OglethorpePower

Exhibit E – Environmental Report

Rocky Mountain Pumped Storage Hydroelectric Project

November 2023

FERC No. 2725

Application for New License for Major Water Power Project >5MW

EXECUTIVE SUMMARY

This document is Oglethorpe Power Corporation's (An Electric Membership Corporation) (OPC's) Exhibit E for Federal Energy Regulatory Commission (FERC) relicensing of the Rocky Mountain Pumped Storage Hydroelectric Project (Rocky Mountain Project, the Project) (FERC No. 2725). OPC is using FERC's Traditional Licensing Process (TLP), as approved by FERC, for all pre-application activities leading up to filing of the Rocky Mountain license application. This Exhibit E is part of OPC's draft license application (DLA). Relicensing participants may file written comments on the DLA with FERC within 90 days of the November 17, 2023 filing date; comments are due by February 15, 2024.

The 904-megawatt Rocky Mountain Project consists of a 221-acre Upper Reservoir, a 600-acre Lower Reservoir, two Auxiliary Pools, and a powerhouse, and is located on Heath Creek in Floyd County, Georgia. OPC operates the Project in a pumped storage mode for generation of peaking power and to provide spinning reserve. OPC is not proposing to add capacity or make any major modifications to the Project. The Project does not occupy any federal lands. The original license expires December 31, 2026.

This Exhibit E describes the existing environmental setting of the Project and its immediate vicinity and provides a draft environmental analysis by resource area of the impacts of OPC's proposal to continue operating the Rocky Mountain Project. OPC developed its licensing proposal based on input received during consultation with state and federal resource agencies, Indian Tribes, and members of the public, and by using information generated by seven resource studies conducted by OPC. Additional input on preliminary environmental measures received from stakeholders during the comment period for the DLA will be analyzed in Exhibit E of the final license application, which will be filed by December 31, 2024.

Project Setting

The Rocky Mountain Project is located on headwater tributaries of Armuchee Creek, a tributary to the Oostanaula River in the upper Coosa River basin in northwest Georgia. The Project is situated in the Ridge and Valley physiographic province. The Coosa River is part of the larger Alabama-Coosa-Tallapoosa River basin. The main tributaries of the Coosa River, the Oostanaula and Etowah rivers, converge to form the Coosa River at Rome, Georgia, about 10 air miles southeast of the Project. The Coosa River flows west from

Rome, enters Alabama, and continues south-southwest to the Alabama River, Mobile River, and the Gulf of Mexico at Mobile Bay. Nine major dams impound the Coosa and Alabama Rivers downstream of the Project; the nearest dam, Weiss Dam, is located about 85 stream/river miles downstream of the Project.

The Rocky Mountain Project occupies the Heath Creek and Lavender Creek tributary systems of Armuchee Creek. The drainage area of Heath Creek upstream of the Main Dam, which includes the Lower Reservoir and the Auxiliary Pools, is approximately 16.6 square miles. The Upper Reservoir sits atop Rock Mountain on the drainage divide between Rock Mountain Creek of the Lavender Creek system and intermittent headwaters of the Heath Creek system. There are no natural watersheds or streams entering the Upper Reservoir.

There are approximately 5,000 acres of land and water within the FERC project boundary, with 3,700 acres available to the public for recreational activities. Under an off-license Resource Management Agreement between OPC and the Georgia Department of Natural Resources, GDNR manages the recreation, fish, and wildlife resources, and associated habitat as the Rocky Mountain Recreation and Public Fishing Area.

Current Operation

All power produced by the Rocky Mountain Project results from generation using water in the Upper Reservoir during periods of peak electricity demand. The pumping of water from the Lower to the Upper Reservoir typically occurs at night and occasionally during daytime hours during cooler months. During normal operations, the Upper Reservoir water level fluctuates between the normal maximum pool elevation of 1,392 feet mean sea level (MSL) and normal minimum pool elevation of 1,341 feet MSL. The active volume of the Upper Reservoir is 10,003 acre-feet of water, which is cycled between the Lower and Upper Reservoirs. At the normal minimum pool elevation, the Upper Reservoir contains a reserve storage capacity of 647 acre-feet.

During the generating cycle, the Lower Reservoir typically increases in elevation by 20 ft from approximately 690.5 feet MSL to 710.5 feet MSL. The Lower Reservoir contains 18,800 acre-feet of storage at its normal maximum elevation.

OPC operates the Project to release a continuous minimum flow of 1.2 cubic feet per second (cfs) from the Lower Reservoir (Main Dam) into Heath Creek, as required by Article 34 of the current license.

OPC's Licensing Proposal

OPC proposes to continue operating the Rocky Mountain Project as it is currently operated. OPC proposes the following measures to protect, mitigate potentially adverse impacts to, or enhance environmental resources at the Rocky Mountain Project. These proposed environmental measures are based on OPC's assessment of the Project, the findings of the resource studies conducted according to the Final Study Plan, and discussions with resource agencies and stakeholders. The measures are subject to change based upon comments received on this DLA and ongoing consultation.

- Continue to operate the Project to release a continuous minimum flow of 1.2 cfs from the Lower Reservoir into Heath Creek for the protection of downstream water quality and aquatic habitat.
- Implement a Bald Eagle Management Plan to avoid disturbance at active Bald Eagle nest sites within the project boundary.
- Implement a Bat Habitat Protection Plan to avoid and/or minimize impacts of project operations and maintenance on potentially suitable hibernacula and roosting sites in forest habitat for federally endangered Northern Long-eared Bat and Indiana Bat and proposed endangered Tricolored Bat.
- Implement Invasive Species Management measures for periodic monitoring and treatment of terrestrial invasive exotic plant occurrences as necessary to minimize the spread of invasive species at project recreation facilities, for educational signage to help prevent transport and introduction of aquatic nuisance species to the Auxiliary Pools, and for periodic treatment, control, or removal of aquatic nuisance species as warranted to avoid or minimize interference with public recreational use and hydropower operations.
- Enhance recreation amenities at Antioch Lake East (accessed from Main entrance) by renovating and updating the interior of the Visitor Center bathroom for year-round use and replacing the restroom near the boat ramp with an Americans with Disabilities Act (ADA)-compliant CXT building. These improvements would enhance the availability, quality, and condition of restrooms.
- Enhance recreation amenities at Antioch Lake West (accessed from Main entrance) by replacing the restroom near the boat ramp with an ADA-compliant CXT building and installing a designated kayak launch at the West Antioch "roadbed." These improvements would enhance access for kayaking and the condition of restrooms.
- Enhance recreation amenities at Antioch Lake West (accessed from Beach entrance) by updating the interior of the bathrooms at the beach, peninsula point east of the beach area, and campground and replacing the restroom at the group camp with

an ADA-compliant CXT building. These improvements would enhance the quality and condition of restrooms.

- Enhance recreation amenities at Heath Lake (accessed from Heath entrance) by replacing the restroom near the boat ramp with an ADA-compliant CXT building and creating a separate parking and kayak launching and loading area at the existing Heath Lake archery range. These improvements would enhance access for kayaking, reduce congestion at the boat ramp, and enhance the quality and condition of restrooms.
- Improve septic and sanitation systems by renovating campground and beach sewage lift system, replacing aging septic tank system at campground host site with sewage lift system, and replacing/rebuilding wet well lids on septic pump pits in the campground, beach, peninsula point east of the beach area, and the Visitors Center. These improvements would enhance the quality and condition of existing recreation facilities.
- Develop and implement a Recreation Enhancement Plan for the proposed recreation enhancement measures.
- Continue annual funding of operations and maintenance (O&M) activities consistent with the Resource Management Agreement between OPC and GDNR.
- Develop and implement a Historic Properties Management Plan through a Programmatic Agreement to assure the preservation and long-term management of historic properties within the project boundary.

In addition, OPC will evaluate the feasibility of creating or adapting existing access to improve ADA-compliant accessibility at the Rocky Mountain PFA. A final proposal regarding ADA-compliant access will be provided in the FLA.

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ACRONYMS

A

acre-ft	acre-feet
ADA	Americans with Disabilities Act
ACT	Alabama-Coosa-Tallapoosa
Applicant	Oglethorpe Power Corporation

B

BMP	best management practices

C

CEII	Critical energy infrastructure information
CFR	Code of Federal Regulations
cfs	cubic feet per second
Commission	Federal Energy Regulatory Commission

D

DLA	Draft License Application
DO	dissolved oxygen

E

EFH	essential fish habitat
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act

F

FERC	Federal Energy Regulatory Commission
FLA	Final License Application
FPA	Federal Power Act
ft	feet
FWS	U.S. Fish and Wildlife Service

G

GDNR	Georgia Department of Natural Resources
GEPD	Georgia Environmental Protection Division
GHPD	Georgia Historic Preservation Division
GIS	geographic information system
GMFMC	Gulf of Mexico Fishery Management Council
GPC	Georgia Power Company
GWh	gigawatt-hour (equals one million kilowatt-hours)

H

Hp	horsepower
Hz	hertz (cycles per second)

I

ILP	Integrated Licensing Process
ITS	Integrated Transmission System

K

kW	kilowatt
kWh	kilowatt-hour
kV	kilovolts

M

mg/L	milligrams per liter
MSL	mean sea level
MW	megawatt
MWH	Montgomery Watson Harza
μS/cm	microSiemens per centimeter

N

NEPA	National Environmental Policy Act
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NOI	Notification of Intent
NWI	National Wetlands Inventory

O

OPC	Oglethorpe Power Corporation

P

PAD	Pre-Application Document
PMF	probable maximum flood
Project	Rocky Mountain Pumped Storage Hydroelectric Project
PURPA	Public Utility Regulatory Policies Act of 1978

R

REP	Recreation Enhancement Plan
Rocky Mountain PFA	Rocky Mountain Recreation and Public Fishing Area
RTE	rare, threatened, and endangered

S

SCORP	Statewide Comprehensive Outdoor Recreation Plan
SHPO	State Historic Preservation Officer
sq mi	square miles
SWAP	State Wildlife Action Plan

T

TLP	traditional licensing process
TRC	TRC Environmental Corporation

U

USACE	U.S. Army Corps of Engineers
USGS	U.S. Geological Survey

W

WMA	Wildlife Management Area

1.0 INTRODUCTION

1.1 Purposes

Oglethorpe Power Corporation (An Electric Membership Corporation) (OPC) is filing with the Federal Energy Regulatory Commission (FERC, or Commission) its Exhibit E, the Environmental Report, for relicensing of the Rocky Mountain Pumped Storage Hydroelectric Project (FERC No. 2725) (Rocky Mountain Project, or Project).[1] OPC is using FERC's Traditional Licensing Process (TLP), as approved by FERC, for all pre-application activities leading up to filing of the Rocky Mountain license application. This Exhibit E, as part of OPC's draft license application (DLA), has been prepared to meet the information requirements at 18 Code of Federal Regulations (CFR) § 4.51(f) and is structured in the form of an Environmental Assessment to aid FERC's environmental review process.

The 904-megawatt (MW) Rocky Mountain Project consists of a 221-acre Upper Reservoir, a 600-acre Lower Reservoir, two Auxiliary Pools, and a powerhouse, and is located on Heath Creek in Floyd County, Georgia (Figure 1). OPC is not proposing to add capacity or make any major modifications to the Project. The Project does not occupy any federal lands. The original license expires December 31, 2026.

The purposes of this Exhibit E are to:

- Describe the existing environmental setting of the Project and immediate vicinity.
- Provide a draft environmental analysis by resource area of the continuing and incremental impacts of OPC's licensing proposal.
- Discuss proposed measures for protection, mitigation, and enhancement (environmental measures) with respect to each resource area affected by the licensing proposal.
- Document consultation with resource agencies and stakeholders concerning studies, potential resource issues, and environmental measures.

Following receipt of written comments by relicensing participants within 90 days of the DLA filing and following subsequent consultation concerning study findings and

[1] OPC is filing as agent for its co-licensees Georgia Power Company, Rocky Mountain Leasing Corporation, and U.S. Bank National Association.

proposed environmental measures, OPC will revise Exhibit E and file it with the final license application (FLA) by December 31, 2024.

1.2 Statutory and Regulatory Requirements

1.2.1 Clean Water Act

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

1.2.2 Endangered Species Act

As FERC's non-federal designee for informal consultation under the Endangered Species Act (ESA), OPC consulted with the U.S. Fish and Wildlife Service (FWS) in developing study plans for the Aquatic Resources Study, Terrestrial and Wetland Resources Survey, and Trispot Darter Survey and discussing the study findings relative to rare, threatened, and endangered (RTE) species. OPC is filing these study reports for review and comment by FWS and other state and federal resource agencies with the DLA. Discussion of the potential for occurrence of federally listed threatened and endangered species, species proposed for federal listing, candidate species, and species under review at the Project can be found in Section 3.2.5.

No federally listed threatened or endangered species were collected or observed during field surveys within the project boundary or in Heath Creek downstream. The Aquatic Resources Study sampled fish and freshwater mussels and snails in Heath Creek and did not detect the occurrence of any federally listed species. Surveys for the federally threatened Trispot Darter (*Etheostoma trisella*) in small tributaries to Heath Creek also did not detect the species. One live individual of Alabama Rainbow (*Cambarunio nebulosus*), a mussel species currently under review by FWS for possible listing, was found in Heath Creek about 2 stream miles downstream of the project boundary; none were found within the project boundary. Continued project operation would not be expected to adversely affect habitat used by Alabama Rainbow in Heath Creek.

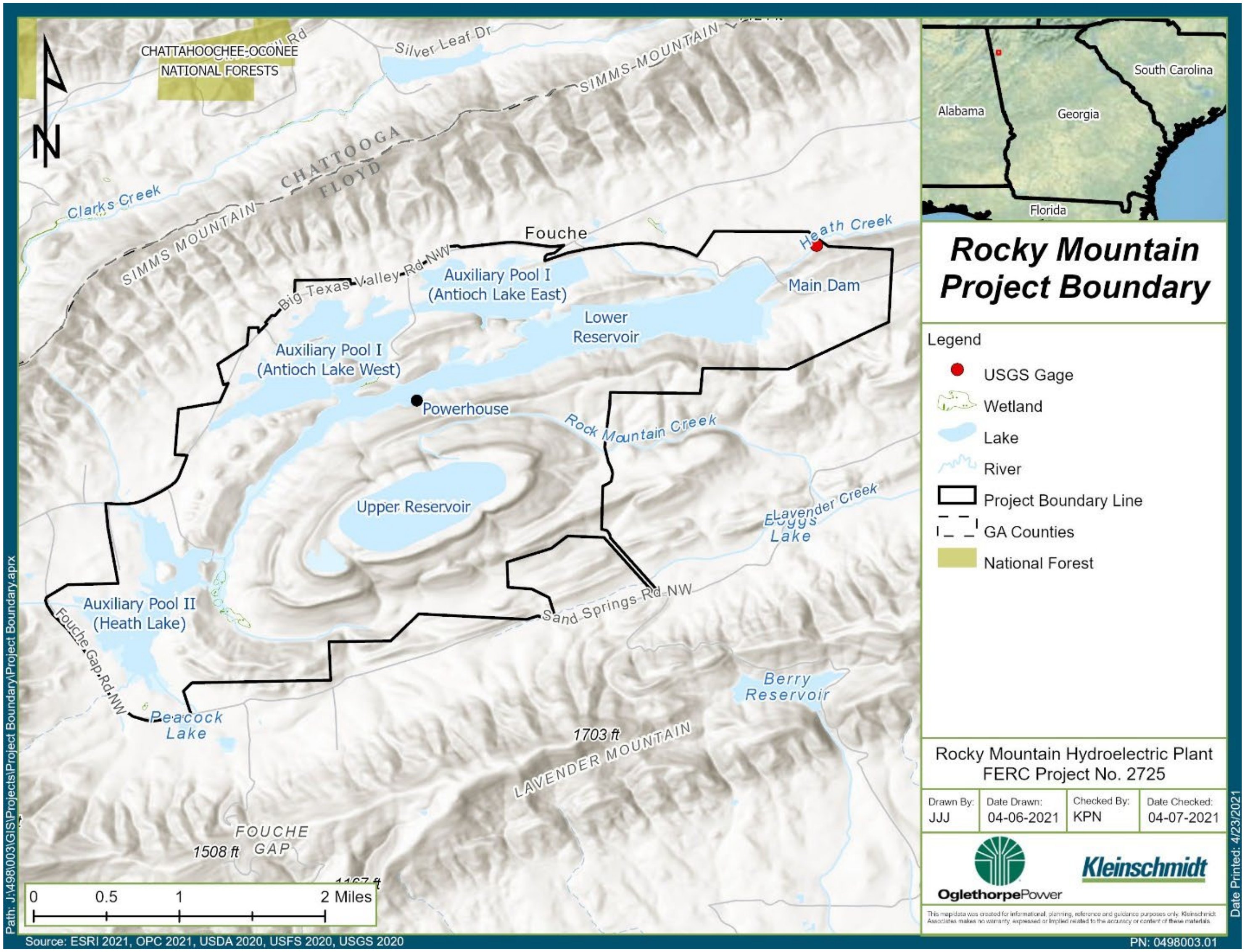

Figure 1 Project Boundary Map

The Terrestrial and Wetland Resources Survey did not observe any federally listed plant or wildlife species within the project boundary. Potentially suitable summer roosting habitat for Indiana Bat (*Myotis sodalis*), Northern Long-eared Bat (*Myotis septentrionalis*), and Tricolored Bat (*Perimyotis subflavus*; proposed endangered) was observed as being interspersed throughout the project boundary; surveys specifically targeting bats were not conducted. While never identified at the Rocky Mountain Pumped Storage Project, because these listed bat species are known to occur in the region, OPC proposes to adopt a Bat Habitat Protection Plan to avoid and/or minimize potential impacts of project operations and maintenance on potentially suitable hibernacula and roosting sites in forest habitat. As OPC is not proposing any major modifications to the Project under the new license, continued project operation and maintenance and project-related recreation would not be expected to adversely affect habitat for Indiana Bat, Northern Long-eared Bat, or Tricolored Bat.

One federal candidate species, Monarch Butterfly (*Danaus plexippus*), potentially occurs within the project vicinity. Monarch Butterfly occurs across the continental U.S., depends on the presence of milkweed species as host plants for reproduction, and migrates south in the fall to overwinter in central Mexico. A variety of milkweed species naturally occur throughout most of Georgia and several common species used by the butterfly grow in nearly every region of the state. Continued project operation would not be expected to result in the loss of milkweed or nectar sources available for use by Monarch Butterfly.

OPC's study findings indicate that continued project operation would not be likely to adversely affect any species listed as federally endangered or threatened under the ESA, or any candidate species.

1.2.3 Coastal Zone Management Act

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

The Rocky Mountain Project is 670 river miles upstream from the Gulf of Mexico, above nine existing dams on the Alabama and Coosa Rivers. The Project is not located within the coastal zone of either Georgia or Alabama. The state of Georgia's coastal zone includes the 11 counties that border tidally-influenced waters or have economies that are closely tied to coastal resources, including Brantley, Bryan, Camden, Charlton, Chatham, Effingham, Glynn, Liberty, Long, McIntosh, and Wayne. The state of Alabama's coastal zone extends inland to the continuous 10-foot elevation contour in Baldwin and Mobile Counties, surrounding Mobile Bay, Alabama.

OPC will send requests for CZMA consistency certification, or confirmation that the Project would not affect the coastal zone, to the GDNR's Coastal Resources Division (CRD) and the Alabama Department of Environmental Management's (ADEM's) Alabama Coastal Area Management Program. Their determinations regarding whether continued operation of the Project would result in reasonably foreseeable impacts to coastal uses and resources will be documented in Exhibit E of OPC's FLA.

1.2.4 National Historic Preservation Act

Section 106 of the National Historic Preservation Act (NHPA) requires that every federal agency take into account how each of its undertakings could affect historic properties. Historic properties are districts, sites, buildings, structures, traditional cultural properties, and objects significant in American history, architecture, engineering, and culture that are eligible for inclusion in the National Register of Historic Places (NRHP). To meet the requirements of Section 106, FERC typically executes a Programmatic Agreement (PA) between FERC, the State Historic Preservation Officer (SHPO), and the Advisory Council on Historic Preservation and requires the licensee to develop and implement a Historic Properties Management Plan (HPMP). The HPMP would provide for the preservation and long-term management of archaeological sites that are either eligible or potentially eligible and recommended for monitoring under the new license. Discussion of the historic properties occurring within the Area of Potential Effects (APE) of the Rocky Mountain Project can be found in Section 3.3.8.

OPC would be invited to participate in consultations to develop the PA and to sign as a concurring party. Interested Tribes also would be invited to comment on the agreement. The terms of the PA would ensure that OPC addresses and develops treatment measures for applicable adverse effects to historic properties identified within the APE under the final HPMP. Applicable Tribes would also be invited to participate in development of the HPMP. OPC distributed a copy of the Pre-Application Document (PAD) (OPC 2021) to eleven Tribes, including Alabama-Coushatta Tribe of Texas, Alabama-Quassarte Tribal Town, Cherokee Nation, Coushatta Tribe of Louisiana, Eastern Band of Cherokee Indians, Kialegee Tribal Town, Muscogee (Creek) Nation, Seminole Tribe of Florida, Seminole Nation of Oklahoma, Thlopthlocco Tribal Town, and United Keetoowah Band of Cherokee. The Cherokee Nation has expressed interest in the Project (Section 3.2.8).

1.2.5 Wild and Scenic Rivers Act

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

1.2.6 Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act requires federal agencies to consult with National Oceanic and Atmospheric Administration Fisheries on all actions that may adversely affect Essential Fish Habitat (EFH). The Rocky Mountain Project, located far upstream of the Fall Line in the Ridge and Valley province, does not affect any EFH for the maintenance of suitable marine fishery habitat quality and quantity under the Magnuson-Stevens Fishery Conservation and Management Act.

The Gulf of Mexico Fishery Management Council (GMFMC) has not designated EFH for any species of fish or shellfish found in the vicinity of the Rocky Mountain Project (GMFMC 2016). The Project is 670 river miles upstream from the Gulf of Mexico, above nine existing major dams on the Alabama and Coosa Rivers.

1.3 Pre-Filing Consultation Summary

The Commission's TLP regulations (18 CFR Part 16) require that applicants consult with the appropriate resource agencies, Tribes, and other entities before filing an application for a new license. This consultation is necessary for compliance with the National Environmental Policy Act (NEPA), Fish and Wildlife Coordination Act, ESA, NHPA, and other federal statutes. Pre-filing consultation must be completed and documented according to the Commission's regulations. The consultation record is provided in Appendix A.

1.3.1 Stakeholder Consultation

OPC identified and consulted with numerous stakeholders prior to filing the DLA. In addition to FERC, the following agencies, governments, Indian Tribes, and non-governmental organizations were contacted via telephone, email, mail, and face-to-face and virtual meetings in accordance with the distribution protocol established in the PAD:

- Advisory Council on Historic Preservation
- Alabama-Coushatta Tribe of Texas
- Alabama-Quassarte Tribal Town
- American Rivers
- American Whitewater
- Berry College
- Bureau of Indian Affairs, U.S. Department of the Interior
- Chattooga County
- Cherokee Nation
- City of Rome
- City of Summerville
- Coosa River Basin Initiative
- Coushatta Tribe of Louisiana
- Eastern Band of Cherokee Indians
- Floyd County
- Georgia Department of Community Affairs - Historic Preservation Division
- Georgia Department of Natural Resources - Environmental Protection Division
- Georgia Department of Natural Resources - State Parks and Historic Sites Division
- Georgia Department of Natural Resources - Wildlife Resources Division
- Georgia Forestry Commission
- Georgia River Network
- Georgia Soil and Water Conservation Commission Region II
- Kialegee Tribal Town
- Muscogee (Creek) Nation
- National Park Service

- National Oceanic and Atmospheric Administration Fisheries Service
- Northwest Georgia Regional Commission
- Seminole Tribe of Florida
- Seminole Nation of Oklahoma
- Thlopthlocco Tribal Town
- United Keetoowah Band of Cherokee
- U.S. Environmental Protection Agency Region 4
- U.S. Fish and Wildlife Service
- U.S. Forest Service - Chattahoochee National Forest

1.3.2 Study Plan Development

After filing the PAD with FERC on December 10, 2021, OPC received FERC approval to use the Traditional Licensing Process (TLP) on January 26, 2022. OPC held a virtual Joint Agency and Public Meeting and Site Visit (Joint Meeting) with interested stakeholders on March 16, 2022. In the Joint Meeting, OPC presented its proposed plans to conduct resource studies to address information gaps and meet the information needs for FERC's National Environmental Policy Act review of the license application. The GDNR Wildlife Resources Division and FWS subsequently provided comments on the PAD and proposed study plans on May 12-13, 2022. OPC consulted with GDNR, FWS, GEPD, and the Georgia Department of Community Affairs Historic Preservation Division (GHPD) on the proposed study plans in meetings and email communications from April through July 2022.

OPC distributed Final Study Plans in August 2022. Study plans were prepared for five resource studies: water quality assessment; aquatic resources study; terrestrial and wetland resources survey; recreation use analysis; and cultural resources assessment, including archaeological and architectural assessments. All study plans addressed or incorporated recommendations made by GDNR, FWS, GEPD, and GHPD pertaining to the recreation use analysis, water quality monitoring, fish and mussel survey site selection and survey methods, and the cultural resources assessment. In addition, OPC conducted a Trispot Darter Survey pursuant to consultation with FWS and GDNR in September 2022 concerning aquatic resources, fisheries, and protected species potentially occurring at the Project. FWS and GDNR requested that OPC conduct surveys for the Trispot Darter, a federally threatened fish species, in potential spawning habitat within the project boundary in winter 2023.

1.3.3 Resource Studies

OPC conducted the first season of studies between June 2022 and May 2023. OPC held virtual Relicensing Study Update and Preliminary Results meetings with FWS, GDNR, and GEPD in May and June 2023 to discuss preliminary study findings. During the study results meetings, OPC agreed to conduct a second season of water quality monitoring in summer 2023 to further describe and evaluate water quality conditions in Heath and the Lower Reservoir.

Final study reports for the first season of studies are provided in Appendices B and C.

1.3.4 Stakeholder Meetings

In May and June 2021, prior to filing the PAD, OPC held stakeholder consultation meetings with FWS, GDNR, GHPD, GEPD, and the U.S. Environmental Protection Agency (EPA). The purpose of these meetings was to orient the agencies to the project and discuss the upcoming relicensing process.

After OPC filed its PAD and the relicensing proceeding began in December 2021, OPC hosted two virtual Joint Meetings on March 16, 2022. At these meetings, OPC provided an overview of the Rocky Mountain Project, including a virtual site visit, reviewed information about the Project, and discussed existing data and studies to be developed by OPC as part of the consultation process.

After the Joint Meeting, OPC developed proposed study plans that incorporated PAD comments and study plan requests submitted by agencies. OPC consulted with GDNR, FWS, GEPD, and GHPD on the proposed study plans in meetings and email communications from April through July 2022. OPC met again with FWS and GDNR in September 2022 to discuss the need for the Trispot Darter Survey. After the first year of studies, OPC met with GDNR, FWS, and GEPD in May and June 2023 to discuss preliminary study results. OPC met again with GDNR in October 2023 to discuss potential measures for enhancing recreation facilities and access at the Project identified by GDNR for consideration by OPC in developing a licensing proposal, as well as potential measures related to aquatic and terrestrial resources.

2.0 PROPOSED ACTION AND ALTERNATIVES

This section sets out OPC's licensing proposal for continuing to operate the Rocky Mountain Project under the new license. The section first describes the no-action alternative, which is the baseline from which to compare the proposed action and includes the existing project facilities and current project operations. Next, the section describes the applicant's proposal, including OPC's proposed operation and proposed environmental measures.

2.1 No-Action Alternative

The Rocky Mountain Project is located in Floyd County, Georgia, approximately 10 miles northwest of the city of Rome (Figure 2). The Project consists of a 221-acre Upper Reservoir; a 600-acre Lower Reservoir on Heath Creek; two Auxiliary Pools (Auxiliary Pool I and Auxiliary Pool II) adjacent to the Lower Reservoir totaling about 600 acres; a three-unit powerhouse; a substation located 1.5 miles from the powerhouse; three 230-kV transmission lines in a single corridor comprising a total of 1.5 miles, known as the Primary Transmission Line; an access road; and appurtenant facilities.[2]

The Project is located on Heath Creek within the Armuchee Creek tributary system of the Oostanaula River in the Coosa River basin of northwest Georgia (Figure 2). The Coosa River begins within the city of Rome at the confluence of the Oostanaula and Etowah rivers. Armuchee Creek enters the Oostanaula River about 10 river miles upstream of Rome. The Project's Lower Reservoir inundates a portion of Heath Creek, about three

[2] Both the substation, which is commonly referred to as the "Switching Station" of the Project, and the three 230-kV transmission lines comprising a total of approximately 1.5 miles, which is commonly referred to as the "Primary Transmission Line" of the Project, should be removed from the principal project works. The substation and transmission lines have been part of Georgia's Integrated Transmission System (ITS) since 1994. The ITS is a 17,800+ mile network of integrated transmission assets almost exclusively located in the State of Georgia wherein each asset is individually owned, but all transmission assets are jointly planned and operated for the benefit of all of the ITS's participating transmission owners. The ITS provides its participants nearly statewide transmission access while eliminating the need for multiple private transmission contracts or access fees. Since the substation and the transmission lines are part of the ITS, all participants in the ITS have the right to utilize the substation and the transmission lines as part of the state's integrated transmission system, regardless of the Project's status. OPC is proposing in the license application that both the substation and the transmission lines be removed as project works.

miles downstream of its origin from springs in the Lavender and Simms mountains. The drainage area of Heath Creek at the Main Dam is 16.6 square miles (sq mi).

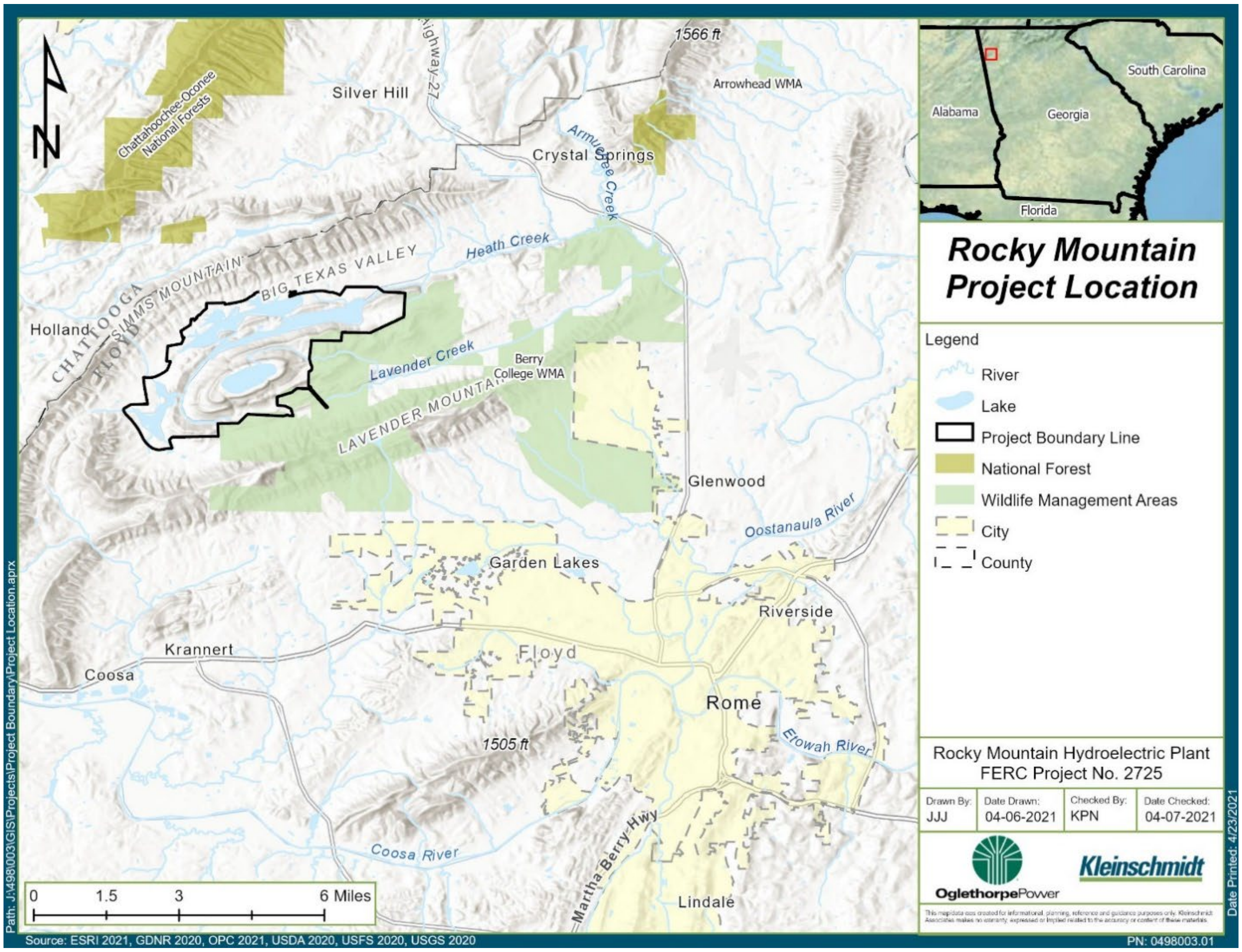

Figure 2 Project Vicinity

The FERC project boundary encompasses 5,000 acres of land and water (Figure 1). The Project's Upper Reservoir is formed by a 120-foot-high, 12,895-foot-long, continuous earth and rockfill dam, which circumscribes the natural concave top of Rock Mountain. The Lower Reservoir is located on Heath Creek. Adjacent to the Lower Reservoir to the north and west are 400-acre and 200-acre Auxiliary Pools. The Project's penstocks provide generating flows to the Project's powerhouse, which is located at the Lower Reservoir. Flows discharged from the powerhouse are stored in the Lower Reservoir. The Project includes a substation located 1.5 miles from the powerhouse and three 230-kV transmission lines in a single corridor comprising a total of 1.5 miles, known as the Primary Transmission Line.[3]

In 1997, OPC and GDNR entered into a formal Resource Management Agreement for the Rocky Mountain Project, a memorandum of agreement, whereby OPC provides the funding for and GDNR manages and the recreation, fish, and wildlife resources, and associated habitat at the Project consistent with the existing license. Auxiliary Pools I and II are managed and operated by GDNR as part of the Rocky Mountain Recreation and Public Fishing Area (Rocky Mountain PFA). They contain a variety of recreational facilities. Auxiliary Pool I is known as Antioch Lake and includes two sub-impoundments referred to as Antioch Lake East and Antioch Lake West. Auxiliary Pool II is known as Heath Lake.

There are no lands of the U.S. occupied or known to be affected by the Rocky Mountain Project.

2.1.1 Existing Project Facilities

The Project began operation in 1995 and includes an Upper Reservoir, a Lower Reservoir, two Auxiliary Pools, water conduits, a powerhouse, electrical transmission interconnection, and recreational facilities (Figure 3). OPC does not propose any additions or modifications to the existing facilities at this time.

The Upper Reservoir is formed by a 120-foot-high, 12,895-foot-long, continuous earth and rockfill dam, which circumscribes the natural concave top of Rock Mountain. At normal maximum operating pool elevation, 1,392 feet (ft) MSL (elevation above mean sea level), the impoundment is 221 acres in size and contains 10,650 acre-feet (acre-ft) of gross storage (10,003 acre-ft of active storage).

[3] As discussed above, Footnote 2, OPC will be proposing that the substation and the Primary Transmission Line be removed from the project works.

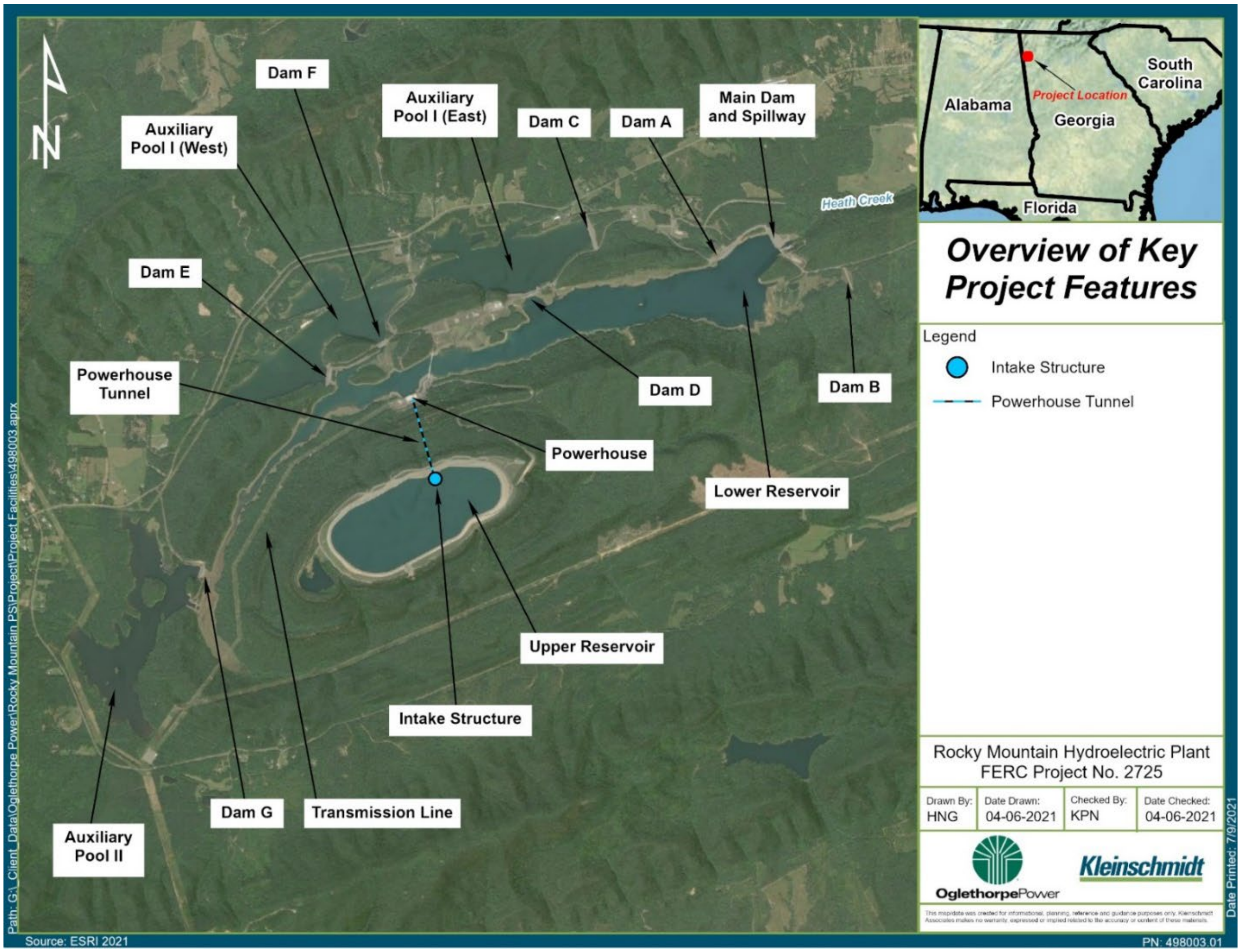

Figure 3 Project Facilities

The Lower Reservoir is formed by three dams: (1) Main Dam: a 120-foot-high, 942-foot-long structure consisting of a combination earth and rockfill embankment type dam with an impervious core and a concrete gravity type dam that contains a gated spillway with two Tainter gates, a 10-inch jet flow gate, a 40-inch jet flow gate, and a minimum flow outlet and a south abutment cut off structure; (2) Dam A: a 70-foot-high, 1,260-foot-long earth and rockfill structure with an impervious core; and (3) Dam B: a 10-foot-high, 690-foot-long earthfill structure. The reservoir is approximately 600 acres containing 18,800 acre-ft of storage at its normal maximum elevation of 710.5 ft MSL.

The intakes for the jet flow gates and minimum flow pipe are located downstream of a trash rack within the Main Dam. The center line of the intake for the 40-inch jet flow gate is at elevation 662 ft MSL; the outlet on the downstream side is also at 662 ft MSL. The inlet for the 10-inch jet flow gate comes off the 40-inch pipe; the center line for the 10-inch jet outlet is at elevation 665 ft MSL. The inlet to the minimum flow pipe is at elevation

665 ft MSL, a depth of 45.5 ft below the normal maximum pool elevation and 25.5 ft below the normal minimum pool elevation of the Lower Reservoir. The minimum flow outlet is at about elevation 642 to 643 ft MSL, or 3 to 4 ft above the minimum tailrace pool level.

The Project has two Auxiliary Pools located adjacent to the Lower Reservoir, both of which are normally maintained at a relatively constant elevation of 715 ft MSL. The primary purposes of the pools are to provide: (1) a total 5,800 acre-ft of reserve storage for drought periods; (2) recreational opportunities concentrated at developed facilities; and (3) wildlife management and lower-density recreational use. Auxiliary Pool I (Antioch Lake) is 400 acres and is contained by an ungated spillway and four dams: (1) Dam D: a 65-foot-high, 775-foot-long earth and rockfill structure; (2) Dam C: a 25-foot-high, 1,024-foot-long earth and rockfill structure; (3) Dam E: a 50-foot-high, 700-foot-long earth and rockfill structure; and (4) Dam F: a 50-foot-high, 405-foot-long earth and rockfill structure, and low-level outlet works. Auxiliary Pool II (Heath Lake) is 200 acres and is formed by Dam G, a 30-foot-high, 335-foot-long earth and rockfill structure with an ungated spillway and low-level outlet works. The two Auxiliary Pools are not directly connected.

The Upper Reservoir intake structure is located on the bottom and has a crest elevation of 1,317 ft MSL, a depth of 75 ft below the normal maximum pool elevation. The intake structure has a crest opening of 70 ft diameter, tapering to 35 ft diameter where it enters the Project's water conduit. A 140-ft-diameter concrete cap is perched 20 ft above the opening supported by 12 radial vanes.

The Project's water conduit consists of a 567-foot-long, 35-foot inside diameter, vertical concrete-lined shaft; a 1,935-foot-long, 35-foot inside diameter, horizontal concrete-lined tunnel; two horizontal concrete-lined bifurcations; three 19-foot inside diameter reinforced concrete-lined penstock connections of varying lengths; and three steel-lined penstocks, each about 470 ft long and each starting with a 19-ft inside diameter and ending with a 10 ft 8-inch inside diameter.

The powerhouse contains three vertical shaft, reversible Francis type pump-turbines each directly connected to a synchronous motor/generator. Table 1 summarizes the pump-turbine design characteristics. Both the pump-turbines and the motor-generators were manufactured by Hitachi, Ltd. Flows discharged from the powerhouse are stored in the Lower Reservoir. The Project has an installed generating capacity of 904 MW at 650 ft best-gate net head and a dependable generating capacity of 851 MW at 613 ft best-gate net head. The maximum hydraulic (discharge) capacity of the powerhouse in generating mode at best gate is 18,750 cubic feet per second (cfs) (FERC 2005).

Steel trash racks in front of the powerhouse draft tubes in the Lower Reservoir have openings of 1 ft 4½ inches high by 9 inches wide.

The Project includes a substation located 1.5 miles from the powerhouse and three 230-kV transmission lines in a single corridor comprising a total of 1.5 miles, known as the Primary Transmission Line.[4]

There are approximately 5,000 acres of land and water within the FERC project boundary, with 3,700 acres available to the public for recreational activities. Under the existing off-license Resource Management Agreement between OPC and GDNR, GDNR manages the recreation, fish, and wildlife resources, and associated habitat, at the Project consistent with the existing FERC license.

[4] As discussed in Section 2.1, Footnote 2, OPC will be proposing that the substation and the Primary Transmission Line be removed from the project works.

Table 1 Turbine Characteristics of the Rocky Mountain Powerhouse

Turbine Type	Turbine Arrangement	Turbine Operating Speed (rpm)	Unit Hydraulic Capacity at Best Gate (cfs)[a]	Number of Runners per Turbine	Runner Inlet Diameter (inches)	Number of Runner Buckets/ Blades	Bucket Spacing at Inlet (inches)	Peripheral Runner Velocity (fps)
Francis (reversible)	Vertical	225	6,250 (5,967)	1	229.812	7	97.92	225.79
Francis (reversible)	Vertical	225	6,250 (5,967)	1	229.812	7	97.92	225.79
Francis (reversible)	Vertical	225	6,250 (5,967)	1	229.812	7	97.92	225.79
		Total – Generating	18,750					
		Total - Pumping	17,901					

Source: OPC

[a] Hydraulic capacity in the pumping cycle is shown in parentheses.

2.1.2 Project Safety

The Rocky Mountain Project has been operating for 28 years under the existing license. During this time, Commission staff has conducted annual operational inspections focusing on the continued safety of the structure, modifications of structures, efficiency and safety of operations, compliance with the terms of the license, and proper maintenance. In addition, the Project has been inspected and evaluated every 5 years by an independent consultant and a consultant's safety report has been submitted for Commission review.

Under a new license, Commission staff would continue to inspect the Project during the new license term to assure continued adherence to Commission-approved plans and specifications, special license articles relating to safety, operation and maintenance, and accepted engineering practices and procedures.

2.1.3 Existing Project Operation

OPC staffs the Project 24-hours per day and operates it in accordance with power grid dispatch requirements to provide peaking power and spinning reserve in the generating mode. The Project uses off-peak power from the grid in the pumping mode. The units are started and stopped from the distributed control system by an operator in the control room.

As a pumped storage project, all power produced by the Project results from generation using water in the Upper Reservoir during periods of peak electricity demand. The pumping of water from the Lower to the Upper Reservoir typically occurs at night and occasionally during daytime hours during cooler months. During the cooler months, generation typically occurs during the morning and evening hours. During the summer, generation typically occurs during the afternoon.

In accordance with Article 34 of the existing license, a minimum flow of 1.2 cfs is released into Heath Creek downstream of the Lower Reservoir (Main Dam).

2.1.3.1 Normal Operation

During normal daily operation of generating and pumping, the Upper Reservoir water level fluctuates between the normal maximum operating pool elevation of 1,392 ft MSL and normal minimum operating pool elevation of 1,341 ft MSL. The active volume of the Upper Reservoir is 10,003 acre-ft of water, which is cycled between the Lower and Upper

Reservoirs. At the normal minimum operating pool elevation, the Upper Reservoir impoundment contains a reserve storage capacity of 647 acre-ft.

During the generating cycle, the Lower Reservoir typically increases in elevation by 20 ft from approximately 690.5 ft MSL to 710.5 ft MSL.

The summary of the Upper and Lower reservoir elevations for the past five years are included in Table 2 and Table 3.

Table 2 Upper Reservoir Elevation Summary

Year	Minimum Recorded Reservoir Elevation (Ft. NGVD)	Maximum Recorded Reservoir Elevation (Ft. NGVD)
2018	1,339.56	1,392.00
2019	1,341.00	1,392.20
2020	1,342.14	1,392.22
2021	1341.0	1392.41
2022	1343.87	1392.40

Table 3 Lower Reservoir Elevation Summary

Year	Minimum Recorded Reservoir Elevation (Ft. NGVD)	Maximum Recorded Reservoir Elevation (Ft. NGVD)
2018	688.73	711.03
2019	687.99	710.47
2020	688.67	710.60
2021	687.58	711.18
2022	688.37	708.85

For the five-year period October 1, 2018 through September 30, 2023, project gross generation averaged 1,360,416,201 kilowatt-hours, pumping power averaged 1,812,719,297 kilowatt-hours, and net generation averaged -452,303,096 kilowatt-hours.

Inflow to the Project originates from small, headwater tributaries and drainageways of the Heath Creek system that drain toward the Auxiliary Pools and the Lower Reservoir. There are no natural watersheds or tributary streams entering the Upper Reservoir atop Rock Mountain. As a pumped storage facility, flows from Heath Creek are not directly used for generation.

Discharges from the Project occur at the Main Dam and are measured at the minimum flow release valve at the Main Dam and at the U.S. Geological Survey (USGS) Gage No. 02388320 (Heath Creek near Armuchee, GA) located about 0.3 mile downstream of the Main Dam. Flows released from the Project, as measured at the Heath Creek gage, for the past five years (2018-2022) have averaged 30 cfs. The maximum instantaneous flow recorded at the USGS gage within the past five years was 3,550 cfs, occurring on September 4, 2022. The Project releases a minimum flow to Heath Creek through a 6-inch diameter pipe/flow release valve to meet the minimum flow requirement of 1.2 cfs. OPC continuously monitors the minimum flow requirement at the Main Dam using an Annubar flow measuring device, and not the USGS gage, because of the greater accuracy of the release valve measurement. The minimum instantaneous flow recorded from the flow release valve within the past five years during normal operation was 1.36 cfs.

The Project has the ability to provide spinning and supplemental (non-spinning) reserves. When providing spinning reserves, a unit is loaded to a part load, varying between 100 and 135 MW, and the differential between operating power and 100 percent capacity is treated as spinning reserve. Supplemental (non-spinning) reserves are provided by having the units responding to dispatch such that they can be brought online in less than 5 minutes.

In 2005, FERC issued an order amending the license allowing an increase in the Project's authorized generating capacity (111 FERC ¶ 62,079). FERC authorized OPC to replace the existing pump-turbine runners and modify other pump-turbine, motor-generator, and auxiliary equipment components to optimize the hydraulic performance and increase the operating capacity of the equipment, thereby increasing its FERC-authorized installed capacity from 760 MW to 904 MW.

2.1.3.2 High-Flow Operation

Given the limited nature of project inflows from the upstream drainage area of Heath Creek, which is approximately 16.6 square miles at the Main Dam, high-flow operations are not significantly different from normal operations.

2.1.3.3 Drought Operation

Storage in the Auxiliary Pools is used to replenish the Lower Reservoir only if, after the pumping cycle, the elevation of the Lower Reservoir has declined to elevation 681 ft MSL. To prevent cavitation damage to the pump-turbines, the Project cannot be operated when the elevation of the Lower Reservoir falls below elevation 681 ft MSL.

2.1.4 Existing Environmental Measures

OPC operates the Rocky Mountain Project to release a continuous minimum flow of 1.2 cfs from the Lower Reservoir into Heath Creek, as required by Article 34 of the current license. OPC owns the project recreation facilities provided within the Rocky Mountain Recreation and Public Fishing Area (Rocky Mountain PFA), which provide for a variety of recreational opportunities and access in and around the Auxiliary Pools. The facilities include a Visitors Center, day-use areas, boat ramps, courtesy docks, picnic tables, group shelters, a swimming beach and bathhouse, restrooms, playground, camping area, and trails. OPC maintains a Resource Management Agreement with GDNR through which GDNR manages and operates the project recreation facilities. The facilities are described in Section 3.2.6.

OPC also implements a Cultural Resources Management Plan for the Project, as required by Article 40.

2.2 Applicant's Proposal

2.2.1 Proposed Project Facilities

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

2.2.2 Proposed Project Operation

OPC proposes to continue operating the Rocky Mountain Project as it is currently operated, as described above in Section 2.1.3.

2.2.3 Proposed Environmental Measures

OPC proposes the following measures to protect, mitigate potentially adverse impacts to, or enhance environmental resources at the Rocky Mountain Project. These proposed environmental measures are based on OPC's assessment of the Project, the findings of the resource studies conducted according to the Final Study Plan, and discussions with resource agencies and stakeholders. The measures are subject to change based upon comments received on this DLA and ongoing consultation.

- Continue to operate the Project to release a continuous minimum flow of 1.2 cfs from the Lower Reservoir into Heath Creek for the protection of downstream water quality and aquatic habitat.
- Implement a Bald Eagle Management Plan to avoid disturbance at active Bald Eagle nest sites within the project boundary.
- Implement a Bat Habitat Protection Plan to avoid and/or minimize impacts of project operations and maintenance on potentially suitable hibernacula and roosting sites in forest habitat for federally endangered Northern Long-eared Bat and Indiana Bat and proposed endangered Tricolored Bat.
- Implement Invasive Species Management measures for periodic monitoring and treatment of terrestrial invasive exotic plant occurrences as necessary to minimize the spread of invasive species at project recreation facilities, for educational signage to help prevent transport and introduction of aquatic nuisance species to the Auxiliary Pools, and for periodic treatment, control, or removal of aquatic nuisance species as warranted to avoid or minimize interference with public recreational use and hydropower operations.
- Enhance recreation amenities at Antioch Lake East (accessed from Main entrance) by renovating and updating the interior of the Visitor Center bathroom for year-round use and replacing the restroom near the boat ramp with an Americans with Disabilities Act (ADA)-compliant CXT building. These improvements would enhance the availability, quality, and condition of restrooms.
- Enhance recreation amenities at Antioch Lake West (accessed from Main entrance) by replacing the restroom near the boat ramp with an ADA-compliant CXT building and installing a designated kayak launch at the West Antioch "roadbed." These improvements would enhance access for kayaking and the condition of restrooms.
- Enhance recreation amenities at Antioch Lake West (accessed from Beach entrance) by updating the interior of the bathrooms at the beach, peninsula point east of the beach area, and campground and replacing the restroom at the group camp with an ADA-compliant CXT building. These improvements would enhance the quality and condition of restrooms.

- Enhance recreation amenities at Heath Lake (accessed from Heath entrance) by replacing the restroom near the boat ramp with an ADA-compliant CXT building and creating a separate parking and kayak launching and loading area at the existing Heath Lake archery range. These improvements would enhance access for kayaking, reduce congestion at the boat ramp, and enhance the quality and condition of restrooms.
- Improve septic and sanitation systems by renovating campground and beach sewage lift system, replacing aging septic tank system at campground host site with sewage lift system, and replacing/rebuilding wet well lids on septic pump pits in the campground, beach, peninsula point east of the beach area, and the Visitors Center. These improvements would enhance the quality and condition of existing recreation facilities.
- Develop and implement a Recreation Enhancement Plan for the proposed recreation enhancement measures.
- Continue annual funding of operations and maintenance (O&M) activities consistent with the Resource Management Agreement between OPC and GDNR.
- Develop and implement a Historic Properties Management Plan through a Programmatic Agreement to assure the preservation and long-term management of historic properties within the project boundary.

In addition, OPC will evaluate the feasibility of creating or adapting existing access to improve ADA-compliant accessibility at the Rocky Mountain PFA. A final proposal regarding ADA-compliant access will be provided in the FLA.

3.0 ENVIRONMENTAL ANALYSIS

3.1 General Description of the River Basin

The Rocky Mountain Project is located on headwater tributaries of Armuchee Creek, a tributary to the Oostanaula River in the upper Coosa River basin in northwest Georgia (Figure 2). The Coosa River is part of the larger Alabama-Coosa-Tallapoosa (ACT) River basin. The main tributaries of the Coosa River, the Oostanaula and Etowah rivers, originate in the Blue Ridge physiographic province and flow west and southwest through the Ridge and Valley province. The Oostanaula and Etowah Rivers converge to form the Coosa River at Rome, Georgia, about 10 air miles southeast of the Project. The Coosa River flows west from Rome for 30 miles, enters Alabama, and continues south-southwest 256 miles before joining the Tallapoosa River to form the Alabama River (U.S. Army Corps of Engineers [USACE] 2014). The Alabama River flows west-southwest for 314 miles and converges with the Tombigbee River to form the Mobile River, which flows south 45 miles to the Gulf of Mexico at Mobile Bay.

The ACT River basin drains a total area of approximately 22,739 sq mi. The Coosa River basin drains approximately 10,156 sq mi, of which 4,579 sq mi (45 percent) are in northwest Georgia and 100 sq mi (1 percent) are in southeast Tennessee (USACE 2014).

The Oostanaula River drains an area of approximately 2,150 sq mi (USACE 2014). The Coosawattee and Conasauga Rivers form the Oostanaula River about 25 air miles northeast of the Project. The Oostanaula River meanders southwest for 47 miles to its confluence with the Etowah River.

Armuchee Creek drains a watershed area of 226 sq mi in the Ridge and Valley province, flows southeasterly, and enters the Oostanaula River about 10 miles above its mouth (USACE 2014). Armuchee Creek originates in narrow, rolling valleys north of the Project in Walker and Chattooga Counties. Steep forested ridges along the east and west sides of the upper basin in these counties include some lands within the Chattahoochee-Oconee National Forest. After flowing south into Floyd County, Armuchee Creek is joined from the west by Little Armuchee Creek, Heath Creek, and Lavender Creek, as it meanders southeast to the Oostanaula River.

The Rocky Mountain Project occupies the Heath Creek and Lavender Creek tributary systems of Armuchee Creek. The drainage area of Heath Creek upstream of the Main Dam and spillway, which includes the Lower Reservoir and Auxiliary Pools, is approximately 16.6 sq mi. The Upper Reservoir sits atop Rock Mountain on the drainage divide between Rock Mountain Creek of the Lavender Creek system, which drains east, and intermittent headwaters of the Heath Creek system. There are no natural watersheds or streams entering the Upper Reservoir.

3.1.1 Dams in the Basin

Other than the Project, there are no major dams in the Armuchee Creek watershed. Two major dams are located on rivers in the upper Coosa River basin in northwest Georgia: Carters Dam and Lake and Carters Reregulation Dam Project on the Coosawattee River; and Allatoona Dam and Lake Project on the Etowah River. Both projects are owned and operated by the USACE (Table 4).

The main stem of the Oostanaula River is unimpounded but the river’s flow is regulated by Carters Dam and Lake and Carters Reregulation Dam, located on the Coosawattee River 27 miles upstream of its mouth (USACE 2014). Carters Dam is 445 ft high and creates a 3,275-acre reservoir. Carters Reregulation Dam, located immediately downstream, creates an 870-acre pool. The Carters Project is a pumped storage peaking facility. The regulation dam is the lower pool for pumped storage operation and also serves to reregulate peaking flows from Carters Lake to provide a more stable downstream flow. Allatoona Dam and Lake are located on the Etowah River 48 miles upstream of its confluence with the Oostanaula River.

Nine major dams regulate the flow of the Coosa and Alabama Rivers downstream of the Rocky Mountain Project in Alabama. They include six FERC-licensed dams on the Coosa River owned and operated by Alabama Power Company (APC) and three USACE locks and dams on the Alabama River (Table 4). The nine dams impound 470 miles (80 percent) of the Coosa and Alabama Rivers downstream of the Project (Freeman et al. 1997).

The first dam downstream of the Project is Weiss Dam on the Coosa River in northeast Alabama, located about 85 stream/river miles downstream of the Project. Weiss Lake covers 30,027 acres and extends 13 miles upstream into northwest Georgia on the Coosa River downstream of Rome.

Table 4 Dams on the Mainstream Rivers of the Coosa and Alabama River Basins

River Basin/Project	Owner	Reservoir Size (acres)	Total Storage (acre-ft)	Conservation Storage (acre-ft)
GEORGIA				
Coosawattee River				
Carters Dam and Lake	USACE	3,275	383,565	141,402
Carters Reregulation Dam	USACE	870	17,500	16,000
Etowah River				
Allatoona Dam and Lake	USACE	11,862	367,471	284,580
Thompson-Weinman Dam	Private	--	--	--
ALABAMA				
Coosa River				
Weiss Dam and Lake	APC	30,027	306,655	263,417
H. Neely Henry Dam and Lake	APC	11,235	120,853	118,210
Logan Martin Dam and Lake	APC	15,269	273,467	144,383
Lay Dam and Lake	APC	11,795	262,887	92,352
Mitchell Dam and Lake	APC	5,855	170,783	51,577
Jordan/Bouldin Dam and Lake	APC	5,890/734	236,130	19,057
Alabama River				
Robert F. Henry Lock and Dam/R.E. “Bob” Woodruff Lake	USACE	13,500	247,210	36,450
Millers Ferry Lock and Dam/William “Bill” Dannelly Lake	USACE	18,528	346,254	46,704
Claiborne Lock and Dam and Lake	USACE	6,290	102,480	NA

Source: USACE (2014)

3.1.2 Major Land Uses

The Armuchee Creek basin drains portions of Walker, Chattooga, and Floyd counties in northwest Georgia. The Rocky Mountain Project is located in northwestern Floyd County. There are no incorporated towns or cities in the small, rural watersheds of Heath and Lavender Creeks. According to the Rome-Floyd County Comprehensive Plan, the predominant land uses surrounding the Project are agricultural/conservation lands and residential areas along minor collector roads on the north and west sides of the Project (Rome-Floyd County 2018). The future character of land use surrounding the project is planned to include conservation, defined as undeveloped natural lands and environmentally sensitive areas, and rural areas, defined as open or cultivated land including agricultural and timber operations and rural residential uses.

The Armuchee Creek basin is in the Coosa-North Georgia Water Planning Region of Georgia (GEPD 2017). Approximately 66 percent of the land cover in the Coosa River portion of the planning region is forested and about 14 percent is used for pasture/hay and row crops.

Land uses in the Heath Creek watershed are primarily forest (77.8 percent), agriculture (10.6 percent), open water (6.5 percent), recreational lands (2.3 percent), and quarries (1.5 percent) (GEPD 2009). Residential uses, woody wetlands, emergent wetlands, and bare rock each comprise less than 1 percent. There are no national forest lands within Floyd County in either the Heath Creek or Lavender Creek watersheds.

All lands within the Rocky Mountain project boundary, except the project facilities, paved roads, and communication facilities, are managed and operated by GDNR as the Rocky Mountain PFA consistent with the Resource Management Agreement between OPC and GDNR. In particular, GDNR manages and operates the recreational resources, which are centered on the Auxiliary Pools (Antioch Lake and Heath Lake), through the agreement with OPC, in the same manner as state public fishing areas and wildlife management areas. Rocky Mountain PFA offers fishing, hunting, boating, canoeing, hiking, picnicking, wildlife viewing, biking, swimming, camping, and archery (see Section 3.2.6).

The 15,609-acre Berry College Wildlife Management Area (WMA) abuts the Rocky Mountain project boundary along its southeasterly extent. Located in Floyd County, the WMA encompasses Lavender Mountain to the south, includes portions of Lavender Creek, and extends southeast to the Berry College campus near Rome. Berry College WMA offers opportunities for hunting, wildlife viewing, hiking, biking, and horseback riding.

Arrowhead WMA is located 8 miles northeast of the Project in Floyd County in the Lovejoy Creek watershed, a tributary to the Oostanaula River. The WMA consists of 338 acres of mostly forested land with lakes and managed waterfowl impoundments and offers hiking, hunting, wildlife viewing, and youth fishing.

John's Mountain WMA is located 18 miles northeast of the Project in the Oostanaula River basin at the intersection of Floyd, Walker, Gordon, and Whitfield counties. This 24,849-acre WMA offers hunting opportunities for deer, bear, turkey, and small game.

3.1.3 Major Water Uses

Public water supply is a major use in the upper Coosa River basin. The city of Rome draws water from both the Oostanaula and Etowah Rivers. Floyd County drinking water supply comes from several sources, including a spring in the city of Cave Spring, two wells, and Woodward Creek, an eastern tributary to the Oostanaula River.

As estimated by USGS, the principal water uses of water withdrawals (surface and groundwater) in the Coosa River basin in Floyd County, in descending magnitude of use, are thermo-electric generation[5], industrial use, public supply, livestock and aquaculture, irrigation of crops and golf courses, domestic use, commercial and public use, and mining (Painter 2019). Surface water accounted for 99 percent of all 2015 water withdrawals in Floyd County, while groundwater accounted for 1 percent.

The Coosa-North Georgia Regional Water Plan (GEPD 2023), developed as part of Georgia's state-wide water planning process, assesses current and future water and wastewater needs in the 18-county planning region that includes the Rocky Mountain Project. Municipal water demands and wastewater flows for Floyd County are projected to remain relatively steady through 2040 and then decrease slightly through 2060. Agricultural water demands for crop production are projected to increase through 2060. The surface water availability resource assessment indicated that surface water sources in Floyd County are generally adequate to meet future water demands. In addition, the available assimilative capacity of the Oostanaula River for pollutants that deplete oxygen remains good to very good.

3.1.4 Tributary Streams

The Project occupies the headwaters of the Heath Creek and Lavender Creek systems. Tributaries to the Lower Reservoir and Auxiliary Pools are small, unnamed warmwater tributaries and drainageways to Heath Creek. There are no natural watersheds or tributary streams entering the Upper Reservoir atop Rock Mountain.

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[5] Georgia Power's Plant Hammond is located in Floyd County downstream of Rome and used surface-water withdrawals from the Coosa River for cooling water purposes. However, the plant was decommissioned in July 2019.

3.1.5 Climate

Climate of the Coosa River basin near Rome, Georgia is moist and temperate with mean annual precipitation of 54 inches, with only 1 inch occurring as snowfall (U.S. Climate Data 2021). Rainfall is relatively evenly distributed throughout the year but the driest months are September and October. Winter is the wettest season and March the wettest month on average. Average high temperatures range from 52°F in January to 90°F in July. Average low temperatures range from 31°F in January to 71°F in July.

3.2 Proposed Action

3.2.1 Geology and Soils

3.2.1.1 Affected Environment

The Rocky Mountain Project lies in the Armuchee Ridges District of the Ridge and Valley physiographic province (Clark and Zisa 1976). The Ridge and Valley province is a relatively low-lying region between the Blue Ridge province to the east, the Piedmont province to the south, and the Appalachian Plateau to the northwest (Griffith et al. 2001, Chowns 2018). The Ridge and Valley province is characterized by roughly parallel north-northeasterly trending ridges with sandstone and chert forming thin acidic soils (Chowns 2018). The ridges are steep and separated by valleys with fertile lowland soils underlain by shale and limestone. The Armuchee Ridges District consists of a series of prominent, narrow ridges rising abruptly 600-700 ft above the valley floors (Clark and Zisa 1976). These ridges, capped predominantly by the Red Mountain sandstone of Silurian age, stand at elevations of 1,400 to 1,600 ft. Intervening valley floors are generally underlain by shales and limestones of Mississippian and Cambro-Ordovician age, respectively.

The Project is in the Southern Shale Valleys and Southern Sandstone Ridges level IV ecoregions (Griffith et al. 2001, Edwards et al. 2013). Ecoregions are areas where ecosystems, including the type, quality, and quantity of environmental resources, are generally similar (EPA 2021). The Main Dam, Lower Reservoir, Auxiliary Pools, and Heath Creek valley are in the Southern Shale Valleys ecoregion. This ecoregion is made up of rolling valleys and low, rounded hills that are composed mainly of shale or a shaly limestone with some clayey sediment. The soils tend to be deep, acidic, moderately well-drained, and slowly permeable. The valleys of tributary streams in this ecoregion can be at elevations as low as 600 ft.

Rock Mountain and the Upper Reservoir are in the Southern Sandstone Ridges ecoregion. This ecoregion encompasses sandstone ridges but also has areas of shale, siltstone, and conglomerate. The ridges are steep and typically have narrow crests, and the soils are generally stony, sandy, and of low fertility.

The shoreline characteristics of the project waterbodies vary between the two operating pools with large daily fluctuations in water levels, the Auxiliary Pools with stable water levels, and Heath Creek downstream of the Main Dam. There are no known areas of significant shoreline erosion within the project boundary.

The Upper Reservoir is a man-made structure with a continuous earth and rockfill dam that forms the reservoir structure. The rocky shoreline is maintained clear of vegetation for dam safety purposes. Due to the composition of the Upper Reservoir shoreline, there are no areas of significant shoreline erosion.

The Lower Reservoir is an inundated portion of Heath Creek. Steeper shoreline areas, such as near the powerhouse and dams, consist of exposed bedrock and/or riprap. OPC voluntarily conducts annual shoreline inspections of the Lower Reservoir by boat, visually inspecting the entire accessible shoreline, including the Main Dam, Dam A, and adjacent dams and spillways forming the Auxiliary Pools (Dams D, E, F and G); Dam G (Heath Lake) is not accessible at lower reservoir pool levels. The shoreline inspection of the Lower Reservoir in June 2022 found minor bank undercutting in a few spots along the south shoreline between the Main Dam and bridge to the powerhouse, and minor bank sloughing on the north shoreline west of an old gristmill site. However, healthy, grassy vegetation covered approximately 90 percent of the reservoir shoreline and no areas of significant shoreline erosion or bank failure were observed. The minor areas of erosion were related to reservoir fluctuations from project operations and did not appear to have increased since previous inspections.

The shorelines of the Auxiliary Pools (Antioch Lake and Heath Lake) are well vegetated, including mature timber, with the exception of recreational facilities within the Rocky Mountain PFA, which have either stable, landscaped (grassy) riparian zones or a mix of landscaped and natural vegetative riparian zones. There are no known issues of significant erosion along the shorelines of the Auxiliary Pools.

A physical habitat assessment of Heath Creek downstream of the Main Dam and within the project boundary during the August 2022 fish community survey (Station HC-1) found the riparian zone to be forested and the stream banks to be relatively stable and moderately vegetated (Kleinschmidt Associates [Kleinschmidt] 2023a). In addition, riprap immediately downstream of the Main Dam aids in channel stability and helps reduce erosion and channel incision within the tailrace of the dam. No areas of significant erosion or bank failure were observed within the project boundary.

3.2.1.2 Environmental Impacts and Recommendations

OPC proposes to continue operating the Rocky Mountain Project as currently operated. During normal daily generation and pumping, the Lower Reservoir elevation would continue to fluctuate up to 20 ft and the Upper Reservoir elevation would continue to fluctuate up to 51 ft. The Project would continue to release a continuous minimum flow of 1.2 cfs from the Lower Reservoir into Heath Creek.

OPC's proposed operation would not adversely affect shorelines within the operating pools as a result of erosion and sedimentation. Although the reservoir level would fluctuate substantially during daily pumped storage operations, the potential for shoreline erosion in the Upper Reservoir would be negligible due to the use of rock fill around the entire reservoir perimeter, which would be maintained free of vegetation, and the lack of public access for shoreline recreation. The potential for shoreline erosion in the Lower Reservoir would be minimized by healthy, grassy vegetation covering an estimated 90 percent of the shoreline and armoring provided by riprap along the Main Dam, Dams A, D, E, F, and G, and the Auxiliary Pool I and Auxiliary Pool II spillways. Moreover, the continued lack of public recreation access to the Lower Reservoir would preclude wave action from watercraft and shoreline recreation activities as potential sources of shoreline erosion in the Lower Reservoir.

Normal daily project operations would not affect water levels in the Auxiliary Pools, which would be used only during drought operation to replenish the Lower Reservoir and only when, after the pumping cycle, the Lower Reservoir elevation declined to below 681 ft. During normal operations, water levels in the Auxiliary Pools would remain relatively stable, as controlled by their ungated spillways, which discharge directly into the Lower Reservoir. The potential for shoreline erosion in the Auxiliary Pools would be further minimized by the extensive natural vegetative buffer zone around the majority of the shoreline and the mix of stable, landscaped and natural vegetative buffer zone conditions along the recreational facilities within the Rocky Mountain PFA. In addition, fishing boats used on the Auxiliary Pools must operate at idle (no-wake) speed, thereby minimizing the potential for shoreline erosion due to wave action from watercraft.

OPC's proposed operation also would not adversely affect shoreline conditions in Heath Creek downstream of the Main Dam. Releases from the Main Dam would approximate run-of-river flow conditions on a daily average basis. Releases above the minimum flow would be made to pass inflow above that needed to maintain the upper and lower reservoirs within their normal reservoir storage volumes and operating pool elevations. The potential for shoreline erosion downstream of the Main Dam would be moderated by the riprap and grassy shoreline vegetation close to the dam, and by the stream-bank protection provided by the densely forested vegetative riparian zones along both sides of the creek extending downstream.

Unavoidable Adverse Impacts

Temporary effects of shoreline disturbance from construction of proposed recreation enhancements (Section 3.2.6.2) would be minimized through the implementation of best management practices (BMPs) for minimizing soil disturbance, controlling erosion, restoring natural contours, and revegetating disturbed areas, as recommended in the Manual for Erosion and Sediment Control in Georgia (Green Book) (Georgia Soil and Water Conservation Commission 2016).

3.2.2 Water Resources

3.2.2.1 Affected Environment

The Rocky Mountain Project is located on tributaries of Armuchee Creek in the Oostanaula River basin of the upper Coosa River basin. The Lower Reservoir and the Auxiliary Pools (Antioch Lake and Heath Lake) are on Heath Creek and its tributaries. The drainage area of Heath Creek upstream of the Main Dam is 16.6 sq mi. The Upper Reservoir is on the drainage divide between Rock Mountain Creek of the Lavender Creek system, and Heath Creek, and has no discharge outlet to either creek.

Water Quantity

Under a surface water withdrawal permit issued by GEPD, OPC is authorized to withdraw inflow from Heath Creek for the purpose of non-consumptive use for power generation; the permitted monthly average withdrawal is 140 million gallons per day (GEPD 2021). Because the Project is a pumped storage facility, flows from Heath Creek are not directly used for generation. A total of 10,003 acre-ft of water is cycled between the Lower and Upper Reservoirs. The Project generates power using water from the Upper Reservoir during periods of peak electricity demand, and pumps water from the Lower Reservoir back to the Upper Reservoir during periods of low demand and available base power.

The pumping of water from the Lower Reservoir to the Upper Reservoir typically occurs at night and on weekends. During normal daily operations of generation and pumping, the Upper Reservoir water level fluctuates between a normal minimum pool elevation of 1,341 ft MSL and a normal maximum operating pool elevation of 1,392 MSL. The Lower Reservoir typically fluctuates 20 ft in elevation, between 690.5 ft MSL to the normal maximum operating pool elevation of 710.5 MSL. Storage in the Auxiliary Pools is used to replenish the Lower Reservoir only if, after the pumping cycle, the elevation of the Lower Reservoir has declined to 681 ft MSL. The project cannot be operated with a Lower Reservoir elevation below that level (FERC 2005).

Under a National Pollutant Discharge Elimination System permit issued by GEPD, OPC is authorized to discharge non-contact bearing oil cooling water from the three generating units, non-contact HVAC cooling water, and station sump and compressor cooling water to Heath Creek, subject to effluent limitations and monitoring requirements (GEPD 2021).

There are no existing or proposed uses of project waters for irrigation, domestic water supply, industrial, or other consumptive purposes.

Flow Statistics

Under Article 34 of the existing FERC license, OPC operates the Project to provide a continuous minimum flow release of 1.2 cfs from the Main Dam to Heath Creek via a designated minimum flow release valve. The nearest streamflow gage to the Project is located on Heath Creek about 0.3 mile downstream of the Main Dam (USGS Gage No. 02388320, Heath Creek near Armuchee, GA). Daily average flow data at the gage were compiled for the period of record January 1, 1996 through December 31, 2022. The mean daily average flow for the years 1996-2022 was 23.1 cfs. The maximum daily average flow was 1,130 cfs on September 4, 2022. The calculated 50-percent exceedance flow for the period was 4 cfs (Figure 4).

Monthly minimum, average, and maximum flows at this gage for the 27-year period of record (1996-2022) are listed for each month in Table 5. Average monthly flows ranged from a low of 4.4 cfs in August to a high of 49.2 cfs in March. The minimum flows usually occurred in mid to late summer and high flows tended to occur in winter and early spring, excluding the extreme high-flow event in September 2022.

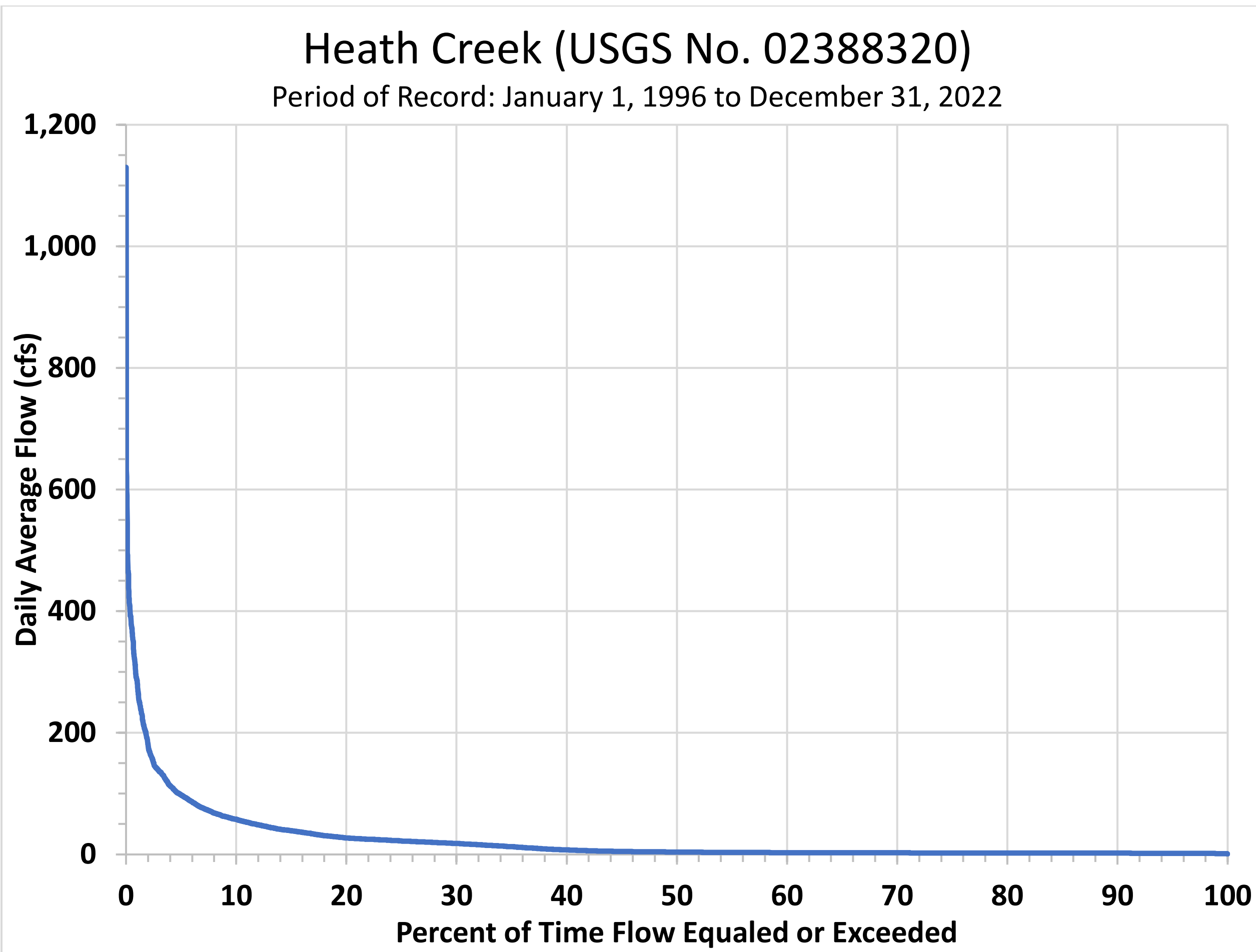

Figure 4 Annual Flow Duration Curve for Heath Creek

Table 5 Minimum, Average, and Maximum Monthly Flows at USGS Gage No. 02388320 Heath Creek near Armuchee, GA from January 1, 1996 to December 31, 2022

MONTH	MINIMUM FLOW (CFS)	AVERAGE FLOW (CFS)	MAXIMUM FLOW (CFS)
January	1.4	40.7	613
February	1.7	47.5	486
March	2.3	49.2	574
April	1.9	32.2	621
May	1.9	19.7	759
June	1.5	9.5	466
July	1.1	7.7	410
August	1.1	4.4	234
September	1.1	10.2	1,130
October	1.6	8.7	391
November	0.8	16.5	836
December	1.4	32.4	494
Annual	0.8	23.1	1,130

Source: USGS (2022)

Water Quality

Water Use Classifications and Attainment Status

GEPD (2022a) classifies the water use of tributaries to Heath Creek within the Rocky Mountain PFA, which contains the Auxiliary Pools (Antioch Lake and Heath Lake), as Recreation, including for boating, swimming, and fishing. Waters classified for recreation also support fishing use. Heath Creek downstream of the Lower Reservoir is classified as Fishing. The Project's Lower and Upper Reservoirs, which are not available for public use, are classified as Fishing.

In addition to general criteria applicable to all waters, specific criteria apply to Recreation and Fishing use designations, including numeric criteria for bacteria (culturable *E. coli*), dissolved oxygen (DO), pH, and water temperature (GEPD 2022a). The applicable DO criteria for the Auxiliary Pools and Heath Creek, which support warmwater species of fish, are a daily average of 5.0 milligrams per liter (mg/L) and no less than 4.0 mg/L at all times. The pH should be within the range of 6.0 to 8.5, and water temperature should not exceed 90°F (32.2°C).

GEPD's current water use attainability assessment of Georgia waters lists Antioch Lake as supporting its designated use (GEPD 2022b). However, Heath Lake is listed as not supporting its fishing use due to the presence of polychlorinated biphenyls (PCBs) in fish tissue (GEPD 2022b). GDNR's current fish consumption guidelines recommend limiting the consumption of Channel Catfish from Heath Lake over 16 inches in length to one meal per week due to PCBs and mercury (GDNR 2021a). The use of PCBs has been banned in the U.S., their levels in water and sediment have been declining, and their detection in fish tissue has been attributed to nonpoint source pollution and urban runoff. Mercury in waterbodies originates largely from air sources that deposit in waters or on adjacent lands and wash into nearby waters in runoff (EPA 2023). Fish consumption advisories for sport fish due to PCBs and mercury are widespread in Georgia reservoirs (GDNR 2021a). Project operations, maintenance, and project-related recreation are not sources of PCBs or mercury in fish tissue.

GEPD (2022b) assessed a 1-mile segment of Heath Creek upstream of the Main Dam, in the Lower Reservoir, as supporting its designated Fishing use.[6] However, the 4.3-mile segment of Heath Creek downstream of the Main Dam is currently listed as not supporting its designated use due to elevated densities of fecal coliform bacteria, attributed to nonpoint sources (GEPD 2022b). A total maximum daily load (TMDL) evaluation of fecal coliform in Heath Creek indicated that the potential sources are mainly wildlife, agricultural livestock (e.g., beef cattle, swine, and horses), and urban development (e.g., leaking septic systems) (GEPD 2009). None of these sources has a nexus with project operations and maintenance or project-related recreation. GEPD (2009) estimated that a 70-percent reduction in load from the watershed is necessary to achieve the water quality standard.

[6] GEPD's 2022 list document for streams refers to the Main Dam as Selman Lake Dam, a name that appears on the National Hydrography Dataset map but that is not used by OPC for the Lower Reservoir.

GEPD (2022a) classifies the Lavender Creek watershed upstream from Floyd County Road 893 as secondary trout waters. Secondary trout waters are streams without evidence of natural trout reproduction but that are capable of supporting stocked trout year-round. The designation includes Rock Mountain Creek, a tributary to Lavender Creek that originates at the base of the Upper Reservoir. Secondary trout stream criteria include no elevation exceeding 2°F of natural stream temperature, a daily average DO concentration of 6.0 mg/L, and DO no less than 5.0 mg/L at all times. Because there is no surface outlet from the Upper Reservoir, there is no nexus between project operations and effects on water temperature and DO concentration in Rock Mountain Creek, which currently supports its designated use (GEPD 2022b).

Historical Water Quality Data

Water quality data collected by OPC since project operations began in 1995 include both field measurements and samples for water chemistry analysis in the laboratory. Article 31 of the license required that water quality monitoring be completed for five years after the Project began operation. OPC submitted the final water quality report in 2005, finding that the Project did not have detrimental effects on water quality (Montgomery Watson Harza 2003 [MWH]; OPC 2005). Water quality data collection for lab analysis continued at the Project to the present with some changes to locations and frequency over time.

OPC monitored water quality at the following seven sampling stations within the project boundary during the five years following commencement of project operations in 1995:

- RM08 – Rock Mountain Creek, near Upper Reservoir flowing easterly away from the Project
- RM11 – Heath Creek downstream of Main Dam
- RM13 – Auxiliary Pool II (Heath Lake)
- RM14 – Auxiliary Pool I (Antioch Lake), between the two basins of the pool
- RM15 – Auxiliary Pool I (Antioch Lake), eastern basin
- RM16 – Downstream end of Lower Reservoir
- RM100 – Auxiliary Pool I (Antioch Lake), swimming beach

Water quality measurements conducted in the field by OPC staff since project operations began included water temperature, pH, DO, and conductivity for the years 1996-2020.

These data, as summarized in the PAD (OPC 2021), were consistent with overall good water quality conditions at the Project with parameter ranges and means typical of natural variation in reservoirs and small streams of northern Georgia.

Since project operations began in 1995, OPC collected water chemistry grab samples at the same monitoring locations for laboratory analysis by an independent laboratory. Over time, sampling station RM08 (Rock Mountain Creek) was removed from water chemistry sampling because previous sampling results indicated that water quality of the creek is unaffected by project operation. Stations RM14 (Auxiliary Pool I between the two basins) and RM16 (downstream end of Lower Reservoir) were removed from the lab analysis sampling due to similarities with sampling points RM11 (Heath Creek downstream of Main Dam), RM13 (Auxiliary Pool II), and RM15 (Auxiliary Pool I, eastern basin). As summarized in the PAD (OPC 2021), these water chemistry data indicated overall good water quality conditions at the Project with parameter ranges and means typical of reservoirs and small streams in northern Georgia.

2022-2023 Water Quality Study

OPC conducted a Water Quality Assessment in 2022-2023 (Kleinschmidt 2023b) according to OPC's Final Study Plan for the Project distributed in August 2022 (OPC 2022). Discrete monitoring and water sample collection and analysis was performed monthly from June 2022 to May 2023 at stations RM11 (Heath Creek), RM13 (Heath Lake), RM15 (Antioch Lake East), and RM16 (Lower Reservoir). During each sampling event at each station, measurements of water temperature, specific conductance, pH, DO, and turbidity were recorded. Water chemistry samples were analyzed by Pace Analytical Services, LLC (Pace) (NELAC No. E87653) for Ammonia, Total Kjeldahl Nitrogen (TKN), Nitrate-Nitrite, Total Phosphorus, Orthophosphate, and 5-day Biochemical Oxygen Demand (BOD). At the request of GDNR, an additional sample for Ammonia was collected in Heath Creek at Texas Valley Road in July 2022. The sample was collected at fish sampling station HC-2, located about 2.5 stream miles downstream of the Main Dam at Texas Valley Road, for the purpose of detecting whether downstream ammonia concentrations could pose stress to freshwater mussels.

In addition, a continuous data logger was deployed in Heath Creek (RM11) approximately 1,000 ft downstream of the Main Dam and set to record measurements of water temperature and DO at hourly intervals from June 23, 2022 through June 30, 2023. Data were downloaded from the logger and the logger was cleaned and checked approximately every two weeks during the critical period (months May-October), and monthly in other seasons.

The results of the laboratory analysis of eleven sets of monthly samples (June 2022-May 2023) are summarized in Table 6 along with historical water chemistry data from the PAD for comparison.[7] The results for most parameters at each site were generally lower compared to previous analyses (OPC 2021). Ammonia was detected at measurable levels in only three samples – one from RM13 (Heath Lake) and two from RM 15 (Antioch Lake East). Ammonia was not detected in measurable levels in Heath Creek at RM11 during any month or in Heath Creek 2.5 miles downstream of the Main Dam in July 2022. The highest average concentrations for TKN, Nitrate-Nitrite, and Total Phosphorus in 2022-2023 occurred in samples from RM15 but they were lower than previous analyses. Orthophosphate was detected in only a single sample from RM11 (Heath Creek).

The results of monthly measurements of water temperature, specific conductance, pH, DO, and turbidity are presented in Table 7. Results for each parameter met applicable water quality numeric criteria with the exception of some pH values in the Auxiliary Pools. Measured pH values exceeded 8.5 on five occasions at RM13 (Heath Lake; June, July, and August 2022; April and May 2023), and on four occasions at RM 15 (Antioch Lake East; June, July, and August 2022; May 2023). These occurrences were likely associated with high levels of primary production (i.e., photosynthesis) by algae/phytoplankton as evidenced by the associated high levels of DO saturation measured concurrently with the high pH values. High levels of primary production are likely due at least in part to fertilization practices utilized by GDNR to enhance fish production for angler success in the Rocky Mountain PFA (see Section 3.2.3.1, Auxiliary Pools – Antioch Lake and Heath Lake). Maximum pH values in the Auxiliary Pools also occasionally exceeded 8.5 in previous analyses (OPC 2021).

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[7] Some historical values in Table 6 differ from those presented in the PAD because extreme outliers in the historical data were removed for this comparison (e.g., 2,000 mg/L ammonia at RM 11). Also, in both the historical and current datasets, results of zero and non-detections were not used in the calculation of parameter averages.

