Hydroelectric Project (Georgia Power 2015a)
- Wallace Dam Preliminary Application Document (Georgia Power 2015b)
- *The Natural Environments of Georgia* (Wharton 1978)
- *The Natural Communities of Georgia* (Edwards, et al. 2013)
- *Mammals of Alabama* (Best and Dusi 2014)
- *Special Bulletin 31: Weeds of Southern Turfgrasses* (Murphy, et al. 2004)
- *Amphibians and Reptiles of Georgia* (Jensen, et al. 2008)
- State Wildlife Action Plan of Georgia (Georgia Department of Natural Resources 2015)
- A Gap Analysis of Georgia: August 2003 Final Report (U.S. Geological Survey 2003)
- North American Breeding Bird Dataset 1966 – 2015 (Pardieck, et al. 2016)
- Christmas Bird Count Historical Results (National Audubon Society 2010)
- *The Sibley Field Guide to Birds of Eastern North America* (Sibley 2003)
- *Field Guide to the Rare Plants of Georgia* (Chafin 2007)
- *Ecoregions of Alabama and Georgia* (Griffith, et al. 2001)
- The Flora of the Oconee National Wildlife Refuge (Georgia Botanical Society 2014)
- Chattahoochee-Oconee National Forest Land and Resource Management Plan (U.S. Forest Service 2004)
- International Ecological Classification Standard: Terrestrial Ecological Classification (NatureServe 2007)

A review of available information resources allowed field investigators to prepare for the terrestrial, wetland, and littoral survey efforts and develop a general understanding of potential habitats that may occur within the Project boundary. An understanding of potential habitats and previously recorded species also assisted in developing lists of fauna that could potentially occur in proximity to Wallace Dam. Field guides were reviewed to determine whether a species' range extended into the Project boundary and to assist in identification of species encountered.

A review of the Georgia Exotic Pest Plant Council's List of Non-native Invasive Plants in Georgia[3] also was performed prior to conducting field studies to evaluate which invasive plant species could potentially be encountered.

2.2 GIS Mapping

Georgia Power developed preliminary GIS maps to assist field investigators in conducting the field surveys. Background data used to develop the maps included aerial imagery from the National Agriculture Imagery Program (NAIP)[4], which consists of digital orthorectified quarter quad tiles acquired at a one-meter ground sample distance having a 6 meter horizontal accuracy. Other background files included the Georgia Land Use Trends data (Kramer and Campbell 2008), the U.S. Fish & Wildlife Service's (USFWS) National Wetlands Inventory imagery data[5], and Project boundary data provided by Georgia Power. Due to the size of the Project and the need to reproduce printable maps for field use, field maps were developed using a map index; this method resulted in the creation of 397 individual grid maps at a 1:500 scale. Triplicate maps were distributed to field staff and included: 1) aerial imagery, 2) land cover classifications, and 3) known/recorded occurrence data of federal and/or state-listed rare, threatened, and endangered (RTE) species. These maps allowed for investigators to ground truth land classification types within the Project boundary and a zone extending 2,000 feet beyond the project boundary, assist in navigating across the Project, and target specific habitats where listed species potentially occur.

Following completion of the field surveys, the GIS maps were updated to reflect current conditions of land use, refine habitat types and locations, update wetlands and littoral habitat locations and areas based on observations during pedestrian and watercraft surveys, and to depict locations of observed RTE species or potentially suitable habitats.

[3] http://www.gainvasives.org/species/weeds/
[4] https://www.fsa.usda.gov/programs-and-services/aerial-photography/imagery-programs/naip-imagery/index
[5] https://www.fws.gov/wetlands/Data/Mapper.html

2.3 Field Surveys

Field surveys were conducted April 25-28, May 9-12, and June 20-23, 2016. Survey efforts included a minimum of two teams of investigators, having a minimum of two biologists/ecologists on each team. During field surveys conducted from watercraft, teams often had one additional member (typically Georgia Power Land Management or Environmental Affairs personnel) who was familiar with the lake and Project boundary. Each team member participated in the field surveys and was assigned a focused responsibility; for example, one team member would target botanical resources, one investigator would focus on visual and auditory observations for birds, and the remaining team member would navigate and focus on observations of other wildlife and/or spoor. However, every team member had sufficient knowledge in both flora and fauna of the Piedmont physiographic province of Georgia so that each team member was able to contribute species lists and habitat types to other team member's area of responsibility.

The initial week (April 25 – 28) targeted areas within the Project boundary that were accessible on foot, which included several public recreation areas and the 15.67-mile transmission easement. Evaluating these areas during the initial field survey week allowed each team to become familiar with common habitats and plant species that occurred throughout the Project boundary and adjacent lands. Additionally, the initial pedestrian surveys were used to develop a detailed species list that would serve as the foundation for the remaining survey efforts.

Field reconnaissance surveys conducted in May were primarily performed from Georgia Power-owned watercraft. Much of the Project boundary that encompasses the Lake Oconee shoreline is limited to 25 feet from full pool elevation. Because of the narrow width of land to be surveyed (i.e., 25 feet), adequate evaluations of habitat types and observations of flora and fauna could be performed efficiently from a boat. This approach reduced the amount of time required to perform the field surveys that would otherwise have been conducted on foot. In cases where the Project boundary extended beyond 25 feet and access was prohibited from roads, the boat driver would find a suitable landing and allow a team of two investigators to perform a pedestrian survey within the extended boundary.

Field surveys conducted in June included completing the areas accessible by watercraft and also targeting additional areas in the northern section of the Project boundary that required pedestrian access. These areas included large expanses of forested floodplain along the Oconee River, much of which were located within the Oconee National Forest and Redlands Wildlife Management Area. Also during June, any

remaining parcels/segments not previously visited, as determined by reviewing the aforementioned grid maps, were targeted for evaluation.

Throughout the course of the field surveys, each team would record observations in dedicated field notebooks and develop species lists specific to a particular taxa. Lists for plants, birds, mammals, reptiles, and amphibians were developed by each team so that cumulative lists could be generated from each team's field notebooks. Within each habitat type, the observed dominant plant species were recorded. This method allowed for ground-truthing existing habitats with those provided in the GIS land cover classification background files. Community data forms were used to document each habitat type and a global positioning system (GPS) point was acquired to document the specific location of where each community data form was recorded. These data allowed investigators to record dominant plant species in each vegetative stratum, including canopy, subcanopy, and herbaceous layers. Additionally, field investigators would record the presence of invasive species and noted any wildlife observations (and spoor) in the vicinity of the data point.

Where relatively unaltered vegetative community stands or tracts were present, habitat type characterizations used in this report generally follow the U.S. National Vegetation Classification/Terrestrial Ecological Classifications system (NatureServe 2007). This classification system allowed investigators to match dominant floristic associations, landscape settings, and other biophysical characteristics with conditions observed in the field. Patchy or altered landscapes were assigned more generalized habitat classifications that were more consistent with the Georgia Land Use Trends characterizations.

Occurrences of invasive species also were GPS-located and mapped where a species occupied more than 50 percent cover of a particular strata. This method allowed for field investigators to transfer invasive-dominated community information to the GIS database so that these areas could be depicted on the maps for location and potential follow-up assessments.

Although the field survey effort was thorough in coverage, the overall size/acreage of the Project study area limited the efforts to record plant and animal species to those areas within the Project boundary. However, the field effort was sufficient in providing accurate characterizations of the various representative habitats, flora, and fauna found in the area. Additional tasks related to the presence of RTE species or their respective habitats were performed concurrently with the terrestrial resources surveys; specific details regarding these methods are presented in the separate RTE Species Study Report.

3.0 STUDY RESULTS

Results of the field surveys are separated into terrestrial botanical resources, wildlife, wetlands and littoral habitats, and invasive species.

3.1 Project Setting

The Wallace Dam Project is situated within the Piedmont Ecoregion (Level III) and, more particularly, the Southern Outer Piedmont Level IV Ecoregion in Georgia (Figure 5; Georgia Power 2015b).

The Wallace Dam Project is located within the Upper Oconee watershed (Hydrologic Unit Code 03070101). The headwaters of the Oconee and Apalachee Rivers, which are the primary tributaries to Lake Oconee, originate in the Southern Inner Piedmont Ecoregion of Hall and Gwinnett Counties, respectively. These rivers converge near the northern portions of Lake Oconee and from that point southward, the river channel is identified as the Oconee River. Below Wallace Dam, the Oconee River remains impounded as a result of Lake Sinclair. Downstream of Lake Sinclair, the Oconee River continues southward and crosses the Fall Line before eventually converging with the Ocmulgee to form the Altamaha River.

The Georgia Department of Natural Resources' (GADNR) Oconee River Basin Management Plan (1998) describes the underlying geology of the Oconee River basin as being largely comprised of Precambrian and older Paleozoic rocks such as mica schist, felsic gneiss and schist, and granite gneiss. This document also discusses the presence of saprolite beneath the soil surface, which is highly erodible when exposed. As a result of intense agricultural practices in previous centuries, erosion of this material has caused excessive sedimentation in the basin's river valleys. Based on observations of the Apalachee and Oconee Rivers in vicinity of the Project, these alluvial river systems carry significant sediment loads, which have caused the development of numerous shallow flats and early successional "islands" suitable for herbaceous/emergent, scrub-shrub, and forested wetland communities.

3.2 Terrestrial Botanical Resources

Lands within and encompassing the Wallace Dam Project contain a mosaic of vegetative communities. Much of these lands have been altered from past and current agricultural and silvicultural practices, and, to a lesser degree, alteration arising from residential, commercial, and transportation development. Thus, native climax communities are rare within the project area. Below are descriptions of the 12 vegetative communities observed along with additional descriptions of flora found within the Project boundary.

3.2.1 Vegetative Communities/Habitat Types

Twelve vegetative communities were observed as a result of the field surveys conducted for the Wallace Dam Project. Table 3-1 provides a list of these habitat types along with estimated acreages of each type within the Project boundary and the 2,000-foot zone extending beyond the Project boundary. Community data forms (Appendix A) provide a representative description of each habitat type encountered and Table 1 of Appendix B presents the relationships between each species and the habitat(s) in which it was observed. Appendix C contains a selection of representative photographs of each habitat type encountered.

Table 3-1. Vegetative Communities and their Estimated Acreages* within the Project Boundary.

Vegetative Community/ Habitat Type	Approximate Acreage within Project Boundary	Approximate Acreage within 2,000-foot Zone
Mixed Pine/Hardwood Forest	2,473	31,041
Floodplain and Riparian Forest	997	2,850
Mesic Slope Forest	77	417
Pine Plantation/Pine Forest	445	12,650
Dry Oak/Pine Forest	59	75
Granite Outcrop	17	22
Transmission Easement	413	707
Agricultural Land	430	8,220
Forested Wetland	651	1,136
Scrub-Shrub Wetland	117	156
Emergent/Herbaceous Wetland	143	143
Developed Areas	1,463	13,895
Open Water (Primarily Lake Oconee)	18,375	18,963
Total Acreage	**25,660**	**90,275**

*Acreage calculations are estimates developed from aerial imagery and other GIS-based sources and are considered approximate.

3.2.1.1 Mixed Pine/Hardwood Forest

The mixed pine/hardwood forest community is the most common habitat type found within the Project boundary. This vegetative community is dominated by loblolly pine (*Pinus taeda*), mockernut and pignut hickories (*Carya tomentosa, C. glabra*), Southern red oak (*Quercus falcata*), sweetgum (*Liquidambar styraciflua*), and tuliptree (*Liriodendron tulipifera*) in the canopy. Midstory species include blackgum (*Nyssa sylvatica*), flowering dogwood (*Cornus florida*), Southern sugar maple (*Acer barbatum*), Eastern redbud (*Cercis canadensis*), hawthorn (*Crataegus spp.*), sparkleberry (*Vaccinium arboreum*), and black

cherry (*Prunus serotina*). Dominant herbaceous species include Christmas fern (*Polystichum acrostichoides*), woodoats (*Chasmanthium spp*.), partridge berry (*Mitchella repens*), violets (*Viola* spp.), and greenbriers (*Smilax spp*.). Much of the narrow strip of land between the lake edge and the Project boundary is comprised of this habitat. This community is also found in adjacent public lands and recreational areas. The mixed pine/hardwood forest community occupied approximately 2,473 acres (34 percent) of the Project area.

3.2.1.2 Floodplain and Riparian Forest

This vegetative community is associated with streams and rivers, with alluvial soils/sediment deposition, periodic flooding, and mesic conditions influencing the species composition. Typical species found in the canopy included sweetgum, American sycamore (*Platanus occidentalis*), sugarberry (*Celtis laevigata*), red maple (*Acer rubrum*), black willow (*Salix nigra*), black walnut (*Juglans nigra*), green ash (*Fraxinus pennsylvanica*), box elder (*Acer negundo*), and water oak (*Quercus nigra*). Scattered occurrences of American beech (*Fagus grandifolia*), loblolly pine, and cherrybark oak (*Q. pagoda*) also were observed. Midstory species often included ironwood (*Carpinus caroliniana*), hop hornbeam (*Ostrya virginiana*), Carolina silverbells (*Halesia carolina*), and hazel alder (*Alnus serrulata*). Herbaceous vegetation may include various greenbriers, Christmas fern, violets, common sneezeweed (*Helenium autumnale*), false garlic (*Nothoscordum bivalve*), false nettle (*Boehmeria cylindrica*), and butterweed (*Packera glabella*). Approximately 997 acres (13.5 percent) of floodplain and riparian forest habitat occurs within the Project boundary.

The presence of beavers and associated dams along the Oconee and Apalachee River floodplains has contributed to the development of various wetland communities, including herbaceous/emergent, scrub-shrub, and forested wetlands. Descriptions of these habitat types are provided in detail below for each respective community type.

3.2.1.3 Mesic Slope Forest

This sparsely disturbed habitat type was observed in scattered locations along steeper slopes above floodplains or riparian corridors. Canopy vegetation includes American beech, Southern magnolia (*Magnolia grandifolia*), Northern red oak (*Quercus rubra*), white oak (*Q. alba*), shagbark and mockernut hickories (*Carya ovata, C. tomentosa*), blackgum, tuliptree, and sweetgum. Subcanopy species include Southern sugar maple, sourwood (*Oxydendron arboreum*), red maple, ironwood, hop hornbeam, Carolina silverbells, American holly (*Ilex opaca*), witch-hazel (H*amamelis virginiana*), cucumber magnolia

(*Magnolia acuminata*), basswood (*Tilia americana*), and buckeye (*Aesculus spp*.). Herbaceous vegetation was generally sparse, but included cranefly orchid (*Tipularia discolor*), wood-sorrel (*Oxalis spp*.), mayapple (*Podophyllum peltatum*), and several species of trillium (*Trillium spp*.). Approximately 77 acres (1 percent) of mesic slope forest occurred within the Project boundary.

3.2.1.4 Pine Plantation/Pine Forest

The pine plantation/pine forest habitat type was common within the 2,000 foot zone around the Project boundary and throughout the counties in which the Project resides. This vegetative community reflected disturbed conditions and typically included intensively managed pine plantations in various ages, from recently planted to merchantable-aged stands (20 to 30 years). The dominant species was loblolly pine, although scattered occurrences of shortleaf (*Pinus echinata*), slash (*P. elliottii*), and longleaf (*P. palustris*) pines were observed. Midstory species included various oaks (*Quercus spp*., depending upon soil moisture regime), hickories (*Carya spp*.), and early successional hardwoods such as sweetgum and tuliptree. A prescribed burn regime is a component of the management of some of the pine plantations (particularly within Oconee National Forest and Redlands Wildlife Management Area), which allowed for a more open understory. Therefore, herbaceous and shrub species were sparse but included beautyberry (*Callicarpa americana*), blackberries (*Rubus spp*.), greenbriers, muscadine (*Vitis rotundifolia*), St. John's wort (*Hypericum spp*.), Virginia creeper (*Parthenocissus quinquefolia*), American pokeweed (*Phytolacca americana*), cinquefoil (*Potentilla spp*.), sumac (*Rhus spp*.), vetch (*Vicia spp*.), and lyreleaf sage (*Salvia lyrata*). Managed pine plantations and other pine-dominated forests occupied approximately 445 acres (6 percent) of the Project lands.

3.2.1.5 Dry Oak/Pine Forest

The dry oak/pine forest is an upland forest of the southern Piedmont, where soils are often rocky or sandy and well-drained. Typically dominated by oaks and pines, this community commonly occurred on upland ridges and upper- to mid-slope elevations. The dominant canopy species included post oak (*Q. stellata*), southern red oak, blackjack oak (*Q. marilandica*), shortleaf pine, loblolly pine, and pignut hickory. Canopy species seedlings, as well as persimmon (*Diospyros virginiana*), sparkleberry, deerberry (*Vaccinium stamineum*), and hawthorn (*Crataegus spp.*) occupied the midstory. Herbaceous species that commonly occurred in this habitat include bracken fern (*Pteridium aquilinum*), tick-trefoil (*Desmodium spp*.), spiderwort (*Tradescantia spp*.), butterfly pea (*Clitoria mariana*), and partridge pea (*Chamaecrista*

fasciculata). Approximately 59 acres (less than 1 percent) of land within the Project boundary contained the dry oak/pine forest habitat.

3.2.1.6 Granite Outcrop

Granite outcrops are characterized by the presence of smooth, bare/exposed granite and related rocks with "islands" of vegetation scattered throughout, and are most common (in comparison with other regions) in the Piedmont (Edwards, et al. 2013). Vegetation on these outcrops can be complex and typically coincides with small patches of microhabitats, where soil depth affects species recruitment. Vegetation often transitions from moss and lichens to herbs, herbs to shrubs, and shrubs to trees. Microhabitats occur within depressions which retain water, thus forming niche habitats for several protected species. During the course of the field surveys, investigators observed eastern red cedar (*Juniperus virginiana*), loblolly pine, mosses, prickly pear (*Opuntia humifusa*), hairy lipfern (*Cheilanthes lanosa*), fringetree (*Chionanthus virginicus*), bird's foot violet (*Viola pedata*), yucca (Yu*cca filamentosa*), threadleaf sundrop (*Oenothera linifolia*), and Carolina jessamine (*Gelsemium sempervirens*) along the edges of the outcrop. Depressional features within the outcrops harbored stitchwort (*Minuartia spp*.), elf orpine (*Diamorpha smallii*), toadflax (*Nuttallanthus canadensis*), and Piedmont quillwort (*Isoetes piedmontana*). Of note, the federal- and state-threatened pool sprite (*Amphianthus pusillus*) was observed in depressional features within one of the granite outcrops. The largest of the granite outcrop habitats is located within the Lawrence Shoals campground. This habitat type occupied approximately 17 acres (less than 0.5 percent) within the Project study area.

3.2.1.7 Transmission Easement

The study area included a 15.67-mile transmission easement that traversed a number of habitat types between Wallace Dam and Eatonton, Georgia. The easement appears to be periodically maintained through mowing and spot-application of herbicide; however, some sections are located within agricultural lands that are used as pasture. The transmission easement habitat is primarily limited to herbaceous species. Although most of the corridor is located in uplands, occasional perennial and intermittent streams were observed within the easement corridor. Herbaceous wetlands, which often encompassed the stream systems, also were observed within the easement right-of-way. Upland vegetation included various grasses (*Poa spp., Lolium multiflorum, Panicum spp*., *Dicanthelium spp*., etc.) as well as goldenrods (*Solidago spp*.), thoroughworts (*Eupatorium spp*.), goundsel/ragworts (*Packera spp*.), plantains (*Plantago spp*.), clovers (*Trifolium spp.*) tick-trefoils, and numerous other early successional species observed

throughout the easement corridor. Wetland vegetation, such as arrow arum (*Peltandra virginica*), devil's beggartick (*Bidens frondosa*), stiff marsh bedstraw (*Galium tinctorium*), and various sedges (*Carex spp*.) occurred in the herbaceous wetlands within the transmission easement. The Georgia Power transmission easement within the Project boundary occupied approximately 413 acres (5.5 percent).

3.2.1.8 Agricultural Land

With the exception of pastures within the transmission easement, agricultural lands were primarily found outside of the Project boundary but throughout the 2,000-foot zone surrounding the Project boundary. Agricultural lands included poultry houses, livestock pastures, and hay fields. Herbaceous vegetation included pasture grasses (*Paspalum notatum*, *Cynodon dactylon*, etc.), a variety of "weedy" forbs such as Venus' lookingglass (*Triodanis perfolata*), little hop clover (*Trifolium dubium*), dogfennel (*Eupatorium capillifolium*), ragweed (*Ambrosia artemisiifolia*), buttercups (*Ranunculus spp*.), and pigweed (*Amaranthus spp*.). Approximately 430 acres (6 percent) of the Project study area are occupied by agricultural lands.