Table 6 Analytical Results for Monthly Water Chemistry Samples Collected at the Project

Analyte		RM11 Current[1]	RM11 Historical[2]	RM13 Current	RM13 Historical	RM15 Current	RM15 Historical	RM16 Current	RM16 Historical
Ammonia (mg/L)	# Detections	0	-	1	-	2	-	0	-
	Min	NA	0.02	0.160	0.031	0.180	0.024	NA	0.026
	Avg	NA	0.285	0.160	0.353	0.438	0.335	NA	0.266
	Max	NA	1.06	0.160	1.770	0.696	2.011	NA	1.490
TKN (mg/L)	# Detections	4	-	9	-	9	-	3	-
	Min	0.120	0.0002	0.152	0.0001	0.384	0.0001	0.13	0.0001
	Avg	0.158	0.640	0.556	0.799	0.669	0.732	0.151	0.638
	Max	0.190	2.800	1.200	6.000	1.040	3.900	0.17	6.550
Nitrate-Nitrite (mg/L)	# Detections	9	-	3	-	2	-	8	-
	Min	0.008	0.0002	0.0571	0.0004	0.210	0.003	0.005	0.006
	Avg	0.141	0.405	0.109	0.365	0.222	0.474	0.086	0.385
	Max	0.560	1.611	0.210	1.099	0.234	1.370	0.230	1.740
Total Phosphorus (mg/L)	# Detections	0	-	2	-	4	-	0	-
	Min	NA	0.011	0.006	0.015	0.005	0.040	NA	0.040
	Avg	NA	0.221	0.032	0.223	0.039	0.244	NA	0.266
	Max	NA	1.440	0.057	3.846	0.064	2.880	NA	4.360
Orthophosphate (mg/L)	# Detections	1	-	0	-	0	-	0	-
	Min	0.030	0.020	NA	0.020	NA	0.020	NA	0.020
	Avg	0.030	0.163	NA	0.181	NA	0.181	NA	0.176
	Max	0.030	1.070	NA	1.630	NA	1.890	NA	2.910
BOD (mg/L)	# Detections	3	-	5	-	5	-	2	-
	Min	3.40	2.60	3.80	2.90	3.56	2.10	7.68	3.80
	Avg	7.18	11.58	7.76	13.92	4.39	14.62	8.84	17.17
	Max	13.10	69.00	12.10	98.00	5.5	97.00	10.00	125.00

[1] June 2022 – May 2023; [2] 1996-2020

Table 7 Summary of Spot Measurements During Monthly Water Chemistry Sampling

Location		Water Temperature (°C)	Specific Conductance (µs/cm)	pH	DO (mg/L)	DO (% sat.)	Turbidity (FNU)
RM11	Min	7.21	111.4	7.03	6.11	74.7	0.66
	Avg	17.00	129.3	7.63	9.16	92.6	1.64
	Max	25.86	147.3	7.96	12.07	108.3	2.96
RM13	Min	6.84	54.9	6.81	4.69	53.9	1.4
	Avg	20.04	69.4	8.10	9.65	107.5	4.30
	Max	31.79	86.1	9.89	13.39	182.2	17.55
RM15	Min	7.77	71.7	7.22	5.22	49.6	0.74
	Avg	19.74	80.7	8.08	9.14	100.0	1.92
	Max	30.72	99.3	9.62	13.13	156.0	6.29
RM16	Min	9.62	102.2	7.43	6.80	82.2	0.00
	Avg	20.02	114.2	7.75	9.01	97.4	1.73
	Max	30.01	125.2	7.97	11.22	109.2	6.58

The continuous DO/water temperature logger was deployed in Heath Creek downstream of the Main Dam on June 23, 2022. Due to a high flow event in September 2022, the logger became buried in sediment and did not collect representative data between September 4 and September 29 (Figure 5). Additionally, a logger malfunction resulted in missing measurements between January 21 and March 10, 2023. Table 8 summarizes the monthly ranges and averages of DO values and water temperatures recorded during the monitoring period. DO concentrations ranged from a minimum of 2.32 mg/L in August 2022 to a maximum of 12.71 mg/L in January 2023. The minimum DO values in July and August 2022 were below the instantaneous minimum criterion of 4.0 mg/L (see below). Water temperatures ranged from a low of 7.0°C in December 2022 to a high of 30.2°C (86.4°F) in August 2022.

Daily average DO concentrations were above the water quality criteria minimum of 5.0 mg/L for all days measured (Figure 5). However, there were several instances when DO concentrations fell below the instantaneous minimum criterion of 4.0 mg/L in July and August 2022. Figure 6 plots hourly DO measurements at station RM11 and flow in Heath Creek at the USGS gage through the monitoring period. In total, there were 12 events when hourly DO values were less than 4.0 mg/L. The duration of these events ranged from a minimum of 1 hour (single measurement) to a maximum of 5 hours. Of the 3,997 hourly

DO measurements recorded by the logger during the critical period in 2022 (June 23-October 31) and 2023 (May 1-June 30), a total of 37 hourly measurements (0.93 percent) were less than 4.0 mg/L. A total of 3,960 hourly measurements (99.07 percent) during the critical period were above 4.0 mg/L. Figure 7 depicts hourly water temperature and flow through the monitoring period and shows that maximum summer water temperatures in Heath Creek were always below the maximum criterion of 90°F (32.2°C).

The intermittent occurrences of DO values below 4.0 mg/L in Heath Creek in July-August 2022 were examined in an effort to determine potential causes. Several of the low DO events were plotted along with water surface elevations for the Lower Reservoir. In all instances, the low DO events occurred as the Lower Reservoir water surface elevation was rising during generation. The line plot in Figure 8 shows an example low-DO event in August 2022 when DO values in Heath Creek declined as the elevation of the Lower Reservoir increased after generation began. This trend suggests that the low-DO events potentially resulted from hydrodynamic turbulence during the onset of generation that pushed low-DO water from the inactive storage zone of the Lower Reservoir into the withdrawal zone of the minimum flow pipe on the upstream side of the Main Dam. The inactive storage volume in the Lower Reservoir approximates 8,797 acre-ft. The inlet to the minimum flow pipe is at elevation 665 ft MSL, about 45.5 ft below the normal maximum pool elevation and 25.5 ft below the normal minimum pool elevation.

Table 8 Summary of Continuous Monitoring Data Collected in Heath Creek Downstream of the Main Dam

Month	Dissolved Oxygen (mg/L)			Water Temperature (°C)		
	Min	Average	Max	Min	Average	Max
Jun-22	5.55	6.74	7.89	23.18	24.57	27.00
Jul-22	3.07	6.13	8.11	23.80	26.28	29.66
Aug-22	2.32	6.12	8.11	26.30	27.58	30.22
Sep-22	4.02	6.49	9.90	22.18	26.09	29.20
Oct-22	6.74	7.98	9.26	16.92	20.01	24.52
Nov-22	6.53	9.15	11.61	11.94	15.94	20.68
Dec-22	9.99	11.21	12.26	7.00	12.06	14.58
Jan-23	10.72	11.89	12.71	9.10	10.34	11.20
Feb-23	-	-	-	-	-	-
Mar-23	9.49	10.75	11.99	11.40	14.11	17.92
Apr-23	7.19	9.81	11.24	14.70	16.80	20.56
May-23	4.23	8.50	10.13	16.64	19.80	22.94
Jun-23	6.26	7.63	9.46	19.68	22.18	25.82

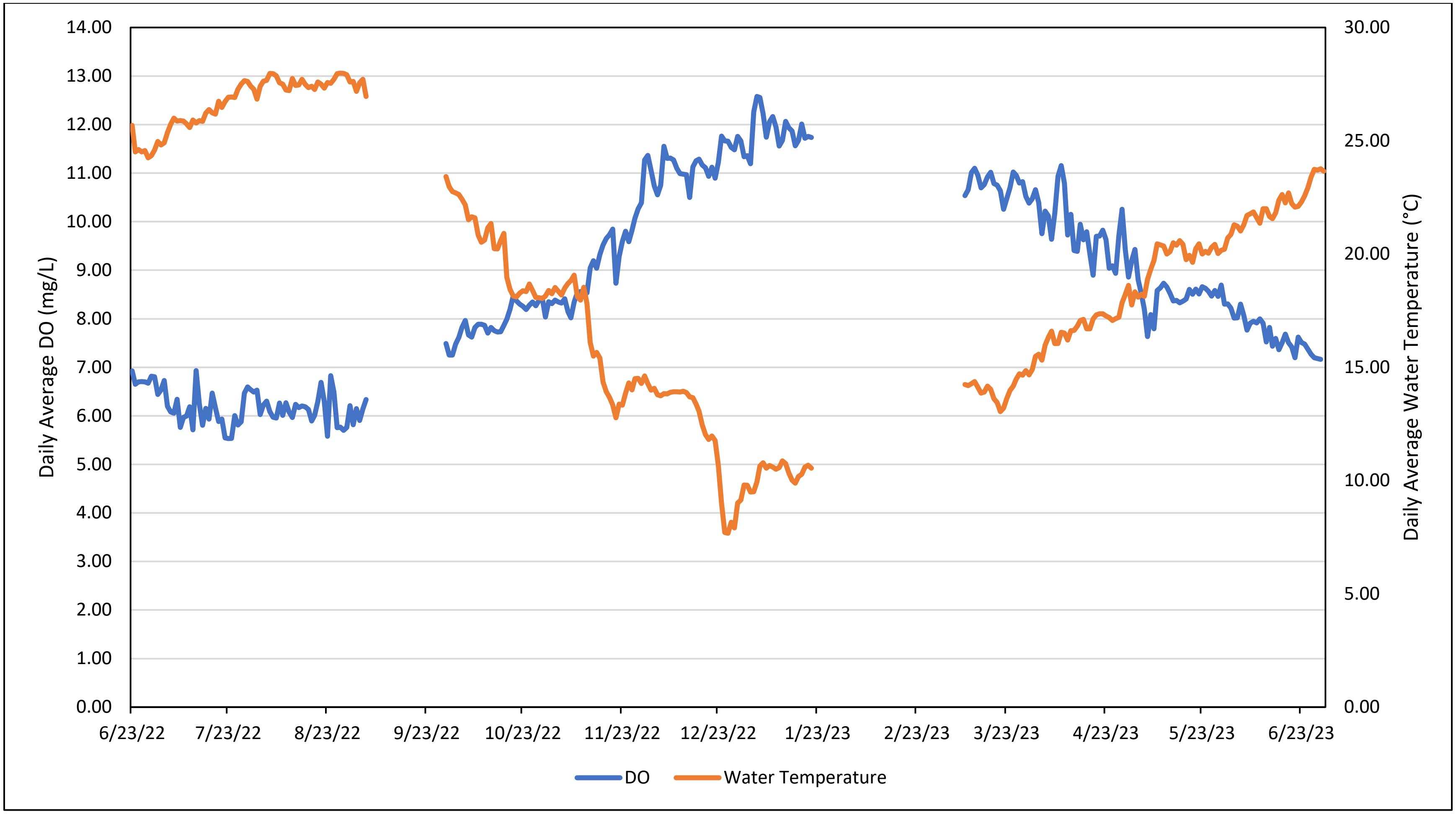


Figure 5 Line Plot of Daily Average Dissolved Oxygen and Water Temperature in Heath Creek Below the Main Dam

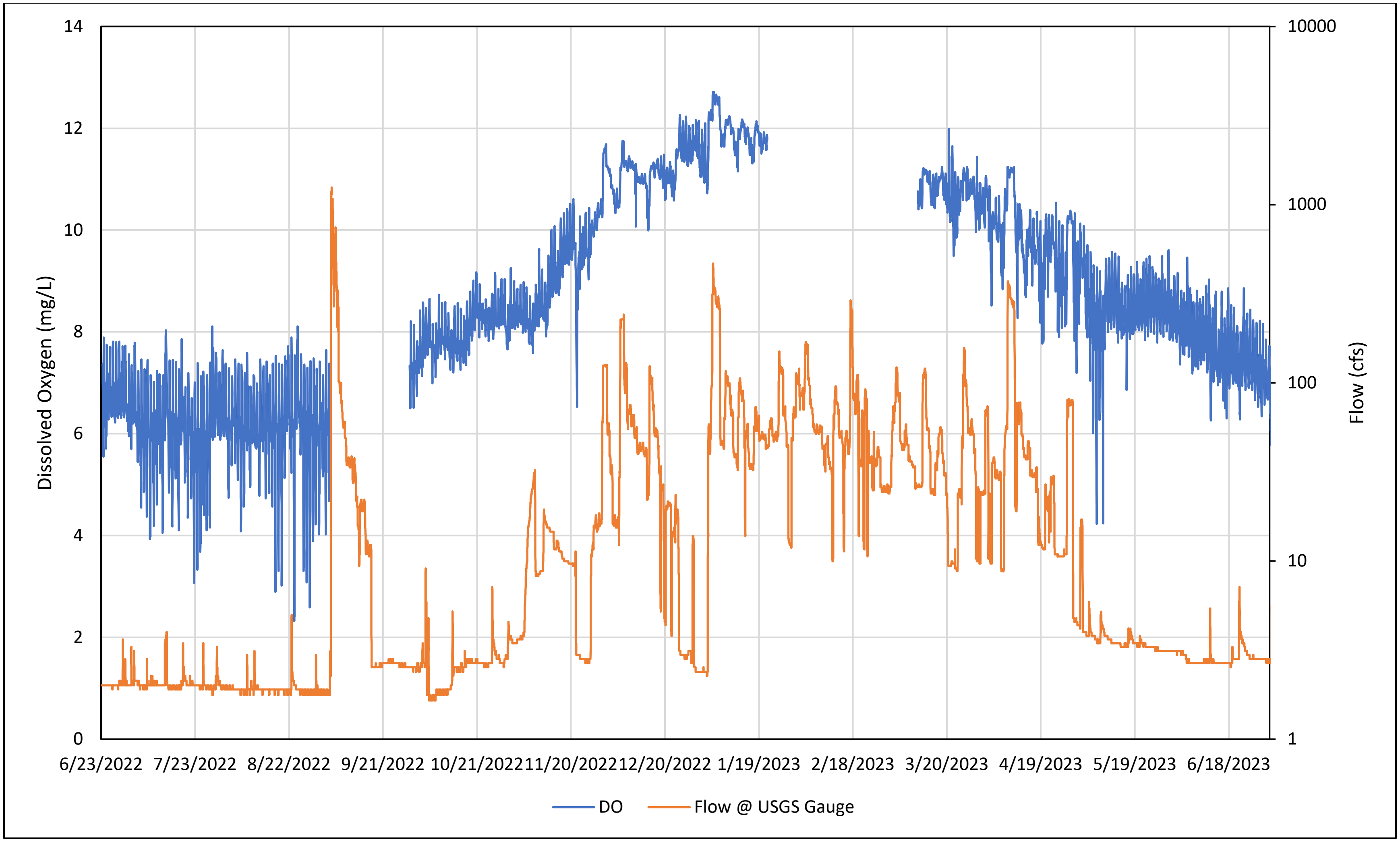


Figure 6 Line Plot of Hourly Dissolved Oxygen Measurements in Heath Creek Below the Main Dam

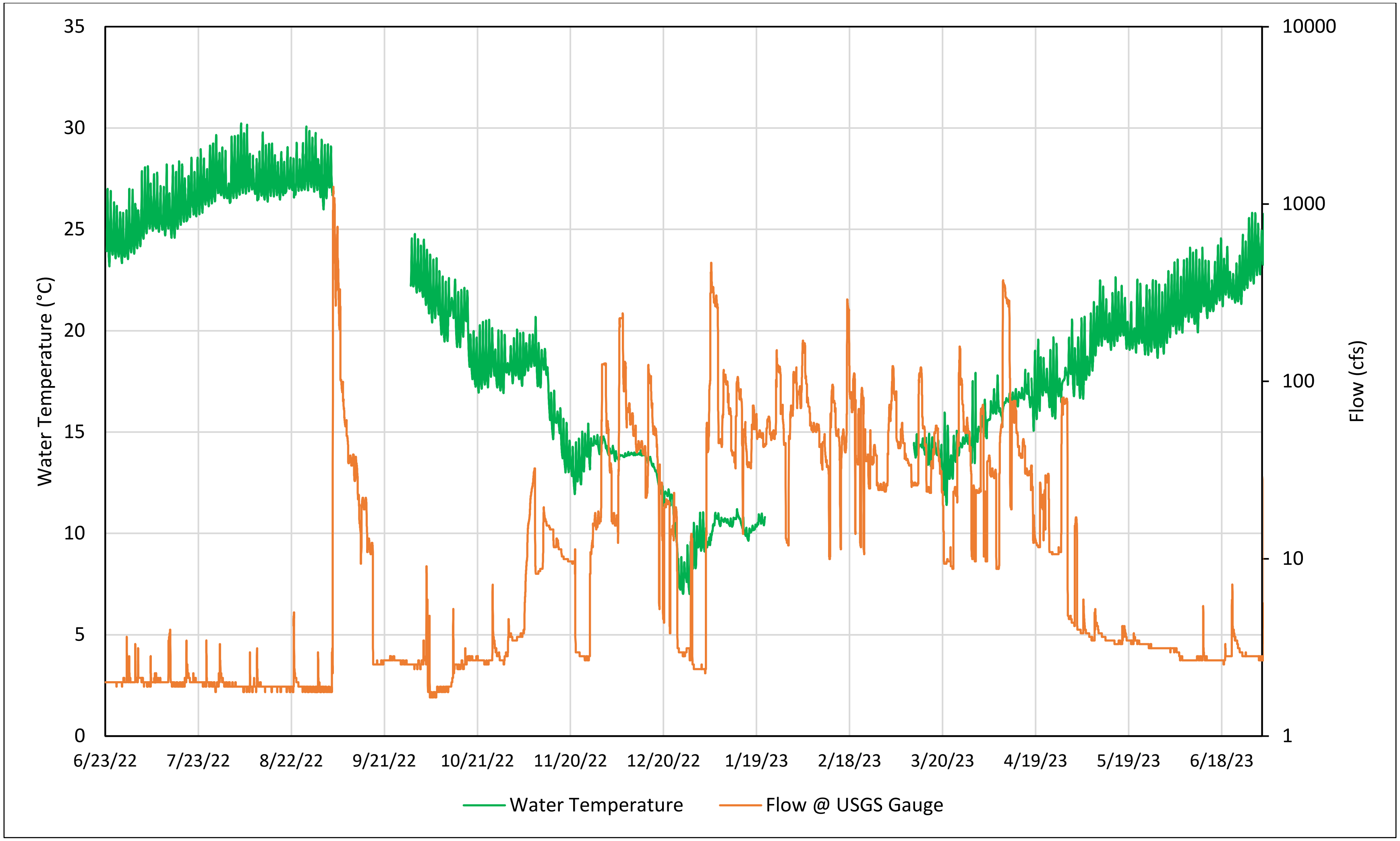


Figure 7 Line Plot of Hourly Water Temperature Measurements in Heath Creek Below the Main Dam

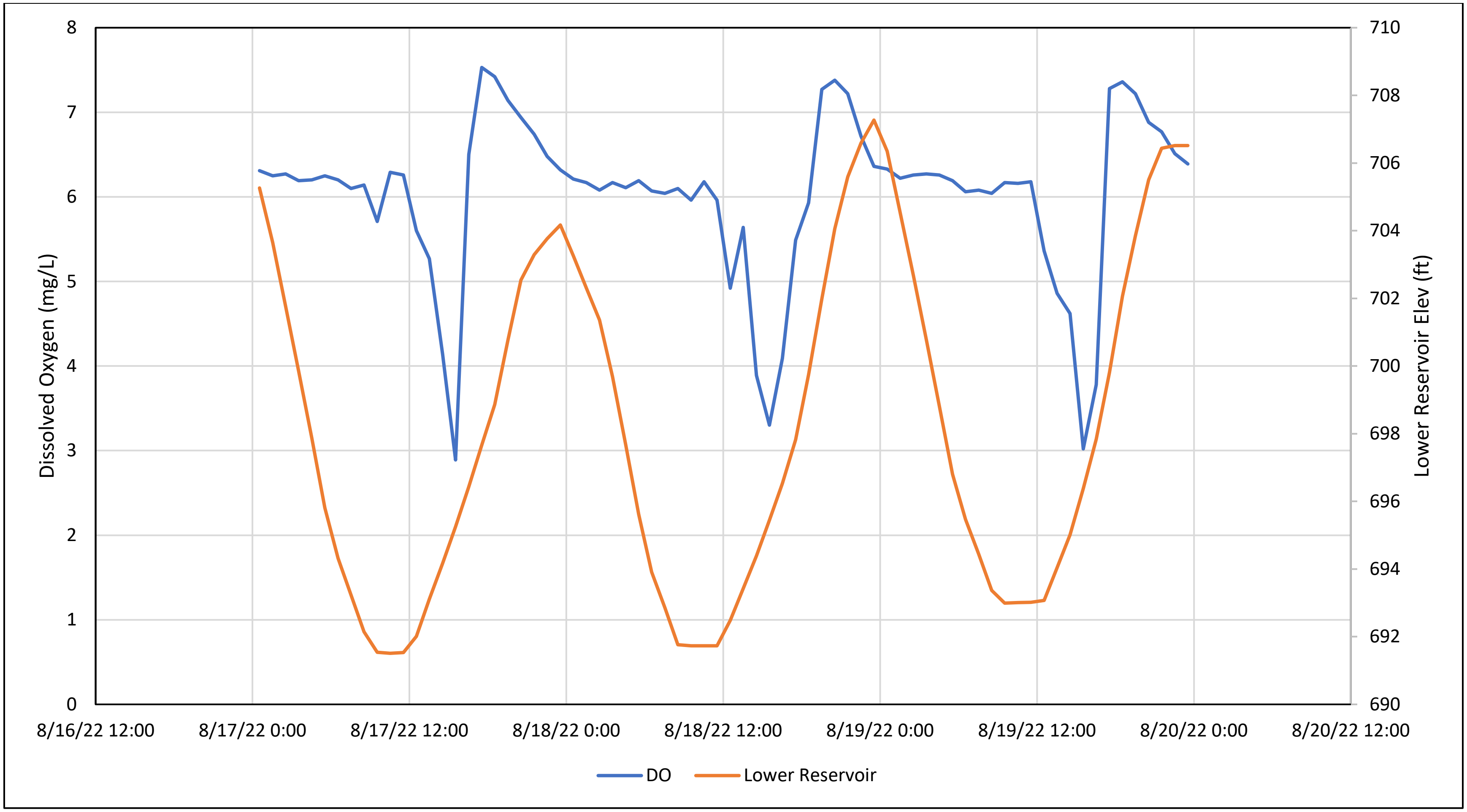


Figure 8 Line Plot Depicting a Low DO Event in Heath Creek below the Main Dam in August 2022

OPC held relicensing study update and preliminary results meetings with GEPD, GDNR, and FWS in May and June 2023. Based on the results of the continuous DO monitoring and consultation with the agencies, OPC conducted a second season of water quality monitoring from July-September 2023 to collect additional data to better understand the occurrence of intermittent DO deviations below 4.0 mg/L in Heath Creek below the Main Dam. The results of the additional monitoring will be provided in a forthcoming addendum to the Water Quality Assessment Study Report and analyzed in the FLA.

3.2.2.2 Environmental Impacts and Recommendations

Project Operations

OPC proposes to continue operating the Rocky Mountain Project consistent with existing license requirements in a pumped-storage mode to provide peaking power and spinning reserve. Under the proposed operating parameters, during normal daily generation and pumping, the Lower Reservoir elevation would continue to fluctuate up to 20 ft and the Upper Reservoir elevation would continue to fluctuate up to 51 ft. The Project would continue to release a continuous minimum flow of 1.2 cfs from the Lower Reservoir into Heath Creek.

Water Quality

Based on historical water quality data collected from 1996 to 2020 and the 2022-2023 Water Quality Assessment, continued project operation would not adversely affect water quality in the Lower and Upper Reservoirs, the Auxiliary Pools, or in Heath Creek downstream of the Main Dam. The monitoring trends and data indicate good overall water quality conditions at the Project since operation began, with parameter ranges and means typical of natural variation in reservoirs and small streams of northern Georgia. Furthermore, nutrient and BOD water chemistry constituents are generally present in lower concentrations today compared to historical results.

Occasional elevated pH values in the Auxiliary Pools have not adversely affected the resident sport fisheries managed by GDNR. Although fertilization practices enhance algal production/photosynthesis, which likely contributes to elevated pH values, GDNR has found a significant direct positive relationship between annual fertilization rates and the combined biomass of Largemouth Bass, Bluegill, and Redear Sunfish collected during spring electrofishing surveys, evidence that fertilization enhances fishing quality in the Auxiliary Pools (see Section 3.2.3.1, Auxiliary Pools – Antioch Lake and Heath Lake).

Minimum Flow Release to Heath Creek

OPC proposes to continue to release a continuous minimum flow of 1.2 cfs from the Lower Reservoir into Heath Creek downstream of the Main Dam. This minimum flow release would continue to protect water quality and aquatic habitat in Heath Creek, which supports diverse, healthy communities of native fish and mussels (see Section 3.2.3.1).

As required by Article 34 of the existing license, OPC completed a site-specific minimum flow study in 1996 to determine the adequacy of the current 1.2-cfs minimum flow requirement for maintaining water quality and aquatic habitat in Heath Creek downstream of the Project (Harza Engineering Company [Harza] 1996). OPC designed and conducted the study in close consultation with GDNR. The study examined the effects of four different minimum flow releases (0.6 cfs, 1.2 cfs, 2.8 cfs, and 8.3 cfs) on downstream aquatic habitat. During 24-hour flow demonstration periods for each discharge in August, physical habitat (depth, velocity, substrate, and cover) was measured at transects established between the Main Dam and the USGS gage; visible instream habitat conditions were described, videotaped, and photographed; and DO and water temperature were continuously monitored in Heath Creek. DO and water temperature also were continuously monitored for 2 days in Lavender Creek, a nearby unimpounded tributary to Armuchee Creek, as a reference site with a natural flow regime. In addition, fish community sampling was conducted at five stations on Heath Creek to compare pre-impoundment and post-impoundment fish community structure.

Based on analysis of the water quality and physical habitat data, the minimum flow study concluded that providing a continuous minimum release of 1.2 cfs would maintain adequate water quality and habitat in Heath Creek below the Main Dam. The flow demonstration found that although there were small increases in wetted stream width, depths, and velocities with increasing discharge, physical habitat did not appear to change appreciably between the 0.6, 1.2 cfs, and 2.8 cfs releases. Measurements of water temperature and DO indicated that increasing discharge reduced daily fluctuations in DO and temperature. The 0.6 cfs discharge had the widest fluctuation in daily patterns with a minimum DO concentration of 4.9 mg/L. Significantly, releases of 1.2 cfs and 2.8 cfs produced similar fluctuations in DO and water temperature and maintained DO levels above 5.5 mg/l throughout the study reach. The 8.3 cfs release resulted in DO values ranging from 7.2 to 8.4 mg/L. The study also showed higher water temperatures in Heath Creek under all flow releases compared to Lavender Creek, which was attributed to solar heating of the Project's Lower Reservoir versus the shaded stream banks of Lavender Creek. Nevertheless, the temperatures in Heath Creek were determined to be within an acceptable range. Moreover, the fish community analyses found the post-impoundment fish community structure in Heath Creek to be similar to that of the pre-impoundment fish community as well as the fish community in Lavender Creek. Based on the site-specific study results, OPC filed with FERC a final report on February 14, 1997, recommending that the Project's minimum flow remain at 1.2 cfs. FERC approved OPC's proposal to continue to release a 1.2 cfs minimum flow to Heath Creek (OPC 2005).

Because the Project cycles water between the Upper and Lower Reservoirs (active volume of 10,003 acre-ft) without storing inflow for purposes other than offsetting evaporation, releases from the Main Dam would vary with inflow and approximate run-of-river flow conditions on a daily average basis, where reservoir outflow is equal to project inflow less evaporation. The plot of discharge during the 2022-2023 monitoring period in Figure 7 shows how stream flow in Heath Creek varied in magnitude on a daily basis as a result of changing project inflow and evaporation. Under OPC’s proposed operation, project releases greater than 1.2 cfs would continue to occur when inflow exceeds the rate of evaporation and the continuous minimum flow release. Releases greater than 1.2 cfs would be made via the jet flow or radial gates to compensate for increases in volume of the Lower Reservoir due to inflows. For the period of record January 1, 1996 through December 31, 2022, the calculated 50-percent exceedance flow of Heath Creek at the USGS gage was 4 cfs, over three times the continuous minimum flow release. For the summer critical months July-September, stream flow at the USGS gage was double the continuous minimum flow release (2.4 cfs) 42 to 57 percent of the time.

The flow demonstration periods in the minimum flow study were for one complete diel (24-hour) cycle in August 1996 at each of the four flows evaluated. After the demonstration had been completed, DO monitoring was conducted in the Lower Reservoir at the elevation of the inlet to the minimum flow pipe (665 ft) for several days to represent the water being released at the dam during the flow demonstrations. DO concentrations at that elevation varied between 3.4 and 5.6 mg/L, suggesting that aeration of the minimum flow release occurred at the discharge point (Harza 1996).

However, the weather conditions during the study period did not represent summer extremes in maximum water temperature (Harza 1996). Under more extreme hot, dry conditions, minimum DO values in Heath Creek could be expected to be lower than those observed during the minimum flow study. As described above, there were several instances in July-August 2022 when DO concentrations in Heath Creek fell below 4.0 mg/L with the current 1.2-cfs minimum flow release.

Summer Water Quality in Heath Creek downstream of the Main Dam

The intermittent summer DO excursions below 4.0 mg/L observed in Heath Creek in July-August 2022 were of short duration and appear to have resulted from vertical stratification of the Lower Reservoir just upstream of the Main Dam and the transient movement of low-DO water near the bottom into the withdrawal zone of the minimum flow pipe with the onset of generation. Thus, any minimum flow release provided via the minimum flow pipe could potentially draw on low DO-water in the reservoir during the summer, resulting in occasional intermittent DO excursions. OPC conducted a second season of water quality monitoring in July-September 2023, including the Lower Reservoir just upstream of the Main Dam, to collect additional data to better understand the occurrence of intermittent DO deviations below 4.0 mg/L in Heath Creek below the Main Dam. The results of the additional monitoring will be provided to stakeholders in a forthcoming addendum to the Water Quality Assessment Study Report and analyzed in the FLA

As evaluated in Section 3.2.3.2, intermittent summer DO excursions below 4.0 mg/L would not be expected to result in significant adverse effects to aquatic communities in Heath Creek.

Unavoidable Adverse Impacts

Construction of the proposed recreation enhancements (Section 3.2.6.2) would comply with applicable sediment and erosion control BMPs such that temporary water quality disturbance, if any, would be localized and minimal.

3.2.3 Fish and Aquatic Resources

3.2.3.1 Affected Environment

The Rocky Mountain Project is located on headwater tributaries of Armuchee Creek in the Oostanaula River basin, within the larger Coosa River basin. The Lower Reservoir and

Auxiliary Pools impound Heath Creek and small tributaries to Heath Creek. The Lower Reservoir discharges from the Main Dam into Heath Creek. A small tributary that formerly entered Heath Creek upstream from the Main Dam site was diverted by the construction of Dam A and now enters Heath Creek downstream of the Main Dam near the USGS gage. Heath Creek flows east from the Main Dam about 4.3 miles to Little Armuchee Creek. Little Armuchee Creek flows 0.7 mile to Armuchee Creek, which flows southeast about 9.5 miles to the Oostanaula River.

The Upper Reservoir sits atop the drainage divide between Heath Creek and Lavender Creek and has no discharge outlet to either drainage, other than via the intake to the Lower Reservoir. Rock Mountain Creek originates near the base of the Upper Reservoir and flows east about 3.3 miles to Lavender Creek. Lavender Creek flows about 5.4 miles before joining Armuchee Creek about 7 miles upstream of the Oostanaula River.

The Coosa River drains west to Alabama, then south-southwest to the Alabama River, Mobile River, and Gulf of Mexico at Mobile Bay. Nine major dams downstream of the Project on the Coosa and Alabama Rivers in Alabama impede the upstream passage of diadromous fish[8] into the project vicinity. The most upstream of these dams, Weiss Dam, is located on the Coosa River about 85 stream/river miles downstream of the Project.

The Oostanaula River basin in the Ridge and Valley province principally supports warmwater fishes. The Auxiliary Pools support highly popular sport fisheries. Heath Creek downstream of the Project supports a healthy stream-fish community.

Distribution of Fishes in the Project Vicinity

The Oostanaula River basin supports about 72 species of fish in 15 families (Straight et al. 2009; Boschung and Mayden 2004) (Table 9). These include species that inhabit mainstem, tributary, reservoir, and wetland habitats within the basin, and introduced species, such as Common Carp and Rainbow Trout.

Heath Creek in the project vicinity and downstream of the Project supports a warmwater fish community. Based on post-construction fish sampling conducted by OPC in 1995-

[8] Diadromous fish species migrate between freshwater and marine/estuarine environments to complete their life cycles.

1996 (Harza 1996), GDNR Stream Team fish sampling data from 2000-2001 (GDNR 2019), and fish sampling conducted by OPC in 2022 (Kleinschmidt 2023a,c), Heath Creek supports a relatively diverse community of about 43 species, including several species of native minnows, sunfishes, suckers, and darters (Table 9). At least one fish species in Heath Creek (Redbreast Sunfish) is an introduced, non-native species to the Oostanaula River basin.

No federally listed threatened or endangered fish species are known to occur within the project boundary, in tributaries to the project waters, or in Heath Creek downstream of the Project to Little Armuchee Creek (Section 3.2.5.1).

Table 9 Fish Species Known from the Oostanaula River Basin and Heath Creek

Family/Scientific Name	Common Name	Oostanaula Basin[a]	Heath Creek[b]
LAMPREYS:			
Ichthyomyzon castaneus	Chestnut Lamprey	X	
Ichthyomyzon gagei	Southern Brook Lamprey	X	X
Lampetra aepyptera	Least Brook Lamprey	X	X
STURGEONS:			
Acipenser fulvescens	Lake Sturgeon	X	
GAR:			
Lepisosteus osseus	Longnose Gar	X	
HERRINGS AND SHAD:			
Hiodon tergisus	Mooneye	X	
Dorosoma cepedianum	Gizzard Shad	X	
Dorosoma petenense	Threadfin Shad	X	
MINNOWS:			
Campostoma oligolepis	Largescale Stoneroller	X	X
Ctenopharyngodon idella	Grass Carp[c]	X	
Cyprinella callistia	Alabama Shiner	X	X
Cyprinella lutrensis	Red Shiner	X	
Cyprinella trichroistia	Tricolor Shiner	X	X
Cyprinella venusta	Blacktail Shiner	X	X
Cyprinus carpio	Common carp[c]	X	
Hybopsis lineapunctata	Lined Chub	X	
Luxilus chrysocephalus	Striped Shiner	X	X
Lythrurus lirus	Mountain Shiner	X	X
Macrhybopsis storeriana	Silver Chub	X	

Family/Scientific Name	Common Name	Oostanaula Basin[a]	Heath Creek[b]
Notemigonus crysoleucas	Golden Shiner	X	X
Notropis asperifrons	Burrhead Shiner	X	
Notropis chrosomus	Rainbow Shiner	X	X
Notropis stilbius	Silverstripe Shiner	X	X
Notropis xaenocephalus	Coosa Shiner	X	X
Phenacobius catostomus	Riffle Minnow	X	X
Pimephales vigilax	Bullhead Minnow	X	
Rhinichthys obtusus	Western Blacknose dace	X	X
Semotilus atromaculatus	Creek Chub	X	X
SUCKERS:			
Hypentelium etowanum	Alabama Hogsucker	X	X
Ictiobus bubalus	Smallmouth Buffalo	X	
Minytrema melanops	Spotted Sucker	X	X
Moxostoma carinatum	River Redhorse	X	X
Moxostoma duquesnei	Black Redhorse	X	X
Moxostoma erythrurum	Golden Redhorse	X	X
Moxostoma poecilurum	Blacktail Redhorse	X	
BULLHEAD CATFISHES:			
Ameiurus natalis	Yellow Bullhead	X	X
Ameiurus nebulosus	Brown Bullhead	X	
Ictalurus furcatus	Blue Catfish	X	
Ictalurus punctatus	Channel Catfish	X	X
Noturus leptacanthus	Speckled Madtom	X	X
Pylodictis olivaris	Flathead Catfish	X	
TROUT:			
Oncorhynchus mykiss	Rainbow Trout[c]	X	
TOPMINNOWS:			
Fundulus olivaceus	Blackspotted Topminnow	X	X
Fundulus stellifer	Southern Studfish	X	X
LIVEBEARERS:			
Gambusia affinis	Western Mosquitofish	X	X
Gambusia holbrooki	Eastern Mosquitofish	X	X
SCULPINS:			
Cottus carolinae	Banded Sculpin	X	X
TEMPERATE BASSES:			
Morone chrysops	White Bass	X	
Morone chrysops x *M. saxatilis*	Hybrid Bass	X	

Family/Scientific Name	Common Name	Oostanaula Basin[a]	Heath Creek[b]
Morone mississippiensis	Yellow Bass[c]	X	
Morone saxatilis	Striped Bass	X	
SUNFISHES:			
Ambloplites ariommus	Shadow Bass	X	
Lepomis auritus	Redbreast Sunfish[c]	X	X
Lepomis cyanellus	Green Sunfish	X	X
Lepomis gulosus	Warmouth	X	X
Lepomis macrochirus	Bluegill	X	X
Lepomis megalotis	Longear Sunfish	X	X
Lepomis microlophus	Redear Sunfish	X	X
Lepomis miniatus x *L. punctatus*	Spotted Sunfish intergrade	X	X
Micropterus coosae	Redeye Bass	X	X
Micropterus henshalli	Alabama Bass	X	X
Micropterus salmoides	Largemouth Bass	X	X
Pomoxis annularis	White Crappie	X	
Pomoxis nigromaculatus	Black Crappie	X	X
PERCHES:			
Etheostoma coosae	Coosa Darter	X	X
Etheostoma rupestre	Rock Darter	X	
Etheostoma stigmaeum	Speckled Darter	X	X
Etheostoma trisella	Trispot Darter	X	
Percina kathae	Mobile Logperch	X	X
Percina nigrofasciata	Blackbanded Darter	X	X
Sander vitreus	Walleye	X	
DRUM:			
Aplodinotus grunniens	Freshwater Drum	X	

[a] Source: Straight et al. (2009); Boschung and Mayden (2004)
[b] Sources: Harza (1996); GDNR (2019) Stream Team database; Kleinschmidt (2023a, c)
[c] Introduced or invasive (non-native to the Oostanaula River basin)

Lower and Upper Reservoirs

The Lower Reservoir covers 600 acres and contains 18,800 acre-ft of storage at its normal maximum operating pool elevation of 710.5 ft MSL. It is long and narrow, extending 4.5 miles up Heath Creek and varying in width from a maximum of 2,200 ft near the Main

Dam to a minimum of 180 ft in the upstream reach near Dam G (Heath Lake). The mean depth of the Lower Reservoir is about 31 ft at its normal maximum operating pool, with maximum depths up to 78 ft at the Main Dam and up to 140 ft immediately in front of the draft tubes at the powerhouse.

The Upper Reservoir is a 221-acre, oval-shaped pool formed by a continuous earth and rockfill dam. The reservoir contains 10,650 acre-ft of gross storage at its maximum operating pool elevation of 1, 392 ft MSL. The maximum depth is 80 ft next to the intake structure on the bottom toward the northeast side of the reservoir. The banks of the Upper Reservoir are rocky and sloped at a ratio of 1:2. The bottom is lined with a 10-ft-deep clay blanket. The active volume of the Upper Reservoir, 10,003 acre-ft of water, is cycled between the Lower and Upper Reservoirs during normal daily pumped storage operation.

Fish populations in the Lower and Upper Reservoirs originate from native fishes in the upstream reaches of Heath Creek that can tolerate impounded conditions, and incidental dispersal of young fish from the Auxiliary Pools via ungated Spillway I (Antioch Lake) and ungated Spillway II (Heath Lake) into the Lower Reservoir. No fisheries surveys of the reservoirs have been conducted but species occurring in the Lower and Upper Reservoirs likely include sunfish and bass, such as Bluegill and Largemouth Bass, and other habitat-generalist species from Heath Creek and the Auxiliary Pools. Because of the large daily fluctuations in water levels due to pumped storage operation, the Lower and Upper Reservoirs are not managed for public fisheries use. Fish are not stocked, nor is public access allowed for fishing or other activities, in either reservoir. For these reasons, fish entrainment that occurs between the Lower and Upper Reservoirs is likely to be negligible.

Auxiliary Pools – Antioch Lake and Heath Lake

The Rocky Mountain PFA contains the Auxiliary Pools Antioch Lake and Heath Lake, which have a total surface area of 559 acres. GDNR intensively manages these lakes for quality public fishing opportunities. The powerhouse access road/causeway bisects Antioch Lake into east and west sub-impoundments, which are considered as separate lakes by GDNR for fisheries management purposes. Table 10 summarizes the physical characteristics of the Auxiliary Pools.

Table 10 Physical Characteristics of Antioch and Heath Lakes

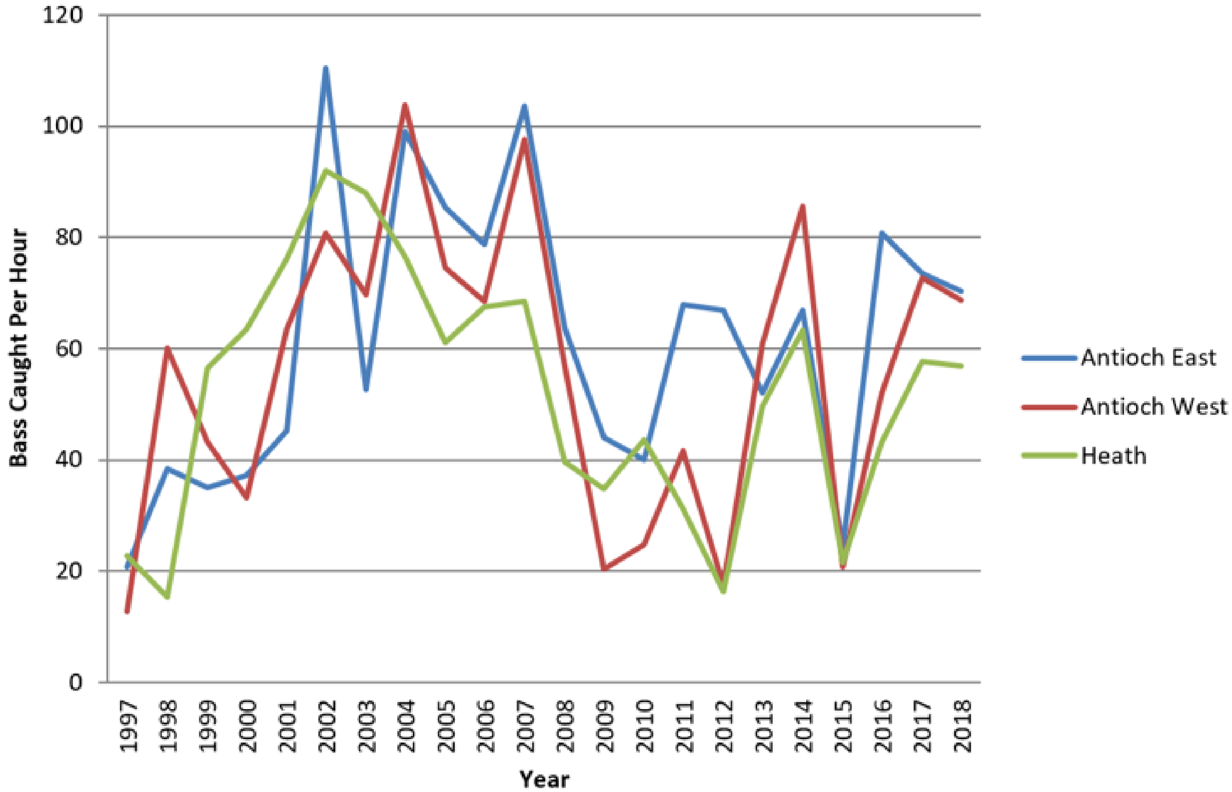
	Antioch Lake		
Attributes	**East**	**West**	**Heath Lake**
Surface area (acres)	154	203	202
Volume (acre-ft)	2,519	2,741	1,850
Shoreline length (ft)	32,060	31,320	NA
Shoreline development index	3.49	2.97	NA
Maximum depth (ft)	48	29	24
Mean depth (ft)	16.4	13.5	9.2
Area less than 10 ft deep (acres)	52 (34%)	89 (44%)	116 (57%)
Area less than 5 ft deep (acres)	29 (19%)	44 (22%)	66 (33%)
Flooded timber (acres)	2.6 (2%)	2.2 (1%)	58.0 (29%)

Source: Hakala (2019)
NA=not available

Antioch Lake and Heath Lake support popular fisheries for Largemouth Bass, Bluegill, Redear Sunfish, Black Crappie , Channel Catfish, and Walleye. Rocky Mountain PFA is the only PFA in Georgia containing Walleye. Antioch Lake (East and West) is open to fishing year-round. Heath Lake, referred to as the "trophy lake," is open the first ten days of every month and is managed to provide high catch rates of quality-sized Largemouth Bass. This access model limits fishing pressure on the trophy lake, while creel and slot-length limits for Largemouth Bass enhance the production of large bass available to anglers (Hakala 2020). Creel and length limits apply to bass, sunfish, crappie, Channel Catfish, and Walleye on both lakes. On Heath Lake, Largemouth Bass in the slot size 14 to 20 inches long must be released, the daily limit is five bass, and only one bass can be over 20 inches long. On Antioch Lake, Largemouth Bass must be at least 14 inches long. Fishing boats used on the lakes must operate at idle (no-wake) speed.

Since 1996, GDNR has performed annual standardized fisheries surveys of Antioch Lake (East and West) and Heath Lake targeting sport fishes at permanently designated stations on each lake (Dallmier 2003; Probst 2011; Hakala 2019). Boat electrofishing surveys are conducted during the spring, and experimental gillnetting surveys are conducted during the fall. For electrofishing, Largemouth Bass, Bluegill, and Redear Sunfish are the primary species targeted for analysis. For gillnetting, only Black Crappie and Walleye are caught in sufficient abundance for analysis. GDNR compiles the sampling data into annual reports, which present population data and trends for the primary species, including catch rates, length-frequency distribution, relative body condition, and the relationship between total annual fertilizer application amounts and the combined biomass of primary species. GDNR has provided OPC annual report summaries for 2002-2005 and 2009-2018.

GDNR initiated annual fertilization of the Auxiliary Pools in 1998. Fertilization increases primary productivity (i.e., plankton density), which drives energy transfer through the food chain, ultimately enhancing the growth and biomass of game fish populations. Substantial declines in the combined biomass of Largemouth Bass, Bluegill, and Redear Sunfish were observed in Antioch and Heath Lakes after 2007, corresponding with dramatic reductions in fertilization rates due to increased fertilizer prices (Probst 2011). Since 2013, fertilization rates have steadily increased and, consequently, game fish biomass has been trending upwards toward pre-2007 levels (Hakala 2019, 2020). GDNR found a significant direct linear relationship between annual fertilization rates and the combined biomass of Largemouth Bass, Bluegill, and Redear Sunfish collected during standardized spring electrofishing surveys two years later, evidence that fertilization levels dictate game fish biomass and fishing quality in the Auxiliary Pools (Hakala 2019). Figure 9 shows annual electrofishing catch rates of Largemouth Bass in the Auxiliary Pools since 1997. Table 11 summarizes catch rates of the primary species for five recent years of available surveys (2014-2018).



Source: Hakala (2019)

Figure 9 Largemouth Bass Annual Electrofishing Catch Rates for Antioch and Heath Lakes, 1997-2018

**Table 11	Summary of GDNR Catch Rates for Antioch and Heath Lakes, 2014-2018**

	Catch per Unit Effort				
Auxiliary Pools	**2014**	**2015**	**2016**	**2017**	**2018**
Antioch Lake – East					
Electrofishing (fish/hour):					
Largemouth bass	66.8	24.4	80.8	73.6	70.4
Bluegill	75.6	31.6	59.2	114.4	92.0
Redear sunfish	1.2	6.4	5.6	52.0	14.4
Gillnetting (fish/net-night):					
Black crappie	4.8	2.4	4.6	4.2	3.2
Walleye	1.8	3.4	3.2	NA	0.8
Antioch Lake – West					
Electrofishing (fish/hour):					
Largemouth bass	85.6	20.8	52.0	72.8	68.8
Bluegill	96.4	48.8	29.6	209.6	143.2
Redear sunfish	11.2	6.0	9.6	20.0	11.2
Gillnetting (fish/net-night):					
Black crappie	3.0	13.0	21.4	5.2	7.2
Walleye	1.0	3.8	5.8	7.2	4.6
Heath Lake					
Electrofishing (fish/hour):					
Largemouth bass	63.2	21.5	43.2	57.6	56.8
Bluegill	36.0	56.4	39.2	48.8	43.2
Redear sunfish	4.0	10.0	12.0	29.6	10.4
Gillnetting (fish/net-night):					
Black crappie	15.2	3.4	5.2	7.8	5.8

Source: Hakala (2015-2017, 2019)
NA=not available

Fishing tournaments are held on Antioch and Heath Lakes by a variety of angling groups, primarily in February-April and September-October (GDNR file data). In 2018-2020, six to nine tournaments were held each year on Antioch Lake. Three tournaments were held by kayak angling groups on both Antioch and Heath Lakes. The number of participants in 22 tournaments ranged from 11 to 78 and averaged 29 anglers.

GDNR has stocked the Auxiliary Pools since 1994-1995 with a variety of fish species, mostly game fish (Table 12). Hybrid Striped Bass were stocked annually in both lakes through 2002 to establish an additional sport fishery, and as a forage management tool, but they did not attract the interest of anglers, so stocking was halted (Hakala 2019). Threadfin Shad were first stocked in 2002 to establish a forage base for game fish, in addition to gizzard shad already present. Walleye fry were first stocked in both lakes in 2008. Walleye have since been stocked annually in Antioch Lake. In 2020, a total of 35,672 fingering Walleye were stocked in Antioch Lake (East and West). Given low angler returns of stocked Walleye at Heath Lake, stocking was halted after 2011.

Table 12 Historical Fish Stocking of Antioch and Heath Lakes, 1994-2020

Species	Year	Number Stocked	
		Antioch Lake (East and West)	Heath Lake
Channel Catfish	1994	39,413	--
	1995	--	10,000
	1998	5,250	4,500
	1999	1,876	5,000
	2004	8,270	--
	2005	2,142	--
	2006	3,350	--
	2017	1,000	--
Grass Carp	2002	--	243
	2003	--	693
	2005	380	305
	2006	--	530
	2012	301	--
	2013	960	400
Hybrid Striped Bass	1994	1,750	--
	1995	18,390	5,364
	1996	10,710	6.060
	1997	10,717	6,487
	1998	1,785	1,010
	1999	1,049	5,375
	2000	9,400	--
	2001	7,140	3,030
	2002	7,140	3,030

Species	Year	Number Stocked	
		Antioch Lake (East and West)	Heath Lake
Largemouth Bass	1994	173,003	--
	2007	4,133	--
	2008	1,108	--
Threadfin Shad	2002	4,500	2,500
	2012	20,000	--
	2013	20,000	5,000
	2015	--	8,000
Walleye	2008	150,000[a]	150,000[a]
	2009	368	--
	2010	4,097	4,097
	2011	6,800	7,430
	2012	14,286	--
	2013	13,158	--
	2014	38,574	--
	2015	37,118	--
	2016	--	--
	2017	12,479	--
	2018	21,364	--
	2019	18,028	--
	2020	35,672	--

Source: Hakala (2019); GDNR Fish Stocking Records
[a] Fry stocked

GDNR periodically implements fish habitat improvements in the Auxiliary Pools to enhance angler success. In 2019, a total of 40 fish attractors were placed in Antioch East and West lakes, including custom plastic-pipe trees, plastic pallet attractors, cedar trees, and mixed hardwood brush piles (Hakala 2019). Many of the attractors are marked to allow anglers to locate them more easily.

GDNR has investigated several minor fish kills in recent years in the Auxiliary Pools (GDNR file investigation forms). Most have occurred in Antioch Lake West and have involved Bluegill and Redear Sunfish exhibiting red sores. Laboratory analysis of dead fish from a 2017 incident indicated a likely bacterial infection induced by spawning stress, which can weaken fish immune systems. Incidents at Heath Lake in 2019 and Antioch Lake East in 2012 also involved Bluegill and Redear Sunfish with red sores. A fish kill in Heath Lake in

2015 involved mostly Gizzard Shad and apparently was caused by low DO levels (Hakala 2019). There has been no evidence that fish have died from other than natural causes during these incidents.

Heath Creek Downstream of the Main Dam

Heath Creek is a low-gradient stream, descending about 25 ft in elevation over a length of about 4.3 miles to Little Armuchee Creek, a gradient of about 6 ft per mile. The riparian zone is forested and the stream channel shaded over most of the length of Heath Creek. Habitats present include glides, pools, shallow runs, and riffles (Dinkins and Dinkins 2022; Kleinschmidt 2023a), The predominant substrates are gravel, sand, and silt. Beaver dams create long deep pools in several reaches. Boulder and bedrock substrates are limited to the reach immediately downstream of the Main Dam.

Historical Fish Community Surveys (1995-2002)

OPC conducted post-construction fish sampling at six locations in Heath Creek in 1995-1996, in accordance with Article 33 of the original license, to evaluate the fish community (Harza 1996). Fish were sampled within 250-ft-long segments at each station using three consecutive backpack electrofishing passes. A total of 31 species in eight families were collected. Sunfish and black bass species (family Centrarchidae) dominated the fish community with 12 species and comprised 76 percent of the catch by number for all stations and sampling months combined. The top ten numerically abundant species, in descending order of abundance, were Longear Sunfish, Redbreast Sunfish, Bluegill, Spotted Sunfish intergrade, Largescale Stoneroller, Blacktail Shiner, Redear Sunfish, Warmouth, Blackbanded Darter, and Alabama Hogsucker. These species comprised 83 percent of the total catch by number for all stations and sampling months combined.

GDNR's Stream Team conducted fisheries sampling in Heath Creek downstream of the Project in May 2001 and August 2002 to evaluate fish community health following GDNR's biomonitoring standard operating procedures (SOPs) (GDNR 2019). Backpack electrofishing was conducted in wadable habitat at Texas Valley Road, about 2.5 stream miles downstream of the Main Dam. The Heath Creek fish community at Texas Valley Road included 35 species in eight families, mostly species of sunfishes, minnows, suckers, darters, and topminnows. The top ten numerically abundant species overall for both sampling events combined, in descending order of abundance, were Striped Shiner, Redbreast Sunfish, Longear Sunfish, Coosa Shiner, Tricolor Shiner, Largescale Stoneroller, Spotted Sunfish intergrade, Southern Studfish, Green Sunfish, and Bluegill. These species comprised 76 percent of the total catch by number. GDNR applied the Index of Biotic Integrity (IBI), a multi-metric approach to comparing fish community attributes with least-disturbed reference conditions for the ecoregion, to assess the quality of the Heath Creek fish community. The IBI analysis yielded scores of 44 and 48 for May 2001 and August 2002, respectively, corresponding to “good” biotic integrity compared to reference conditions.

2022 Fish Community Surveys

OPC conducted a fisheries survey in August 2022 to characterize the existing fish community in Heath Creek downstream of the Main Dam (Kleinschmidt 2023a). The survey was conducted at two stations:

- Station HC-1: Heath Creek between the Main Dam and the USGS gage, within the project boundary.
- Station HC-2: Heath Creek upstream of Texas Valley Road, about 2.5 stream miles downstream of the Main Dam and 2.2 miles downstream of the project boundary.

The survey was conducted using backpack electrofishing methods and followed GDNR’s SOPs for biomonitoring of fish communities in wadeable streams (GDNR 2020a). The fish community data were analyzed using the multi-metric IBI and Index of well-being (Iwb) to evaluate fish community health compared to least-disturbed reference conditions within the Ridge and Valley ecoregion (GDNR 2020b).

The Heath Creek fish community surveys in August 2022 yielded 27 species of fish in eight families, mostly species of sunfishes, minnows, suckers, darters, and bullhead catfishes (Table 13). The species composition of the fish community was similar overall to that from the 2001-2002 surveys conducted by GDNR at Texas Valley Road (same location as Station HC-2), when 35 species from the same eight families were collected in both years combined (Table 13). Three additional fish species were collected in tributaries to Heath Creek in February 2023 during the separate Trispot Darter survey (see below), but no Trispot Darters were collected (Kleinschmidt 2023c). Of the 30 total fish species collected in Heath Creek and its tributaries in 2022-2023, 25 species also were collected in Heath Creek in 2001-2002. None of the fish species collected in 2022-2023 or 2001-2002 are listed as federally threatened or endangered species or state protected species in Georgia.

The August 2022 fisheries sampling at Station HC-1 within the project boundary yielded a total of 205 individuals representing 15 species (Table 13). The most common species was Bluegill with a relative abundance of 52 percent. The top five numerically abundant species, in descending order of abundance, were Bluegill, Longear Sunfish, Redbreast Sunfish, Redeye Bass, and Coosa Shiner. These species comprised 85 percent of the total catch by number. Sunfish species of the genus *Lepomis* comprised a combined 79 percent of captured individuals.

The slow flowing, uniform pool habitat conditions in Station HC-1 were favorable to sunfishes, which dominated the sample. Station HC-1 received an IBI score of 20, which corresponds to "very poor" biotic integrity compared to least-disturbed reference conditions within the same ecoregion. With sunfishes dominating the fish community, low numerical scores were received for several IBI metrics, including proportion of individuals as *Lepomis* species, proportion of insectivorous Cyprinid species, and proportion of benthic fluvial specialists. Similarly, the high proportion of Bluegill in the sample resulted in a low IBI metric score for evenness and a low diversity index used in calculating the Iwb score. The Iwb score for Station HC-1 was 6.48, which is within the "poor" condition category compared to least-disturbed reference conditions.

OPC sampled within the same reach of Heath Creek within the project boundary as Station HC-1 in August 1996 (referred to as Station 0) and also collected 15 species (Harza 1996). Sunfishes dominated the fish community. The top five numerically abundant species, in descending order of abundance, were Bluegill, Longear Sunfish, Redbreast Sunfish, Redear Sunfish, and Spotted Sunfish intergrade. These species comprised 81 percent of the total catch by number. The similarity in species richness and sunfish numerical dominance between the August 1996 and August 2022 surveys suggests there has been relatively little change in the physical habitat conditions and fish community of Heath Creek within the project boundary since initial post-construction monitoring.

The August 2022 fisheries sampling downstream of the project boundary at Station HC-2 (Texas Valley Road) yielded 77 individuals representing 22 species (Table 13). The top five numerically abundant species, in descending order of abundance, were Striped Shiner, Creek Chub, Largescale Stoneroller, Longear Sunfish, and Coosa Shiner. These species comprised 48 percent of the total catch. Numerical abundance was more evenly distributed across species but the overall number of captures was relatively low.

Although the fish community at Station HC-2 was diverse, the capture rates were low, resulting in an IBI score of 40, which corresponded to “fair” biotic integrity compared to least-disturbed reference conditions. Individual IBI metrics with high numerical scores included total number of native insectivorous Cyprinid species, total number of intolerant species, proportion of individuals as *Lepomis* species, proportion of insectivorous Cyprinid species, and proportion of top carnivores. These metrics indicated favorable species composition, the presence of species sensitive to habitat perturbations, good availability of benthic invertebrate food supply, and healthy trophic diversity. The metrics receiving low scores were total number of native sucker species, evenness, and number of individuals per 200 meters of stream. In fact, the low number of fish captured penalized the otherwise high evenness metric score, had there been more than 100 captures, lowering the total IBI score from a possible 44 (“good” condition) to 40 (“fair” condition) (Kleinschmidt 2023a). The Iwb score for HC-2 was 7.43, also within the “fair” condition category.

OPC sampled Heath Creek in the same reach as Station HC-2 in July 1995 and November 1995 (Harza 1996). The July sampling yielded 74 fish representing 16 species, and the November sampling yielded 252 fish representing 24 species. GDNR Stream Team sampling of the same reach in May 2001 yielded 349 fish representing 25 species, and the August 2002 sampling yielded 916 fish representing 33 species (Kleinschmidt 2023a). Sampling at Station HC-2 in August 2022 yielded relatively low numerical abundance but species richness (22) was within the range of that observed between 1995 and 2001-2002. Although the number of individuals collected varied widely between years, the species composition within Heath Creek remained similar across sample years. Factors potentially contributing to different fish capture rates between studies and years included differing sampling methods and technique, survey reach length, field teams, depth and water clarity, and natural interannual variation in fish populations (Kleinschmidt 2023a).

Table 13 Fish Collected in Heath Creek During 2022 Fisheries Assessments at Station HC-1 (Below Main Dam) & Station HC-2 (Upstream of Texas Valley Rd)

Family Name/Species		Station HC-1				Station HC-2			
Common Name	**Scientific Name**	**Count**	**RA** (%)	**Mass** (g)	**Bio-mass** (%)	**Count**	**RA** (%)	**Mass** (g)	**Bio-mass** (%)
Cyprinidae (Minnows):									
Largescale Stoneroller	*Campostoma oligolepis*	3	1.5	4	0.1	7	9.1	50	5.1
Alabama Shiner	*Cyprinella callistia*	–	–	–	–	3	3.9	20	2.0
Tricolor Shiner	*Cyprinella trichroistia*	–	–	–	–	2	2.6	13	1.3
Striped Shiner	*Luxilus chrysocephalus*	–	–	–	–	10	13.0	214	21.9
Mountain Shiner	*Lythrurus lirus*	–	–	–	–	3	3.9	7	0.7
Coosa Shiner	*Notropis xaenocephalus*	12	5.9	11	0.2	5	6.5	13	1.3
Creek Chub	*Semotilus atromaculatus*	–	–	–	–	10	13.0	95	9.7
Catostomidae (Suckers):									
Alabama Hogsucker	*Hypentelium etowanum*	3	1.5	263	4.3	3	3.9	112	11.5
Black Redhorse	*Moxostoma duquesnei*	1	0.5	160	2.6	–	–	–	–
Blacktail Redhorse	*Moxostoma poecilurum*	1	0.5	166	2.7	–	–	–	–
Ictaluridae (Bullhead Catfishes):									
Yellow Bullhead	*Ameiurus natalis*	–	–	–	–	1	1.3	35	3.6
Channel Catfish	*Ictalurus punctatus*	1	0.5	90	1.5	–	–	–	–
Funduliidae (Topminnows):									
Southern Studfish	*Fundulus stellifer*	–	–	–	–	2	2.6	2	0.2
Poeciliidae (Livebearers):									
Mosquitofish	*Gambusia sp.*	–	–	–	–	3	3.9	1	0.1
Cottidae (Sculpins):									
Banded Sculpin	*Cottus carolinae*	–	–	–	–	4	5.2	20	2.0
Centrarchidae (Sunfishes):									
Redbreast Sunfish	*Lepomis auritus*	18	8.8	724	11.9	1	1.3	15	1.5
Green Sunfish	*Lepomis cyanellus*	3	1.5	79	1.3	–	–	–	–
Warmouth	*Lepomis gulosus*	4	2.0	132	2.2	1	1.3	11	1.1
Bluegill	*Lepomis macrochirus*	106	51.7	3,308	54.2	2	2.6	26	2.7
Longear Sunfish	*Lepomis megalotis*	21	10.2	297	4.9	5	6.5	40	4.1
Redear Sunfish	*Lepomis microlophus*	1	0.5	56	0.9	–	–	–	–
Spotted Sunfish	*Lepomis punctatus*	8	3.9	131	2.1	4	5.2	30	3.1
Hybrid Sunfish	*Lepomis sp.*	1	0.5	17	0.3	–	–	–	–
Redeye Bass	*Micropterus coosae*	17	8.3	662	10.8	1	1.3	99	10.1
Largemouth Bass	*Micropterus salmoides*	–	–	–	–	2	2.6	113	11.6
Percidae (Perches):									
Coosa Darter	*Etheostoma coosae*	5	2.4	5	0.1	2	2.6	2	0.2
Mobile Logperch	*Percina kathae*	–	–	–	–	3	3.9	51	5.2
Blackbanded Darter	*Percina nigrofasciata*	–	–	–	–	3	3.9	8	0.8
Total		205		6,105		77		977	
Total Number of Species		15				22			
Total Number of Native Species		14				21			
Survey Reach Length (meters)		336				232			

Note: RA = Relative Abundance

Trispot Darter Survey

OPC conducted a survey for the Trispot Darter (*Etheostoma trisella*), a federally listed threatened species, in small tributaries of Heath Creek near the Main Dam in winter 2023 (Kleinschmidt 2023c). The survey was conducted in consultation with FWS and GDNR Wildlife Conservation Section for the purpose of evaluating the potential use of small tributaries within the project boundary as spawning habitat by Trispot Darters. The Trispot Darter uses distinct breeding and nonbreeding habitats (Freeman and Hagler 2009; FWS 2017). During the nonbreeding season (approximately April-October), Trispot Darters inhabit small to medium rivers and the lower reaches of tributaries. In late fall, mature adults begin moving upstream into tributaries and eventually smaller streams and adjacent seepage areas and ditches, where they remain through winter to early spring. Spawning occurs during winter months (January-March) in seasonally wet tributaries and intermittent seepage areas that become available as precipitation increases and the water table rises. Spawning sites tend to be shallow, may have little or no flow, and often include emergent vegetation or moderate leaf litter. The adhesive eggs attach to vegetation or rocky substrates and are abandoned by the adults.

The study area included small tributary streams and a seepage area and associated ditches draining to Heath Creek via the diversion channel from Dam A, which flows around the north side of the Main Dam and enters Heath Creek downstream of the Main Dam near the USGS gage (Kleinschmidt 2023c). Fish sampling methods included seining, backpack electrofishing, dipnetting, and combinations thereof, in wadeable habitats. Two survey events were conducted three weeks apart, on February 7 and February 28, 2023.

No Trispot Darters were collected or observed during the winter survey events. Ephemeral and intermittent channels potentially available as spawning habitat generally lacked instream cover or aquatic vegetation for egg attachment. Twenty-two species of fish were collected, none of which are federally or state protected species (Kleinschmidt 2023c).

No Trispot Darter records are presently known for the Heath Creek watershed in nonbreeding or breeding habitats (GDNR 2023a). Bearden et al. (2021) used environmental DNA (eDNA) testing in water samples from numerous Coosa River tributary sites in Alabama and Georgia to guide sampling site selection for suitable Trispot Darter spawning habitat. Water sampling for eDNA analysis included Heath Creek at Texas Valley Road in January 2019 but the eDNA test result was negative for Trispot Darter.

Freshwater Mollusks

OPC conducted a freshwater mussel survey in October 2022 (Dinkins and Dinkins 2022) to characterize the existing mussel community in Heath Creek downstream of the Main Dam and to assess for the occurrence of RTE species of freshwater mussels and snails. Three experienced mussel surveyors, using masks and snorkels, searched the entire 4.3-mile reach of Heath Creek from its confluence with Little Armuchee Creek upstream to the Main Dam, with the exception of an 840-meter section impounded by beaver dams. The survey reach was divided into sections based on access and habitat characteristics, and the number of live mussels, fresh dead shells, and substrate characteristics were recorded for each section. The mussel survey report is provided as an appendix to the Aquatic Resources Study Report (Kleinschmidt 2023a).

The mussel survey documented the occurrence of four native species of mussels (family Unionidae) in Heath Creek downstream of the Main Dam (Table 14) (Dinkins and Dinkins 2022). A total of 147 live mussels were found, representing three species. Southern Rainbow and Little Spectaclecase comprised 99.3 percent of all live mussels; both species were found throughout Heath Creek. One live specimen of Alabama Rainbow was found about 2 miles downstream of the Main Dam and one fresh dead shell also was found just upstream of Heath Creek's confluence with Little Armuchee Creek. A fourth native Unionid species, Paper Pondshell, was detected as two fresh dead shells about 1.5 miles downstream of the Main Dam.

Table 14 Summary of 2022 Mussel Survey Results for Heath Creek

Common Name	Scientific Name	Number of Live Mussels	Relative Abundance (Percent)	Number of Fresh Dead Shells
Southern Rainbow	*Villosa vibex*	93	63.3	26
Little Spectaclecase	*Leaunio lienosa* (=*Villosa lienosa*)	53	36.0	258
Alabama Rainbow	*Cambarunio nebulosus* (=*Villosa nebulosa*)	1	0.7	1
Paper Pondshell	*Utterbackia imbecillis*	--	--	2
	Total	**147**		**287**

Source: Dinkins and Dinkins (2022)

Although live mussels were found throughout the length of Heath Creek, the majority were encountered in the approximately 1-mile reach between the Main Dam and the section impounded by beaver dams. A total of 111 live mussels (76 percent of the total sample) were found in this reach. The survey section with the greatest number of live mussels (91) was the upstream-most, 80-meter section immediately downstream of the Main Dam. The physical habitats present at most sites were similar, consisting of pools and glides with mixes of sand, silt, and gravel substrates. However, the more upstream sections tended to have a more even mix of sand and gravel with less silt, and the section below the Main Dam also contained boulders and bedrock (Dinkins and Dinkins 2022).

None of the four mussel species found in Heath Creek are listed as federally threatened or endangered or protected in Georgia. However, Alabama Rainbow is under review by FWS for possible future federal listing (FWS 2011). The one live individual was found about 2 miles downstream of the project boundary.

Two aquatic gastropod species, Cylinder Campeloma (*Campeloma regulare*) and Upland Hornsnail (*Pleurocera showalteri*), also were detected during the mussel survey. Neither species is listed as federally threatened or endangered or state protected.

Migratory Fishes

The Rocky Mountain Project is about 670 miles upstream of the Gulf of Mexico. Due to the presence of multiple dams and impoundments downstream on the Coosa and Alabama Rivers (Table 4), no diadromous fish species occur in the Oostanaula River basin. However, the landlocked population of Striped Bass (*Morone saxatillis*) in Weiss Lake, the first impoundment on the Coosa River downstream of Rome, appears to spawn in the Oostanaula and Conasauga Rivers (Davin et al. 1999). Striped Bass spawning is not known to occur in Armuchee Creek or Heath Creek in the project vicinity.

In 2002, GDNR began a program to re-establish Lake Sturgeon (*Acipenser fulvescens*) in the upper Coosa River basin through a reintroduction program. Annual stocking of hatchery-raised fingerlings since 2002 has been successful and resulted in a steadily increasing population of Lake Sturgeon in the upper Coosa River basin (Bezold and Peterson 2008). Lake Sturgeon principally inhabit the Coosa River from Rome downstream into Weiss Lake (GDNR 2023a). No historic or recent records of Lake Sturgeon are known for Armuchee Creek or Heath Creek in the project vicinity.

State Protected Aquatic Species

No federally protected aquatic species are known to occur within the project boundary or in Heath Creek downstream of the Project. One freshwater mussel species (Alabama Rainbow) and one dragonfly species (Cherokee Clubtail), both under review for federal listing, are discussed with federally protected species in Section 3.2.5 (Threatened and Endangered Species).

Six other Georgia protected aquatic species potentially occur in the project vicinity, including one mussel and five fish species (Table 15). State protected species in Georgia are listed as endangered, threatened, rare, or unusual, in descending order of rarity. The six species are:

- Alabama Spike (*Elliptio arca*) – Georgia endangered;
- Coldwater Darter (*Etheostoma ditrema*) – Georgia endangered;
- Rock Darter (*Etheostoma rupestre*) – Georgia rare;
- Lined Chub (*Hybopsis lineapunctata*) – rare;
- River Redhorse (*Moxostoma carinatum*) – rare;
- Burrhead Shiner (*Notropis asperifrons*) – threatened.

Alabama Spike occurs in medium-size creeks to large rivers, usually in sand and gravel substrates in water less than 1 meter deep (Williams et al. 2008). In Georgia, few recent collections of live individuals have been made outside of the Oostanaula River (Wisniewski 2018a). The mussel survey in Heath Creek in October 2022 did not find Alabama Spike.

Coldwater Darter inhabits limestone springs and spring runs in association with aquatic plants and organic debris in areas with slow or no current (Freeman 1999). The species was not collected in Heath Creek or its tributaries during the 2022 fish community survey or the 2023 Trispot Darter survey.

Rock Darter occurs over rocky substrates in swift riffles of larger streams and rivers, often in association with Riverweed (Albanese 2008a). The species was not collected during the 2022 fish survey of Heath Creek.

Lined Chub is usually found in pools of small and medium-sized streams with moderate current over sandy substrates (Albanese 2008b). Lined Chub was not collected in Heath Creek during the 2022-2023 fish surveys.

River Redhorse inhabit medium to large rivers and streams where they occur in riffles, runs, and pools, and rarely enter smaller streams except during the breeding season (Freeman and Albanese 1999; Etnier and Starnes 1993)). Adults are fast-swimming and are usually found in the swiftest portions of streams. River Redhorse was not collected in Heath Creek during the 2022-2023 fish surveys.

Burrhead Shiner occurs in pools and runs over rocky substrate in small to medium-sized clear streams (Albanese 2008c). In Georgia, the species is known from the Conasauga and Oostanaula River basins but it was not collected in Heath Creek during the 2022-2023 fish surveys.

Table 15 Rare, Threatened, and Endangered Species Potentially Occurring in Rocky Mountain Project Vicinity[a]

Scientific Name	Common Name	Federal Status[b]	Georgia Status[c]	Global Rank[d]	Habitat
PLANTS:					
Arabis georgiana	Georgia Rockcress	LT	T	G1	Rocky or sandy river bluffs and banks, in circumneutral soil
Asclepias purpurascens	Purple Milkweed		R	G5?	Calcareous flatwoods, wet meadows near Rome
Aureolaria patula	Spreading Yellow Foxglove		T	G3	Circumneutral alluvial bottoms
Carya myristiciformis	Nutmeg Hickory		R	G4	Calcareous flatwoods
Clematis fremontii	Fremont's Leatherflower		E	G5	Grassy openings in flatwoods of mostly lowland oaks and red maple
Clematis socialis	Alabama Leatherflower	LE	E	G1	Grassy openings in flatwoods of mostly lowland oaks and red maple
Crataegus triflora	Three-flower Hawthorn		T	G2G3	Hardwood forests on rocky, limestone slopes
Cypripedium acaule	Pink Ladyslipper		U	G5	Upland pine and mixed pine-hardwood forests with acidic soils,; in the mountains, it often occurs near edges of Rhododendron thickets and mountain bogs.
Cypripedium parviflorum	Yellow Ladyslipper		R	G5	Montane cove forests; rich deciduous forests
Helianthus verticillatus	Whorled Sunflower	LE	E	G1	Wet prairies over dolomite
Jamesianthus alabamensis	Alabama Warbonnet		E	G3	Streambanks, in circumneutral soil
Lilium michiganense	Michigan Lily		R	G5	Remnant wet prairies and calcareous flatwoods
Lysimachia fraseri	Fraser's Loosestrife		R	G3	Moist, open, bouldery gravel bars and streambanks; edges of sandstone and granite outcrops
Marshallia mohrii	Mohr's Barbara's Buttons	LT	T	G3	Wet prairies over dolomite
Neviusia alabamensis	Alabama Snow-wreath		T	G3	Along wet weather streams over limestone
Pachysandra procumbens	Allegheny-spurge		R	G4G5	Mesic hardwood forests over basic soils
Prenanthes barbata	Barbed Rattlesnake Root		R	G3	Limestone glades and barrens, edges of remnant prairies
Rudbeckia heliopsidis	Little River Black-eyed Susan		T	G2	Limestone or sandstone barrens and streamsides
Sabatia capitata	Cumberland Rose-gentian		R	G2	Meadows over sandstone or shale

Scientific Name	Common Name	Federal Status[b]	Georgia Status[c]	Global Rank[d]	Habitat
Scutellaria montana	Large-flowered Skullcap	LT	T	G4	Mesic hardwood-shortleaf pine forests; usually mature forest with open understory, sometimes without a pine component
Silene regia	Royal Catchfly		E	G3	Limestone barrens; remnant prairies
Spiranthes magnicamporum	Great Plains Ladies-tresses		E	G3G4	Limestone glades
Symphyotrichum georgianum	Georgia Aster		T	G3	Upland oak-hickory-pine forests and openings; sometimes with Echinacea laevigata or over amphibolite
Thalictrum debile	Trailing Meadowrue		T	G2	Mesic hardwood forests over limestone
Viburnum bracteatum	Limerock Arrow-wood		E	G1G2	Mesic hardwood forests over limestone
Xyris tennesseensis	Tennessee Yellow-eyed Grass	LE	E	G2	Seepy margins of limestone spring runs
INSECTS:					
Danaus plexippus	Monarch Butterfly	C		G4	Lays eggs on milkweed as obligate host plant; adults in eastern U.S. migrate south in fall to overwinter in central Mexico
Stenogomphurus consanguis	Cherokee Clubtail	UR	T	G3	Spring-fed, moderately-flowing forest streams, especially where they drain small ponds
FRESHWATER MUSSELS:					
Cambarunio nebulosus (=*Villosa nebulosa*)	Alabama Rainbow	UR		G3	Small creeks to rivers in flowing water in combinations of sand and gravel and in fine sediments among cobbles and boulders
Elliptio arca	Alabama Spike		E	G2G3Q	Medium creeks to large rivers; sand and gravel substrate
Hamiota altilis	Finelined Pocketbook	LT	T	G2G3	Small streams to large rivers; sand, gravel, and cobble substrates; usually not in swift current
Medionidus acutissimus	Alabama Moccasinshell	LT	E	G2	Margins of streams with a typical sand and gravel substrate in clear water of moderate flow in small to large rivers
Medionidus parvulus	Coosa Moccasinshell	LE	E	G1	Sand and gravel in highly oxygenated, clear streams and small rivers with moderate to strong flow

Scientific Name	Common Name	Federal Status[b]	Georgia Status[c]	Global Rank[d]	Habitat
Pleurobema decisum	Southern Clubshell	LE	E	G2	Large rivers to medium sized streams with flowing water; gravel with interstitial sand
Pleurobema georgianum	Southern Pigtoe	LE	E	G1	High quality rivers (small rivers to large streams) in shoals and runs with stable gravel and sandy-gravel substrates
Ptychobranchus greenii (=*Ptychobranchus foremanianus* in Coosa River basin)	Triangular Kidneyshell	LE	E	G1	Medium to large rivers in moderate to swift current; sand and gravel substrate
FRESHWATER SNAILS:					
Leptoxis foremani	Interrupted Rocksnail	LE	E	G1	Shallow runs with clean, mixed substrates, free of silt
FISH:					
Cyprinella caerulea	Blue Shiner	LT	E	G2	Flowing runs and pools in streams with cool water and firm substrates
Etheostoma ditrema	Coldwater Darter		E	G2	Limestone springs and spring runs among aquatic vegetation or coarse organic debris at depths of 1 meter or less
Etheostoma rupestre	Rock Darter		R	G4	Swift rocky shoals in rivers, often in association with Riverweed
Etheostoma trisella	Trispot Darter	LT	E	G1	Shallow main-channel habitats of larger streams, and in smaller tributary streams during winter spawning
Hybopsis lineapunctata	Lined Chub		R	G3G4	Upland creeks over sandy substrate with gentle current
Moxostoma carinatum	River Redhorse		R	G4	Swift waters of medium to large rivers
Notropis asperifrons	Burrhead Shiner		T	G4	Small streams to medium-sized rivers in pools, slow runs, and backwater areas
AMPHIBIAN:					
Aneides aeneus	Green Salamander		R	G3G4	Sandstone cliffs and outcroppings with abundant, moist cracks and crevices, or in moist forests around rocky sites
REPTILES:					
Graptemys geographica	Northern Map Turtle		R	G5	Large streams and rivers
Graptemys pulchra	Alabama Map Turtle		R	G4	Rivers and large streams

Scientific Name	Common Name	Federal Status[b]	Georgia Status[c]	Global Rank[d]	Habitat
BIRD:					
Haliaeetus leucocephalus	Bald Eagle		T	G5	Edges of lakes and large rivers; seacoasts
MAMMALS:					
Myotis grisescens	Gray Bat	LE	E	G4	Roosts and hibernates exclusively in suitable caves; wintering caves are deep and vertical; summer caves usually near river or reservoir; forages over open water near forested shorelines
Myotis septentrionalis	Northern Long-eared Bat	LE	E	G1G2	Hibernates in tight crevices in caves and mines in winter; roosts in summer in tree cavities and under exfoliating bark; forages on forested hillsides and ridges
Myotis sodalis	Indiana Bat	LE	E	G2	Hibernates in large groups in suitable caves; roosts in summer in trees under loose exfoliating bark near woodland edge; forages in riparian and upland forest, sometimes over water
Perimyotis subflavus	Tricolored Bat	PE		G3G4	Roosts in winter in caves, mines, tunnels, trees, or culverts; roosts in summer in dead or live tree foliage within riparian areas; occasionally found in human structures

Sources: FWS (2023a, b); GDNR (2023); NatureServe (2023); Williams et al. (2008), Chafin (2007).

[a] This list is for federally and/or state protected rare species with known element of occurrence records in Floyd County, Georgia.

[b] Federal status: LE = listed endangered; LT = listed threatened; PE = proposed endangered; C = candidate for listing but not yet proposed for listing; UR = under review to determine if listing may be warranted.

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

[d] 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.

3.2.3.2 Environmental Impacts and Recommendations

Project Operations

OPC proposes to continue operating the Rocky Mountain Project consistent with existing license requirements in a pumped-storage mode for peaking power and spinning reserve. During normal daily generation and pumping, the Lower Reservoir elevation would continue to fluctuate up to 20 ft and the Upper Reservoir elevation would continue to fluctuate up to 51 ft. The Project would continue to release a continuous minimum flow of 1.2 cfs from the Main Dam of the Lower Reservoir into Heath Creek.

Lower and Upper Reservoirs

OPC's proposed operation would not adversely affect fish and aquatic resources in the Lower and Upper Reservoirs. The elevations of both reservoirs would continue to fluctuate widely on a daily basis and these fluctuations would limit the reproductive capacity of nest-building fishes, including sunfishes and catfishes, due to the absence or limited availability of stable littoral-zone spawning habitats. Dispersal of young fish into the Lower Reservoir would continue to occur seasonally from upstream tributaries and occasionally via the ungated spillways from the Auxiliary Pools during high project inflows but many of these fish would be unlikely to successfully reproduce within the Lower and Upper Reservoirs. No fish would be stocked in the reservoirs and public fishing access would continue to be prohibited.

Auxiliary Pools – Antioch Lake and Heath Lake

Normal daily project operations would not affect water levels or aquatic habitat for sport fish species in the Auxiliary Pools. Water levels in the lakes would fluctuate seasonally with project inflow and remain relatively stable on a day-to-day basis. Consistent with the Resource Management Agreement between OPC and GDNR, OPC anticipates that GDNR would continue to manage Antioch Lake and Heath Lake for sport fish production and quality public fishing opportunities within the Rocky Mountain PFA.

Consistent with current operations, water from the Auxiliary Pools would be used to replenish the Lower Reservoir only during drought operation and only when, after the pumping cycle, the Lower Reservoir elevation declined to below 681 ft. Such drought conditions could occur during the drier months of drought years, most likely from mid-summer to fall, which would be after the spring and early summer spawning seasons of many resident sport fishes. Lowered elevations of the Auxiliary Pools during drought would reduce the area of available littoral-zone habitat for the rearing of young fish but would not be expected to result in significant adverse effects to the sport fisheries in Antioch Lake or Heath Lake.

Aquatic Habitat in Heath Creek Downstream of the Main Dam

Operating the Project to provide a continuous minimum flow release of 1.2 cfs to Heath Creek will continue to maintain and protect downstream habitat for fish and freshwater mussels. The site-specific minimum flow study completed by OPC in 1996 in consultation with GDNR concluded that a continuous minimum release of 1.2 cfs would maintain adequate water quality and aquatic habitat in Heath Creek (Harza 1996) (see Section 3.2.2.2). The study examined the effects of four different minimum flow releases (0.6, 1.2, 2.8, and 8.3 cfs) and found that although small increases in wetted stream width, depths, and velocities occurred with increasing discharge, physical habitat did not change appreciably between 1.2 and 2.8 cfs. Releases of 1.2 and 2.8 cfs also produced similar fluctuations in DO and water temperature and maintained DO levels above 5.5 mg/L during 24-hour flow demonstration periods in August. In addition, the fish community present in Heath Creek under a 1.2-cfs minimum flow regime was similar to that of the pre-impoundment fish community in Heath Creek as well as the fish community in Lavender Creek, a nearby reference tributary. Available habitat and land cover information suggest that the channel of Heath Creek has not changed appreciably in overall dimensions, stability, or habitat characteristics since 1996 (Harza 1996; Kleinschmidt 2023a). Hence, the findings of the minimum flow study remain applicable for characterizing the effects of project operations on aquatic habitat; see below for related evaluation of summer DO concentrations in Heath Creek.

OPC’s minimum flow release proposal would continue to support the maintenance of relatively diverse, healthy communities of native fish and mussels in Heath Creek downstream of the Project. The fish community would continue to consist mainly of native minnows, sunfishes, suckers, and darters, with a variety of fluvial specialists,[9] including Coosa Shiner, Largescale Stoneroller, Striped Shiner, Alabama Hogsucker, Redeye Bass,

[9] Fluvial specialists are species that depend on flowing-water habitats for all or part of their life cycles.

Coosa Darter, Mobile Logperch, Blackbanded Darter, and others. Historical and recent fishery surveys have shown a fish community of similar species composition and structure persisting in Heath Creek since initial post-impoundment monitoring while the Project has been operating with a continuous minimum flow release of 1.2 cfs. In addition, the minimum flow release would continue to support aquatic habitat conditions for a mollusk community consisting of several native species of freshwater mussels and aquatic snails, noted for an exceptionally high density of mussels compared to similarly sized streams in the same ecoregion (Kleinschmidt 2023a).

Summer DO Concentrations in Heath Creek

OPC's continuous DO monitoring of Heath Creek downstream of the Main Dam from June 2022 to June 2023 found that daily average DO concentrations were above 5.0 mg/L for all days measured, including the critical period June through October (Section 3.2.2.1). During the critical period, 99.07 percent of the hourly measurements were above the instantaneous minimum criterion of 4.0 mg/L but there were 12 instances in July-August 2022 (0.93 percent of the measurements) when DO concentrations fell below 4.0 mg/L for periods of 1 to 5 hours. During these instances, DO values in Heath Creek declined as the elevation of the Lower Reservoir increased after generation began. This trend, and the results of DO monitoring in the Lower Reservoir at the elevation of the inlet to the minimum flow pipe (665 ft) in August 1996 which found DO values ranging from 3.4 to 5.6 mg/L, suggest that vertical stratification of the Lower Reservoir occurs below the active storage volume at the Main Dam. Hydrodynamic turbulence within the reservoir occurring with the onset of generation may move low-DO water near the bottom into the withdrawal zone of the minimum flow pipe. OPC conducted additional monitoring in July-September 2023, including the Lower Reservoir just upstream of the Main Dam, to collect additional data to better understand the occurrence of intermittent DO deviations below 4.0 mg/L in Heath Creek below the Main Dam. The results will be provided to stakeholders in a forthcoming addendum to the Water Quality Assessment Study Report and analyzed in the FLA.

Intermittent summer DO excursions below 4.0 mg/L of short duration in mid-to late summer would not result in significant adverse effects to aquatic communities in Heath Creek, as demonstrated by the continuing presence of relatively diverse, stable, and healthy communities of native fish and mussels. Sensitive early life stages of fish in Heath Creek below the Main Dam would not be exposed to DO concentrations below 4.0 mg/L for prolonged periods. Continuous monitoring in 2022-2023 showed that DO values remained above 5.0 mg/L in late winter to early summer, when most of the fish species spawn. Concentrations below 4.0 mg/L occurred only in July and August, predominantly after the spawning, hatching, and larval development life-stage periods for fluvial specialist species in Heath Creek. Maximum summer water temperatures in Heath Creek were always below the maximum criterion of 90°F (32.2°C), such that juvenile and adult fish and mussels were not exposed to synergistic stress of low DO and high water temperature. The predominant fish species in the reach below the Main Dam are sunfishes, which tend to be habitat-generalist species capable of tolerating transient changes in water quality. Fish could also move into deeper pools in shaded portions of the channel or into the nearby tributary to avoid low-DO water. The majority of live mussels encountered during the 2022 mussel survey were in the reach immediately downstream of the Main Dam, indicating that healthy populations persist despite occasional, intermittent DO excursions.

Fish Passage

OPC's continued operation of the Project as proposed would not affect upstream passage of highly migratory or diadromous fish species in the upper Coosa River basin. The Project is on a small tributary stream, diadromous species do not have access to the upper Coosa River basin, and the highly migratory species Striped Bass and Lake Sturgeon are not known to range upstream into Armuchee Creek or Heath Creek in the project vicinity.

State Protected Aquatic Species

OPC's proposed operation would not adversely affect any state protected aquatic species. The six Georgia protected aquatic species potentially occurring in the project vicinity that are not federally listed (Alabama Spike, Coldwater Darter, Rock Darter, Lined Chub, River Redhorse, and Burrhead Shiner) were not collected during the 2022 fish community survey and are presently not known to occur in Heath Creek downstream of the Project.

Fish Entrainment and Turbine-Induced Mortality

Fish approaching the powerhouse draft tubes in the Lower Reservoir during the pumping cycle may become entrained with intake water flow and subjected to the risks of turbine-induced injury or mortality. Entrained fish would pass through the reversible pump-turbines during pumping, which would typically occur at night, and subsequently during the next generation cycle when the active storage volume returns to the Lower Reservoir. The following analysis is based on desktop review of entrainment field study data compiled by the Electric Power Research Institute (EPRI 1992, 1997), FERC (1995a), and others for numerous hydroelectric sites, including several southeastern sites.

Project Facilities

The operating pools of the Rocky Mountain Project include the 221-acre Upper Reservoir atop Rock Mountain and the 600-acre Lower Reservoir on Heath Creek. The Upper Reservoir has earth and rockfill banks, contains 10,650 acre-ft of storage, has a maximum depth of 80 ft, fluctuates up to 51 ft during normal daily operations, and has no upstream watershed. The Lower Reservoir contains 18,800 acre-ft of storage, averages 31 ft deep at normal maximum pool, has maximum depths of 78 ft at the Main Dam and 140 ft in front of the draft tubes, and fluctuates up to 20 ft during normal daily operations. The watershed area of Heath Creek upstream of the Main Dam is about 16.6 sq mi. Only small tributaries and spillway overflow from the Auxiliary Pools enter the Lower Reservoir.

The powerhouse contains three vertical, reversible Francis pump-turbines with the hydraulic capacity, operating speeds, size, and spacing summarized in Table 1. The Project has a best-gate net head of 650 ft. The active volume of the Upper Reservoir is 10,003 acre-ft, which would continue to cycle between the Lower and Upper Reservoirs during normal daily operation.

Entrainment Size Distribution

Common trends and data from other studied hydroelectric sites indicate that small and/or young fish would likely comprise the majority of fish entrained by the Rocky Mountain Project. In numerous field studies at other hydroelectric sites in the eastern U.S., fish less than 4 inches long represented over 75 percent of estimated annual entrainment (EPRI 1992, 1997; FERC 1995a). Among southeastern hydroelectric projects, fish under 4 inches long comprised 98 and 71 percent of entrainment samples at Buzzard’s Roost and Richard B. Russell, respectively (EPRI 1997). Entrainment samples collected at Gaston Shoals, Ninety-Nine Islands, Hollidays Bridge, and Saluda in South Carolina consisted of more variably sized fish. The average proportion of fish less than 6 inches long was 59 percent at these four sites, while the average proportion of fish between 6 and 8 inches was 24 percent. However, the studies at all four sites concluded that some resident fish in the tailrace likely intruded into the tailrace sampling net (FERC 1995a), potentially biasing the catch toward larger fish (EPRI 1992, 1997).

Size-class information summarized by FERC (1995a) showed that small to moderate-sized fish dominated entrainment samples at the Abbeville and King Mill projects adjacent to the Savannah River. Fish under 6 inches long comprised over 75 percent and 95 percent of entrainment samples at Abbeville and King Mill, respectively. Small fish also dominated entrainment samples at Stevens Creek on the Savannah River, where fish less than 3 inches long comprised 77 percent of the entrainment sample (FERC 1995b).

Sampling of pumpback entrainment at Jocassee and Richard B. Russell, two pumped storage sites located on major waterbodies in South Carolina and Georgia, reported similar numerical dominance of small fish. Fish under 6 inches long comprised 86 percent of the pumpback sample at Jocassee, while fish under 5.4 inches long comprised 94 percent of the pumpback sample at Richard B. Russell.

The trash racks in front of the Rocky Mountain draft tubes have openings of 1 ft 4½ inches by 9 inches. Although fish of any species and size in the Heath Creek watershed could pass through the racks, field studies across a wide range of trash rack spacing indicate that the majority of entrained fish would be small regardless of the trash rack spacing (FERC 1995a, EPRI 1997). Winchell (2000) evaluated size data from the EPRI entrainment database and found no relationship between trash rack spacing and the size distribution of entrained fish. Fish greater than 10 inches in length represented only 3 percent of annual entrainment on average in the EPRI database. The relatively low vulnerability of larger fish to entrainment relates in part to their stronger swimming performance and ability to escape the hydraulic forces of intake flow.

Although the production of young fish in the Lower Reservoir would be limited by the large daily fluctuations in water levels, which destabilize and expose potential littoral-zone spawning habitats for nest-building fishes, small and young fish would disperse into the reservoir from upstream tributaries and the Auxiliary Pools. Young fish generally are more susceptible than larger fish of being transported downstream during higher flow conditions and are less capable of escaping pumping intake velocities as they approach the powerhouse.

Entrainment Species Composition

The fish community in Heath Creek and the Auxiliary Pools, and entrainment studies at other southeastern hydroelectric sites (EPRI 1997; FERC 1995a, 1995b), indicate that entrainment at the Project would likely be numerically dominated by species of sunfishes, catfishes, and minnows. Minnows, perches, and suckers also may be entrained. Species of sunfish, catfish, minnows, suckers, and darters (perch) occur in Heath Creek and the Auxiliary Pools. Although Threadfin Shad and Gizzard Shad occur in the Auxiliary Pools, shad dispersing into the Lower Reservoir would be likely to achieve limited reproductive success due to the magnitude of daily water level fluctuations. Shad spawn in shallow waters or along shorelines and deposit adhesive eggs on boulders, logs, or debris (Etnier and Starnes 1993), their eggs would be susceptible to exposure following pumping.

Although the magnitude of entrainment at the Rocky Mountain Project would likely be very small, a portion of entrainment could consist of juvenile sport fish species, such as Bluegill, Redear Sunfish, and Black Crappie. These species reproduce in the Auxiliary Pools and juveniles could disperse into the Lower Reservoir via spillway overflow during high flow events. Largemouth Bass, the region's premier sport fish also inhabit the Auxiliary Pools but would likely represent a small proportion of entrainment. Notably, the species was absent among the top entrained species at southeastern projects (EPRI 1997; FERC 1995a).

Entrainment Seasonal Distribution

To the extent that entrainment would occur at the Rocky Mountain Project, it would most likely occur primarily in spring and summer, following the spawning and rearing seasons of sunfishes, catfishes, and minnows in the upstream Heath Creek watershed, when young fish would be most abundant and tend to be dispersing between habitats. Lower entrainment rates would be expected from late fall through winter, when colder water temperatures tend to reduce fish movements.

Entrainment Magnitude

Despite the occurrence of fish entrainment at the Rocky Mountain Project, the magnitude of entrainment would likely be very small compared to other southeastern hydroelectric sites due to the small size of the Lower Reservoir, the small watershed area upstream, the limited fish dispersal pathways from the Auxiliary Pools to the Lower Reservoir, the lack of stable shallow littoral-zone fish habitat, the low densities of shad and other forage species, and the large daily fluctuations of the Lower and Upper Reservoirs. The water level fluctuations in the Lower Reservoir would substantially limit the reproductive capacity of nest-building fishes and other species that rely on littoral-zone habitats for spawning and rearing of young. The Upper Reservoir would lack any stable fish habitat. Moreover, because of the large daily fluctuations of the Lower and Upper Reservoirs, no public access would be permitted, and the reservoirs would not be stocked with fish or managed as fisheries habitat. For these reasons, fish entrainment at the Project would be considered negligible.

Turbine Passage Mortality

Survival of fish passing through turbine types with larger water passages, such as Kaplan, Francis, and bulb turbines, commonly exceeds 70 percent (Cada and Rinehart 2000). Mortality studies conducted with resident fishes using adequate methods to control for handing stress and recapture injury typically have shown low fish mortality rates for low-head Francis turbines, as low as 1 to 2 percent and averaging about 6 percent (EPRI 1992). However, the Rocky Mountain Project has reversible Francis pump-turbines operating at a head of 650 ft, so passage mortality rates would likely be much higher.

Eicher Associates, Inc (1987; as summarized by EPRI 1992) examined data from 22 studies of salmonid (trout and salmon) mortality at Francis turbines operating at heads ranging from 40 ft to over 400 ft and found mortality to be positively correlated with both head and peripheral runner velocity. Salmonids do not occur in Heath Creek but are generally more sensitive than warm-water fish species to injury and stress from turbine passage and provide a conservatively high predictor of turbine passage mortality. The correlation between head and mortality of salmonids for Francis turbines, as plotted by EPRI (1992), predicts turbine-induced mortalities on the order of 45 percent during generation at rated head of 450 ft, while the relationship between peripheral runner velocity and mortality predicts moralities on the order of 48 percent during generation with a peripheral runner velocity of 120 feet per second (fps). Because head and peripheral runner velocity are higher at Rocky Mountain, mortality rates during the generation cycle may be higher than 48 percent (i.e., lower than 52 percent survival).

EPRI (1997) compiled turbine passage survival estimates for numerous hydroelectric sites in the eastern U.S. using Francis turbines but only five operated at a rated head of over

100 ft (range of 100 to 258 ft). Turbine passage survival estimates at these five sites (Bond Falls, Colton, Hardy, Hoist, and Schaghticoke), excluding test results for which control fish mortality exceeded 10 percent (per guidance of EPRI [1997]), were highly variable depending on species but highest for smaller size classes of fish and for turbines with rotational speeds less than 300 revolutions per minute (rpm). Immediate survival rates averaged 67 percent for small fish (< 6 inches), 57 percent for moderate-sized fish (maximum size of test group > 6 inches and < 10 inches), and 39 percent for large fish (maximum size of test group > 10 inches). The lowest average survival rate of small fish was observed at Hoist (46 percent) which had rated head of 142 ft and the highest turbine rotational speed (360 rpm) of the five sites tested. The Francis turbines at Rocky Mountain operate at rated flow substantially higher than at four of the sites (4 to 15 times higher for generation) and also have fewer runner blades than three of the sites (7 versus 16-19), indicating a higher probability that an entrained fish at Rocky Mountain could avoid direct blade strikes and collisions with structures within the turbine system. Pressure changes experienced by entrained fish during the generation cycle would be greater at Rocky Mountain than the five sites due to its higher head.

Doyle et al. (2022) estimated the survival of fish following passage through a hypothetical large, pumped storage facility during the pumping phase. During the pumping phase, the stressors on fish act somewhat differently than during generation, the fundamental difference being that fish passing through the turbine during pumping experience a rapid and extreme compression rather than the rapid decompression that occurs during generation. Most studies regarding turbine passage have focused on the effects of rapid decompression on fish through conventional turbines. This study simulated the individual stressors expected to occur during passage through a 2,000-MW pumped storage facility with a head differential of 800 meters (2,625 ft) using laboratory-simulated (shear strain and extreme compression) and modeling (blade strike) approaches. Redfin (European) Perch, a close relative of Yellow Perch in North America, was chosen for analysis because of its wide distribution in riverine and lake habitats. The study results indicated that Redfin Perch could survive the shear, pressure, and blade strike stressors expected during pumping. Impacts varied by life stage but juvenile survival was greater than 70 percent across all shear strain rates. All juveniles and adults survived the pressure profile, and the probability of survival from blade strike risk was predicted to be 82.9 to 88.3 percent for juveniles and 71.2 to 80 percent for adults.

Environmental Impacts

In conclusion, small and/or young fish would likely comprise the majority of fish entrained at the Rocky Mountain Project. To the extent entrainment occurs, it would likely consist of sunfishes, catfishes, and minnows and occur primarily in spring and summer. However, the number of fish entrained annually would likely be small due to the small size of the Lower Reservoir, the small watershed upstream, and the large daily fluctuations of the Lower and Upper Reservoirs, which would significantly limit the reproductive capacity of resident fish. Despite potentially high rates of turbine-induced mortality during pumping and generation, losses of fish would be expected to be minimal because of the small number entrained. Additionally, the Project would compensate for effects of entrainment by providing popular sport fishing opportunities to the public in the Auxiliary Pools. Thus, continued operation of the Rocky Mountain Project would likely result in only negligible effects to fish populations as a result of fish entrainment and turbine-induced mortality, while enhancing public fishing opportunities through the Rocky Mountain PFA.

Unavoidable Adverse Impacts

Any unavoidable fish losses resulting from entrainment mortality would continue to occur with continued project operation. These losses, however, would be negligible and would not significantly affect fish populations and recreational fishing opportunities within the Rocky Mountain PFA.

3.2.4 Terrestrial Resources

3.2.4.1 Affected Environment

Terrestrial Vegetative Communities

GDNR Terrestrial Vegetative Survey

GDNR (2013) conducted a vegetative survey of the uplands within the Rocky Mountain PFA (i.e., the project boundary) in summer 2012 for the Terrestrial Management Plan for the Project. The monitoring survey was conducted to determine the natural community types, species composition, and characteristics of the land management units of the Rocky Mountain PFA's terrestrial/upland woodlands. GDNR monitored 138 randomly selected plots across the PFA for species composition and measured plant community structure to include tree basal area, canopy height, canopy density, ground vegetative cover, and tree size. GDNR used NatureServe natural community types to describe the major vegetation community types within the project boundary.

GDNR (2013) defined 19 land management units designed to contain contiguous areas of the same dominant natural community type and/or lands supporting similar management needs. They ranged in area from a small island in Heath Lake (9 acres) to a large tract comprising the entire north and west side slope of Rock Mountain (630 acres).

Three dominant upland natural vegetative communities were identified within the Rocky Mountain PFA, including:

- Pine-Oak Piedmont Forest – Mixed pine-hardwood forests in areas surrounding the Auxiliary Pools, including the public recreation facilities, and the northern side and lower end of the Lower Reservoir; dominated by Loblolly Pine and several species of hardwood, including Sweetgum, Black Cherry, Shagbark Hickory, and various oaks.
- Oak-Chestnut (Subxeric Ridgetop) Forest – Oak-pine woodlands on the slopes around Rock Mountain, comprised of Chestnut Oak, Sand Hickory, other mixed oaks, Shortleaf Pine, and Loblolly Pine; this community contains the regionally rare montane Longleaf Pine and examples of the American Chestnut/Chinquapin hybrid (*Castanea dentata* x *Castanea pumila*).
- Oak-hickory (Dry-Mesic) Forest – Located southwest of Rock Mountain at the upstream end of the Heath Creek system, higher elevation forests comprised of Chestnut Oak, Loblolly Pine, Shortleaf Pine, Black Oak, Post Oak, and Sand Hickory, with scattered areas of montane Longleaf Pine and Chinquapin; lower elevation forests comprised of loblolly pine, Tulip Poplar, Willow Oak, and Northern Red Oak.

GDNR (2013) identified management recommendations for consideration for each of the 19 land management units, the most common being prescribed burning and forest thinning. Invasive exotic species control was recommended for three land units (see Exotic Invasive Plant Species below).

OPC Terrestrial and Wetland Resources Survey

OPC conducted a Terrestrial and Wetland Resources Survey in 2022-2023 to describe terrestrial wildlife and botanical resources and floodplain, wetland, and riparian habitats occurring within the project boundary (Corblu Ecology Group [Corblu] 2023). Field reconnaissance surveys were conducted in July and September 2022 and March 2023 to observe terrestrial communities and associated wildlife habitat, to characterize wetland, riparian, and littoral habitats, and to search potentially suitable habitat for RTE species of plants and wildlife. The survey areas included the project recreation facilities. Corblu (2023) characterized 14 vegetative community/habitat types and identified nearly 300 species of plants.

Mixed Pine-Hardwood Forest is the dominant terrestrial vegetative community type within the project boundary, covering about 56 percent of the lands (i.e., excluding open water) (Corblu 2023). The canopy is dominated by Loblolly Pine, Mockernut and Pignut Hickories, Southern Red Oak, Sweetgum, and Tulip Poplar. Midstory species include Blackgum, Flowering Dogwood, Florida Maple, Eastern Redbud, Hawthorn, Sparkleberry, and Black Cherry. Dominant herbaceous species include Christmas Fern, woodoats, Partridge Berry, violets, and greenbriers. Mixed Pine-Hardwood Forest is widely distributed in the Heath Creek watershed around the Auxiliary Pools, project recreation facilities, and lower slopes on the south, southwest, and north sides of Rock Mountain.

Mesic Slope Forest occupies about 8 percent of the lands within the project boundary. This community occurs along steeper slopes above floodplains or riparian corridors on the northwest, northeast, and east sides of Rock Mountain (Corblu 2023). Canopy species include American Beech, Southern Magnolia, Northern Red Oak, White Oak, Shagbark Hickory, Mockernut Hickory, Blackgum, Tulip Poplar, and Sweetgum. Subcanopy species include Florida Maple, Sourwood, Red Maple, American Hornbeam, Hop Hornbeam, Carolina Silverbells, American Holly, Witch-hazel, Cucumber Magnolia, Basswood, and Buckeye. Herbaceous vegetation was generally sparse, but included Cranefly Orchid, Woodsorrel, Mayapple, and several species of trillium.

Dry Oak-Pine Forest occupies about 7 percent of the lands within the project boundary. This community occurs on rocky or sandy and well-drained soils at mid- to upper-slope elevations on the east side of Rock Mountain and along both sides of the transmission line corridor extending southwest from the powerhouse (Corblu 2023). Dominant canopy species include White Oak, Northern Red Oak, Shortleaf Pine, Loblolly Pine, and Mockernut Hickory. The midstory includes canopy-species seedlings, Basswood, Blackgum, American Elm, and hawthorn. Herbaceous species in this community include Christmas Fern, Tick-trefoil, Mayapple, and Wild Ginger.

Xeric/Sub-Xeric Ridgetop Forest covers about 6 percent of the lands within the project boundary and occurs primarily at upper elevations on Rock Mountain around the Upper Reservoir (Corblu 2023). This natural community has canopies dominated by species including Chestnut Oak, Shortleaf Pine, Blackjack Oak, and Black Cherry. Midstory species include Winged Elm, Winged Sumac, Sparkleberry, and hawthorn. Herbaceous species include Trumpet Creeper, White Snakeroot, and blackberry.

Developed land, referred to as Anthropogenic Disturbances by Corblu (2023), covers about 7 percent of the lands within the project boundary. These lands include the project recreational facilities, Visitors Center, project works, other OPC facilities, utility easements, and substation. Many of these areas are landscaped and maintained by mowing and other vegetation control measures. Flora include horticultural varieties of trees and shrubs and lawns of common turfgrasses. Scattered populations of invasive species were observed, including Tree-of-heaven and Chinese Privet.

Transmission Easement rights-of-way occupy about 4 percent of the lands within the project boundary. These include the transmission corridor between the powerhouse and substation, which was primarily bordered by Mixed Pine-Hardwood Forest but also traversed other habitat types (Corblu 2023). The corridor is periodically maintained through mowing or other management measures; however, some sections are located within emergent wetlands that cannot be maintained. The transmission corridor habitat is primarily limited to herbaceous species. Although most of the corridor is located within uplands, occasional emergent wetlands and streams were observed within the corridor. Upland vegetation included Chinese Bushclover, Shrubby Bushclover, goldenrods, Broomsedge, Sicklepod, Butterfly Weed, and numerous other early successional species. Wetland vegetation, such as Meadow Beauty, False Nettle, Marsh Dewflower, and various sedges occurred in the emergent wetlands within the transmission corridor.

Other upland/non-wetland community types within the project boundary and their approximate coverage are Planted Pine/Pine Forest (3 percent), Improved Roads/Unimproved Roads (2 percent), Bottomland Hardwood Forest (0.4 percent), and Boulder Field (<0.1 percent).

Vegetated Wetlands and Aquatic Plants

Emergent/herbaceous and forested wetlands cover approximately 119 acres, or 3 percent, of the lands within the project boundary (Corblu 2023). Emergent/herbaceous wetlands occupy 85.4 acres and forested wetlands occupy 33.9 acres.

Emergent/herbaceous wetlands occur in scattered areas around the Lower Reservoir and Auxiliary Pools. In the Lower Reservoir, they primarily occur in the shallow upstream end of the reservoir and in the shallow area upstream of Dam B near the Main Dam. Both of these areas experience fluctuating water levels due to project operations. Common vegetation in these areas include Cattail, Sweetscent, Marshpepper Knotweed, Meadow Beauty, False Nettle, flatsedges, bullrushes, sedges, and pennywort. Other emergent wetlands occur in the seepage area below Dam A, the borrow pit next to the southwest end of the Upper Reservoir, and a few other scattered locations. Emergent wetlands along the transmission lines included the herbaceous species Meadow Beauty, False Nettle, Marsh Dewflower, and various sedges.

Forested wetlands are scattered throughout the southern region of the project boundary, in poorly drained areas within floodplains, riparian corridors, and open water edges. Dominant canopy vegetation includes Sugarberry, Green Ash, Water Oak, Red Maple, and American Sycamore. Midstory vegetation contains American Hornbeam, American Elm, Sweetshrub, and Hearts-a-burstin.' Herbaceous vegetation observed in forested wetlands throughout the project boundary include Green Arrow-arum, Netted Chainfern, Sensitive Fern, Jack-in-the-pulpit, Woodland Spider-lily, and Slender Woodoats.

Littoral habitat within the project boundary includes mainly the shallow zones of the Auxiliary Pools where sunlight penetrates to the bottom substrates. Heath Lake has extensive littoral habitat, with 33 percent of the lake area having a depth of less than 5 ft and 29 percent of the lake area containing flooded timber. Areas less than 5 ft deep comprise 19 percent and 22 percent of the areas of Antioch Lake East and Antioch Lake West, respectively. The littoral zone of the Lower Reservoir varies dramatically over the course of the day as the water level fluctuates with project operations.

The field reconnaissance survey of wetland and riparian resources did not identify any significant areas of submergent/submersed aquatic vegetation or invasive aquatic nuisance vegetation within the Auxiliary Pools or the Lower Reservoir (Corblu 2023).

Exotic Invasive Plant Species

During the 2022-2023 field surveys, scattered occurrences of terrestrial invasive plant species were observed throughout the project boundary but they comprised only a minor component of the vegetation community (Corblu 2023). Scattered patches of Japanese Stiltgrass (*Microstegium vimineum*) occurred in forested floodplains of larger streams. Chinese Bushclover (*Lespedeza cuneata*) and Shrubby Bushclover (*L. bicolor*) were found in small patches throughout the right-of-way easement. Chinese Privet (*Ligustrum sinense*) was found along forest edges on Big Texas Valley Road, and Tree-of-heaven (*Ailanthus altissima*) was observed bordering maintained forest edges near recreation facilities and behind the powerhouse. Infestations dominating a particular vegetation stratum included eleven occurrences of Tree-of-heaven, Chinese Privet, Chinese Bushclover, Shrubby Bushclover, and Japanese Stiltgrass (Corblu 2023).

GDNR (2013) recommended invasive exotic species control for three land units within the project boundary including patches of Chinese Privet in several locations, Japanese Wisteria (*Wisteria floribunda*) near the Visitors Center, and Japanese Stiltgrass along streams between Heath Lake and the west side of the project boundary.

Wildlife Resources

The 5,000 acres of lands and waters within the Rocky Mountain project boundary provide substantial areas of natural habitat for a diverse wildlife community. Wildlife observations during the terrestrial field surveys totaled 85 species, with 8 mammal species, 62 birds, 5 amphibians, and 10 reptiles (Corblu 2023). The mammals most commonly observed included White-tailed Deer, North American Beaver, Nine-banded Armadillo, Raccoon, and Eastern Gray Squirrel. Additional species observed included Coyote, Eastern Chipmunk, and Eastern Cottontail. Other mammal species not observed but expected to occur in the ecoregion include Red Fox, Striped Skunk, Bobcat, Virginia Opossum, Big Brown Bat, Red Bat, Muskrat, River Otter, and Mink.

Amphibian and reptile species were observed during field surveys in a variety of habitats, including Mixed Pine-Hardwood, Xeric/Sub-Xeric Ridgetop Forest, riparian forests, various wetlands, and Mesic Slope Forest (Corblu 2023). Common species observed included Southern Leopard Frog, Southern Cricket Frog, Midland Water Snake, and Yellow-bellied Slider. Additional reptile species observed included Black Rat Snake, Black

Racer, Timber Rattlesnake, Dekay's Brown Snake, Broadhead Skink, Green Anole, Eastern Mud Turtle, and Eastern Box Turtle. Additional amphibian species observed included American Toad, Fowler's Toad, and Dusky Salamander. Although not observed during the 2022-2023 field surveys, Green Salamander (*Aneides aeneus*), a Georgia rare species, occurs among the boulders and cliffs in forests on the slopes of Rock Mountain (GDNR 2013, 2023).

A wide variety of birds use diverse wetland, upland, and open-water habitats within the project boundary, including neotropical migrant songbirds, raptors, waterfowl, and shorebirds (Corblu 2023). Sixty-two bird species were identified during the field surveys. Common species included Northern Cardinal, American Crow, Blue Jay, Carolina Chickadee, Carolina Wren, Great Blue Heron, Mourning Dove, Osprey, Downy Woodpecker, and Turkey Vulture. Six diurnal raptors, four species of waterfowl, and four species of wading/shorebirds were observed during field surveys.

One sighting of the state-threatened Bald Eagle (*Haliaeetus leucocephalus*) was recorded during the field surveys. One known active Bald Eagle nesting territory occurs within the project boundary. Although populations are increasing, Bald Eagle remains protected under the Bald and Golden Eagle Protection Act (BGEPA) and Migratory Bird Treaty Act (MBTA) and is considered a high-priority species under the Georgia State Wildlife Action Plan (GDNR 2015).

Waterfowl and game bird species observed in the Rocky Mountain project boundary included Mallard, Wood Duck, Green-winged Teal, Canada Goose, Double-crested Cormorant, and Eastern Wild Turkey (Corblu 2023). Wading bird observations included Great Blue Heron and Great Egret. No wading bird rookeries were observed during the course of the field surveys. Shorebirds included Kildeer and Solitary Sandpiper.

A full list of bird species observed during the 2022-2023 field surveys as well as lists of species observed from the most recent Floyd County (GAFC) Audubon Christmas Bird Count and USGS Breeding Bird Surveys along the Shannon survey route is provided in the Terrestrial and Wetland Resources Survey Study Report (Corblu 2023).

State Protected Plant Species

Six federally threatened and endangered plant species potentially occur in the project vicinity, as evaluated in Section 3.2.5 (Threatened and Endangered Species). However, none of the species are presently known to occur within the Rocky Mountain project boundary.

Twenty other Georgia protected plant species potentially occur in the project vicinity (Table 15). State protected species in Georgia are listed as endangered, threatened, rare, or unusual, in descending order of rarity. Of the 20 plant species that are not also federally listed, five are endangered, six are threatened, eight are rare, and one is unusual. Table 15 identifies the habitat requirements of these species. None of the species are presently known to occur within the project boundary but potentially suitable habitat for four of the species was observed within the project boundary during OPC's 2022-2023 terrestrial field surveys (Corblu 2023). The four species are:

- Alabama Warbonnet (*Jamesianthus alabamensis*) – Georgia endangered;
- Georgia Aster (*Symphyotrichum georgianum*) – Georgia threatened;
- Allegheny Spurge (*Pachysandra procumbens*) – Georgia rare; and
- Pink Ladyslipper (*Cypripedium acaule*) – Georgia unusual.

Alabama Warbonnet is a perennial aster that occurs along shaded stream banks over shale or limestone in the Coosa River valley (Chafin 2007, 2020a). Potentially suitable habitat for the species was observed along headwater perennial and intermittent streams of Rock Mountain Creek and Heath Creek (Corblu 2023). These habitats are not near or adjacent to project facilities, except where the powerline right-of-way crosses the upper reach of Heath Creek. The species was not observed during the 2022-2023 terrestrial surveys.

Georgia Aster is a perennial herb that occurs in edges and openings in rocky, upland oak-hickory-pine forests, former prairies, woodlands, and savannahs, and roadsides and rights-of-way through these habitats (Chafin 2007, 2020b). The species is known to occur along powerline rights-of-way in Floyd County but none were observed within the project boundary during the 2022-2023 terrestrial surveys.

Allegheny Spurge is a perennial herb that grows in moist, mature hardwood forests over soils high in calcium (Chafin 2007, 2020c). Potentially suitable habitat was observed primarily within the Mesic Slope Forest along the north-facing slopes of Rock Mountain. These habitats do not occur adjacent to project facilities. No plants of Allegheny Spurge were observed during the 2022-2023 field surveys.

Pink Ladyslipper is a perennial herb with a bright pink flower that grows in upland pine and mixed pine-hardwood forests with acidic soils (Chafin 2020d). Mixed Pine-Hardwood Forest is the most prevalent habitat type within the project boundary and occurs adjacent to project facilities, access roads, and powerline rights-of-way (Corblu 2023). No flowering Pink Ladyslippers were observed during the spring 2023 field survey.

State Protected Wildlife Species

Three federally endangered bat species, Gray Bat (*Myotis grisescens*), Northern Long-eared Bat (*Myotis septentrionalis*), and Indiana Bat *(Myotis sodalist*), potentially occur in the project vicinity. A fourth bat species proposed for listing as federally endangered, Tricolored Bat (*Perimyotis subflavus*), may also occur in the project vicinity. These species are evaluated in Section 3.2.5 (Threatened and Endangered Species).

Four other Georgia protected terrestrial wildlife species have been documented within the project boundary or potentially occur in the project vicinity (Table 15):

- Bald Eagle (*Haliaeetus leucocephalus*) – Georgia threatened;
- Green Salamander (*Aneides aeneus*) – Georgia rare;
- Northern Map Turtle (*Graptemys geographica*) – Georgia rare; and
- Alabama Map Turtle (*Graptemys pulcha*) – Georgia rare.

Bald Eagles currently reside in the project area; there is one known nesting territory within the project boundary. Individuals have been observed by OPC and GDNR personnel frequenting areas around the Auxiliary Pools and the Lower and Upper Reservoirs. One Bald Eagle was sighted during the 2022-2023 field surveys (Corblu 2023).

Green Salamander has been documented to occur among boulders and cliffs in forests on the slopes of Rock Mountain within the project boundary (GDNR 2013). The species lives in and around sandstone cliffs and outcroppings with abundant, moist cracks and crevices and occasionally occurs on live trees or behind the bark of rotting trees in moist forests around rocky sites (Jensen 2007). GDNR (2013) reported Green Salamanders as occurring in boulder areas and palisades within Oak (Chestnut) Ridgetop Forest and Mixed Pine-Hardwood Forest on eastern, southern, and southwest slopes of Rock Mountain.

Northern Map Turtle and Alabama Map Turtle inhabit large streams and rivers with swift current and an abundance of basking sites (Floyd and Jensen 2023a, b). Heath Creek and Rock Mountain Creek within the project boundary and downstream of the Project are smaller streams not typical of the species' preferred habitats. Neither map turtle species was observed during the 2022-2023 field surveys (Corblu 2023).

Terrestrial and Wildlife Management

GDNR (2013) developed a Terrestrial Management Plan for the upland portions of the Rocky Mountain PFA. The Plan addresses activities affecting terrestrial portions of the PFA, which are managed by GDNR, aside from the project works. The Plan serves as a guide for managing the natural upland portions of the PFA with goals developed using fieldwork and information from the SWAP (GDNR 2015). The Terrestrial Management Plan characterizes the species and natural communities of Rock Mountain and the surrounding woodlands within the project boundary; provides management recommendations for various land units defined on the basis of natural and anthropogenic borders, or breaks, to support wildlife and natural community health; and identifies rare, threatened, endangered, and unique species and natural communities on Rock Mountain and in the surrounding woodlands and develops management strategies to support them.

The Rocky Mountain PFA is primarily used for public fishing but also includes provisions for wildlife hunting. The PFA includes the Rocky Mountain Archery Range and provides opportunities for archery hunting of deer, turkey, and small game. Waterfowl hunting is allowed on Antioch Lake and Heath Lake (GDNR 2021b).

3.2.4.2 Environmental Impacts and Recommendations

Bald Eagle

Although no longer federally listed as a threatened species under the ESA, the Bald Eagle remains protected under the federal BGEPA and MBTA. Project operation and maintenance would not be expected to adversely affect Bald Eagles or their habitat. However, to conserve and protect habitat for Bald Eagles within the project boundary, OPC proposes to implement a Bald Eagle Management Plan in partnership with GDNR. The plan would be focused on land management practices that avoid disturbance at active Bald Eagle nest sites known to occur within the project boundary. To avoid disturbing Bald Eagle nests on lands within the project boundary, super canopy trees would be left on the shorelines of the Auxiliary Pools and OPC would implement current FWS National Bald Eagle Management Guidelines (FWS 2007) pertaining to prescribed distance buffers, natural or landscape buffers, and activity-specific guidelines as applicable. In addition, OPC would coordinate annually with GDNR regarding active eagle nest locations within the project boundary and cooperate with GDNR's annual monitoring of Bald Eagles at the Project. The Bald Eagle Management Plan, including the specific measures to be implemented, will be provided in the FLA.

Exotic Invasive Species

Public use of the recreation facilities, including campsites, beach, and public fishing areas, and their respective access roads are not being adversely impacted by exotic invasive plant species. The occurrences of invasive species within the project boundary are relatively limited and sparse, with few dense infestations present. Operation and maintenance of the Project has not been a major factor contributing to the occurrence or spread. The occurrence of exotic invasive plant species within the project boundary has resulted mainly from anthropogenic disturbance along roadways and utility rights of way, where spread can be attributed to propagules (seeds, rhizomes, etc.) being introduced to new areas by vehicle or operation of equipment. Exotic invasive species such as Chinese Privet and Japanese Stiltgrass are now widespread and common throughout Georgia and the eastern and southern U.S., typically in floodplains (Merriam and Feil 2002, Loewenstein and Loewenstein 2005). Although total elimination is unlikely, periodic monitoring and treatment as necessary would be effective for reducing infestations and eliminating interference with public access and utilization of the project recreation facilities.

Based on the analysis provided above, OPC proposes to implement Invasive Species Management measures in consultation with GDNR. Every three years following license issuance, OPC would consult with GDNR on monitoring terrestrial invasive exotic plant occurrences at the project recreation facilities within the Rocky Mountain PFA. Invasive exotic plant populations would be treated periodically, as necessary, to eliminate any interference with public access and utilization at these sites. Acceptable treatment methods would include limited herbicide application, pulling, hand-cutting, and other means considered effective for controlling invasive exotic plant species while presenting no significant risk to other environmental resources.

The management of aquatic nuisance species (plant and animal) would focus primarily on preventing their transport and introduction to the Auxiliary Pools from boaters and anglers by the use of educational signage placed at each boat ramp. The signage would encourage boaters and anglers to take simple actions to prevent the movement of aquatic nuisance species between waterbodies. OPC also would consult with GDNR every three years on any significant invasive aquatic plant and animal species occurrences observed by GDNR in the Auxiliary Pools during fisheries surveys or management activities. Although no significant occurrences of aquatic nuisance species are presently known in the project waters, should significant occurrences be detected in the future, OPC would consult with GDNR on potential management implications and acceptable means of control, removal, or management, if warranted, to avoid or minimize interference with public recreational use and hydropower operations.

Construction of Proposed Enhancement Measures

Construction of the proposed recreation enhancements at Heath Lake to improve kayak access and at Antioch Lake West (Main entrance) to install a kayak launch would occur primarily in previously developed areas with the exception of permanent alteration of a small area of grassy meadow in creating a parking and kayaking launching and loading area at the existing location of the Heath Lake archery range. The areas of potential disturbance at each site will be quantified in the FLA. No wetlands or streams would be directly impacted.

Construction of recreation enhancements would temporarily disturb upland and riparian vegetation and associated wildlife in the vicinity of the construction sites. However, these disturbances would be short in duration and the sites would be restored, including reseeding as necessary following construction. Wildlife displaced from forested habitat next to construction sites would relocate to suitable habitat in the surrounding forest. Secondary impacts to animal populations would be negligible.

Unavoidable Adverse Impacts

Construction of the kayak access and parking at Heath Lake would result in the permanent alteration of a small area of grassy meadow and displacement of associated wildlife to adjacent habitats.

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

3.2.5 Threatened and Endangered Species

3.2.5.1 Affected Environment

Based on searches using the FWS Information for Planning and Consultation (IPaC) tool and review of the GDNR Georgia Biodiversity Portal, 18 federally listed threatened and endangered species of plants and wildlife with known records of occurrence in Floyd County potentially occur in the project vicinity (Table 15). Another wildlife species (a bat) is currently proposed for listing as federally endangered, and two other wildlife species (an insect and a mussel) are under federal review for possible listing. In addition, FWS (2020a) has determined that one butterfly species is a candidate species for federal listing.

Federally Protected Species

Eighteen species currently listed as threatened and endangered under the federal Endangered Species Act potentially occur in the project vicinity (Table 15). They include six plant species, seven mollusk (mussel/snail) species, two fish species, and three bat species:

- Georgia Rockcress (*Arabis georgiana*) – threatened;
- Alabama Leatherflower (*Clematis socialis*) – endangered;
- Whorled Sunflower (*Helianthus verticillatus*) – endangered;
- Mohr's Barbara's-buttons (*Marshallia mohrii*) – threatened;
- Large-flowered Skullcap (*Scutellaria montana*) – threatened;
- Tennessee yellow-eyed Grass (*Xyris tennesseensis*) – endangered;
- Finelined Pocketbook (*Hamiota altilis*) – threatened;
- Alabama Moccasinshell (*Medionidus acutissimus*) – threatened;
- Coosa Moccasinshell (*Medionidus parvulus*) – endangered;
- Southern Clubshell (*Pleurobema decisum*) – endangered;
- Southern Pigtoe (*Pleurobema georgianum*) – endangered;

- Triangular Kidneyshell (*Ptychobranchus greenii*)[10] – endangered;
- Interrupted Rocksnail (*Leptoxis foremani*) – endangered;
- Blue Shiner (*Cyprinella caerulea*) – threatened;
- Trispot Darter (*Etheostoma trisella*) – threatened;
- Gray Bat (*Myotis grisescens*) – endangered;
- Northern Long-eared Bat (*Myotis septentrionalis*) – threatened; and
- Indiana Bat (*Myotis sodalis*) – endangered.

None of these federally protected species are presently known to occur within the Rocky Mountain project boundary. Review of available critical habitat designations also indicates that the Rocky Mountain Project is not within the designated critical habitat of any federally protected species. All 18 of the species are described below.

Georgia Rockcress

Georgia Rockcress is a perennial herb that occurs in the Lower Gulf Coastal Plain, Upper Gulf Coastal Plain, Red Hills, Black Belt, Piedmont, and Ridge and Valley physiographic provinces (FWS 2014a). It inhabits shallow soils on rocky slopes above streams, thinly wooded areas of limestone or granite bluffs, hardwood forests on slopes above streams, or sandy eroding riverbanks (Chafin 2007). Georgia Rockcress flowers in March-April. Eighteen extant populations of Georgia Rockcress are located across Alabama and Georgia, including five in Georgia and one spanning across both states (FWS 2014a). FWS has designated 17 critical habitat units (732 acres) for Georgia Rockcress, none of which are located within the project boundary. The species was not detected during the field surveys (Corblu 2023).

Alabama Leatherflower

Alabama Leatherflower is a perennial herb that occurs in Coosa Valley flatwoods in sunny, grassy openings with wet to moist and silty-clay soils (Chafin 2007). The species flowers in late April-May. Since its recovery plan in 1984, populations of Alabama Leatherflower have expanded from two Alabama counties to eight natural populations (FWS 2020b). In

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[10] The Coosa River population of Triangular Kidneyshell is recognized as the separate species Rayed Kidneyshell (*Ptychobranchus foremanianus*) by Williams et al. (2008) and GDNR (Wisniewski 2018c).

Georgia, the only known natural population is located in a state Natural Area in Floyd County (FWS 2020b). This species was not detected during the field surveys (Corblu 2023) and is not presently known to occur within the Rocky Mountain project boundary.

Whorled Sunflower

Whorled Sunflower is a perennial herb and obligate wetland plant that occurs in the Coosa Valley (Chafin 2007). Habitat requirements include wet, sunny prairie openings in floodplains and wet depressions with prairie grasses (Little Bluestem and Big Bluestem). This herb reproduces sexually and must be cross pollinated to produce seeds. Common pollinators of the Whorled Sunflower include bees and butterflies. Reproduction can also occur through clonal propagation via rhizomes (FWS 2020c). Flowering occurs in August-October. There are six populations known in the Coosa Valley prairies of Georgia, all of which are protected by a conservation agreement (Chafin 2007). One extant population is known to occur in Floyd County on land owned by Weyerhaeuser Company, with most of the population protected by a conservation easement (FWS 2020c). This species is not presently known to occur within the Rocky project boundary and was not detected during the field surveys (Corblu 2023).

Mohr's Barbara's Buttons

Mohr's Barbara's Buttons (or Coosa Barbara's Buttons) is a perennial herb that occurs in small, prairie openings in the Coosa Valley and on shale outcrops along streams (Chafin 2007). This herb reproduces sexually and can only produce viable fruit if cross-pollination occurs, usually by beetles and small insects. Seed dispersal may occur through small animals, such as birds (FWS 2016a). Flowering occurs in mid-May-June (Chafin 2007). Five extant populations of Mohr's Barbara's Buttons occur in Georgia, all of which fall within Floyd County, totaling around 4,000 plants (FWS 2016a). One of these extant populations crosses into Cherokee County, Alabama (FWS 2016a). Most of the extant populations fall within state-owned or conservation lands, such as the Berry College WMA and a conservation easement on timber lands (FWS 2016a). This species is not presently known to occur within the project boundary and was not detected during the field surveys (Corblu 2023).

Large-flowered Skullcap

Large-flowered Skullcap is a perennial herb that occurs in moist hardwood and hardwood-pine forests with open understory in the Ridge and Valley province of northwest Georgia and southeast Tennessee (Chafin 2007). The species flowers from mid-May to early June and fruits mature in June-early July (FWS 1996). Large-flowered Skullcap reproduces sexually after plants are several years old, relying on moths, hummingbirds, and butterflies for pollination (Chafin 2007). Visits by pollinators are infrequent, resulting in low seed production or self-pollination. Production of viable fruit often fails. Although the 53 known populations are concentrated on Lookout and Signal Mountains in Tennessee and in Floyd County, Georgia, this species is not presently known to occur within the Rocky Mountain project boundary and was not detected during the field surveys (Corblu 2023).

Tennessee Yellow-eyed Grass

Tennessee Yellow-eyed Grass is a perennial monocot and obligate wetland plant that occurs over calcareous bedrock in sunny, wet areas (FWS 2014b; Chafin 2007). Calcareous bedrock includes spring runs, edges of shallow streams and ponds, seeps, wet meadows, and swales (Chafin 2007). This herb reproduces vegetatively and sexually but does not depend solely on pollinators for reproduction. A species of bee (*Lasioglossum zephyrum*) may have exclusive access to the flower's pollen, as it has learned to open the plant's buds and collect pollen from the early ripening anthers (Chafin 2007). This herb grows in clumps and flowers are only open mid-late-morning in August-September. There are 25 known populations of Tennessee Yellow-eyed Grass, nine of which occur in Georgia. Although one extant population is known to occur in Floyd County, the species is not presently known to occur within the Rocky Mountain project boundary (FWS 2014b) and it was not detected during the 2022-2023 field surveys (Corblu 2023).

Finelined Pocketbook

Finelined Pocketbook is a freshwater mussel endemic to the eastern Mobile Basin of Alabama, Georgia, and Tennessee, where it occurs in small creeks to large rivers in sandy to muddy sand substrates or gravel shoals with slight to moderate current (Williams et al. 2008, Wisniewski 2018b). Females are known to brood larvae (glochidia) from late summer through late spring and release superconglutinates into the water column.

Superconglutinates consist of a long gelatinous string with several glochidial packages attached, which float in the current to mimic a small fish and attract predatory host fish. Fishes reported to serve as glochidial hosts based on laboratory trials include Largemouth Bass, Spotted Bass, Coosa Bass, and Green Sunfish (Wisniewski 2018b).

In the upper Coosa River basin in Georgia, Finelined Pocketbook is currently known to occur in the Conasauga River, Ellijay River, and several of their tributaries. The species historically occurred in the Armuchee Creek system but no recent occurrences are known and it is possibly extirpated from the system (GDNR 2023a). Finelined Pocketbook was not found in Heath Creek during the October 2022 mussel survey (Dinkins and Dinkins 2022).

Alabama Moccasinshell

Alabama Moccasinshell is a freshwater mussel species endemic to the Mobile Basin, where known populations occur in isolated and widely separated locations (Williams et al. 2008). The species inhabits medium-sized creeks to rivers with sand and gravel substrates and swift flowing shoal areas. In Georgia, the species appears to be currently restricted to the Conasauga River and several of its tributaries (Wisniewski 2018c). Alabama Moccasinshell was not detected in the 2022 mussel survey of Heath Creek.

Coosa Moccasinshell

Coosa Moccasinshell is a freshwater mussel species endemic to the Mobile Basin in streams above the Fall Line, primarily in tributaries (Williams et al. 2008). The species typically occurs in shoals areas of small streams to large rivers with sand, gravel, or cobble substrates. In Georgia, the species appears to be currently restricted to the upper Conasauga River watershed (Wisniewski 2018d). Coosa Moccasinshell was not detected in the 2022 mussel survey of Heath Creek.

Southern Clubshell

Southern Clubshell is a freshwater mussel species endemic to the Mobile Basin, where known populations occur in scattered, isolated locations, with most remaining populations in tributaries (Williams et al. 2008, Wisniewski 2018e). The species usually occurs in flowing water in large creeks and rivers in gravel or sand substrates. In Georgia, Southern Clubshell appears to be currently restricted to the Conasauga River and

Coosawattee River watersheds. The species was not found in the 2022 mussel survey of Heath Creek.

Southern Pigtoe

Southern Pigtoe is an elliptical to oval-shaped mussel that has a maximum length of approximately 2.5 inches (FWS 2019a). The species is endemic to the Coosa River basin in Alabama, Georgia, and Tennessee, where it occurs in riffles, runs, and shoals of medium creeks to large rivers, typically in sand and gravel substrates (Williams et al. 2008). The Southern Pigtoe is a short-term brooder, releasing parasitic glochidia during spring and early summer. Reported glochidial host fishes include Alabama Shiner, Blacktail Shiner, and Tricolor Shiner (FWS 2019b). Historically more common and widespread, the Southern Pigtoe is now very rare and occurs as only a few isolated populations. All known populations are small and localized (FWS 2019a).

The Southern Pigtoe is currently known in Armuchee Creek from a single site occurrence; Armuchee Creek was not included in the species' critical habitat designation because it was not considered essential due to limited habitat availability, degraded habitat, or other factors (FWS 2004, 2019b). Southern Pigtoe was not detected in the October 2022 mussel survey of Heath Creek (Dinkins and Dinkins 2022).

Triangular Kidneyshell

Triangular Kidneyshell is a freshwater mussel species endemic to the Mobile Basin. Referred to in the Coosa River basin portion of its range as the separate species Rayed Kidneyshell by some authorities (Williams et al. 2008; Wisniewski 2018f), the species occurs in isolated reaches of the Coosa River basin, where it is very rare. Triangular Kidneyshell occurs in flowing water habitats of medium to large rivers in mixtures of sand and gravel substrates. In Georgia, the species appears to be restricted to the Conasauga River watershed and the mainstem Coosawattee River downstream of Carters Reservoir. Triangular Kidneyshell was not detected in the 2022 mussel survey of Heath Creek.

Interrupted Rocksnail

Interrupted Rocksnail is an aquatic snail species endemic to the Coosa River basin of Alabama and Georgia that is currently known in Georgia only from a 7.2-mile reach of the mainstem Oostanaula River in Gordon and Floyd Counties (Wisniewski 2018g). The species inhabits shallow runs with clean, mixed substrates free of silt. The designated critical habitat for Interrupted Rocksnail includes the primary channel of the Oostanaula River but does not include Armuchee Creek or Heath Creek (FWS 2010). The species was not observed in the 2022 mussel survey of Heath Creek.

Blue Shiner

Blue Shiner is endemic to the Mobile Basin, where it is historically known from the Coosa River basin of southeastern Tennessee, northwestern Georgia, and eastern Alabama and from the Cahaba River of central Alabama (Freeman 2008). The species typically occurs in small to medium-sized streams in riffles and runs, as well as pools with moderate to swift current, over gravel to cobble or boulder substrates. In Georgia, Blue Shiner is currently known only from the upper Conasauga River watershed. The species is probably extirpated from the Oostanaula River (Freeman 2008). Blue Shiner was not collected during the 2022 fish community survey of Heath Creek.

Trispot Darter

Trispot Darter is endemic to the upper Coosa River basin in Georgia, Alabama, and southeastern Tennessee. Trispot Darters use distinct breeding and nonbreeding habitats (Freeman and Hagler 2009; FWS 2017). During the nonbreeding season (April-October), darters inhabit shallow main-channel habitats of larger streams. In late fall, mature adults begin moving upstream into tributaries and eventually smaller streams and adjacent seepage areas and ditches, where they remain through winter to early spring. Spawning occurs during winter (January-March) in seasonally wet tributaries and intermittent seepage areas that become available as precipitation increases and the water table rises. In Georgia, Trispot Darters occur in the Conasauga River and some of its tributaries, the Coosawatee River and a few tributaries below Carters Reservoir, and a few tributaries to the Oostanaula River (Freeman and Hagler 2009). The species is not presently known to occur in Armuchee Creek or Heath Creek. OPC's survey for breeding Trispot Darters in tributaries of Heath Creek within the project boundary in winter 2023 did not collect or observe the species (see Section 3.2.3.1, Heath Creek Downstream of the Main Dam). Moreover, eDNA testing of water samples from Heath Creek at Texas Valley Road in January 2019 did not detect presence of the species (Bearden et al. 2021).

Gray Bat

Gray Bat is a highly colonial species in eastern North America distinguished from other species of the genus *Myotis* by its larger size and the uniformly gray fur on its back. The primary range of the species is centered on the cave regions of Alabama, Missouri, Arkansas, Kentucky, and Tennessee, with smaller populations found in adjacent states, including Georgia (FWS 2009; Ozier 2020a). Gray Bats inhabit caves year-round, occupying cold hibernating caves or mines in winter and dispersing to warmer maternity and bachelor caves during summer (Ozier 2020a). Mating occurs in the fall prior to hibernation, and each female delivers a single pup after arriving at the maternity cave in late May or early June. The summer caves are almost always near a river or reservoir, where Gray Bats feed on night-flying aquatic and terrestrial insects. Most foraging occurs over open water near a forested shoreline, and bats forage up to 12 miles or more from roost sites. A primary threat to the Gray Bat is anthropogenic disturbance to their caves. Infection of Gray Bats by the fungus causing white-nose syndrome (WNS), a disease that infects the skin of hibernating bats and has devastated populations of other bat species, is also a possible threat (Ozier 2020a).

In Georgia, Gray Bats are known to occupy only three caves regularly during the summer in Chattooga, Walker, and Coosa Counties; however, additional roost caves are likely present in northwest Georgia (Ozier 2020a). In the Terrestrial Management Plan for the Project, GDNR (2013) reported the presence of the "caves, rock shelters, and talus slopes" habitat type on the slopes of Rock Mountain, a high-priority habitat type identified in the SWAP (GDNR 2015), but did not recommend any management measures for bats. The Gray Bat is not presently known to occur within the project boundary.

Northern Long-eared Bat

Northern Long-eared Bat, distinguished from other species of *Myotis* by its long ears, is a wide-ranging species found in a variety of forested habitats in summer and hibernates in caves in winter (FWS 2016b). The species is found across eastern and north-central U.S. and southern Canada and is generally associated with old-growth forests (NatureServe 2023). Northern Long-eared Bats overwinter in hibernacula that include caves and abandoned mines (FWS 2016b). Rarely are there more than 100 individuals per hibernation colony (NatureServe 2023). Mating occurs in late summer or fall prior to hibernation, and each female delivers a single pup in June or early July. In summer, the bats generally are colonial but tend to be more solitary than other *Myotis* species, often roosting alone in deep cracks and crevices, under bark, or in hollows of live and dead trees. Foraging occurs within forests, along forest edges and clearings, and occasionally over ponds. The predominant threat to Northern Long-eared Bat is mortality due to WNS (FWS 2016b). The species' abundance has declined by up to 99 percent from pre-WNS levels in the northeastern U.S. Other threats include wind energy mortality, effects from climate change, and habitat loss.

Northern Long-eared Bat is more common in the northern part of is range and has only been documented in northern and western Georgia (Beck 2019). Although not known to occur in Floyd County, there are relatively recent records of the species from adjacent counties (GDNR 2023a). During OPC's 2023/2023 terrestrial surveys, potentially suitable habitat was interspersed throughout the project boundary (Corblu 2023). The species is not presently known to occur within the project boundary.

Indiana Bat

Indiana Bat is a medium-sized *Myotis* species characterized by small, mouse-like ears that hibernates colonially in caves and mines in winter. Indiana Bats cluster in large groups in suitable caves to hibernate. The species needs winter caves with a stable temperature and standing water to maintain relative humidity levels. More than 85 percent of the population hibernates in just nine caves in Indiana, Missouri, and Kentucky (Ozier 2020b). During the summer, Indiana Bats roost in trees, usually under loose, exfoliating bark, at sites typically at a woodland edge or in a forest opening warmed by the sun. The bats forage in riparian, floodplain, and upland forest, and sometimes over open water. In late summer or early fall, both males and females return to wintering hibernacula (caves) to mate and enter hibernation.

Indiana Bat is known to occur over much of the eastern half of the U.S. but has been documented in Georgia from only two caves in Dade County, located north-northwest of the project area, and from occasional winter records in other parts of northwestern Georgia (Ozier 2020b). The nearest known maternal colonies are in northeastern Alabama and southern Kentucky. Current threats to the species include human cave disturbance, pesticides, loss and fragmentation of forested habitats, and the fungal disease WNS. WNS triggers frequent arousal during hibernation, which depletes fat reserves and causes severe wing damage, dehydration, and starvation (Ozier 2020b).

The critical habitat designation for Indiana Bat does not include any areas in Georgia (FWS 1976). Although potentially suitable summer roosting habitat exists within the project boundary (Corblu 2023), there are very few records of Indiana Bat in Georgia and the species is not known to occupy any habitat in Floyd County (Ozier 2020b, GDNR 2023a).

Proposed Endangered Species

FWS (2022) proposed listing the Tricolored Bat (*Perimyotis subflavus*) as an endangered species under the Endangered Species Act on September 14, 2022, and found that designating critical habitat would not be prudent. Tricolored Bat has a widespread distribution and potentially occurs in the project area.

Tricolored Bat

Tricolored Bat, which has no Georgia state protection, is a small species of bat that occupies a wide range across eastern and central North America (NatureServe 2023). Tricolored Bats can be found in suitable habitats throughout Georgia (GDNR 2023a). They inhabit open forests with large trees and woodland edges, roost during summer in dead or live tree foliage, and hibernate in caves or mines with high humidity. Summer roosts may also be in caves, mines, rock crevices, bridges, and culverts. Tricolored bats feed on a variety of insects including moths, flies, mosquitoes, midges, and beetles. Tricolored Bats in northern Georgia have experienced severe declines in population due to WNS. Despite these declines, Tricolored Bats are still the most common cave-dwelling species found during winter surveys in Georgia (Ferrall 2023). WNS is the primary influence that has led to the species' proposed listing, followed by wind energy-related mortality; other threats include habitat loss, although of low severity, and negative impacts anticipated from climate change (FWS 2021).

Although no targeted surveys were conducted for Tricolored Bat and no individuals or hibernacula were observed within the project boundary during the field surveys (Corblu 2023), recent occurrence records of Tricolored Bats are known from Floyd County in the project vicinity (GDNR 2023a).

Candidate Species

FWS (2020a) added Monarch Butterfly (*Danaus plexippus plexippus*) to the candidate species list, meaning that listing as a threatened or endangered species is warranted but precluded by higher priority actions. The species is not yet proposed for listing.

Monarch Butterfly

Monarch Butterfly is a large, conspicuous butterfly that exhibits long-distance migration and overwinters as adults at forested locations in Mexico and California. Adult monarch butterflies feed on nectar from a wide variety of flowers. Reproduction is dependent on the presence of milkweed, the sole food source for larvae. Larvae develop and feed on the milkweed plant and sequestering chemicals as a defense against predators. Adults live six to nine months, and multiple generations are produced over the course of the breeding season. Monarch butterflies potentially occur across the continental U.S. but populations have been declining over the past 20 years. Primary threats to the species include the loss and degradation of habitat from conversion of grasslands to agriculture, widespread use of herbicides, exposure to insecticides, land-clearing activities in overwintering sites, urban development, and general loss of milkweed and nectar sources across the species' range from various land development activities (FWS 2020a).

During OPC's 2022-2023 terrestrial surveys, potentially suitable habitat for Monarch Butterfly was identified in one area within the project boundary. This area was found along the transmission line easement and meets the FWS' preferred habitat description for the species. Butterfly Weed, a member of the milkweed family, was observed at this location. Due to the lack of forested canopy, it is possible that other areas along the transmission line easements may contain Butterfly Weed or other milkweed species (*Asclepias* species).

Species Under Review

Two species undergoing status review by FWS to determine if their listing as federally threatened or endangered may be warranted occur or potentially occur in the project vicinity (FWS 2011, 2023). They include Cherokee Clubtail (*Stenogomphurus consanguis*), a Georgia threatened species, and Alabama Rainbow (*Cambarunio nebulosus*), which has no state protection. Brief accounts of each species are provided below.

Cherokee Clubtail

Cherokee Clubtail is a dragonfly restricted to the southern Appalachian region of Virginia, North Carolina, Tennessee, Georgia, and Alabama (Beaton 2008). The aquatic larvae of the species usually occur in small, first- and second-order spring-fed streams with sand, gravel, and fine detritus substrates in partly shaded to open areas. Adults use these same habitats during the breeding season and are also found in nearby fields and other areas of open habitat. In Georgia, Cherokee Clubtail is known from at least 10 streams in 6 counties within the Ridge and Valley province, including Floyd County (Beaton 2008). Although no occurrence records of Cherokee Clubtail are known from the Armuchee Creek system near the Project, potentially suitable spring-fed habitat for the species was identified in three small, headwater stream locations within the project boundary during the 2022-2023 terrestrial surveys. These areas are located along the base of Rock Mountain in the Rock Mountain Creek watershed (two locations in Mesic Slope Forest) and in the headwaters of Heath Creek (one location in Forested Wetland) upstream of the Lower Reservoir (Corblu 2023). No Cherokee Clubtails were observed during the surveys.

Alabama Rainbow

Alabama Rainbow is a mussel endemic to the Mobile Basin in Alabama, Georgia, and Tennessee above the Fall Line; it was historically widespread in northwestern Georgia (Williams et al. 2008; Escobar 2021). Alabama Rainbow inhabits small streams to rivers where it occurs in flowing water in various combinations of sand and gravel substrates and in fine sediments among cobbles and boulders. In Georgia, it currently occupies the Coosa, Conasauga, upper Coosawatee, Etowah, and Oostanaula rivers and their tributaries (Escobar 2021). OPC's mussel survey of Heath Creek in October 2022 found one live specimen of Alabama Rainbow about 2 stream miles downstream of the Main Dam and one fresh dead shell just upstream of Heath Creek's confluence with Little Armuchee Creek (Dinkins and Dinkins 2022) (see Section 3.2.3.1, Freshwater Mollusks). The species was not found within the project boundary.

3.2.5.2 Environmental Impacts and Recommendations

OPC proposes to continue operating the Rocky Mountain Project as currently licensed. During normal daily generation and pumping, the Lower Reservoir elevation would continue to fluctuate up to 20 ft and the Upper Reservoir elevation would continue to fluctuate up to 51 ft. The Project would continue to release a continuous minimum flow of 1.2 cfs from the Lower Reservoir into Heath Creek. OPC is not proposing to make any major modifications to the Project under the new license.

Continued project operation would not be expected to affect any federally listed species, species proposed for federal listing, federal candidate species, or federal status-review species of plants and wildlife. There is no designated critical habitat for federally protected species within the project boundary or in Heath Creek downstream of the Project.

Heath Creek downstream of the Project would continue to provide suitable habitat for a healthy small-stream community of native mussels, including Alabama Rainbow (federal status review). Potentially suitable small-stream habitat for Cherokee Clubtail (federal status review), which was observed during OPC's 2022-2023 field surveys along headwater streams in forests upstream of, or away from, project facilities and roads (Corblu 2023), is located in small areas that would not be affected by project operation and maintenance.

Terrestrial and riparian habitats within the project boundary would continue to provide potentially suitable habitat for endangered Northern Long-eared Bat, endangered Indiana Bat, and proposed endangered Tricolored Bat. Vegetative community types providing potentially suitable habitat within the project boundary include bottomland hardwoods, dry oak-pine forest, emergent wetland, forested wetland, and mixed pine-hardwood forest (Corblu 2023). Because these habitats are interspersed throughout the 5,000-acre project boundary and are not closely associated with project facilities or operations, continued project operation and maintenance would be unlikely to affect or disturb potentially suitable forest habitats or hibernacula for these bat species within the project boundary.

While never identified at the Rocky Mountain Pumped Storage Project, because these listed bat species are known to occur in the region, OPC proposes to adopt a Bat Habitat Protection Plan under the new license to avoid and/or minimize the potential impacts of project operations and maintenance on potentially suitable hibernacula and roosting sites in forest habitat. This plan would take into consideration such habitat when planning vegetation management or tree removal activities and seek to avoid time frames of the most sensitive life stages of federally protected bats, including during hibernation and during the pup season, when females are close to giving birth and have non-volant (i.e., unable to fly) young. The plan would also seek to minimize the amount of tree removal.

The Bat Habitat Protection Plan, including the specific measures to be implemented, will be provided in the FLA.

Monarch Butterfly, a federal candidate species, depends on the presence of milkweed species as host plants for reproduction. Butterfly Weed, a milkweed species, was identified in open areas along the transmission line easement (Corblu 2023). Continued project operation and maintenance would not be expected to result in the loss of milkweed or nectar sources available for use by Monarch Butterfly within the project boundary.

3.2.6 Recreation and Land Use

3.2.6.1 Affected Environment

Existing Recreational Facilities

Within the approximately 5,000 acres of land and water encompassed by the Rocky Mountain project boundary, 3,700 acres, known as the Rocky Mountain PFA, are available for public recreational use (OPC 2005; Kleinschmidt 2023d). There are three main recreation areas within the Rocky Mountain PFA (Figures 10 through 13). Auxiliary Pool I, or Antioch Lake, is separated into two main areas for recreation: Antioch Lake East and Antioch Lake West. The third main recreation area is Auxiliary Pool II, or Heath Lake. Public recreational use of the Upper and Lower Reservoirs, and their shorelines, is prohibited due to safety concerns caused by large fluctuations in pond levels from project operations. OPC maintains a Resource Management Agreement with GDNR that allows GDNR to manage and operate the Project's recreation facilities. GDNR allows day-use vehicle parking and overnight camping for a fee.

Below is a description of the various recreation areas available at the Rocky Mountain PFA and their associated amenities. In addition to the recreation amenities described below, a variety of hiking and biking trails are available within the project boundary (Figure 10).

The eastern-most entrance to the Rocky Mountain PFA on Big Texas Valley Road is the main entrance and provides public recreation access to Antioch Lake East and the eastern end of Antioch Lake West (Figure 11). Antioch Lake East includes a Visitors Center and day-use facilities. The Visitors Center includes the following amenities:

- Parking for vehicles and buses (including two ADA-complaint spaces);
- A covered building with restrooms;

- A picnic area with tables and grills; and
- Interpretive signage.

The day-use facilities at Antioch Lake East include:

- A picnic area with tables and grills;
- A picnic shelter with tables and grills;
- A one-lane, concrete boat launch;
- A floating dock;
- A paved parking area (including one ADA-complaint space);
- Bank fishing; and
- Restrooms.

The day-use facilities at the eastern end of Antioch Lake West accessed from the main entrance include:

- A boating area with parking for vehicles and vehicles with trailers (including one ADA-compliant space), a concrete boat launch, a wooden courtesy dock, and a picnic area with tables and grills;
- Restrooms; and
- Bank fishing.

The middle entrance, or beach entrance, to the Rocky Mountain PFA on Big Texas Valley Road provides public recreation access to the main body of Antioch Lake West (Figure 12) which is the most highly developed area and includes the following amenities:

- A beach-oriented picnic area with paved parking lot;
- A large picnic area with a group shelter, tables, and grills;
- A swimming area with a sand beach, beach house with ADA-compliant restrooms, and parking (including four ADA-compliant spaces);
- Restrooms (east of the beach near the point of the peninsula);
- Bank fishing;
- A family campground with recreational vehicle (RV) sites, a campers station with shower and restroom facilities, and a sanitary dump facility; and
- A group camp with vehicle parking, walk-in tent sites, and a picnic shelter with tables and grills.

A western-most entrance to the Rocky Mountain PFA on Texas Valley Road provides public recreation access exclusively to Heath Lake (Figure 13). Heath Lake is open to the public for fishing during the first 10 days of each month. In addition, hunting is allowed at and around Heath Lake during state-designated hunting seasons. The Heath Lake recreation area includes the following amenities

- A parking area (including one ADA-compliant space);
- A single-lane, concrete boat launch;
- A picnic area with tables and grills;
- An archery range;
- Bank fishing; and
- Restrooms.

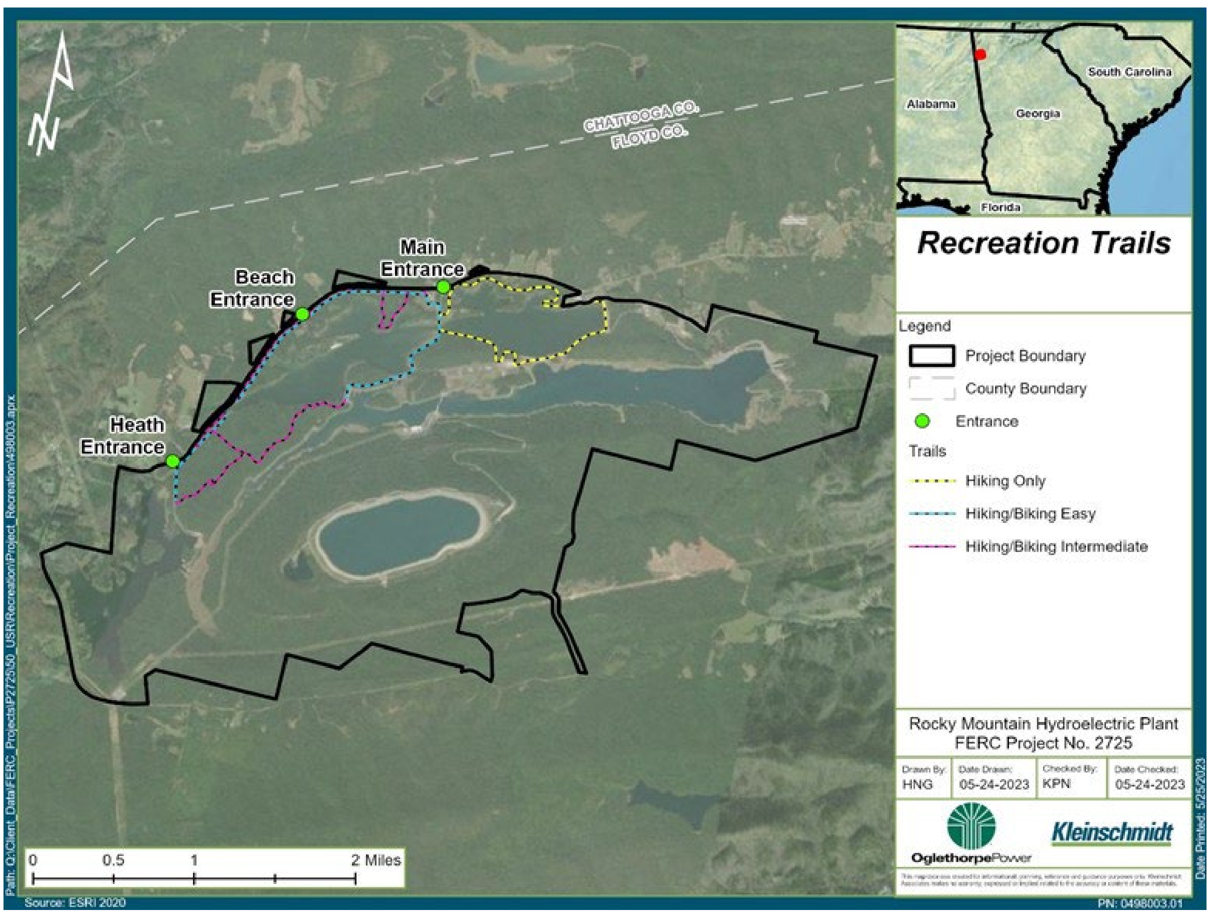

Figure 10 Recreation Trails at Rocky Mountain PFA

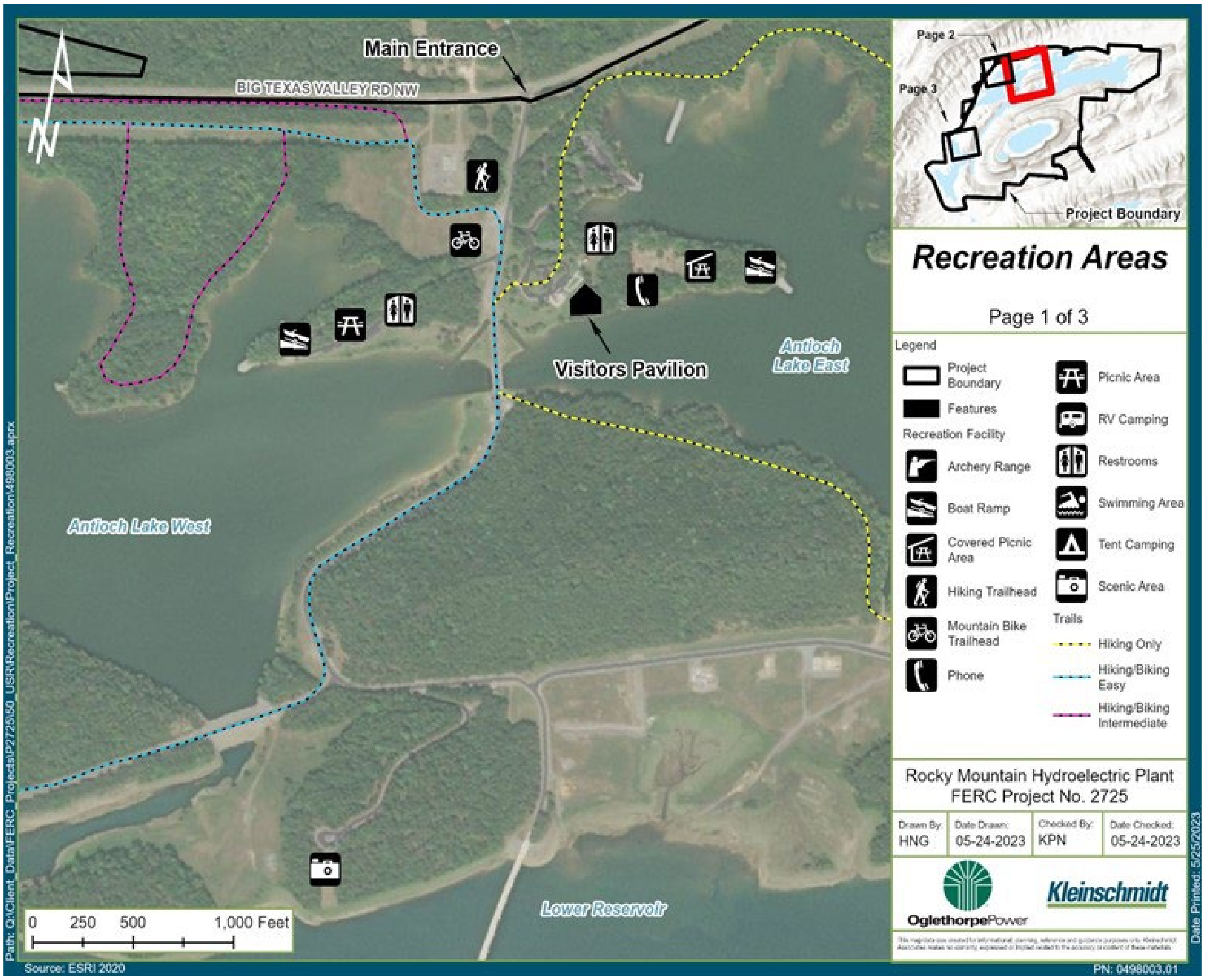

Figure 11 Recreation Amenities at Rocky Mountain PFA – Antioch Lake East and West

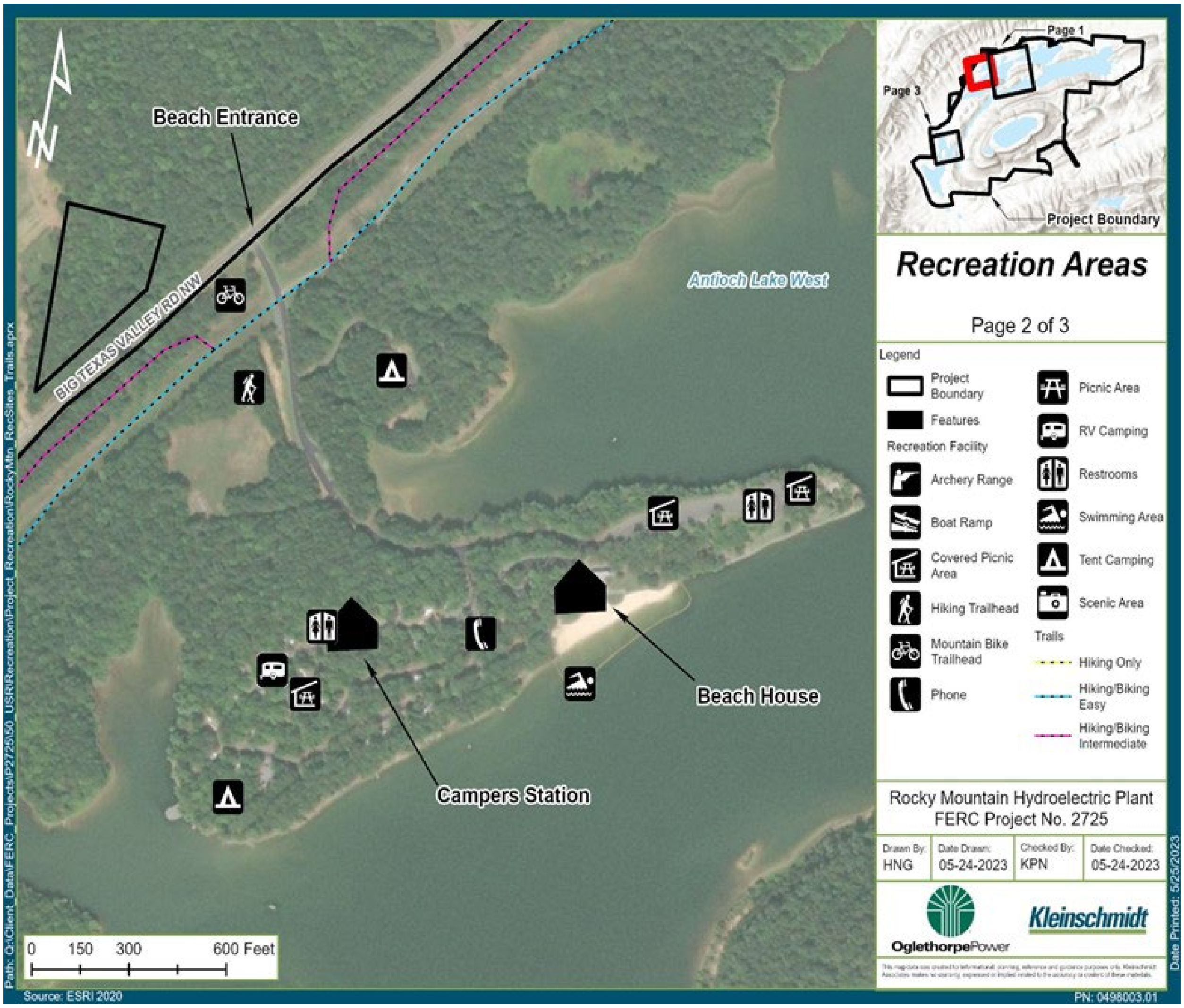

Figure 12 Recreation Amenities at Rocky Mountain PFA – Antioch Lake West

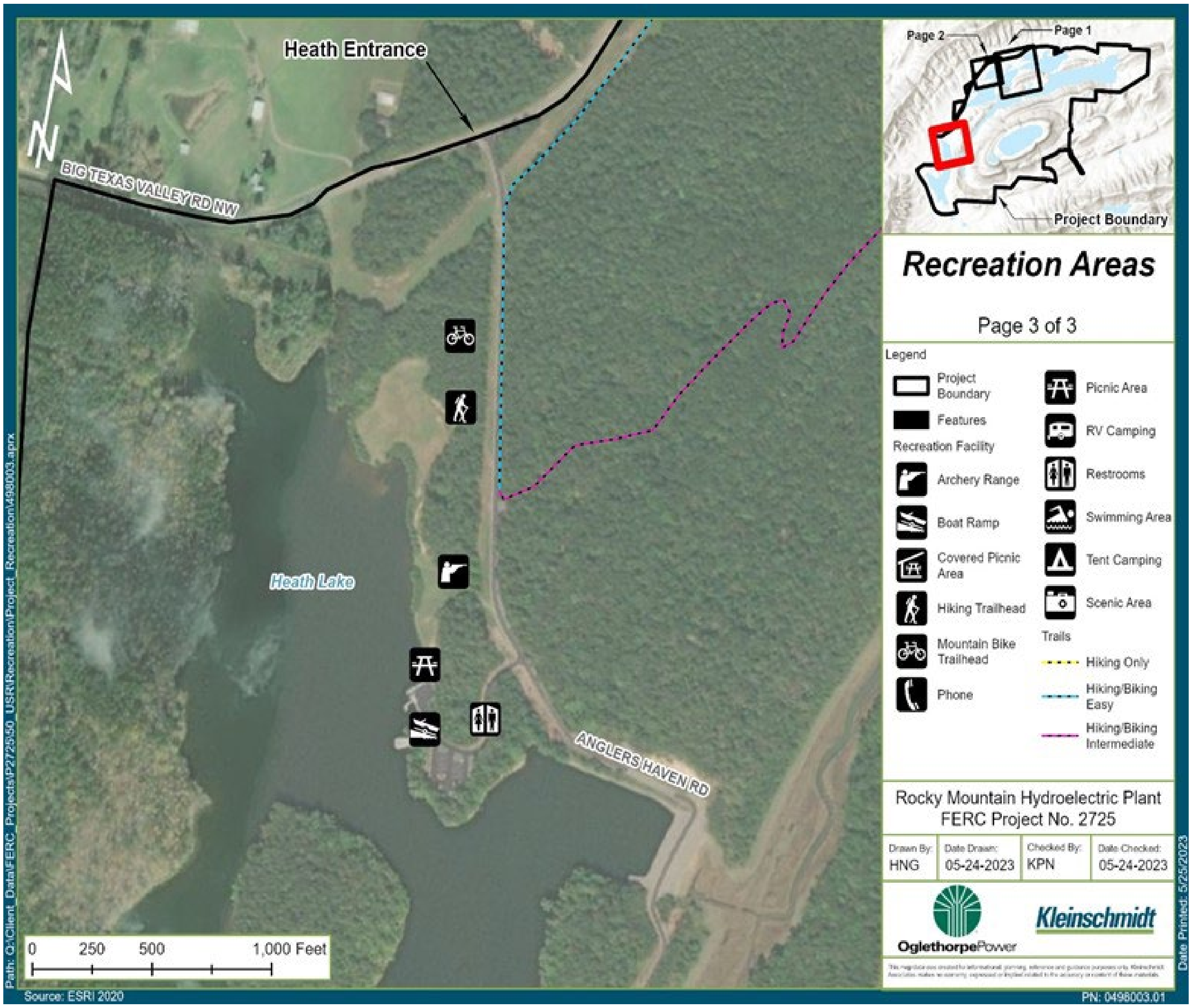

Figure 13 Recreation Amenities at Rocky Mountain PFA – Heath Lake

Existing and Potential Use

OPC conducted a Recreation Use Analysis in 2022-2023 in consultation with the GDNR to characterize existing recreational use at the Rocky Mountain Project, evaluate the potential effects to recreation resources from continued project operation and maintenance, and to use population data from Floyd County to assess potential future recreation needs at the Project (Kleinschmidt 2023d). OPC completed an inventory of existing recreation facilities, conducted on-site recreation surveys, and collected existing traffic counter data and attendance records from GDNR.

Surveys were collected on 15 days between June 2022 and May 2023. The purpose of these on-site surveys was to assess trends in recreation user composition, primary recreation uses, user satisfaction, and adequacy of existing facilities. A field crew conducted surveys on 9 days between June and October 2022 to capture summer and early fall use and again on 6 days between March and May 2023 to capture spring use. Surveys were conducted on a mix of weekdays, non-peak weekends, and peak weekends (or holidays), with an emphasis towards non-peak weekends. In addition to in-person surveys, a survey drop-box was installed at the campground entrance/check-in area. Campers were able to complete a survey during their visit and leave it in the drop box upon leaving. The survey drop-box was installed from June through October 2022 to capture peak use in the summer and early fall (Kleinschmidt 2023d).

Survey results showed that visitors most often came to the area for boat or bank fishing, swimming, shoreline relaxation, camping, and picnicking (Table 16).

Table 16 Survey Respondents' Reasons for Visiting the Rocky Mountain PFA

Activity	Main	Beach	Heath	Rocky Mountain PFA[11]
Boat Fishing	56%	1%	83%	33%
Bank Fishing	32%	34%	16%	30%
Camping	-	20%	1%	17%
Picnicking	-	25%	-	15%
Swimming	-	52%	-	28%
Hunting	-	-	1%	1%
Hiking	1%	1%	-	5%
Biking	1%	-	-	2%
Pleasure Boating	-	-	-	1%
Canoeing/Kayaking	10%	2%	13%	8%
Wildlife Viewing	1%	3%	-	6%
Shoreline Relaxation	-	25%	6%	18%
Other	3%	5%	-	3%

Source: Kleinschmidt 2023d

[11] Information in this column is from a combination of survey responses collected at the Main, Beach, and Heath entrances, as well as the information collected at the Campground (included in Section 4.2).

Anglers indicated they fished in Antioch Lake West most often (41 percent), followed by Heath Lake (38 percent), and Antioch Lake East (21 percent). Anglers were asked to rate their fishing experience on the day they were interviewed according to the following scale: 1) very poor; 2) poor; 3) fair; 4) good; and 5) very good. Of the 176 anglers that responded, most indicated their fishing experience was good (27 percent) or very good (22 percent), however some indicated their fishing experience was fair (20 percent), poor (18 percent) or very poor (13 percent).

Visitors were asked to rate the quality of a variety of existing facilities at the Rocky Mountain PFA according to the following scale: 5) very good; 4) good; 3) fair; 2) poor; and 1) very poor. Table 17 summarizes the responses by facility. Most visitors rated the facilities provided at the Rocky Mountain PFA as very good or good. Both restroom and bank fishing facilities also were rated as very good or good most of the time but had a higher percentage of fair, poor, and very poor ratings compared to other facilities.

Table 17 Facility Ratings According to Rocky Mountain PFA Visitors

Facilities	Very Good (5)	Good (4)	Fair (3)	Poor (2)	Very Poor (1)
Parking	61%	29%	6%	3%	0%
Boat Ramp	55%	37%	6%	2%	0%
Docks	60%	32%	7%	1%	0%
Restrooms	43%	38%	15%	3%	1%
Bank Fishing	43%	32%	19%	4%	3%
Beach	62%	33%	5%	1%	0%
Picnic Areas	64%	32%	3%	1%	0%
Campsites	73%	21%	6%	0%	0%
Trails	54%	36%	8%	3%	0%
Cleanliness	73%	23%	3%	0%	0%

Source: Kleinschmidt 2023d

In addition, visitors were asked to list any specific improvements they would like to see at Rocky Mountain PFA, including any other comments or suggestions for the recreation area. At the Main entrance, respondents most often indicated that improved bathroom cleanliness is warranted, among other improvements. At the Beach entrance, respondents indicated a desire for improved bathrooms (cleanliness and added shower areas), larger and/or deeper swimming area, improved or new grills, and more fish, among others. At the Heath entrance, respondents indicated a desire for more fish in the lake, improved and/or wider boat ramps, and improved bathrooms, among others. At the campground, campers noted desired improvements including the addition of Wi-Fi access, adding new gravel in areas, and re-orienting some campsites.

Annual recreation use was estimated using GDNR traffic count data and attendance records. GDNR installed traffic counters at the three Rocky Mountain PFA entrances (main, beach, and Heath) to collect continuous vehicle traffic counts in 2022. In addition, GDNR collected information on campground visitation. GDNR used the traffic counter data and campground visitation data to estimate total guest attendance, or recreation days, for each month in 2022 (Table 18). The annual recreation use estimate for the Rocky Mountain PFA in 2022 is 279,912 recreation days. The highest use occurred in June and the lowest use occurred in December.

Table 18 2022 Annual Recreation Use Estimates at the Rocky Mountain PFA by Month

Month	Attendance
January	7,798
February	15,513
March	14,685
April	26,174
May	38,102
June	57,715
July	41,269
August	21,355
September	19,156
October	16,836
November	13,943
December	7,366
Total	**279,912**

Source: GDNR 2023b; Kleinschmidt 2023d

In addition to the total visitation at the campground, GDNR provided data on the occupancy of available campsites in 2022 (Table 19). The most popular months for camping were April, June, and July, however there were still camping opportunities available within each of these months.

Table 19 Rocky Mountain PFA 2022 Campground Occupancy Rates

Month	Total Campsites	Occupancy Percentage
January	1,395	5.1
February	1,260	11.3
March	1,395	32.3
April	1,350	62.5
May	1,395	55.7
June	1,350	61.0
July	1,395	59.9
August	1,395	46.4
September	1,350	55.0
October	1,395	51.4
November	1,395	36.0
December	1,395	10.2
Total CY22	16,470	40.6

Source: GDNR 2023b; Kleinschmidt 2023d

Estimated projections of future recreation use at the Project were developed using the projected population estimates for the next 40 years for Floyd County, as reported by the Georgia Governor's Office of Planning and Budget (GAOPB). The population projections were applied to the annual use estimate for the Project to determine a future recreation use estimate. Future growth projections indicate that Georgia will see a 5 percent increase in population between 2020 and 2025, with additional increases over each 5-year time frame. Floyd County is also expected to see population growth over the same time period, however, at a slower rate than the state of Georgia. The rate of growth is expected to slow over time for both Georgia and Floyd County.

The population projections for Floyd County were applied to the estimated recreation days for the Rocky Mountain PFA. By 2035, the PFA is estimated to accumulate over 294,000 annual recreation days (Table 20). A new FERC license for the Rocky Mountain Project would be issued for a term of up to 50 years, with 40 years being FERC's default term. Assuming a 40-year new license term, the PFA could receive over 314,000 annual recreation days, which would equal an increase of approximately 34,400 recreation days, or approximately 12 percent.

Table 20 Estimated Recreation Day Projections through 2060 for the Rocky Mountain PFA

Rocky Mountain PFA	Recreation Days								
	2022 Estimate	2025 Projection	2030 Projection	2035 Projection	2040 Projection	2045 Projection	2050 Projection	2055 Projection	2060 Projection
	279,912	285,011	289,799	294,157	298,382	302,669	306,965	310,827	314,336

Source: Kleinschmidt 2023d

Most visitors to Rocky Mountain PFA rated the quality of existing facilities as very good or good. In addition, crowding, lack of parking, and lack of facilities were not typically noted as issues at the PFA. OPC plans to continue to maintain the PFA with GDNR consistent with the off-license Resource Management Agreement in a manner similar to years past and upgrade degrading facilities as needed.

Shoreline Buffer Zones and Management Policies

OPC does not have a formal shoreline management plan. In consideration of public safety due to the rapid fluctuations of water levels in the operational pools, OPC prohibits recreational use and development of the Project's Upper and Lower Reservoir shorelines. In addition, OPC owns all of the land within the project boundary and there are no residential or commercial developments along the shorelines of the Auxiliary Pools. The shorelines of the Auxiliary Pools are used principally for wildlife habitat, visual aesthetics, and public recreation purposes as part of the Rocky Mountain PFA.

As noted in Section 3.2.1, OPC conducts annual shoreline inspections along the Lower Reservoir to monitor erosion. The most recent shoreline inspection in June 2022 found minor bank undercutting in a few areas along the south shoreline between the Main Dam and bridge to the powerhouse, and minor bank sloughing on the north shoreline west of an old gristmill site. However, healthy, grassy vegetation covered approximately 90 percent of the reservoir shoreline and no areas of significant shoreline erosion or bank failure were observed. The minor areas of erosion were related to reservoir fluctuations from project operations and did not appear to have increased since previous inspections.

Land Use

The Project is in the Texas Valley within the Ridge and Valley province. Specifically, the Project is located in a rural portion of Floyd County approximately 10 miles north of the city of Rome. Rome is the county's main employment and population center. Approximately 99,443 persons are residents of Floyd County with approximately 37,913 persons residing within the city of Rome (US Census Bureau 2023).

Land use in the project vicinity is dominated by small scale farms and rural residences. The approximately 5,000 acres of land within the project boundary can be classified into one of the following categories: project works, public recreation, and wildlife habitat. Project works are primarily located at the Upper and Lower Reservoirs and major facilities include: several dams; a partially submerged powerhouse; a substation; and three 230-kV transmission lines, known as the Primary Transmission Line.[12] Public recreation occupies approximately 3,700 acres within the project boundary with most of those acres located at Auxiliary Pool I. Additional public recreation land is located at Auxiliary Pool II. Public access to the Upper and Lower Reservoirs is restricted for public safety reasons. These reservoirs are classified under the project works category. Consistent with the Resource Management Agreement between OPC and GDNR, GDNR manages lands around the western portion of Auxiliary Pool II and lands around the southern portion of the Upper Reservoir as wildlife habitat.

3.2.6.2 Environmental Impacts and Recommendations

Potential impacts of continued project operation and maintenance on recreation and land use would be limited mainly to the Auxiliary Pools within the Rocky Mountain PFA. Potential impacts may include effects of managing the Rocky Mountain PFA lakes and facilities for public fishing and recreation.

Most visitors to Rocky Mountain PFA rated the quality of existing facilities as very good or good. In addition, crowding, lack of parking, and lack of facilities were not typically noted as issues at the PFA. While the recreation use analysis findings do not indicate the need for expansion of the PFA, including additional parking or new facilities, at this time, OPC is proposing to implement several recreation enhancements following consultation with GDNR.

Recreation Improvements

OPC identified potential recreation enhancements through agency and stakeholder meetings, including the Joint Meeting and study planning and preliminary results meetings, and from the recreation user surveys at the Project in 2022 and 2023. In a letter dated June 22, 2022, GDNR listed facility repairs and improvements at the Rocky Mountain PFA for OPC to consider in its licensing proposal. OPC has adopted many of those

[12] As discussed in Section 2.1, Footnote 2, OPC will be proposing that the substation and the Primary Transmission Line be removed as project works.

measures in its licensing proposal. OPC proposes to improve recreational access and facilities at the Project by working with GDNR and stakeholders to implement the measures listed below at Antioch Lake East and West (Auxiliary Pool I) and Heath Lake (Auxiliary Pool II). In addition to the site-specific measures listed below, OPC will evaluate the feasibility of creating or adapting existing access to improve ADA-compliant accessibility at the Rocky Mountain PFA. A final proposal regarding ADA-compliant access will be provided in the FLA.