3.2.1.9 Forested Wetland

Forested wetland communities were generally found in poorly drained areas within floodplains, riparian corridors, and lake edges, but also in other locations where sufficient hydrology and hydric soils were found. Forested wetlands were more common along the rivers and larger tributaries to Lake Oconee, particularly near the northern (upper) reaches of the lake. Forested wetlands also occurred near the confluence of larger tributaries and Lake Sinclair near the southern Property boundary. Dominant canopy vegetation included sugarberry, water hickory (*Carya aquatica*), green ash, willow oak (*Quercus phellos*), blackgum, red maple, box elder, and American sycamore. Midstory vegetation contained persimmon, rusty blackhaw (*Viburnum rufidulum*), switchcane (*Arundinaria gigantea*), black willow, and ironwood. Herbaceous vegetation included ferns such as broadbeech fern (*Phegopteris hexagonoptera*), netted chainfern (*Woodwardia areolata*), common lady-fern (*Athyrium filix-femina*), and sensitive fern (*Onoclea sensibilis*). Lizard's tail (*Saururus cernuus*) also was observed throughout many forested wetlands. Approximately 651 acres (9 percent) of forested wetlands were observed within the Project boundary.

3.2.1.10 Scrub-Shrub Wetland

Scrub-shrub wetlands are dominated by early successional and scrub-shrub vegetation, such as buttonbush (*Cephalanthus occidentalis*), alder, silky dogwood (*Cornus amomum*), black willow, and Virginia willow (*Itea virginica*). Other species commonly found in these habitats include box elder, marshpepper knotweed (*Persicaria hydropiper*), Virginia water horehound (*Lycopus virginicus*), sedges,

and softrush. Approximately 117 acres (1.5 percent) of scrub-shrub wetland habitat are located within the Project study area, with most areas found along the transition from open water or emergent/herbaceous wetlands to forested wetlands within large stream or river floodplains. Additional scrub-shrub wetland habitat was observed on small islands that have formed from sediment deposition in the upper reaches of the lake.

3.2.1.11 Emergent/Herbaceous Wetland

The emergent/herbaceous wetland habitat occurred in scattered areas around the lake, particularly in shallow coves and the upper reaches of the lake where sediment deposition has formed shallow flats. Additional locations where this habitat was observed included seasonal to permanently flooded wetlands formed from beaver activities; these areas are primarily found in the floodplains of the Oconee and Apalachee Rivers. Common vegetation in these areas include lizard's tail, parrotfeather (*Myriophyllum aquaticum*), marshpepper knotweed, rice cutgrass (*Leersia orysoides*), false nettle, alligatorweed, sedges, devil's beggarticks, softrush, and pennywort (*Hydrocotyle sp*.). Approximately 143 acres (2 percent) of the Project study area consisted of emergent/herbaceous wetlands.

3.2.1.12 Developed Areas

The developed areas habitat included a variety of lands that have been altered or landscaped, including recreational facilities (parks, boat ramps, marinas, etc.), residential lots/subdivisions, golf courses, quarry, other utility easements, etc. Many of these areas are landscaped and regularly maintained by mowing and other vegetation control measures. Flora within these areas often included horticultural varieties of trees and shrubs and lawns consisting of bermudagrass, zoysia, or other turfgrasses. Approximately 1,463 acres (20 percent) of the Project study area are occupied by developed and/or landscaped areas.

3.2.2 Observed Flora within the Project Boundary

In addition to characterizing the 12 habitat types encountered, field investigators created a cumulative list of flora observed during the field surveys. Species richness is relatively high considering the acreage of lands that have been manipulated for agricultural, silvicultural, recreational, and residential activities. As a result, over 400 species of plants were identified (Appendix B, Table 2). The referenced table also depicts the locations (by habitat type) where the species was observed, so that each species can be attributed to one or more habitats found within the Project boundary. Please note that while some RTE species were observed during the field surveys, discussions related to those findings are presented in the

separate RTE Species Report and are not presented herein. Appendix D provides representative photographs of flora observed within the Project boundary.

3.3 Wildlife

A review of the U.S. Geological Surveys' (USGS) GAP Analysis of Georgia (2003) indicated that the Piedmont, and more particularly the counties encompassing the Wallace Dam Project boundary, have lower species richness scores than other areas of the state. This finding is especially true for amphibian species richness, where the GAP Analysis depicted a score range between 0 and 28. Mammal species richness is also predicted to be low (37 to 44 species) compared with other locations in the state. One notable difference is the breeding bird richness score, which calculated a range of between 110 to 114 species (the second highest richness score for the state). Overall, the Georgia GAP analysis predicted a cumulative wildlife species richness score that ranged from 221 to 231 (the second lowest richness score range within Georgia).

Wildlife observations were relatively common within the Project boundary, with 152 mammal, bird, amphibian, and reptile species observed. As discussed previously, the field survey effort for wildlife was limited to direct observations (visual or auditory) of individuals or their spoor. No targeted trapping or focused survey efforts were conducted for wildlife; therefore, species richness for taxa such as small mammals and more secretive amphibians and reptiles is understandably low. Table 3-2 presents the species richness for each primary taxa observed and Appendix D provides representative photographs of some of the fauna encountered during the field surveys.

Table 3-2. Species Richness Observed for Wildlife within the Wallace Dam Project Boundary.

Wildlife Taxa	Species Richness
Mammals	15
Birds	115
Amphibians	10
Reptiles	13
Total Species Richness Observed	**152**

3.3.1 Mammals

Observations of mammals and/or their spoor were relatively common. The most common species observed included the white-tailed deer (*Odocoileus virginianus*), American beaver (*Castor canadensis*), nine-banded armadillo (*Dasypus novemcinctus*), raccoon (*Procyon lotor*), and Eastern gray squirrel

(*Sciurus carolinensis*). A total of 15 mammal species were observed during the field surveys. Table 3-3 provides a list of mammal species observed within the Project boundary.

Table 3-3. Mammal Species Observed within the Wallace Dam Project Boundary.

Common Name	Scientific Name
Coyote	*Canis latrans*
American Beaver	*Castor canadensis*
Nine-Banded Armadillo	*Dasypus novemcinctus*
River Otter	*Lontra canadensis*
Striped Skunk	*Mephitis mephitis*
White-Tailed Deer	*Odocoileus virginianus*
Common Muskrat	*Ondatra zibethicus*
Common Raccoon	*Procyon lotor*
Eastern Gray Squirrel	*Sciurus carolinensis*
Fox Squirrel	*Sciurus niger*
Hispid Cotton Rat	*Sigmodon hispidus*
Wild Boar	*Sus scrofa*
Eastern Cottontail	*Sylvilagus floridanus*
Eastern Chipmunk	*Tamias striatus*
Gray fox	*Urocyon cinereoargenteus*

3.3.2 Amphibians and Reptiles

Amphibians and reptiles were observed throughout the Project study area. Species were observed in a variety of habitats, including mixed pine/hardwood, floodplain and riparian forests, various wetlands, and mesic slope hardwood forests. Common species observed within the Project boundary included Southern leopard frog (*Lithobates sphenocephalus*), Cope's gray treefrog (*Hyla chrysoscelis*), Southern cricket frog (*Acris gryllus*), green anole (*Anolis carolinensis*), black racer (*Coluber constrictor*), and Northern water snake (*Nerodia sipedon*). Two species of turtle, the pond slider (*Trachemys scripta*) and river cooter (*Pseudemys concinna*), were commonly seen basking on logs and other debris within the reservoir and associated streams. A total of 13 reptiles and 10 amphibians were observed during the field surveys. Tables 3-4 and 3-5 present a list of reptiles and amphibians (respectively) observed within the Wallace Dam Project boundary.

Table 3-4. Reptiles Observed within the Wallace Dam Project Boundary.

Common Name	Scientific Name
Eastern Copperhead	*Agkistrodon contortrix*
Green Anole	*Anolis carolinensis*
Six-Lined Race Runner	*Aspidoscelis sexlineata*
Black Racer	*Coluber constrictor*
Eastern King Snake	*Lampropeltis getula*
Red-Bellied Water Snake	*Nerodia erythrogaster*
Northern Water Snake	*Nerodia sipedon*
Common Five-Lined Skink	*Plestiodon fasciatus*
Broadhead skink	*Plestiodon laticeps*
Eastern Fence Lizard	*Sceloporus undulatus*
Ground Skink	*Scincella lateralis*
Eastern Box Turtle	*Terrapene carolina*
Yellow-Bellied Slider	*Trachemys scripta*

Table 3-5: Amphibians Observed within the Wallace Dam Project Boundary.

Common Name	Scientific Name
Southern Cricket Frog	*Acris gryllus*
Fowler's Toad	*Anaxyrus fowleri*
Southern Toad	*Anaxyrus terrestris*
Southern Two-Lined Salamander	*Eurycea cirrigera*
Bird-Voiced Treefrog	*Hyla avivoca*
Cope's Gray Treefrog	*Hyla chrysoscelis*
Green Treefrog	*Hyla cinerea*
American Bullfrog	*Lithobates catesbeianus*
Banjo Frog	*Lithobates clamitans*
Southern Leopard Frog	*Lithobates sphenocephalus*

3.3.3 Birds

Field investigators identified 115 bird species during the field surveys. Common species included the Northern cardinal (*Cardinalis cardinalis*), American crow (*Corvus brachyrhynchos*), blue jay (*Cyanocitta cristata*), Carolina chickadee (*Poecile carolinensis*), Carolina wren (*Thryothorus ludovicianus*), great blue heron (*Ardea herodias*), mourning dove (*Zenaida macroura*), osprey (*Pandion haliaetus*), red-bellied woodpecker (*Melanerpes carolinus*), and turkey vulture (*Cathartes aura*). Eight diurnal raptors were observed, and, despite the time of year (i.e., spring/summer), five species of waterfowl and seven species of wading/shorebirds were observed.

Some notable species observed included the Swainson's warbler (*Limnothlypis swainsonii*), Northern bobwhite (*Colinus virginianus*), Mississippi kite (*Ictinia mississippiensis*), bald eagle (*Haliaeetus leucocephalus*), and over 20 species of warblers. Table 2 in Appendix B provides a list of bird species

observed, as well as lists of species observed from the most recent Lake Oconee Audubon Christmas Bird Count and USGS Breeding Bird Surveys at the Siloam, Rutledge, and Maxey survey routes.