- <u>Antioch Lake East – Main Entrance</u>
  - Renovate and update interior of Visitor Center bathroom for year-round use (currently closed during winter).
  - Replace restroom near boat ramp with ADA-compliant CXT building.
- <u>Antioch Lake West – Main Entrance</u>
  - Replace restroom near boat ramp with ADA-compliant CXT building.
  - Install formal kayak launch at West Antioch "roadbed."
- <u>Antioch Lake West – Beach Entrance</u>
  - Update interior of bathrooms at beach area, peninsula point, and campground.
  - Replace restroom at group camp with ADA-compliant CXT building.
- <u>Heath Lake – Heath Entrance</u>
  - Replace restroom near boat ramp with ADA-compliant CXT building.
  - Improve kayak access by creating a separate parking and kayak launching and loading area at existing location of Heath Lake archery range.
- <u>Septic and Sanitation Improvements</u>
  - Renovate campground and beach sewage lift system.
  - Replace aging septic tank system at campground host site with sewage lift system.
  - Replace/rebuild wet well lids on septic pump pits in the campground, beach area, peninsula point east of the beach area, and the Visitor Center.

OPC proposes to prepare a Recreation Enhancement Plan (REP) as part of the FLA. The REP will describe the existing recreation facilities at the Project, the specific measures proposed for improving recreation access and amenities at these facilities, and the schedule for implementing these proposed enhancement measures. OPC also will continue annual funding of O&M activities consistent with the Resource Management Agreement between OPC and GDNR.

Shoreline and Land Management

OPC is not proposing any modifications to shoreline management at the Project. Public access would continue to be restricted at the Upper and Lower Reservoirs for safety reasons. Public recreation access and opportunities would continue to be provided at Auxiliary Pools I and II and the surrounding trail system in the Rocky Mountain PFA.

Construction of Proposed Enhancement Measures

Construction of the proposed recreation enhancements could cause temporary disturbances due to noise and limited recreation access at the affected facilities. However, to the extent practical, construction would occur during the fall and winter when recreation use is lowest. All construction work will be performed to minimize impacts to environmental resources, including water quality, terrestrial vegetation, and wildlife near the construction sites. These minor, temporary disturbances, particularly the installation of new restrooms, creating or adapting existing ADA access, and improving kayaking access could affect existing vegetation and local water quality. However, implementation of proper sedimentation and erosion control BMPs and restoration practices during and immediately following construction, as recommended in the Green Book (Georgia Soil and Water Conservation Commission 2016), would minimize these impacts.

Unavoidable Adverse Impacts

Construction of the proposed recreation enhancements would permanently change the use of minor amounts of land within the project boundary, most of which would continue to be used for recreation purposes.

Construction of the kayak paved access and parking at Heath Lake would result in the permanent alteration of an open grassy area/meadow. The use of BMPs during construction would minimize impacts to water quality, wildlife habitat, and aesthetic resources.

3.2.7 Aesthetic Resources

3.2.7.1 Affected Environment

As described in Section 2.1.1, the Project includes an Upper Reservoir, a Lower Reservoir, two Auxiliary Pools, water conduits, a powerhouse, electrical transmission interconnection, and recreational facilities. There are approximately 5,000 acres of land and water within the project boundary, with 3,700 acres available to the public for recreational activities. The main features of the Project are identified on Figure 3 and descriptions of the visual character of the features are provided below.

The Upper Reservoir is a man-made impoundment that is 221 acres in size at normal maximum operating pool elevation and is formed by a 120-foot-high, 12,895-foot-long, continuous earth and rockfill dam, which circumscribes the natural concave top of Rock Mountain. The shoreline immediately adjacent to the reservoir is maintained clear of vegetation. Rock Mountain is forested with an access road on the eastern side of the mountain. Due to the elevation and intervening vegetation, the Upper Reservoir is generally hidden from public view.

The Project's water conduit is underground between the intake at the Upper Reservoir and the Powerhouse and is completely hidden from public view. The powerhouse on the Lower Reservoir can be seen from a portion of Auxiliary Pool I (Antioch Lake) and from trails along the south sides of Antioch Lake East and West. The top level of the powerhouse is visible as a broad concrete and metal deck that includes the entrance building, a small building housing the backup diesel generator, the air intake and west stairway, a large steel-frame crane, and four transformers. Designed like a steamboat, the entrance building is visible above-ground as a small one-story rectangular building clad in textured concrete panels with a flat concrete roof decorated with a faux smokestack and wheelhouse (TRC 2023b). The rest of the powerhouse extends more than seven stories below ground, hidden from view.

The Lower Reservoir is approximately 600 acres and is formed by the Main Dam and Dams A, B, D, E, F, and G. The Lower Reservoir extends upstream on Heath Creek and its tributaries around the north and west sides of Rock Mountain in the valley directly at the base of the mountain. Auxiliary Pool I lies north and Auxiliary Pool II lies west of the Lower Reservoir and both pools feed into the Lower Reservoir via a control gate or an ungated spillway. The Upper and Lower Reservoirs undergo daily water level fluctuations of 51 and 20 ft, respectively. The water level fluctuations of the Upper and Lower Reservoirs are mostly hidden from main roads, properties surrounding the project boundary, and the project recreational facilities because of the prevailing topography, vegetation, and relative isolation. Hikers and bikers may observe water level changes in the Lower Reservoir from trails and viewpoints along the south sides of Antioch Lake East and West.

The Project's two Auxiliary Pools are normally maintained at a relatively constant elevation. The pools provide reserve storage for drought periods, as well as recreational opportunities and wildlife management. Auxiliary Pool I is 400 acres and is contained by an ungated spillway and Dams D, C, E, and F. Auxiliary Pool II is 200 acres and is formed by a 30-foot-high, 335-foot-long earth and rockfill structure with an ungated spillway and low-level outlet works (Dam G). The Auxiliary Pools can be seen from several locations, including the project recreation facilities (as described in Section 3.2.6) and Antioch Baptist Church. Vegetation and forests surrounding the Auxiliary Pools obscure the visibility of the pools from most locations along the roads, although the pools can be seen from certain segments of public roads, depending on the season.

The Project includes a substation located 1.5 miles from the powerhouse and three 230-kV transmission lines in a single corridor comprising a total of 1.5 miles, known as the Primary Transmission Line.[13]

3.2.7.2 Environmental Impacts and Recommendations

OPC's proposal to continue operating the Project would not involve activities directly affecting visual aesthetic qualities within the project boundary. Due to intervening topography, forests, and vegetation, viewsheds of the project features are minimal and are primarily of the Auxiliary Pools from the project recreation facilities within the Rocky Mountain PFA. The project recreation facilities provide for naturally scenic views of Antioch Lake and Heath Lake, forested shorelines, wetlands, wildlife habitat, and mountainous topography beyond. The Upper and Lower Reservoirs undergo daily water level fluctuations of 51 and 20 ft, respectively, but these fluctuations are mostly hidden from public view by the intervening topography, vegetation, and relative isolation. No issues related to aesthetic resources have been identified at the Project. Thus, continued operation of the Project as proposed would not adversely affect aesthetic resources.

[13] As discussed in Section 2.1, Footnote 2, OPC will be proposing that the substation and the Primary Transmission Line be removed from the project works.

OPC is proposing the construction of recreation enhancements at existing recreation sites causing short-term, localized impacts to aesthetic resources. Potentially adverse impacts would only last during the active construction period. Aesthetics would be considered during the design and landscaping of new recreation amenities.

Unavoidable Adverse Impacts

No unavoidable adverse impacts to aesthetic resources are anticipated.

3.2.8 Cultural and Tribal Resources

3.2.8.1 Affected Environment

The Rocky Mountain project area, including Texas Valley and Rock Mountain, was used for thousands of years dating back to the Late Paleoindian period. The area was heavily used during the Early Archaic and Late Archaic times, and more lightly used in the Middle Archaic time. Historians believe that Texas Valley and Rock Mountain were likely isolated from mainstream prehistoric life during all periods (Garrow and Cleveland 1997a).

Between 1972 and 1996, many cultural resources studies were completed at the Project, which Garrow & Associates, Inc. summarized into one document, the *Cultural Resource Studies at the Rocky Mountain Project, Floyd County, Georgia: A Technical Synthesis, 1972-1977* (Garrow and Cleveland 1997a). The synthesis lists numerous prehistoric archaeological resources, historic archaeological resources, and historic architectural resources that have been documented in the project area since 1972.

Archaeological Assessment

In 2020, OPC conducted archaeological monitoring of six sites within the project boundary previously recommended for preservation and monitoring, with the goal of visually assessing the condition of each site (TRC 2021). Based on the monitoring observations, OPC conducted additional archaeological field surveys in 2022 at four of the sites to refine site boundaries, update the site forms, and evaluate the National Register of Historic Places (NRHP) eligibility status of one of the sites (TRC 2023b). TRC performed both the 2020 monitoring and the 2022 archaeological surveys for OPC.

Brief descriptions of the six sites are provided below.

- 9FL80 (The Fouche Mill Property) – this property was a Saw and Grist Mill and Fishing Club from the mid-19th to early 20th century. Originally developed by Simpson Fouche's sons, the site included a grist, sawmill, and cotton gin and a post office. The mill was sold to the Texas Valley Milling Company in 1896, which later developed the Texas Valley Fishing Club on the property. The mill component of the site was inundated when the Project's Lower Reservoir was created (TRC 2023b).
- 9FL106 (The Reed/Milam Property) – this site was a Farmstead from the mid-19th to early 20th century. The property was originally a farmstead complex that included a dogtrot log house, a shed, and an outhouse. The property ownership transferred from Reed to Milam and later to Epsy, where it remained until the late 1970s. The site is located on a walking trail at the Rocky Mountain Project and has several surface features visible (TRC 2023b).
- 9FL108 (The Cargle Property) – this property was a Farmstead from the early 20th century. The property changed hands frequently between 1832 and 1856 until it was acquired by Isaac Murdock. The Murdock family owned the property until the early 20th century, at which time the property again changed ownership frequently. A store on the property was in operation by 1916 and in the 1940s, then owner W. M. Cargle moved the store to a new location on the same property. The store was eventually moved to the Rocky Mountain Visitors Center where it is currently maintained. With the removal of the store, the Cargle Property has lost its integrity (TRC 2023b).
- 9FL138 (The Fisher House) – this site was a house from the mid-19th to early 20th century. The property was purchased in 1849 by John Fisher, who was thought to be the first Floyd County resident to own the property. The site remains intact with various surface features visible (TRC 2023b).
- 9FL148 (The Fouche/Hardy Farm) – this property was a House/Agricultural Complex from the mid-19th to mid-20th century. Previous surveys identified many structures and two prehistoric sites within the boundaries of the Fouche/Hardy Farm. Surveys in the 1980s characterized the site as having five distinct areas, which included structures such as houses, barns, smokehouses, campfires, among others (TRC 2023b).
- 9FL554 (The Clarence Montgomery Farm) – this property (previously known as site GP-FL-14/CRFL14) was a House from the early 20th century. The site includes house ruins, a collapsed log structure, collapsed wood frame outbuildings, and scattered trash. The house ruin is reported to have belong to Clarence Montgomery, a tenant on the Fouche/Hardy Farm. The site is typical of historic house sites in the area surrounding the Rocky Mountain Project (TRC 2023b).

During the 2020 site visit, TRC noted that three of the sites (9FL80, 9FL138 and 9FL148) were incorrectly plotted in the Georgia Site Files. An additional site, 9FL554, had not been previously assessed as to its NRHP eligibility status. On November 29 and 30, 2022, TRC returned to these four sites to confirm their location, correct any locational discrepancies present in the Georgia Site Files, and determine whether continued monitoring is necessary. Limited shovel testing was conducted at most sites to confirm site location and boundaries. A more intensive grid shovel testing was implemented at site 9FL554. A summary of the 2022 study is included in Table 21.

Table 21 Summary of 2022 Archaeological Assessment

Site ID	Site Name	Field Survey Activities/Objectives	NRHP Eligibility	TRC Recommendation
9FL80	Fouche Mill Property	Update site boundaries and site form	Unknown[b]	Annual monitoring
9FL106	Reed/Milam Property	none	Recommended	Annual monitoring
9FL108	Cargle Property[a]	none	Unknown[b]	Discontinue monitoring; site has lost integrity since removal of store
9FL138	Fisher House	Update site boundaries and site form	Recommended	Annual monitoring
9FL148	Fouche/Hardy Farm	Systematic pedestrian survey; update site boundaries and site form	Unknown[b]	Annual monitoring
9FL554/ GP-FL-14	Clarence Montgomery Farm	Shovel testing to delineate site boundaries, evaluate NRHP eligibility, update site form	Not Recommended	Discontinue monitoring; site has minimal integrity, does not meet NRHP criteria

[a] Former location of Cargle/Cordle Store, moved to Visitors Center.
[b] Previously assessed as not eligible; unknown by current standards.
Source: TRC 2023b

TRC (2023b) completed all of the study objectives and made recommendations for future monitoring. Annual monitoring is recommended for the Fouche Mill Property (9FL80) (specifically when lake levels are low to determine the extent of any existing mill features), the Reed/Milam Property (9FL106), the Fisher House (9FL138), and the Fouche/Hardy Farm (9FL148). The Fisher House and the Reed/Milam Property remain recommended eligible for listing in the NRHP. TRC (2023b) recommends that monitoring at the Cargle Property and the Clarence Montgomery House be discontinued, since these sites have lost their integrity, the Cargle store has been developed as an interpretive exhibit on public display, and the Clarence Montgomery House would not be affected by project operation and maintenance or project-related recreation.

As part of the 2022 archaeological survey, TRC assessed the presence of Traditional Cultural Properties (TCPs) within the Rocky Mountain project boundary. TRC reviewed the GNAHRGIS database, the *Revised Cultural Resources Management Plan for the Rocky Mountain Project, Floyd County, Georgia* (Garrow and Cleveland 1997b), and the previous cultural resources reports on file at OPC. No TCPs were noted in the available databases and the previous documentation of the Project.

Architectural Survey

OPC conducted an architectural survey of the Rocky Mountain Project in October 2022, which included background research and photographic documentation of major project structures. The survey was conducted by TRC (2023a) using the guidelines of the *Georgia Historic Resources Survey Manual*, the National Register Bulletin 24, *Guidelines for Local Surveys: a Basis for Preservation Planning*, and National Register Bulletin 15, *How to Apply the National Register Criteria for Evaluation*.

Information was compiled and subsequent recommendations were made regarding eligibility for listing in the NRHP for the project works. Per 36 CFR 60.4, cultural resources eligible for listing on the NRHP are buildings, structures, objects, sites, and districts that have "integrity" and meet one or more of the criteria listed below.

- Criterion A (Event). Association with one or more events that have made a significant contribution to the broad patterns of national, state, or local history.
- Criterion B (Person). Association with the lives of persons significant in the past.
- Criterion C (Design/Construction). Embodiment of distinctive characteristics of a type, period, or method of construction; or representation of the work of a master; or possession of high artistic values; or representation of a significant and distinguishable entity whose components may lack individual distinction.
- Criterion D (Information Potential). Properties that yield, or are likely to yield, information important in prehistory or history. Criterion D is most often (but not exclusively) associated with archaeological resources. To be considered eligible

under Criterion D, sites must be associated with specific or general patterns in the development of the region. Therefore, sites become significant when they are seen within the larger framework of local or regional development.

For a property to be eligible for listing in the NRHP, it must exhibit qualities of physical integrity. Aspects of physical integrity include location, setting, materials, workmanship, feeling, and association.

While the project was noted to be in excellent condition without any major structural alterations since completion in 1995, TRC (2023a) concluded that the Rocky Mountain Project is not eligible for NRHP listing. The Project does not meet any of the criteria required for eligibility and is under 50 years of age. The Project will reach 50 years of age in 2045. In addition, the Project does not possess exceptional importance regarding the history of hydroelectric power development.

Tribal Resources

There are no federally recognized tribal lands existing in the State of Georgia. However, there are several federally recognized Indian Tribes that historically occupied the project vicinity. Consistent with the National Historic Preservation Act (NHPA) and implementing regulations (36 CFR 800), on April 8, 2021, FERC made initial contact inviting Indian Tribes[14] to participate in the Rocky Mountain Project relicensing. FERC continued to reach out to Tribes through May and June 2021. The Muscogee (Creek) Nation stated that there are no likely concerns regarding the Project and their tribe. The Cherokee Nation expressed interest and requested continued consultation for the Project. In August 2021, FERC reached out to the Tribes listed below and received no response.

- Alabama-Quassarte Tribal Town
- Coushatta Tribe of Louisiana
- Eastern Band of Cherokee Indians
- Kialegee Tribal Town
- Thlopthlocco Tribal Town
- Poarch Band of Creeks
- United Keetoowah Band of Cherokee Indians

[14] See Document Accession # 20210408-3027 for a list of the Indian Tribes contacted by FERC.

- Eastern Shawnee Tribe of Oklahoma
- Alabama-Coushatta Tribe of Texas
- Seminole Nation of Oklahoma

3.2.8.2 Environmental Impacts and Recommendations

Sources of potential adverse impacts to cultural resources listed in the existing CRMP include future project-related construction or ground disturbing activities; pothunting or vandalism; and natural disturbances caused by erosion or flooding. The archaeological monitoring and surveys performed in 2020 and 2022 found all six sites to be well maintained and protected, with no evidence of looting, natural destruction, erosion caused by project operations, or vandalism. Continued project operations are not expected to have any adverse effects on the identified archaeological properties at the Project because no ground disturbing or construction activities are planned at this time.

OPC will consult with GHPD, affected Indian Tribes, and the Advisory Council on Historic Preservation in developing a Historic Properties Management Plan and implementing a Programmatic Agreement for the Project to avoid impacts to historic properties. OPC proposes to annually monitor the four historic properties recommended in the 2022 archaeological survey (TRC 2023b) throughout a new license term to prevent pothunting or vandalism from occurring.

3.2.9 Socioeconomic Resources

3.2.9.1 Affected Environment

The Project is in Floyd County, Georgia, approximately 10 miles northwest of the city of Rome. Rome is the most populous city in the county and is the county seat. The Project employs 33 full-time and two part-time employees and contributes over $3,200,000 per year in tax revenue to Floyd County.

The following sections describe socioeconomic conditions in the project region, including: the city of Rome, Floyd County, Chattooga County[15], and the state of Georgia, to provide context. The selected socioeconomic characteristics of the project region discussed

[15] No portion of the Project is located in Chattooga County, Georgia; however, the one-mile buffer used for the Environmental Justice analysis includes Chattooga County.

include general land use patterns, population patterns, income, poverty, and employment. In addition, the Rocky Mountain project boundary and surrounding one-mile buffer were screened for environmental justice communities.

General Land Use Patterns

As described further in Sections 3.1.2 and 3.2.6, the area immediately surrounding the Project is primarily rural. Land cover within the project boundary, which encompasses about 5,000 acres, can be divided into the following categories: project works, public recreation, and wildlife habitat. Land use in the project vicinity is devoted to small-scale farming and scattered residences. The project region contains both rural and urban areas.

Population Patterns

Table 22 summarizes the population, demographics, income, poverty, and employment in the project region. In 2020, the total population of Floyd County was 98,584, the total population of Chattooga County was 24,965, the population of the city of Rome was 37,713, and the population of the state of Georgia was 10,711,908 (U.S. Census Bureau 2023). Gender and age across Rome, Floyd and Chattooga counties, and the state of Georgia are generally similar. Regarding race, 80.0 and 86.6 percent of the Floyd County and Chattooga County populations, respectively, are white. In Rome, 61.2 percent of the population is white and 59.4 percent of the population in the state of Georgia is white. The Black or African American population makes up 15.0 percent of the total population in Floyd County, 10.0 percent in Chattooga County, 33.0 percent in Georgia, and 25.1 percent in Rome.

Median household income (in 2021 dollars) was $52,388 for Floyd County and $37,946 for Chattooga County, both of which are below the statewide median household income. When looking at all persons, the poverty rate was 16.2 percent for Floyd County and 20.2 percent for Chattooga County, which is higher than the statewide poverty rate of 14.0 percent.

Table 22 Population Patterns, Demographics, Income, Poverty, and Employment of Project Region

	City of Rome	Floyd County	Chattooga County	Georgia
Population				
Population (2020)	37,713	98,584	24,965	10,711,908
Population (2021 estimate)	37,746	98,499	24,828	10,788,029
Population Change (2020 to 2022)	0.1%	-0.1%	-0.6%	0.7%
Geography				
Land Area (sq mi)	31.7	509.8	313.3	57,716.9
Population Density (people/sq mi)	1,190.5	193.4	79.7	185.6
Gender				
Female	54.0%	51.1%	48.9%	51.2%
Male	46.0%	48.9%	51.1%	48.8%
Age				
Persons under 5 years old	5.5%	5.7%	5.9%	5.9%
Persons under 18 years old	25.1%	22.8%	22.1%	23.4%
Persons 65 years old and over	16.2%	17.0%	18.5%	14.7%
Race				
White alone	61.2%	80.0%	86.6%	59.4%
Black or African American alone	25.1%	15.0%	10.0%	33.0%
American Indian and Alaska Native alone	0.9%	0.9%	0.5%	0.5%
Asian alone	2.0%	1.6%	0.6%	4.6%
Native Hawaiian and Other Pacific Islander alone	0.0%	0.3%	0.4%	0.1%
Two or More Races	6.2%	2.2%	2.0%	2.4%
Hispanic or Latino				
Hispanic or Latino	22.1%	12.1%	5.7%	10.2%
White alone, Not Hispanic or Latino	47.5%	69.8%	82.1%	51%
Health				
Disability	13.9%	11.5%	13.0%	8.9%
Education				
High School graduate or higher	78.9%	83.7%	72.0%	88.2%
Bachelor's Degree or higher	25.0%	20.9%	10.9%	33.0%
Income, Poverty, and Employment				
Median Household Income	$40,000	$52,388	$37,946	$65,030
Per Capita Income	$26,749	$28,051	$19,577	$34,516
Poverty Rate	24.7%	16.2%	20.2%	14.0%
In Labor Force	55.1%	57.6%	48.2%	62.9%

U.S. Census Bureau 2023

Environmental Justice

Executive Order 14008, Tackling the Climate Crisis at Home and Abroad, and Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, as amended, require federal agencies to consider if impacts on human health or the environment would be disproportionately high and adverse for minority and low-income populations in the surrounding community resulting from the programs, policies, or activities of federal agencies. As defined by FERC, the term "environmental justice (EJ) community" includes disadvantaged communities that have been historically marginalized and overburdened by pollution. EJ communities include but may not be limited to minority populations, low-income populations, or Indigenous peoples. Census block groups are statistical divisions of census tracts that generally contain between 600 and 3,000 people and the thresholds used for populations meeting EJ status are as follows:

- For minority populations, the meaningfully greater analysis method was used, where the minority population in a block group is at least 10 percent greater than that of the same population for the county.
- The "low-income threshold criteria" was used to identify environmental justice communities based on income level, where the percent of low-income population in the identified block group is equal to or greater than that of the county.

A one-mile buffer surrounding the Rocky Mountain project boundary was screened for EJ communities using the methods described above. Figure 14 depicts the census block groups that intersect the area screened for EJ (Block Group 1 in census tract 101.00, Block Group 1 in census tract 106.00, and Block Group 1 in census tract 003.00). Table 23 provides associated race and ethnicity data, as well as data on households in poverty of applicable block groups, counties, and the state of Georgia. There are no EJ communities within a one-mile buffer of the project boundary, as the poverty levels of applicable block groups are lower than the respective county poverty level and the minority populations of applicable block groups do not exceed the established thresholds (U.S. Census Bureau 2020).

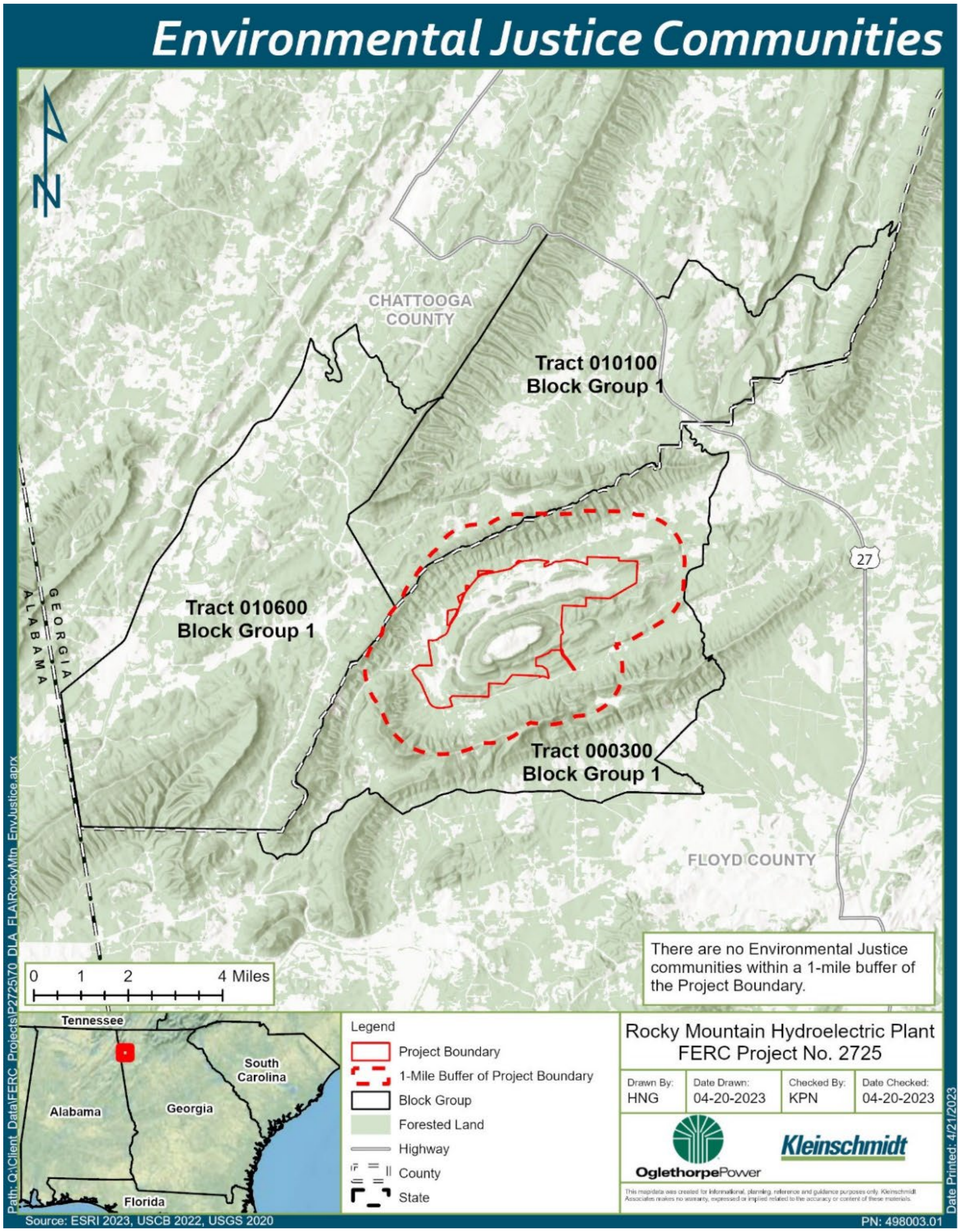

Figure 14 Environmental Justice Communities

Table 23 Race, Ethnicity, and Income Data for Environmental Justice Screening

	RACE AND ETHNICITY DATA										LOW-INCOME DATA	LANGUAGE DATA
Geographic Area	**Total Population (count)**	**White Alone, not Hispanic (count)**	**African American/ Black (count)**	**Native American/ Alaska Native (count)**	**Asian (count)**	**Native Hawaiian & Other Pacific Islander (count)**	**Some Other Race (count)**	**Two or More Races (count)**	**Hispanic or Latino (count)**	**Total Minority Population (%)**	**Below Poverty Data (%)**	**Non-English Speaking Persons Aged 5 Years and Greater (%)**
Georgia	10,516,579	5,478,289	3,275,581	17,433	430,473	5,441	38,425	257,880	1,013,057	48%	14%	1%
Chattooga County	**24,826**	**20,500**	**2,376**	**15**	**91**	**0**	**0**	**519**	**1,325**	**17%**	**21%**	**0%**
Census Tract 010600, Block Group 1	1,619	1,426	28	15	12	0	0	123	15	12%	13%	0%
Census Tract 010100, Block Group 1	655	571	62	0	0	0	0	0	22	13%	1%	0%
Floyd County	**97,805**	**68,886**	**13,437**	**108**	**1,147**	**0**	**400**	**2,778**	**11,049**	**30%**	**17%**	**2%**
Census Tract 000300, Block Group 1	752	696	36	0	0	0	0	0	20	7%	5%	0%

Source: U.S. Census Bureau 2020

3.2.9.2 Environmental Impacts and Recommendations

OPC proposes to operate the Rocky Mountain Project in the same manner as currently operated with similar contributions to the local economy resulting from lower cost renewable energy provided from this Project to its customers, jobs, and operating and maintenance funding. The Licensee pays a gross shared revenue tax to the state of Georgia, which is distributed to communities throughout the state. The Project also contributes to the local labor force through employment opportunities at the Project and associated recreation resources. Given the current positive contribution the Project makes to local socioeconomic resources, no change to socioeconomic resources are expected. In addition, no environmental justice communities were identified in the 1-mile buffer surrounding the Project. Hence, OPC's proposal for continued project operation would not adversely affect socioeconomic resources or environmental justice communities in the project vicinity.

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APPENDIX A

CONSULTATION RECORD

Appendix B

Study Reports

WATER QUALITY ASSESSMENT STUDY REPORT

ROCKY MOUNTAIN PUMPED STORAGE HYDROELECTRIC PROJECT

(FERC NO. 2725)

Prepared for:

Oglethorpe Power Corporation

Prepared by:

Kleinschmidt Associates

September 2023

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1.0 INTRODUCTION

This report presents the findings of the Water Quality Assessment conducted for the Federal Energy Regulatory Commission (FERC) relicensing of Oglethorpe Power Corporation's (OPC's) Rocky Mountain Pumped Storage Hydroelectric Project (FERC No. 2725) (Rocky Mountain Project, the Project). The study was conducted according to OPC's Final Study Plan for the Project distributed in August 2022 (OPC 2022) and included discrete water chemistry sampling at four historic sampling stations and continuous monitoring in Heath Creek downstream of the Main Dam. OPC will use the information generated by this study to evaluate the potential effects of continued project operation on water quality at the Project in the license application.

The 904-megawatt Rocky Mountain Project consists of a 221-acre Upper Reservoir, a 600-acre Lower Reservoir, two Auxiliary Pools, and a powerhouse on Heath Creek in Floyd County, Georgia. OPC is not proposing to add capacity or make any major modifications to the Project under the new license. The Project does not occupy any federal lands. The original license expires December 31, 2026.

The Project's Main Dam and Lower Reservoir are located on Heath Creek within the Armuchee Creek tributary system of the Oostanaula River in the upper Coosa River basin. The upstream drainage area of Heath Creek at the Main Dam is 16.6 square miles (sq mi). Heath Creek flows from the Main Dam about 4 stream miles to Little Armuchee Creek. Little Armuchee Creek flows into Armuchee Creek, which flows into the Oostanaula River.

1.1 Objectives

The specific objectives of this study were to:

- Characterize existing water quality in the Rocky Mountain study area.
- Develop water quality information sufficient for analyzing the effects of project operation and maintenance and project-related recreation on water quality in the license application.

1.2 Study Area

The study area for the Water Quality Assessment included the Lower Reservoir, Auxiliary Pool I (Antioch Lake), Auxiliary Pool II (Heath Lake), and Heath Creek downstream of the Main Dam within the project boundary. (Figure 1).

Figure 1 Water Quality Monitoring Sites

2.0 METHODS

2.1 Discrete Monitoring

Discrete water chemistry samples were collected monthly between June 2022 and May 2023 at four historic water quality sampling stations within the project boundary (Figure 1).[1] The stations included:

- RM11 (Heath Creek downstream of Main Dam)
- RM13 (Heath Lake)
- RM15 (Antioch Lake East)
- RM16 (Lower Reservoir near the Main Dam)

Samples were analyzed by Pace Analytical Services, LLC (Pace)(NELAC No. E87653) for Ammonia, Total Kjeldahl Nitrogen (TKN), Nitrate-Nitrite, Total Phosphorus, Orthophosphate, and 5-day Biochemical Oxygen Demand (BOD). The analytical methods and detection limits are summarized in Table 1. In addition, spot measurements of surface water temperature, specific conductance, pH, dissolved oxygen (DO), and turbidity were collected at each site during discrete chemistry sample collection using an EXO 3 multiparameter sonde (Yellow Springs Instruments).

Sample results were compared to historical sampling results from 1996 to 2020 as presented in the Pre-Application Document (PAD) for the same parameters. Appendix A provides the water quality sampling summary data tables from the PAD.

At the recommendation of the Georgia Department of Natural Resources Environmental Protection Division (GEPD), an additional sample for Ammonia was collected in Heath Creek at Texas Valley Road in July 2022. The sample was collected at fish sampling station HC-2, located about 2.5 stream miles downstream of the Main Dam, for the purpose of detecting whether downstream ammonia concentrations could pose stress to freshwater mussels.

[1] The Pre-Application Document summarizes water quality data collected by OPC and the Georgia Department of Natural Resources at the Project between 1996 and 2020. Tabular summaries of those data are presented in Appendix A of this report.

Table 1 Detection Limits for Discrete Chemistry Samples Analyzed by Pace

Analyte	Method	Method Detection Limit (mg/L)	Reported Detection Limit (mg/L)
Ammonia	350.1	0.117	0.250
TKN	351.2	0.140	0.250
Nitrate-Nitrite	353.2	0.050	0.100
Total Phosphorus	365.4	0.035	0.100
Orthophosphate	SM 4500P E-2011	0.014	0.030
BOD	SM 5210 B-2016	NA	3.33

Note: mg/L = milligrams per liter

2.1 Continuous Monitoring - Heath Creek

A HOBO DO logger (Onset Computer Corp.) was deployed in Heath Creek approximately 1,000 ft downstream of the Main Dam on June 23, 2022. The logger was programmed to record measurements of water temperature and DO at hourly intervals. Data was downloaded from the DO logger at approximately one-month intervals during which it was cleaned and checked for accuracy using an EXO 3 multiparameter sonde. During the summer months, the DO logger was checked and cleaned more frequently (approximately every two weeks) to prevent excessive biofouling. The one-year monitoring period ended on June 30, 2023.[2]

[2] Based on study update/preliminary results meetings with agencies in May-June 2023, OPC has been conducting a second season of DO monitoring in July-September 2023 to investigate potential causes of intermittent instances of DO concentrations falling below 4.0 mg/L in Heath Creek, as observed in July-August 2022. At the conclusion of the second season of monitoring, the DO monitoring results will be updated in a separate study report addendum.

3.0 RESULTS AND DISCUSSION

3.1 Discrete Monitoring

The results of the laboratory analysis of eleven sets of monthly samples (June 2022-May 2023) are summarized in Table 2. Due to a laboratory error, samples from December 2022 were not tested and were discarded. The results for most parameters at each site were generally lower compared to previous analyses (OPC 2021). Ammonia was only detected at measurable levels in three samples – one from RM13 (Heath Lake) and two from RM 15 (Antioch Lake East). Ammonia was not detected in measurable levels in Heath Creek at RM11 during any month or in Heath Creek 2.5 miles downstream of the Main Dam in July 2022. The highest average concentrations for TKN, nitrate-nitrite, and total phosphorus occurred in samples from RM15. Orthophosphate was detected in only a single sample from RM11 (Heath Creek).

The results of monthly measurements of water temperature, specific conductance, pH, DO, and turbidity are presented in Table 3 and Figures 2 to 7. Results for each parameter generally exceeded applicable water quality criteria minima. However, pH values exceeded the water quality criteria maximum of 8.5 on five occasions at RM13 (Heath Lake; June, July, and August 2022; April and May 2023), and on four occasions at RM 15 (Antioch Lake East; June, July, and August 2022; May 2023). These occurrences were likely associated with high levels of primary production (i.e., photosynthesis) by algae/phytoplankton as evidenced by the associated high levels of DO saturation measured concurrently with the high pH values. These high levels of primary production are likely due in part to fertilization practices utilized by the Georgia Department of Natural Resources (GDNR) to enhance fish production for angler success in these lakes.

Table 2 Analytical Results for Monthly Discrete Chemistry Samples Collected at the Project

Analyte		RM11		RM13		RM15		RM16	
		Current[1]	Historical[2]	Current	Historical	Current	Historical	Current	Historical
Ammonia (mg/L)	# Detections	0	-	1	-	2	-	0	-
	Min	NA	0.02	0.160	0.031	0.180	0.024	NA	0.026
	Avg	NA	0.285	0.160	0.353	0.438	0.335	NA	0.266
	Max	NA	1.06	0.160	1.770	0.696	2.011	NA	1.490
TKN (mg/L)	# Detections	4	-	11	-	10	-	4	-
	Min	0.120	0.0002	0.152	0.0001	0.246	0.0001	0.13	0.0001
	Avg	0.158	0.640	0.717	0.799	0.627	0.732	0.218	0.638
	Max	0.190	2.800	2.100	6.000	1.040	3.900	0.418	6.550
Nitrate-Nitrite (mg/L)	# Detections	11	-	3	-	2	-	9	-
	Min	0.008	0.0002	0.0571	0.0004	0.210	0.003	0.005	0.006
	Avg	0.132	0.405	0.109	0.365	0.222	0.474	0.081	0.385
	Max	0.560	1.611	0.210	1.099	0.234	1.370	0.230	1.740
Total Phosphorus (mg/L)	# Detections	1	-	3	-	6	-	0	-
	Min	0.047	0.011	0.006	0.015	0.005	0.040	NA	0.040
	Avg	0.047	0.221	0.084	0.223	0.060	0.244	NA	0.266
	Max	0.047	1.440	0.201	3.846	0.110	2.880	NA	4.360
Orthophosphate (mg/L)	# Detections	1	-	0	-	1	-	0	-
	Min	0.030	0.020	NA	0.020	0.053	0.020	NA	0.020
	Avg	0.030	0.163	NA	0.181	0.053	0.181	NA	0.176
	Max	0.030	1.070	NA	1.630	0.053	1.890	NA	2.910
BOD (mg/L)	# Detections	3	-	7	-	6	-	2	-
	Min	3.40	2.60	3.80	2.90	3.56	2.10	7.68	3.80
	Avg	7.18	11.58	7.72	13.92	4.30	14.62	8.84	17.17
	Max	13.10	69.00	12.10	98.00	5.5	97.00	10.00	125.00

[1] June 2022 – May 2023; [2] 1996 - 2020

Table 3 Summary of Spot Measurements Collected During Monthly Discrete Chemistry Sampling

Location		Water Temperature (°C)	Specific Conductance (µs/cm)	pH	DO (mg/L)	DO (% sat.)	Turbidity (FNU)
RM11	Min	7.21	111.4	7.03	6.11	74.7	0.66
	Avg	17.00	129.3	7.63	9.16	92.6	1.64
	Max	25.86	147.3	7.96	12.07	108.3	2.96
RM13	Min	6.84	54.9	6.81	4.69	53.9	1.40
	Avg	20.04	69.4	8.10	9.65	107.5	4.30
	Max	31.79	86.1	9.89	13.39	182.2	17.55
RM15	Min	7.77	71.7	7.22	5.22	49.6	0.74
	Avg	19.74	80.7	8.08	9.14	100.0	1.92
	Max	30.72	99.3	9.62	13.13	156.0	6.29
RM16	Min	9.62	102.2	7.43	6.80	82.2	0.00
	Avg	20.02	114.2	7.75	9.01	97.4	1.73
	Max	30.01	125.2	7.97	11.22	109.2	6.58

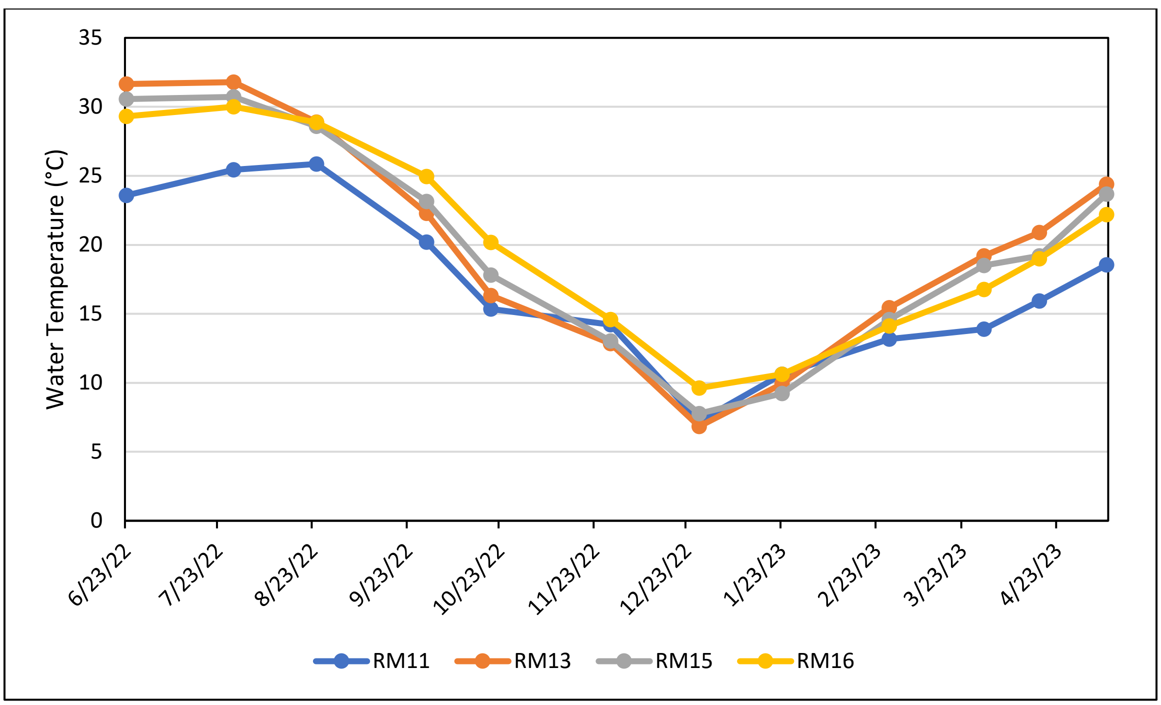

Figure 2 Monthly Water Temperature Measurements Collected During Monthly Discrete Chemistry Sampling

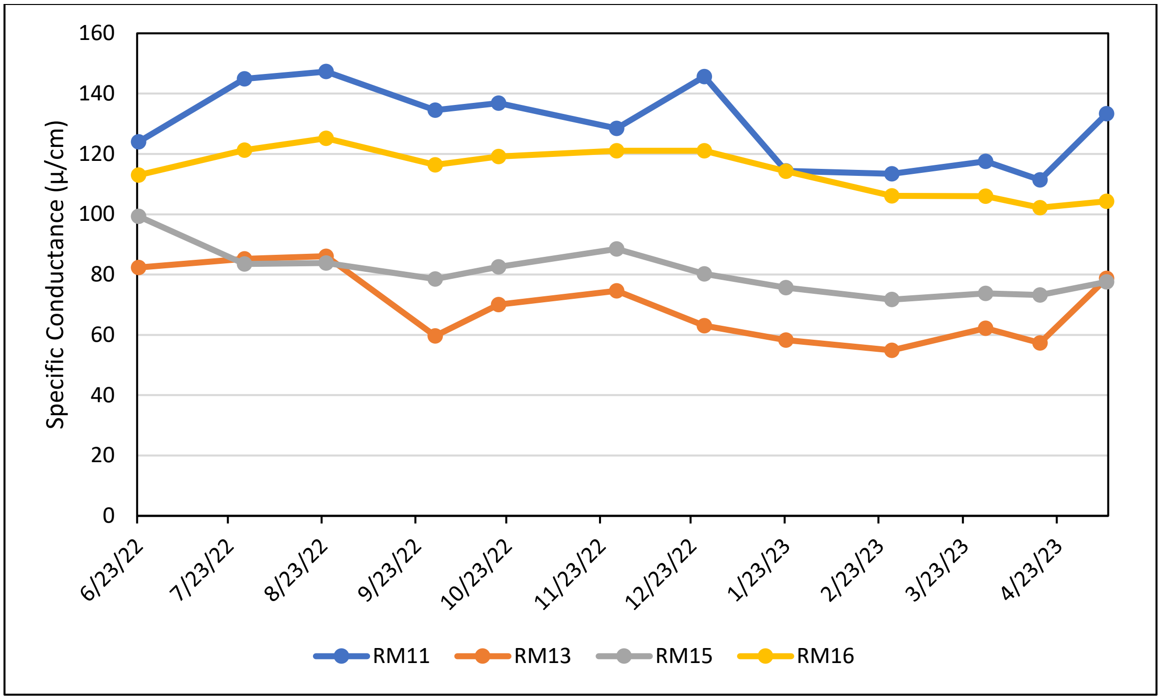

Figure 3 Monthly Specific Conductance Measurements Collected During Monthly Discrete Chemistry Sampling

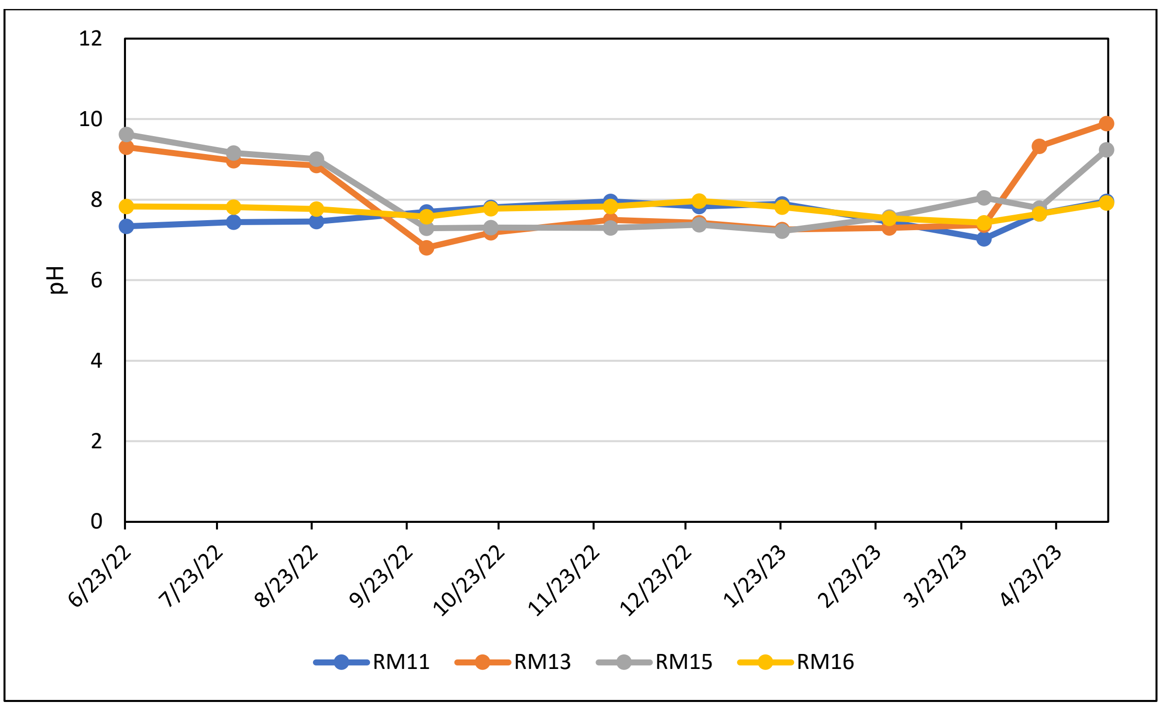

Figure 4 Monthly pH Measurements Collected During Monthly Discrete Chemistry Sampling

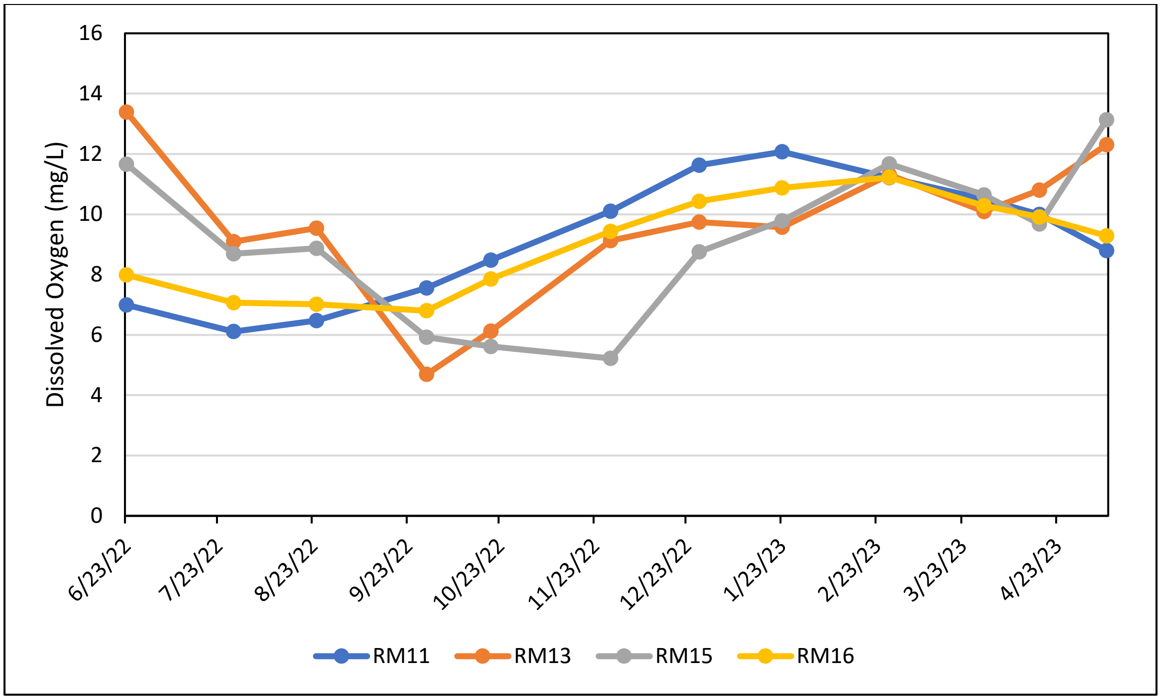

Figure 5 Monthly Dissolved Oxygen Measurements Collected During Monthly Discrete Chemistry Sampling

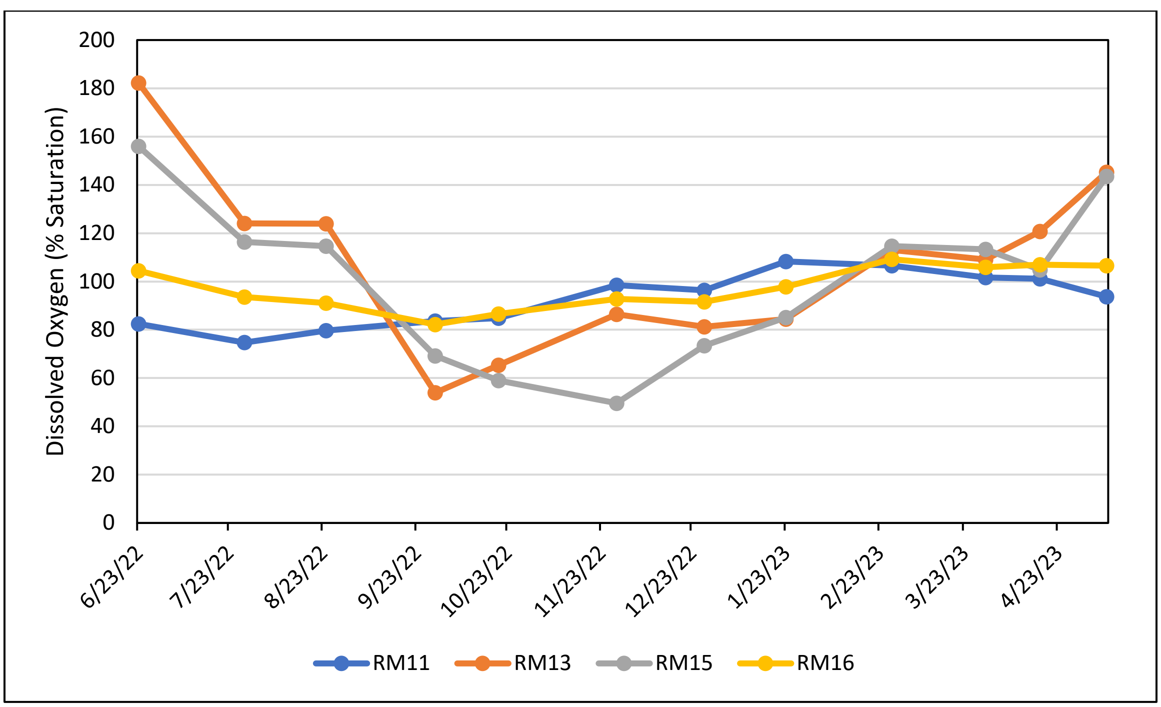

Figure 6 Monthly Dissolved Oxygen Saturation Measurements Collected During Monthly Discrete Chemistry Sampling

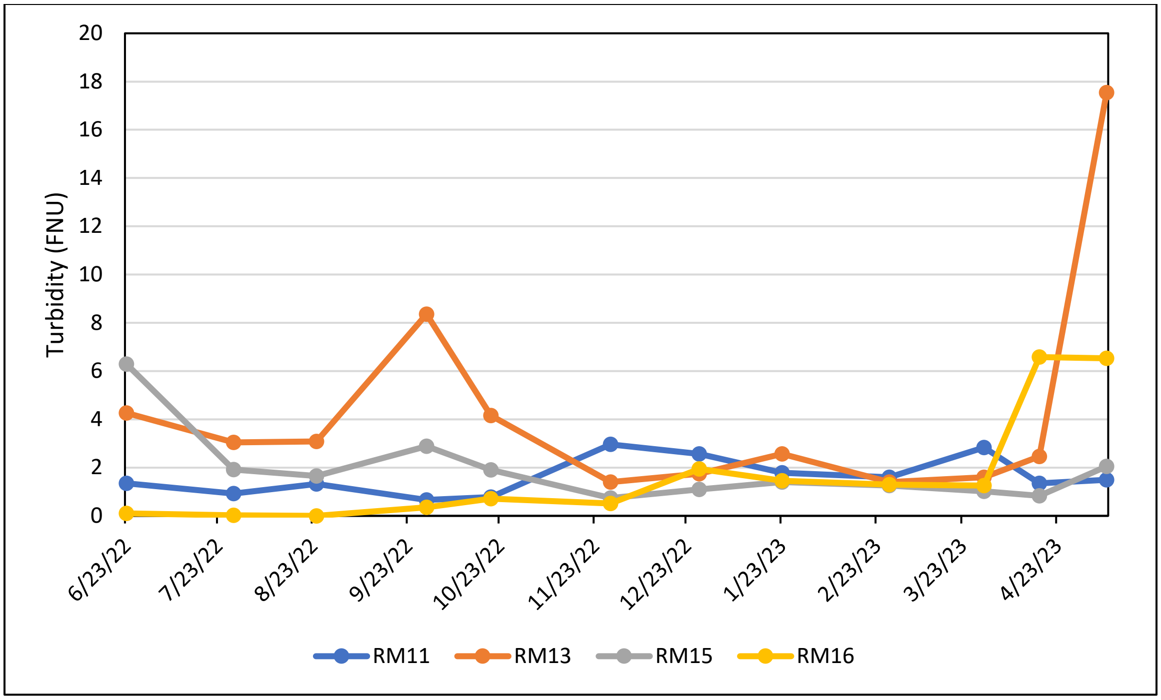

Figure 7 Monthly Turbidity Measurements Collected During Monthly Discrete Chemistry Sampling

3.2 Continuous Monitoring – Heath Creek

The continuous DO/water temperature logger was deployed in Heath Creek downstream of the Main Dam on June 23, 2022. Due to a high flow event in September 2022, the logger became buried in sediment and did not collect representative data between September 4 and September 29. Additionally, a logger malfunction resulted in missing measurements between January 21 and March 10, 2023. During the monitoring period, DO concentrations ranged from a minimum of 2.32 milligrams per liter (mg/L) to a maximum of 12.71 mg/L (Table 4). Water temperatures ranged from a low of 7.00 degrees Celsius to a high of 30.22 degrees Celsius.

Daily average DO concentrations were above the water quality criteria minimum of 5.0 mg/L for all days measured (Figure 8). However, there were several instances where DO concentrations fell below the instantaneous minimum criteria of 4.0 mg/L in July and August 2022. In total, there were 12 events where instantaneous DO levels were less than 4.0 mg/L. The duration of these events ranged from a minimum of one hour (single measurement) to a maximum of 5 hours. Of the 3,997 hourly DO measurements recorded by the logger during the critical period in 2022 (June 23-October 31) and 2023 (May 1-

June 30), a total of 37 measurements (0.93 percent) were less than 4.0 mg/L. Line graphs depicting hourly DO and water temperature in Heath Creek are presented in Figures 9 and 10.

These intermittent instances of low DO values were examined in an effort to determine potential causes. Several of the low DO events were plotted along with water surface elevations for the Lower Reservoir. In all instances, the low DO events occurred as the Lower Reservoir water surface elevation was rising during conventional generation. It is hypothesized that these low DO events were potentially the result of hydrodynamic turbulence during conventional generation that pushed low-DO water from the inactive storage zone of the Lower Reservoir into the withdrawal zone of the minimum flow release intake on the upstream side of the main dam during the beginning of generation. A line plot depicting an example of this phenomenon is presented in Figure 11.

Table 4 Summary of Continuous Monitoring Data Collected in Heath Creek Downstream of the Main Dam

Month	Dissolved Oxygen (mg/L)			Water Temperature (°C)		
	Min	Average	Max	Min	Average	Max
Jun-22	5.55	6.74	7.89	23.18	24.57	27.00
Jul-22	3.07	6.13	8.11	23.80	26.28	29.66
Aug-22	2.32	6.12	8.11	26.30	27.58	30.22
Sep-22	4.02	6.49	9.90	22.18	26.09	29.20
Oct-22	6.74	7.98	9.26	16.92	20.01	24.52
Nov-22	6.53	9.15	11.61	11.94	15.94	20.68
Dec-22	9.99	11.21	12.26	7.00	12.06	14.58
Jan-23	10.72	11.89	12.71	9.10	10.34	11.20
Feb-23	-	-	-	-	-	-
Mar-23	9.49	10.75	11.99	11.40	14.11	17.92
Apr-23	7.19	9.81	11.24	14.70	16.80	20.56
May-23	4.23	8.50	10.13	16.64	19.80	22.94
June-23	6.26	7.63	9.46	19.68	22.18	25.82

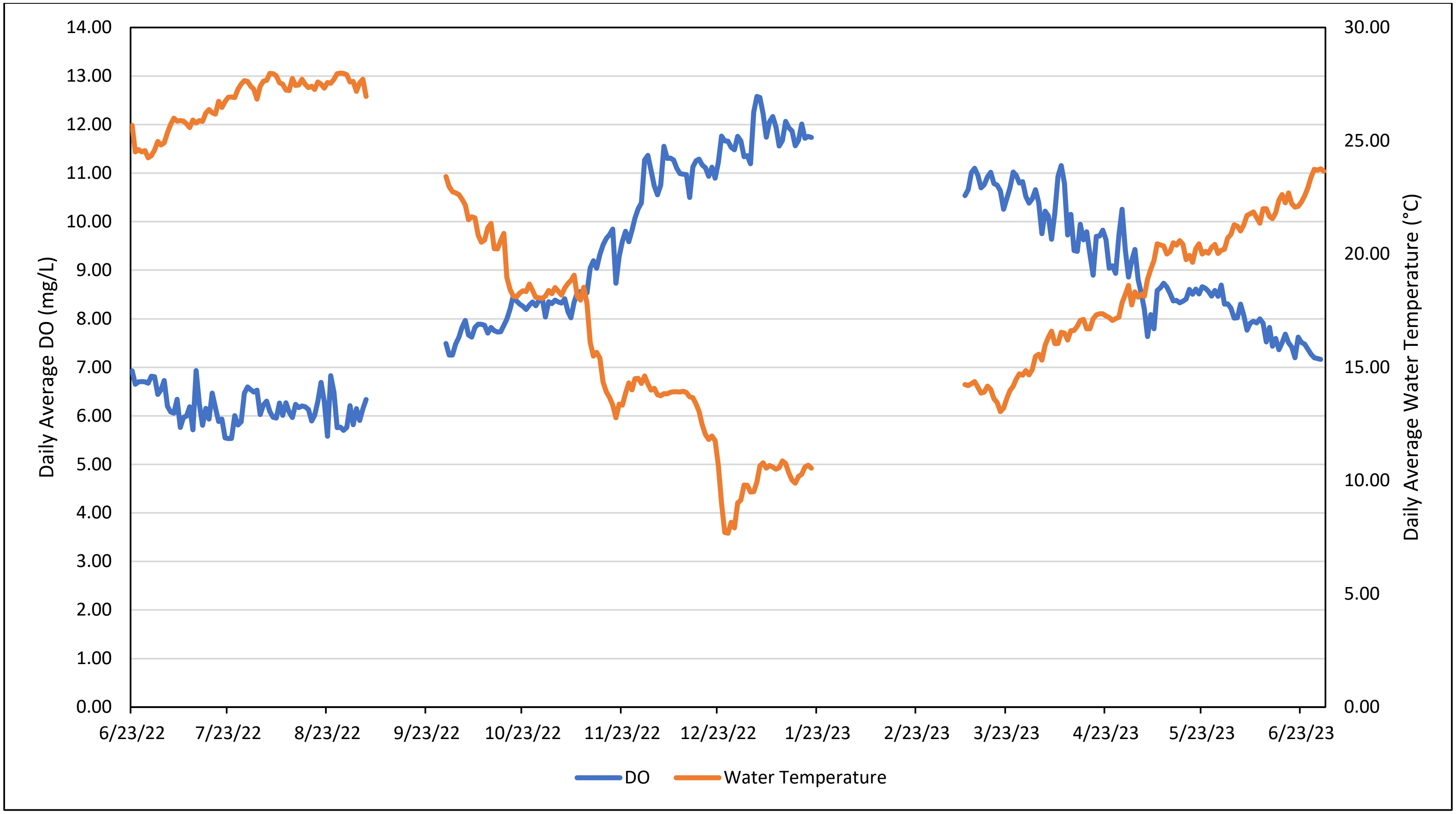

Figure 8 Line Plot of Daily Average Dissolved Oxygen and Water Temperature in Heath Creek Below the Main Dam

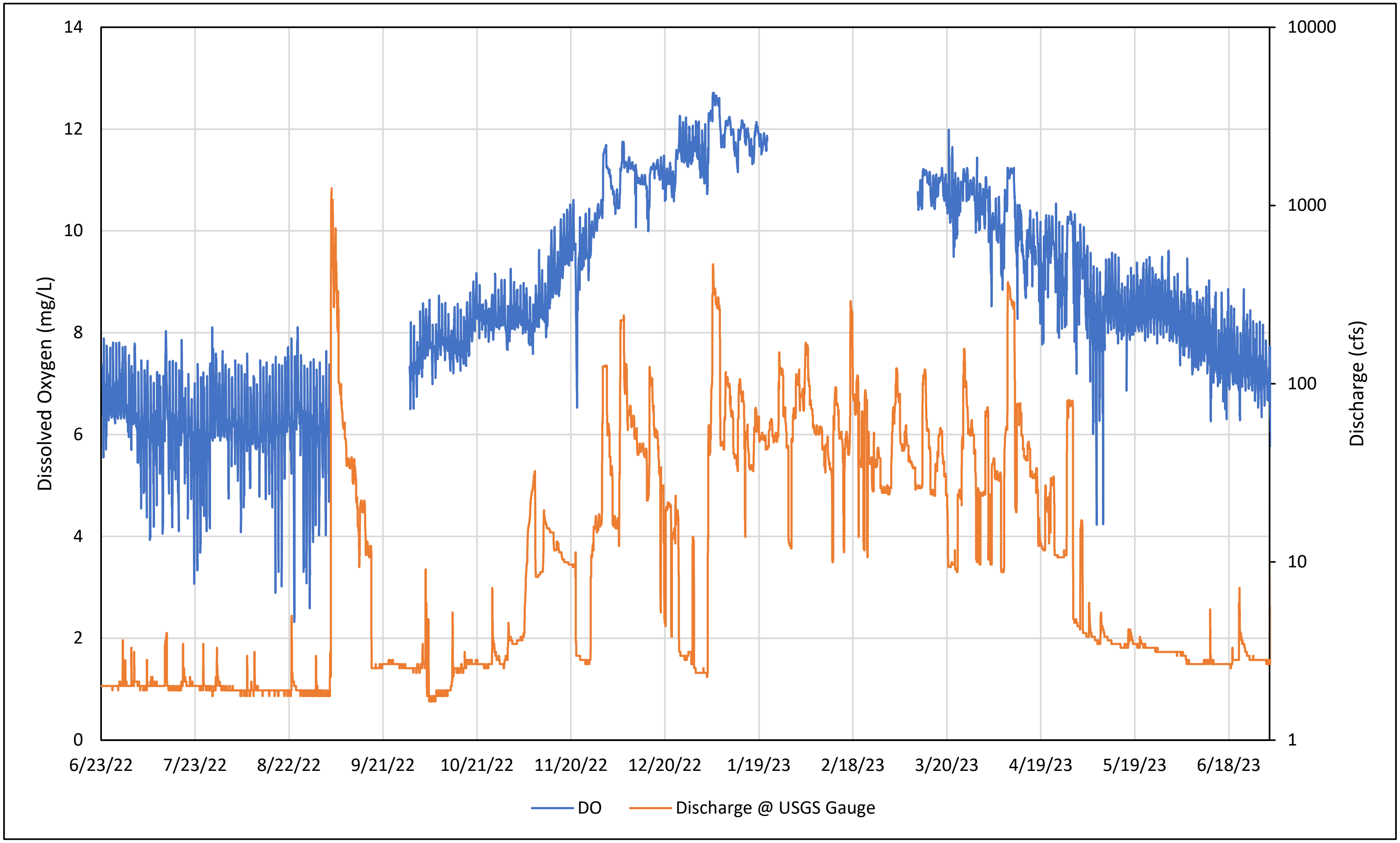

Figure 9 Line Plot of Hourly Dissolved Oxygen Measurements in Heath Creek Below the Main Dam

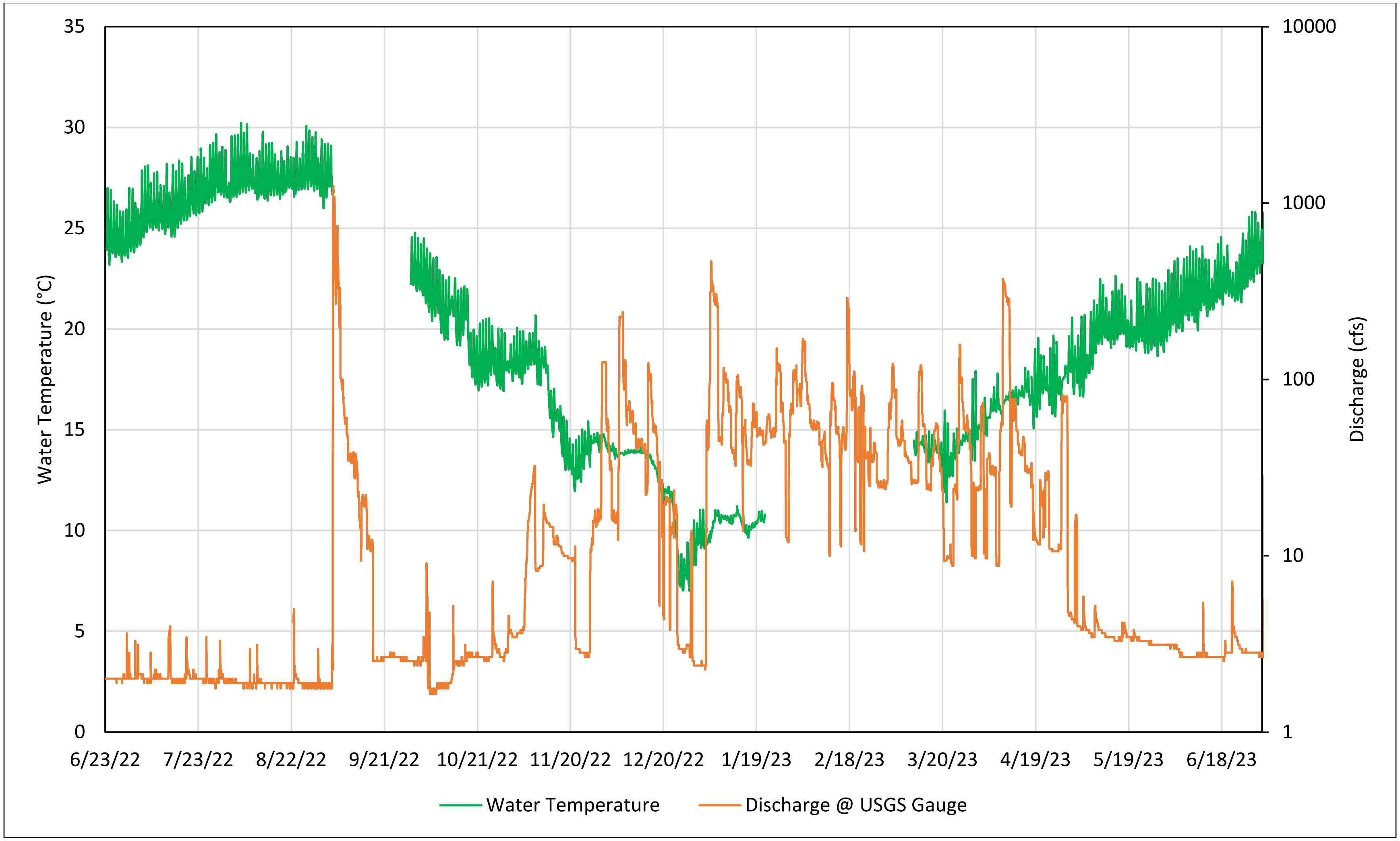

Figure 10 Line Plot of Hourly Water Temperature Measurements in Heath Creek Below the Main Dam

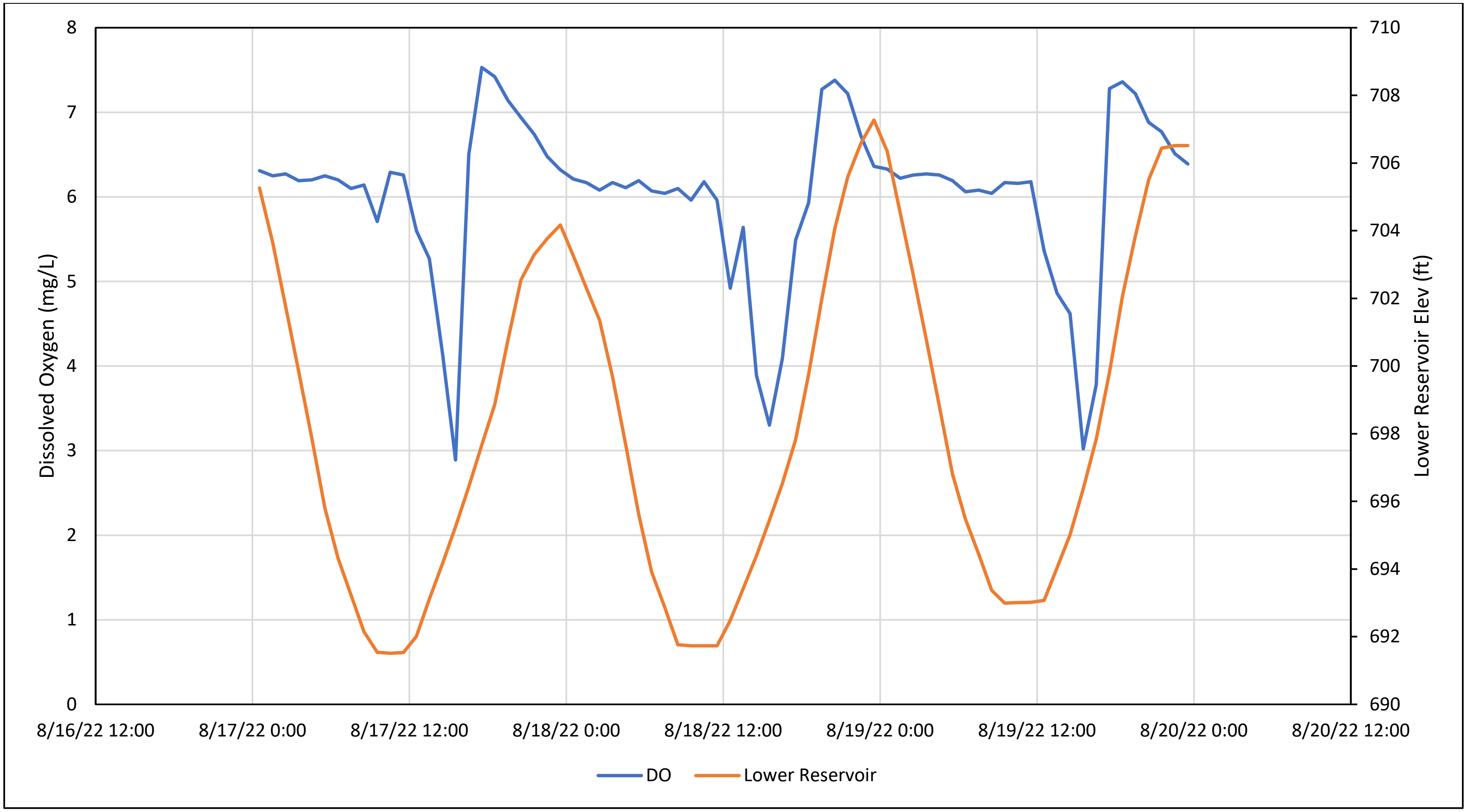

Figure 11 Line Plot Depicting a Low DO Event in August 2022

4.0 SUMMARY

In accordance with the Final Study Plan, OPC performed monthly water chemistry sampling in Heath Creek downstream of the Main Dam (RM11), Heath Lake (RM13), Antioch Lake East (RM15), and the Lower Reservoir near the Main Dam (RM16). Additionally, OPC performed continuous (hourly) monitoring of DO and water temperature in Heath Creek downstream of the Main Dam.

Following is a summary of key findings of this study:

- Results of discrete chemistry samples indicated most constituents were present at low levels when compared to historical results.
- Spot measurements collected during discrete chemistry sampling indicated DO and water temperature are meeting water quality criteria at all fours sites sampled.
- Elevated summer pH values (>8.5) measured at RM13 and RM 15 in the Auxiliary Pools are likely the result of high primary productivity in those lakes associated with fertilization practices utilized by GDNR to maintain a quality fishery for anglers.
- Continuous monitoring in Heath Creek below the Main Dam (RM11) indicated that water temperature and daily average DO levels met applicable water quality criteria.
- Instantaneous DO measurements at RM11 met applicable criteria (>4.0 mg/L) 99.07 percent of the time during the critical period in 2022 (June 23-October 31) and 2023 (May 1-June 30).
- Rare low DO events at RM11 occurred during July and August 2022 and were of relatively short duration.

5.0 REFERENCES

Oglethorpe Power Corporation (OPC). 2021. Pre-Application Document (PAD). Rocky Mountain Pumped Storage Hydroelectric Project, FERC No. 2575.

Oglethorpe Power Corporation (OPC). 2022. Final Study Plans. Rocky Mountain Pumped Storage Hydroelectric Project, FERC No. 2575.

APPENDIX A

HISTORICAL WATER QUALITY DATA FROM PAD

Table A1 Summary of OPC Water Quality Field Measurements for the Rocky Mountain Project, 1996-2002

			RM08 (Rock Mountain Creek)				RM11 (Heath Creek)			
Parameter	**Units**	**Criterion**	**# of Samples**	**Minimum**	**Average**	**Maximum**	**# of Samples**	**Minimum**	**Average**	**Maximum**
Water temperature	°C	32.2°	59	6.30	19.27	30.50	75	7.00	19.96	33.60
pH	Standard	6.0-8.5	58	6.75	7.67	8.48	74	6.77	7.91	8.85
Dissolved oxygen	mg/L	4	58	4.84	8.66	11.70	73	4.86	8.59	12.44
Conductivity	µS/cm	NA	59	84.90	233.83	426.00	75	26.70	194.12	390.00
			RM13 (Auxiliary Pool II)				**RM14 (Auxiliary Pool I, between basins)**			
Parameter	**Units**	**Criterion**	**# of Samples**	**Minimum**	**Average**	**Maximum**	**# of Samples**	**Minimum**	**Average**	**Maximum**
Water temperature	°C	32.2°	75	4.00	21.26	34.90	58	8.60	22.44	35.50
pH	Standard	6.0-8.5	73	6.72	7.87	10.36	57	6.56	7.89	9.26
Dissolved oxygen	mg/L	4	73	2.53	8.35	11.90	57	5.07	8.46	11.90
Conductivity	µS/cm	NA	75	42.80	102.83	325.00	58	60.00	108.29	810.00
			RM15 (Auxiliary Pool I, east)				**RM16 (Lower Reservoir)**			
Parameter	**Units**	**Criterion**	**# of Samples**	**Minimum**	**Average**	**Maximum**	**# of Samples**	**Minimum**	**Average**	**Maximum**
Water temperature	°C	32.2°	76	5.10	21.00	34.60	75	6.00	20.95	34.00
pH	Standard	6.0-8.5	75	7.16	8.17	9.80	73	6.72	7.85	8.30
Dissolved oxygen	mg/L	4	74	4.10	8.45	13.39	73	5.13	8.61	11.67
Conductivity	µS/cm	NA	76	68.00	114.48	850.00	75	84.90	182.81	258.00

Source: OPC

NA = not applicable.

Table A2 Summary of OPC Water Chemistry Data for the Rocky Mountain Project, 1996-2002,2015-2020

		RM08 (Rock Mountain Creek)					RM11 (Heath Creek)					RM13 (Aux. Pool II)				
Parameter	**Units**	**N**	**Min**	**Mean**	**Max**	**SD**	**N**	**Min**	**Mean**	**Max**	**SD**	**N**	**Min**	**Mean**	**Max**	**SD**
Turbidity	NTU	57	0.00	13.74	97.40	20.03	88	0.00	3.10	11.00	2.53	121	0.00	13.47	1017.00	87.76
TSS	mg/L	60	0.00	18.93	272.00	41.95	75	0.00	4.73	50.00	6.02	75	0.00	4.81	22.00	4.33
Hardness	mg/L	59	15.60	98.20	250.00	56.48	136	5.88	95.47	868.00	100.69	136	7.06	45.31	186.00	24.48
Alkalinity	mg/L	59	1.37	65.78	159.20	40.32	136	0.89	68.65	127.60	23.45	136	0.52	44.29	598.00	50.59
BOD	mg/L	59	2.80	15.47	84.00	15.24	75	2.60	11.58	69.00	11.76	75	2.90	13.92	98.00	17.62
TKN	mg/L	59	0.00	0.44	3.50	0.70	80	0.00	0.64	2.80	0.64	111	0.00	1.15	39.92	3.47
Ammonia	mg/L	39	0.00	0.22	0.97	0.19	81	0.02	24.97	2000.00	171.48	86	0.03	0.35	1.77	0.31
Nitrate nitrogen	mg/L	51	0.00	0.47	1.31	0.29	76	0.00	0.37	1.61	0.30	75	0.00	0.65	25.00	2.13
Nitrite nitrogen	mg/L	51	0.00	0.05	0.11	0.03	75	0.00	0.04	0.17	0.03	75	0.00	0.05	0.34	0.05
Ortho phosphates	mg/L	58	0.00	0.22	2.19	0.40	75	0.00	0.16	1.07	0.23	72	0.00	55.73	2000.00	328.64
Total phosphates	mg/L	59	0.00	0.43	5.00	0.88	80	0.01	0.22	1.44	0.27	115	0.01	3.70	400.00	34.16
Total coliform	Col/100mL	59	1.00	784.31	9800.00	2216.89	74	0.00	370.92	5000.00	982.08	74	0.00	488.49	13000.00	1682.52
Fecal coliform	Col/100mL	53	0.00	31.08	440.00	70.33	61	0.00	3.69	20.00	3.71	60	0.00	5.92	55.00	9.68
		RM14 (Aux. Pool I, between basins)					**RM15 (Aux. Pool I, east)**					**RM16 (Lower Reservoir)**				
Parameter	**Units**	**N**	**Min**	**Mean**	**Max**	**SD**	**N**	**Min**	**Mean**	**Max**	**SD**	**N**	**Min**	**Mean**	**Max**	**SD**
Turbidity	NTU	59	0.00	12.28	122.00	20.95	110	0.00	3.56	24.00	3.50	74	0.00	5.51	47.20	8.55
TSS	mg/L	59	0.00	15.47	250.00	36.72	76	0.00	3.67	11.00	2.56	74	0.00	9.76	98.00	19.01
Hardness	mg/L	59	8.63	38.38	113.95	20.94	137	13.10	52.02	691.79	63.07	74	30.30	89.13	314.72	40.42
Alkalinity	mg/L	59	0.40	36.93	75.00	16.09	137	0.49	41.65	87.50	12.88	74	0.76	68.24	125.00	25.32
BOD	mg/L	59	2.00	18.44	108.00	21.64	76	2.10	14.62	97.00	17.01	74	3.80	17.17	125.00	23.95
TKN	mg/L	59	0.00	0.43	4.90	0.86	114	0.00	1.09	41.82	3.60	75	0.00	0.64	6.55	0.97
Ammonia	mg/L	59	0.02	68.14	4000.00	516.28	91	0.02	0.34	2.01	0.29	75	0.03	0.27	1.49	0.24
Nitrate nitrogen	mg/L	67	0.00	0.38	1.46	0.27	67	0.00	0.41	1.32	0.30	83	0.00	0.35	1.40	0.29
Nitrite nitrogen	mg/L	59	0.00	0.06	0.54	0.09	75	0.00	0.04	0.19	0.03	82	0.00	0.04	0.34	0.04
Ortho phosphates	mg/L	59	0.00	0.21	2.08	0.36	72	0.00	0.18	1.89	0.29	76	0.00	0.17	2.91	0.37
Total phosphates	mg/L	59	0.00	0.40	3.22	0.69	108	0.04	0.28	4.00	0.52	76	0.00	0.85	45.00	5.13
Total coliform	Col/100mL	12	10.00	122.50	360.00	86.90	0	--	--	--	--	60	0.00	189.67	3000.00	523.18
Fecal coliform	Col/100mL	45	0.00	13.82	260.00	36.39	57	0.00	3.65	30.00	4.63	64	0.00	13.22	180.00	26.54

Table A3 GEPD Water Quality Data at Heath Creek (RV-14-4434), 2001 and 2012

		2001					2012				
Parameter	**Units**	**N**	**Min**	**Mean**	**Max**	**SD**	**N**	**Min**	**Mean**	**Max**	**SD**
Water Temperature	°C	22	3.40	15.16	26.50	6.01	12	8.15	13.78	22.12	4.80
pH	Standard	21	7.10	7.68	8.20	0.23	12	6.62	7.37	7.78	0.38
Dissolved oxygen	mg/L	22	6.10	8.49	11.30	1.50	12	4.40	7.47	10.42	2.31
Conductivity	µmho/cm	22	104.00	190.23	221.00	32.33	12	130.00	163.08	193.00	24.84
Turbidity	NTU	12	0.50	3.29	7.20	2.29	12	2.40	5.33	8.00	2.14
Total Suspended Solids	mg/L	12	1.00	6.33	18.00	4.48	12	1.00	3.86	8.40	2.32
Alkalinity	mg/L CaCO3	12	69.00	84.17	95.00	8.32	12	58.00	76.58	88.00	10.61
Hardness	mg/L CaCO3	0	n/a	n/a	n/a	n/a	12	61.00	79.08	91.00	10.82
Biological Oxygen Demand	mg/L	12	0.20	0.59	1.30	0.30	12	2.00	2.00	2.00	0.00
Total Kjeldahl Nitrogen	mg/L	0	n/a	n/a	n/a	n/a	12	0.20	0.20	0.24	0.01
Ammonia	mg/L	12	0.02	0.04	0.07	0.01	12	0.03	0.03	0.03	0.00
Inorganic Nitrogen (Nitrate and Nitrite)	mg/L	12	0.02	0.08	0.15	0.04	12	0.02	0.06	0.10	0.03
Phosphorus	mg/L	12	0.02	0.02	0.02	0.00	12	0.02	0.02	0.03	0.00
Fecal Coliforms	MPN/100mL	16	20.00	248.75	1100.00	316.10	15	20.00	371.33	1700.00	512.01

Aquatic Resources Study Report

Rocky Mountain Pumped Storage Hydroelectric Project
(FERC No. 2725)

Prepared for:
Oglethorpe Power Corporation

Prepared by:
Kleinschmidt Associates

August 2023

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1.0 INTRODUCTION

This report presents the findings of the Aquatic Resources Study conducted for the Federal Energy Regulatory Commission (FERC) relicensing of Oglethorpe Power Corporation's (OPC's) Rocky Mountain Pumped Storage Hydroelectric Project (FERC No. 2725) (Rocky Mountain Project, the Project). The study was conducted according to OPC's Final Study Plan for the Project distributed in August 2022 and included a fish community survey and a freshwater mussel survey in 2022. OPC will use the information generated by this study to evaluate the potential effects of continued project operation on aquatic habitat in Heath Creek downstream of the Project in the license application.

The 904-megawatt Rocky Mountain Project consists of a 221-acre Upper Reservoir, a 600-acre Lower Reservoir, two Auxiliary Pools, and a powerhouse on Heath Creek in Floyd County, Georgia. OPC is not proposing to add capacity or make any major modifications to the Project under the new license. The Project does not occupy any federal lands. The original license expires December 31, 2026.

The Project's Main Dam and Lower Reservoir are located on Heath Creek within the Armuchee Creek tributary system of the Oostanaula River in the upper Coosa River basin. The upstream drainage area of Heath Creek at the Main Dam is 16.6 square miles (sq mi). Heath Creek flows from the Main Dam about 4 stream miles to Little Armuchee Creek. Little Armuchee Creek flows into Armuchee Creek, which flows into the Oostanaula River.

1.1 Objectives

The specific objectives of this study were to:

- Characterize existing communities of fish and mussels in Heath Creek downstream of the Project.
- Develop aquatic resources information sufficient for analyzing the effects of continued project operation on aquatic habitat downstream of the Project in the license application, including assessing the presence/absence of rare, threatened, and endangered (RTE) species of freshwater mussels and snails.

OPC also conducted a separate survey for the Trispot Darter (*Etheostoma trisella*), a federally listed threatened fish species, in winter 2023, as requested by the U.S. Fish and Wildlife Service (FWS) and the Georgia Department of Natural Resources (GDNR) Wildlife Conservation Section during consultation in September 2022. The survey findings are presented in a separate Trispot Darter Survey Study Report (Kleinschmidt Associates [Kleinschmidt] 2023).

1.2 Study Area

The study area for the Aquatic Resources Study included Heath Creek from the Main Dam, which creates the Lower Reservoir, downstream to its confluence with Little Armuchee Creek, a free-flowing stream reach of approximately 4 miles (Figure 1).

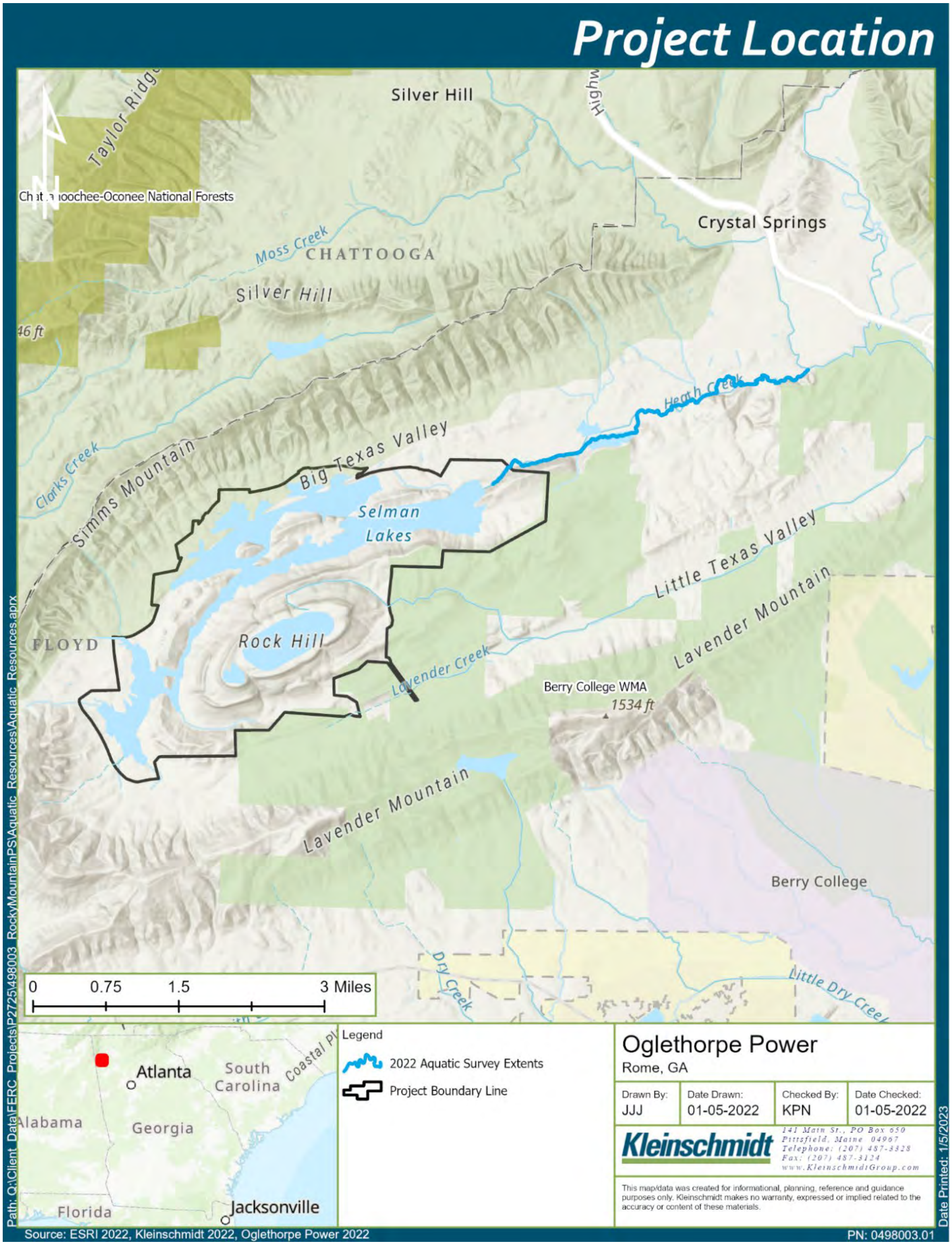

Figure 1 Project Boundary and Study Area

2.0 METHODS

2.1 Fish Community Survey

Consistent with GDNR recommendations during consultation, fish community sampling was conducted at two stations on Heath Creek in August 2022 (Figure 2), including:

- Station HC-1: Heath Creek below the Main Dam; located near U.S. Geological Survey (USGS) Gage No. 02388320 (Heath Creek near Armuchee, GA) within the FERC project boundary.
- Station HC-2: Heath Creek upstream of Texas Valley Road; located about 2.5 stream miles downstream of the Main Dam, this station was previously surveyed by the GDNR Stream Team in 2001-2002.

The fisheries assessments at sampling stations HC-1 and HC-2 were performed in accordance with GDNR's Standard Operating Procedures (SOPs) for Conducting Biomonitoring on Fish Communities in Wadeable Streams in Georgia (GDNR 2020a). Reconnaissance at the sampling stations included characterizing habitats, examining riparian zone impacts, and collecting stream measurements to determine sampling transect length. Stream measurements included depth, wetted width, bankfull width, bankfull height, top of bank, and bank angles. Following the established SOPs, sampling transect length was calculated as 35 times the mean stream width (MSW).

A quantitative physical habitat assessment was conducted at each sampling station in accordance with the GDNR protocol for riffle/run-prevalent streams in the Ridge and Valley Ecoregion. This assessment rated the following 10 habitat parameters:

1. Epifaunal Substrate/Instream Cover
2. Embeddedness
3. Velocity/Depth Combinations
4. Channel Alteration
5. Sediment Deposition
6. Riffle Frequency
7. Channel Flow Status
8. Bank Vegetative Protection
9. Bank Stability
10. Riparian Vegetative Zone

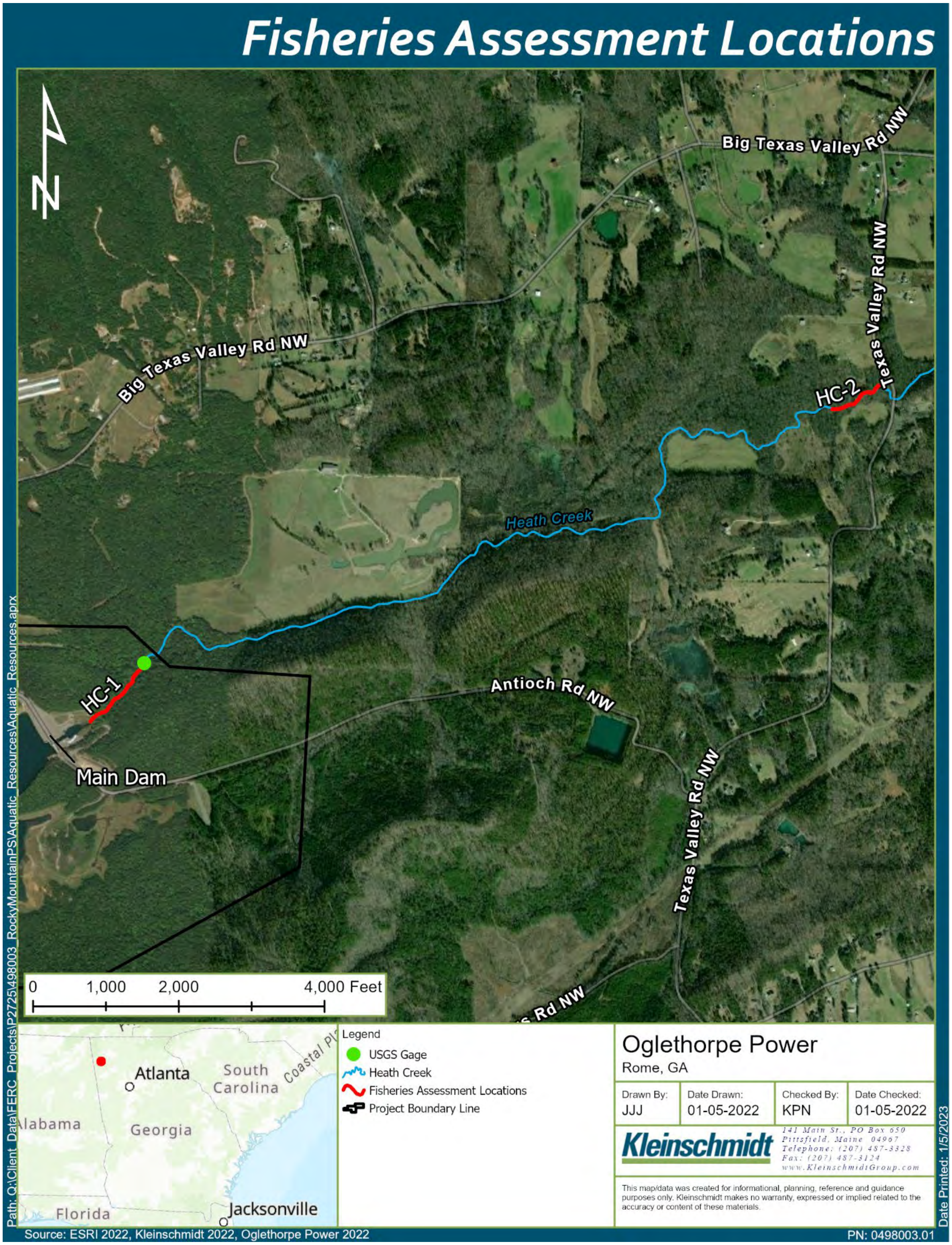

Figure 2 Fisheries Assessment Locations

Each parameter was scored on a scale from 0 to 20, with 20 as the highest-ranking value. Bank vegetative protection, bank stability, and riparian vegetative zone were evaluated independently for both banks of the stream. Two biologists independently conducted the physical habitat assessment for each sampling station. The scores for each parameter were averaged then combined to obtain a total physical habitat score for each sampling station, in accordance with the SOP.

The fisheries sampling was performed at each sampling station in accordance with the GDNR SOP with a sample reach of 35 times the MSW. The sampling stations on Heath Creek were sampled using two backpack electrofishing units (BPEFs) and a four-person crew (i.e., two BPEF and two dedicated netters). Sampling took place in an upstream direction starting at the downstream end of the sampling reach. Collected fish were identified to species, enumerated, weighed, and returned to the stream. Individuals were inspected for deformities, eroded fins, lesions, tumors, parasites, or other abnormalities (DELTs). The fish community data was analyzed using the multi-metric Index of Biotic Integrity (IBI) and Index of well-being (Iwb) to evaluate fish community health compared to reference conditions within the Ridge and Valley ecoregion (GDNR 2020b). The IBI integrates characteristics of the fish community, population, and individuals to assess fish community health and biologic integrity compared to least-disturbed reference stream conditions in the same ecoregion. Metrics are based on species richness, evenness, feeding guilds, habitat use, and species sensitivity or tolerance to pollutants. Each metric is assigned a low, medium, or high score of 1, 3, or 5, respectively. The total IBI is the sum of individual metric scores and falls within one of five integrity classes (excellent, good, fair, poor, or very poor).

In accordance with the SOP, depending on the size of the upstream watershed, the following metrics were calculated:

1. Total No. of Native Fish Species
2. Total No. of Benthic Invertivore Species
3. (b) Total No. of Native Centrarchid Species (watershed is >15 sq mi)
4. Total No. of Native Insectivorous Cyprinid Species
5. Total No. of Native Round-bodied Sucker Species
6. (b) Total No. of Intolerant Species (watershed is >15 sq mi)
7. Evenness
8. Proportion of Individuals as *Lepomis* species
9. Proportion of Individuals as Insectivorous Cyprinid Species
10. (b) Proportion of Individuals as Top Carnivores (watershed is >15 sq mi)
11. Proportion of Individuals as Benthic Fluvial Specialists

12. Number of Individuals Collected per 200 meters
13. Proportion of Individuals with External Anomalies

Prior to the fisheries sampling, *in situ* water quality was measured and recorded at each sampling station. A multi-parameter water quality meter was used to measure water temperature (°C), pH, dissolved oxygen concentration (mg/L), specific conductivity (μS/cm), and turbidity (NTUs). The water quality meter was calibrated prior to field use according to the manufacturer's specifications. Other observations related to water quality such as odor, clarity, color, and the presence of surface oils were recorded at each sample station.

2.2 Freshwater Mussel Survey

A survey for mussels and aquatic snails in Heath Creek was conducted by Dinkins Biological Consulting, LLC, on October 23-25, 2022, to characterize the occurrence, distribution, relative abundance, and species richness of the native freshwater mollusk community (Dinkins and Dinkins 2022). Appendix A provides the mussel survey report, which is summarized herein. The survey included habitats with potential to support RTE species of mussels and snails (mollusks). Several state and/or federally protected freshwater mollusk species occur or historically occurred in the Armuchee Creek system, and therefore, may have the potential to occur in Heath Creek.

The survey reach on Heath Creek extended from its confluence with Little Armuchee Creek upstream a distance of approximately 4 stream miles (6.6 river kilometers) to the Main Dam within the project boundary (Figure 3). Except for sections impounded by beaver dams, the entire reach was examined by three experienced mussel surveyors, led by Gerald Dinkins, using visual (masks and snorkels) and tactile searches. The survey reach was divided into 17 sections of varying lengths based on access and habitat characteristics. Sections were identified with letters A-Q, with A being the most downstream section near Little Armuchee Creek and Q being near the Main Dam. Each section was searched from bank to bank, working in an upstream direction, until biologists were satisfied habitats had been sufficiently examined. Level of effort, habitat types, and substrate characteristics for each survey section were recorded. Live mussels, fresh dead shells, and intact relict shells were enumerated. All live mussels were measured to the nearest millimeter (long axis) with a hand-held caliper, photographed, and returned to the substrate where they were found. Voucher specimens of each mussel species found fresh dead were retained and were archived in the McClung Museum malacology collection at the University of Tennessee, Knoxville.

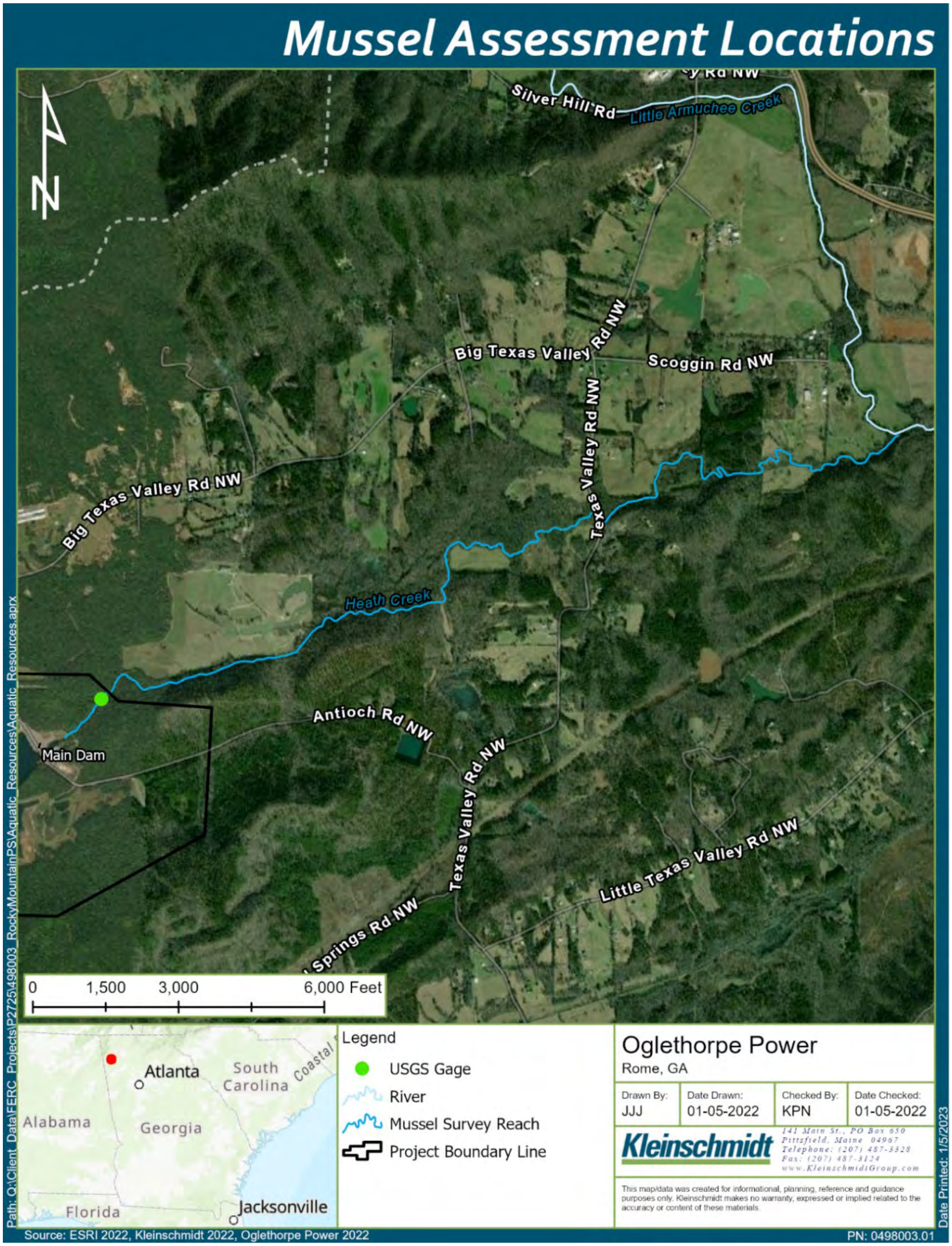

Figure 3 Mussel Assessment Locations

3.0 RESULTS AND DISCUSSION

3.1 Fish Community Survey

The Heath Creek fish community sampling in August 2022 yielded 27 species of fish in eight families, mostly species of sunfishes, minnows, suckers, darters, and bullhead catfishes (Table 1). The species composition of the fish community was similar overall to that from the 2001 and 2002 surveys conducted in Heath Creek by GDNR, when 35 species from the same eight families were collected in the two years combined (Table 2). Three additional fish species were collected in tributaries to Heath Creek in February 2023 during the separate Trispot Darter surveys, including a lamprey species representing a ninth family[1]; no Trispot Darters were collected (Kleinschmidt 2023). Of the 30 total fish species collected in Heath Creek and its tributaries in 2022-2023, 25 were also collected in 2001-2002. None of the fish species collected in Heath Creek in 2022-2023 or 2001-2002 are listed as federally threatened or endangered species or state protected species in Georgia.

The fish community sampling results from August 2022 for stations HC-1 and HC-2 are presented and discussed further below.

Table 1 Fish Collected in Heath Creek during August 2022 Fish Community Survey

Family Name/Species		Station HC-1				Station HC-2			
Common Name	Scientific Name	Count	RA (%)	Mass (g)	Bio-mass (%)	Count	RA (%)	Mass (g)	Bio-mass (%)
Cyprinidae (Minnows):									
Largescale Stoneroller	*Campostoma oligolepis*	3	1.5	4	0.1	7	9.1	50	5.1
Alabama Shiner	*Cyprinella callistia*	–	–	–	–	3	3.9	20	2.0
Tricolor Shiner	*Cyprinella trichroistia*	–	–	–	–	2	2.6	13	1.3
Striped Shiner	*Luxilus chrysocephalus*	–	–	–	–	10	13.0	214	21.9
Mountain Shiner	*Lythrurus lirus*	–	–	–	–	3	3.9	7	0.7
Coosa Shiner	*Notropis xaenocephalus*	12	5.9	11	0.2	5	6.5	13	1.3
Creek Chub	*Semotilus atromaculatus*	–	–	–	–	10	13.0	95	9.7
Catostomidae (Suckers):									
Alabama Hogsucker	*Hypentelium etowanum*	3	1.5	263	4.3	3	3.9	112	11.5
Black Redhorse	*Moxostoma duquesnei*	1	0.5	160	2.6	–	–	–	–
Blacktail Redhorse	*Moxostoma poecilurum*	1	0.5	166	2.7	–	–	–	–
Ictaluridae (Bullhead Catfishes):									

[1] The three additional fish species were Least Brook Lamprey (*Lampetra aepyptera*, family Petromyzontidae), Rainbow Shiner (*Notropis chrosomus*), and Speckled Darter *(Etheostoma stigmaeum*).

Family Name/Species		Station HC-1				Station HC-2			
Common Name	**Scientific Name**	**Count**	**RA** (%)	**Mass** (g)	**Bio-mass** (%)	**Count**	**RA** (%)	**Mass** (g)	**Bio-mass** (%)
Yellow Bullhead	*Ameiurus natalis*	–	–	–	–	1	1.3	35	3.6
Channel Catfish	*Ictalurus punctatus*	1	0.5	90	1.5	–	–	–	–
Funduliidae (Topminnows):									
Southern Studfish	*Fundulus stellifer*	–	–	–	–	2	2.6	2	0.2
Poeciliidae (Livebearers):									
Mosquitofish	*Gambusia sp.*	–	–	–	–	3	3.9	1	0.1
Cottidae (Sculpins):									
Banded Sculpin	*Cottus carolinae*	–	–	–	–	4	5.2	20	2.0
Centrarchidae (Sunfishes):									
Redbreast Sunfish	*Lepomis auritus*	18	8.8	724	11.9	1	1.3	15	1.5
Green Sunfish	*Lepomis cyanellus*	3	1.5	79	1.3	–	–	–	–
Warmouth	*Lepomis gulosus*	4	2.0	132	2.2	1	1.3	11	1.1
Bluegill	*Lepomis macrochirus*	106	51.7	3,308	54.2	2	2.6	26	2.7
Longear Sunfish	*Lepomis megalotis*	21	10.2	297	4.9	5	6.5	40	4.1
Redear Sunfish	*Lepomis microlophus*	1	0.5	56	0.9	–	–	–	–
Spotted Sunfish intergrade	*Lepomis miniatus* x *L. punctatus*	8	3.9	131	2.1	4	5.2	30	3.1
Hybrid Sunfish	*Lepomis sp.*	1	0.5	17	0.3	–	–	–	–
Redeye Bass	*Micropterus coosae*	17	8.3	662	10.8	1	1.3	99	10.1
Largemouth Bass	*Micropterus salmoides*	–	–	–	–	2	2.6	113	11.6
Percidae (Perches):									
Coosa Darter	*Etheostoma coosae*	5	2.4	5	0.1	2	2.6	2	0.2
Mobile Logperch	*Percina kathae*	–	–	–	–	3	3.9	51	5.2
Blackbanded Darter	*Percina nigrofasciata*	–	–	–	–	3	3.9	8	0.8
Total		205		6,105		77		977	
Total Number of Species		15				22			
Total Number of Native Species		14				21			
Survey Reach Length (meters)		336				232			

Note: RA = Relative Abundance

Table 2 Fisheries Comparison for Sample Station HC-2 on Heath Creek in 2001, 2002, and 2022

Family Name/Species		2001		2002		2022	
Common Name	**Scientific Name**	**Count**	**RA** (%)	**Count**	**RA** (%)	**Count**	**RA** (%)
Cyprinidae (Minnows):							
Largescale Stoneroller	*Campostoma oligolepis*	5	1.4	69	7.5	7	9.1
Alabama Shiner	*Cyprinella callistia*	–	–	5	0.5	3	3.9
Tricolor Shiner	*Cyprinella trichroistia*	51	14.6	63	6.9	2	2.6
Blacktail Shiner	*Cyprinella venusta*	10	2.9	5	0.5	–	–
Striped Shiner	*Luxilus chrysocephalus*	40	11.5	125	13.6	10	13.0
Mountain Shiner	*Lythrurus lirus*	8	2.3	14	1.5	3	3.9
Rainbow Shiner	*Notropis chrosomus*	–	–	2	0.2	–	–
Silverstripe Shiner	*Notropis stilbius*	–	–	3	0.3	–	–

Family Name/Species		2001		2002		2022	
Common Name	**Scientific Name**	**Count**	**RA** (%)	**Count**	**RA** (%)	**Count**	**RA** (%)
Coosa Shiner	*Notropis xaenocephalus*	44	12.6	85	9.3	5	6.5
Riffle Minnow	*Phenacobius catostomus*	–	–	1	0.1	–	–
Creek Chub	*Semotilus atromaculatus*	–	–	6	0.7	10	13.0
Catostomidae (Suckers):							
Alabama Hogsucker	*Hypentelium etowanum*	3	0.9	32	3.5	3	3.9
Black Redhorse	*Moxostoma duquesnei*	1	0.3	4	0.4	–	–
Golden Redhorse	*Moxostoma erythrurum*	13	3.7	2	0.2	–	–
Blacktail Redhorse	*Moxotoma poecilurum*	2	0.6	1	0.1	–	–
Ictaluridae (Bullhead Catfishes):							
Yellow Bullhead	*Ameiurus natalis*	–	–	–	–	1	1.3
Speckled Madtom	*Noturus leptacanthus*	1	0.3	–	–	–	–
Funduliidae (Topminnows):							
Blackspotted Topminnow	*Fundulus olivaceus*	–	–	5	0.5	–	–
Southern Studfish	*Fundulus stellifer*	14	4.0	38	4.1	2	2.6
Poeciliidae (Livebearers):							
Mosquitofish	*Gambusia sp.*	–	–	1	0.1	3	3.9
Cottidae (Sculpins):							
Banded Sculpin	*Cottus carolinae*	1	0.3	7	0.8	4	5.2
Centrarchidae (Sunfishes):							
Redbreast Sunfish	*Lepomis auritus*	44	12.6	101	11.0	1	1.3
Green Sunfish	*Lepomis cyanellus*	2	0.6	43	4.7	–	–
Warmouth	*Lepomis gulosus*	4	1.1	7	0.8	1	1.3
Bluegill	*Lepomis macrochirus*	6	1.7	32	3.5	2	2.6
Longear Sunfish	*Lepomis megalotis*	30	8.6	107	11.7	5	6.5
Redear Sunfish	*Lepomis microlophus*	8	2.3	9	1.0	–	–
Spotted Sunfish	*Lepomis punctatus*	25	7.2	41	4.5	4	5.2
Redeye Bass	*Micropterus coosae*	9	2.6	28	3.1	1	1.3
Alabama Bass	*Micropterus henshalli*	1	0.3	–	–	–	–
Largemouth Bass	*Micropterus salmoides*	–	–	23	2.5	2	2.6
Black Crappie	*Pomoxis nigromaculatus*	–	–	2	0.2	–	–
Percidae (Perches):							
Coosa Darter	*Etheostoma coosae*	5	1.4	17	1.9	2	2.6
Speckled Darter	*Etheostoma stigmaeum*	11	3.2	22	2.4	–	–
Mobile Logperch	*Percina kathae*	–	–	1	0.1	3	3.9
Blackbanded Darter	*Percina nigrofasciata*	11	3.2	15	1.6	3	3.9
Total Number of Individuals		349		916		77	
Total Number of Species		25		33		22	
Total Number of Native Species		24		32		21	
Survey Reach Length		235		301		232	
Survey Date		15-May-01		7-Aug-02		26-Aug-22	

Note: RA = Relative Abundance

HC-1 – Heath Creek below Main Dam

The sampling transect at HC-1 was a 336-meter reach with a downstream terminus at the confluence of an unnamed tributary to Heath Creek near the USGS gauge and an upstream terminus at the top of a riprap riffle immediately downstream of the Main Dam. The reach is predominantly a singular slow run with pools on outside bends or near undercut banks (Figures 4 and 5). Two small areas within the reach had moderate flow, which included the riprap riffle near the Main Dam, and a gravelly run with a patch of water willow (*Justicia americana*) immediately upstream of the unnamed tributary. With the exception of these two runs, the stream channel is predominantly shaded with little sunlight reaching the substates. Substrates were dominated by sand and silt. Patches of gravel and cobble substrates were present but were embedded within fine sediments and silt. Similarly, bedrock outcrops within the stream channel were covered in a layer of silt.

Figure 4 Upper reaches of the HC-1 survey location, facing downstream

Figure 5 Middle reaches of the HC-1 survey location, facing downstream

At the time of the assessment, the water was clear, slightly stained, and no odors or surface oils were observed (Table 3). Patches of groundwater were observed entering the upper sections of the survey reach. The physical habitat assessment resulted in a combined habitat score of 125 (Table 4). Parameters that received optimal scores included channel alteration, channel flow status, and riparian vegetative zone. Conversely, moderate or low scores were received for embeddedness, sediment deposition, and riffle frequency.

Table 3 Water Quality in Heath Creek during August 2022 Fish Community Survey

Parameter	Station HC-1	Station HC-2
Temperature (°C)	25.9	23.8
Dissolved Oxygen (mg/L)	6.6	7.5
pH	7.59	7.51
Conductivity (µS)	144.9	166.3
Turbidity (NTU)	7	12
Water Clarity	Clear	Clear
Water Color	Slightly Stained	Slightly Stained
Surface Oils/Sheens	None	None
Odors	None	None

Table 4 Mean Physical Habitat Scores in Heath Creek during August 2022 Fish Community Survey

Parameter	Station HC-1	Station HC-2
Epifaunal Substrate/ Instream Cover	13	15.5
Embeddedness	7.5	11.5
Velocity/Depth Combinations	13	13.5
Channel Alteration	18	18
Sediment Deposition	4	14.5
Riffle Frequency	7	9.5
Channel Flow Status	18	17.5
Bank Vegetative Protection (Left Bank)	6.5	7
Bank Vegetative Protection (Left Bank)	5.5	6.5
Bank Stability (Left Bank)	7.5	7.5
Bank Stability (Left Bank)	7.5	7.5
Riparian Vegetative Zone (Left Bank)	10	10
Riparian Vegetative Zone (Right Bank)	7.5	10
Total Score	**125**	**148.5**

The fisheries assessment on Heath Creek at HC-1 was conducted on August 25, 2022. During the fisheries sampling event, 205 individuals representing 15 different species were collected (Table 1). All species were native to the Coosa River basin except Redbreast Sunfish (*Lepomis auritus*). The most common species was Bluegill (*Lepomis macrochirus*) with a relative abundance of 52 percent. The top five numerically abundant species, in descending order of abundance, were Bluegill, Longear Sunfish (*L. megalotis*), Redbreast Sunfish (*L. auratus*), Redeye Bass (*Micropterus coosae*), and Coosa Shiner (*Notropis xaenocephalus*). These species comprised 85 percent of the total catch by number. Sunfish species of the genus *Lepomis* comprised a combined 79 percent of captured individuals. The Iwb score for HC-1 was 6.48, which is within the "poor" condition category compared to least-disturbed reference conditions (Table 5).

Using the scoring criteria for streams within the Ridge and Valley Ecoregion with drainage areas greater than 15 sq mi, HC-1 received an IBI score of 20, which is within the "very poor" condition category compared to reference conditions (Table 5). No metrics received high scores of 5. The metrics for number of native Centrarchid species, number of sucker species, and proportion of top carnivores received medium scores of 3, whereas all remaining metrics received a low score of 1.

Table 5 Index of Biotic Integrity (IBI) and Index of Well Being (Iwb) Scores for Heath Creek during August 2022 Fish Community Survey

Metric and Description	Station	
	HC-1	**HC-2**
Metric 1 – Total No. of Native Fish Species	14	21
Numerical score for metric	**1**	**3**
Metric 2 – Total No. of Benthic Invertivore Species	1	4
Numerical score for metric	**1**	**3**
Metric 3b – Total No. of Native Centrarchid Species, >15 sq mi	7	6
Numerical score for metric	**3**	**3**
Metric 4 – Total No. of Native Insectivorous Cyprinid Species	1	5
Numerical score for metric	**1**	**5**
Metric 5 – Total No. of Native Round-bodied Sucker Species	3	1
Numerical score for metric	**3**	**1**
Metric 6b – Total No. of Intolerant Species, >15 sq mi	2	4
Numerical score for metric	**3**	**5**
Metric 7 – Evenness (%)	63.84	92.81
Numerical score for metric	**1**	**1**
Metric 8 –Proportion of Individuals as *Lepomis* Species (%)	79.02	16.88
Numerical score for metric	**1**	**5**
Metric 9 – Proportion of Insectivorous Cyprinid Species (%)	5.85	29.87
Numerical score for metric	**1**	**5**
Metric 10b – Proportion of Top Carnivores, >15 sq mi (%)	10.24	5.19
Numerical score for metric	**3**	**5**
Metric 11 – Proportion of Benthic Fluvial Specialists (%)	4.87	23.38
Numerical score for metric	**1**	**3**
Metric 12 – Number of Individuals Collected per 200m	24	66
Numerical score for metric	**1**	**1**
Metric 13 – Proportion of Individuals with External Anomalies (%)	0.49	0
Numerical penalty for metric	**-0**	**-0**
Total IBI Score	**20**	**40**
Condition Category	**Very Poor**	**Fair**
Iwb Score	**6.48**	**7.43**
Condition Category	**Poor**	**Fair**

Ultimately, the high proportion of sunfishes within the sample contributed heavily to the IBI score for HC-1. With sunfishes dominating the fish community, low scores were received for proportion of *Lepomis* species (Metric 8). Consequently, proportions of insectivorous Cyprinids (Metric 9) and benthic fluvial specialists (Metric 10) were low, resulting in low corresponding metric scores. Similarly, the high proportion of sunfishes resulted in a low diversity index and a low score for evenness (Metric 7).

HC-2 – Heath Creek Upstream of Texas Valley Road

The sampling transect at HC-2 was a 232-meter reach of Heath Creek upstream of Texas Valley Road with a downstream terminus beginning at the previously established GDNR fisheries sampling starting location approximately 75 meters upstream of the bridge. The reach is a slightly meandering channel consisting of a series of slow, shallow runs and pools (Figures 6 and 7). Occasional patches of moderate current are present, but mostly limited to in-channel structure like woody structure or areas where channel morphology constricted flows between gravel or sand bars. The stream channel is shaded, and stream banks appear relatively stable. Although some evidence of scour during high flow events is present in localized areas, this reach of Heath Creek has access to numerous side channels, and a broad active floodplain. Substrates were dominated by a range of fine to coarse sands. Patches of gravel were present in swift runs and silt was mostly limited to bank margins and deep pools.

Figure 6 Upper reaches of the HC-2 survey location, facing downstream

Figure 7 Lower-middle reaches of the HC-2 survey location, facing downstream

At the time of the assessment, the water was clear, slightly stained, and no odors or surface oils were observed (Table 3). The physical habitat assessment resulted in a combined habitat score of 148.5 (Table 4). Parameters that received optimal scores included channel alteration, channel flow status, and riparian vegetative zone. Conversely, moderate or low scores were received for embeddedness and riffle frequency.

The fisheries assessment on Heath Creek at HC-2 was conducted on August 25, 2022. During the fisheries sampling event, 77 individuals representing 22 different species were collected (Table 1). All species were native to the Coosa River basin except Redbreast Sunfish. The top five numerically abundant species, in descending order of abundance, were Striped Shiner (*Luxilus chrysocephalus*), Creek Chub (*Semotilus atromaculatus*), Largescale Stoneroller (*Campostoma oligolepis*), Longear Sunfish, and Coosa Shiner. These species comprised 48 percent of the total catch. Species composition was relatively even across taxa, but overall numbers of captures were low. The Iwb score for HC-2 was 7.43, which is within the “fair” condition category compared to least-disturbed reference conditions (Table 5).

Using the scoring criteria for streams within the Ridge and Valley Ecoregion with drainage areas greater than 15 sq mi, HC-2 received an IBI score of 40, which is within the “fair” condition category compared to reference conditions (Table 5). High scores were received for number of insectivorous minnows, number of intolerant species, proportion of *Lepomis* species, proportion of insectivorous Cyprinids, and proportion of top carnivores. The metrics that received low scores included number of native sucker species, evenness, and number of individuals per 200 meters of stream. Typically, an evenness value of 92.8 would have received the highest metric score of 5; however, when fewer than 100 individuals are captured, Metric 7 is automatically assigned a score of 1. In general, the fisheries community in Heath Creek at HC-2 is diverse and even. However, the overall low number of captures resulted in penalizing Metric 7, which lowered the total IBI score from a possible 44 (“good” condition category) to 40 (fair” condition category).

GDNR performed a fisheries IBI assessment in the same stream reach as station HC-2 in May 2001 and August 2002. Total IBI scores for 2001 and 2002 were 44 and 48, respectively, which were within the “good” condition category (Table 2). The 2001 and 2002 assessments took place prior to the 2005 IBI SOP revisions and the 2020 update. Sampling methodologies and scoring metrics have been revised since 2001-2002. Whether the 2001 and 2002 IBI scores would score similarly using the latest IBI SOP is unknown. A re-analysis of the GDNR data was not part of the 2022 aquatic survey.

The most obvious difference between the 2022 and prior surveys was the number of captures (Table 2). Fewer than 100 individuals were collected in 2022, whereas 349 and 916 were collected in 2001 and 2002, respectively. When comparing survey reaches, length reach was nearly identical between 2001 and 2022. However, the survey reach for 2002 was over 60 meters longer than in 2001 and 2022. Also, between the GDNR surveys in 2001 and 2002, an additional 567 individuals and eight more species were collected. The reason behind this difference in capture rate and species richness between sampling events is uncertain. However, the additional 60 meters of sampling in 2002 may have contributed to additional captures and species.

Over 20 years have passed since the 2001 and 2002 GDNR fisheries IBI assessments on Heath Creek upstream of Texas Valley Road. An examination of past and present aerial and satellite imagery shows very few developments or changes in land use in the Heath Creek watershed since 2001-2002. However, some timber harvest and thinning operations occurred along an unnamed tributary to Heath Creek in the late 2000’s, and an approximately 15-acre parcel on the left ascending bank of Heath Creek within the HC-2 survey reach was cleared between 2014 and 2017. Land was cleared up the streambank on approximately 160 meters of Heath Creek and an additional 250 meters along the creek's side channels and tributaries. At the time of the 2022 fisheries assessment, the previously cleared area appeared to be well established and maintained with dense herbaceous vegetation and occasional trees and shrubs remaining along the stream bank.

At the time of the 2022 fisheries assessment, the HC-2 survey location contained a relatively diverse and even fisheries community. The sample was not dominated by generalist or sunfishes, and no physical condition anomalies (DELTS) were observed. However, the relatively low number of captures ultimately contributed to a reduced IBI score from what could have been achieved if more than 100 individuals were collected. Field observations indicated that some fish evaded capture during the sampling event. The high conductivity within Heath Creek required high output from BPEFs, and numerous individuals were seen avoiding immobilization and were unable to be netted. Although some individuals evaded capture, this likely did not account for the overall reduction in capture rates compared to 2001-2002. Other factors potentially contributing to the differing fish capture rates between 2001-2002 and 2022 include differences in sampling technique, field teams, depth and water clarity, in-stream habitats, and local riparian zone conditions. Also, changing fish populations or interannual variation in hydrology and climatic factors leading up to and during sampling events may have contributed to the differences in fish capture rates. Although the number of individuals collected varied substantially between years, the species composition within Health Creek remained similar across sample years.

3.2 Freshwater Mussel Survey

The mussel survey within Heath Creek was conducted on October 23-25, 2022; the mussel survey report (Dinkins and Dinkins 2022) is provided as Appendix A. Approximately 1,590 person-hours of effort were expended in the survey reach between the Main Dam and Little Armuchee Creek. Except for one section, suitable mussel habitats within all 17 sections were surveyed (Appendix A, Figure 2). Section L, an approximately 840-meter section, was impounded by beaver dams and was not surveyed. In total, 147 live mussels representing three native species of the family Unionidae were collected during the 2022 mussel surveys (Table 6). These species included Little Spectaclecase (*Leaunio [Villosa] lienosa*), Southern Rainbow (*Villosa vibex*), and Alabama Rainbow (*Cambarunio [Villosa]* *nebulosus [nebulosa]*). A fourth native Unionid species, Paper Pondshell (*Utterbackia imbecillis*), was detected as two fresh dead shells within Section K, downstream of the Section L beaver impoundment. Southern Rainbow was the most common species and comprised 63.3 percent of the live-mussel sample, followed by Little Spectaclecase (36 percent), and Alabama Rainbow (0.7 percent) (Table 6).

Table 6 Mussels Collected in Heath Creek during October 2022 Mussel Survey

Common Name	Scientific Name	Live	RA (%)	Dead Shells	
				Fresh	Relict
Southern Rainbow	*Villosa vibex*	93	63.3	26	1
Little Spectaclecase	*Leaunio lienosa* (=*Villosa lienosa*)	53	36.0	258	4
Alabama Rainbow	*Cambarunio nebulosus* (=*Villosa nebulosa*)	1	0.7	1	--
Paper Pondshell	*Utterbackia imbecillis*	--	--	2	--
Total		147		287	5

Note: RA = Relative Abundance

Based on the experience of the mussel survey leader, the mussel community and density of individuals within the survey reach in Heath Creek are considered exceptional when compared to similarly sized streams within the Ridge and Valley ecoregion (Gerald Dinkins, personal communication 2022). None of the species detected in Heath Creek during the survey are currently listed as federally threatened or endangered species or state protected species. Alabama Rainbow is currently under review by FWS to determine if its future listing as federally threatened or endangered may be warranted (FWS 2011). One live Alabama Rainbow was found in a reach about 2 stream miles downstream of the project boundary and a fresh dead shell was found in the reach just upstream of Heath Creek's confluence with Little Armuchee Creek (Dinkins and Dinkins 2022); no live individuals or fresh dead shells of the species were detected within the project boundary.

Although live mussels were found throughout the sampling reach of Heath Creek, the majority of live mussels were encountered in the approximately 1-mile stream reach between the Main Dam and the Section L beaver impoundment (Appendix A, Figure 2). A total of 111 live mussels (76 percent of the total live sample) were collected in this reach. Further, the survey section with the greatest number of live mussels collected (91) was

Section Q, the upstream-most, 80-meter section immediately downstream of the Main Dam. In general, the physical habitats at most sites were similar, consisting of pools and glides with mixes of sand, silt, and gravel substrates. However, the more upstream sections tended to have a more even mix of sand and gravel with less silt, and Section Q below the Main Dam also contained boulders and bedrock, which were absent in the other sections (Dinkins and Dinkins 2022).

In addition to live mussels, fresh dead and relict shells were identified to species and enumerated (Table 6). The upstream sections with abundant fresh dead shells exhibited signs of muskrats, including middens, burrows, and spore. Muskrat middens and discarded shells from recently consumed mussels were easily spotted and readily collected, which may have contributed to the number of dead shells observed. Further, a flood event in early September 2022 may have mobilized and re-deposited loose substrates, including dead shells, throughout the reach, increasing the likelihood of their detection.

Two aquatic gastropods were also collected during the survey, including Cylinder Campeloma (*Campeloma regulare*) and Upland Hornsnail (*Pleurocera showalteri*), which were detected at Section J and Section A, respectively (Appendix A, Figure 2). Neither species is federally threatened or endangered, or state protected in Georgia.

4.0 SUMMARY

4.1 Fish Community Survey

A fisheries survey was conducted in August 2022 to characterize the existing fish community in Heath Creek downstream of the Project. The survey was conducted at two representative stations using backpack electrofishing methods and following GDNR's SOPs for fish communities in wadeable streams. The survey yielded 27 species of fish, mostly species of sunfishes, minnows, suckers, darters, and bullhead catfishes. Species composition was similar overall to surveys conducted in 2001-2002 by GDNR using similar methods. None of the fish species collected in Heath Creek in August 2022, by GDNR in 2001-2002, or in the separate Trispot Darter survey conducted by OPC in February 2023 (Kleinschmidt 2023) are listed as federally threatened or endangered species or state protected species.

In general, the fish community within Heath Creek included a wide range of species, and individuals appeared healthy. However, the slow flowing, uniform pool habitat conditions in station HC-1 were favorable to sunfishes, which dominated the sample. Despite the species richness in HC-1, the dominance of sunfishes contributed to an IBI rating of "very poor" for the sampling reach compared to least-disturbed reference conditions. Habitats within station HC-2 were slightly more dynamic than HC-1, with more bends, runs, and woody structure. However, water depths in runs were very shallow and deeper pools were stagnant and contained accumulated sediments. The fisheries community within station HC-2 was diverse but capture rates were low, ultimately resulting in an IBI rating of "fair" compared to reference conditions.

4.2 Freshwater Mussel Survey

A freshwater mussel survey was conducted in October 2022 to characterize the existing mussel community in Heath Creek downstream of the Project and to assess for the occurrence of RTE species of freshwater mussels and snails. The entire reach of Heath Creek from its mouth at Little Armuchee Creek upstream to the Main Dam (about 4 stream miles) was examined by experienced mussel surveyors using masks and snorkeled, with the exception of sections impounded by beaver dams. The survey documented the occurrence of three native freshwater mussel species (live individuals) in Heath Creek, including, in descending order of relative abundance, Southern Rainbow, Little

Spectaclecase, and Alabama Rainbow. A fourth native species, Paper Pondshell, was detected as fresh dead shells. None of the four mussel species found in Heath Creek are listed as federally threatened or endangered or protected in Georgia. Alabama Rainbow is under review by FWS for possible future federal listing. One live individual was found in a survey reach about 2 stream miles downstream of the project boundary.

Two aquatic gastropod species, Cylinder Campeloma and Upland Hornsnail, also were detected during the mussel survey. Neither species is listed as federally threatened or endangered or state protected.

5.0 REFERENCES

Dinkins, B., and G. Dinkins. 2022. Survey for freshwater mussels in Heath Creek downstream of Rocky Mountain Pump Storage Dam, Floyd County, Georgia. Dinkins Biological Consulting, LLC, Powell, Tennessee. November 2022.

Georgia Department of Natural Resources (GDNR). 2020a. Part I: Standard Operating Procedures for Conducting Biomonitoring on Fish Communities in Wadeable Stream in Georgia. Wildlife Resources Division, Fisheries Management Section.

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Kleinschmidt Associates (Kleinschmidt). 2023. Trispot Darter Survey Study Report. Rocky Mountain Pumped Storage Hydroelectric Project (FERC No. 2725). Prepared for Oglethorpe Power Corporation. August 2023.

U.S. Fish and Wildlife Service (FWS). 2011. Endangered and threatened wildlife and plants: partial 90-day finding on a petition to list 404 species in the southeastern United States as endangered or threatened with critical habitat. Federal Register 76(187):59836-59862. September 27, 2011.

Appendix A

MUSSEL SURVEY REPORT

SURVEY FOR FRESHWATER MUSSELS IN HEATH CREEK DOWNSTREAM OF ROCKY MOUNTAIN PUMPED STORAGE DAM, FLOYD COUNTY, GEORGIA

November 2022

Prepared by
Barbara Dinkins
Gerald Dinkins

Prepared for
for Kleinschmidt Group

Dinkins Biological Consulting, LLC
3720 West Beaver Creek
P O Box 1851
Powell, TN 37849

BACKGROUND

As part of the Federal Energy and Regulatory Commission relicensing of the Rocky Mountain Pumped Storage Project (RMPSP), U.S. Fish and Wildlife Service (USFWS) and Georgia Department of Natural Resources (GDNR) requested a mussel survey in Heath Creek between the RMPSP dam and the confluence with Little Armuchee Creek, Floyd County, Georgia (**Figure 1**). Little Armuchee Creek is part of the Armuchee Creek system in the Oostanaula River drainage. Several threatened/endangered freshwater mussel species and endangered aquatic gastropod species are known to occur in the Armuchee Creek system. Dinkins Biological Consultants, LLC (DBC) was contracted by the Kleinschmidt Group to conduct this survey.

PERMITS

Gerald Dinkins led the mussel and snail survey under the authority of a state scientific collecting permit issued by Georgia Department of Natural Resources (GDNR) and a federal permit issued by the U.S. Fish and Wildlife Service (FWS) (collecting permit number ES069754) (**Appendix A**).

METHODS

Fieldwork was conducted 23-25 October 2022. Prior to the field effort, recent precipitation, streamflow, and gage height data were examined using the U.S. Geological Survey (USGS) monitoring gage number 02388350 on Heath Creek just below the RMPSP dam (Appendix B).

The survey reach included the reach of Heath Creek between its confluence with Little Armuchee Creek upstream to the outfall for the lower pump storage dam (34.3870° -85.2099° to 34.3683° -85.2693°) (**Figure 2**). Except for sections impounded by beaver dams, the entire 6.6-kilometer reach was examined by three experienced mussel surveyors using masks and snorkels. The reach was divided into 17 sections of varying lengths based on access and habitat characteristics. Each section was searched from bank to bank, working in an upstream direction, until it was determined all habitats had been sufficiently examined. Number of live mussels, fresh dead shells, and substrate characteristics in each section were recorded. All live mussels were measured to the nearest millimeter (long axis) using a hand-held caliper. Live mussels were photographed and returned to the substrate where they were found. Voucher specimens of each mussel species found fresh dead were retained and will be archived in the McClung Museum malacology collection at the University of Tennessee, Knoxville.

The physical characteristics of the stream are provided in **Table 1**. During the survey, water visibility was greater than one meter, water temperature was approximately 20 °C, and weather conditions were clear. Flow measurements at the gage are provided in **Appendix C**. Photographs of the study are provided in **Appendix D**.

RESULTS

We documented four species of mussels in Heath Creek. We found 147 live individuals of three species: *Leaunio lienosa* (Little Spectaclecase), *Villosa vibex* (Southern Rainbow), and *Cambarunio nebulosus* (Alabama Rainbow) (**Table 2**). Dead shells of a fourth species (*Utterbackia imbecillis*, Paper Pondshell) were found immediately below a beaver pond. Two species of aquatic gastropods were found sporadically throughout the survey reach -

Campeloma regulare (Cylinder Campeloma) and *Pleurocera showalteri* (Upland Hornsnail). None of the species of freshwater mussels or aquatic snails are federally listed by the USFWS.

Length frequency histograms for *Leaunio lienosa* and *Villosa vibex* are provided in **Appendix B**. Multiple size classes were observed for both species. An insufficient number of live individuals of Cambarunio nebulosus and *Utterbackia imbecillis* were found to make an interpretation of their size structure. Specimens of *L. lienosa* have been sent to Dr. Nathan Johnson, Research Biologist with the U.S. Geological Survey's Wetland and Aquatic Research Center in Gainesville, Florida for genetic confirmation of the species. *Leaunio lienosa* is conchologically similar to the closely related *L. umbrans* (Coosa Creekshell). Both species are relatively common in the upper Coosa drainage of Alabama and Georgia. Neither are protected by state or federal law.

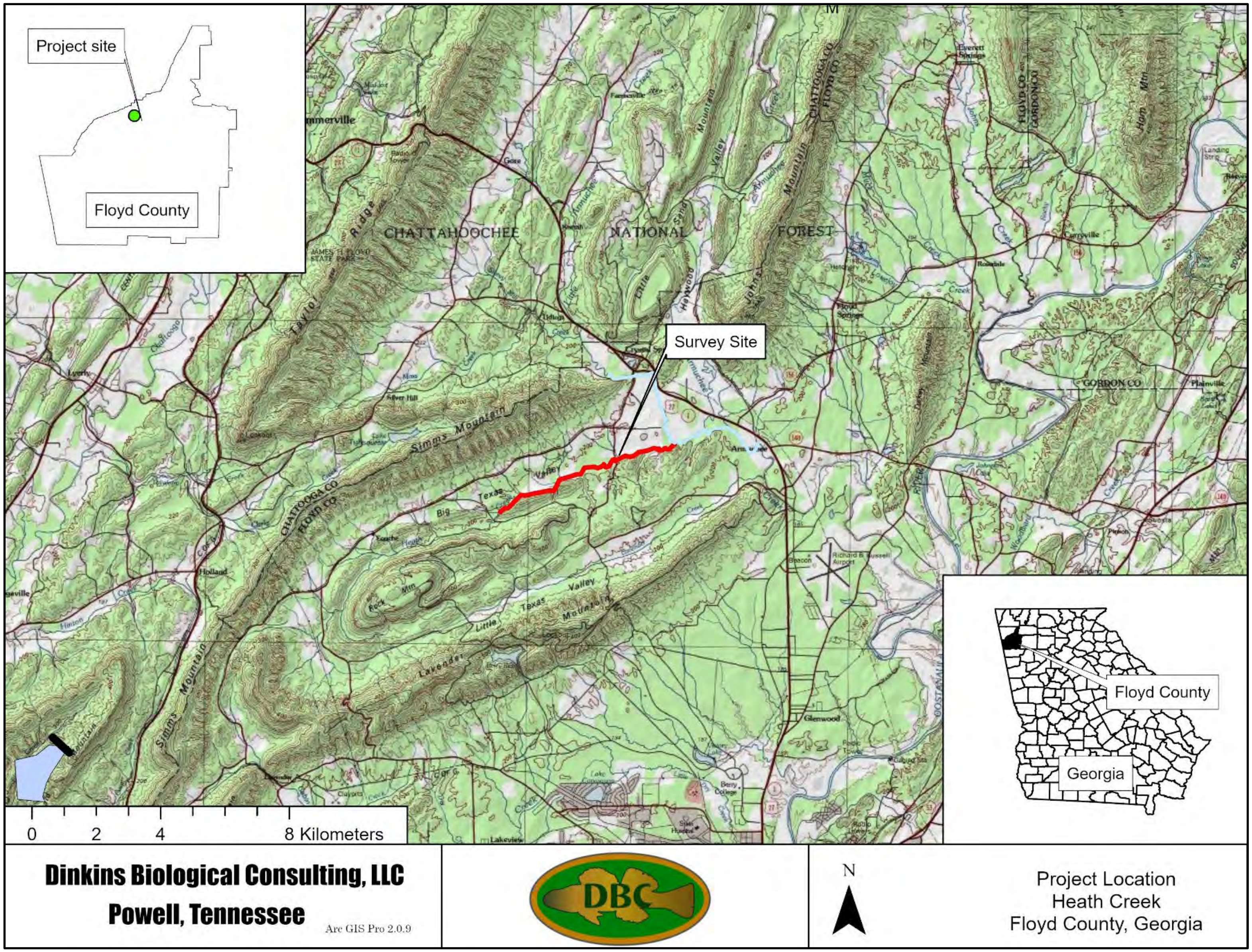


Figure 1. Location of the project site.

Figure 2. Study Reach Diagram, Heath Creek, Floyd County, Georgia.

Table 1. Physical characteristics and information for survey reaches.

		Survey Reach								
		A	B	C	D	E	F	G	H	I
	Date	23 Sep 2022	23 Sep 2022	23 Sep 2022	23 Sep 2022	23 Sep 2022	23 Sep 2022	25 Sep 2022	25 Sep 2022	25 Sep 2022
	Start Location (decimal degrees)	34.38667 -85.21028,	34.38583 -85.21167	34.38556 -85.21222	34.38528 -85.21472	34.38444 -85.22222	34.38417 -85.22639	34.38194 -85.23000	34.38161 -85.23281	34.38023 -85.23598
	End Location (decimal degrees	34.38583 -85.21167	34.38556 -85.21222	34.38528 -85.21472	34.38444 -85.22222	34.38417 -85.22639	34.38194 -85.23000	34.38161 -85.23281	34.38023 -85.23598	34.38061 -85.23906
	Time (person minutes)	60	75	135	90	75	60	135	90	90
	Reach Length (m)	180	160	320	730	640	330	330	310	360
	Depth (Min/Max/Avg) (m)	0.1-0.5	0.1-1	0.2-0.5	0.2-1	0.2-0.5	0.1-1	0.1-1	0.1-1.5	0.1-1.5
	Habitats Present	Riffle	Riffle/Pool	Glide/Pool	Glide/Pool	Glide/Pool	Glide/Pool	Glide/Pool	Riffle/Pool/ Run	Riffle/Pool/ Run
	Riparian Width (LDB/RDB)	2/>10	2/>10	2/>10	2/2	0/>10	>10/>10	>5/>5	>5/2	>5/>5
Substrate Composition %	Silt	10	20		40	30	30	30	30	30
	Sand	30	20	40	30	40	40	30	30	20
	Gravel	60	60	60	30	30	30	40	40	40
	Cobble									
	Boulder									
	Bedrock									
	Woody debris									10
	Notes	Shoal complex	Gravel bar	Some excellent habitat	Mostly Degraded, but some habitat	Long, shallow pool and beaver dam	Long, deep pool	Nice mixture of habitat	Nice mixture of habitat	Large gravel point bars, upper end destabilized

Table 1 (cont.) Physical characteristics and other information about each reach section

		Reach Sections							
		J	K	L	M	N	O	P	Q
	Date	24 Sep 2022	24 Sep 2022	24 Sep 2022	24 Sep 2022	24 Sep 2022	23 Sep 2022	23 Sep 2022	23 Sep 2022
	Start Location (decimal degrees)	34.38083 -85.24010	34.37743 -85.24205	34.37716 -85.24527	34.37429 -85.25202	34.37401 -85.25399	34.37139 -85.26417	34.36972 -85.26556	34.36944 -85.26802
	End Location (decimal degrees	34.37743 -85.24205	34.37716 -85.24527	34.37429 -85.25202	34.37401 -85.25399	34.37139 -85.26417	34.36972 -85.26556	34.36944 -85.26802	34.36922 -85.26726
	Time (person minutes)	135	90	0	135	180	60	90	90
	Approximate Reach Length (m)	370	300	840	210	1020	200	100	80
	Depth (m)	0.1-1	0.2->2	>2	0.2->2	0.2-0.3	0.1-0.3	0.1-0.3	0.1-0.3
	Habitats Present	Riffle/Pool	Deep Pool	Deep pool	Pool/Rifles	Pool	Pool	Glide/Pool	Shallow Run/Pool
	Riparian Width (LDB/RDB)	>10/>10	>10/>10		>5/>10	>5/>10	>10/>10	2/2	0/0
Substrate Composition %	Silt/clay		70	100					
	Sand				50	50	50	50	25
	Gravel				50	50	50	50	25
	Cobble								
	Boulder								25
	Bedrock								25
	Woody debris		30						
	Notes		Mostly impacted, some shoal	Beaver dam, no habitat, skipped	Beaver pool, some shoals	Shallow pool/glide	Shallow pool with nice habitat	Large accumulation of shell	Below dam, many shells

Table 2. Mussel species found in each survey section. Number of fresh dead in parentheses and number of relict shells in brackets. CPUE = Catch per unit effort in minutes.

Species	Reach Sections								
	A	B	C	D	E	F	G	H	I
Cambarunio nebulosus	(1)							1	
Leaunio lienosa		(2)	7(5)	1(4)[2]	[2]		1(7)	5(8)	
Villosa vibex	1	(1)	1(1)	(3)[1]			1(1)	1	2
Utterbackia imbecillis									
No. live mussels	1	0	8	1	0	0	2	7	2
No. live mussels/meter	0.01	0.00	0.03	0.00	0.00	0.00	0.01	0.02	0.01
CPUE	0.02	0.00	0.06	0.01	0.00	0.00	0.01	0.07	0.02
Campeloma regulare									
Pleurocera showalteri	Present								

Table 2 (cont.)

Species	Reach Sections							
	J	K	L	M	N	O	P	Q
Cambarunio nebulosus			Reach not sampled					
Leaunio lienosa	4(7)	10(19)		1(50)	7(82)	5(7)	4(42)	8(27)
Villosa vibex	1	(1)		(1)	1(12)	2(1)	(9)	83(5)
Utterbackia imbecillis		(2)						
No. live mussels	5	10		1	8	7	4	91
No. live mussels/meter	0.04	0.11		0.01	0.04	0.12	0.04	1.01
CPUE	0.01	0.03		0.00	0.01	0.04	0.04	1.14
Campeloma regulare.	Present							
Pleurocera showalteri								

APPENDIX A

FEDERAL AND STATE COLLECTING PERMITS

DEPARTMENT OF THE INTERIOR

U.S. FISH & WILDLIFE SERVICE
Endangered Species Permit Office
1875 Century Boulevard, Suite 200
Atlanta, GA 30345
permitsR4ES@fws.gov

FEDERAL FISH AND WILDLIFE PERMIT

1. PERMITTEE

GERALD R DINKINS
P.O. BOX 1851
POWELL, TN 37849
U.S.A.

2. AUTHORITY-STATUTES
16 USC 1539(a)
16 USC 1533(d)

REGULATIONS
50 CFR 17.22
50 CFR 17.32

50 CFR 13

3. NUMBER
TE069754-5 AMENDMENT

4. RENEWABLE
☒ YES
☐ NO

5. MAY COPY
☒ YES
☐ NO

6. EFFECTIVE
04/11/2016

7. EXPIRES
04/30/2021

8. NAME AND TITLE OF PRINCIPAL OFFICER (If #1 is a business)

9. TYPE OF PERMIT
NATIVE ENDANGERED & THREATENED SP. RECOVERY - E & T WILDLIFE

10. LOCATION WHERE AUTHORIZED ACTIVITY MAY BE CONDUCTED
Location: Alabama, Arkansas, Florida, Georgia, Illinois, Indiana, Iowa, Kentucky, Louisiana, Maryland, Michigan, Minnesota, Mississippi, Missouri, North Carolina, Ohio, Pennsylvania, South Carolina, Tennessee, Virginia, West Virginia, and Wisconsin

11. CONDITIONS AND AUTHORIZATIONS:

A. GENERAL CONDITIONS SET OUT IN SUBPART D OF 50 CFR 13, AND SPECIFIC CONDITIONS CONTAINED IN FEDERAL REGULATIONS CITED IN BLOCK #2 ABOVE, ARE HEREBY MADE A PART OF THIS PERMIT. ALL ACTIVITIES AUTHORIZED HEREIN MUST BE CARRIED OUT IN ACCORD WITH AND FOR THE PURPOSES DESCRIBED IN THE APPLICATION SUBMITTED. CONTINUED VALIDITY, OR RENEWAL, OF THIS PERMIT IS SUBJECT TO COMPLETE AND TIMELY COMPLIANCE WITH ALL APPLICABLE CONDITIONS, INCLUDING THE FILING OF ALL REQUIRED INFORMATION AND REPORTS.

B. THE VALIDITY OF THIS PERMIT IS ALSO CONDITIONED UPON STRICT OBSERVANCE OF ALL APPLICABLE FOREIGN, STATE, LOCAL, TRIBAL, OR OTHER FEDERAL LAW.

C. VALID FOR USE BY PERMITTEE NAMED ABOVE.

Trained assistants not named on this permit may work on permitted activities under the direct and on-site supervision of the individuals named above. However, trained assistants may not work independently at a site. All site investigators who will handle the federally listed species on the attached species list shall be trained in their identification and handling techniques, advised on the laws and restrictions related to listed species, and apprised of permit conditions. The number of site investigators at any site shall be of an appropriate, manageable, size so that the individuals named above shall observe actions and prevent or limit harm to listed species and their habitats.

D. Acceptance of this permit serves as evidence that the permittee understands and agrees to abide by the terms of this permit and all sections of title 50 Code of Federal Regulations, Parts 13 and 17, pertinent to issued permits. Section 11 of the Endangered Species Act of 1973, as amended, provides for civil and criminal penalties for failure to comply with the permit conditions.

E. Permittee is authorized to take (capture, identify, and release) the **fish** species identified on the attached species list; and take (capture, identify, release, and collect relict shells) the **mollusk** species (freshwater mussels and

☒ ADDITIONAL CONDITIONS AND AUTHORIZATIONS ALSO APPLY

12. REPORTING REQUIREMENTS
Annual reports are due January 31 following each year the permit is in effect.

ISSUED BY

TITLE
CHIEF, DIVISION OF ENVIRONMENTAL REVIEW

DATE
04/11/2016

ORDER #: 121998651

GEORGIA
DEPARTMENT OF NATURAL RESOURCES

Scientific Collecting Permit

Order Date: **6/23/2022** Licensee Customer #: **1000592405** License Name: **GERALD DINKINS**

Effective Date: **6/23/2022** Expiration Date: **3/31/2023**

Special Information: **Species Name: NATIVE LISTED & NON-LISTED FRESHWATER MUSSELS/SNAILS & FISHES**

Responsible Person Name: Gerald Dinkins - University of Tennessee, Dinkins Biological Consulting LLC

Above named is hereby permitted, in accordance with O.C.GA 27-2-12 and the regulations of the Georgia Department of Natural Resources subject to the terms, exceptions, and restrictions expressed on the attached ""General Conditions"" and subject to any other applicable state or federal regulations, to take for scientific and educational purposes only in the state of Georgia, wildlife which is listed above.

This permit is conditional and confers NO privileges whatsoever to take, possess, exchange, or transport migratory birds or their parts, nests, or eggs unless the permittee has in his or her possession, while exercising the privilege granted herein a valid subsisting permit to take Migratory Birds and their parts, nests, or eggs for scientific purposes in the state of Georgia issued to him by the U.S. Fish and Wildlife Service, and unless or until that condition is fulfilled, the taking of Migratory Birds, their parts, nests, or eggs is a violation of the regulations as set forth by the State.

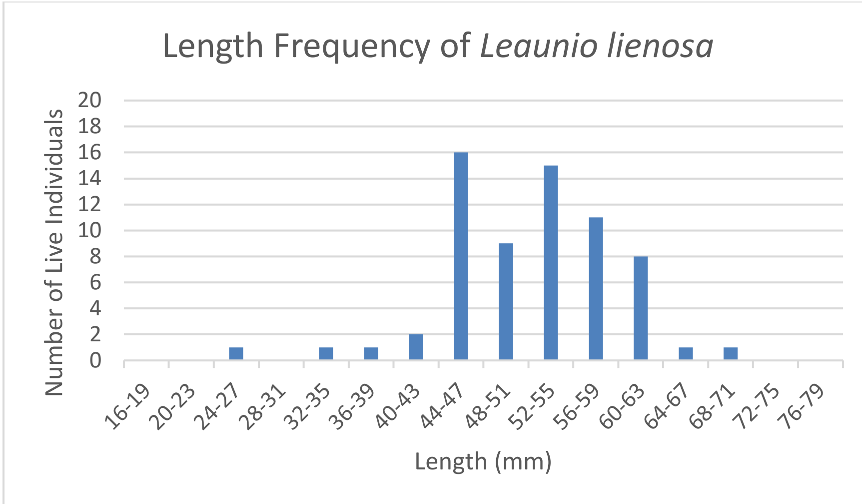
Unless otherwise specified, permittee must submit a complete report of all specimens collected under the authority of this permit upon expiration date of permit. This permit (copy and letter of authorization for sub-permittees) must be in possession while collecting.

Signature of Licensee ______________________

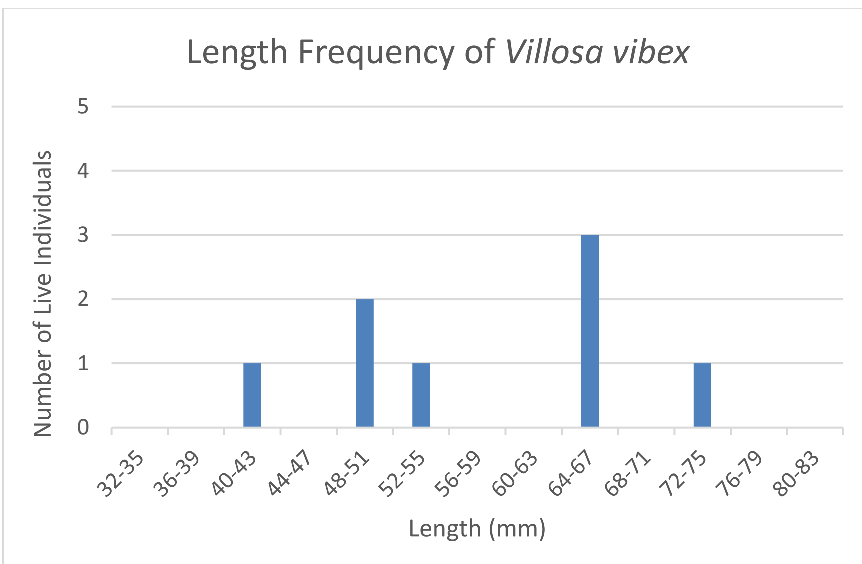
Condition: LOCATION: Statewide
Sub-Permittee: Barbara Dinkins
1.Fish species shall be collected by seine or electroshocker. State & federally listed fishes may be collected by hand seining or netting, & observed via wading, snorkeling, scuba diving, or backpack electrofishing. Federally-listed fish species may be temporarily retained for identification purposes, & shall be released near their original point of capture immediately after identification.
2.Freshwater unionids shall be collected using visual searches (SCUBA, snorkeling, viewbuckets), tactile searches, raking, & ponar dredge. Specimens may be retained for further identification & voucher collections providing that the specimens are not state or federally listed as unusual, rare, threatened, or endangered. All state & federally listed species should be immediately identified, counted, photographed, or measured & returned to the substrate from which they were collected.
3.WRD has determined, pursuant to O.C.G.A. 27-2-12, that this permit will provide valuable information regarding the species & population proposed for study. WRD has determined that this project is of sound design, does not duplicate previous research, & will not be detrimental to the species or populations proposed for study. O.C.G.A. 27-2-12 (e) requires that the permittee submit to DNR, reports detailing the information or data obtained from such collections & in carrying out this permittee is therefore acting as an agent of DNR in furthering the conservation and protection of this state's natural resources.
** This permit is subject to general provisions numbered 1-15, General Permit Conditions for State Protected Freshwater fishes- Updated March 2021 and General Conditions for Freshwater mollusks updated March 2021 , as attached. All pages are part of this permit and shall be attached here to. (7 pages, including permit)

GERALD DINKINS
7103 BAYLESS LN
POWELL, TN 37849

APPENDIX B
LENGTH FREQUENCY HISTOGRAMS

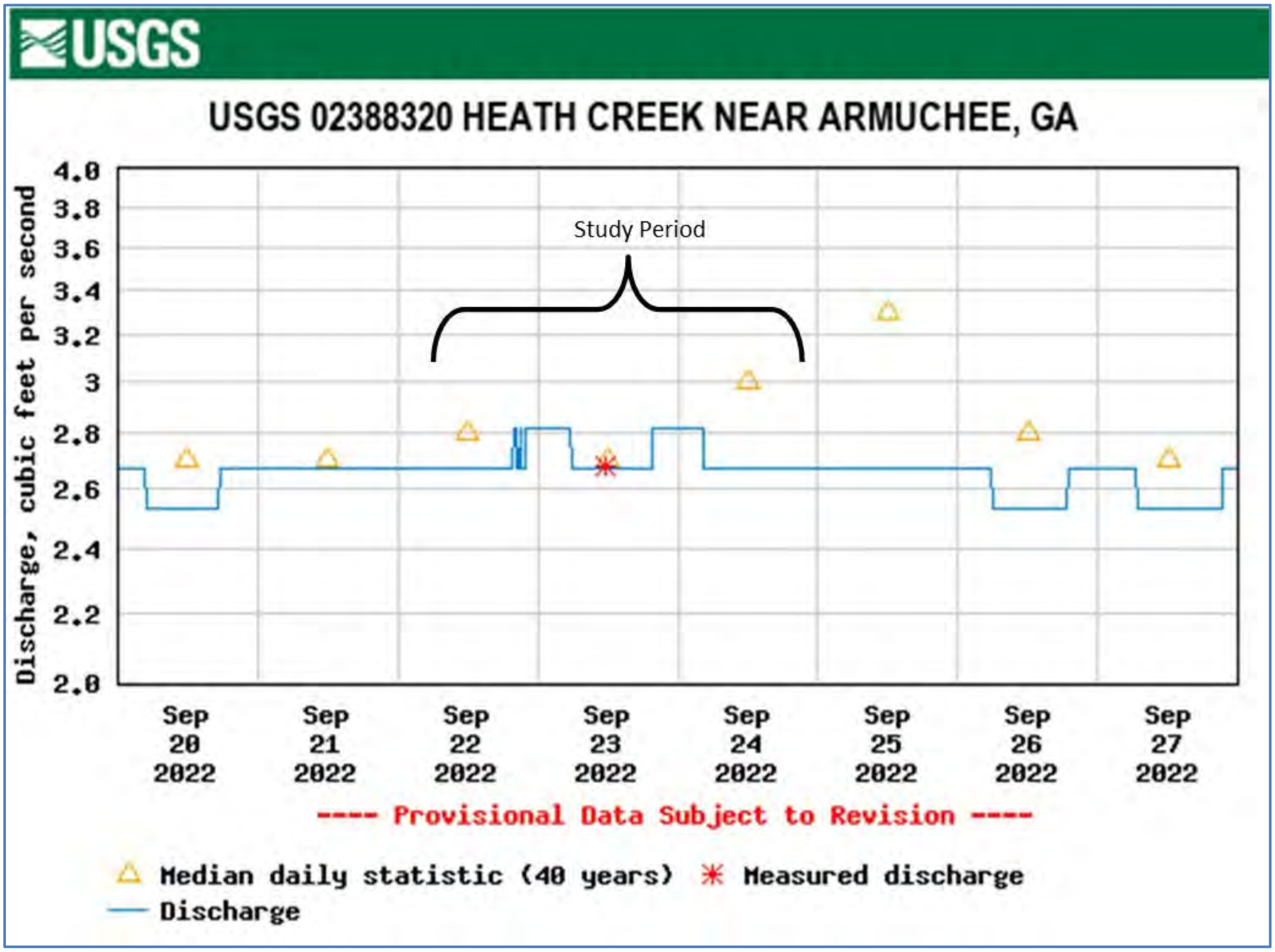


Mean	52
Median	52
Mode	45



Mean	58
Median	59
Mode	49

APPENDIX C
USGS GAGE INFORMATION


USGS
USGS 02388320 HEATH CREEK NEAR ARMUCHEE, GA
Discharge, cubic feet per second
4.0
3.8
3.6
3.4
3.2
3
2.8
2.6
2.4
2.2
2.0
Study Period
Sep 20 2022
Sep 21 2022
Sep 22 2022
Sep 23 2022
Sep 24 2022
Sep 25 2022
Sep 26 2022
Sep 27 2022
---- Provisional Data Subject to Revision ----
Median daily statistic (40 years)
Measured discharge
Discharge

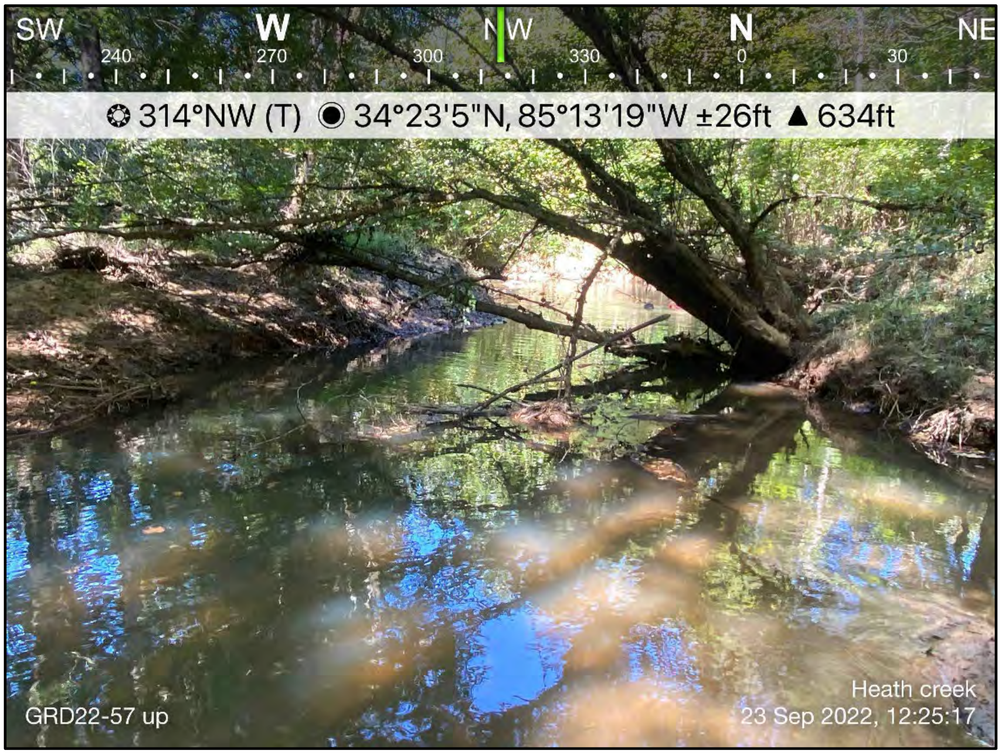
APPENDIX D
PHOTOGRAPHS

Photograph 1. *Villosa vibex* (Southern Rainbow)

Photograph 2. *Leaunio lienosa* (Little Spectaclecase)

Photograph 3. Reach Section A, looking downstream.

Photograph 4. Reach Section B, looking downstream.



Photograph 5. Reach Section D, looking upstream.

Photograph 6. Reach Section F, looking upstream.

Photograph 7. Reach Section F, looking downstream.

Photograph 8. Reach Section H, looking upstream.

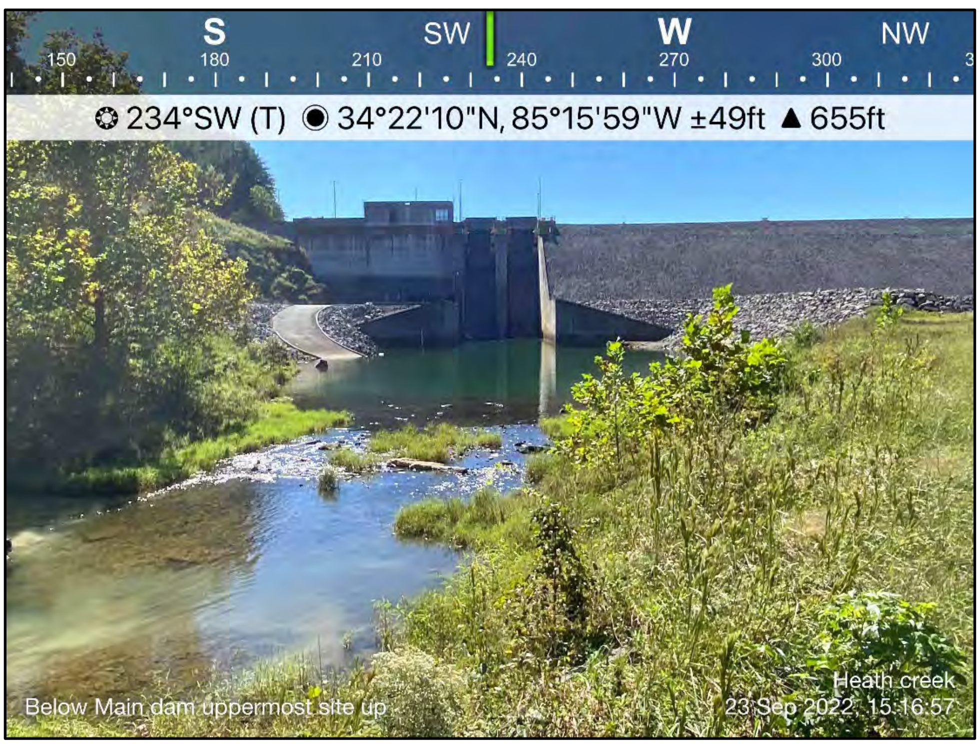
Photograph 9. Reach Section J, looking upstream.

Photograph 10. Reach Section K, looking downstream.

Photograph 11. Reach Section O, looking downstream

Photograph 12. Reach Section P, looking upstream.

Photograph 13. Reach Section Q, dead shells on bank



Photograph 14. Reach Section Q, looking upstream.

TRISPOT DARTER SURVEY STUDY REPORT

ROCKY MOUNTAIN PUMPED STORAGE HYDROELECTRIC PROJECT

(FERC NO. 2725)

Prepared for:

Oglethorpe Power Corporation

Prepared by:

Kleinschmidt Associates

Kleinschmidt

August 2023

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1.0 INTRODUCTION

This report presents the findings of a survey for the Trispot Darter (*Etheostoma trisella*), a federally listed threatened species, conducted for the Federal Energy Regulatory Commission (FERC) relicensing of Oglethorpe Power Corporation's (OPC's) Rocky Mountain Pumped Storage Hydroelectric Project (FERC No. 2725) (Rocky Mountain Project, the Project). The survey was conducted pursuant to OPC's consultation with the U.S. Fish and Wildlife Service (FWS) and the Georgia Department of Natural Resources (GDNR) Wildlife Resources Division in September 2022 concerning aquatic resources, fisheries, and protected species potentially occurring at the Project. FWS and GDNR requested that OPC conduct surveys for the Trispot Darter in potential spawning habitat within the project boundary in winter 2023. This survey was conducted to address the agencies' request for two distinct survey events separated by several weeks in small tributaries of Heath Creek near the Main Dam between late January and late February 2023. The survey findings will aid FWS and GDNR in evaluating and understanding the potential for occurrence of the Trispot Darter in Heath Creek within the project boundary.

The 904-megawatt Rocky Mountain Project consists of a 221-acre Upper Reservoir, a 600-acre Lower Reservoir, two Auxiliary Pools, a powerhouse, and appurtenant facilities on Heath Creek in Floyd County, Georgia. OPC is not proposing to add capacity or make any major modifications to the Project under the new license. The Project does not occupy any federal lands. The original license expires December 31, 2026.

1.1 Background

The Main Dam and Lower Reservoir are on Heath Creek within the Armuchee Creek tributary system of the Oostanaula River in the upper Coosa River basin (Figure 1). Heath Creek flows from the Main Dam about 4.3 miles to Little Armuchee Creek. Little Armuchee Creek flows into Armuchee Creek, which flows into the Oostanaula River. Armuchee Creek and its tributaries are within the historic range of the Trispot Darter. The species is endemic to the upper Coosa River basin in northwestern Georgia, northeastern Alabama, and southeastern Tennessee.

The Trispot Darter uses distinct breeding and non-breeding habitats (Freeman and Hagler 2009; FWS 2017). During the nonbreeding season (approximately April-October), Trispot Darters inhabit backwaters and pools at the edges of riffles in small to medium rivers and the lower reaches of tributaries. In late fall, mature adults begin moving from main channels upstream into tributaries and eventually small streams and adjacent seepage areas and ditches where they remain from approximately late November/early December to April. Spawning occurs during winter months (January-March) in seasonally wet tributaries and intermittent seepage areas that become available as precipitation increases and the water table rises. Spawning sites tend to be shallow, may have little or no flow, and often include emergent vegetation or moderate leaf litter over cobble, gravel, sand, clay, or silty clay bottom substrates. The adhesive eggs attach to vegetation or rocky substrates and are abandoned by the adults.

1.2 Objectives

The specific objectives of the survey were to:

- Identify potentially suitable spawning habitat for Trispot Darter in the study area.
- Perform two survey events for Trispot Darters separated by several weeks between late January and early March 2023 in potentially suitable spawning habitat within the study area.

1.3 Study Area

The study area included small tributary streams and a seepage area and associated ditches eventually draining to Heath Creek in an area north and west of the Main Dam as identified in discussions with FWS and GDNR (Figure 1). All of the survey areas were within the FERC project boundary and are described in greater detail in Section 2.0,

2.0 METHODS

2.1 Study Area and Survey Segments

The study area OPC identified in consultation with FWS and GDNR included multiple streams and modified channels in the vicinity of Dam A, located about 1,300 feet west of the Main Dam, and which eventually drain east around the north side of the Main Dam into Heath Creek (Figure 2). The study area included:

- The seepage area and associated ditches below Dam A (Dam A Seepage/Ditches),
- The main channel conveying water from the Dam A seepage to Heath Creek (Channel A),
- A forested tributary to Channel A immediately upstream of the Channel A/Heath Creek confluence (Tributary 1),
- A tributary flowing into the Dam A seepage area and combining with Channel A (Tributary 2), and
- A small tributary stream flowing into Tributary 2 (Tributary 3).

Channel A was subdivided into multiple survey sampling segments based on habitat characteristics and applied survey methodology. Some segments were not sampled because of poor habitat or sampling conditions, excessive depth, limited access, or it was deemed by the lead biologist that further investigation was not warranted (Figure 2).

Will Pruitt led the survey effort under the authority of a state scientific collecting permit issued by GDNR and a federal permit issued by FWS (collecting permit number ES65875D), as modified in January 2023 to add the Trispot Darter.

2.2 Sampling Techniques

Following the establishment of survey segments and habitat descriptions, fish sampling was conducted in wadable areas exhibiting potentially suitable habitat conditions for spawning Trispot Darters. Depending on habitat conditions (water depth, channel width, presence of vegetation, flow, etc.) sampling techniques included the use of seining, kick-seining (10’x4’ seine with a mesh size of ¼”), electrofishing, and dipnetting, and various combinations of each. Sampling was conducted from a downstream to upstream direction. Sampling occurred within the study area until biologists determined that sufficient effort was expended within potentially suitable habitats for Trispot Darters. To avoid or reduce risk of potential harm to Trispot Darters and other native fishes, the backpack electrofisher (Smith-Root, Model LR 20) was used at the lowest effective setting to coax fish out of the vegetation, substrate, and undercut banks so that they could be collected by seine or dipnet. This setting was generally pulsed DC current at a 30-percent duty cycle at 60 Hz with an output of approximately 100-150 volts. Collected fish were handled with a wet hand, identified, and released after each net set or transect to reduce holding time. Rather than enumerating non-target fishes, collected species were assigned a presence ranking of rare, uncommon, common, or abundant, depending on observed relative abundance (Table 1).

Prior to the fisheries sampling, *in situ* water quality was measured and recorded within two segments within Channel A: Channel A – Forested; and Channel A – Vegetation Bed. A multi-parameter water quality meter was used to measure water temperature (°C), pH, dissolved oxygen concentration (mg/L), specific conductivity (μS/cm), and turbidity (FNUs). The water quality meter was calibrated prior to field use according to the manufacturer's specifications.

3.0 RESULTS AND DISCUSSION

The two survey events for Trispot Darter took place on February 7 and February 28, 2023. No Trispot Darters were collected or observed during either sampling event. Darter species collected during the survey included Coosa Darter (*Etheostoma coosae*) and Speckled Darter (*E. stigmaeum*), but neither of these species nor any of the other species collected are of conservation concern in Georgia. These darters were in spawning or pre-spawning condition (i.e., males exhibited breeding coloration and females appeared plump and gravid) during the February 7 sampling event and were observed actively spawning during the February 28 sampling event. Twenty-two species of fish were collected during the surveys as listed in Table 1. Table 2 presents the water quality measurements from two locations within Channel A during each survey event. A habitat description and results from each survey segment are summarized below. Figures 3 through 9 provide photos of representative habitats within the survey segments.

3.1 Channel A – Forested

The forested portion of Channel A is a natural (i.e., unmodified) sinuous stream, with a series of bends, runs, and riffles (Figure 2). Undercut banks and sandy pools were occasionally encountered in bends and meanders. Runs were mixed gravel and coarse sand substrates, with riffles dominated by larger gravel or small cobble substrates. In general, this portion of Channel A exhibited moderate flow, stable banks with shrubby and herbaceous cover, and broad forested riparian zone with a mixed hardwood overstory and shrubby understory. This portion of Channel A was not considered spawning habitat for Trispot Darter. However, because this portion of the Channel A could potentially be used by fish moving from Heath Creek upstream into smaller headwater streams, this segment was sampled in attempt to collect fishes ascending these smaller streams.

The moderate flows in gravel runs and riffles allowed for efficient sampling by kick-seining combined with backpack electrofishing. In general, species collected were insectivorous cyprinids and benthic invertivores that prefer moderate currents. The most common species observed in this segment included Mountain Shiner (*Lythrurus lirus*), Rainbow Shiner (*Notropis chrosomus*), Coosa Shiner (*Notropis xaenocephalus*), Alabama Hogsucker (*Hypentelium etowanum*), and Coosa Darter (Table 1).

3.2 Tributary 1

Tributary 1 is a forested perennial stream that flows into the forest portion of Channel A immediately upstream of its confluence with Heath Creek (Figure 2). Although smaller in size, Tributary 1 was similar to the forested portion of Channel A with its frequent bends and riffle-run complexes, dense canopy, and species composition. Course substrates free of sediments were common throughout the sample segment. This segment did not contain spawning habitat for Trispot Darters but could be used to move from non-spawning habitats to headwaters upstream and outside of the project boundary.

Kick-seining in combination with backpack electrofishing was used in the swift runs and riffles, and seine hauls were used in the few sandy pools encountered. The most common species observed in this segment included Mountain Shiner, Rainbow Shiner, Tricolor Shiner (*Cyprinella trichroistia*), and Coosa Darter (Table 1). Least Brook Lamprey (*Lampetra aepyptera*) also was collected at this site.

3.3 Channel A – Run

This segment is within the modified and channelized portion of Channel A (Figure 2). The stream channel is straight and narrowly confined within the steep banks and has a gently sloping gradient allowing slow to moderate flow. Within the streambed, the stream exhibited a series of shallow braided gravel runs through some loosely established dormant emergent vegetation. The canopy was open, but the streambed within the confines of the steep banks remained primarily shaded. The established vegetation within the channel was dormant and decaying, with some patches beginning to green during the sampling event. Similar to the forested portion of Channel A, this segment did not contain spawning habitat for Trispot Darters but could be used to move from non-spawning habitats to smaller tributary streams.

The braided channels within this segment could not effectively be sampled with a seine. Instead, steadily moving upstream with a backpack electrofisher and accompanying dipnetters was the most effective method for this segment. The most common species collected in this reach included Largescale Stoneroller (*Campostoma oligolepis*), Mosquitofish (*Gambusia* sp.), and Spotted Sunfish (*Lepomis punctatus*) (Table 1).

3.4 Channel A – Vegetation Bed

This segment is within the heavily modified and channelized portion of Channel A (Figure 2). The stream channel is confined within the steep banks and has low gradient and slow flow. Dense dormant and decaying emergent vegetation was established for the width of the streambed, with only a narrow channel of water meandering within. In the upstream area of this segment, the stream channel widened into a pool with fine sediment substrates and dead and decaying Cattails (*Typha* sp.) established along steam margins. The canopy was open and the stream channel was in full sun. The established vegetation within the channel was dormant and was just beginning to green during the sampling events. This segment of Channel A contained vegetation that could potentially serve as spawning habitat for Trispot Darters; however, the vegetation was dormant or decaying, and in-stream habitat more closely resembled margins of ponds or swamps with emergent vegetation.

Dipnetting and dipnetting/electrofishing combination were the most effective methods for this segment. The most common species collected in this reach included Mosquitofish, Spotted Sunfish, and Bluegill (*Lepomis macrochirus*) (Table 1).

3.5 Tributary 2

This tributary contained a variety of habitats, including a channelized reach along the northern edge of the Dam A seepage swamp (downstream), and a more naturalized reach within the woodline (upstream) (Figure 2). The channelized area was slow-flowing, with steep banks and sandy substrates, whereas the naturalized reach was more sinuous with mixed gravel and sand substrates and riffle-run sequences. This sampling segment did not contain suitable spawning habitat for Trispot Darters. However, several pairs of spawning Coosa Darters were observed throughout this reach, and this tributary could have served as a route for Trispot Darters to travel into suitable spawning habitats.

The electrofishing with accompanying dipnetters was the most effective method for this segment. The most common species collected in this reach included Rainbow Shiner, Coosa Darter, and Bluegill (Table 1).

3.6 Tributary 3

This sampling segment was a narrow, shallow tributary to Tributary 2 (Figure 2). The narrow channel appeared stable, with potentially intermittent flow status. Substrates were primarily sand and silt, with occasional patches of dense clay and undercut banks. This sampling segment did not contain vegetation, but the narrow intermittent channel was more typical of Trispot Darter spawning sites.

Dipnetting within the narrow stream was the most effective method for this segment. The most common species collected in this reach included Largescale Stoneroller and Bluegill (Table 1).

3.7 Dam A Seepage/Ditches

Two man-made ditches convey dam seepage into the seepage swamp below Dam A (Figure 2). These two ditches were only a few inches deep and had patches of varying substrates. This included placed crushed gravel patches, bare clay, and accumulated leaf litter. In addition, patches of Muskgrass (*Chara sp.*) and hair algae were present in both ditches. The ephemeral seepage and patches of Muskgrass were potentially suitable spawning habitat for Trispot Darters. This area was most effectively sampled with dipnets. The shoreline of the seepage swamp between the two ditches contained aquatic vegetation (Alligatorweed [*Alternanthera philoxeroides*] and primrose [*Ludwigia sp.*]), which was also sampled with dipnets. The fish collected in these areas were limited to Mosquitofish, Bluegill, and Redbreast Sunfish (*Lepomis auritus*) (Table 1).