3.3.3.1 Wading Bird Colonies

Wading bird rookeries were not observed at Wallace Dam during the course of the surveys conducted via watercraft; however, one island located near the southern section of the Richland Creek reach within Lake Oconee contained four great blue heron nests. No other locations on the lake were observed that contained more than one nest in a particular area.

3.3.3.2 Bald Eagle Nests and Occurrences

Georgia Power obtained bald eagle nest data from GADNR on August 12, 2016, which provides the nesting status of known bald eagle nests between 2011 and the 2016 nesting season. Table 3-6 provides a general description of the nest locations and their current status. Seven nests are located within the Project boundary and general descriptions of their locations are provided in Table 3-6.

During the course of the field surveys, bald eagle individuals were observed in scattered locations along Lake Oconee; however, no new/additional nests were observed. Data obtained from GADNR indicated that a total of five eaglets successfully fledged during 2016 from nests surrounding Lake Oconee.

Table 3-6: Bald Eagle Nests in Vicinity of Wallace Dam Project Boundary.

Bald Eagle Nest Site	County	Location Description	2016 Status
Lake Oconee–Cold Springs	Greene	Located approximately 3 miles from Greshamville. Located outside Project boundary.	Abandoned
Lake Oconee–Cold Springs 2	Greene	Located approximately 3 miles from Greshamville. Located outside Project boundary	Active/ Occupied
Parks Mill (west)	Morgan	Located approximately 2 miles from. Located outside Project boundary.	Abandoned
Parks Mill (east)	Greene	Located approximately 2 miles from. Located outside Project boundary.	Abandoned
Old Salem	Greene	Located approximately 2 miles from Long Shoals. Located within Project boundary.	Abandoned
Port Armor G	Greene	Located approximately 2 miles from Greensboro. Located within Project boundary.	Active/Occupied
Carey	Greene	Located approximately 5 miles from Greensboro. Located within Project boundary.	Active
Reynolds Plantation	Greene	Located approximately 1 mile from Long Shoals. Located outside Project boundary.	Abandoned
Reynolds Plantation East	Greene	Located less than 1 mile from the intersection of Hatchers Run and Red Road. Located outside Project boundary.	Active
Wallace Dam East	Hancock	Located less than 1 mile from Wallace Dam. Located within Project boundary.	No Data
Wallace Dam North East	Hancock	Located less than 1 mile from Wallace Dam. Located within Project boundary.	No Data
Wallace Dam 3	Hancock	Located less than 1 mile from Wallace Dam. Located within Project boundary.	No Data
Wallace Dam 4	Hancock	Located less than 1 mile from Wallace Dam. Located within the Project boundary.	No Data
Wallace Dam – Oconee WMA	Hancock	Located approximately 1 mile from Wallace Dam. Located outside Project boundary.	Active

3.4 Wetlands and Littoral Habitats

The USFWS generally define wetlands as areas of land comprised of three attributes: (1) the presence of hydrology, where sufficient saturation or flooding affects the soils and vegetation; (2) the presence of hydrophytic vegetation, where specialized vegetation that is accustomed to wet or saturated growing conditions dominates the area; and, (3) hydric soils, where the saturated or flooded conditions (particularly in the upper 12 inches) provides an oxygen-deficient environment as a result of saturated or flooded conditions (Tiner 1984). This non-regulatory definition was developed to assist public and private entities in understanding and classifying wetlands. The USFWS developed a classification system for wetlands based on hydrology, vegetation, and soils and it is based on five systems having similar hydrologic, geomorphologic, chemical, and/or biological characteristics. This classification system is often referred to as the Cowardin classification system (Cowardin, et al. 1979).

Three dominant wetland habitat types were observed during the field surveys, including forested wetlands, scrub-shrub wetlands, and herbaceous wetlands. Descriptions of these wetland communities are provided in Section 3.2.1. Forested wetlands were primarily found in the upper (northern) section of the Project boundary and within the floodplains of the Oconee and Apalachee Rivers, as well as larger stream systems such as Beaverdam Creek, Richland Creek, Sugar Creek, Little Sugar Creek, and Lick Creek. South of Wallace Dam, forested wetlands were present along Shoulderbone Creek, Sikes Creek, and Herndon Branch – particularly near their confluences with the upper reaches of Lake Sinclair. Cowardin classifications for the forested wetlands include the following:

- PFO1A – Palustrine, forested, broad-leaved deciduous, temporarily flooded wetlands;
- PFO1Ah – Palustrine, forested, broad-leaved deciduous, temporarily flooded, diked/impounded wetlands;
- PFO1C – Palustrine, forested, broad-leaved deciduous, seasonally flooded wetlands;
- PFO1Cb – Palustrine, forested, broad-leaved deciduous, seasonally flooded, beaver-influenced wetlands;
- PFO1Ch - Palustrine, forested, broad-leaved deciduous, seasonally flooded, diked/impounded wetlands.

Scrub-shrub wetlands were often found as a transitional community between forested wetlands and open water or herbaceous/emergent wetlands. Additionally, scattered scrub-shrub wetlands were observed in higher elevations of the islands formed from sediment deposition during flooding of the Oconee and Apalachee Rivers in the northern reaches of Lake Oconee. Scrub-shrub wetlands were also observed along the edges of beaver ponds. Cowardin classifications for the scrub-shrub wetlands include the following:

- PSS1Ah – Palustrine, scrub-shrub, broad-leaved deciduous, temporarily flooded, diked/impounded wetlands;
- PSS1Cb – Palustrine, scrub-shrub, broad-leaved deciduous, seasonally flooded, beaver-influenced wetlands;
- PSS1Ch – Palustrine, scrub-shrub, broad-leaved deciduous, seasonally flooded, diked/impounded wetlands;
- PSS3Ah – Palustrine, scrub-shrub, broad-leaved evergreen, temporarily flooded, diked/ impounded wetlands.

Emergent and herbaceous wetlands were often observed along the edges of sediment "islands" between the scrub-shrub wetlands and open water. These wetland communities also occurred in more permanently inundated portions of beaver-influenced wetlands, which are located within larger floodplains of streams and rivers. Shallow coves and flats developing from sedimentation also contained emergent/herbaceous wetlands. The large, man-made wetland feature at Dyar Pasture was dominated by herbaceous vegetation, including the invasive alligatorweed. Small, scattered littoral/lake fringe wetlands also were observed throughout the Project area, particularly within small embayments and coves at the confluence of smaller stream drainages and Lake Oconee. Cowardin classifications for the herbaceous/emergent wetlands include the following:

- PEM1Ad – Palustrine, emergent, persistent, temporarily flooded, partially drained/ditched wetlands;
- PEM1Ah – Palustrine, emergent, persistent, temporarily flooded, diked/impounded wetlands;
- PEM1Cb – Palustrine, emergent, persistent, seasonally flooded, beaver-influenced wetlands;
- PEM1Ch – Palustrine, emergent, persistent, seasonally flooded, diked/impounded wetlands;
- PEM1Fb – Palustrine, emergent, persistent, semipermanently flooded, beaver-influenced wetlands;
- PEM1Fh – Palustrine, emergent, persistent, semipermanently flooded, diked/impounded wetlands.

Littoral habitats, other than the wetlands described above and within Section 3.2.1, included large areas of standing timber. Many of these areas contain dense remnants of timber just below the water surface. Field investigators ground-truthed many of these areas with historical lake maps that depicted these locations. Cowardin classification for these habitats are labeled the following:

- PFO5Hh – Palustrine, forested, dead, permanently flooded, diked/impounded wetlands.

Table 3-7 provides a list of wetland types observed, their estimated acreages, and the number of features identified within the Project boundary.

Table 3-7: Wetlands Found within the Wallace Dam Project Boundary

Wetland Type	Number of Features Mapped	Estimated Acreage	Cowardin Classifications
Forested Wetland	126	651	PFO1A, PFO1Ah, PFO1C, PFOCb, PFO1Ch
Scrub-Shrub Wetland	128	117	PSS1Ah, PSS1Cb, PSS1Ch, PSS3Ah
Herbaceous/Emergent Wetland	83	143	PEM1Ad, PEM1Ah, PEM1Cb, PEM1Ch, PEM1Fb, PEM1Fh
Littoral Habitat (Standing Timber)	30	933	PFO5Hh

3.5 Invasive Species

Although scattered occurrences of invasive species were observed throughout the Project boundary (including a total of 23 species), the majority of the study area was notably absent of invasive species that dominated a particular stratum. Exceptions included the dense patches of alligatorweed at the Dyar Pasture waterfowl pond/wetland and the herbaceous/emergent wetlands encompassing sediment islands in the upper reaches of Lake Oconee, dense stands of Chinese privet found in the floodplain of the Oconee River within the Redlands Wildlife Management Area, and small "pockets" of Japanese stiltgrass (*Microstegium vimineum*) found within forested floodplains. The plant species list in Table 2 of Appendix A indicates which species are considered invasive plants by the Georgia Exotic Pest Plant Council and also characterizes each invasive species by their current threat status[6]. These characterizations are presented based on a numerical rating:

- Category 1: considered a serious problem in Georgia;
- Category 1-Alert: those that are not currently a serious problem but have the potential to become serious problems;
- Category 2: considered a moderate problem due to displacing native vegetation;
- Category 3: considered a minor problem or the threat has not been determined; and,
- Category 4: those that do not pose a problem but are exotics that have become naturalized in Georgia or additional information on the species is needed.

Populations of invasive species observed within the Project boundary that dominate a particular stratum are depicted on the invasive species figures (Figures 57 through 64). These species are limited to

[6] Please note that the Table 2 species list includes certain species identified only to genus. While there are some native species that fall within the same genera as that of invasives, field investigators confirmed that any species identified only to genus are not invasive/exotic plants.

alligatorweed, Chinese privet, and Japanese stiltgrass. Acreages of land dominated by these invasive plants are provided in Table 3-8.

Table 3-8: Acreages of Lands Dominated by Invasive Species

Invasive Species		Number of Features Mapped	Estimated Acreage of Dominant Stands
Common Name	**Scientific Name**		
Alligatorweed	*Alternanthera philoxeroides*	23	51
Chinese privet	*Ligustrum sinense*	5	122
Japanese stiltgrass	*Microstegium vimineum*	5	6
Total		**33**	**179**

4.0 CONCLUSION

Mixed pine/hardwood forest is the dominant habitat type occurring within the Project boundary, which occupies approximately 2,473 acres (34 percent) of the total terrestrial lands within the study area. The second largest habitat type was the developed areas habitat, which occupied 1,463 acres (20 percent). Wetlands (including forested, scrub-shrub, and emergent/herbaceous communities) occupied 911 acres (12.5 percent) of the study area. Habitat types that generally contained higher species richness include the mesic hardwood slope forest and the wetland communities; however, these habitats represented less than 14 percent of the overall acreage within the study area. Granite outcrops, which often harbor unique or sensitive species, occupied 17 acres within the Project boundary.