4.0 SUMMARY

No Trispot Darters were collected or observed in small tributaries to Heath Creek or associated seepage areas and intermittently wet ditches within the study area during two distinct survey events in winter 2023. Trispot Darters are typically found in shallow streams over cobble, gravel, and sand, often near aquatic vegetation such as Water Willow (*Justicia americana*) (Freeman and Hagler 2009). Patches of Water Willow were identified within Heath Creek, immediately upstream of its confluence with Channel A during fisheries assessments in the summer of 2022. The forested segment of Channel A, Tributary 1, and Tributary 2 contained suitable habitat for Trispot Darters during non-spawning periods. Because of the potential for Trispot Darters to inhabit or move through these areas to seek spawning habitats, these areas were included in the study area for the two winter surveys. The habitats were generally dominated by stream-dwelling fishes that prefer moderate flows over gravel substrates in riffle-run complexes. Known spawning habitats for Trispot Darter are generally smaller streams with intermittent or ephemeral flow, seeps and springs, and often hold aquatic vegetation. The Channel A – Run and Channel A – Vegetation Bed contained emergent vegetation and were considered potential spawning habitat. However, vegetation was primarily dormant or decaying. Tributary 3 and the Dam A Seepage/Ditches provided the small ephemeral/intermittent channels more typical of Trispot Darter spawning habitats; however, Tributary 3 contained little instream cover, no aquatic vegetation, with soft sediment substrates, and habitats within Dam A Seepage/Ditches were limited to a few patches of Muskgrass. These areas were dominated by habitat-generalist species and species that prefer slow water, abundant cover, and are tolerant of soft sediments and silty substrates.

5.0 REFERENCES

Freeman, B.J., and M. Hagler. 2009. Species profile for *Etheostoma trisella*. Original 1999 account and updates. Georgia Biodiversity Portal, Wildlife Resources Division, Wildlife Conservation Section, Social Circle. https://georgiabiodiversity.org/natels/profile?group=fishes&es_id=20635.

U.S. Fish and Wildlife Service (FWS). 2017. Species status assessment for the Trispot Darter (*Etheostoma trisella*). Version 1.0. Region 4, Atlanta, Georgia.

Table 1 Fishes Collected During the February 7 and February 28, 2023 Trispot Darter Surveys.

Common Name / Scientific Name	Overall Presence in Study Area	Channel A Forested	Tributary 1	Channel A Run	Channel A Vegetation Bed	Dam A Seepage / Ditches	Tributary 2	Tributary 3
Least Brook Lamprey *Lampetra aepyptera*	Rare		X					
Largescale Stoneroller *Campostoma oligolepis*	Abundant	X	X	X	X		X	X
Mountain Shiner *Lythrurus lirus*	Uncommon	X	X					
Rainbow Shiner *Notropis chrosomus*	Abundant	X	X	X	X		X	
Coosa Shiner *Notropis xaenocephalus*	Common	X	X					
Alabama Shiner *Cyprinella callistia*	Rare	X						
Tricolor Shiner *Cyprinella trichroistia*	Uncommon	X	X				X	
Creek Chub *Semotilus atromaculatus*	Rare						X	
Alabama Hogsucker *Hypentelium etowanum*	Uncommon	X	X					
Yellow Bullhead *Ameiurus natalis*	Rare				X			
Southern Studfish *Fundulus stellifer*	Uncommon			X	X			
Mosquitofish *Gambusia sp.*	Abundant			X	X	X	X	X
Redbreast Sunfish *Lepomis auritus*	Rare			X		X		
Green Sunfish *Lepomis cyanellus*	Rare				X			
Warmouth *Lepomis gulosus*	Rare				X		X	
Bluegill *Lepomis macrochirus*	Common			X	X	X	X	X
Longear Sunfish *Lepomis megalotis*	Rare				X			
Redear Sunfish *Lepomis microlophus*	Rare				X			
Spotted Sunfish *Lepomis punctatus*	Abundant	X		X	X			
Largemouth Bass *Micropterus salmoides*	Rare				X			
Coosa Darter *Etheostoma coosae*	Common	X	X	X	X		X	
Speckled Darter *Etheostoma stigmaeum*	Rare	X	X					
Total Number of Species	**22**							

Table 2 Water Quality Measurements During the February 7 and February 28, 2023 Trispot Darter Surveys.

Parameter	February 7, 2023		February 28, 2023	
	Channel A Between Confluence with Heath Creek and Confluence with Tributary 1	**Channel A** Between Culvert and Dam A Seepage and Tributary 2	**Channel A** Between Confluence with Heath Creek and Confluence with Tributary 1	**Channel A** Between Culvert and Dam A Seepage and Tributary 2
Temperature (°C)	10.6	9.9	13.3	14.1
Dissolved Oxygen (mg/L)	11.2	11.7	10.2	8.8
pH	7.26	7.14	7.43	7.18
Conductivity (µS)	107.3	104.4	120.6	155.8
Turbidity (NTU)	3.85	3.38	3.40	3.21
Water Clarity	Clear	Clear	Clear	Clear
Water Color	Clear	Clear	Clear	Clear
Surface Oils/Sheens	None	None	None	None
Odors	None	None	None	None

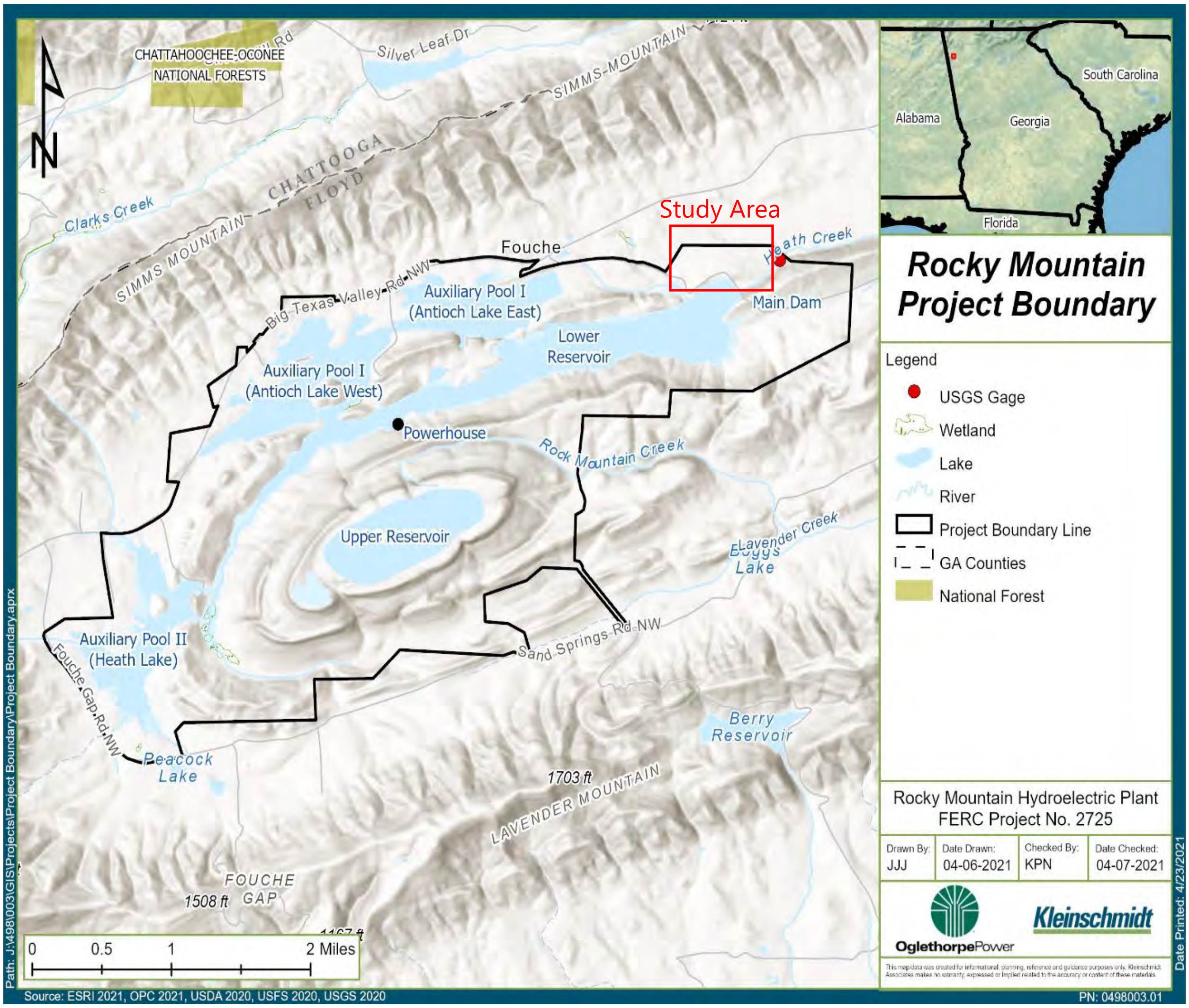

Figure 1 Project Boundary and Study Area

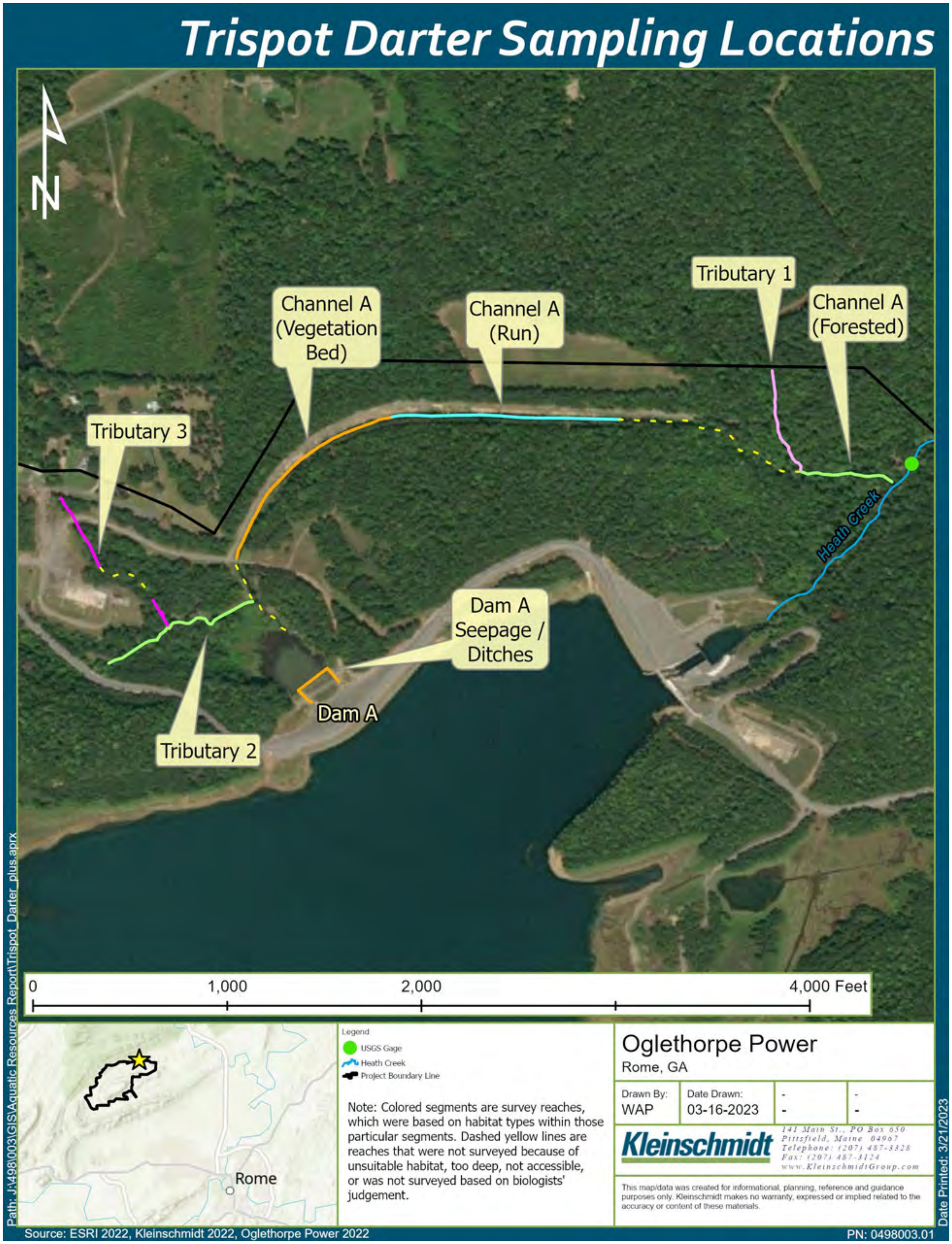

Figure 2 Survey Segments within the Study Area

Figure 3 Channel A – Forested

Forested segment of Channel A, between the confluence of Heath Creek (downstream) and Tributary 1 (upstream).

Figure 4 Tributary 1

Segment of Tributary 1, between of its confluence with Channel A (downstream) and a culvert crossing of the gravel access road (upstream).

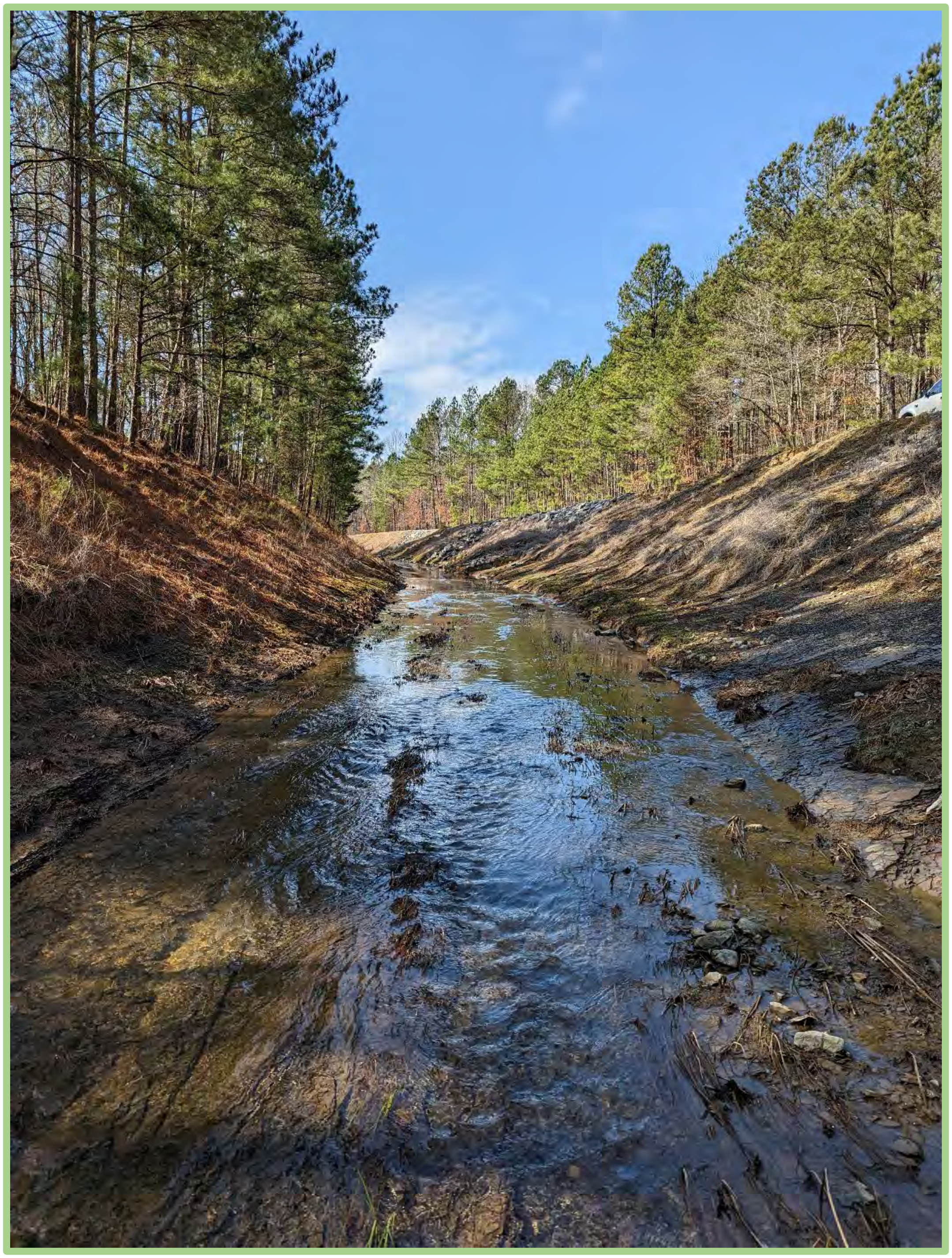

Figure 5 Channel A – Run

Segment of Channel A that was predominantly gravel runs with patches of dormant vegetation.

Figure 6 Channel A – Vegetation Bed

Segment of Channel A with deep pool (foreground) and beds of dormant and decaying subsurface vegetation (background).

Figure 7 Tributary 2

Naturalized portion of Tributary 2, immediately upstream of the channelized portion that runs along the north side of the Dam A seepage swamp.

Figure 8 Tributary 3

Downstream portion of Tributary 3 at its confluence with Tributary 2.

Figure 9 Dam A Seepage/Ditches

Ditch below Dam A conveying seepage to seepage swamp.

Terrestrial and Wetland Resources Survey Study Report
for the
Rocky Mountain Pumped Storage Hydroelectric Project

FERC Project No. 2725

Prepared For:

Kleinschmidt

Prepared By:

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ECOLOGY GROUP

August 25, 2023

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EXECUTIVE SUMMARY

In support of Federal Energy Regulatory Commission (FERC) relicensing of Oglethorpe Power Corporation's (OPC's) Rocky Mountain Pumped Storage Hydroelectric Project (RMPS Project, Project) (FERC Project Number 2725), a terrestrial resources study was conducted to develop information for analyzing the effects of continued project operation on terrestrial and wetland resources and terrestrial rare, threatened, and endangered (RTE) species of plants and wildlife in the license application. This Terrestrial and Wetland Resources Survey Report provides descriptions of terrestrial wildlife, botanical and wetland resources, littoral habitats, documentation of areas dominated by invasive species, and describes potentially suitable habitat for RTE species. Qualitative descriptions of the principal habitat types found within the project boundary, including vegetative community maps, are also provided.

The study area is defined as the FERC project boundary, which generally encompasses the Rocky Mountain Pumped Storage Hydroelectric Project and surrounding recreational lakes and recreational lands, and three Georgia Power and/or Oglethorpe Power managed transmission line corridors.

Potentially suitable habitat for seven state-listed species, two federally listed species, and one candidate species were encountered during field efforts. One sighting of the state-listed bald eagle was also recorded during field efforts. No federally listed species were observed during the RTE survey. Potentially suitable habitats within the project area do not appear to be affected by ongoing project operations or maintenance.

Dominant vegetative community types observed within the study area include mature, mixed pine-hardwood forest, pine forests, and mesic slope forests. Additional habitat types observed include dry oak-pine forest, wetlands, and areas of anthropogenic disturbance (including utility easements, roads, park facilities). A total of 298 species of plants were observed within the RMPS study area.

The mosaic of vegetative communities within the study area provides habitat for numerous wildlife. Five amphibian species and 10 reptile species were observed during the pedestrian surveys. White-tailed deer (*Odocoileus virginianus*) were abundant, and a total of eight mammal species or their spoor were observed. Numerous bird families/taxa were represented during the field study, including (but not limited to) waterfowl, shorebird/wading birds, neo-tropical migrants, raptors, and woodpeckers. A total of 62 avian species were observed within the RMPS study area.

A number of wetlands occur within the project boundary, which are primarily influenced by the Lower Reservoir within the project area and streams that flow into impounded waters. Forested wetlands are scattered throughout the site and are generally found in association with drainages to the various open water bodies. Emergent wetlands are primarily found at the inlet and outlet of the Lower Reservoir and are influenced by the lake's changing water levels.

Invasive species were notably sparse across the study area. A total of six invasive/exotic vegetative species were observed within the project boundary. Invasive species were often found in small, dense patches. Species included Chinese privet (*Ligustrum sinense*) along forest edges on Big Texas Valley Road, both species of bushclover (*Lespedeza bicolor* and *Lespedeza cuneata*) throughout the right-of-way easement, Japanese stiltgrass (*Microstegium vimineum)* in forested floodplains of larger streams and rivers, and tree of heaven (*Ailanthus altissima*) and princess tree (*Paulownia tomentosa*) bordering maintained forest edges near recreation facilities.

1.0 INTRODUCTION

This report presents the findings of the Terrestrial and Wetland Resources Survey conducted for the Federal Energy Regulatory Commission (FERC) relicensing of Oglethorpe Power Corporation's (OPC's) Rocky Mountain Pumped Storage Hydroelectric Project (FERC No. 2725) (RMPS Project, or Project). The RMPS Project is located in Floyd County, Georgia, approximately 10 miles northwest of the city of Rome (Figure 1). The Project consists of a 221-acre Upper Reservoir; a 600-acre Lower Reservoir on Heath Creek; two Auxiliary Pools (Auxiliary Pool I and Auxiliary Pool II) adjacent to the Lower Reservoir totaling approximately 600 acres; a three-unit powerhouse; a substation located 1.5 miles from the powerhouse; three 230-kV transmission lines comprising a total of 1.5 miles[1]; an access road; and appurtenant facilities. The RPMS Project has an installed generating capacity of 904 megawatts (MW). OPC is not proposing to add capacity or make any major modifications to the RMPS Project under the license. The Project does not occupy any federal lands (Figure 2). The original license expires December 31, 2026.

OPC has completed a study to characterize existing terrestrial resources, including vegetative communities, wildlife, wetlands, riparian corridors, and littoral habitats at the RMPS Project for use in analyzing the potential effects of continued project operation on the environment. The study was conducted according to OPC's Final Study Plan for the Project distributed to stakeholders in August 2022. The information generated by this study and presented herein will be used by OPC to evaluate the environmental effects of continued project operation on terrestrial and wetland resources in Exhibit E (Environmental Report) of the license application. The study findings will also inform consultation with resource agencies concerning protected species and potential environmental measures in the license.

1.1 Objectives

Specific study objectives for the terrestrial and wetland resources study were to characterize floral and faunal communities and identify/characterize terrestrial habitats and wetland resources within the project boundary[2]. The specific objectives of the study included:

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[1] OPC is proposing to remove from the principal project works and the project boundary the substation, which is commonly referred to as the "Switching Station" of the Project, and the three 230-kV transmission lines comprising a total of approximately 1.5 miles.

[2] "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.

- Describe terrestrial wildlife and botanical resources occurring in the study area, including lists of representative plant and animal species that use representative habitats and identifying invasive species in these habitats.
- Describe floodplain, wetlands, and riparian habitats occurring in the study area, including lists of representative plant and animal species that use representative habitats and identifying invasive species in these habitats.
- Prepare a map of the principal vegetation community types in the project boundary, including wetlands.
- Identify potentially suitable habitat for rare, threatened, and endangered (RTE) species of plants and animals in the project boundary.
- Develop information sufficient for analyzing the effects of continued project operation on terrestrial and wetland resources and terrestrial RTE species of plants and wildlife in the license application.

Accordingly, the study identifies plant and animal species observed (or known to occur via literature reviews), characterizes upland, wetland, and littoral habitats, and documents the presence of invasive species within the study area. A map was prepared of the principal vegetation community types in the project boundary including wetlands. Additionally, a survey of RTE species and their respective habitats was performed in tandem with the terrestrial and wetland resources survey to identify whether sensitive species or their preferred habitats occur within, or in proximity to, the RMPS project boundary.

1.2 Study Area

The RMPS project boundary encompasses approximately 5,000 acres of land and water within the Ridge and Valley physiographic region of northwest Georgia (Figure 5). The Project is located on Heath Creek within the Armuchee Creek tributary system of the Oostanaula River, which lies within the Coosa River basin (Figures 3 and 4). The Project's Upper Reservoir is formed by a 120-foot-high, 12,895-foot-long, continuous earth and rockfill dam, which circumscribes the natural concave top of Rocky Mountain. The Lower Reservoir is located on Heath Creek. Adjacent to the Lower Reservoir to the north and west are 400-acre and 200-acre Auxiliary Pools. The Project's penstocks provide generating flows to the Project's powerhouse, which is located at the Lower Reservoir. Flows discharged from the powerhouse are stored in the Lower Reservoir. The Project includes a substation located 1.5 miles from the powerhouse and three 230-kV transmission lines comprising a total of 1.5 miles[3].

There are no federally or state-owned lands located within or adjacent to the RMPS Project. Auxiliary Pools I and II are managed and operated by the Georgia Department of Natural Resources (GDNR) as part of the Rocky Mountain Recreation and Public Fishing Area (Rocky Mountain PFA). They contain a variety of recreational facilities. Auxiliary Pool I is known as

[3] As indicated above, OPC will be proposing that the substation and the Primary Transmission Line be removed from the project works.

Antioch Lake and includes two sub-impoundments referred to as Antioch Lake East and Antioch Lake West. Auxiliary Pool II is known as Heath Lake (Figure 3).

2.0 STUDY METHODS

Methods for conducting the terrestrial and wetlands resources study consisted of the following elements.

2.1 Review of Existing Information

Prior to conducting the field reconnaissance surveys, Corblu Ecology Group's (Corblu) field ecologists reviewed a comprehensive list 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 data sources include, but are not limited to, the following publicly available information:

- OPC Pre-Application Document (PAD)
- Terrestrial Management Plan for the Rocky Mountain Project (GDNR 2013)
- *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, Shannon Route 2019 (USGS 2019)
- Christmas Bird Count Floyd County (National Audubon Society 2023
- *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)
- International Ecological Classification Standard: Terrestrial Ecological Classification (NatureServe 2007)
- Georgia Exotic Pest Plant Council (2022)

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 RMPS Project. 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[4] also was performed prior to conducting field studies to evaluate which invasive plant species could potentially be encountered within the RMPS Project study area.

2.2 GIS Mapping

Corblu developed preliminary GIS maps to assist field investigators in conducting field surveys. Background data used to develop the maps included aerial imagery from the National Agriculture Imagery Program (NAIP)[5] (Figure 3), 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[6] (Figure 6), and project boundary data provided from internal sources. 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 six individual grid maps at a 1:1000 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 RTE species. These maps allowed investigators to ground truth land classification types within 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, if any, or potentially suitable habitats.

2.3 Rare, Threatened, and Endangered Species Surveys

A RTE species survey was conducted concurrent with the terrestrial, wetlands, and littoral resources survey to determine the occurrence or potential occurrence of federal- and state-listed species known to occur in Floyd County. Prior to the field surveys, an office review of available resources and databases was performed to develop a list of potential federal and state-listed species and their preferred habitats known to occur within the above-referenced county. The list of known protected species was compiled by a review of the USFWS' Information for Planning and Consultation (IPaC) web application (Appendix A), along with other publicly available resources[7]. Table 1 of Appendix B provides a list of species that are known to occur within the project vicinity, along with summary descriptions of the species and their preferred habitats.

[4] http://www.gainvasives.org/species/weeds/
[5] https://www.fsa.usda.gov/programs-and-services/aerial-photography/imagery-programs/naip-imagery/index
[6] https://www.fws.gov/wetlands/Data/Mapper.html
[7] https://ipac.ecosphere.fws.gov/
https://www.georgiabiodiversity.com/portal/table/ga_protected/

Additional tasks related to the presence of RTE species, or their respective habitats also were performed concurrently with the terrestrial and wetland resources survey. When potentially suitable habitat for a particular species was encountered, field ecologists recorded the location and documented the habitat conditions and community type. GPS locations of these features were assimilated into the project shapefiles to include in the GIS mapping effort.

2.4 Field Surveys

Field surveys were conducted July 26-28, 2022, September 20-21, 2022, and March 30-31, 2023. Survey efforts included one to two teams of investigators, having a minimum of two biologists/ecologists on each team. Each team member participated in the field surveys and was assigned a focused responsibility; for example, one team member targeted botanical resources and one investigator focused on visual and auditory observations for birds and other wildlife. Both team members recorded observations of other wildlife and/or spoor and also noted occurrences of invasive species. However, every team member had sufficient knowledge in both flora and fauna of the Ridge and Valley 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 (July 26 – 28) targeted areas within the project boundary security fence that were accessible by foot and vehicle via onsite roads/trails. These areas included the Upper Reservoir, the surrounding slopes of Rocky Mountain, and approximately five miles of powerline utility right-of-way. Pedestrian surveys during the initial week were used to develop familiarity with the area and develop species lists that served as the foundation for the remaining survey efforts. After areas within the security fence were completed, field efforts focused on areas within the Rocky Mountain PFA. The Rocky Mountain PFA generally encompasses Auxiliary Pool I and Auxiliary Pool II, and contains recreational areas, camp sites, and hiking/biking trails.

Subsequent field efforts conducted in September included areas that were not observed during the July field efforts. These areas primarily included Heath Lake (Auxiliary Pool II), the southern slopes of the Upper Reservoir, and the ridge south of the Lower Reservoir. Investigators deployed personal watercrafts into Heath Lake to gain access to more isolated areas and record the lake's littoral habitat along the shoreline.

The final field investigation occurred during March 30-31, 2023. Field efforts in March were conducted to survey areas previously identified as potentially suitable habitats for listed species throughout the project area. These areas included riparian corridors, dry oak-pine forest, mixed pine-hardwood, forested wetland, bottomland hardwood, and mesic slope forest. This survey event also allowed for field ecologists to identify spring ephemeral flora, particularly along north-facing slopes and other mesic hardwood forest habitats.

Throughout the course of the field surveys each team recorded observations in dedicated field notebooks and developed species lists specific to a particular taxon. 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. Community data were used to document each habitat type and a global positioning system (GPS) point was acquired to document the specific locations. These data allowed investigators to record dominant plant species in each vegetative stratum, including canopy, subcanopy, and herbaceous layers. Additionally, field investigators recorded the presence of invasive species and noted any wildlife observations (and spoor) in the vicinity of the data point.

During pedestrian surveys, observations of invasive species were documented in field books. The location of invasive species was recorded where a species occupied more than 10 percent of the cover of a particular strata. This method allowed field investigators to transfer areas of concern to the GIS database so that these areas could be depicted on the maps for location and potential follow-up assessments.

3.0 STUDY RESULTS

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

3.1 Project Setting

Ecoregion data were utilized to provide a framework for describing the overall ecology of the region, and there are six major ecoregions that are generally recognized within the State of Georgia (Edwards, et al. 2013). The six ecoregions (Level III physiographic regions) include the Blue Ridge, Ridge and Valley, Southwestern Appalachians, Piedmont, Upper Coastal Plain, and Lower Coastal Plain (Griffith, et al. 2001). These areas are delineated based on common physical and biological characteristics, which include soils, climate, hydrology, vegetative communities, wildlife, and underlying geology. The RMPS Project is situated within the Ridge and Valley Ecoregion (Level III) in Georgia (Figure 5).

The RMPS Project is located on Heath Creek within the Armuchee Creek tributary system of the Oostanaula River in the Coosa River basin of northwest Georgia. The Project is located within the Oostanaula watershed (Hydrologic Unit Code 03150103). The Coosa River begins within the city of Rome at the confluence of the Oostanaula and Etowah Rivers. Armuchee Creek enters the Oostanaula River about 10 river miles upstream of Rome. The Project's Lower Reservoir inundates a portion of Heath Creek, about three miles downstream of its origin from springs in the Lavender and Simms mountains. The drainage area of Heath Creek at the Main Dam is 16.6 square miles (sq mi).

The Georgia Department of Natural Resources' (GDNR) Coosa River Basin Management Plan (1998) describes the underlying geology of the Coosa River basin as being largely comprised of Paleozoic rocks such as shale, siltstone, sandstone, limestone, and dolostone. The Valley and Ridge province is found to have more intense rock deformation within the Coosa River Basin and the valley floor of the Coosa River is deposited with discontinuous quartz sand and gravel bed from Cenozoic age.

3.2 Rare, Threatened, and Endangered Species Surveys

RTE species surveys for federally and Georgia state-listed species were conducted concurrent with the terrestrial and wetland resources survey of the RMPS Project.

3.2.1 Overview

Under the terms of Section 7(a)(2) of the Endangered Species Act, as decreed by the USFWS and amended through the 108th U.S. Congress, federal agencies shall, "ensure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species which is determined by the Secretary, after consultation as appropriate with affected States, to be critical…". Thus, any potential activities occurring from modifications/development within the existing RMPS Project that would require a federal permit, would also trigger a review of the project by the USFWS for compliance with the Endangered Species Act. The following discussion outlines Corblu's methods and results regarding federally listed species, which include endangered, threatened, and candidate species. Species that are not federally listed but considered state-protected were also included within the scope of work.

The field survey was limited to a preliminary assessment where Corblu ecologists evaluated the RMPS Project to identify whether potentially suitable habitat occurs for each respective species. Targeted, species-specific surveys were not included in this task. Corblu noted the various terrestrial and aquatic habitats and vegetative community types that occur within the project boundary. Where applicable, potentially suitable habitats within the Project were GPS located and are depicted on the field data maps (Figure 07 through Figure 14).

3.2.2 Survey Results

Corblu initiated the desktop review for protected species on July 15, 2022 (updated May 10, 2023) and developed a list of federally listed and state-protected species known to occur within the area the project is located, as well as those known to occur in Floyd County, Georgia (Appendix B, Table 1). The desktop resources identified 2 reptiles, 2 insects, 1 crustacean, 8 aquatic mussels, 1 freshwater snail, 7 fish, 1 amphibian, 2 birds, 3 mammals, and 26 flowering plants.

No federally listed species were observed during the protected species survey for the RMPS Project. Although no individuals were observed, Corblu ecologists recorded suitable habitat for two federally listed species. These species included the Indiana bat (*Myotis sodalis*), and Northern Long-eared bat (*Myotis septentrionalis*). In addition, one sighting of the state-listed bald eagle (*Haliaeetus leucocephalus*) was observed and suitable habitat for seven state-listed species (described in the following paragraphs) were recorded during field efforts. No other suitable habitats were observed for the remainder of the listed species within the project area. Please note that Corblu's scope of work consisted of passive, pedestrian surveys to identify suitable habitats for listed species and record occurrences of species identified on-site, in accordance with the Study Plan. Targeted, species-specific surveys, such as mist-netting or acoustic surveys for bats, trapping/collection activities for invertebrates, linear/gridded vegetation plots for plants, and herpetofauna arrays for reptiles and amphibians were not conducted for this study.

Potentially suitable habitat for the Monarch butterfly (candidate species) was identified in one area within the project boundary (Figure 11). This area was found along the transmission line easement and meets the USFWS' preferred habitat description for the species. Butterfly weed (*Asclepias tuberosa*) was observed at this location. Due to the lack of forested canopy, it is possible that other areas along the transmission line easements may contain butterfly weed or other milkweed species (*Asclepias spp*.).

Potentially suitable habitat for two federally listed bat species (Indiana bat and Northern long-eared bat) was interspersed throughout the project boundary. These areas meet the USFWS' preferred habitat descriptions for the species. USFWS describes these habitats as "a wide variety of forested/wood habitats with live trees and/or snags that have exfoliating bark, cracks, crevices, and/or cavities, as well as emergent wetlands and adjacent edges of agricultural fields, old fields, and pastures. Indiana and Northern long-eared bats have also been observed roosting in human-made structures". Habitat matching this USFWS description can be found within the following mapped habitat type polygons: bottomland hardwoods, dry oak-pine forest, emergent wetland, forested wetland, and mixed pine-hardwood (Figures 8-13). Ongoing project operations do not appear to affect potentially suitable habitats/hibernacula of bats onsite.

Potentially suitable habitat for the state-listed bald eagle was identified along the edges of Auxiliary Pool I (East), Auxiliary Pool I (West), Auxiliary Pool II, Lower Reservoir, and Upper Reservoir. These areas fit the GDNR's preferred habitat description for the species. GDNR describes this habitat as "at edges of lakes, large rivers, and seacoasts". Representative photographs of littoral habitat types also provide an adequate depiction of the potentially suitable habitat for the bald eagle (Appendix C). Habitat matching this GDNR description can be found within the open water- and littoral-mapped habitat type polygons (Figures 8-13). Figure 14 discloses the approximate location of where Corblu ecologists encountered one individual. As identified in the PAD, one known active bald eagle nesting territory occurs within the project boundary.

Potentially suitable habitat for the state-listed Cherokee clubtail (*Stenogomphurus consanguis*), which is under review by USFWS for possible federal listing, was identified in three areas within the project boundary (Figures 9, 12, and 13). These areas meet the GDNR's preferred habitat description for the species, which describes this habitat as "small first- and second-order spring fed streams with silty pool bottoms; occupied streams are often spring-fed." These areas are located along the base of Rocky Mountain and do not appear to be affected by project operations and maintenance. Representative photographs were taken of potentially suitable Cherokee clubtail habitat sites and are provided in Appendix C.

Potentially suitable habitat for state-listed green salamander (*Aneides aeneus*) was identified throughout the project area, but primarily on the southern slopes of Rocky Mountain. GDNR describes the preferred habitat as “moist rock crevices, canopies of trees, or within hardwood forests”. This species has been observed by GDNR among the boulders and cliffs in forests on the slopes of Rocky Mountain (GDNR 2013). These areas do not occur within or immediately adjacent to the project works/operations and do not appear to be affected by project operations and maintenance. Habitat matching this GDNR description can be found within the following mapped habitat type polygons: dry oak-pine forest, and mixed pine-hardwood (Figures 12 and 13).

Although individuals were not detected within the study area, Corblu ecologists observed potentially suitable habitat for four state-listed plant species within the RMPS project boundary. These four species include the pink ladyslipper (*Cypripedium acaule*), Alabama warbonnet (*Jamesianthus alabamensis*), Allegheny spurge (*Pachysandra procumbens*), and Georgia aster (*Symphyotrichum georgianum*). GDNR habitat summaries were accessed through the Georgia Biodiversity Portal and are provided below, along with potential effects, if any, to these species and/or their preferred habitats.

- Pink ladyslipper: Found in upland oak-hickory-pine forests and piney woods. This habitat is the most dominant habitat type within the RMPS Project boundary (depicted as mixed pine-hardwood on Figures 8 through 13). Professional experience has observed that this species typically requires relatively undisturbed habitat, often on north-facing slopes with a well-established layer of duff/detritus. However, these specific requirements are not necessary for the species to occur. This habitat occurs adjacent to project facilities, including areas along the shorelines of reservoirs/auxiliary pools, adjacent to access roads and powerline easements, and adjacent to impoundment structures throughout the project area. Continued project operations and maintenance as proposed would not be expected to adversely affect the species.
- Alabama warbonnet: This plant is found along stream banks in circumneutral soils. Potentially suitable habitat for this species occurs along headwater perennial and intermittent streams of Rocky Mountain Creek and Heath Creek (Figures 4 and 6). These habitats do not occur near or adjacent to project facilities or public facilities, except for the upper reach of Heath Creek and its tributaries that intersect the powerline right-of-way, and do not appear to be affected by project operations and maintenance. Adverse effects to this species are not expected under currently on-going operation activities.
- Allegheny spurge: Found within mesic hardwood forests over basic soils. Preferred habitat for this species is primarily within the mesic hardwood forest along the north-facing slopes of Rocky Mountain, located north of the Upper Reservoir and south of the Lower Reservoir (Figures 3 and 12). These habitats do not occur immediately adjacent to project facilities.

Continued operation of ongoing activities are not expected to affect this species or its habitat. Expansion of project infrastructure or disturbance within the mesic hardwood forest habitat could negatively affect this species' preferred habitat.

- Georgia aster: Found within upland oak-hickory-pine forests and openings, sometimes with *Echinacea laevigata* or over amphibolite. This species has been previously found along powerline right-of-ways in Floyd County; however, no individuals were observed during the field surveys. Potentially suitable habitat for this species is depicted on Figures 8 through 13 (mixed pine-hardwood and easement right-of-way habitats). Continued project operation is not expected to affect this species' preferred habitat. A positive effect on this species' habitat is plausible should expansion of the powerline right-of-ways be necessary in the future.

3.3 Terrestrial Botanical Resources

Lands within and encompassing the RMPS Project contain a mosaic of vegetative communities (Figures 8-13). Much of these lands have been altered from natural undeveloped lands to accommodate the RMPS operations. Thus, the majority of vegetative communities have been influenced by anthropogenic disturbances. Below are descriptions of the 14 vegetative communities observed along with additional descriptions of flora found within the project boundary.

3.3.1 Vegetative Communities/Habitat Types

Fourteen vegetative communities were observed during the field surveys conducted for the RMPS Project. Vegetative community characterizations for this survey were similar to GDNR's dominant natural community designations for the 2013 Terrestrial Management Plan. Table 3-1 provides a list of these habitat types along with estimated acreages of each type within the project boundary. A column is provided in this table for comparison between GDNR natural community types and vegetative community types described in this report. Table 2 of Appendix B presents the plant species encountered across all habitat types within the project study area. Appendix C contains a selection of representative photographs of some of the habitat types encountered.

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

Vegetative Community/ Habitat Type	GDNR Dominant Natural Community Designations**	Approximate Acreage within Project Boundary*
Anthropogenic Disturbance	N/A	279.30
Bottomland Hardwood Forest	Seasonally Flooded Oak Forest	14.20
Boulder Field	Cliffs, Boulder Fields	0.92
Dry Oak-Pine Forest	Pine-Oak Piedmont Forest	256.21
Easement Right-of-Way	N/A	150.90
Emergent Wetland	N/A	85.37
Forested Wetland	N/A	33.94
Littoral	N/A	141.98
Mesic Slope Forest	Mesic Oak-Hickory-Pine Forest; Oak-Hickory Dry Mesic Forest; Oak-Hickory-Maple Forest	310.51
Mixed Pine-Hardwood Forest	Mixed Pine-Hardwood Forest; South-Facing Slope Mixed Pine-Hardwood Forest	2,091.75
Open Water (Reservoirs/Lakes)	N/A	1,120.24
Planted-Pine/Pine Forest	N/A	116.91
Improved Roads/Unimproved Roads	N/A	70.8
Xeric/Sub-Xeric Ridgetop Forest	Oak sub-Xeric Ridgetop Forest; Oak (Chestnut) Ridgetop Forest	208.28
Total Acreage		**4,881.31**

*Acreage calculations are estimates developed from aerial imagery and other GIS-based sources and are considered approximate. **Comparisons between this report's vegetative community types and GDNR's natural community types should be used to compare similarities, but are not identical in vegetative composition

1. <u>Anthropogenic Disturbances</u>

The anthropogenic disturbance habitat included a variety of lands that have been altered including recreational facilities (campgrounds, boat ramps, visitors' center, etc.), OPC facilities, utility easements, substations 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. Scattered populations of invasive species were also observed in these areas, including but not limited to tree of heaven and Chinese privet. Approximately 279 acres (5.7 percent) of the project study area is occupied by lands considered as anthropogenic disturbances.

2. <u>Bottomland Hardwood Forest</u>

The Bottomland hardwood forest habitat type was observed in the northeastern portion of the project area along Heath Creek. Dominant canopy and midstory species included American sycamore (*Platanus occidentalis*), tuliptree (*Liriodendron tulipifera*), mockernut hickory (*Carya tomentosa*), and Florida maple (Acer floridanum). Midstory species contained American hornbeam (*Carpinus caroliniana*), Eastern redbud (*Cercis canadensis*), American elm (*Ulmus* *americana*), and paw paw *(Asimina triloba*). Herbaceous flora included trillium (*Trillium spp.*), rivercane (*Arundinaria gigantea*), Christmas fern (*Polystichum acrostichoides*), and wingstem (*Verbesina alternifolia*). Approximately 14 acres (0.29 percent) of bottomland hardwood forest was observed within the project boundary.

3. Boulder Field

This habitat type occupies approximately one acre (less than 0.02 percent) within the project study area and acts as the spillway for the Upper Reservoir. This area is characterized by the presence of bare/exposed bedrock that has been modified for use as the spillway. Vegetation found in this habitat lacks canopy and subcanopy species and contains a scattered herbaceous layer. Species found in this habitat include pineweed (*Hypericum gentianoides*), rabbit tobacco (*Pseudognaphalium obtusifolium*), reindeer moss (*Cladonia rangiferina*), bahiagrass (*Paspalum notatum*), mannagrass (*Glyceria grandis*), and horseweed (*Erigeron canadensis*).

4. 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 occurs on upland ridges and upper- to mid-slope elevations. The dominant canopy species includes white oak (*Quercus alba*), Northern red oak (*Q. rubra*), shortleaf pine (*Pinus echinata*), loblolly pine (*P. taeda*), and mockernut hickory. Canopy species seedlings, as well as basswood (*Tilia americana*), blackgum (*Nyssa sylvatica*), American elm, and hawthorn (*Crataegus sp*.) occupied the midstory. Herbaceous species that commonly occur in this habitat include Christmas fern, tick-trefoil (*Desmodium spp*.), mayapple (*Podophyllum peltatum*), and wild ginger (*Hexastylis spp.*). Approximately 256 acres (5.2 percent) of land within the project boundary contained the dry oak/pine forest habitat.

5. Transmission Easement

The study area included approximately 1.5-mile of transmission easement that was primarily boarded by mixed pine hardwood forest but also traversed other habitat types throughout the project area. The easement appears to be periodically maintained through mowing or other management measures; however, some sections are located within emergent wetlands that cannot be maintained. The transmission easement habitat is primarily limited to herbaceous species. Although most of the corridor is located within uplands, occasional emergent wetlands and streams were observed within the easement corridor. Upland vegetation included Chinese bushclover (*Lespedeza cuneata*), shrubby bushclover (*L. bicolor*), goldenrods (*Solidago spp*.), broomsedge (*Andropogon virginicus*), sicklepod (*Senna obtusifolia*), butterfly weed (*Asclepias tuberosa*), and numerous other early successional species. Wetland vegetation, such as meadow beauty (*Rhexia spp.*), false nettle (*Boehmeria cylindrica*), marsh dewflower (*Murdannia keisak*), and various sedges (*Carex spp*.) occurred in the emergent wetlands within the transmission easement. The transmission easement within the project boundary occupied approximately 151 acres (3.1 percent).

6. Emergent/Herbaceous Wetland

The emergent/herbaceous wetland habitat occurred in scattered areas around the Lower Reservoir and auxillary pools, particularly in areas where water levels frequently fluctuate. Common vegetation in these areas include cattail (*Typha spp.)*, sweetscent (*Pluchea odorata*), marshpepper knotweed (*Persicaria hydropiper*), meadow beauty, false nettle, flatsedges (*Cyperus spp.),* bullrushes (*Scirpus spp.),* sedges, and pennywort (*Hydrocotyle spp*.). Approximately 85 acres (1.7 percent) of the project study area consisted of emergent/herbaceous wetlands.

7. Forested Wetland

Forested wetland communities were found scattered throughout the southern region of the project area, in poorly drained areas within floodplains, riparian corridors, and open water edges. Dominant canopy vegetation included sugarberry (*Celtis laevigata*, green ash (*Fraxinus pennsylvanica*), water oak (*Q. nigra*), red maple (A. rubrum), and American sycamore. Midstory vegetation contained American hornbeam, American elm, sweetshrub (*Calycanthus floridus*), and hearts-a-burstin' (*Euonymus americanus*). Herbaceous vegetation observed in forested wetlands throughout the project area included green arrow-arum (*Peltandra virginica*), netted chainfern (*Woodwardia areolata*), sensitive fern (*Onoclea sensibilis*), jack-in-the-pulpit (*Arisaema triphyllum*), woodland spider-lily (*Hymenocallis occidentalis*), and slender woodoats (*Chasmanthium laxum)*. Approximately 34 acres (0.70 percent) of forested wetlands were observed within the project boundary.

8. Littoral Habitat

Littoral habitat was observed along the shores of the Auxiliary Pools and Lower Reservoir. Dominant canopy species included willow oak (*Q. phellos*), American sycamore, and red maple. Common midstory species observed were hazel alder (*Alnus serrulata)*, black willow (*Salix nigra*), and swamp dogwood (*Cornus foemina*). Herbaceous species included marshpepper knotweed, false nettle, path rush (*Juncus tenuis*), plume grass (*Saccharum alopecuroides*), and bushy bluestem (*Andropogon glomeratus)*. Approximately 142 acres (2.9 percent) of littoral habitat was observed within the project boundary.

9. Mesic Slope Forest

This sparsely distributed habitat type was observed in scattered locations along steeper slopes above floodplains or riparian corridors. Canopy vegetation includes American beech (*Fagus grandifolia*), Southern magnolia (*Magnolia grandifolia*), Northern red oak (*Q. rubra*), white oak (*Q. alba*), shagbark (*C. ovata)* and mockernut hickory, blackgum, tuliptree, and sweetgum (Liquidambar styraciflua). Subcanopy species include Florida maple, sourwood (*Oxydendron arboreum*), red maple, American hornbeam, hop hornbeam (*Ostrya virginiana*), Carolina silverbells (*Halesia carolina*), American holly (*Ilex opaca*), witch-hazel (H*amamelis virginiana*), cucumber magnolia (*Magnolia acuminata*), basswood, and buckeye (*Aesculus spp*.). Herbaceous vegetation was generally sparse, but included cranefly orchid (*Tipularia discolor*), woodsorrel

(*Oxalis spp*.), mayapple (*Podophyllum peltatum*), and several species of trillium (*Trillium spp*.). Approximately 311 acres (6.4 percent) of mesic slope forest occurred within the project boundary.

10. 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, mockernut and pignut hickories, Southern red oak (*Q. falcata*), sweetgum, and tuliptree in the canopy. Midstory species include blackgum, flowering dogwood (*Cornus florida*), Florida maple, Eastern redbud, hawthorn (*Crataegus spp*.), sparkleberry (*Vaccinium arboreum*), and black cherry (*Prunus serotina*). Dominant herbaceous species include Christmas fern, 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 2092 acres (42.9 percent) of the project area.

11. Planted Pine/Pine Forest

The pine forest habitat type was primarily found surrounding facility structures/buildings and planted-pine habitat was also concentrated near the northeastern portion of the project boundary, with sparse communities found along the project boundary edge where surrounding silviculture practices have occurred. This vegetative community reflected disturbed conditions and typically included managed pine plantations of various ages, from recently planted to merchantable-aged stands (20 to 30 years). The dominant species was loblolly pine, although scattered occurrences of Virginia pine (*P. virginiana*) pine was observed. Midstory species included cherry bark oak (*Quercus pagoda*), green ash, and early successional hardwoods such as sweetgum and tuliptree. Herbaceous and shrub species included tick-trefoils, blackberry (*Rubus spp*.), greenbriers, muscadine (*Vitis rotundifolia*), St. Andrew’s Cross (*Hypericum hypericoides*.), and partridge pea. Managed pine plantations and other pine-dominated forests occupied approximately 117 acres (2.4 percent) of the project boundary.

12. Xeric/Sub-Xeric Ridgetop Forest

This habitat is primarily found in the upper elevations of the project area, generally surrounding the pumped storage reservoir. Xeric/sub-xeric areas within the project area have canopies dominated by species such as chestnut oak (*Q. montana*), shortleaf pine (*Pinus echinata*), blackjack oak (*Q. marilandica*), and black cherry. Midstory species include winged elm (*Ulmus alata*), winged sumac (*Rhus copallinum*), sparkleberry, and hawthorn. Herbaceous species include trumpet creeper (*Campsis radicans*), white snakeroot (*Ageratina altissima*), and blackberry. Approximately 208 acres (4.3 percent) of xeric/sub-xeric ridgetop forest occurred within the project boundary.

3.3.2 Observed Flora within the Project Boundary

In addition to characterizing the 14 habitat types encountered, field investigators created a cumulative list of flora observed during the field surveys. Nearly 300 species of plants were identified (Appendix B, Table 2).

3.3.3 Wildlife

A review of the U.S. Geological Surveys' (USGS) GAP Analysis of Georgia (2003) indicated that the Ridge and Valley, and more specifically Floyd County, has mid to upper values for species richness scores when compared to other areas of the state. Amphibians were an exception in this finding, where the GAP Analysis depicted a score range between 29 and 33, which is lower than the median value for the state of Georgia. 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 232 to 244 (the median richness score range within Georgia).

Wildlife observations were relatively common with a total of 85 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. Observations were based on passive encounters; no targeted 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 C provides representative photographs of some of the fauna encountered during the field surveys.

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

Wildlife Taxa	Species Richness
Mammals	8
Birds	62
Amphibians	5
Reptiles	10
Total Species Richness Observed	**85**

<u>Mammals</u>

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

Common Name	Scientific Name
Coyote	*Canis latrans*
American beaver	*Castor canadensis*
Nine-banded armadillo	*Dasypus novemcinctus*
White-tailed deer	*Odocoileus virginianus*
Common raccoon	*Procyon lotor*
Eastern gray squirrel	*Sciurus carolinensis*
Eastern chipmunk	*Tamias striatus*
Eastern cottontail	*Sylvilagus floridanus*

Reptiles and Amphibians

Herpetofauna were observed throughout the RMPS Project study area. Species were observed in a variety of habitats, including mixed pine/hardwood, xeric/subxeric and riparian forests, various wetlands, and mesic slope hardwood forests. Common species observed included Southern leopard frog (*Lithobates sphenocephalus*), Southern cricket frog (*Acris gryllus*), and midland water snake (*Nerodia sipedon*). One species of turtle, the yellow-bellied slider (*Trachemys scripta*), was commonly seen basking on logs and other debris within the reservoir and associated streams. A total of five amphibians and 10 reptiles were observed during the field surveys. Tables 3-4 and 3-5 present a list of reptiles and amphibians (respectively) observed within the project boundary.

Table 3-4. Reptiles Observed within the RMPS Project Boundary.

Common Name	Scientific Name
Black rat snake	*Pantherophis obsoletus*
Black racer	*Coluber constrictor*
Midland water snake	*Nerodia sipedon*
Timber rattlesnake	*Crotalus horridus*
Yellow-Bellied slider	*Trachemys scripta*
Dekay's brown snake	*Storeria dekayi*
Broadhead skink	*Plestiodon laticeps*
Green anole	*Anolis carolinensis*
Eastern mud turtle	*Kinosternon subrubrum*
Eastern box Turtle	*Terrapene carolina*

Table 3-5: Amphibians Observed within the RPMS Boundary.

Common Name	Scientific Name
Southern cricket frog	*Acris gryllus*
Fowler's toad	*Anaxyrus fowleri*
Southern leopard frog	*Lithobates sphenocephalus*
Northern dusky salamander	*Desmognathus fuscus*
American toad	*Anaxyrus americanus*

Birds

Field investigators identified 62 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*), downy woodpecker (*Dryobates pubescens*), and turkey vulture (*Cathartes aura*). Six diurnal raptors, four species of waterfowl, and four species of wading/shorebirds were observed during field surveys. Table 3 in Appendix B provides a list of bird species observed, as well as lists of species observed from the most recent Floyd County (GAFC) Audubon Christmas Bird Count and USGS Breeding Bird Surveys along the Shannon survey route.

3.4 Wetlands and Littoral Habitats

The USFWS generally defines 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).

Two dominant wetland habitat types were observed during the field surveys, including forested wetlands and emergent wetlands. Descriptions of these wetland communities are provided in Section 3.3.1. Forested wetlands were scattered across the RMPS project area. These wetlands were primarily found within the floodplains of Rocky Mountain Creek, along low-lying areas bordering the Auxiliary Pools and Lower Reservoir, and at the edges of emergent wetland communities. Cowardin classifications for the forested wetlands include the following:

- PFO1Cb – Palustrine, forested, broad-leaved deciduous, seasonally flooded wetlands; beavers
- PFO1C – Palustrine, forested, broad-leaved deciduous, seasonally flooded wetlands

Emergent wetlands were often found as a transitional community between forested wetlands and open water. Two of the largest emergent wetland communities found with the project boundary are in both the northern and southern reaches of the Lower Reservoir and are influenced by fluctuating water levels. Cowardin classifications for the emergent wetlands include the following:

- PEM1C – Palustrine, emergent, persistent, seasonally flooded, impounded/diked

Littoral habitat within the project boundary includes mainly the shallow zones of the Auxiliary Pools where sunlight penetrates to the bottom substrates. Heath Lake has extensive littoral habitat, with 33 percent of the lake area having a depth of less than 5 ft and 29 percent of the lake area containing flooded timber. Areas less than 5 ft deep comprise 19 percent and 22 percent of the areas of Antioch Lake East and Antioch Lake West, respectively. The littoral zone of the Lower Reservoir varies dramatically over the course of the day as the water level fluctuates with project operations. Cowardin classifications for the littoral habitat include the following:

- L2UB – Lacustrine, Littoral, unconsolidated bottom

Table 3-6 provides a list of wetland types observed, their estimated acreages, and the number of features identified within the project boundary.

Table 3-6: Wetlands and Littoral Resources Found within RMPS Project Boundary

Wetland Type	Number of Features Mapped	Estimated Acreage	Cowardin Classification
Forested Wetland	13	31.8	PFO1Cb, PFO1C
Emergent Wetland	14	85.4	PEM1Ch
Littoral Habitat	13	104.1	L2UB

3.5 Invasive Species

Although scattered occurrences of invasive species were observed throughout the project boundary (including a total of six species), most of the study area was notably absent of invasive species that dominated a particular stratum. Exceptions included "pockets" of Japanese stiltgrass (*Microstegium vimineum*) found within forested floodplains. The plant species list in Table 2 of Appendix B indicates which species are considered invasive plants by the Georgia Exotic Pest Plant Council and characterizes each invasive species by their current threat status[8]. These characterizations are presented based on a numerical rating. All species encountered are classified as Category 1, which are considered a serious problem in the state of Georgia.

Populations of invasive species observed within the RMPS project boundary that dominate a particular stratum are depicted via color-coded points on the habitat type figures (Figures 8 ,9 ,10, 11, and 12). These species are limited to tree of heaven, Chinese privet, Chinese bushclover, shrubby bushclover, and Japanese stiltgrass. The recorded number of occurrences during field efforts for these species are provided in Table 3-7.

Table 3-7: Invasive/Exotic Species Occurrences at Rocky Mountain*

Invasive/Exotic Species		Number of Features Mapped
Common Name	**Scientific Name**	
Tree of heaven	*Ailanthus altissima*	1
Chinese privet	*Ligustrum sinense*	4
Chinese bushclover	*Lespedeza cuneata*	2
Shrubby bushclover	*Lespedeza bicolor*	2
Japanese stiltgrass	*Microstegium vimineum*	3
	Total	**11**

*Species listed as Category 1 by the Georgia EPPC Invasive Plant List.

4.0 CONCLUSION

Mixed pine/hardwood forest was the dominant habitat type observed within the project boundary, which occupied approximately 2,091 acres (56 percent) of the total terrestrial lands within the study area. The second largest habitat type was the open water (reservoirs/lakes) habitat, which occupied 1,120 acres (23 percent). Wetlands (including forested and emergent/herbaceous communities) occupied 119 acres (2.45 percent) of the study area.

Dominant canopy species throughout the project boundary include loblolly pine, mockernut hickory, pignut hickory, southern red oak, sweetgum, shortleaf pine, green ash, willow oak and

[8] 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.

tuliptree. Common midstory species include flowering dogwood, red maple, Florida maple, winged elm, Eastern redbud, American hornbeam, hazel alder, black gum, sweetshrub, paw-paw, and hop hornbeam. Dominant herbaceous species included sedges, goldenrod, Christmas fern, knotweeds, greenbriers, woodoats, tick-trefoils, netted chain fern, muscadine, wood sorrels, and lawn grasses. A total of 298 species of plants were identified during the field surveys, indicating a relatively diverse assemblage of flora despite the presence of various forms of anthropogenic disturbances in the project vicinity.

Overall, exotic/invasive species were present throughout the study area but did not dominate any particular vegetative stratum except for 11 locations (Figures 8-13). Six invasive species were observed, but typically only comprised a minor component of the community. Both species of bushclover were found in small patches throughout the right-of-way easement, scattered populations of Japanese stiltgrass occurred in forested floodplains of the larger streams and rivers, Chinese privet was primarily found along forest edges on Big Texas Valley Road, and tree of heaven was observed bordering maintained forest edges near recreation facilities and behind the power generation facility.

Wildlife observations within the project area were typical of those expected to occur within the Ridge and Valley of Georgia. Seven species of mammals were observed, including the white-tailed deer, nine-banded armadillo, Eastern gray squirrel, and raccoon. Field investigators identified 62 species of birds during the field surveys. Common species included Northern cardinal, American crow, Carolina chickadee, Carolina wren, and turkey vultures. Bald eagles and ospreys were observed over the Lower Reservoir, and great blue herons were often seen foraging along the shoreline. Waterfowl sightings included wood ducks (*Aix sponsa*), green-winged teal (*Anas crecca*), and Canada geese (*Branta canadensis*). Double-crested cormorants (*Phalacrocorax auritus*) were commonly seen on the Lower Reservoir as well. Of note, 24 separate taxa/groupings were represented in the bird species list.

Reptile and amphibian observations were less common; however, these species are typically more difficult to observe when conducting reconnaissance-style wildlife surveys. A total of five amphibian species and 10 reptile species were observed within the project boundary. Common sightings included Southern leopard frogs, cricket frogs, yellow-bellied sliders, water snakes, and Eastern box turtles.

Potentially suitable habitat for seven state-listed species and three federally listed species were encountered during field efforts. One sighting of the state-listed bald eagle was also recorded during field efforts. No federally listed species were observed during the RTE survey.

OPC proposes to continue operating the RMPS Project as it is currently operated. No capacity addition or major modifications are proposed in the license application. Existing operations do not involve activities that are expected to negatively affect terrestrial resources, wetland and littoral habitats, or federally-/state-listed species.

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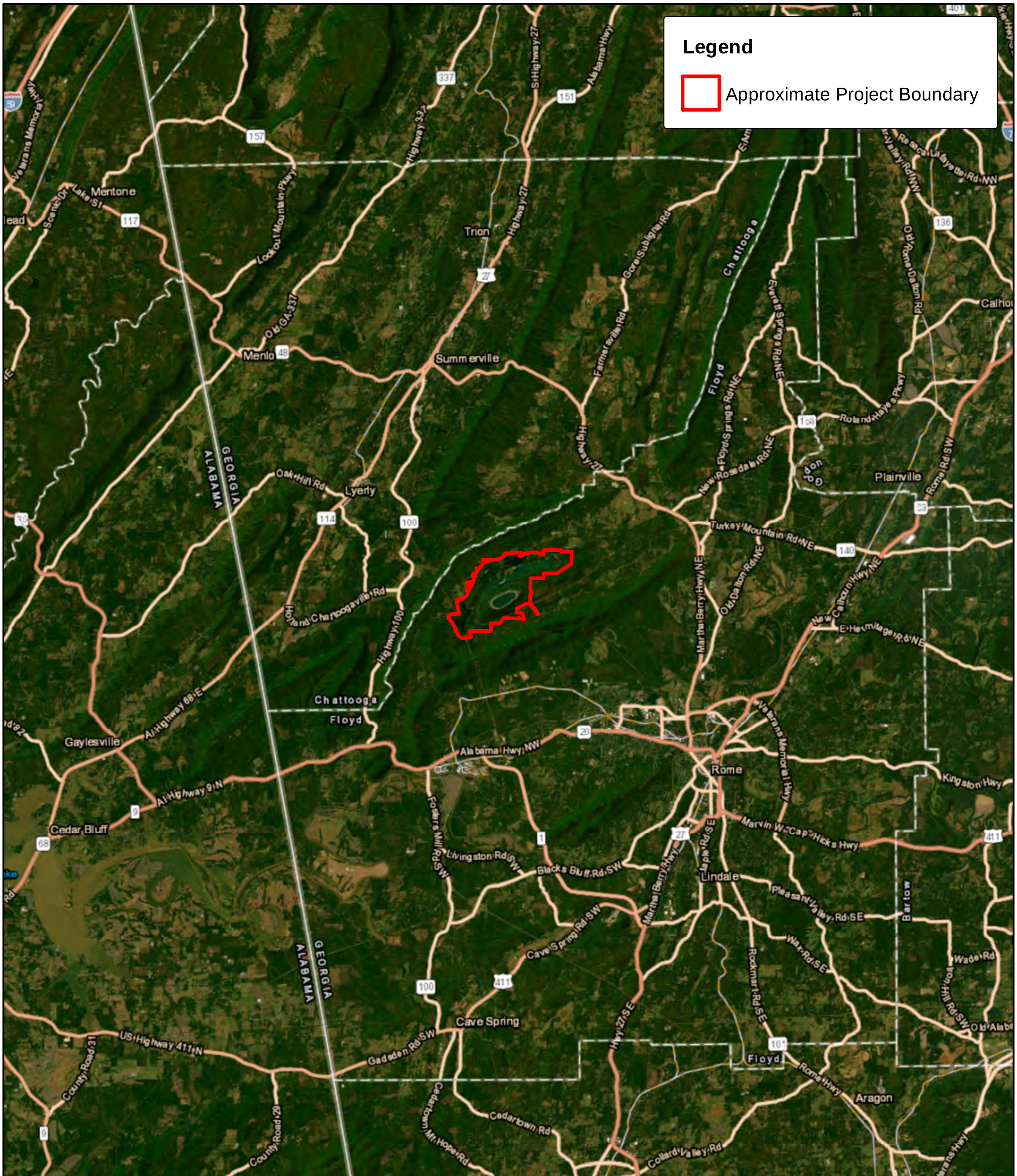

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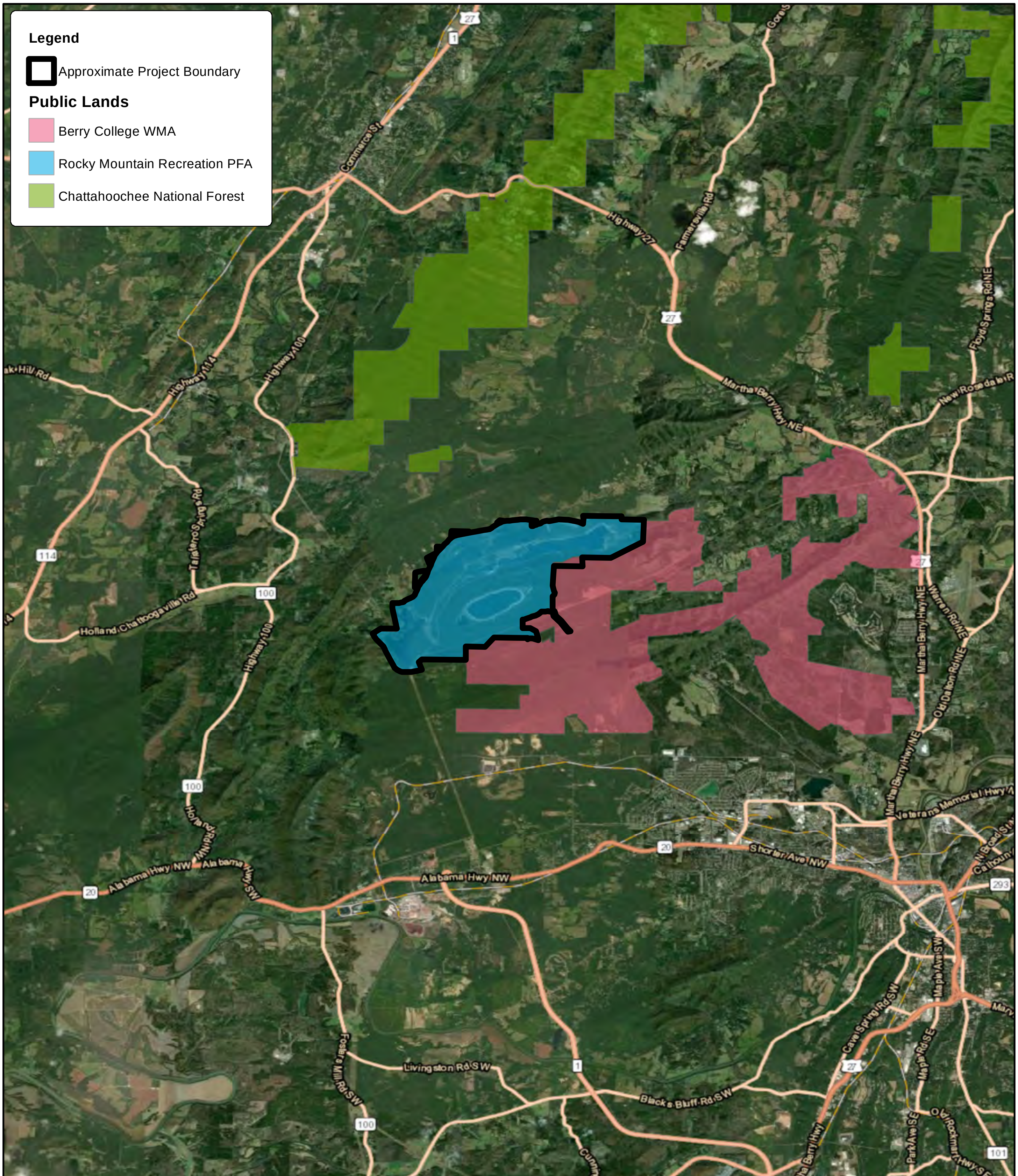
Rocky Mt. Pumped Storage Hydroelectric Project
Floyd County, Georgia

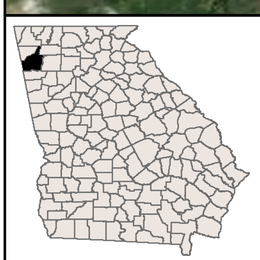
Figure 01
Site Location
Map

0 2.5 5 10
Miles
1 inch = 5 miles

corblu
ECOLOGY GROUP

Date Created:
April 2023





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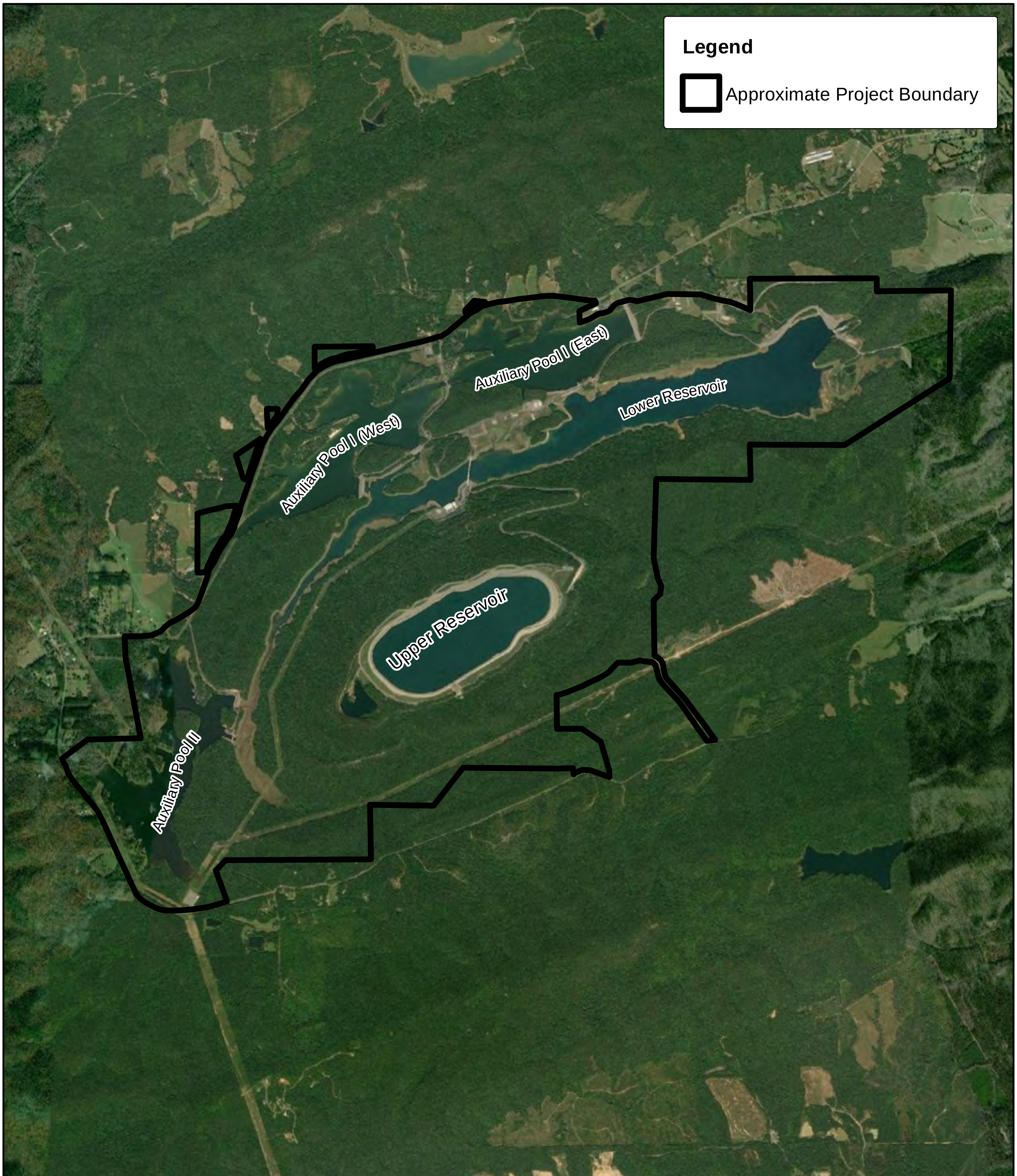
Rocky Mt. Pumped Storage Hydroelectric Project
Floyd County, Georgia

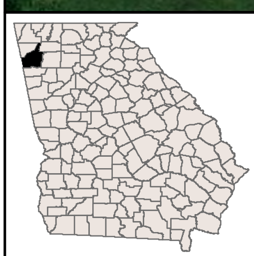
Figure 02
Public Lands in Vicinity Map

0 1.75 3.5 7 Miles

1 inch = 3 miles

Date Created: April 2023





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Rocky Mt. Pumped Storage Hydroelectric Project
Floyd County, Georgia

Figure 03
Aerial Photography
Map

0 0.5 1 2
Miles
1 inch = 1 miles

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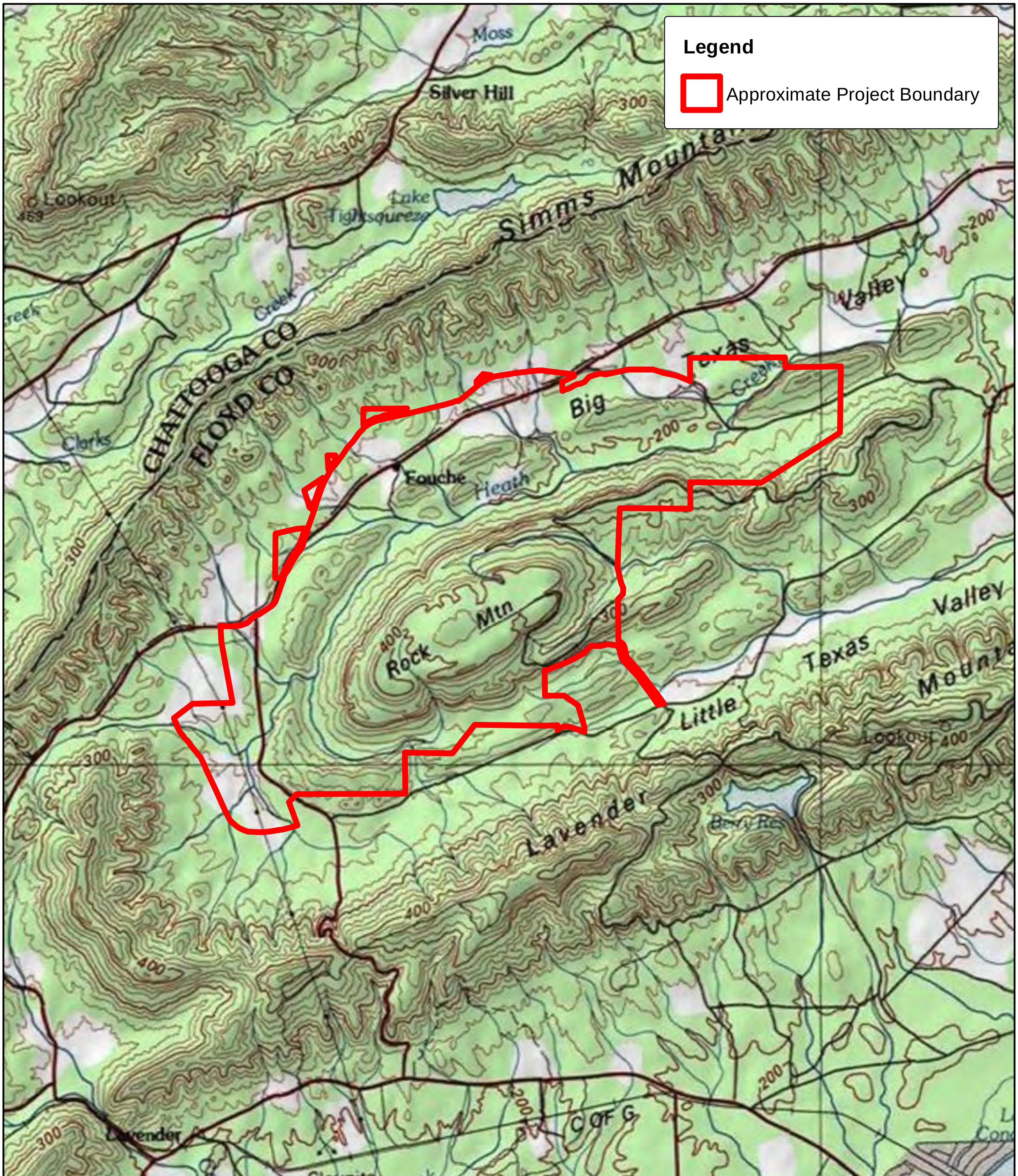
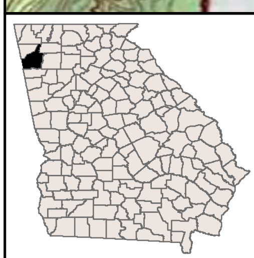
ECOLOGY GROUP

Date Created:
April 2023





N

Rocky Mt. Pumped Storage Hydroelectric Project
Floyd County, Georgia

0 0.5 1 2 Miles

1 inch = 1 miles

Figure 04
USGS Topography
Map

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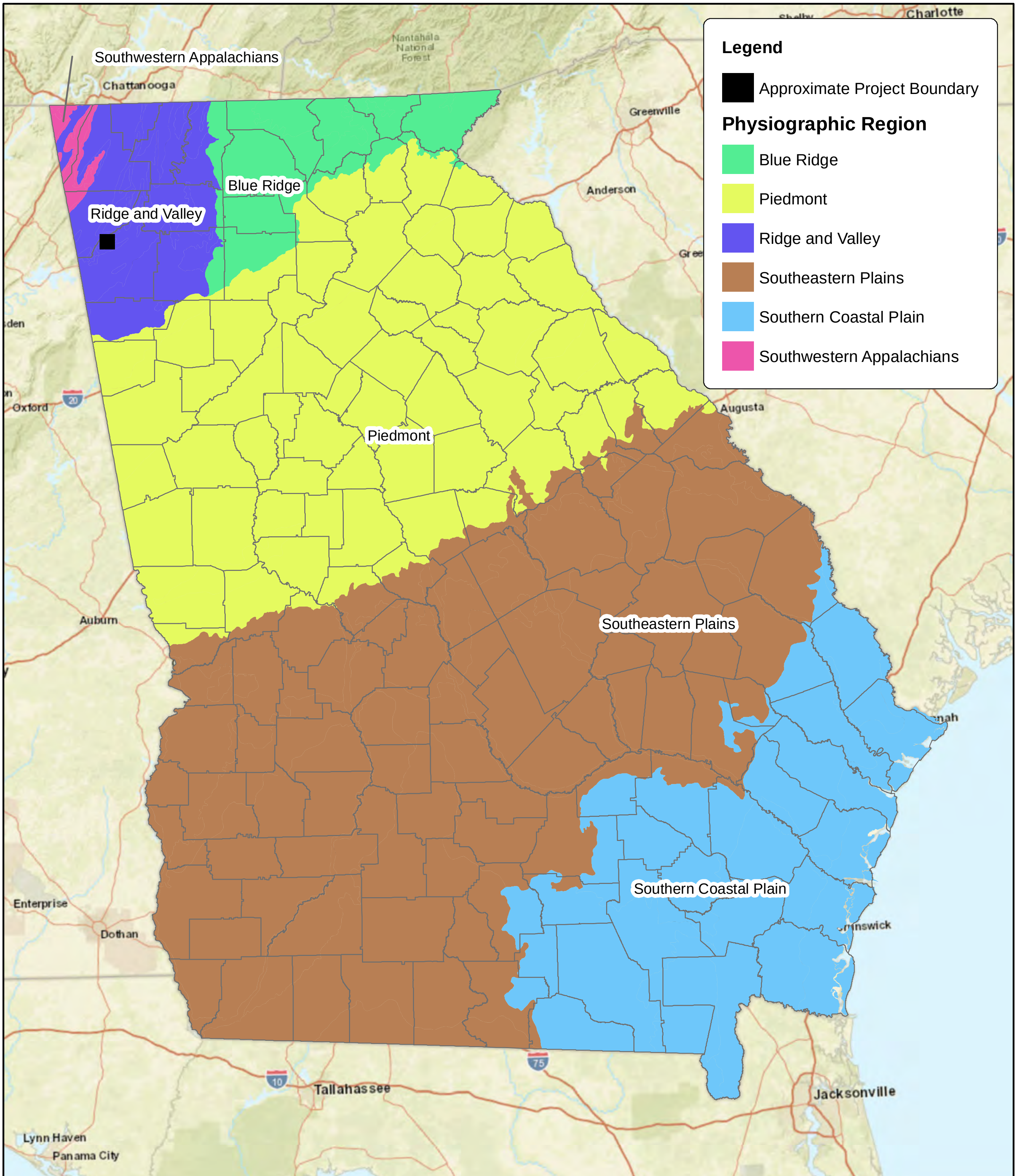
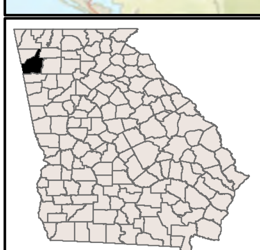
Date Created:
April 2023





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Rocky Mt. Pumped Storage Hydroelectric Project
Floyd County, Georgia

0 20 40 80 Miles

1 inch = 42 miles

Figure 05
Physiographic Region
Map

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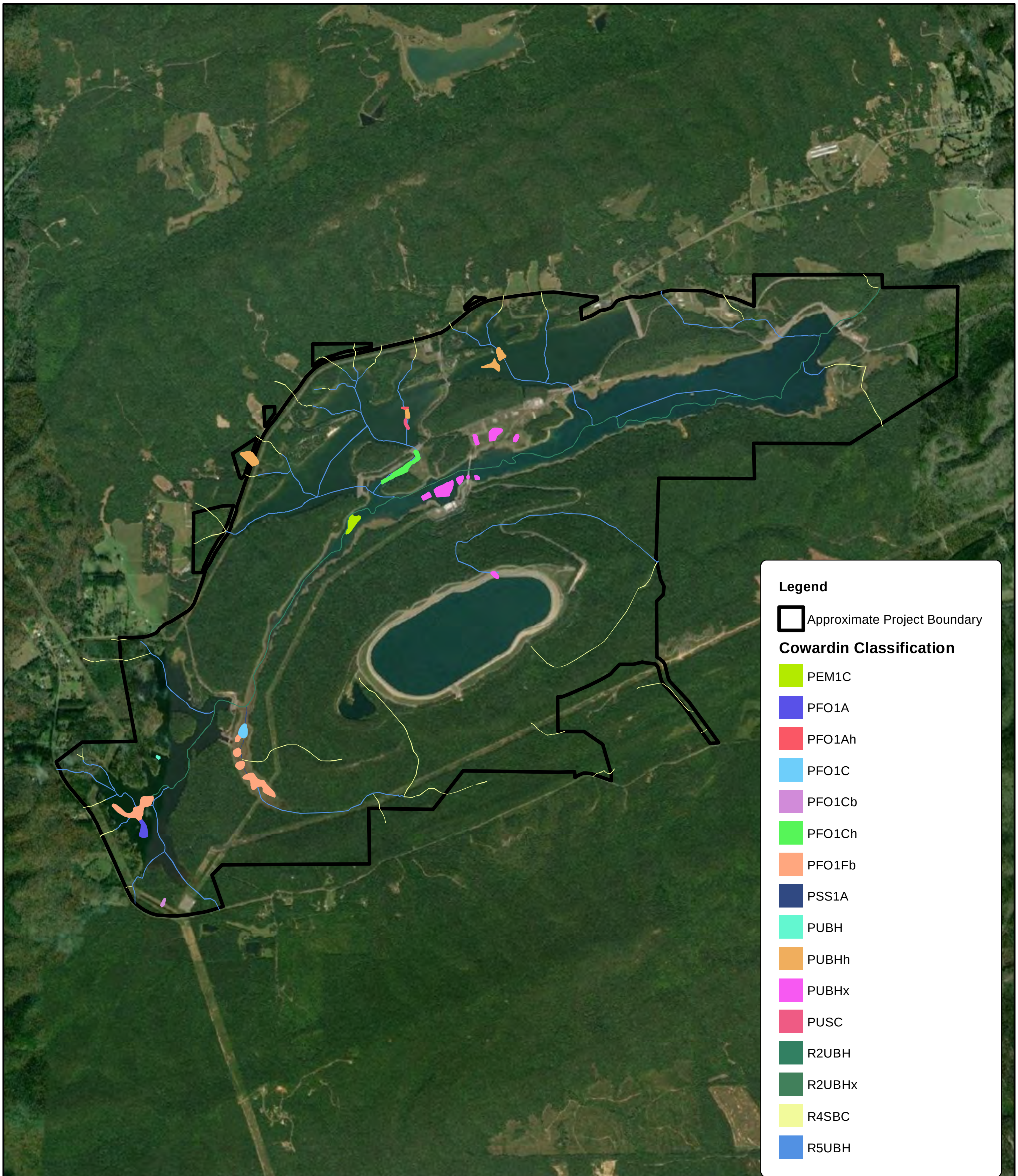
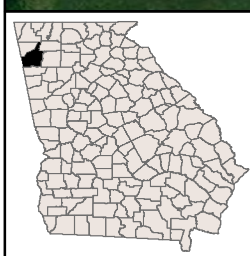
Date Created:
April 2023





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Rocky Mt. Pumped Storage Hydroelectric Project
Floyd County, Georgia

Figure 06
National Wetlands Inventory Map

0 0.5 1 2 Miles

1 inch = 1 miles

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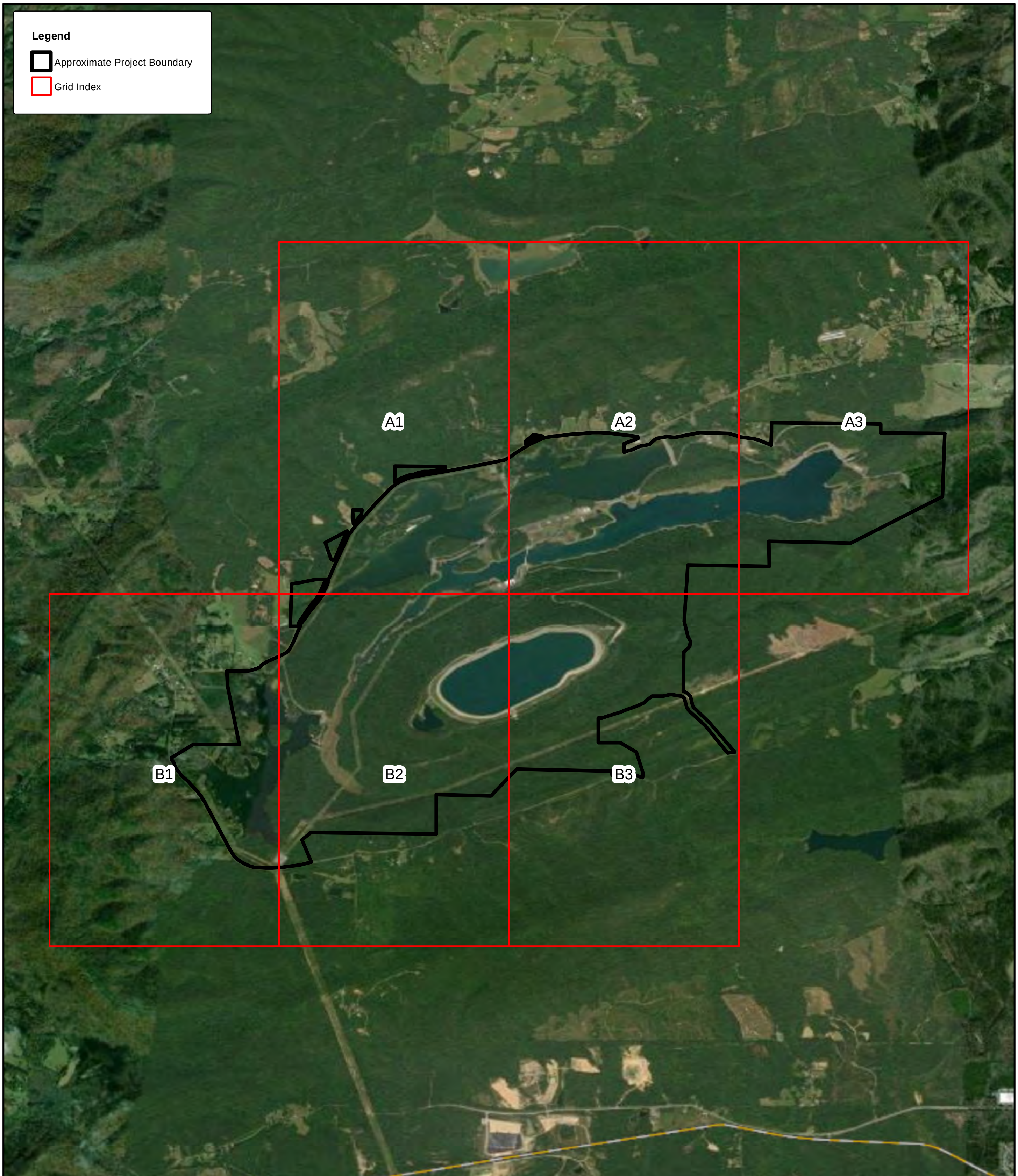
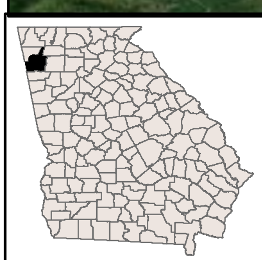
Date Created: April 2023