Dominant canopy species throughout the Project included loblolly pine, mockernut hickory, pignut hickory, white oak, southern red oak, sweetgum, and tuliptree. Common midstory species included flowering dogwood, red maple, Southern sugar maple, winged elm, Eastern red cedar, ironwood, and hop hornbeam. Dominant herbaceous species included lawn grasses, sedges, goldenrod, Christmas fern, Indian hemp, greenbriers, woodoats, and groundsel/ragworts. A total of 410 species of plants were identified during the field surveys, indicating a relatively diverse assemblage of vegetative communities despite the presence of various developed areas in the Project vicinity.

Overall, exotic/invasive species were present throughout the study area but not dominant in any particular vegetative stratum. Twenty-three invasive species were observed, but typically only comprise a minor component of the community. Exceptions to this finding included dense patches of alligatorweed in the Dyar Pasture waterfowl pond and on the perimeters of several islands in the upper reaches of Lake Oconee. Dense stands of Chinese privet were observed within the floodplain of the Oconee River and

within the Redlands Wildlife Management Area. Scattered patches of Japanese stiltgrass occurred in forested floodplains of the larger streams and rivers. Despite the presence of these areas, only 179 acres (less than one percent) of the 25,660 acres of land within the Project boundary (including Lake Oconee) contained a dominant layer of invasive species.

Outside of the Project boundary, but within the 2,000-foot zone around the project boundary, much of the landscape is dominated by pine plantation, agricultural lands, and other developed areas such as residential and commercial developments.

Wildlife observations within the Project area are typical of those expected to occur within the Piedmont of Georgia. Fifteen species of mammals were observed, including the white-tailed deer, gray fox, nine-banded armadillo, striped skunk, Eastern gray squirrel, and raccoon. Feral hog sign was abundant on Georgia Power land east of Wallace Dam, but scarce in other sections of the study area.

Field investigators identified 115 species of birds during the field surveys. Common species included Northern cardinal, American crow, Carolina chickadee, Carolina wren, and turkey vultures. Over 20 species of warblers were observed, included several occurrences of the Swainson's warbler. Bald eagles and ospreys were observed over Lake Oconee, and great blue herons were often seen foraging along the shoreline. Due to the time of year, waterfowl sightings were less common (5 species observed) but included mallards (*Anas platyrhyncos*), wood ducks (*Aix sponsa*), red-breasted merganser (*Mergus serrator*), blue-winged teal (*A. discors*), and Canada geese (*Branta canadensis*). Double-crested cormorants (*Phalacrocorax auritus*) were commonly seen on the lake as well. Of note, 33 separate taxa/families were represented in the bird species list.

Reptile and amphibian observations were less common; however, these species can be difficult to observe when conducting reconnaissance-style wildlife surveys. A total of 10 amphibian species and 13 reptile species were observed within the Project boundary. Common sightings included Southern leopard frogs, green treefrogs, cricket frogs, ground skinks, yellow-bellied sliders, northern watersnakes, green anoles, and Eastern box turtles.

Georgia Power proposes to continue operating the Wallace Dam Hydroelectric Project as it is currently operated. No capacity addition or major modifications are proposed under the new license. Georgia Power's proposal to continue operating the Project would not involve activities that are expected to negatively affect terrestrial resources or wetland and littoral habitats.

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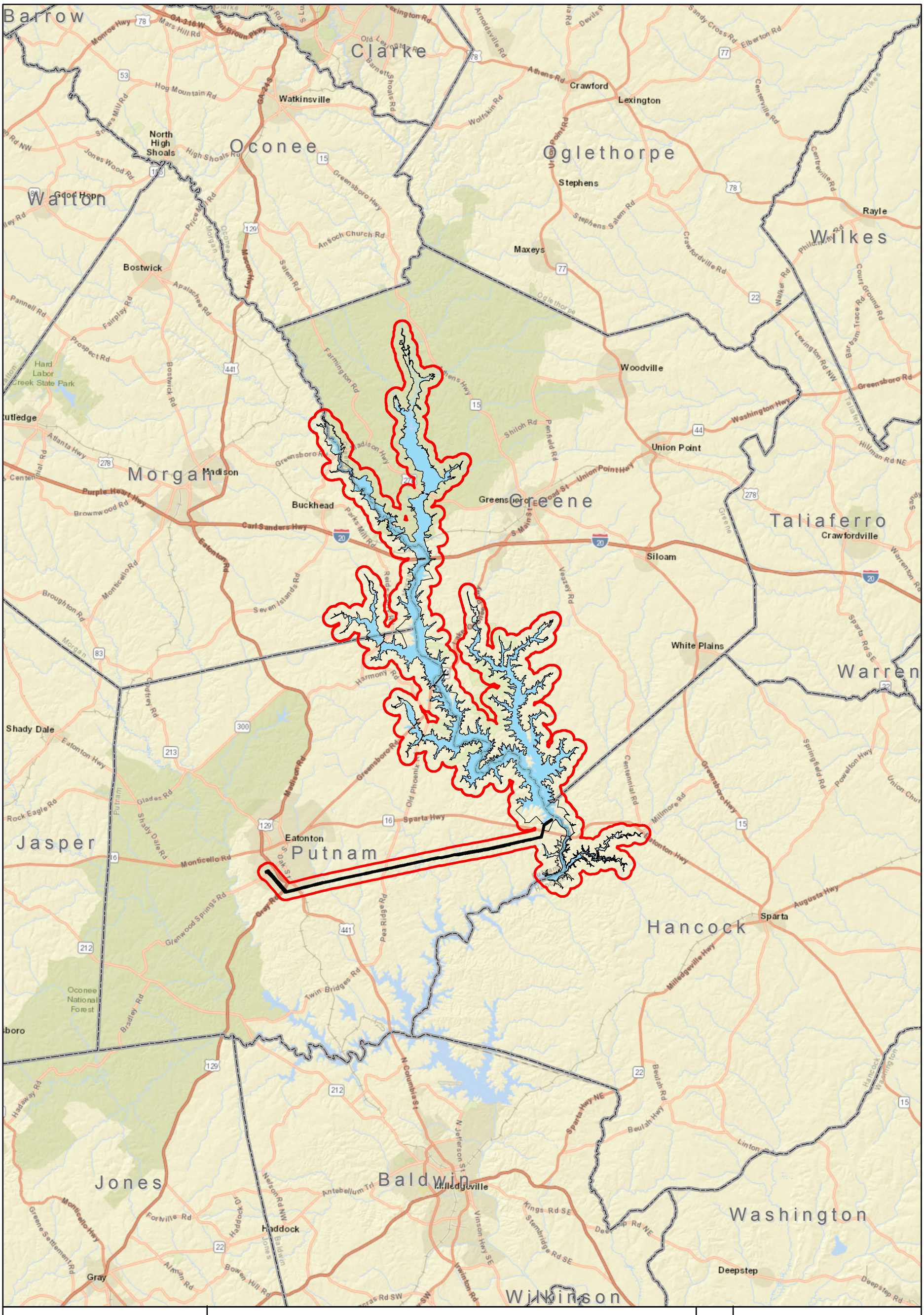
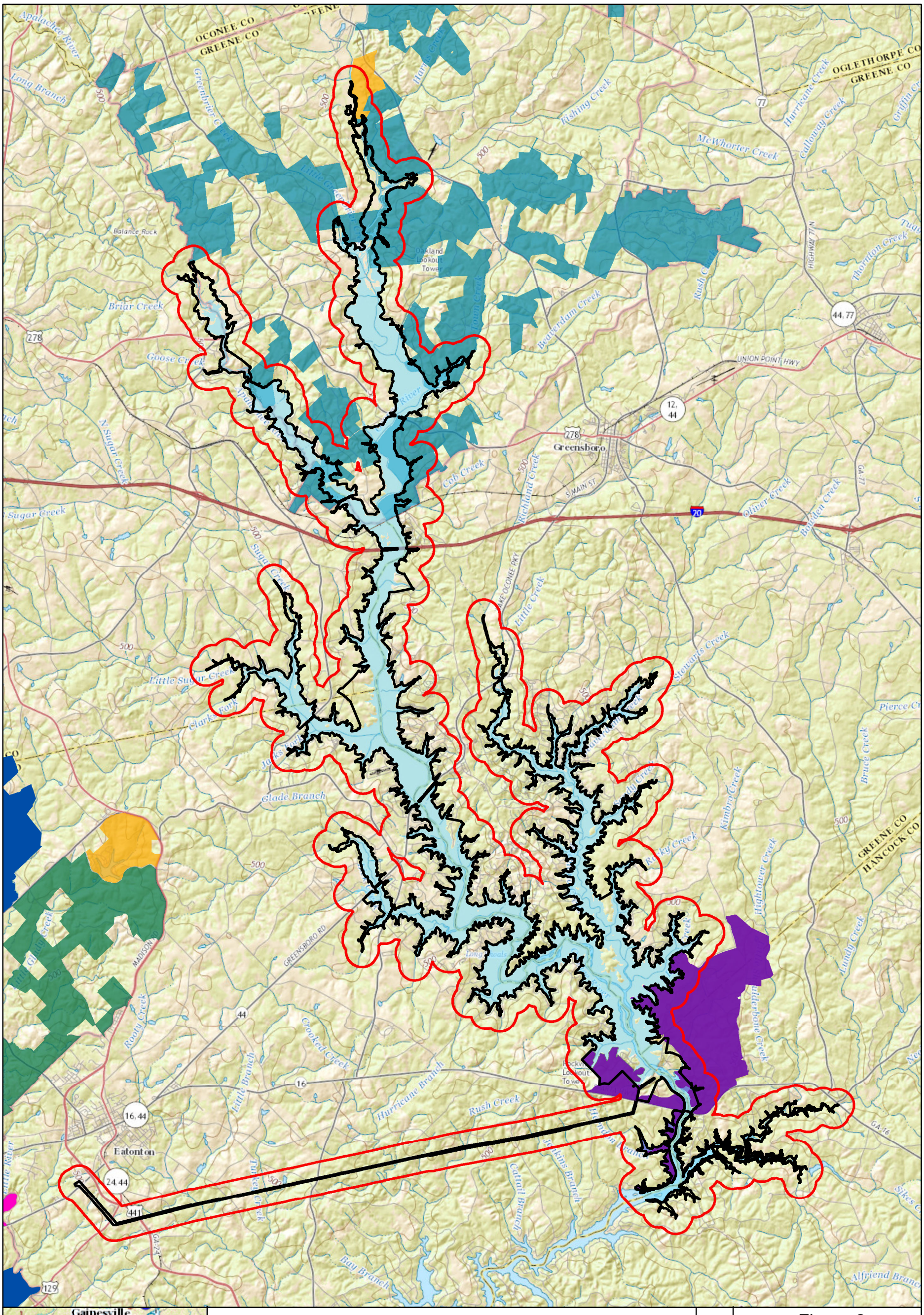
FIGURES


Barrow
Clarke
Oconee
Oglethorpe
Walton
Wilkes
Morgan
Greene
Taliaferro
Putnam
Hancock
Jasper
Warren
Jones
Baldwin
Washington
Wilkinson
Watkinsville
North High Shoals
Good Hope
Bostwick
Maxeys
Stephens
Crawford
Lexington
Rayle
Woodville
Union Point
Buckhead
Madison
Greensboro
Siloam
Crawfordville
White Plains
Eatonton
Sparta
Shady Dale
Gray
Haddock
Milledgeville
Deepstep
Hard Labor Creek State Park
Oconee National Forest
Monroe Hwy
Mars Hill Rd
Paul Broun Pkwy
Hog Mountain Rd
Jones Wood Rd
High Shoals Rd
Greensboro Hwy
Antioch Church Rd
Salem Rd
Apalachee Rd
Fairplay Rd
Prospect Rd
Pannell Rd
Bostwick Rd
Farmington Rd
Athens Rd
Wolfskin Rd
Union Point Rd
Stephens-Salem Rd
Crawfordville Rd
Centerville Rd
Elberton Rd
Sandy Cross Rd
Arnoldsville Rd
Barnett Shoals Rd
Old Lexington Rd
Lexington Rd
Walker Rd
Lexington Rd NW
Bartram Trace Rd
Court Ground Rd
Greensboro Rd
Washington Hwy
Union Point Hwy
Hillman Rd NE
Shiloh Rd
Penfield Rd
Atlanta Hwy
Purple Heart Hwy
Brownwood Rd
Carl Sanders Hwy
Eatonton Rd
Monticello Rd
Broughton Rd
Seven Islands Rd
Parks Mill Rd
Veazey Rd
Sparta Rd SE
Warrenton Rd
Harmony Rd
Madison Rd
Eatonton Hwy
Rock Eagle Rd
Glades Rd
Shady Dale Rd
Greenwood Springs Rd
Gray Rd
Pea Ridge Rd
Twin Bridges Rd
Bradley Rd
Hadaway Rd
Greene Settlement Rd
Fortville Rd
Nelson Rd NW
Antebellum Trl
Alman Rd
Bowen Hill Rd
Haddock Dr
N Columbia St
N Jefferson St
Vinson Hwy SE
Irwinton Rd
Sparta Hwy NE
Beulah Rd
Beulah Hwy
Linton
Kings Rd SE
Stembridge Rd SE
Deepstep Rd NE
Deepstep Rd
Millmore Rd
Centennial Rd
Springfield Rd
Powelton Hwy
Union Church Rd
Greensboro Hwy
Sparta Hwy
Augusta Hwy
Milledgeville Hwy
Hancock Washington
Wallace Dam Hydroelectric Project (FERC No.2413)
Morgan, Greene, Putnam & Hancock Counties, Georgia
Legend
Project Boundary
2000' Buffer
Georgia Counties
N
Figure 1
Project Location
0 3 6
Miles
corblu ECOLOGY GROUP
GEORGIA POWER
A SOUTHERN COMPANY

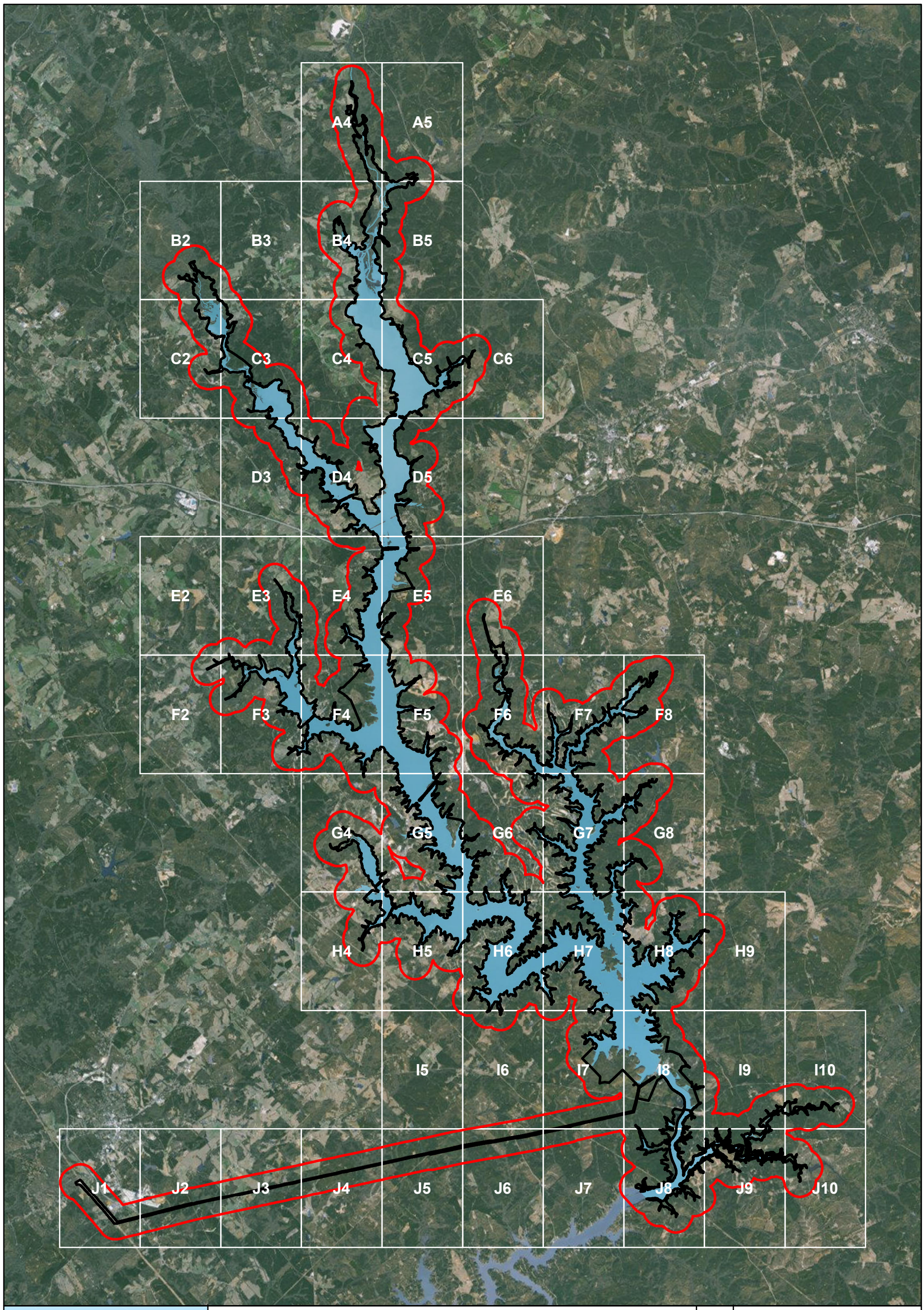


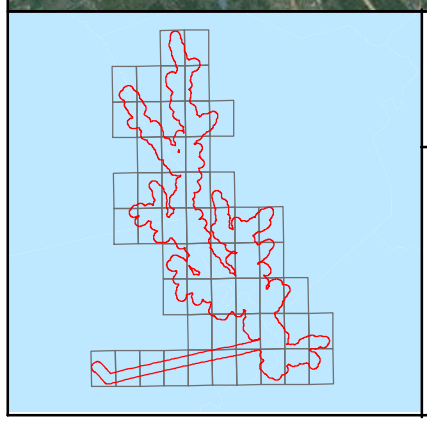
Wallace Dam Hydroelectric Project (FERC No.2413)
Morgan, Greene, Putnam & Hancock Counties, Georgia

Figure 2
Public Lands in Vicinity of Project

corblu ECOLOGY GROUP

GEORGIA POWER
A SOUTHERN COMPANY





Wallace Dam Hydroelectric Project (FERC No.2413)
Morgan, Greene, Putnam & Hancock Counties, Georgia

Legend

- Project Boundary
- 2000' Buffer
- Map Index

N

Figure 3
Habitat Map Index

0 1.5 3 Miles

corblu ECOLOGY GROUP

GEORGIA POWER
A SOUTHERN COMPANY

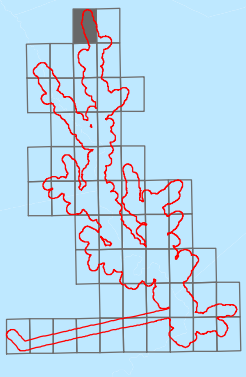
A4

A5

B3

B4

B5



Wallace Dam Hydroelectric Project (FERC No.2413)
Morgan, Greene, Putnam & Hancock Counties, Georgia

Legend

- Project Boundary
- 2000' Buffer
- Map Index

Habitat Types / Land Cover

- Developed Areas
- Agricultural/Clearcut/Open Areas
- Dry Oak-Pine Forest
- Easement
- Emergent/Herbaceous Wetland
- Floodplain/Riparian Forest
- Forested Wetland
- Mesic Hardwood Slope Forest
- Mixed Pine/Hardwood Forest
- Open Water
- Pine Forest/Planted Pine
- Rock Outcrop
- Scrub/Shrub Wetland
- Submerged Timber
- Streams

N

Figure 4
A4 Habitat Types

0 800 1,600 Feet

corblu ECOLOGY GROUP

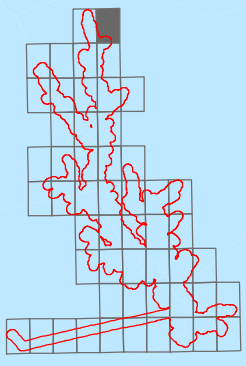
GEORGIA POWER
A SOUTHERN COMPANY

A4

A5

B4

B5



Wallace Dam Hydroelectric Project (FERC No.2413)
Morgan, Greene, Putnam & Hancock Counties, Georgia