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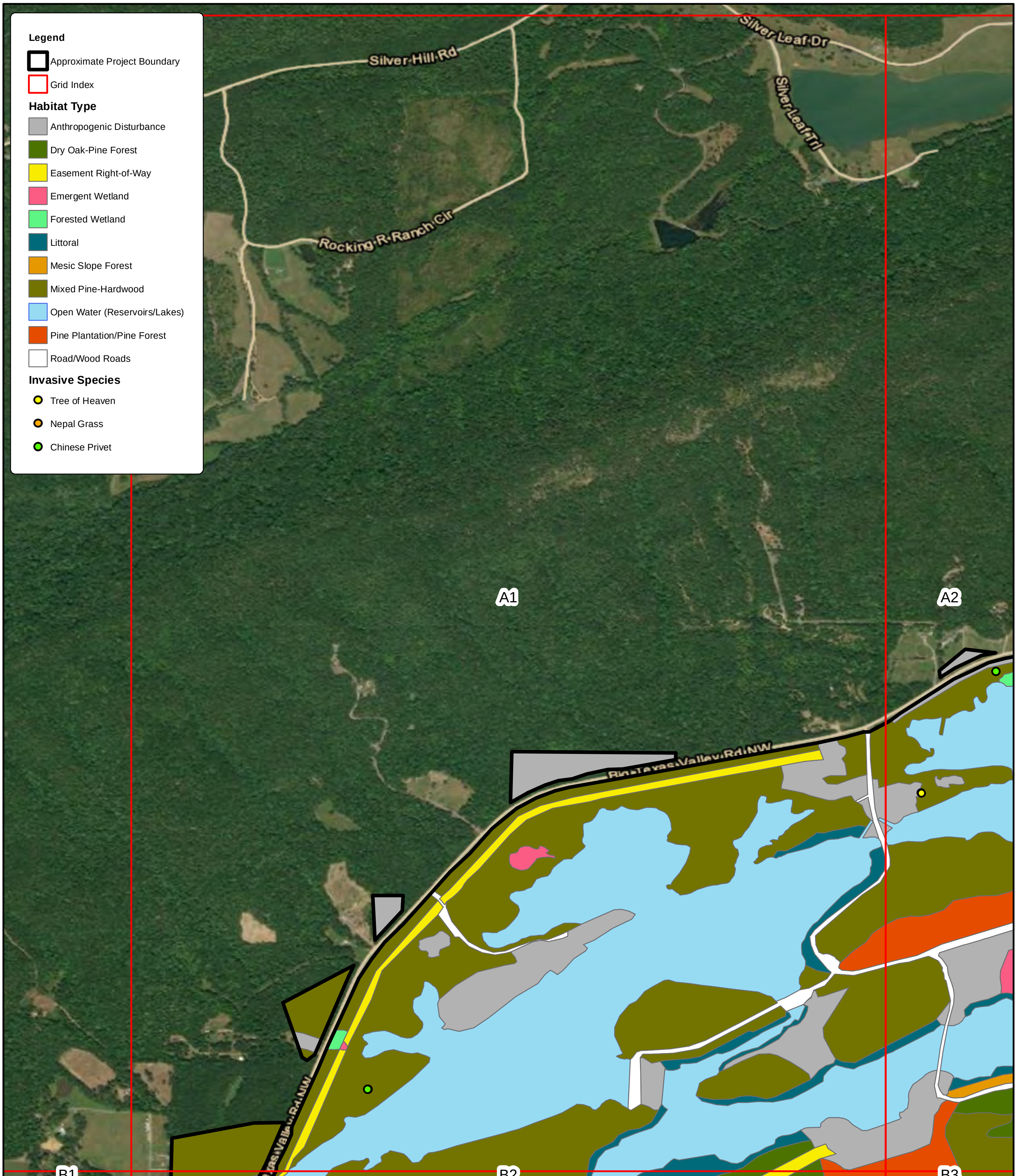
Rocky Mt. Pumped Storage Hydroelectric Project
Floyd County, Georgia

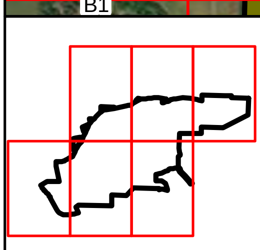
0 0.5 1 2 Miles

1 inch = 1 miles

Figure 07
Habitat Types
Grid Index Map

Date Created:
April 2023





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Rocky Mt. Pumped Storage Hydroelectric Project
Floyd County, Georgia

Figure 08
Habitat Types
Grid: A1

0 800 1,600 3,200
Feet
1 inch = 1,600 feet

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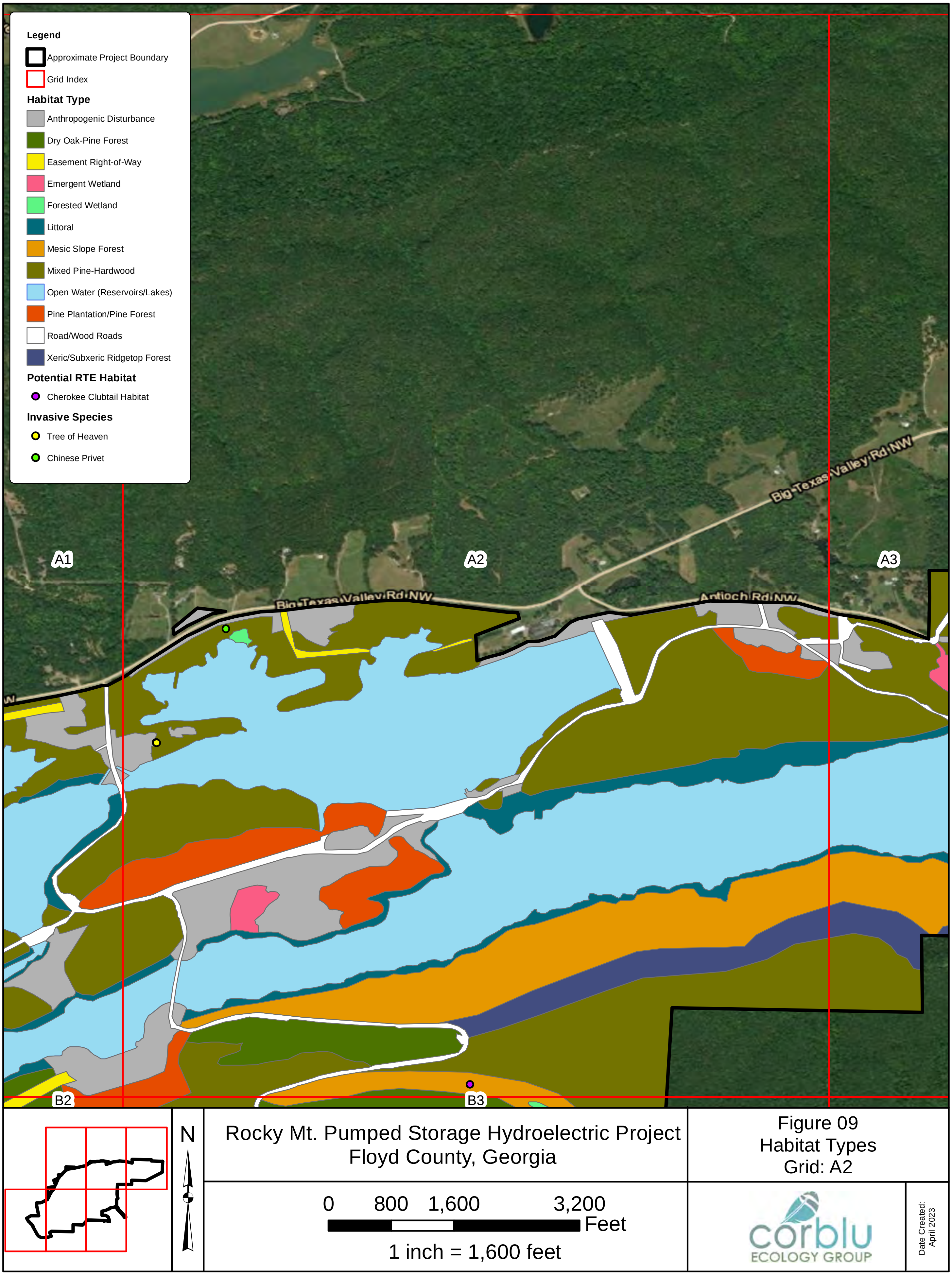
Date Created:
April 2023



Rocky Mt. Pumped Storage Hydroelectric Project
Floyd County, Georgia

Figure 09
Habitat Types
Grid: A2

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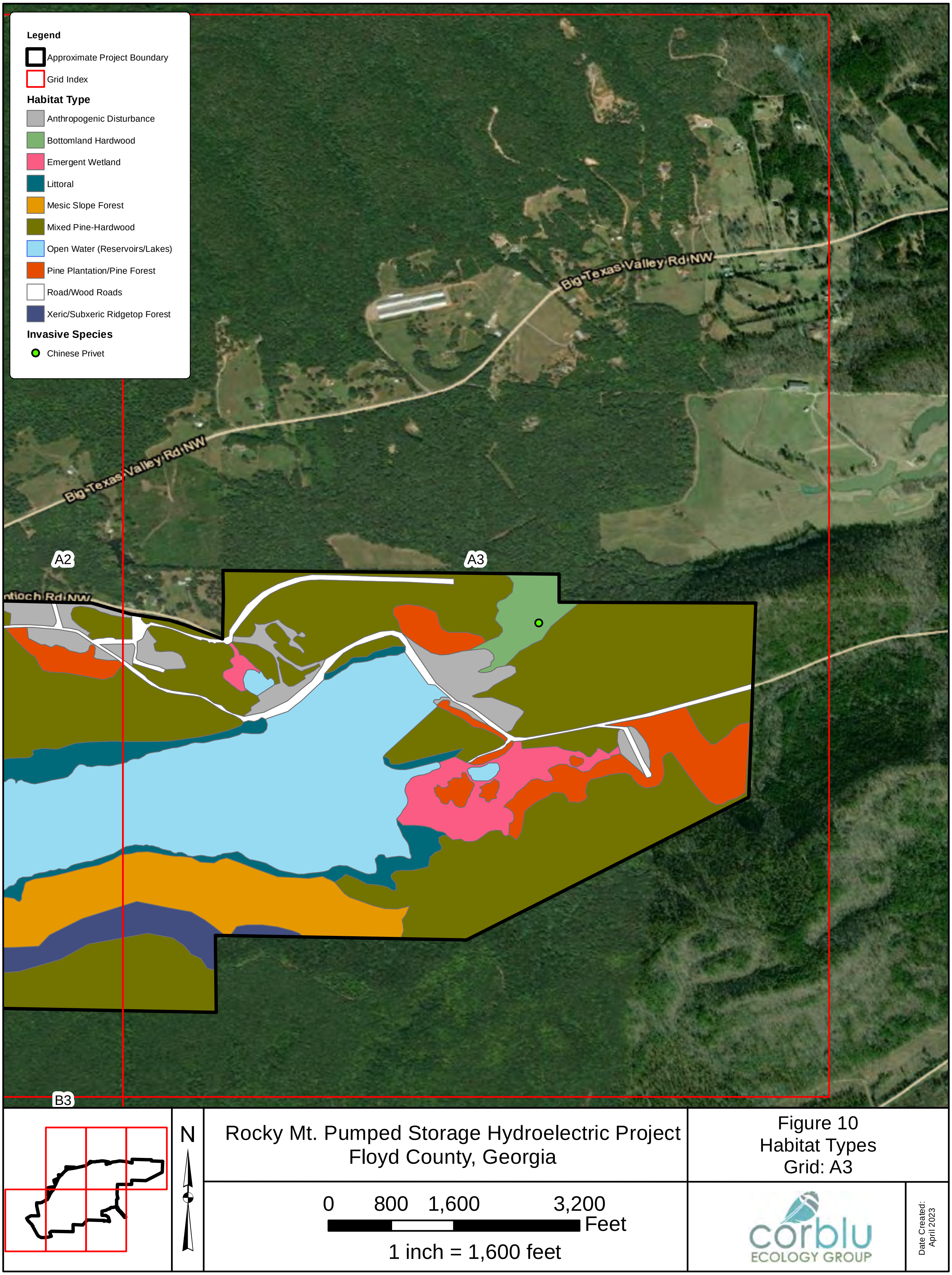
Date Created:
April 2023



Rocky Mt. Pumped Storage Hydroelectric Project
Floyd County, Georgia

Figure 10
Habitat Types
Grid: A3

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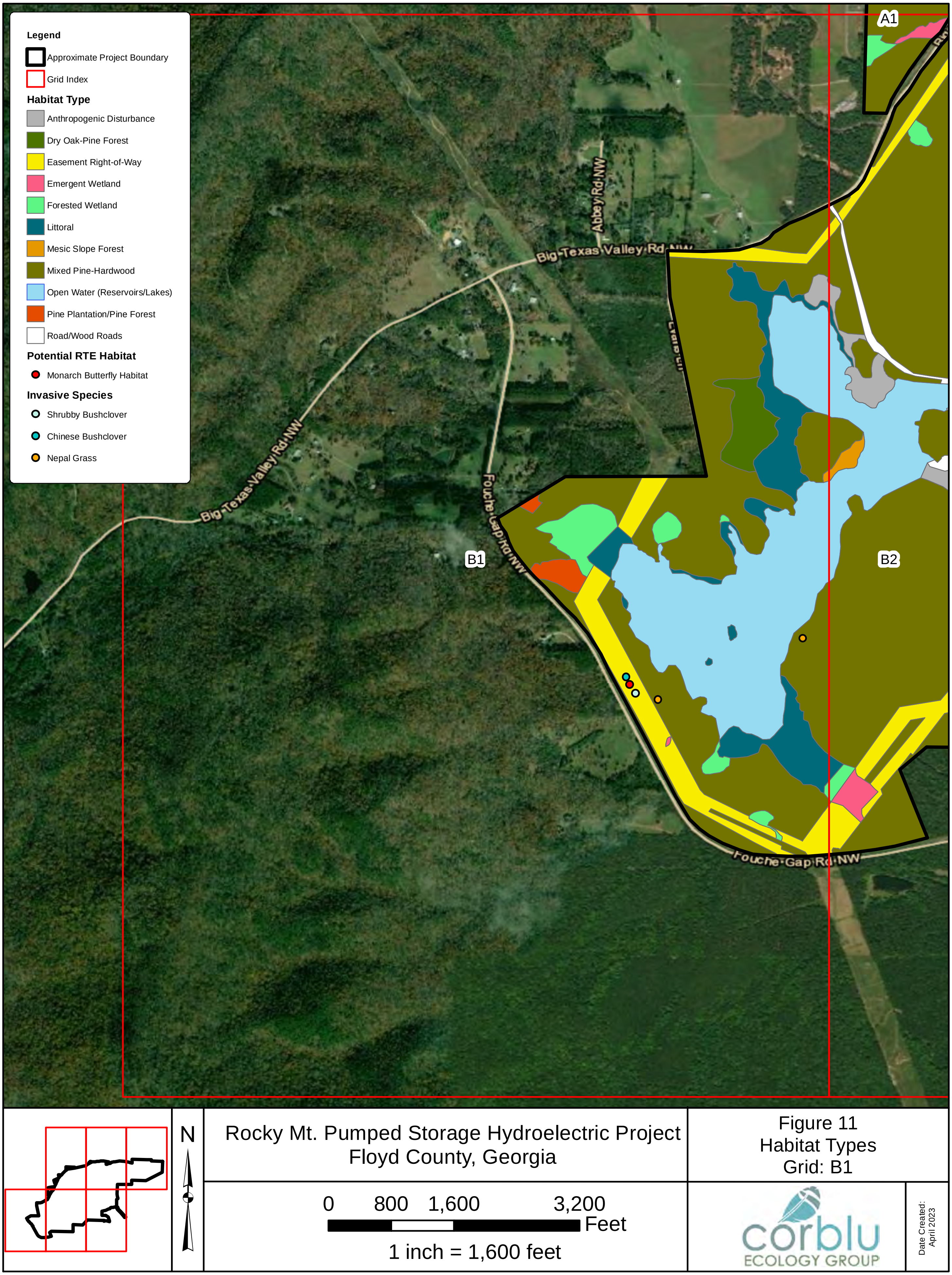
Date Created: April 2023

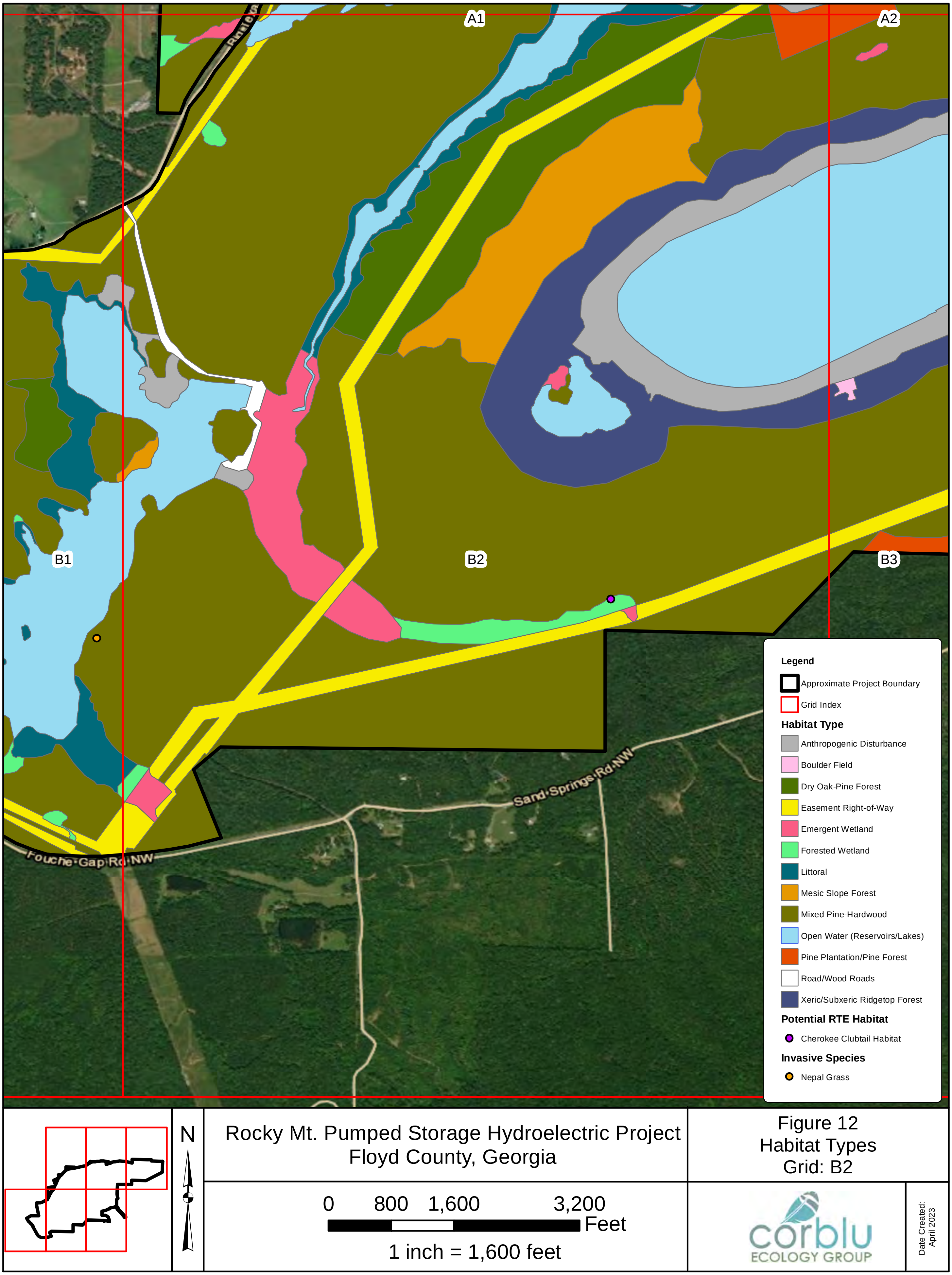


Rocky Mt. Pumped Storage Hydroelectric Project
Floyd County, Georgia

Figure 11
Habitat Types
Grid: B1

Corblu Ecology Group

Date Created: April 2023



Rocky Mt. Pumped Storage Hydroelectric Project
Floyd County, Georgia

Figure 12
Habitat Types
Grid: B2

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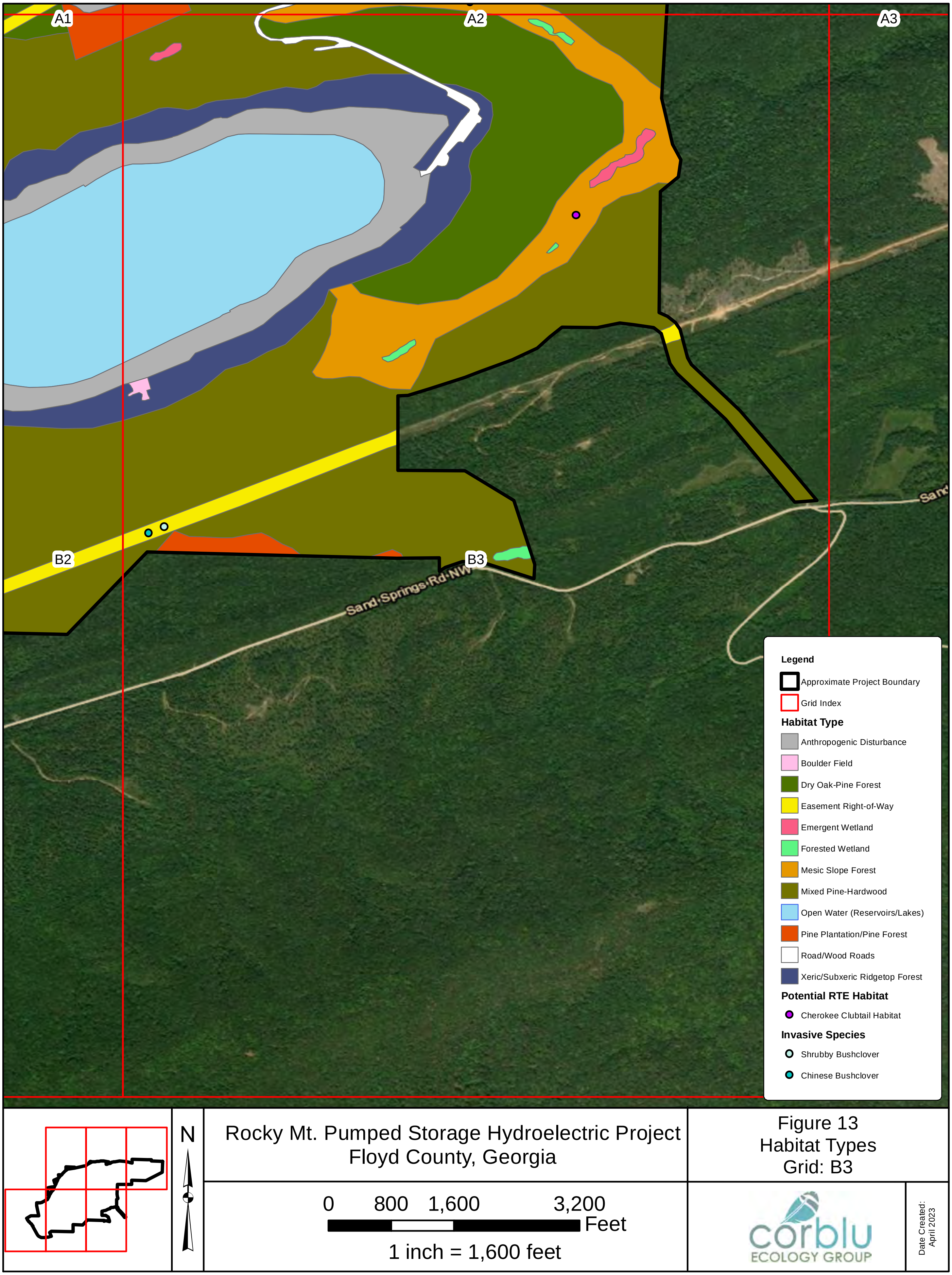
Date Created:
April 2023



Rocky Mt. Pumped Storage Hydroelectric Project
Floyd County, Georgia

Figure 13
Habitat Types
Grid: B3

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Date Created:
April 2023

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Georgia Ecological Services Field Office
355 East Hancock Avenue
Room 320
Athens, GA 30601-2523
Phone: (706) 613-9493 Fax: (706) 613-6059

In Reply Refer To: July 15, 2022
Project Code: 2022-0064168
Project Name: Rocky Mountain Pumped Storage Hydroelectric Project

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

Thank you for your request for information on federally listed species and important wildlife habitats that may occur in your project area. The U.S. Fish and Wildlife Service (Service) has responsibility for certain species of wildlife under the Endangered Species Act (ESA) of 1973 as amended (16 USC 1531 et seq.), the Migratory Bird Treaty Act (MBTA) as amended (16 USC 701-715), Fish and Wildlife Coordination Act (FWCA) (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.) and the Bald and Golden Eagle Protection Act (BGEPA) as amended (16 USC 668-668c). We are providing the following guidance to assist you in determining which federally imperiled species may or may not occur within your project area and to recommend some conservation measures that can be included in your project design if you determine those species or designated critical habitat may be affected by your proposed project.

FEDERALLY-LISTED SPECIES AND DESIGNATED CRITICAL HABITAT

Attached is a list of endangered, threatened, and proposed species that may occur in your project area. Your project area may not necessarily include all or any of these species. Under the ESA, it is the responsibility of the Federal action agency, project proponent, or their designated representative to determine if a proposed action "may affect" endangered, threatened, or proposed species, or designated critical habitat, and if so, to consult with the Service further. Similarly, it is the responsibility of the Federal action agency or project proponent, not the Service, to make “no effect” determinations. If you determine that your proposed action will have “no effect” on threatened or endangered species or their respective critical habitat, you do not need to seek concurrence with the Service. Nevertheless, it is a violation of Federal law to harm or harass any federally listed threatened or endangered fish or wildlife species without the appropriate permit. If you need additional information to assist in your effect determination, please contact the Service.

If you determine that your proposed action may affect federally listed species, please consult with the Service. Through the consultation process, we will analyze information contained in a biological assessment or equivalent document that you provide. If your proposed action is associated with Federal funding or permitting, consultation will occur with the Federal agency under section 7(a)(2) of the ESA. Otherwise, an incidental take permit pursuant to section 10(a)(1)(B) of the ESA (also known as a Habitat Conservation Plan) may be necessary to exempt harm or harass federally listed threatened or endangered fish or wildlife species. For more information regarding formal consultation and HCPs, please see the Service's Section 7 Consultation Library and Habitat Conservation Plans Library Collections.

Action Area. The scope of federally listed species compliance not only includes direct effects, but also any indirect effects of project activities (e.g., equipment staging areas, offsite borrow material areas, or utility relocations). The action area is the spatial extent of an action's direct and indirect modifications or impacts to the land, water, or air (50 CFR 402.02). Large projects may have effects to land, water, or air outside the immediate footprint of the project, and these areas should be included as part of the action area. Effects to land, water, or air outside of a project footprint could include things like lighting, dust, smoke, and noise. To obtain a complete list of species, the action area should be uploaded or drawn in IPaC rather than just the project footprint.

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. An updated list may be requested through IPaC.

If you determine that your action may affect any federally listed species and would like technical assistance from our office, please send us a complete project review package (refer to Georgia Ecological Services' Project Planning and Review page for more details), including the following information (reference to these items can be found in 50 CFR§402.13 and 402.14):

1. A description of the proposed action, including any measures intended to avoid, minimize, or offset effects of the action. Consistent with the nature and scope of the proposed action, the description shall provide sufficient detail to assess the effects of the action on listed species and critical habitat, including:
    - The purpose of the action;
    - The duration and timing of the action;
    - The location of the action;
    - The specific components of the action and how they will be carried out;
    - Description of areas to be affected directly or indirectly by the action;
    - Maps, drawings, blueprints, or similar schematics of the action
2. An updated Official Species List

3. Biological Assessments (may include habitat assessments and information on the presence of listed species in the action area);
4. Description of effects of the action on species in the action area and, if relevant, effect determinations for species and critical habitat;
5. Conservation measures and any other available information related to the nature and scope of the proposed action relevant to its effects on listed species or designated critical habitat (examples include: stormwater plans, management plans, erosion and sediment plans). Please see our Georgia Planning and Consultation Tools page for recommendations.

Please submit all consultation documents via email to gaes_assistance@fws.gov or by using IPaC, uploaded documents, and sharing the project with a specific Georgia Ecological Services staff member. If the project is on-going, documents can also be sent to the Georgia Ecological Services staff member currently working with you on your project. For Georgia Department of Transportation related projects, please work with the Office of Environmental Services ecologist to determine the appropriate USFWS transportation liaison.

WETLANDS AND FLOODPLAINS

Under Executive Orders 11988 and 11990, Federal agencies are required to minimize the destruction, loss, or degradation of wetlands and floodplains, and preserve and enhance their natural and beneficial values. These habitats should be conserved through avoidance, or mitigated to ensure that there would be no net loss of wetlands function and value. We encourage you to use the National Wetland Inventory (NWI) maps in conjunction with ground-truthing to identify wetlands occurring in your project area. The Service's NWI program website (https://www.fws.gov/program/national-wetlands-inventory) integrates digital map data with other resource information. We also recommend you contact the U.S. Army Corps of Engineers for permitting requirements under section 404 of the Clean Water Act if your proposed action could impact floodplains or wetlands.

MIGRATORY BIRDS

The MBTA prohibits the taking of migratory birds, nests, and eggs, except as permitted by the Service's Migratory Birds Program (https://fws.gov/program/migratory-birds). To minimize the likelihood of adverse impacts to migratory birds, we recommend construction activities occur outside the general bird nesting season from March through August, or that areas proposed for construction during the nesting season be surveyed, and when occupied, avoided until the young have fledged.

We recommend review of Birds of Conservation Concern to fully evaluate the effects to the birds at your site. This list identifies birds that are potentially threatened by disturbance and construction. It can be found at the Service's Migratory Birds Conservation Library Collection (https://fws.gov/library/collections/migratory-bird-conservation-documents).

Information related to best practices and migratory birds can be found at the Service's Avoiding and Minimizing Incidental Take of Migratory Birds Library Collection (https://fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds).

BALD AND GOLDEN EAGLES

The bald eagle (*Haliaeetus leucocephalus*) was delisted under the ESA on August 9, 2007. Both the bald eagle and golden eagle (*Aquila chrysaetos*) are still protected under the MBTA and BGEPA. The BGEPA affords both eagles protection in addition to that provided by the MBTA, in particular, by making it unlawful to “disturb” eagles. Under the BGEPA, the Service may issue limited permits to incidentally “take” eagles (e.g., injury, interfering with normal breeding, feeding, or sheltering behavior nest abandonment). For information on bald and golden eagle management guidelines, we recommend you review information provided at the Service's Bald and Golden Eagle Management Library Collection (https://fws.gov/library/collections/bald-and-golden-eagle-management).

NATIVE BATS

If your species list includes Indiana bat (*Myotis sodalis*) or northern long-eared bat (*M. septentrionalis*) and the project is expected to impact forested habitat that is appropriate for maternity colonies of these species, forest clearing should occur outside of the period when bats may be present. Federally listed bats could be actively present in forested landscapes from April 1 to October 15 of any year and have non-volant pups from May 15 to July 31 in any year. Non-volant pups are incapable of flight and are vulnerable to disturbance during that time.

Indiana, northern long-eared, and gray (*M. grisescens*) bats are all known to utilize bridges and culverts in Georgia. If your project includes maintenance, construction, or any other modification or demolition to transportation structures, a qualified individual should complete a survey of these structures for bats and submit your findings via the Georgia Bats in Bridges cell phone application, free on Apple and Android devices. Please include these findings in any biological assessment(s) or other documentation that is submitted to our office for technical assistance or consultation.

Additional information on bat avoidance and minimization can be found at Georgia Ecological Services' Planning and Consultations Tools and Bat Conservation in Georgia pages.

MONARCH BUTTERFLY

On December 20, 2020, the Service determined that listing the Monarch butterfly (*Danaus plexippus*) under the Endangered Species Act is warranted but precluded at this time by higher priority listing actions. With this finding, the monarch butterfly becomes a candidate for listing. The Service will review its status each year until we are able to begin developing a proposal to list the monarch.

As it is a candidate for listing, the Service welcomes conservation measures for this species. Recommended, and voluntary, conservation measures for projects in Georgia can be found at our Monarch Conservation in Georgia page.

STATE AGENCY COORDINATION

Additional information that addresses at-risk or high priority natural resources can be found in the State Wildlife Action Plan (https://georgiawildlife.com/WildlifeActionPlan), at Georgia Department of Natural Resources, Wildlife Resources Division Biodiversity Portal (https://

georgiawildlife.com/conservation/species-of-concern), Georgia's Natural, Archaeological, and Historic Resources GIS portal (https://www.gnahrgis.org/gnahrgis/index.do), and the Georgia Ecological Services HUC10 Watershed Guidance page.

Thank you for your concern for endangered and threatened species. We appreciate your efforts to identify and avoid impacts to listed and sensitive species in your project area. For further consultation on your proposed activity, please email gaes_assistance@fws.gov and reference the project county and your Service Project Tracking Number.

This letter constitutes Georgia Ecological Services' general comments under the authority of the Endangered Species Act.

Attachment(s):

- Official Species List
- Migratory Birds
- Wetlands

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Georgia Ecological Services Field Office
355 East Hancock Avenue
Room 320
Athens, GA 30601-2523
(706) 613-9493

Project Summary

Project Code: 2022-0064168
Event Code: None
Project Name: Rocky Mountain Pumped Storage Hydroelectric Project
Project Type: Power Gen - Hydropower - FERC
Project Description: FERC Relicensing
Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@34.34889655,-85.30600831302587,14z

Counties: Floyd County, Georgia

Endangered Species Act Species

There is a total of 17 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Gray Bat *Myotis grisescens* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6329	Endangered
Indiana Bat *Myotis sodalis* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/5949	Endangered
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Clams

NAME	STATUS
Alabama Moccasinshell *Medionidus acutissimus* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/7287	Threatened
Coosa Moccasinshell *Medionidus parvulus* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/2575	Endangered
Finelined Pocketbook *Hamiota altilis* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/1393	Threatened
Southern Clubshell *Pleurobema decisum* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/6113	Endangered
Southern Pigtoe *Pleurobema georgianum* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/1520	Endangered
Triangular Kidneyshell *Ptychobranchus greenii* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/4396	Endangered

Snails

NAME	STATUS
Interrupted (=georgia) Rocksnail *Leptoxis foremani* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/7019	Endangered

Insects

NAME	STATUS
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

Flowering Plants

NAME	STATUS
Alabama Leather Flower *Clematis socialis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6300	Endangered
Georgia Rockcress *Arabis georgiana* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/4535	Threatened
Large-flowered Skullcap *Scutellaria montana* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4721	Threatened
Mohr's Barbara's Buttons *Marshallia mohrii* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7610	Threatened
Tennessee Yellow-eyed Grass *Xyris tennesseensis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6010	Endangered
Whorled Sunflower *Helianthus verticillatus* Population: There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/3375	Endangered

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

Migratory Birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

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1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Sep 1 to Aug 31
Bobolink *Dolichonyx oryzivorus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 20 to Jul 31

NAME	BREEDING SEASON
Canada Warbler *Cardellina canadensis* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 20 to Aug 10
Cerulean Warbler *Dendroica cerulea* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/2974	Breeds Apr 27 to Jul 20
Eastern Whip-poor-will *Antrostomus vociferus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 1 to Aug 20
Kentucky Warbler *Oporornis formosus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 20 to Aug 20
Prairie Warbler *Dendroica discolor* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 1 to Jul 31
Red-headed Woodpecker *Melanerpes erythrocephalus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Sep 10
Rusty Blackbird *Euphagus carolinus* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds elsewhere
Wood Thrush *Hylocichla mustelina* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Aug 31

Probability Of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

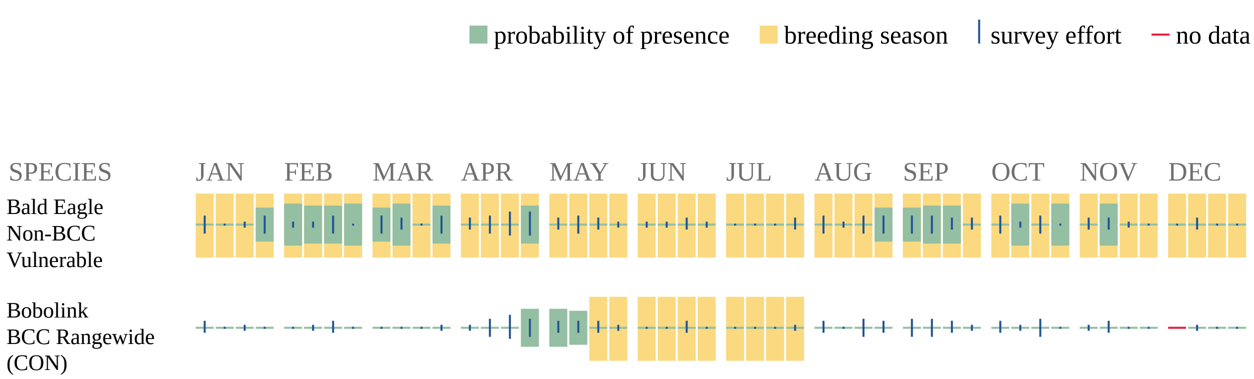
1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

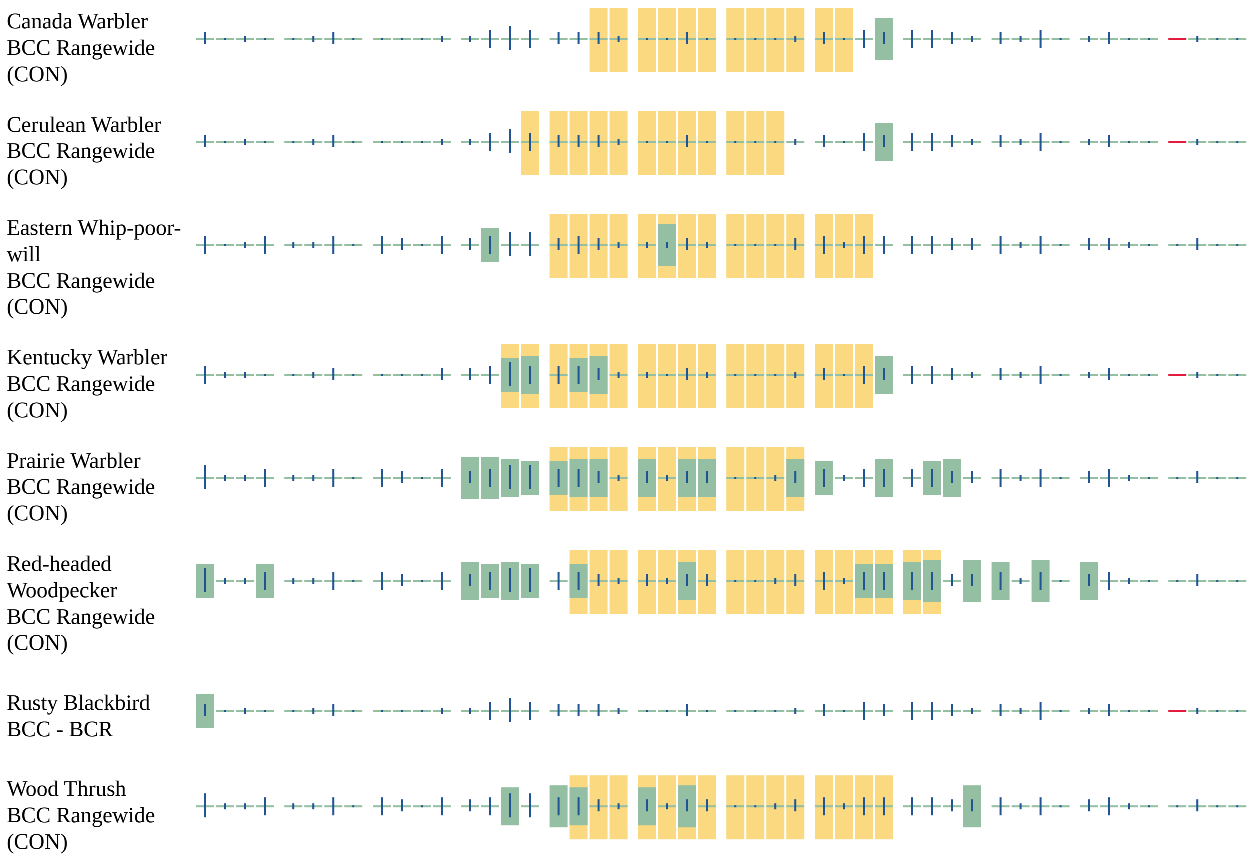
Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.





Additional information can be found using the following links:

- Birds of Conservation Concern https://www.fws.gov/program/migratory-birds/species
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf

Migratory Birds FAQ

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?
The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?
The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?
To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?
Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and

3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects
For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?
If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report
The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell

me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Wetlands

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

FRESHWATER POND

- Palustrine

RIVERINE

- Riverine

IPaC User Contact Information

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Scientific Name	Common Name	Georgia Status	Federal Status	Global Rank	Habitat	Suitable Habitat Onsite*	Observed Within Project Boundary	Data Source[1]
FLORA								
PLANTS:								
Arabis georgiana	Georgia Rockcress	T	LT	G1	Rocky or sandy river bluffs and banks, in circumneutral soil			GA, IPaC
Asclepias purpurascens	Purple Milkweed	R		G5?	Calcareous flatwoods, wet meadows near Rome			GA
Aureolaria patula	Spreading Yellow Foxglove	T		G3	Circumneutral alluvial bottoms			GA
Carya myristiciformis	Nutmeg Hickory	R		G4	Calcareous flatwoods			GA
Clematis fremontii	Fremont's Leatherflower	E		G5	Grassy openings in flatwoods of mostly lowland oaks and red maple			GA
Clematis socialis	Alabama Leatherflower	E	LE	G1	Grassy openings in flatwoods of mostly lowland oaks and red maple			GA, IPaC
Crataegus triflora	Three-flower Hawthorn	T		G2G3	Hardwood forests on rocky, limestone slopes			GA
Cypripedium acaule	Pink Ladyslipper	U		G5	Upland oak-hickory-pine forests; piney woods	X		GA
Cypripedium parviflorum	Yellow Ladyslipper	R		G5	Montane cove forests; rich deciduous forests			GA
Helianthus verticillatus	Whorled Sunflower	E	LE	G1	Wet prairies over dolomite			GA, IPaC
Jamesianthus alabamensis	Alabama Warbonnet	E		G3	Streambanks, in circumneutral soil	X		GA
Lilium michiganense	Michigan Lily	R		G5	Remnant wet prairies and calcareous flatwoods			GA
Lysimachia fraseri	Fraser's Loosestrife	R		G3	Moist, open, bouldery gravel bars and streambanks; edges of sandstone and granite outcrops			GA
Marshallia mohrii	Coosa Barbara's-buttons	T	LT	G3	Wet prairies over dolomite			GA, IPaC
Neviusia alabamensis	Alabama Snow-wreath	T		G3	Along wet weather streams over limestone			GA
Pachysandra procumbens	Allegheny-spurge	R		G4G5	Mesic hardwood forests over basic soils	X		GA
Prenanthes barbata	Barbed Rattlesnake Root	R		G3	Limestone glades and barrens, edges of remnant prairies			GA

Scientific Name	Common Name	Georgia Status	Federal Status	Global Rank	Habitat	Suitable Habitat Onsite*	Observed Within Project Boundary	Data Source[1]
FLORA								
PLANTS:								
Rudbeckia heliopsidis	Little River Black-eyed Susan	T		G2	Limestone or sandstone barrens and streamsides			GA
Sabatia capitata	Cumberland Rose-gentian	R		G2	Meadows over sandstone or shale			GA
Scutellaria montana	Large-flowered Skullcap	T	LT	G4	Mesic hardwood-shortleaf pine forests; usually mature forest with open understory, sometimes without a pine component			GA, IPaC
Silene regia	Royal Catchfly	E		G3	Limestone barrens; remnant prairies			GA, NEQQ, NWQQ
Spiranthes magnicamporum	Great Plains Ladies-tresses	E		G3G4	Limestone glades			GA
Symphyotrichum georgianum	Georgia Aster	T		G3	Upland oak-hickory-pine forests and openings; sometimes with Echinacea laevigata or over amphibolite			GA
Thalictrum debile	Trailing Meadowrue	T		G2G3	Mesic hardwood forests over limestone			GA
Viburnum bracteatum	Limerock Arrow-wood	E		G1G2	Mesic hardwood forests over limestone			GA
Xyris tennesseensis	Tennessee Yellow-eyed Grass	E	LE	G2	Seepy margins of limestone spring runs			GA, IPaC
FAUNA								
INSECTS:								
Danaus plexippus	Monarch Butterfly		C	G4	Lays eggs on milkweed as obligate host plant; adults undergo long-distance migration to overwinter at forested sites in Mexico and California	X		IPaC
Stenogomphurus consanguis	Cherokee Clubtail	T		G3	Spring-fed moderately-flowing forest streams, especially where they drain small ponds	X		GA
CRUSTACEANS:								
Cambarus scotti	Chattooga River Crayfish	T		G3	Rocky riffles in streams with moderate to swift current	N/A		NWQQ
MUSSELS:								
Elliptio arca	Alabama Spike	E		G2G3	Medium creeks to large rivers; sand and gravel substrate	N/A		GA
Hamiota altilis	Finelined Pocketbook	T	LT	G2G3	Small streams to large rivers; sand, gravel, and cobble substrates; usually not in swift current	N/A		GA, IPaC
Medionidus acutissimus	Alabama Moccasinshell	E	LT	G2	Usually found in sand on the margins of streams with a typical sand and gravel substrate in clear water of moderate flow in small to large rivers	N/A		IPaC
Medionidus parvulus	Coosa Moccasinshell	E	LE	G1	Usually found in sand and gravel in highly oxygenated, clear streams with moderate to strong flow in streams and small rivers	N/A		IPaC

Scientific Name	Common Name	Georgia Status	Federal Status	Global Rank	Habitat	Suitable Habitat Onsite*	Observed Within Project Boundary	Data Source[1]
FAUNA								
MUSSELS:								
Pleurobema decisum	Southern Clubshell	E	LE	G2	Large rivers to medium sized streams with flowing water; gravel with interstitial sand	N/A		GA, IPAC
Pleurobema georgianum	Southern Pigtoe	E	LE	G1	High quality rivers (small rivers to large streams) in shoals and runs with stable gravel and sandy-gravel substrates	N/A		IPaC
Ptychobranchus foremanianus	Rayed Kidneyshell	E	LE	G1	Medium to large rivers in moderate to swift current; sand and gravel substrate	N/A		GA
Ptychobranchus greenii	Triangular Kidneyshell		LE	G1	Sections of river 3 ft in depth and having a good current and a firm substrate as opposed to coarse gravel and sand	N/A		IPaC
FRESHWATER SNAILS:								
Leptoxis foremani	Interrupted Rocksnail	E	LE	G1	Rocky shoals in current	N/A		GA, IPaC
FISH:								
Cyprinella caerulea	Blue Shiner	E	LT	G2	Flowing runs and pools in streams with cool water and firm substrates	N/A		GA, NEQQ, NWQQ
Etheostoma ditrema	Coldwater Darter	E		G2	Vegetated springs and spring runs or small streams with spring influence	N/A		GA
Etheostoma rupestre	Rock Darter	R		G4	Swift rocky riffles often associated with attached vegetation such as Podostemum	N/A		GA
Etheostoma trisella	Trispot Darter	E	LT	G1	Breeding: vegetated spring seepage areas. Nonbreeding: clear streams in vegetated shallow slackwater areas	N/A		GA
Hybopsis lineapunctata	Lined Chub	R		G3G4	Upland creeks over sandy substrate with gentle current	N/A		GA
Moxostoma carinatum	River Redhorse	R		G4	Swift waters of medium to large rivers	N/A		GA
Notropis asperifrons	Burrhead Shiner	T		G4	Small streams to medium-sized rivers in pools, slow runs, and backwater areas	N/A		GA
AMPHIBIANS:								
Aneides aeneus	Green Salamander	R		G3G4	Moist rock crevices; canopies of trees; within hardwood forests	X		GA, NEQQ
REPTILES:								
Graptemys geographica	Northern Map Turtle	R		G5	large streams and rivers			GA
Graptemys pulchra	Alabama Map Turtle	R		G4	Rivers and large streams			GA

Scientific Name	Common Name	Georgia Status	Federal Status	Global Rank	Habitat	Suitable Habitat Onsite*	Observed Within Project Boundary	Data Source[1]
FAUNA								
BIRDS:								
Haliaeetus leucocephalus	Bald Eagle	T		G5	Edges of lakes and large rivers; seacoasts	X	X	GA, NEQQ
Peucaea aestivalis	Bachman's Sparrow	R		G3	Open pine or oak woods; old fields; brushy areas, young large grassy pine regeneration areas			GA
MAMMALS:								
Myotis grisescens	Gray Bat		LE	G4	Roost sites are nearly exclusively restricted to caves throughout the year. Winter roosts are in deep vertical caves with domed halls.			IPaC
Myotis septentrionalis	Northern Long-eared Bat		LE	G1G2	Caves and mines in winter; riparian areas, upland forests, cracks and crevices in dead and live trees in summer	X		IPaC
Myotis sodalis	Indiana Bat		LE	G2	Limestone caves with pools; wooded areas near streams, upland forests, large snags in open areas including ridge tops	X		IPaC

*Cells marked as N/A are aquatic organisms. Corblu's scope of work did not include aquatic resources.

Data Source:		
NEQQ	Georgia Biodiversity	NE Quarter Quad
NWQQ	Georgia Biodiversity	NW Quarter Quad
GA	Georgia Biodiversity	Floyd County
IPaC	USFWS	

Scientific Name	Common Name
Acer floridanum	Florida maple
Acer leucoderme	chalk maple
Acer negundo	box elder
Acer rubrum	red maple
Adiantum pedatum	Northern maidenhair fern
Aesculus pavia	red buckeye
Aesculus spp.	buckeye
Aesculus sylvatica	painted buckeye
Agalinis purpurea	purple false foxglove
Ageratina altissma	white snakeroot
*Ailanthus atlissima**	tree of heaven
*Albizia julibrissin**	mimosa
Alnus serrulata	hazel alder
Ambrosia artemisiifolia	annual ragweed
Amelanchier arborea	downy serviceberry
Ampelopsis arborea	peppervine
Amphicarpaea bracteata	hog peanut
Amsonia tabernaemontana	Eastern blue star
Andropogon glomeratus	bushy bluestem
Andropogon virginicus	broomsedge
Anemonoides quinquefolia	wood anemone
Antennaria plantaginifolia	plantainleaf pussytoes
Aralia spinosa	devil's walking-stick
Arisaema dracontium	green dragon
Arisaema triphyllum	jack-in-the-pulpit
Arisaema triphyllum ssp. quinatum	five leaf jack-in-the-pulpit
Aristida stricta	wiregrass
Arnoglossum atriplicifolium	pale indian plantain
Arundinaria gigantea	river cane
Asclepias amplexicaulis	clasping milkweed
Asclepias tuberosa	butterfly weed
Asmina parviflora	dwarf pawpaw
Asmina triloba	paw-paw
Asplenium platyneuron	ebony spleenwort
Athyrium asplenioides	Southern lady fern
Bidens bipinnata	spanish needles
Bidens spp.	beggarticks
Bignonia capreolata	crossvine
Boehmeria cylindrica	false nettle
Callicarpa americana	American beautyberry
Calycanthus floridus	eastern sweetshrub

Scientific Name	Common Name
Campsis radicans	trumpet creeper
Cardamine angustata	slender toothwort
Carex crinita	fringed sedge
Carex intumescens	bladder sedge
Carex lupilina	common hop sedge
Carex lurida	shallow sedge
Carex spp.	sedge
Carpinus caroliniana	American hornbeam
Carya glabra	pignut hickory
Carya ovata	shagbark hickory
Carya tomentosa	mockernut hickory
Catalpa bignonioides	Southern catalpa
Celtis laevigata	sugarberry
Celtis occidentalis	hackberry
Cephalanthus occidentalis	buttonbush
Cercis canadensis	Eastern redbud
Chasmanthium latifolium	river oats
Chasmanthium laxum	slender wood oats
Chasmanthium sessiliflorum	longleaf woodoats
Chimaphila maculata	pipsissewa
Cirsium vulgare	bull thistle
Cladinia rangiferina	reindeer lichen
Claytonia virginica	spring beauties
Commelina virginica	Virginia dayflower
Conoclinium coelestinum	blue mistflower
Conopholis americana	American cancer-root
Coreopsis spp.	tickseed
Cornus alternifolia	alternate leaf dogwood
Cornus amomum	silky dogwood
Cornus florida	flowering dogwood
Cornus foemina	swamp dogwood
Crataegus spp.	hawthorn
Cuscuta spp.	dodder
Cynanchum laeve	climbing milkweed
Cynodon dactylon	bermuda grass
Cyperus esculentus	yellow nutsedge
Dactylis glomerata	orchard grass
Daucus carota	queen anne's lace
Decumaria barbara	woodvamp
Desmodium spp.	tick-trefoil
Dichanthelium aciculare	needleleaf rosette grass

Scientific Name	Common Name
Dichanthelium clandestinum	deer tongue grass
Dichanthelium commutatum	variable rosette-panicgrass
Dichanthelium scoparium	velvety rosette-panicgrass
Dichanthelium spp.	panicgrass
Dioscorea villosa	wild yam
Diospyros virginiana	common persimmon
Diphasiastrum digitatum	groundcedar
Dulichium arundinaceum	three-way sedge
Elephantopus carolinianus	Carolina elephant's foot
Elephantopus tomentosus	common elephant's foot
Elymus virginicus	Virginia wild rye
Eragrostis spp.	lovegrass
erigeron annuus	daisy fleabane
Erigeron canadensis	horseweed
Erigeron philadelphicus	common fleabane
Erythrina herbacea	coral bean
Euonymus americanus	hearts-a-bustin
Eupatorium capillifolium	dogfennel
Eupatorium hyssopifolium	hyssop-leaf boneset
Eupatorium perfoliatum	common boneset
Eupatorium serotinum	lateflowering boneset
Eurybia divaricata	white wood aster
Eurybia macrophylla	bigleaf aster
Fagus grandifolia	American beech
Festuca rubra	red fescue
Festuca spp.	fescue
Fraxinus pennsylvanica	green ash
Galax urceolata	beetleweed
Galium pilosum	hairy bedstraw
Geranium carolinianum	Carolina geranium
Geum spp.	avens
Gleditsia triacanthos	honey locust
Glyceria spp.	mannagrass
Goodyera oblongifolia	rattlesnake plantain
Halesia carolina	Carolina silverbell
Hamamelis virginiana	witch-hazel
Helenium amarum	bitter sneezeweed
Helianthus divaricatus	woodland sunflower
Hexasepalum teres	poorjoe
Hexastylis arifolia	little brown jug
Hieracium venosum	rattlesnake weed

Scientific Name	Common Name
Houstonia caerulea	azure bluet
Hydrangea arborescens	wild hydrandea
Hydrangea quercifolia	oak-leaf hydrangea
Hydrocotyle spp.	dollar weed
Hydrocotyle umbellata	manyflower marsh-pennywort
Hymenocallis occidentalis	Northern spider lilly
Hypericum gentianoides	pineweed
Hypericum hypericoides	St. Andrew's cross
Hypericum perforatum	St. John's wort
Hypoxis hirsuta	common goldstar
Ilex decidua	possumhaw
Ipomoea pandurata	man of the earth
Iris cristata	dwarf crested iris
Iris verna	dwarf violet iris
Juglans nigra	black walnut
Juncus coriaceus	leathery rush
Juncus effusus	soft rush
Juncus tenuis	path rush
Juniperus virginiana	Eastern red cedar
Justicia americana	American water willow
Kalmia latifolia	mountain laurel
Krigia spp.	dwarf dandelion
Lamium purpureum	purple deadnettle
Leersia oryzoides	rice cutgrass
*Lespedeza bicolor**	bicolor lespedeza
Lespedeza capitata	roundhead lespedeza
*Lespedeza cuneata**	sericia lespedeza
Leucanthemum vulgare	oxeye daisy
*Ligustrum sinense**	Chinese privet
Linaria canadensis	toadflax
Lindera benzoin	spicebush
Liquidambar styraciflua	sweetgum
Liriodendron tulipifera	tuliptree
Lobelia puberula	downy lobelia
Lobelia siphilitica	great blue lobelia
Lonicera japonica	Japanese honeysuckle
Ludwigia spp.	primrose willow
Lycopodium spp.	club moss
Lycopus virginicus	bugleweed
Lythrum salicaria	purple loosestrife
*Microstegium vimineum**	Japanese stiltgrass

Scientific Name	Common Name
Mimosa nuttallii	sensitive-briar
Mitchella repens	partridge pea
Monarda clinopodia	basil bergamot
Morus rubra	red mulberry
*Murdannia keisak**	marsh dewflower
Nandina domestica	dwarf nandina
Nyssa sylvatica	black gum
Obolaria virginica	Virginia pennywort
Onoclea sensibilis	sensitive fern
Ophioglossum vulgatum	Southern adderstongue
Osmunda regalis	royal fern
Osmundastrum cinnamomea	cinnamon fern
Ostrya virginiana	American hophornbeam
Oxalis debilis	large flower pink-sorrel
Oxalis violacea	violet wood sorrel
Oxydendrum arboreum	sourwood
Panicum anceps	beaked panicgrass
Parthenocissus quinquefolia	Virginia creeper
Paspalum notatum	bahia grass
Passiflora incarnata	purple passion-flower
Passiflora lutea	yellow passion-flower
*Paulownia tomentosa**	princess tree
Peltandra virginica	arrow arums
Persicaria hydropiperoides	water pepper
Persicaria spp.	smartweed
Phegopteris hexagonoptera	broad beech fern
Phlox amoena	hairy phlox
Phlox spp.	phlox
Phytolacca americana	American pokeweed
Pinus echinata	shortleaf pine
Pinus taeda	loblolly pine
Pinus virginiana	Virginia pine
Pityopsis nervosa	common silkflower
Plantago lanceolata	narrow leaf plantain
Plantago major	broad leaf plantain
Platanus occidentalis	sycamore
Pleopeltis polypodiodes	resurrection fern
Pluchea foetida	stinking camphorweed
Pluchea odorata	marsh fleabane
Podophyllum peltatum	May apple
Polemonium reptans	Jacob's ladder

Scientific Name	Common Name
Polygonatum biflorum	Solomon's seal
Polystichum acrostichoides	Christmas fern
Pontederia cordata	pickerelweed
Prunus americana	American plum
Prunus serotina	black cherry
Pseudognaphalium obtusifolium	rabbit tobacco
Pteridium aquilinum	Eastern bracken fern
Pycananthemum pycnanthemoides	Southern mountain mint
Pycnanthemum tenuifolium	narrowleaf mountain mint
Pyrularia pubera	buffalo nut
Quercus alba	white oak
Quercus falcata	Southern red oak
Quercus laurifolia	laurel oak
Quercus marilandica	black jack oak
Quercus montana	chestnut oak
Quercus nigra	water oak
Quercus pagoda	cherrybark oak
Quercus phellos	willow oak
Quercus rubra	northern red oak
Quercus stellata	post oak
Ratibida columnifera	upright prairie coneflower
Rhexia spp.	meadow beauty
Rhododendron periclymenoides	pinxter azalea
Rhododendron spp.	wild azalea
Rhododendron viscosum	swamp azalea
Rhus copallinum	winged sumac
Rhus glabra	smooth sumac
Rhynchospora caduca	anglestem beaksedge
Rosa multiflora	multiflora rose
Rubus spp.	blackberry
Rudbeckia spp.	black-eyed susan
Rudbeckia triloba	brown-eyed susan
Rumex crispus	curly leaf dock
Sabatia angularis	rose pink
Saccharum alopecuroides	silver plume grass
Saccharum giganteum	sugarcane plume grass
Sagittaria latifolia	duck potato
Salix nigra	black willow
Sambucus canadensis	common elderberry
Sanicula canadensis	Canadian blacksnake root
Sassafras albidum	sassafras

Scientific Name	Common Name
Saxifraga virginiensis	early saxifrage
Schoenoplectus pungens	three-square bulrush
Schoenoplectus tabernaemontani	softstem bulrush
Scirpus cyperinus	woolgrass
Scirpus spp.	bulrush
Senna obtusifolia	sicklepod
Silene virginica	fire pink
Silphium perfoliatum	rosinweed
Silphium radula	roughstem rosinweed
Smallanthus uvedalia	bear's foot
Smilax bona-nox	saw greenbrier
Smilax glauca	cat greenbrier
Smilax rotundifolia	common greenbrier
Smilax smallii	lance-leaf greenbrier
Solanum carolinense	horse nettle
Solidago canadensis	Canada goldenrod
Solidago gigantea	giant goldenrod
Solidago rugosa	wrinkleleaf goldenrod
Sorghastrum nutans	indiangrass
Symphyotrichum patens	late purple aster
Taraxacum spp.	dandelion
Thalictrum spp.	meadow rue
Thalictrum thalictroides	rue anemone
Thelypteris noveboracensis	New York fern
Thelypteris palustris	marsh fern
Tiarella cordifolia	heartleaf foamflower
Tilia americana	basswood
Triadenum walteri	greater marsh St. Johnwort
Trientalis borealis	maystar
Trifolium repens	white clover
Trillium catesbaei	Catesby's trillium
Trillium spp.	trillium
Typha latifolia	common cattail
Ulmus alata	winged elm
Ulmus americana	American elm
Vaccinium arboreum	sparkleberry
Vaccinium corymbosum	highbush blueberry
Vaccinium elliottii	Elliott's blueberry
Vaccinium steminium	Southern gooseberry
Valerianella radiata	beaked corn salad
Verbena brasiliensis	Brazilian verbena

Scientific Name	Common Name
Verbesina alternifolia	wingstem
Veronia noveboracensis	New York ironweed
Viburnum acerifolium	maple leaf viburnum
Viburnum nudum	possumhaw viburnum
Viburnum prunifolium	blackhaw
Vicia caroliniana	Carolina vetch
Vinca spp.	periwinkle
Vitis rotundifolia	muscadine
Woodwardia areolata	netted chainfern
Yucca filamentosa	yucca
Zizia aurea	golden alexanders

** Denotes **Category 1** Invasive Species per Georgia Exotic Pest Plant Council*

Table 3. Birds Known to Occur in Proximity to RMPS Project Appendix B: Tables

Common Name	Scientific Name	Audubon (GAFC Christmas Count)[1]	USGS Breeding Bird Surveys[2]	Terrestrial Field Surveys (2022/2023)[3]
Blackbirds				
Brown-headed Cowbird	*Molothrus ater*	x	x	x
Common Grackle	*Quiscalus quiscula*	x	x	x
Eastern Meadowlark	*Sturnella magna*	x	x	
Orchard Oriole	*Icterus spurius*		x	
Red-winged Blackbird	*Agelaius phoeniceus*	x	x	x
Rusty Blackbird	*Euphagus carolinus*	x		
Cardinals, Grosbeaks, Allies				
Blue Grosbeak	*Passerina caerulea*		x	x
Indigo Bunting	*Passerina cyanea*		x	x
Northern Cardinal	*Cardinalis cardinalis*	x	x	x
Scarlet Tanager	*Piranga olivacea*		x	
Summer Tanager	*Piranga rubra*		x	x
Catbirds, Mockingbird, and Thrashers				
Brown Thrasher	*Toxostoma rufum*		x	x
Gray Catbird	*Dumetella carolinensis*		x	
Northern Mockingbird	*Mimus polyglottos*	x	x	x
Cormorants and Anhingas				
Double-crested Cormorant	*Nannopterum auritum*			x
Cuckcoos				
Black-billed Cuckoo	*Coccyzus erythropthalmus*		x	
Yellow-billed Cuckoo	*Coccyzus americanus*		x	
Falcons				
American Kestrel	*Falco sparverius*	x	x	
Finches, Euphonias and Allies				
American Goldfinch	*Spinus tristis*	x	x	x

Table 3. Birds Known to Occur in Proximity to RMPS Project Appendix B: Tables

Common Name	Scientific Name	Audubon (GAFC Christmas Count)[1]	USGS Breeding Bird Surveys[2]	Terrestrial Field Surveys (2022/2023)[3]
House Finch	*Haemorhous mexicanus*	x	x	x
Purple Finch	*Haemorhous purpureus*	x		
Gnatcatchers				
Blue-gray Gnatcatcher	*Polioptila caerulea*	x	x	x
Grebes				
Pied-billed Grebe	*Podilymbus podiceps*	x		
Grouse, Quail, and Allies				
Northern Bobwhite	*Colinus virginianus*		x	
Wild Turkey	*Meleagris gallopavo*	x	x	x
Gulls, Terns, and Skimmers				
Herring Gull	*Larus argentatus*	x		
Ring-billed Gull	*Larus delawarensis*	x		
Herons, Ibis, and Allies				
Great Blue Heron	*Ardea herodias*	x	x	x
Great Egret	*Ardea alba*		x	x
Green Heron	*Butorides virescens*		x	
Hummingbirds				
Ruby-throated Hummingbird	*Archilochus colubris*		x	
Jays, Magpies, Crows, and Ravens				
American Crow	*Corvus brachyrhynchos*	x	x	x
Blue Jay	*Cyanocitta cristata*	x	x	x
Fish Crow	*Corvus ossifragus*	x		
Kingfishers				
Belted Kingfisher	*Megaceryle alcyon*	x	x	x
Kinglets				
Golden-crowned Kinglet	*Regulus satrapa*	x		

Table 3. Birds Known to Occur in Proximity to RMPS Project Appendix B: Tables

Common Name	Scientific Name	Audubon (GAFC Christmas Count)[1]	USGS Breeding Bird Surveys[2]	Terrestrial Field Surveys (2022/2023)[3]
Ruby-crowned Kinglet	*Corthylio calendula*	x		x
Martins and Swallows				
Barn Swallow	*Hirundo rustica*		x	x
Cliff Swallow	*Petrochelidon pyrrhonota*		x	
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*		x	
Purple Martin	*Progne subis*		x	x
New World Sparrows				
Chipping Sparrow	*Spizella passerina*	x	x	x
Eastern Towhee	*Pipilo erythrophthalmus*	x	x	x
Field Sparrow	*Spizella pusilla*	x	x	x
Grasshopper Sparrow	*Ammodramus savannarum*		x	
Savannah Sparrow	*Passerculus sandwichensis*	x		
Song Sparrow	*Melospiza melodia*	x	x	
Swamp Sparrow	*Melospiza georgiana*	x		
Nightjars				
Chuck-will's-widow	*Antrostomus carolinensis*		x	
Common Nighthawk	*Chordeiles minor*		x	
Eastern Whip-poor-will	*Antrostomus vociferus*		x	
Nuthatches				
Brown-headed Nuthatch	*Sitta pusilla*	x	x	x
White-breasted Nuthatch	*Sitta carolinensis*	x	x	x
Old World Sparrows				
House Sparrow	*Passer domesticus*	x	x	
Owls				
Barred Owl	*Strix varia*	x	x	
Eastern Screech-Owl	*Megascops asio*	x		

Table 3. Birds Known to Occur in Proximity to RMPS Project Appendix B: Tables

Common Name	Scientific Name	Audubon (GAFC Christmas Count)[1]	USGS Breeding Bird Surveys[2]	Terrestrial Field Surveys (2022/2023)[3]
Great Horned Owl	*Bubo virginianus*	x	x	
Northern Saw-wet Owl	*Aegolius acadicus*	x		
Pigeons and Doves				
Eurasian Collared-Dove	*Streptopelia decaocto*	x	x	
Mourning Dove	*Zenaida macroura*	x	x	x
Rock Pigeon	*Columba livia*	x	x	
Rails, Gallinules, and Allies				
Virginia Rail	*Rallus limicola*	x		
American Coot	*Fulica americana*	x		
Shorebirds				
Killdeer	*Charadrius vociferus*	x	x	x
Wilson's Snipe	*Gallinago delicata*	x		
Solitary Sandpiper	*Tringa solitaria*			x
American Woodcock	*Scolopax minor*	x		
Shrikes				
Loggerhead Shrike	*Lanius ludovicianus*		x	
Starlings				
European Starling	*Sturnus vulgaris*	x	x	x
Swifts				
Chimney Swift	*Chaetura pelagica*		x	
Thrushes				
American Robin	*Turdus migratorius*	x	x	x
Eastern Bluebird	*Sialia sialis*	x	x	x
Hermit Thrush	*Catharus guttatus*	x		
Wood Thrush	*Hylocichla mustelina*		x	
Tits, Chickadees, and Titmice				

Table 3. Birds Known to Occur in Proximity to RMPS Project Appendix B: Tables

Common Name	Scientific Name	Audubon (GAFC Christmas Count)[1]	USGS Breeding Bird Surveys[2]	Terrestrial Field Surveys (2022/2023)[3]
Carolina Chickadee	*Poecile carolinensis*	x	x	x
Tufted Titmouse	*Baeolophus bicolor*	x	x	x
Treecreepers				
Brown Creeper	*Certhia americana*	x		
Tyrant Flycatchers: Pewees, Kingbirds, and Allies				
Acadian Flycatcher	*Empidonax virescens*		x	
Eastern Kingbird	*Tyrannus tyrannus*		x	
Eastern Phoebe	*Sayornis phoebe*	x	x	x
Eastern Wood-Pewee	*Contopus virens*		x	
Great Crested Flycatcher	*Myiarchus crinitus*		x	
Vireos				
Blue-headed Vireo	*Vireo solitarius*	x		x
Red-eyed Vireo	*Vireo olivaceus*		x	x
White-eyed Vireo	*Vireo griseus*	x	x	x
Yellow-throated Vireo	*Vireo flavifrons*		x	x
Vultures, Hawks, and Allies				
Bald Eagle	*Haliaeetus leucocephalus*	x		x
Black Vulture	*Coragyps atratus*	x		x
Broad-winged Hawk	*Buteo platypterus*		x	
Cooper's Hawk	*Accipiter cooperii*	x	x	x
Northern Harrier	*Circus hudsonius*	x		
Osprey	*Pandion haliaetus*			x
Red-shouldered Hawk	*Buteo lineatus*	x	x	
Red-tailed Hawk	*Buteo jamaicensis*	x	x	x
Turkey Vulture	*Cathartes aura*	x	x	x
Waterfowl				

Table 3. Birds Known to Occur in Proximity to RMPS Project Appendix B: Tables

Common Name	Scientific Name	Audubon (GAFC Christmas Count)[1]	USGS Breeding Bird Surveys[2]	Terrestrial Field Surveys (2022/2023)[3]
American Wigeon	*Mareca americana*	x		
Blue-winged Teal	*Anas discors*	x		
Canada Goose	*Branta canadensis*	x	x	x
Gadwall	*Mareca strepera*	x		
Green-winged Teal	*Anas crecca*	x		x
Hooded Merganser	*Lophodytes cucullatus*			
Mallard	*Anas platyrhynchos*	x		x
Northern Shoveler	*Spatula clypeata*	x		
Redhead	*Aythya americana*	x		
Ring-necked Duck	*Aythya collaris*	x		
Ruddy Duck	*Oxyura jamaicensis*	x		
Wood Duck	*Aix sponsa*	x	x	x
Waxwings				
Cedar Waxwing	*Bombycilla cedrorum*	x	x	
Wood Warblers				
Black-and-white Warbler	*Mniotilta varia*		x	x
Black-throated Green Warbler	*Setophaga virens*			x
Common Yellowthroat	*Geothlypis trichas*	x	x	x
Hooded Warbler	*Setophaga citrina*		x	x
Kentucky Warbler	*Geothlypis formosa*		x	
Louisiana Waterthrush	*Parkesia motacilla*		x	x
Northern Parula	*Setophaga americana*		x	x
Orange-crowned Warbler	*Vermivora celta*	x		
Ovenbird	*Seiurus aurocapilla*		x	
Palm Warbler	*Setophaga palmarum*	x		
Pine Warbler	*Setophaga pinus*	x	x	x

Table 3. Birds Known to Occur in Proximity to RMPS Project

Common Name	Scientific Name	Audubon (GAFC Christmas Count)[1]	USGS Breeding Bird Surveys[2]	Terrestrial Field Surveys (2022/2023)[3]
Prairie Warbler	*Setophaga discolor*		x	
Prothonotary Warbler	*Protonotaria citrea*		x	
Worm-eating Warbler	*Helmitheros vermivorum*		x	
Yellow-rumped Warbler (Myrtle)	*Setophaga coronata*	x		
Yellow-throated Warbler	*Setophaga dominica*		x	
Woodpeckers				
Downy Woodpecker	*Dryobates pubescens*	x	x	x
Hairy Woodpecker	*Dryobates villosus*	x	x	
Pileated Woodpecker	*Dryocopus pileatus*	x	x	x
Red-bellied Woodpecker	*Melanerpes carolinus*	x	x	x
Red-headed Woodpecker	*Melanerpes erythrocephalus*	x	x	
Yellow-bellied Sapsucker	*Sphyrapicus varius*	x		
Northern Flicker	*Colaptes auratus*	x	x	x
Wrens				
Carolina Wren	*Thryothorus ludovicianus*	x	x	x
House Wren	*Troglodytes aedon*	x	x	
Sedge Wren	*Cistothorus stellaris*	x		
Winter Wren	*Troglodytes hiemalis*	x		
Yellow-breasted Chats				
Yellow-breasted Chat	*Icteria virens*		x	x

1. Audubon Christmas Count - Floyd County. County Code GAFC. January 02, 2023
2. USGS North American Breeding Bird Surveys. Historical List for Shannon Route
3. Terrestrial Field Surveys: April-June, 2022 & March 2023

Rocky Mountain Pumped Storage Hydroelectric Project

Representative Photographs
of
Terrestrial Resources Survey

Mesic Forest

Mixed Pine Hardwood Forest

Forested Wetland

Forested Wetland

Dry Oak Slope Forest

Littoral Zone

Boulder Field

Upland Hardwood Forest

Littoral Zone

Xeric/Sub-Xeric

Transmission Line Easement

Transmission Line Easement

Bottomland Hardwood

Anthropogenic Disturbance

Open Water

Pine Plantation/Pine Forest

Intermittent Stream (Southside)

Emergent Wetland at Quarry

corblu ECOLOGY GROUP	**Rocky Mountain Pumped Storage Hydroelectric Project** **Floyd County, Georgia**	**Representative Photographs** *Date: July/September 2022 & March 2023*

Cliff Waterfall

Beaver Lodge

Potential Cherokee Clubtail Habitat

Potential Cherokee Clubtail Habitat

Black Racer Snake

Southern Leopard Frog

Eastern Box Turtle

Northern Dusky Salamander

Dekay's Brown Snake

Timber Rattlesnake

Dwarf Violet Iris

Heartleaf Foamflower

American Cancer Root

Eastern Blue Star

CORBLU ECOLOGY GROUP

Rocky Mountain Pumped Storage Hydroelectric Project

Floyd County, Georgia

Representative Photographs

Date: July/September 2022 & March 2023 s

Recreation Use Analysis Study Report

Rocky Mountain Pumped Storage Hydroelectric Project

FERC No. 2725

Prepared for:

Oglethorpe Power Corporation

Prepared by:

Kleinschmidt Associates

September 2023

Kleinschmidt

Kleinschmidtgroup.com

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1.0 INTRODUCTION

This report presents the findings of the Recreation Use Analysis conducted for the Federal Energy Regulatory Commission (FERC) relicensing of Oglethorpe Power Corporation's (OPC's) Rocky Mountain Pumped Storage Hydroelectric Project (FERC No. 2725) (Rocky Mountain Project or Project). The study was conducted according to OPC's Final Study Plan for the Project distributed in August 2022 and included recreation user surveys in 2022 and 2023. OPC will use the information generated by this study to evaluate the potential effects of continued project operation on recreation resources at the Project in the license application.

The 904-megawatt Rocky Mountain Project is located on Heath Creek, approximately 10 miles northwest of the city of Rome, in Floyd County, Georgia. The Project consists of a 221-acre Upper reservoir, a 600-acre Lower Reservoir, two Auxiliary Pools, and a powerhouse. OPC is not proposing to add capacity or make any major modifications to the Project under the new license. The Project does not occupy any federal lands. The original license expires December 31, 2026.

1.1 Study Purpose and Objectives

After filing the Pre-Application Document (PAD) with FERC on December 10, 2021, OPC held a virtual Joint Meeting and Site Visit with interested stakeholders on March 16, 2022. In the Joint Meeting, OPC presented its proposed plans to conduct resource studies to address information gaps and meet the information needs for FERC's National Environmental Policy Act review of the license application. The Georgia Department of Natural Resources (GDNR) Wildlife Resources Division provided comments on the PAD and proposed study plans, including the Recreation Use Analysis study plan, in May 2022. OPC held an in-person meeting with GDNR on April 22, 2022, to discuss the proposed Recreation Use Analysis study plan. The final study plan addresses or incorporates recommendations made by GDNR during consultation.

The purpose of the Recreation Use Analysis is to characterize existing recreational use at the Rocky Mountain Project for evaluating the potential effects to recreation resources from continued project operation and maintenance, and to use population data from Floyd County to assess potential future recreation needs at the Project.

The study focused on the following objectives:

- Characterize the existing facilities and recreational use within the project boundary through existing information review, and field activities to inventory and describe existing facilities and survey recreation users at the Project.

- Develop recreational use information sufficient for analyzing the effects of continued project operation and maintenance on recreation resources in the license application.

1.2 Study Area

The study area, known as the Rocky Mountain Recreation and Public Fishing Area (Rocky Mountain PFA), includes Auxiliary Pool I (Antioch Lake East and West), Auxiliary Pool II (Heath Lake), and other recreation areas, such as hiking and biking trails, within the project boundary (Figure 1). The two auxiliary pools are located adjacent to the Lower Reservoir and are comprised of the 400-acre Auxiliary Pool I, known as Antioch Lake, which is further delineated as Antioch Lake East and Antioch Lake West, and the 200-acre Auxiliary Pool II, known as Heath Lake.

Due to large daily fluctuations in pond levels of the Upper Reservoir and Lower Reservoir, public access is not permitted, and they therefore were not analyzed as part of this study.

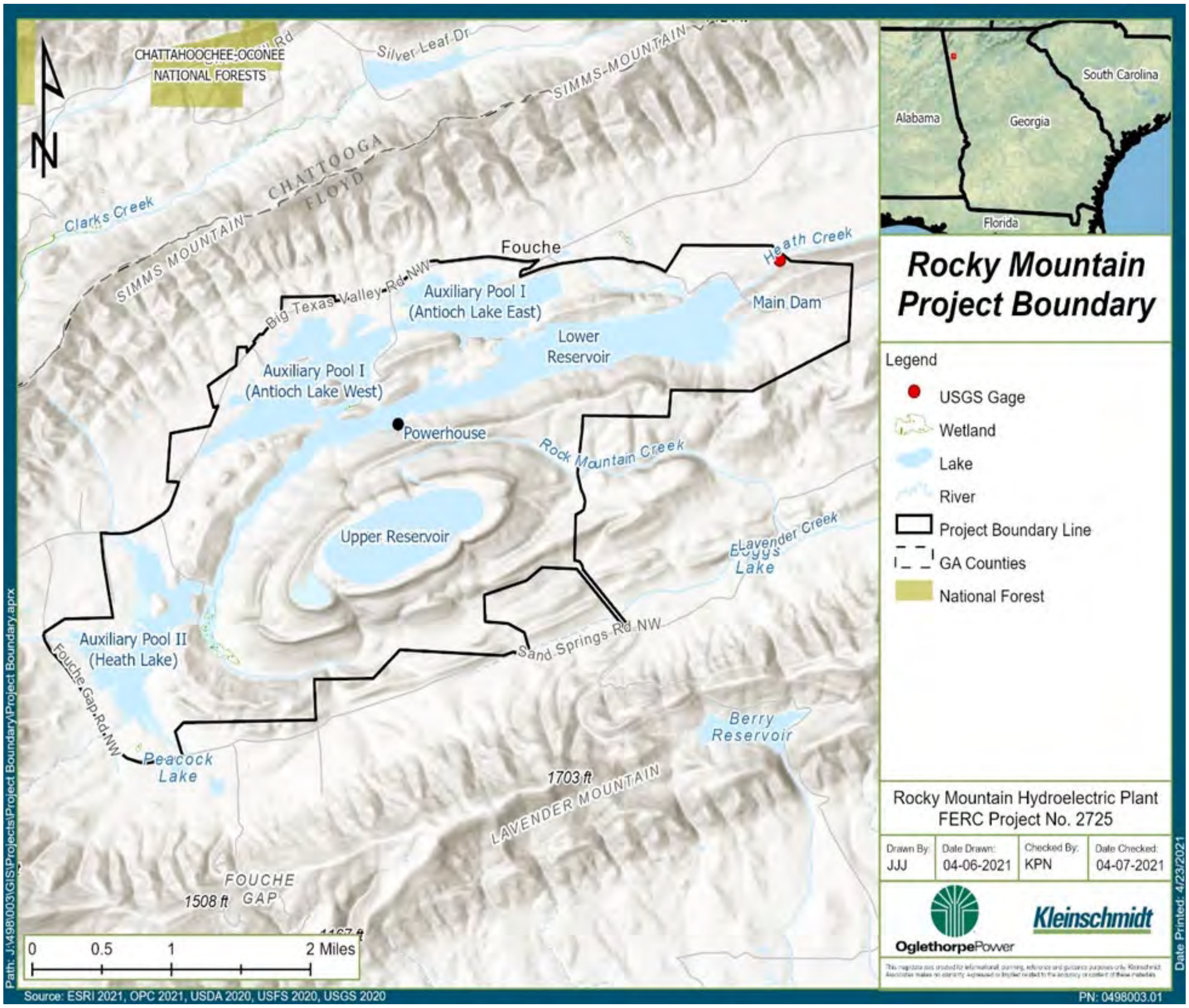

Figure 1 Project Boundary Map

2.0 METHODOLOGY

A complete inventory of existing recreation facilities was conducted in 2022. Data were collected on the type, number, and size of facilities (restrooms, parking areas, boat ramps, picnic shelters and tables, campsites, trails, etc.) at the Rocky Mountain PFA. The general condition of all facilities was noted during the inventory. Any Americans with Disabilities Act (ADA) compliant facilities were identified.

As recommended by GDNR, OPC conducted on-site recreation surveys, collecting data on public use characteristics and user satisfaction levels. Recreation users at the Project were surveyed on 15 days between June 2022 and May 2023. The purpose of these on-site surveys was to assess trends in recreation user composition, primary recreation uses, user satisfaction, and adequacy of existing facilities. Annual recreation use was estimated using GDNR traffic count data, as described below. The field crew conducted surveys on 9 days between June and October 2022 to capture summer and early fall use and again on 6 days between March and May 2023 to capture spring use. Surveys were conducted on a mix of weekdays, non-peak weekends, and peak weekends (or holidays), with an emphasis towards non-peak weekends, using the survey form developed in consultation with GDNR (Appendix A). The survey schedule is provided in Table 1. The two or three-person field crew[1] was on site to conduct surveys for 8 hours each survey day, generally between the hours of 8:00 AM and 4:00 PM. During the spring survey events, the field crew was on site generally between the hours of 7:00 AM and 3:00 PM to interview morning anglers. Each member of the field crew was stationed at one of three locations to conduct surveys: the main entrance ("Main"), the beach entrance ("Beach"), or the Heath Lake entrance ("Heath"). Surveys were conducted at the Heath entrance only during the first 10 days of each month, which corresponds to the days Heath Lake is open for fishing.

OPC's recreation survey methodology and level of effort in 2022-2023 were similar to those used by GDNR in a 2006-2007 recreation survey of the Rocky Mountain PFA. The 2022-2023 recreation survey field effort totaled approximately 320 hours, as compared to the approximately 310 hours of surveys GDNR completed in 2006-2007. As such, in addition to providing statistically valid and sufficiently robust data for representing

[1] On some survey days, as indicated in Table 1, an OPC employee joined the field crew to collect surveys.

recreation users and their satisfaction levels with the Rocky Mountain PFA facilities, the 2022-2023 recreation survey provides a useful comparison with the 2006-2007 survey results.

Table 1 Recreation Survey Schedule

Survey #	Month, Year	Day Type	Entrances	# in Field Crew
1	June 25, 2022	Weekend	Main, Beach	3
2	July 2, 2022	Holiday	Main, Beach, Heath	3
3	July 27, 2022	Weekday	Main, Beach	3
4	August 7, 2022	Weekend	Main, Beach, Heath	3
5	August 26, 2022	Weekday	Main, Beach	3
6	September 1, 2022[2]	Weekday	Main, Beach, Heath	3
7	October 4, 2022	Weekday	Main, Beach	2
8	October 21, 2022	Weekday	Main, Beach, Heath	3
9	October 22, 2022	Weekend	Main, Beach	3
10	March 5, 2023	Weekend	Main, Beach, Heath	2
11	March 31, 2023	Weekday	Main, Beach	3
12	April 1, 2023	Weekend	Main, Beach, Heath	2
13	April 29, 2023	Weekend	Main, Beach	2
14	May 8, 2023	Weekday	Main, Beach, Heath	2
15	May 21, 2023	Weekend	Main, Beach	3

In addition to in-person surveys, a survey drop-box was installed at the campground entrance/check-in area. Campers were able to complete a survey during their visit and leave it in the drop box upon leaving. The survey drop-box was in place from June through October 2022 to capture peak use in the summer and early fall. The campground survey form was developed in consultation with GDNR (Appendix A).

Altogether, 306 surveys were collected in 2022 and 2023. Table 2 shows the breakdown of surveys collected at each location. Information collected during the surveys is summarized in Sections 4.1 and 4.2.

[2] Only one survey event occurred in September 2022. The second survey event that was planned for late September was canceled due to a forecasted hurricane and associated storms in the area. The canceled survey event was made up in late October 2022.

Table 2 Surveys Collected by Location

Location	Surveys Collected
Beach	142
Main	71
Heath	69
Campground	24
Total	**306**

Current recreational use was determined using existing data and information collected by GDNR, including attendance records, traffic count data, and staff observations. These sources of data were used to develop OPC's 2015 Form 80 recreation report filed with FERC. GDNR continuously collects traffic count data using counter devices installed at the three Rocky Mountain PFA entrances. GDNR provided one full year of traffic count data and one full year of campground visitation data, which were used to estimate recreational use at the Rocky Mountain PFA in 2022 for comparison to recreational use estimates for prior years, as summarized in the PAD. The reported estimate of recreation use is presented in "recreation days." FERC defines a recreation day as one visit by a person to a development for purposes of recreation during any 24-hour period. An estimate of recreational use during 2022 is presented in Section 4.3.

Estimated projections of future recreation use at the Project were developed using the projected population estimates for the next 40 years for Floyd County, as reported by the Georgia Governor's Office of Planning and Budget (GAOPB). The population projections were applied to the annual use estimate for the Project to project a future recreation use estimate, as presented in Section 4.4. This information was considered when determining future recreation needs at the Project.

The need for recreation and site development or modifications of existing recreation resources was assessed based on the inventory, recreation surveys, and future recreation use estimates. The needs assessment focused on the existing condition and user opinions of the Rocky Mountain PFA, the presence of "barrier-free" facilities, and the capability of the PFA to meet current and anticipated future recreation demand. The need for new recreation sites and/or facilities, as well as improvements to existing recreation amenities, will be evaluated in the license application through assessment of the study findings and recommendations provided by stakeholders, particularly GDNR.

Appendix B documents OPC's consultation with GDNR on the survey approach and obtaining GDNR traffic count and visitation data for the project recreation facilities.

3.0 RECREATION RESOURCES

3.1 Project Recreation Resources

Within the approximately 5,000 acres of land and water encompassed by the Rocky Mountain project boundary, 3,700 acres, known as the Rocky Mountain PFA, are available for public recreational use (OPC 2005). There are three main recreation areas within the Rocky Mountain PFA (Figures 2 through 4). Auxiliary Pool I, or Antioch Lake, is separated into two main areas for recreation: Antioch Lake East and Antioch Lake West. The third main recreation area is Auxiliary Pool II, or Heath Lake. Public recreational use of the Upper and Lower Reservoirs, and their shorelines, is prohibited due to safety concerns caused by large fluctuations in pond levels from project operations. OPC maintains a Memorandum of Agreement with GDNR that allows GDNR to manage and operate the Project's recreation facilities. GDNR allows day use vehicle parking and overnight camping for a fee.

The following sections describe the various recreation areas available at the Rocky Mountain PFA and their associated amenities. In addition to the recreation amenities described below, a variety of hiking and biking trails are available within the project boundary (Figure 5).

3.1.1 Antioch Lake

Main Entrance

The eastern-most entrance to the Rocky Mountain PFA on Big Texas Valley Road is the Main entrance and provides public recreation access to Antioch Lake East and the eastern end of Antioch Lake West (Figure 2).