Legend

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- 2000' Buffer
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Habitat Types / Land Cover

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- Open Water
- Pine Forest/Planted Pine
- Rock Outcrop
- Scrub/Shrub Wetland
- Submerged Timber
- Streams

N

Figure 5
A5 Habitat Types

0 800 1,600
Feet

corblu ECOLOGY GROUP

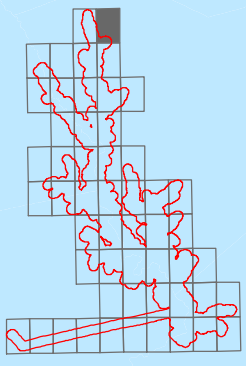
GEORGIA POWER
A SOUTHERN COMPANY

A4

A5

B4

B5



Wallace Dam Hydroelectric Project (FERC No.2413)
Morgan, Greene, Putnam & Hancock Counties, Georgia

Legend

- Project Boundary
- 2000' Buffer
- Map Index

Habitat Types / Land Cover

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- Rock Outcrop
- Scrub/Shrub Wetland
- Submerged Timber
- Streams

N

Figure 5
A5 Habitat Types

0 800 1,600
Feet

corblu ECOLOGY GROUP

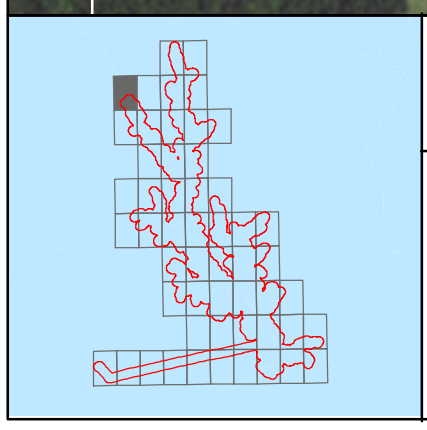
GEORGIA POWER
A SOUTHERN COMPANY

B2

B3

C2

C3



Wallace Dam Hydroelectric Project (FERC No.2413)
Morgan, Greene, Putnam & Hancock Counties, Georgia

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- Open Water
- Pine Forest/Planted Pine
- Rock Outcrop
- Scrub/Shrub Wetland
- Submerged Timber
- Streams

N

Figure 6
B2 Habitat Types

0 800 1,600
Feet

corblu ECOLOGY GROUP

GEORGIA POWER
A SOUTHERN COMPANY

A4

B2

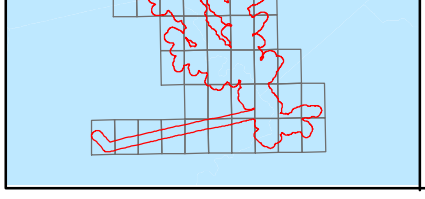
B3

B4

C2

C3

C4



Wallace Dam Hydroelectric Project (FERC No.2413)
Morgan, Greene, Putnam & Hancock Counties, Georgia

Legend

- Project Boundary
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Habitat Types / Land Cover

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- Open Water
- Pine Forest/Planted Pine
- Rock Outcrop
- Scrub/Shrub Wetland
- Submerged Timber
- Streams

N

Figure 7
B3 Habitat Types

0 800 1,600 Feet

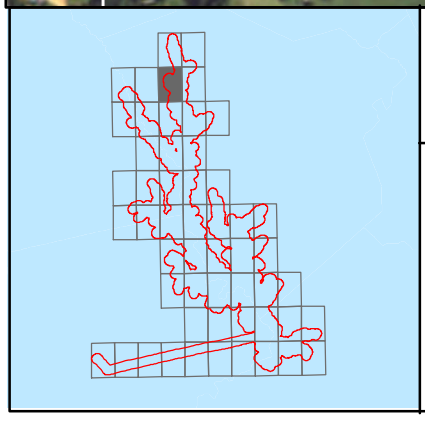
corblu ECOLOGY GROUP

GEORGIA POWER
A SOUTHERN COMPANY

A4 A5

B3 B4 B5

C3 C4 C5



Wallace Dam Hydroelectric Project (FERC No.2413)
Morgan, Greene, Putnam & Hancock Counties, Georgia

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- Open Water
- Pine Forest/Planted Pine
- Rock Outcrop
- Scrub/Shrub Wetland
- Submerged Timber
- Streams

N

Figure 8
B4 Habitat Types

0 800 1,600 Feet

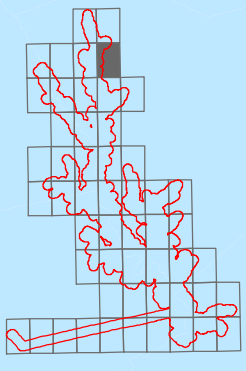
corblu ECOLOGY GROUP

GEORGIA POWER A SOUTHERN COMPANY

A4 A5

B4 B5

C4 C5 C6



Wallace Dam Hydroelectric Project (FERC No.2413)
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- Open Water
- Pine Forest/Planted Pine
- Rock Outcrop
- Scrub/Shrub Wetland
- Submerged Timber
- Streams

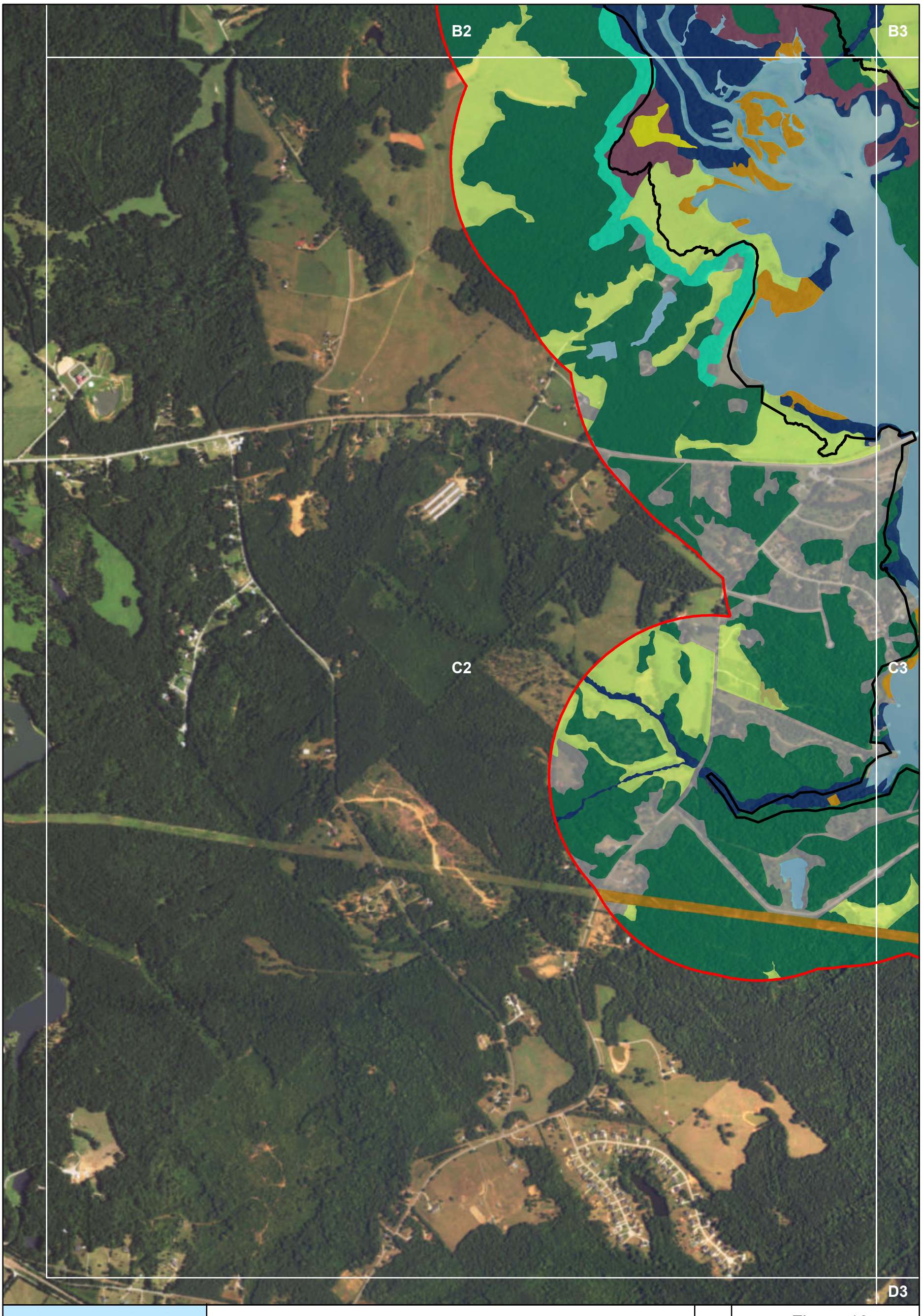
N

Figure 9
B5 Habitat Types

0 800 1,600 Feet

corblu ECOLOGY GROUP

GEORGIA POWER
A SOUTHERN COMPANY



Wallace Dam Hydroelectric Project (FERC No.2413)
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- Open Water
- Pine Forest/Planted Pine
- Rock Outcrop
- Scrub/Shrub Wetland
- Submerged Timber
- Streams

N

Figure 10
C2 Habitat Types

0 800 1,600 Feet

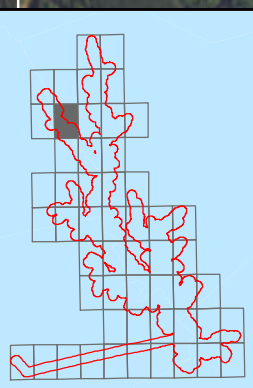
corblu ECOLOGY GROUP

GEORGIA POWER
A SOUTHERN COMPANY

B2 B3 B4

C2 C3 C4

D3 D4



Wallace Dam Hydroelectric Project (FERC No.2413)
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Habitat Types / Land Cover

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- Mesic Hardwood Slope Forest
- Mixed Pine/Hardwood Forest
- Open Water
- Pine Forest/Planted Pine
- Rock Outcrop
- Scrub/Shrub Wetland
- Submerged Timber
- Streams

N

Figure 11
C3 Habitat Types

0 800 1,600
Feet

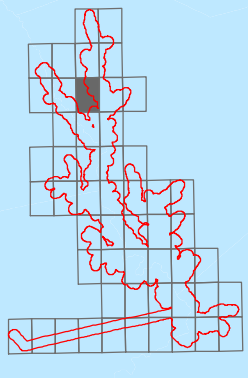
corblu ECOLOGY GROUP

GEORGIA POWER
A SOUTHERN COMPANY

B3 B4 B5

C3 C4 C5

D3 D4 D5



Wallace Dam Hydroelectric Project (FERC No.2413)
Morgan, Greene, Putnam & Hancock Counties, Georgia

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Habitat Types / Land Cover

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- Open Water
- Pine Forest/Planted Pine
- Rock Outcrop
- Scrub/Shrub Wetland
- Submerged Timber
- Streams

N

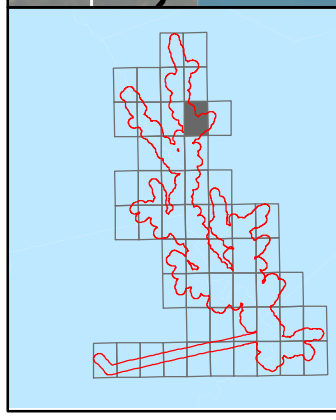
Figure 12
C4 Habitat Types

0 800 1,600 Feet

corblu ECOLOGY GROUP

GEORGIA POWER
A SOUTHERN COMPANY

B4
B5
C4
C5
C6
D4
D5



Wallace Dam Hydroelectric Project (FERC No.2413)
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Habitat Types / Land Cover

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- Open Water
- Pine Forest/Planted Pine
- Rock Outcrop
- Scrub/Shrub Wetland
- Submerged Timber
- Streams

N

Figure 13
C5 Habitat Types

0 800 1,600 Feet

corblu ECOLOGY GROUP

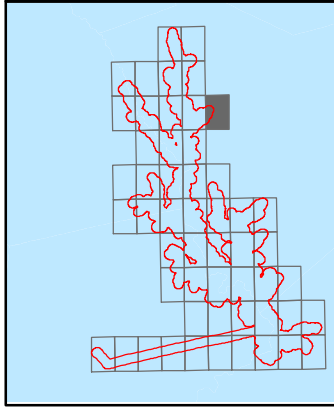
GEORGIA POWER
A SOUTHERN COMPANY

B5

C5

C6

D5



Wallace Dam Hydroelectric Project (FERC No.2413)
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Habitat Types / Land Cover

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- Forested Wetland
- Mesic Hardwood Slope Forest
- Mixed Pine/Hardwood Forest
- Open Water
- Pine Forest/Planted Pine
- Rock Outcrop
- Scrub/Shrub Wetland
- Submerged Timber
- Streams

N

Figure 14
C6 Habitat Types

0 800 1,600
Feet

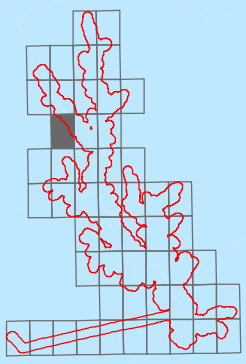
corblu ECOLOGY GROUP

GEORGIA POWER
A SOUTHERN COMPANY

C2 C3 C4

D3 D4

E2 E3 E4



Wallace Dam Hydroelectric Project (FERC No.2413)
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- Open Water
- Pine Forest/Planted Pine
- Rock Outcrop
- Scrub/Shrub Wetland
- Submerged Timber
- Streams

N

Figure 15
D3 Habitat Types

0 800 1,600 Feet

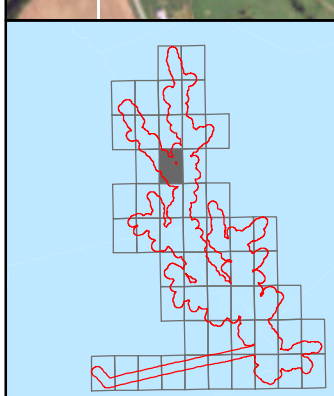
corblu ECOLOGY GROUP

GEORGIA POWER
A SOUTHERN COMPANY

C3 C4 C5

D3 D4 D5

E3 E4 E5



Wallace Dam Hydroelectric Project (FERC No.2413)
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Habitat Types / Land Cover

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- Open Water
- Pine Forest/Planted Pine
- Rock Outcrop
- Scrub/Shrub Wetland
- Submerged Timber
- Streams

N

Figure 16
D4 Habitat Types

0 800 1,600 Feet

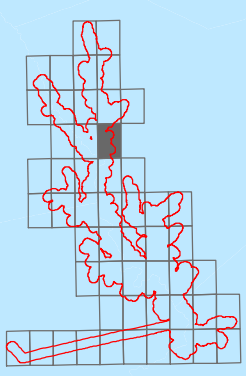
corblu ECOLOGY GROUP

GEORGIA POWER
A SOUTHERN COMPANY

C4 C5 C6

D4 D5

E4 E5 E6



Wallace Dam Hydroelectric Project (FERC No.2413)
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- Submerged Timber
- Streams

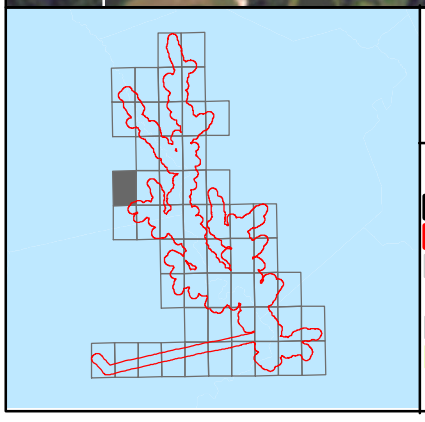
N

Figure 17
D5 Habitat Types

0 800 1,600 Feet

corblu ECOLOGY GROUP

GEORGIA POWER
A SOUTHERN COMPANY



Wallace Dam Hydroelectric Project (FERC No.2413)
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- Open Water
- Pine Forest/Planted Pine
- Rock Outcrop
- Scrub/Shrub Wetland
- Submerged Timber
- Streams

N

Figure 18
E2 Habitat Types

0 800 1,600 Feet

corblu ECOLOGY GROUP

GEORGIA POWER
A SOUTHERN COMPANY

D3
D4
E2
E3
E4
F2
F3
F4

Wallace Dam Hydroelectric Project (FERC No.2413)
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- Scrub/Shrub Wetland
- Submerged Timber
- Streams

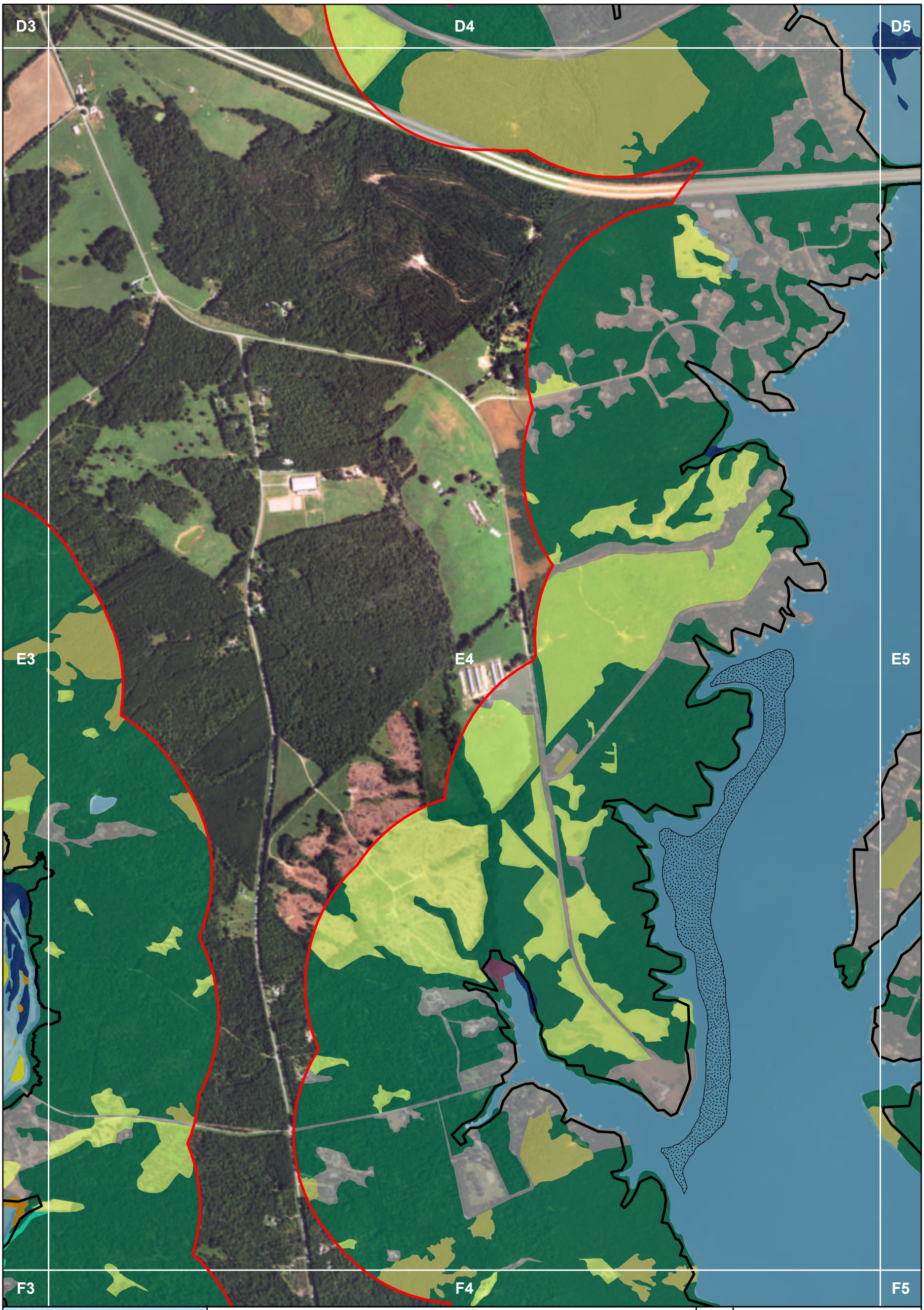
N

Figure 19
E3 Habitat Types

0 800 1,600 Feet

corblu ECOLOGY GROUP

GEORGIA POWER
A SOUTHERN COMPANY



Wallace Dam Hydroelectric Project (FERC No.2413)
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- Submerged Timber
- Streams

N

Figure 20
E4 Habitat Types

0 800 1,600 Feet

corblu ECOLOGY GROUP

GEORGIA POWER
A SOUTHERN COMPANY