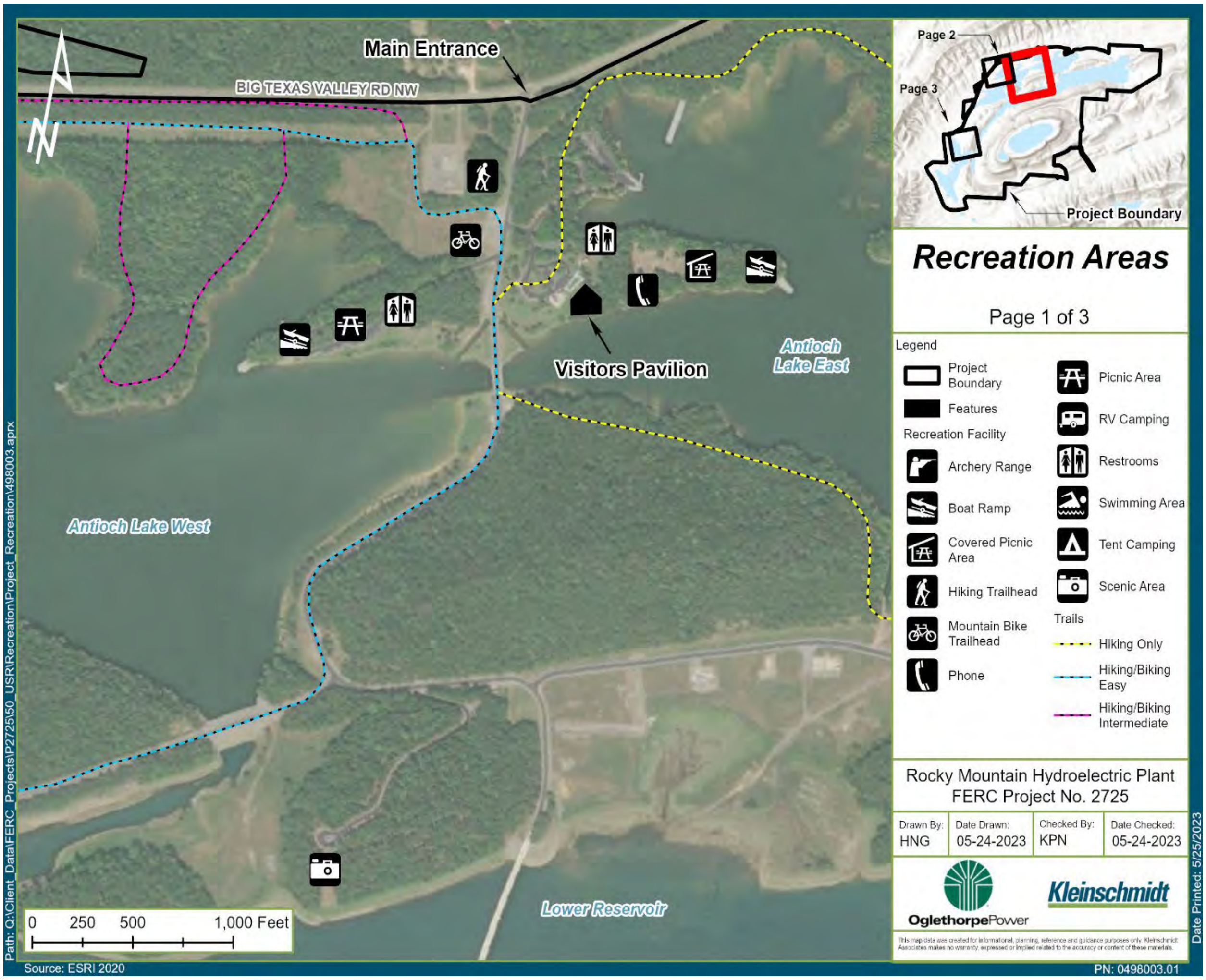

Figure 2 Recreation Amenities at Rocky Mountain PFA – Antioch Lake East and West

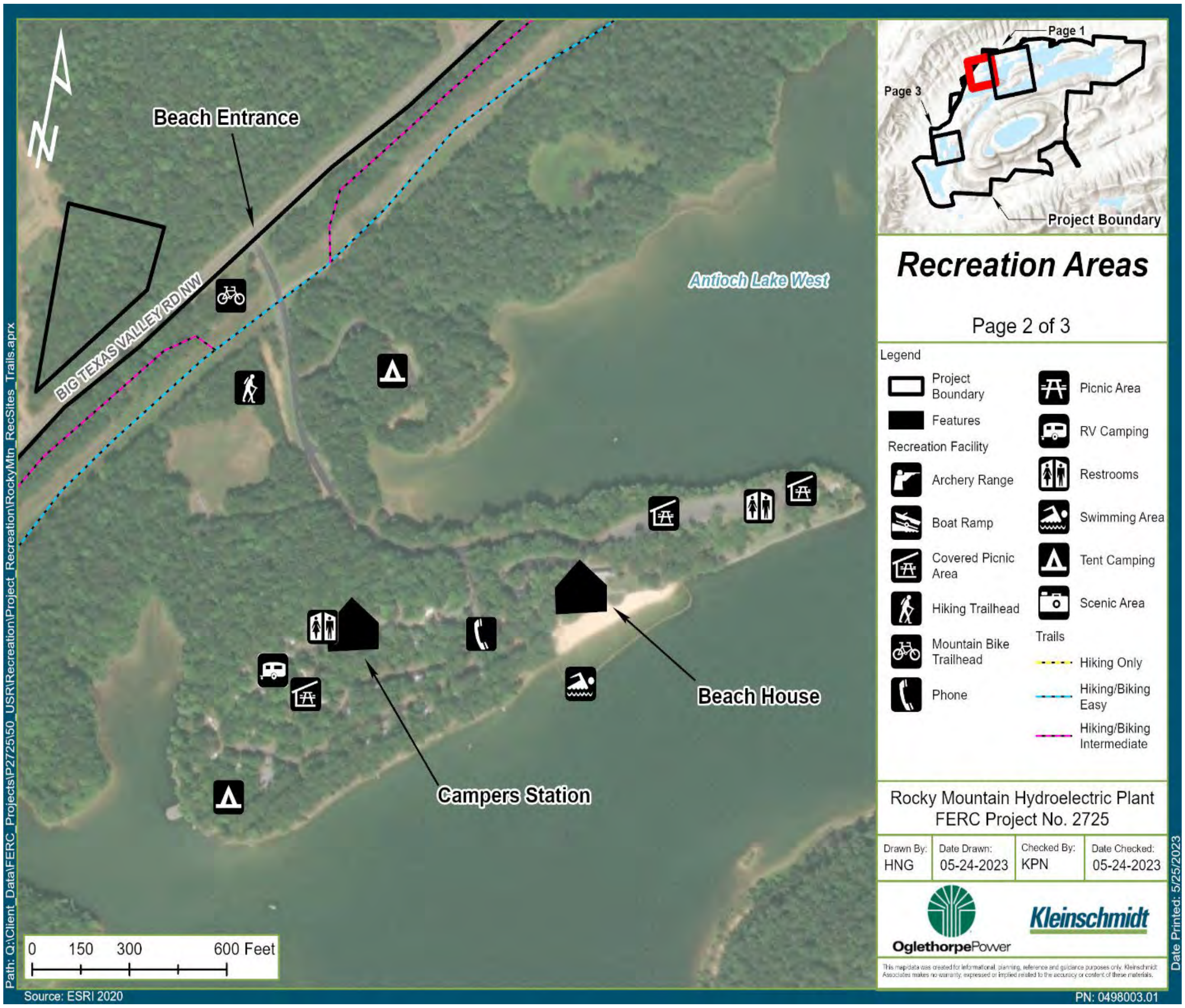

Figure 3 Recreation Amenities at Rocky Mountain PFA – Antioch Lake West

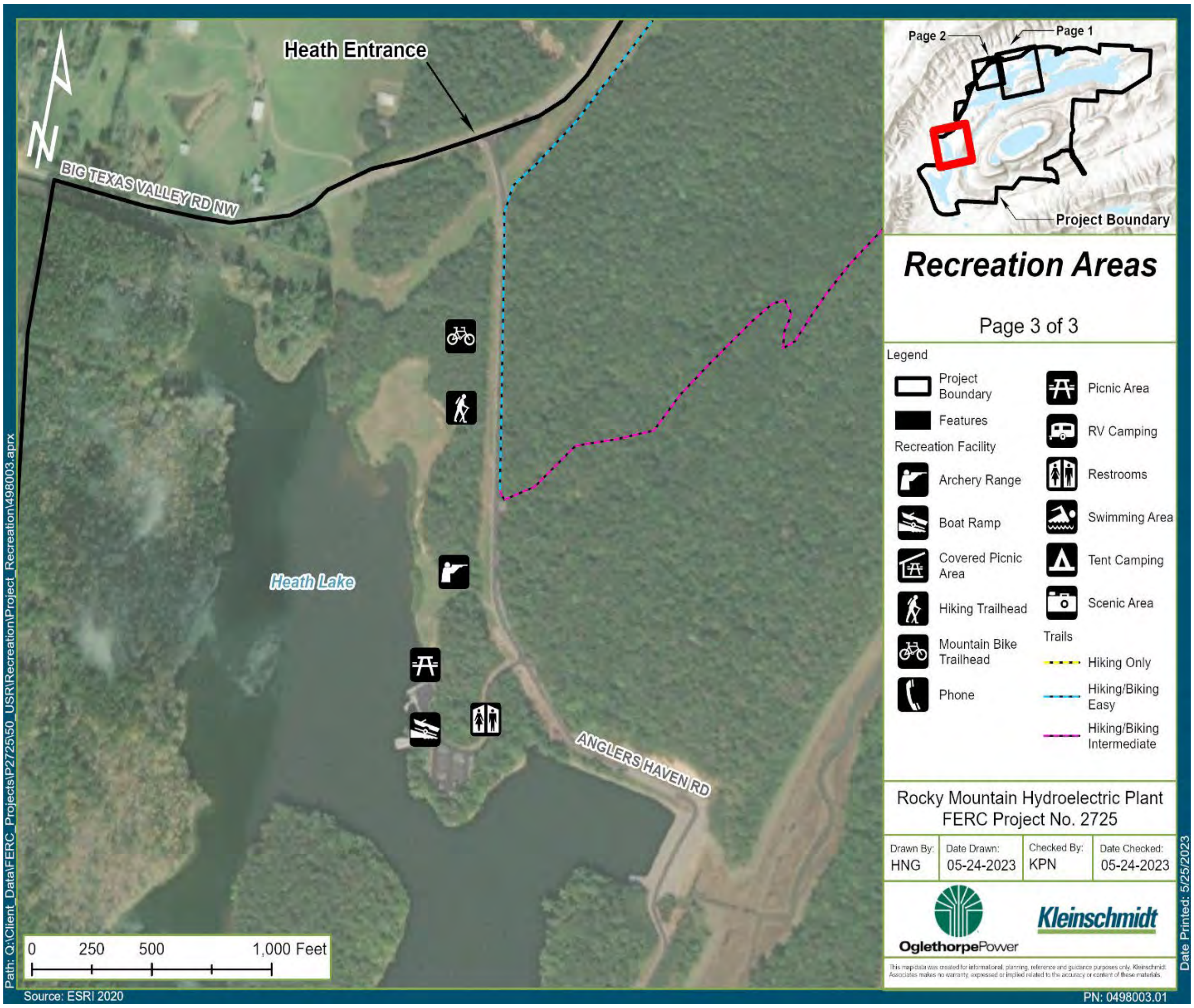

Figure 4 Recreation Amenities at Rocky Mountain PFA – Heath Lake

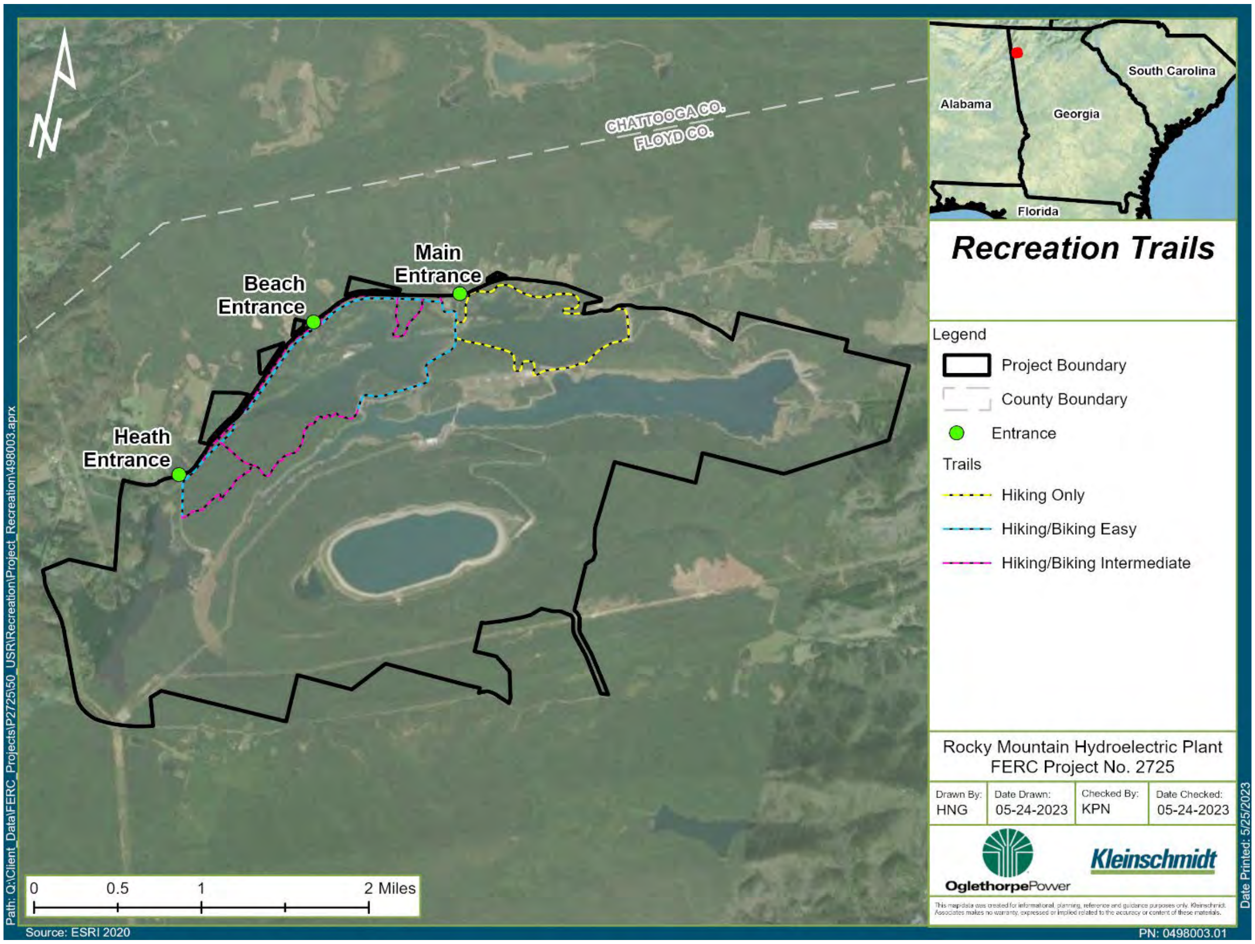

Figure 5 Recreation Trails at Rocky Mountain PFA

Antioch Lake East includes a visitor pavilion and day use facilities (OPC 2005). The visitor center includes the following amenities (Figure 2):

- Parking for vehicles and buses (including two ADA-compliant spaces);
- A covered building with restrooms (Figure 6);
- A picnic area with tables and grills; and
- Interpretive signage.

The day use facilities at Antioch Lake East include (Figure 2):

- A picnic area with tables and grills;
- A picnic shelter with tables and grills;
- A one-lane, concrete boat launch (Figure 7);
- A floating dock;

- A paved parking area (including one ADA-compliant space);
- Bank fishing; and
- Restrooms.

The day-use facilities at the eastern end of Antioch Lake West accessed from the Main entrance include (Figure 2):

- A boating area with parking for vehicles and vehicles with trailers (including one ADA-compliant space), a concrete boat launch, a wooden courtesy dock, and a picnic area with tables and grills;
- Restrooms; and
- Bank fishing.

Figure 6 Antioch Lake East Visitor Center Pavilion

Figure 7 Antioch Lake East Boat Ramp and Courtesy Dock

Beach Entrance

The middle entrance to the Rocky Mountain PFA on Big Texas Valley Road (identified in this report as the "Beach Entrance") provides public recreation access to the main body of Antioch Lake West (Figure 3), which is the most highly developed area and includes the following amenities:

- A beach-oriented picnic area with paved parking lot;
- A large picnic area with a group shelter, tables, and grills;
- Restrooms;
- Bank fishing;
- A swimming area with a sand beach, beach house with ADA-compliant restrooms, and parking (including four ADA-compliant spaces) (Figure 8);
- A family camping area with recreational vehicle (RV) sites, a campers station with shower and restroom facilities (Figure 9), and a sanitary dump facility; and
- A group camping area with vehicle parking, walk-in tent sites, and a picnic shelter with tables and grills.

Figure 8 Beach Area

Figure 9 Campers Station at Campground

3.1.2 Heath Lake

A western-most entrance to the Rocky Mountain PFA on Texas Valley Road provides public recreation access exclusively to Heath Lake (Figure 4). Heath Lake is open to the public for fishing during the first 10 days of each month. In addition, hunting is allowed at and around Heath Lake during state-designated hunting seasons. The Heath Lake recreation area includes the following amenities:

- A parking area (including one ADA-compliant space);
- A single-lane, concrete boat launch (Figure 10);
- A picnic area with tables and grills;
- An archery range;
- Bank fishing; and
- Restrooms.

Figure 10 Heath Lake Boat Ramp and Dock

3.2 Regional Recreation Resources

In addition to the project recreation resources described above, the region surrounding the Project has many recreation areas with various amenities available to the public (Figure 11). The sections below describe some of the more popular recreation resources in the region.

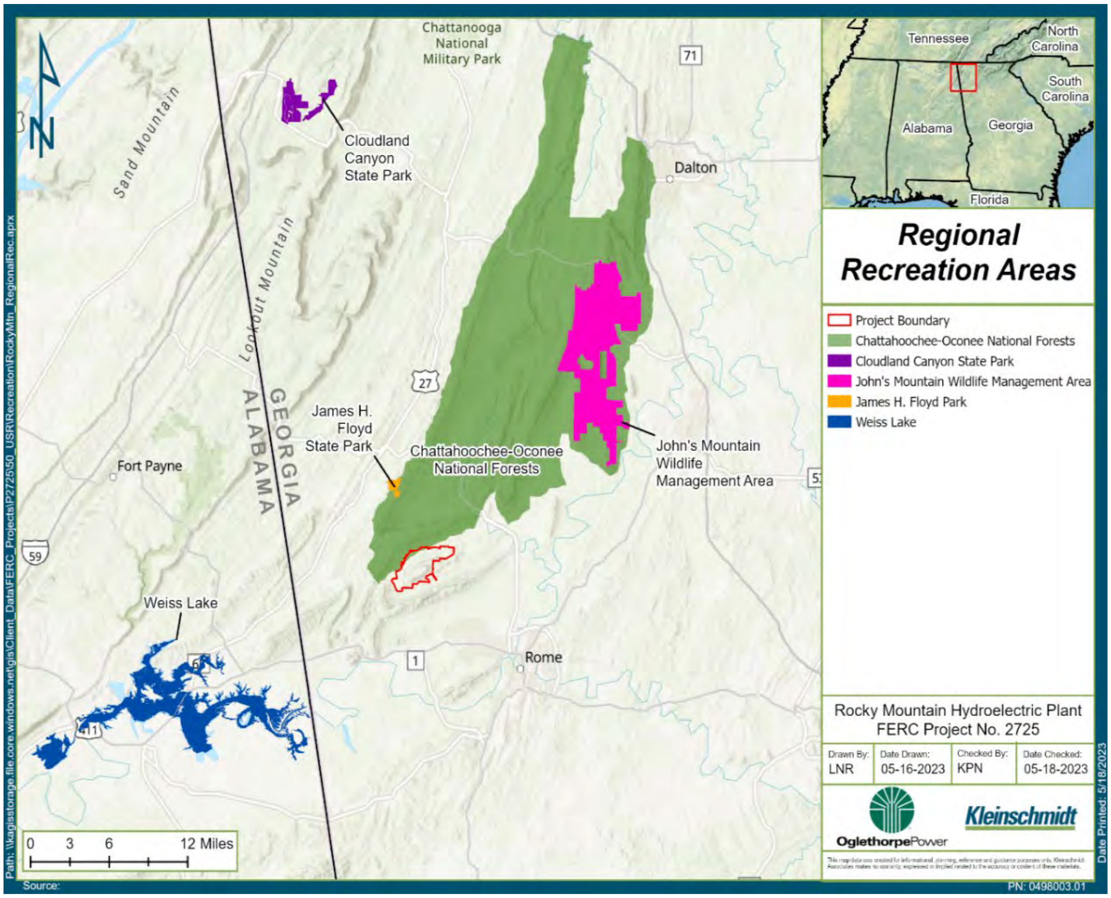

Figure 11 Regional Recreation Areas

3.2.1 Chattahoochee-Oconee National Forest

The Chattahoochee National Forest (NF) lies north and northeast of the Project. The Chattahoochee NF comprises three north Georgia districts of the larger Chattahoochee-Oconee NF, which encompasses 867,000 acres across 26 counties in north and east-central Georgia (U.S. Forest Service, n.d.a). The Chattahoochee-Oconee NF offers quality outdoor recreation opportunities, including dozens of campgrounds and picnic areas, natural scenery, history, culture, and 850 miles of trails.

The Conasauga Ranger District (Conasauga District), which covers the western third of the Chattahoochee NF, extends southwest to within about 2 miles north of the Project on Taylor Ridge in Chattooga County (U.S. Forest Service, n.d.b). Within the Conasauga District, diverse landscapes ranging from the Ridge and Valley Province northeast to the Cohutta Mountains in the Blue Ridge Province offer recreational opportunities that include:

- Bicycling and mountain biking;
- Camping;
- Cabin rentals;
- Fishing;
- Hiking;
- Horse riding and camping;
- Nature viewing;
- OHV riding and camping;
- Picnicking;
- Boating; and
- Swimming.

3.2.2 James H. Floyd State Park

The 561-acre James H. Floyd State Park, located approximately 18 miles north of the Project, is surrounded by the Chattahoochee NF and offers many recreation opportunities. Visitors can fish in the two stocked lakes, hike to an old marble mine with views of a small waterfall, hike a variety of other trails, and enjoy birdwatching (GDNR, n.d.a). There is a fee for entrance to the park, and the hours of operation are daily from 7:00 AM to 10:00 PM. In addition to the amenities noted above, the park includes the following:

- a variety of campsites;
- 4 picnic shelters;
- a boardwalk;
- 2 boat ramps;
- An ADA-accessible fishing pier; and
- 2 playgrounds.

3.2.3 Cloudland Canyon State Park

Approximately 35 miles north of the Project is the 3,538-acre Cloudland Canyon State Park. This park is one of the most scenic in the state with views of sandstone cliffs, waterfalls, wild caves, abundant wildlife, canyons, and dense woodland with cascading creeks (GDNR, n.d.b). There are 30 miles of mountain biking trails, 16 miles of horseback riding trails, and 64 miles of hiking trails. The park also offers overnight stays in equipped cottages or yurts and a variety of camping and backpacking options. Caving is also available provided visitors have appropriate permits and reservations. In addition to those mentioned, the park includes the following amenities:

- 6 picnic shelters;
- 1 group shelter;
- 1 group lodge;
- Disc golf;
- A playground; and
- A gift shop/camp store.

3.2.4 Weiss Lake

Weiss Lake is owned by Alabama Power Company and is in northeastern Alabama, along the Alabama-Georgia border approximately 17 miles southwest of the Project (Alabama Department of Conservation and Natural Resources [ADCNR], n.d.). The lake covers 30,200 acres and is known primarily as a fishing destination. The lake has major economic influence in Cherokee County, Alabama due to the significance of the sport fishing industry (ADCNR, n.d.). There are 37 privately run marinas operating on Weiss Lake, as well as campgrounds, motels, and rental cabins (ADCNR, n.d.).

3.2.5 John's Mountain WMA

The 24,849-acre John's Mountain Wildlife Management Area (WMA) is located in Walker, Whitfield, Gordon, and Floyd Counties, Georgia, about 24 miles northeast of the Project. The WMA offers hunting opportunities for deer, turkey, bear, and small game (GDNR, n.d.c). In addition to hunting, the WMA offers the following activities and amenities:

- Biking;
- Hiking;
- Horseback riding;
- Primitive camping;
- River fishing;
- Shooting;
- Wildlife viewing;
- Nature trails; and
- Picnic sites and shelters.

4.0 RESULTS

4.1 Recreation Surveys – Main, Beach, and Heath Entrances

This section provides the findings of the recreation surveys completed at the Rocky Mountain PFA during the summer of 2022 and spring of 2023. Of the 306 recreation users surveyed, 23 percent were from the Main entrance, 46 percent were from the Beach entrance, 23 percent were from the Heath entrance, and 8 percent were from the campground. Campground survey results are discussed in Section 4.2.

4.1.1 User Demographics and Group Size

Prior to beginning each interview, recreation clerks noted whether the interviewee was in a vehicle with a boat trailer, a vehicle without a boat trailer, or a vehicle with an RV or camper. Those encountered at the Main entrance either had vehicles with boat trailers (58 percent) or vehicles without trailers (42 percent). Visitors at the Beach entrance primarily had vehicles without trailers (86 percent), followed by vehicles with an RV or camper (10 percent) and vehicles with boat trailers (4 percent). At the Heath entrance, visitors primarily had vehicles with boat trailers (75 percent). Twenty-five percent of visitors encountered at the Heath entrance had vehicles without trailers.

Visitors were asked to indicate their county and state of origin. Table 3 summarizes these responses which indicate that 40 percent of visitors came from Floyd County. An additional 17 percent of visitors came from Chattooga County, Georgia, which borders Floyd County to the northwest. Another 16.5 percent of visitors came from Gordon, Polk, and Walker counties, Georgia, all of which also border Floyd County. Thus, 74 percent of visitors originated from Floyd County and adjacent counties. The remaining visitors primarily traveled from counties in Georgia and Alabama near the Project, and a few were visiting from other states including Kentucky, Florida, and Arizona.

These 2022-2023 survey results were very similar to those collected by GDNR during their 2006-2007 recreation survey. GDNR's survey found that 77.5 percent of visitors to the Rocky Mountain PFA came from Floyd County and adjacent counties. Forty-four percent of visitors originated from Floyd County, 11.8 percent came from Chattooga County, 10.0 percent came from Gordon County, 6.8 percent came from Walker County, and 4.6 percent came from Polk County.

Table 3 County and State of Origin of Visitors to Rocky Mountain PFA

County	State	Percent of Visitors
Floyd	GA	40.1%
Chattooga	GA	16.8%
Bartow	GA	6.8%
Gordon	GA	6.1%
Polk	GA	5.4%
Walker	GA	5.0%
Whitfield	GA	3.6%
Cherokee	GA	2.2%
Colbert	AL	1.8%
Murray	GA	1.1%
Calhoun	AL	0.7%
Catoosa	GA	0.7%
Cobb	GA	0.7%
Douglas	GA	0.7%
Fulton	GA	0.7%
Gilmer	GA	0.7%
Jones	GA	0.7%
Paulding	GA	0.7%
Bulloch	GA	0.4%
Dade	GA	0.4%
Dekalb	AL	0.4%
Gwinnett	GA	0.4%
Haralson	GA	0.4%
Lee	AL	0.4%
Lee	FL	0.4%
Maricopa	AZ	0.4%
Oglethorpe	GA	0.4%
Pickens	GA	0.4%
Pulaski	KY	0.4%
Stephens	GA	0.4%
Towns	GA	0.4%
Walton	GA	0.4%
Winston	AL	0.4%

Visitors were also asked to indicate their age within a specified range and the age ranges of others in their party (Appendix A). Most respondents indicated their age was over 55 years (31 percent) compared to other age ranges (Table 4). Others within a respondent’s party were most often adults (18-55 years of age) (44 percent) or children (infants-12 years of age) (27 percent). GDNR’s 2006-2007 survey estimated that approximately 70 percent of visitors were adults and 30 percent were children (<16 years of age).

Table 4 Ages of Survey Respondents at Rocky Mountain PFA

Age Range	Percent of Respondents
16-24	7%
25-34	18%
35-44	22%
45-54	23%
55+	31%

Visitors interviewed at the Main, Beach, and Heath entrances were asked to indicate how many people were in their vehicle. Respondents averaged 2 people in their vehicle at the Main entrance, 3.6 people at the Beach entrance, and 2 people at the Heath entrance. Respondents most often indicated 2 people were in their vehicle across all entrances.

Visitors were asked how many days, including the day of the interview, they visited Rocky Mountain PFA in the last 30 days. Respondents averaged 3 visits over the previous 30 days. The most frequently reported number of visits was 1 day (reported 51 percent of the time) while the maximum reported number of visits was 30 days.

Visitors were asked how they heard about the Rocky Mountain PFA. Thirty-eight percent of respondents noted they heard about the area through a friend or relative, 2 percent heard about the area through social media, and 59 percent noted another reason. Of the other reasons listed, the most frequent was that the visitor was a local or lived in the area. Other common reasons listed included using the internet to search for recreation areas, Boy Scout/Girl Scout trips, found while driving around the area, and found while looking for campgrounds.

When visiting the Rocky Mountain PFA, visitors are required to obtain a permit through GDNR. Permit types include daily, annual, and campground options. Most visitors (66 percent) noted they obtained a daily permit for their visit, followed by annual permits (21 percent) and campground permits (8 percent). Four percent of visitors indicated they did not obtain a permit prior to recreating at the Rocky Mountain PFA.

4.1.2 Reasons for Visits and Visitation Experience

Visitors were asked to indicate all the reasons why they visited the Rocky Mountain PFA on the day of their interview (Table 5). Respondents encountered at the Main entrance most often indicated they visited for boat fishing (52 percent), followed by bank fishing (24 percent), and canoeing/kayaking (10 percent). A small percentage of visitors at the Main entrance indicated other reasons for visiting including biking, hiking, wildlife viewing, paddle boarding, and walking. Respondents encountered at the Beach entrance most often indicated they visited for swimming (57 percent), followed by shoreline relaxation (29 percent), picnicking (25 percent), bank fishing (24 percent), and camping (22 percent). Other reasons for visiting as noted at the Beach entrance included a small percentage each for canoeing/kayaking, wildlife viewing, boat fishing, hiking, scenic views, and attending a birthday party. Respondents encountered at the Heath entrance most often indicated they visited for boat fishing (85 percent), followed by bank fishing (15 percent) and camping (2 percent).

When looking at the Rocky Mountain PFA as a whole, visitors most often indicated they came to the area for boat or bank fishing, swimming, shoreline relaxation, camping, and picnicking. In 2006-2007, GDNR found that 33.7 percent of visitors were at the PFA for fishing, 30.2 percent for swimming, 16.1 percent for camping, less than 1 percent for hunting, and 19.5 percent for other reasons. Of those other reasons, approximately half indicated they were sight-seeing or riding around the area.

Table 5 Survey Respondents' Reasons for Visiting the Rocky Mountain PFA

Activity	Main	Beach	Heath	Rocky Mountain PFA[3]
Boat Fishing	56%	1%	83%	33%
Bank Fishing	32%	34%	16%	30%
Camping	-	20%	1%	17%
Picnicking	-	25%	-	15%
Swimming	-	52%	-	28%
Hunting	-	-	1%	1%
Hiking	1%	1%	-	5%
Biking	1%	-	-	2%

[3] Information in this column is from a combination of survey responses collected at the Main, Beach, and Heath entrances, as well as the information collected at the Campground (included in Section 4.2).

Activity	Main	Beach	Heath	Rocky Mountain PFA[3]
Pleasure Boating	-	-	-	1%
Canoeing/Kayaking	10%	2%	13%	8%
Wildlife Viewing	1%	3%	-	6%
Shoreline Relaxation	-	25%	6%	18%
Other	3%	5%	-	3%

Anglers (fishermen, fishers) were asked to indicate which lake they fished in while at the Rocky Mountain PFA. Anglers indicated they fished in Antioch Lake West most often (41 percent), followed by Heath Lake (38 percent), and Antioch Lake East (21 percent). Anglers were also asked to rate their fishing experience on the day they were interviewed according to the following scale: 1) very poor; 2) poor; 3) fair; 4) good; and 5) very good. Of the 176 anglers that responded, most indicated their fishing experience was good (27 percent) or very good (22 percent), however some indicated their fishing experience was fair (20 percent), poor (18 percent) or very poor (13 percent). On average, anglers rated their fishing experience as 3.27, or between fair and good. During GDNR's 2006-2007 recreation survey, anglers on average rated their fishing experience as 3.74.

Hunters were also asked to rate their hunting experience on the day they were interviewed. Only one hunter was encountered during the study and they indicated their hunting experience was fair.

4.1.3 Quality of Existing Facilities

Visitors were asked to rate the quality of a variety of existing facilities at the Rocky Mountain PFA according to the following scale: 5) very good; 4) good; 3) fair; 2) poor; and 1) very poor. Table 6 summarizes the responses by facility. The vast majority of visitors rated the facilities provided at the Rocky Mountain PFA as very good or good. Both restroom and bank fishing facilities also were rated as very good or good most of the time but had a higher percentage of fair, poor, and very poor ratings compared to other facilities.

Table 6 Facility Ratings According to Rocky Mountain PFA Visitors

Facilities	Very Good (5)	Good (4)	Fair (3)	Poor (2)	Very Poor (1)
Parking	61%	29%	6%	3%	0%
Boat Ramp	55%	37%	6%	2%	0%
Docks	60%	32%	7%	1%	0%
Restrooms	43%	38%	15%	3%	1%
Bank Fishing	43%	32%	19%	4%	3%
Beach	62%	33%	5%	1%	0%
Picnic Areas	64%	32%	3%	1%	0%
Campsites	73%	21%	6%	0%	0%
Trails	54%	36%	8%	3%	0%
Cleanliness	73%	23%	3%	0%	0%

In addition, visitors were asked to list any specific improvements they would like to see at Rocky Mountain PFA, including any other comments or suggestions for the recreation area. All responses by location are included in Tables 7 through 9. At the Main entrance, respondents most often indicated that improved bathroom cleanliness is warranted. Other improvements suggested by more than one user included parking, bank fishing, and kayak access. At the Beach entrance, respondents indicated a desire for improved bathrooms (cleanliness and added shower areas), larger and/or deeper swimming area, improved or new grills, and more fish. Other suggestions from multiple users at the Beach entrance included improved cell reception and Wi-Fi, improved bank fishing/more docks, and more or wider parking spaces. At the Heath entrance, respondents indicated a desire for more fish in the lake, improved and/or wider boat ramps, and improved bathrooms, among others. Shoreline ADA accessibility was a need mentioned by users at each of the three entrances.

Table 7 Improvements, Comments and Suggestions – Main Entrance

No.	Improvements, Comments, and Suggestions - Main Entrance
1	1. Dnr presence earlier in day. Idle only wake not enforced. 2. People break sunrise and sunset rules. Love bringing boys out. Very relaxing. Good stocked fish. Would like annual pass purchase option at parking pass machine.
2	A disc golf course would be nice
3	Bathroom stinks
4	Bathrooms cleaner

No.	Improvements, Comments, and Suggestions - Main Entrance
5	Better cell coverage
6	Clean the bathrooms more. Parking could be improved at Heath, has been blocked in by other trailers in the past. Lots of broke lines in water at Antioch East.
7	Deeper boat ramp and more offshore structures
8	Dock for bank fishing
9	Dock is in good shape everything is in good shape except outhouse restrooms
10	Don't interfere with weekend fishers by having feeders for the fish or putting chemicals in water to reduce algae growth
11	Everything is great.
12	Great place great fishing
13	handicap accessible area from shore to fish at.
14	Kayak access on Antioch East would be nice
15	Keep putting in more structures. More fish
16	Larger parking areas
17	Limit horsepower of motors
18	Make it easier to get annual passes
19	Maybe manage the birds (cormorants and pelicans eating the bait fish) note he mentioned having a 15-day senior citizen permit (does that fall under daily)
20	More bank fishing access around the lakes, boaters can be very rude (fish over the top of bank fishers even though they have plenty of shoreline to go to)
21	More campsites, cleaner restrooms, outhouse restroom Antioch west needs pressure washing,
22	More cover along banks for fishing
23	Occasional floating bottles (may be trotlines or juglines)
24	Parking pass machine should take cards
25	Ramp a little flat for big boats
26	Separate kayak launch, post lake fertilization dates online would be great
27	Some of the debris in the water could be removed
28	They make fishing jet skis now and it would be nice if those were allowed, allow jet skis on Heath on the days it's not open to fishing, stock more panfish, stock the lakes up and have a kids fishing rodeo, build a hangout lodge with a restaurant (seen lakes in Wisconsin with something like that), dirt bike trails
29	Too much vegetation in water to catch fish
30	Trails used to be cut back better by Shawn. Best kept secret in Floyd County.
31	Visitor center bathroom closes in winter with port-a-potty outside. Would prefer it remain open all year. Can tell the women's toilets are not scrubbed with a brush and just have blue stuff squirted in it but at least there is toilet paper. Have to use campground bathroom in the winter. Doesn't like to use pit toilet at Antioch east boat ramp because it smells bad.
32	Water quality issues at lake top
33	Widen boat ramp
34	Wish the trophy lake was open more often

Table 8 Improvements, Comments, and Suggestions – Beach Entrance

No.	Improvements, Comments, and Suggestions - Beach Entrance
1	A closer playground to beach
2	Air circulation in restrooms
3	Better campsite management for reservations higher AMP outlets for RV use
4	Better cell reception
5	Better grills, signs for trails
6	Better kayak access
7	Better marked trails, deeper swimming area
8	Bigger swim area
9	Bigger swim area
10	Can't think of any
11	Can't think of any
12	Cell service
13	Clean more
14	Cleaner bathrooms - they can get messy by end of the day
15	Cleaner more sanitary bathrooms
16	Cleaning bathrooms more
17	Concession stand
18	Couple more docks or areas to fish
19	Do kayak rentals
20	Docks could use railings, need more toilets, automatic flushers, more separated dressing rooms repair some grills, need a map of the trails, cell service is lacking
21	Doesn't like how camping requires reservations now - didn't know that
22	Dog friendly beach
23	Don't know
24	Don't know
25	Electrical and water hookups for camping on wrong side and camping spots are narrow
26	Floating dock with a slide to keep kids off floating buoy line, need an indoor shower in the bathroom
27	Heath open longer than 10 days
28	Improve the wifi
29	Internet and wifi
30	Larger beach and swimming area
31	Larger beach area
32	Larger swimming area/beach
33	Level out some campgrounds along the lake, too sloped, have website warn that some are sloped. Cell signal and wifi would be nice,
34	Lifeguard
35	Little more trees or shade for bank fishing
36	More access for disabled people, the sidewalks down to the water are steep, gazebo to fish under would be nice
37	More activities or planned events would be nice
38	More big covered picnic areas for parties

No.	Improvements, Comments, and Suggestions - Beach Entrance
39	More docks with designated parking
40	More docks, more picnic tables closer to water, bathroom closer to water
41	More fish
42	More fish
43	More fish
44	More fish in the reservoirs
45	More fish More limits
46	More fish stocking, smoother walkways down to bank - difficult to get wheelchair/walker down to bank
47	More fish would be great, caught a lot more last summer
48	More parking
49	More picnic tables and grills, expand beach
50	More primitive campsites
51	More shade, get rid of ants
52	More showers in bathroom, electrical outlets and water in wrong place - when you back in the hook ups are on the wrong side, narrow camp spots
53	More signage for trails, cleaner bathrooms
54	More swim area
55	More wooded areas on the walking trails, they're too open
56	Need more than 1 ramp at Antioch West, more bathrooms and showers
57	Not a fan of the reservations at campground
58	One of the trails floods when rains - very muddy
59	Only problem is boats causing wake
60	People leaving trash and bait cups occasionally, otherwise very clean
61	Pool, splash pad
62	Possibly having food trucks on weekends, paddle boat or kayak/canoe rentals.
63	Power outlets at pavilion
64	Refresh feeders more frequently for fish
65	Replace with new grills, better fishing, stock more fish
66	Shade options by the sand
67	Signs for directions
68	Some grills rusted, level off some of the campsites, fish feeder hasn't been throwing feed, gravel is bad for setting up tents, doesn't have a visiting permit and says the permit requirements aren't clear
69	Some more benches closer to the water, water fountains
70	Some more feeders on the bank, maybe stocking but depends on how much being harvested
71	Some of the outhouse style bathrooms at the boat ramps stink in the summer
72	Some way to get phone signal or warning that there would be little to no phone signal, wifi doesn't work
73	Sometimes a little overgrown on the banks for fishing
74	Splash pads, more stuff for kids
75	Stock more fish
76	Stock the lake

No.	Improvements, Comments, and Suggestions - Beach Entrance
77	Take some debris out of reservoir - fishing line gets snagged
78	Tight parking spaces, get rid of ants, deeper and larger swimming area
79	Wider parking spots, more regular cleaning in the bathrooms throughout the day, people smoking
80	Wifi/phone reception via closer cell tower

Table 9 Improvements, Comments, and Suggestions – Heath Entrance

No.	Improvements, Comments, and Suggestions - Heath Entrance
1	Additional Parking
2	Algae in water maybe water quality issues
3	Another boat ramp, No gas powered motors
4	bathroom bugs and smell
5	Bathrooms a bit cleaner
6	Better fishing
7	Better handicap accessibility
8	Better turnaround circle
9	Bigger and more fish
10	Bigger ramp
11	Extend boat turn around
12	Fishing access at night
13	Floors in restroom falling in Food truck
14	Flushable restroom vs vault
15	Full sewage hookups
16	Less trees more fish
17	limit number of boats
18	longer beach area
19	Longer Boat ramp Additional Parking Open more than 10 days
20	Make boat ramp longer and people to actually use the parking spots
21	more fish
22	more fish
23	More Fish
24	More fish
25	More fish
26	More fish
27	More fish -do not feed fish
28	More parking at Heath, more days open for fishing at Heath
29	More parking at Heath, more days open for fishing at Heath
30	More parking at Heath, more stocked wildlife in all lakes
31	More parking More fish
32	No fishing tournament keep slot lake
33	remove ability to reserve online campsites as always booked

No.	Improvements, Comments, and Suggestions - Heath Entrance
34	Some night fishing
35	Stock more
36	stocking lakes machine to pay for parking broken
37	Widen the boat ramp
38	Wider- 2 boat ramps

4.2 Recreation Surveys - Campground

The survey available at the campground included some of the same questions asked in the main survey and some questions specific to camping at the Rocky Mountain PFA. This information is summarized below.

4.2.1 User Demographics and Group Size

Campers were asked to indicate their county and state of origin. Table 10 summarizes these responses which indicate most campers live in Floyd County and northwest Georgia. Seventy-four percent of campers originated from Floyd County and adjacent Walker, Gordon, Polk, and Chattooga counties. Approximately 8 percent of campers staying at the Rocky Mountain PFA Campground were visiting from Alabama or Tennessee.

Table 10 County and State of Origin of Visitors to Rocky Mountain PFA Campground

County	State	Percent of Campers
Floyd	GA	35%
Walker	GA	17%
Gordon	GA	9%
Polk	GA	9%
Chattooga	GA	4%
Clayton	GA	4%
Dade	GA	4%
DeKalb	AL	4%
Knox	TN	4%
Paulding	GA	4%
Whitfield	GA	4%

Campers were also asked to indicate their age within a specified range and the age ranges of others in their party. Most respondents indicated their age was over 55 years (70 percent) compared to other age ranges (Table 11). Others within a respondent's party were most often adults (18-55 years of age) (55 percent), followed by senior adults (55+)

(50 percent), children (infants-12 years of age) (40 percent) and youth (13-17 years of age) (25 percent).

Table 11 Ages of Survey Respondents at Rocky Mountain PFA Campground

Age Range	Percent of Respondents
16-24	-
25-34	13%
35-44	9%
45-54	9%
55+	70%

Campers were asked to indicate how many people were staying in their campsite. Campers indicated an average group size of 3 people per campsite. A group size of 2 was reported most often.

To camp at the Rocky Mountain PFA, visitors must book a reservation through GDNR's online booking program. Campers were asked to rate their online booking experience for camping reservations according to the following scale: 5) very good; 4) good; 3) fair; 2) poor; and 1) very poor. A sizeable majority of campers (81 percent) indicated their experience with online booking was very good (52 percent) or good (29 percent). Lower numbers of campers indicated their experience was fair (14 percent) or very poor (5 percent). Similarly, visitors must obtain a permit through GDNR to visit the Rocky Mountain PFA. Permit types include daily, annual, and campground options. As expected, most campers obtained a campground permit (83 percent); however, some campers had a daily or annual permit (8 percent and 8 percent, respectively).

Campers at Rocky Mountain PFA were asked about the type of camp option they used, including tent, RV, tent/RV combo, or group camp. Campers most often indicated they camped in an RV (67 percent), followed by a tent (25 percent), or a tent/RV combo (8 percent). No campers interviewed indicated they stayed in the group camp.

4.2.2 Reasons to Visit and Visitation Experience

Campers were asked to note all activities they participated in while camping (Table 12). Most campers indicated they participated in shoreline relaxation (67 percent of all campers). Other popular activities included wildlife viewing (58 percent), swimming (54 percent), hiking (50 percent), bank fishing (42 percent), picnicking (38 percent), canoeing/kayaking (29 percent), pleasure boating (17 percent), and biking (17 percent). A small percentage of campers indicated they were also participating in boat fishing, hunting, and sitting around campfires.

Table 12 Survey Respondents' Reasons for Visiting the Rocky Mountain PFA Campground

Activity	Campground
Camping	100%
Shoreline Relaxation	67%
Wildlife Viewing	58%
Swimming	54%
Hiking	50%
Bank Fishing	42%
Picnicking	38%
Canoeing/Kayaking	29%
Biking	17%
Pleasure Boating	17%
Boat Fishing	8%
Hunting	4%
Other	4%

Anglers at the campground were asked to rate their fishing experience on the day they were interviewed according to the following scale: 5) very good; 4) good; 3) fair; 2) poor; and 1) very poor. Anglers at the campground most often indicated that their fishing experience was fair (67 percent), with the remaining anglers indicating that their experience was very good (11 percent), good (11 percent) or very poor (11 percent).

Hunters were also asked to rate their hunting experience on the day they were interviewed. Although one survey respondent at the campground indicated they were hunting at Rocky Mountain PFA, they did not provide information on their hunting experience.

4.2.3 Quality of Existing Facilities

Campers were asked to indicate the quality of the existing camping facilities at the Rocky Mountain PFA according to the following scale: 5) very good; 4) good; 3) fair; 2) poor; and 1) very poor. Table 13 summarizes the responses by facility. The vast majority of campers indicated the quality of the campsites was very good (59 percent) or good (36 percent). Similarly, most campers indicated the quality of the playground as very good (64 percent) or good (29 percent); the restrooms as very good (48 percent) or good (43 percent); and the overall cleanliness of the area as very good (52 percent) or good (35 percent). Most campers who participated in bank fishing indicated that the bank fishing facilities were good (43 percent) or fair (29 percent), while some indicated that they were very good (14 percent) or poor (14 percent).

Table 13 Facility Ratings According to Rocky Mountain PFA Campers

Facility	Rating				
	Very Good (5)	Good (4)	Fair (3)	Poor (2)	Very Poor (1)
Campsite	59%	36%	5%	0%	0%
Playground	64%	29%	0%	7%	0%
Restrooms	48%	43%	4%	4%	0%
Cleanliness	52%	35%	4%	9%	0%
Bank Fishing	14%	43%	29%	14%	0%

In addition, campers were asked to list any specific improvements they would like to see at Rocky Mountain PFA Campground, including any other comments or suggestions for the recreation area. All responses are included in Table 14. Commonly noted improvements include addition of Wi-Fi access, adding new gravel in areas, and re-orienting some campsites.

Table 14 Improvements, Comments, and Suggestions – Campground

No.	Improvements, Comments, and Suggestions - Campground
1	Been camping for several years this is the only time we've had an issue with ants. All food was double packaged, and trash was taken out after each meal. Would be nice to know when booking online which side the picnic table/ fire ring is on.
2	We love camping here! Restrooms are always very clean. Beach and swimming area is fantastic! Campsite could use more gravel. sadly it poured while we were here and the campsite floor was ankle deep with water. we noticed others had more gravel and less standing water but we still had fun. Thanks for all you do to make this such a wonderful family place.
3	The lower campsites are too steep for camper. Bathhouse is cleaner this time. Wi-Fi needs to be open for campers to be able to communicate with family with illnesses in hospital.
4	Campsites need gravel refreshed bad. camp hosts were very nice and helpful we enjoyed our weeks stay.
5	Site 22 faces the wrong way. would like a map of park available overall. great experience. will come back.
6	The campsite hosts and others we met were all very friendly and helpful. Rocky mtn is a beautiful area and we will be returning.
7	Install Ice Machine at bathhouse. You would make a fortune.
8	It would be nice if you could fish at night.

No.	Improvements, Comments, and Suggestions - Campground
9	Put up signs. Clean camp site before you leave. no cigarette butts left behind or trash. I picked up about 20 butts and trash. Hope this helps. no cans in fire pit. do not leave wood where camper goes.
10	Some campsites need some trees cut back so campers can get in better.
11	Fish cleaning station - level up camping spots - expand campground - several spots are backwards when you park the door is on the wrong side these should be changed. but this is a great place and love the no alcohol policy - families can enjoy camping.
12	Online booking experience was rated very poor because of the poor and i mean very poor wifi connection. surely there is money in the budget to upgrade this.
13	Cleaner bathrooms - fix all the backward sites - have more level sites - make more handicap places to camp - allow only campers to go in campground or visitors.
14	Mark the steps with trim line. I feel when I saw the handrails stopped. but the steps were hidden from my view. next to the beach area.
15	Bathroom showers need to be pressure washed. of all the years we have been coming never seen them so dirty shower curtains need to be replaced.
16	Making the campground register campers only to much traffic with people randomly driving through.
17	Wifi or a way for family to contact in case of emergency. Campground kayak/canoe entrance in campground area for those without lake access at campsite. Absolute best host we have ever seen at a campground. They keep the campground clean and you see them out often circling/ checking.
18	Sewer would be nice. Very much enjoy the campground.
19	Confusing access to website for camping.
20	Campground showers: hooks to hang your clothes on in the ladies restroom- first shower. handicap has hooks.
21	Firewood for sale

4.3 Annual Recreation Use Estimates

GDNR installed traffic counters at the three Rocky Mountain PFA entrances (Main, Beach, and Heath) to collect continuous vehicle traffic counts in 2022. Traffic counts collected by GDNR for 2022 are shown in Table 15. In addition, GDNR collected information on campground visitation (Table 16). GDNR used the traffic counter data and campground visitation data to estimate total guest attendance, or recreation days, for each month in 2022 (Table 17). The annual recreation use estimate for the Rocky Mountain PFA in 2022 is 279,912 recreation days. The highest use occurred in June and the lowest use occurred in December.

Recreation use estimates for the 2014 calendar year at the Rocky Mountain PFA were provided on the 2015 Form 80. The annual recreation use estimate for the Rocky Mountain

PFA in 2014 was 266,788 recreation days. Recreation use at the Rocky Mountain PFA has increased by approximately 5 percent since 2014.

Table 15 2022 Traffic Counts and Estimated Attendance at the Rocky Mountain PFA (Main, Beach, and Heath Entrances) by Month

Month	Traffic Counts	Main, Beach, and Heath Entrances – Estimated Attendance
January	4,882	7,727
February	9,863	15,371
March	7,594	14,235
April	13,510	25,330
May	20,534	37,325
June	33,686	56,891
July	23,353	40,433
August	11,693	20,708
September	10,129	18,414
October	8,564	16,119
November	7,753	13,441
December	4,679	7,224
Total	**156,240**	**273,218**

Table 16 2022 Campground Visitation at the Rocky Mountain PFA by Month

Month	Attendance
January	71
February	142
March	450
April	844
May	777
June	824
July	836
August	647
September	742
October	717
November	502
December	142
Total	**6,694**

Table 17 2022 Annual Recreation Use Estimates at the Rocky Mountain PFA by Month

Month	Attendance
January	7,798
February	15,513
March	14,685
April	26,174
May	38,102
June	57,715
July	41,269
August	21,355
September	19,156
October	16,836
November	13,943
December	7,366
Total	**279,912**

In addition to the total visitation at the campground, GDNR provided data on the occupancy of available campsites in 2022 (Table 18). The most popular months for camping were April, June, and July, however there were still camping opportunities available within each of these months.

Table 18 2022 Rocky Mountain PFA Campground Occupancy Rates

Month	Total Campsites	Occupancy Percentage
January	1,395	5.1
February	1,260	11.3
March	1,395	32.3
April	1,350	62.5
May	1,395	55.7
June	1,350	61.0
July	1,395	59.9
August	1,395	46.4
September	1,350	55.0
October	1,395	51.4
November	1,395	36.0
December	1,395	10.2
Total CY22	16,470	40.6

4.4 Future Recreation Use and Needs Analysis

Population data from the most recent (2020) census was gathered from the United States Census Bureau for Floyd County and the entire state of Georgia, as well as projections of future population growth from the Georgia Office of Planning and Budget (GAOPB) (Table 19). Future growth projections indicate that Georgia will see a 5 percent increase in population between 2020 and 2025, with additional increases over each 5-year timeframe. Floyd County is also expected to see population growth over the same time period, however, at a slower rate than the state of Georgia. The rate of growth is expected to slow over time for both Georgia and Floyd County.

Per generally accepted practice and the methods described in the study plan, estimates of future recreation use at the Rocky Mountain PFA were determined by applying the projected population estimates for Floyd County to the annual use estimates described in Section 4.3. The current recreation use is estimated to be 279,912 recreation days in 2022. By 2035, the PFA is estimated to accumulate over 294,000 annual recreation days (Table 20). FERC may issue OPC a new license for the Rocky Mountain Project for a term of 40 years, at which time the PFA could receive over 314,000 annual recreation days. This is an increase of approximately 34,400 recreation days, or approximately 12 percent. Campground occupancy was estimated to be approximately 40 percent during 2022, with April and June experiencing the highest occupancy rates at 62.5 percent and 61 percent, respectively. Assuming that recreation use would increase at the Project by approximately 12 percent over the course of a 40 year license term, the campground would remain under capacity with an estimated occupancy rate of just over 50 percent. High use months may see occupancy rates increase to approximately 75 percent. Considering the entire PFA, survey results did not indicate that capacity is an issue, and therefore, it can be assumed that an increase in use by 12 percent over 40 years will not result in overcrowding.

Most visitors to Rocky Mountain PFA rated the quality of existing facilities as very good or good. In addition, crowding, lack of parking, and lack of facilities were not typically noted as issues at the PFA. GDNR and OPC will likely continue to maintain the PFA in a manner similar to years past and upgrade degrading facilities as needed. However, the recreation use analysis findings do not indicate the need for expansion of the PFA, including additional parking and new facilities, at this time.

Table 19 Population projections through 2060 for Georgia and Floyd County, GA.

	2020 Census	2025 Projection	2030 Projection	2035 Projection	2040 Projection	2045 Projection	2050 Projection	2055 Projection	2060 Projection
Georgia	10,711,908	11,242,166	11,742,622	12,203,589	12,632,994	13,028,837	13,390,283	13,724,576	14,041,287
Percent Change Over 5 Years	-	**5.0%**	**4.5%**	**3.9%**	**3.5%**	**3.1%**	**2.8%**	**2.5%**	**2.3%**
Floyd County, GA	98,584	100,380	102,066	103,601	105,089	106,599	108,112	109,472	110,708
Percent Change Over 5 Years	-	**1.8%**	**1.7%**	**1.5%**	**1.4%**	**1.4%**	**1.4%**	**1.3%**	**1.1%**

Sources: GAOPB 2021, U.S. Census 2020

Table 20 Estimated Recreation Day Projections through 2060 for the Rocky Mountain PFA

	Recreation Days								
	2022 Estimate	2025 Projection	2030 Projection	2035 Projection	2040 Projection	2045 Projection	2050 Projection	2055 Projection	2060 Projection
Rocky Mountain PFA	279,912	285,011	289,799	294,157	298,382	302,669	306,965	310,827	314,336

5.0 SUMMARY

GDNR estimated nearly 280,000 recreation days at the Rocky Mountain PFA in 2022. Based on population projections for Floyd County, the PFA is projected to see an approximately 12 percent increase in use by the year 2060.

Visitors to the PFA are often over the age of 45 and live in Floyd or Chattooga Counties, Georgia. Visitors tend to visit the PFA in groups of 2 or 3 and in groups composed primarily of adults (18-55 years of age) and children (infants-12 years of age). Many visitors to the Rocky Mountain PFA live in the area and have known about the recreation area since it was constructed. On average, survey respondents visited the Rocky Mountain PFA 3 times in the 30 days prior to their interview; about half (51 percent) visited once in the previous 30 days.

Visitors encountered at the Main entrance noted that they were visiting the area to boat fish, bank fish, or canoe/kayak. Additional activities noted included biking, hiking, wildlife viewing, paddle boarding, and walking. Visitors encountered at the Beach entrance noted they were visiting the area to swim, relax along the shoreline, picnic, bank fish, and/or camp. Other activities noted included canoeing/kayaking, wildlife viewing, boat fishing, hiking, scenic viewing, and attending a birthday party. Visitors encountered at the Heath Lake entrance noted they were visiting the area primarily to boat or bank fish, although some were also in the area for canoeing/kayaking, shoreline relaxation, hunting, and camping. Of all anglers interviewed, over half were fishing at Heath Lake. Near half of all anglers encountered during the survey indicated their fishing experience was good or very good, however another third indicated their experience was poor or very poor.

Existing facilities at the Rocky Mountain PFA were typically rated by visitors as being of a very good or good quality. However, visitors encountered at all entrances and the campground indicated there was room for improvement regarding bank fishing facilities.

Campers seemed to be content with the online booking experience, although a few individuals noted some frustration with the process. Visitors provided a variety of suggested improvements at the Rocky Mountain PFA, with the most frequently noted suggestions being increased fish stocking, improved Wi-Fi access, and cleaner bathrooms.

Overall, when comparisons could be made, results from the GDNR 2006-2007 recreation survey were similar to those collected during 2022-2023. During both surveys, most visitors were from the surrounding counties, with a majority of visitors being adults. Both surveys also found the most popular activities at the PFA were, in order of popularity, fishing, swimming, and camping. Although separated by about 15 years, both surveys indicate the Rocky Mountain PFA is an important and well-used recreation resource to the people of northwest Georgia.

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Appendix A

Survey Forms

Oglethorpe Power Corporation Rocky Mountain Pumped Storage Project Recreation Use Survey	Oglethorpe Power Corporation is conducting this survey to learn about recreational use at Rocky Mountain Public Fishing Area (PFA), 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.

Date:	Time:	
1. What is your county and state of residence?	County:	State:

2. How many people are staying in your campsite tonight? _______people

3. What is your age?	___18-24	___25-34	___35-44	___45-54	___55+

4. If you came with others, what are their age groups? (check all that apply)

____Children (Infants-12)	____Youth (13-17)	____Adults (18-55)	____Senior Adults (over 55)

5. How would you rate the online booking experience for camping reservations?

___Very Good (5)	___Good (4)	___Fair (3)	___Poor (2)	___Very Poor (1)

6. What activities are you participating in while camping? (check all that apply)

___Boat Fishing	___Picnicking	___Hiking	___Canoeing/kayaking
___Bank Fishing	___Swimming	___Biking	___Wildlife Viewing
___Hunting	___Pleasure Boating	___Shoreline relaxation	___Other (list below):

7. While camping at Rocky Mountain PFA, are you staying in:

____Tent	____RV	____Tent/RV Combo	____Group Camp

8. If you came to fish today, how would you rate your fishing experience?

___Very Good (5)	___ Good (4)	___Fair (3)	___Poor (2)	___Very Poor (1)

9. If you came to hunt today, how would you rate your hunting experience?

___Very Good (5)	___ Good (4)	___Fair (3)	___Poor (2)	___Very Poor (1)

10. Please rate the quality of the existing camping facilities. (choose one description for each)

Campsite:	___Very Good (5)	___Good (4)	___Fair (3)	___Poor (2)	___Very Poor (1)
Playground:	___Very Good (5)	___Good (4)	___Fair (3)	___Poor (2)	___Very Poor (1)
Restrooms:	___Very Good (5)	___Good (4)	___Fair (3)	___Poor (2)	___Very Poor (1)
Cleanliness:	___Very Good (5)	___Good (4)	___Fair (3)	___Poor (2)	___Very Poor (1)
Bank Fishing:	___Very Good (5)	___Good (4)	___Fair (3)	___Poor (2)	___Very Poor (1)

11. What type of visitation permit do you have? (check all that apply)

___Daily	___Annual	___Campground	___None

12. List any specific improvements you would like to see at Rocky Mountain PFA Campground, and any other comments or suggestions.

Oglethorpe Power Corporation Rocky Mountain Pumped Storage Project Recreation Use Survey	Oglethorpe Power Corporation is conducting this survey to learn about recreational use at Rocky Mountain Public Fishing Area (PFA), 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: _____ Main _____ Beach _____ Heath	Date:	Time:
Interviewer:		
Vehicle Type: ________ Vehicle w/ Trailer ________Vehicle w/o Trailer ________RV/Camper		

1. What is your county and state of residence?	County:	State:
2. How many people are in your vehicle today? ________ people		

3. What is your age?	___16-24	___25-34	___35-44	___45-54	___55+

4. If you came with others, what are their age groups? (check all that apply)

____Children (Infants-12)	____Youth (13-17)	____Adults (18-55)	____Senior Adults (over 55)

5. How did you hear about the area?

_____Friend/Relative	_____Social Media	______________________Other

6. How many times (including today), have you visited Rocky Mtn PFA in the last 30 days? _________

7. What is the primary reason for your visit today? (check all that apply)

___Boat Fishing	___Picnicking	___Hiking	___Canoeing/kayaking
___Bank Fishing	___Swimming	___Biking	___Wildlife viewing
___Camping	___Hunting	___Pleasure Boating	___Shoreline relaxation
___Other:			

8. If you came to fish today, how would you rate your fishing experience?

___Very Good (5)	___Good (4)	___Fair (3)	___Poor (2)	___Very Poor (1)

9. If you came to fish today, where did you fish? (check all that apply)

______Antioch Lake East	______Antioch Lake West	______ Heath Lake

10. If you came to hunt today, how would you rate your hunting experience?

___Very Good (5)	___ Good (4)	___Fair (3)	___Poor (2)	___Very Poor (1)

11. Please rate the quality of the existing facilities at this access area. (choose one for each)

Parking:	___Very Good (5)	___Good (4)	___Fair (3)	___Poor (2)	___Very Poor (1)
Boat Ramp:	___Very Good (5)	___Good (4)	___Fair (3)	___Poor (2)	___Very Poor (1)
Docks:	___Very Good (5)	___Good (4)	___Fair (3)	___Poor (2)	___Very Poor (1)
Restrooms:	___Very Good (5)	___Good (4)	___Fair (3)	___Poor (2)	___Very Poor (1)
Bank Fishing:	___Very Good (5)	___Good (4)	___Fair (3)	___Poor (2)	___Very Poor (1)
Beach:	___Very Good (5)	___Good (4)	___Fair (3)	___Poor (2)	___Very Poor (1)
Picnic Areas:	___Very Good (5)	___Good (4)	___Fair (3)	___Poor (2)	___Very Poor (1)
Campsites:	___Very Good (5)	___Good (4)	___Fair (3)	___Poor (2)	___Very Poor (1)
Trails:	___Very Good (5)	___Good (4)	___Fair (3)	___Poor (2)	___Very Poor (1)
Cleanliness:	___Very Good (5)	___Good (4)	___Fair (3)	___Poor (2)	___Very Poor (1)

12. What type of visitation permit do you have? (check all that apply)

___Daily	___Annual	___Campground	___None

13. List any specific improvements you would like to see at Rocky Mountain PFA, and any other comments or suggestions.

APPENDIX B

CONSULTATION RECORD

From:	Jones, Craig
To:	Kelly Kirven; Steven Layman; McCaslin, Tyler
Subject:	Fwd: Follow Up on Proposed Studies
Date:	Wednesday, April 13, 2022 8:16:27 AM
Attachments:	image001.png

Sent from my iPad. Please pardon the typsos.

Begin forwarded message:

From: "Sibley, Jackson" <Jackson.Sibley@dnr.ga.gov>
Date: March 30, 2022 at 9:05:46 AM EDT
To: "Jones, Craig" <craig.jones@opc.com>, "Hakala, Jim" <Jim.Hakala@dnr.ga.gov>
Cc: "McCaslin, Tyler" <tyler.mccaslin@opc.com>
Subject: RE: Follow Up on Proposed Studies

External E-Mail
Hi Craig,

Thanks for the note. Being at the peak of field season between now and the end of April, Jim and I have been working to identify a meeting date and time that will not interfere with a highly variable (and weather-dependent) sampling schedule. Within your suggested window, we feel we could make the morning of Friday, April 22nd (9:00 am?) work if you all are open as well.

Additionally, we are happy to host (2650 Floyd Springs Road, Armuchee, GA 30105), or can make arrangements to meet at Rocky or elsewhere if need be.
Finally, in the event that we have an unforeseen scheduling conflict with the 22nd, would you all be open to possibly rescheduling the meeting to an inclement weather day within the 19th-29th window, given enough notice?

Thanks,

Jackson Sibley
Fisheries Biologist II
(706) 844-3676
Wildlife Resources Division<https://urldefense.com/v3/__http://georgiawildlife.com/__;!!Niuz6VY!i5HVyER71QtgySA7KMR7dRYdmDQbGKURuSLhQ5biNeyePs1BXN4etfR28vMgdxH3I78s3Q2bHkGEJeEomjk6K_c8K1dD$>
Facebook<https://urldefense.com/v3/__http://www.facebook.com/WildlifeResourcesDivisionGADNR__;!!Niuz6VY!i5HVyER71QtgySA7KMR7dRYdmDQbGKURuSLhQ5biNeyePs1BXN4etfR28vMgdxH3I78s3Q2bHkGEJeEomjk6K_x3eUtI$>
• Twitter<https://urldefense.com/v3/__http://twitter.com/georgiawild__;!!Niuz6VY!i5HVyER71QtgySA7KMR7dRYdmDQbGKURuSLhQ5biNeyePs1BXN4etfR28vMgdxH3I78s3Q2bHkGEJeEomjk6K4D2DaPq$> •
Instagram<https://urldefense.com/v3/__http://www.instagram.com/georgiawildlife__;!!Niuz6VY!i5HVyER71QtgySA7KMR7dRYdmDQbGKURuSLhQ5biNeyePs1BXN4etfR28vMgdxH3I78s3Q2bHkGEJeEomjk6KzMdV-CO$>
Buy a hunting or fishing license today!<https://urldefense.com/v3/__http://georgiawildlife.com/licenses-permits-passes__;!!Niuz6VY!i5HVyER71QtgySA7KMR7dRYdmDQbGKURuSLhQ5biNeyePs1BXN4etfR28vMgdxH3I78s3Q2bHkGEJeEomjk6Kz3qLbsd$>

From: Jones, Craig <craig.jones@opc.com>
Sent: Wednesday, March 30, 2022 8:26 AM
To: Hakala, Jim <Jim.Hakala@dnr.ga.gov>; Sibley, Jackson <Jackson.Sibley@dnr.ga.gov>
Cc: McCaslin, Tyler <tyler.mccaslin@opc.com>
Subject: RE: Follow Up on Proposed Studies

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Good morning,

I'm just following up on the message below. We would welcome the opportunity to walk through our studies in more detail if that's helpful to GDNR.

Best,

Craig

From: Jones, Craig
Sent: Thursday, March 24, 2022 10:38 AM
To: 'Jim Hakala' <Jim.Hakala@dnr.ga.gov<mailto:Jim.Hakala@dnr.ga.gov>>; Sibley, Jackson <Jackson.Sibley@dnr.ga.gov<mailto:Jackson.Sibley@dnr.ga.gov>>
Subject: Follow Up on Proposed Studies

Good Morning Jim and Jackson,

Thanks for the discussion during last week's joint meeting. I'm following up to see if we can schedule some time to discuss the questions you raised about the recreation study in more detail. I'm also happy to discuss any of the other studies in as much detail as you'd like.

Sometime between the 19th and 29th of April would work well for us. Let me know if there are some dates/times in that timeframe that work well for you. It may make sense to do this meeting in person, but I'm good with whatever works well for your team.

Looking forward to hearing from you and getting a follow-up meeting set up.

Best regards,

Craig

Craig A. Jones, PhD
Director, Environmental Policy
Oglethorpe Power Corporation
2100 East Exchange Place, Tucker, GA 30084

Office: 770-270-7348 Mobile: 770-500-8912
Email: craig.jones@opc.com<mailto:craig.jones@opc.com> Web: www.opc.com<https://urldefense.com/v3/__http:/www.opc.com/__;!!HWVSVPY!zyPIFqhE3ySV5y02ymwb1Vu5KETzfhO6tAtzGSvlySqkjx_Imzi6fRbfYcfIA6-xByJuTrI$>

[cid:image001.png@01D84411.B5C9BE60]<https://urldefense.com/v3/__http:/www.opc.com/__;!!HWVSVPY!zyPIFqhE3ySV5y02ymwb1Vu5KETzfhO6tAtzGSvlySqkjx_Imzi6fRbfYcfIA6-xByJuTrI$>

From:	Sibley, Jackson
To:	Jones, Craig; Hakala, Jim
Cc:	McCaslin, Tyler; Steven Layman; Kelly Kirven
Subject:	RE: Follow Up on Proposed Studies
Date:	Wednesday, April 13, 2022 4:12:00 PM
Attachments:	image001.png SurveyFORM2006.xls Rocky User 2006 running summary.xls Survey schedule w.Heath.xls Survey schedule.xls

Craig,

I apologize for another delayed response. In short, we feel that the Recreational Use Analysis (RUA) as described during the JAM meeting may limit the ability to draw meaningful management takeaways from the study. Given the "recreational use" designation applied to Rocky's auxiliary pools, we believe a more intensive RUA approach is warranted. The GADNR conducted a similar use analysis at Rocky in 2006-2007, that covered a one year period. We ask that its format be considered in the development of the proposed RUA. Please find the attached materials, which highlight both the study design and analysis procedures as well as the interview scheduling format.

Please also note these methodological advantages of mirroring the 2006 study:

- Surveying all resource users at Rocky (vs. the proposed "targeted user groups") allows for better understanding of resource use, thereby facilitating prioritization of management efforts and improvements over the license period.
- The longer interviewing period (Jan-Dec vs. July-Nov) allows for capturing seasonal variation in recreation uses; e.g. summer beachgoers vs. winter being fishing-oriented
- A randomized scheduling format is available as a template, which accounts for Heath Lake closure, sunrise/set times, etc.
- Ability to directly compare Rocky recreational use between 2006 and present to ensure continued support of user needs.

We would also like to discuss the inclusion of a few additional survey components:

- Assess current boating access facility usage (ie. boat ramps and associated parking) to ensure user needs are being adequately and safely supported.
- Offering the survey in Spanish to accommodate Latin-X resource users

I look forward to discussing these possibilities in person,

Jackson

Jackson Sibley
Fisheries Biologist II
(706) 844-3676
Wildlife Resources Division
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From: Jones, Craig <craig.jones@opc.com>
Sent: Wednesday, March 30, 2022 9:52 AM
To: Sibley, Jackson <Jackson.Sibley@dnr.ga.gov>; Hakala, Jim <Jim.Hakala@dnr.ga.gov>
Cc: McCaslin, Tyler <tyler.mccaslin@opc.com>; Steven Layman <Steven.Layman@Kleinschmidtgroup.com>; Kelly Kirven <Kelly.Kirven@KleinschmidtGroup.com>
Subject: RE: Follow Up on Proposed Studies

Jim and Jackson,

We are confirmed on our end for April 22nd at 9:00 a.m. Meeting at your Armuchee office will work great.

We're of course open to rescheduling as you describe below. We will have one person coming from South Carolina but can accommodate a change with enough notice.

So that we can be well prepared for the meeting, can you provide any questions or areas of discussion that you'd like us to be prepared to cover? We are planning to walk through the recreation study as discussed during the joint meeting, but a heads up of anything in particular in addition to that would be helpful.

We're looking forward to the meeting.

Best,

cj

From: Jones, Craig
Sent: Wednesday, March 30, 2022 9:20 AM
To: 'Sibley, Jackson' <Jackson.Sibley@dnr.ga.gov>; Hakala, Jim <Jim.Hakala@dnr.ga.gov>
Cc: McCaslin, Tyler <tyler.mccaslin@opc.com>
Subject: RE: Follow Up on Proposed Studies

Hi Jackson,

I completely understand the field season constraints. We'll do some quick calendar checks for the 22nd and, assuming that works, are open to rescheduling as needed.

Best,

cj

From: Sibley, Jackson [mailto:Jackson.Sibley@dnr.ga.gov]
Sent: Wednesday, March 30, 2022 9:06 AM
To: Jones, Craig <craig.jones@opc.com>; Hakala, Jim <Jim.Hakala@dnr.ga.gov>
Cc: McCaslin, Tyler <tyler.mccaslin@opc.com>
Subject: RE: Follow Up on Proposed Studies

External E-Mail

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Thanks,

Jackson Sibley
Fisheries Biologist II
(706) 844-3676
Wildlife Resources Division

From: Jones, Craig <craig.jones@opc.com>
Sent: Wednesday, March 30, 2022 8:26 AM
To: Hakala, Jim <Jim.Hakala@dnr.ga.gov>; Sibley, Jackson <Jackson.Sibley@dnr.ga.gov>
Cc: McCaslin, Tyler <tyler.mccaslin@opc.com>
Subject: RE: Follow Up on Proposed Studies

Good morning,

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Craig

From: Jones, Craig
Sent: Thursday, March 24, 2022 10:38 AM
To: 'Jim Hakala' <Jim.Hakala@dnr.ga.gov>; Sibley, Jackson <Jackson.Sibley@dnr.ga.gov>
Subject: Follow Up on Proposed Studies

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Looking forward to hearing from you and getting a follow-up meeting set up.

Best regards,

Craig

Craig A. Jones, PhD
Director, Environmental Policy
Oglethorpe Power Corporation
2100 East Exchange Place, Tucker, GA 30084

Office: 770-270-7348 **Mobile:** 770-500-8912
Email: craig.jones@opc.com **Web:** www.opc.com

OglethorpePower

From:	Sibley, Jackson
To:	Jones, Craig; Hakala, Jim
Cc:	McCaslin, Tyler; Steven Layman; Kelly Kirven
Subject:	RE: Working Draft of Potential Recreation Survey
Date:	Wednesday, May 25, 2022 10:03:58 AM
Attachments:	image001.png

Hi Craig,

We've had a chance to look through the survey drafts. Overall they look good, we have just a few suggestions that we would like to see implemented prior to starting the survey:

General Survey

- Remove question 2 (zip code)
- Question 3 should read "How many people are in your vehicle today?" to avoid ambiguity/misinterpretation
- Question 4, first block should read "16-24"
- Question 10 should include "check all that apply"

Campground Survey

- Remove "first" question 2 (zip code) and re-number
- Second question 2 (should be labeled Question 3) should read "How many people are staying in your campsite tonight?" to avoid ambiguity/misinterpretation
- We would like to see Questions 9 and 10 from the General Survey included in this survey to obtain fishing quality information from campground users

For both surveys, we would like to see included a "permit type" question to estimate unpermitted visitation. This question should have the options "None" "Daily" "Annual" and "Campground" and include "check all that apply."

Beyond this, our only other point of clarification was whether the campground survey was intended to be in-person or in a survey card format?

Feel free to call to discuss if you have any questions.

Best,

Jackson

Jackson Sibley
Fisheries Biologist II
(706) 844-3676
Wildlife Resources Division

From: Jones, Craig <craig.jones@opc.com>
Sent: Friday, May 13, 2022 3:56 PM
To: Hakala, Jim <Jim.Hakala@dnr.ga.gov>; Sibley, Jackson <Jackson.Sibley@dnr.ga.gov>
Cc: McCaslin, Tyler <tyler.mccaslin@opc.com>; Steven Layman <Steven.Layman@Kleinschmidtgroup.com>; Kelly Kirven <Kelly.Kirven@KleinschmidtGroup.com>
Subject: Working Draft of Potential Recreation Survey

Hi Jim and Jackson,

Thanks again for the productive conversation today. Attached are the working drafts of the surveys we discussed. The survey questions mirror those asked in 2006-2007 plus the additional questions we discussed in April .

Please reach out with any questions. Since these are working drafts, we ask that you do not distribute.

Best,

Craig

Craig A. Jones, PhD
Director, Environmental Policy
Oglethorpe Power Corporation
2100 East Exchange Place, Tucker, GA 30084

Office: 770-270-7348 **Mobile:** 770-500-8912
Email: craig.jones@opc.com **Web:** www.opc.com

OglethorpePower

From:	Sibley, Jackson
To:	Kelly Kirven
Cc:	Hakala, Jim; Steven Layman
Subject:	RE: Rocky Mountain PFA - Traffic Counter Data
Date:	Tuesday, March 7, 2023 8:06:13 AM

Kelly,

Below you will find the traffic count totals for CY2022:

Month (2022)	Total
January	4,882
February	9,863
March	7,594
April	13,510
May	20,534
June	33,686
July	23,353
August	11,693
September	10,129
October	8,564
November	7,753
December	4,679
Sum	**156,240**

Thank you,

Jackson Sibley
Fisheries Biologist
(706) 295-6102
Wildlife Resources Division
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From: Kelly Kirven <Kelly.Kirven@KleinschmidtGroup.com>
Sent: Friday, March 3, 2023 11:44 AM
To: Sibley, Jackson <Jackson.Sibley@dnr.ga.gov>
Cc: Hakala, Jim <Jim.Hakala@dnr.ga.gov>; Steven Layman <Steven.Layman@Kleinschmidtgroup.com>
Subject: Re: Rocky Mountain PFA - Traffic Counter Data

Hi Jackson,

I appreciate the follow up. We do the same during our analysis. We account for a variety of assumptions and corrections, similar to the ones you mentioned, and detail these in our report for transparency. We are on the same page here!

Again, thanks for reaching out and we appreciate DNR providing this data. Have a great weekend!

Kelly

Get Outlook for iOS

From: Sibley, Jackson <Jackson.Sibley@dnr.ga.gov>
Sent: Friday, March 3, 2023 11:25:56 AM
To: Kelly Kirven <Kelly.Kirven@KleinschmidtGroup.com>
Cc: Hakala, Jim <Jim.Hakala@dnr.ga.gov>; Steven Layman <Steven.Layman@Kleinschmidtgroup.com>
Subject: RE: Rocky Mountain PFA - Traffic Counter Data

Kelly,

I should have mentioned in our phone conversation, but I did want to make Kleinschmidt aware that traffic counter data in itself is not a reliable indicator of recreational facility use. To generate our attendance estimates (i.e. facility use), we apply several corrections and expansions to account for site-specific variables (e.g. subtraction of security gate traffic count from general traffic count, an expansion factor applied to vehicle counts to account for variation in vehicle occupancy, and higher expansions for group camp/campground use which are subtracted from total counts).

Apologies if you're already accounting for this statistically, but I thought it may be of value to you in the event you're able to apply DNR's attendance estimates in your RUA analyses in lieu of generating your own estimates from raw data.

Best,

Jackson Sibley
Fisheries Biologist
(706) 295-6102
Wildlife Resources Division
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From: Kelly Kirven <Kelly.Kirven@KleinschmidtGroup.com>
Sent: Thursday, March 2, 2023 12:39 PM
To: Sibley, Jackson <Jackson.Sibley@dnr.ga.gov>

Cc: Hakala, Jim <Jim.Hakala@dnr.ga.gov>; Steven Layman <Steven.Layman@Kleinschmidtgroup.com>
Subject: RE: Rocky Mountain PFA - Traffic Counter Data

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Thanks so much Jackson! If it's not too much trouble to dig up, the raw data would be great. We can include what you have below along with some additional analyses.

Kelly

Kelly Kirven
Section Manager – Terrestrial/Aquatics
Office: 803.462.5633
www.KleinschmidtGroup.com

From: Sibley, Jackson <Jackson.Sibley@dnr.ga.gov>
Sent: Thursday, March 2, 2023 9:58 AM
To: Kelly Kirven <Kelly.Kirven@KleinschmidtGroup.com>
Cc: Hakala, Jim <Jim.Hakala@dnr.ga.gov>; Steven Layman <Steven.Layman@Kleinschmidtgroup.com>
Subject: RE: Rocky Mountain PFA - Traffic Counter Data

Good morning Kelly,

Glad to hear of the progress. Below you'll find a table of PFA attendance for CY22. These data represent pooled traffic counts which have been expanded to estimate total guest attendance for each month. Let me know if you prefer the raw counter data instead. I should be able to dig it up.

CY2022 Attendance

Month	Attendance
JAN	7727
FEB	15371
MAR	14235
APR	25330
MAY	37325
JUN	56891
JUL	40433
AUG	20708
SEP	18414
OCT	16119
NOV	13441
DEC	7224

Total	273218

Best,

Jackson Sibley
Fisheries Biologist
(706) 295-6102
Wildlife Resources Division
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From: Kelly Kirven <Kelly.Kirven@KleinschmidtGroup.com>
Sent: Thursday, March 2, 2023 9:15 AM
To: Sibley, Jackson <Jackson.Sibley@dnr.ga.gov>
Cc: Hakala, Jim <Jim.Hakala@dnr.ga.gov>; Steven Layman <Steven.Layman@Kleinschmidtgroup.com>
Subject: Rocky Mountain PFA - Traffic Counter Data

Good morning Jackson!

I know we have been out of touch for awhile, but I wanted to reach out to you regarding the ongoing recreation study at the Rocky Mountain PFA. We had a successful data collection season last year and are completing the remaining survey days this spring. While we are still collecting survey data, in the interest of time, we are starting to conduct preliminary data analysis and prepare a draft report. I was hoping you could provide the traffic counter data that DNR collected at the PFA in 2022. This data will provide great insight into use at the PFA.

I hope you are doing well and I look forward to hearing from you soon. Thanks!

Kelly

Kelly Kirven
Section Manager – Terrestrial/Aquatics
Kleinschmidt
Office: 803.462.5633
Cell: 423.747.2660
www.KleinschmidtGroup.com

From:	Sibley, Jackson
To:	Kelly Kirven
Cc:	Hakala, Jim
Subject:	RE: Rocky Mountain PFA Campground Data
Date:	Thursday, May 18, 2023 5:01:37 PM

Kelly,

Below you'll find the requested Campground visitation and occupancy rates for Calendar Year 2022.

Month	Total Campsites	Total Visitation	Occupancy Percentage
January	1395	71	5.1
February	1260	142	11.3
March	1395	450	32.3
April	1350	844	62.5
May	1395	777	55.7
June	1350	824	61.0
July	1395	836	59.9
August	1395	647	46.4
September	1350	742	55.0
October	1395	717	51.4
November	1395	502	36.0
December	1395	142	10.2
Total CY22	**16470**	6694	40.6

Let me know if you have questions or need additional data,

Jackson Sibley
Fisheries Biologist
(706) 295-6102
Wildlife Resources Division
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From: Kelly Kirven <Kelly.Kirven@KleinschmidtGroup.com>
Sent: Thursday, May 18, 2023 12:54 PM
To: Sibley, Jackson <Jackson.Sibley@dnr.ga.gov>
Cc: Hakala, Jim <Jim.Hakala@dnr.ga.gov>
Subject: RE: Rocky Mountain PFA Campground Data

No problem Jackson! Thank you!

Kelly Kirven
Section Manager – Terrestrial/Aquatics
Office: 803.462.5633
www.KleinschmidtGroup.com

From: Sibley, Jackson <Jackson.Sibley@dnr.ga.gov>
Sent: Thursday, May 18, 2023 10:36 AM
To: Kelly Kirven <Kelly.Kirven@KleinschmidtGroup.com>
Cc: Hakala, Jim <Jim.Hakala@dnr.ga.gov>
Subject: RE: Rocky Mountain PFA Campground Data

Kelly,

10-4. We'll work to compile the data. I'll be in the field for the remainder of the day so I may not get it to you until tomorrow.

Best,

Jackson Sibley
Fisheries Biologist
(706) 295-6102
Wildlife Resources Division
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From: Kelly Kirven <Kelly.Kirven@KleinschmidtGroup.com>
Sent: Thursday, May 18, 2023 9:17 AM
To: Sibley, Jackson <Jackson.Sibley@dnr.ga.gov>
Cc: Hakala, Jim <Jim.Hakala@dnr.ga.gov>
Subject: RE: Rocky Mountain PFA Campground Data

Campground visitation and site occupancy rates would be great. I'd like to include this information when determining overall recreation use estimates for the PFA. Revenue isn't necessary.

Thank you!

Kelly Kirven
Section Manager – Terrestrial/Aquatics
Office: 803.462.5633

www.KleinschmidtGroup.com

From: Sibley, Jackson <Jackson.Sibley@dnr.ga.gov>
Sent: Thursday, May 18, 2023 9:15 AM
To: Kelly Kirven <Kelly.Kirven@KleinschmidtGroup.com>
Cc: Hakala, Jim <Jim.Hakala@dnr.ga.gov>
Subject: RE: Rocky Mountain PFA Campground Data

Kelly,

Thanks for reaching out. What specific metrics will you need for 2022? Campground visitation, site occupancy rates, campground revenue?

Thanks,

Jackson Sibley
Fisheries Biologist
(706) 295-6102
Wildlife Resources Division
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From: Kelly Kirven <Kelly.Kirven@KleinschmidtGroup.com>
Sent: Thursday, May 18, 2023 9:06 AM
To: Sibley, Jackson <Jackson.Sibley@dnr.ga.gov>
Subject: Rocky Mountain PFA Campground Data

Hi Jackson!

I am working on the recreation report for the Rocky Mountain PFA and in addition to the visitation information you provided (thanks again!) I was wondering if you could provide some data regarding campground reservations for 2022. I'm assuming that information wasn't included in the visitation data you provided previously, since that was based on traffic counts.

Thanks!
Kelly

Kelly Kirven
Section Manager – Terrestrial/Aquatics
Kleinschmidt
Office: 803.462.5633
Cell: 423.747.2660

www.KleinschmidtGroup.com

Architectural Survey and Evaluation of the Rocky Mountain Pumped Storage Hydroelectric Project (FERC No. 2725), Floyd County, Georgia

August 2023

Prepared For:

Oglethorpe Power Corporation
2100 East Exchange Place
Tucker, Georgia 30084

Under Contract to Kleinschmidt Associates, Inc.

Prepared By:

TRC
1187 Vultee Blvd., Suite 101
Nashville, Tennessee 37210

Architectural Survey and Evaluation of the Rocky Mountain Pumped Storage Hydroelectric Project (FERC No. 2725), Floyd County, Georgia

Prepared For:
Oglethorpe Power Corporation

Under Contract to Kleinschmidt Associates, Inc.

Submitted By:
TRC Environmental Corporation
1187 Vultee Blvd., Suite 101
Nashville, Tennessee 37217

Kerri Ross
Architectural Historian and Author, M.S.

August 2023

Abstract

This report presents the findings of an architectural resources survey and National Register of Historic Places (NRHP) evaluation conducted by TRC Environmental Corporation (TRC) for Federal Energy Regulatory Commission (FERC) relicensing of Oglethorpe Power Corporation's Rocky Mountain Pumped Storage Hydroelectric Project (FERC No. 2725) (Rocky Mountain Project, or the Project) in Floyd County, Georgia. The Project began operation in 1995 and is co-owned by Oglethorpe Power Corporation (OPC), with a 74.61 percent undivided interest, and Georgia Power Company (GPC), with a 25.39 percent undivided interest (OPC and Kleinschmidt 2021). OPC, GPC, Rocky Mountain Leasing Corporation, and U.S. Bank National Association are co-licensees for the Project. A Joint Participation Agreement between OPC and GPC gives OPC sole authority over "planning, licensing, design, control, construction, maintenance, and disposal of the Project" (OPC and Kleinschmidt 2021). OPC is not proposing to add capacity or make any major alterations to the Project, and the Project does not occupy any federal lands. The current license expires December 31, 2026.

This survey was conducted in compliance with Section 106 of the National Historic Preservation Act of 1966 (as amended) as part of the FERC relicensing effort. Section 106 requires federal agencies to consider the effects of their actions on properties listed or eligible for listing in the National Register of Historic Places (NRHP) located within the Project's Area of Potential Effects (APE). The APE for this architectural assessment is defined as the FERC Project boundary, which includes a 221-acre Upper Reservoir; a 600-acre Lower Reservoir on Heath Creek; two Auxiliary Pools (Auxiliary Pool I and Auxiliary Pool II) adjacent to the Lower Reservoir totaling about 600 acres; a three-unit powerhouse; a substation located 1.5 miles from the powerhouse; three 230-kV transmission lines comprising a total of 1.5 miles, known as the Primary Transmission Line; and associated facilities within the Project boundary. There are no non-Project related architectural resources located in the APE.

As a result of background research and field survey, TRC recommends there are no architectural resources in the APE that are eligible for listing in the NRHP. TRC finds the Project is not eligible for listing in the NRHP because it is not yet 50 years old and does not meet the registration requirements of Criteria Consideration G for properties that have achieved significance in the last 50 years. This assessment was conducted to produce photographic documentation of all Project resources within the APE and a historic context and analysis that may be used in a future eligibility determination of the Project when it reaches 50 years of age.

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1. Introduction

This report presents the findings of a historical hydro-engineering architectural survey conducted by TRC Environmental Corporation (TRC) for the Federal Energy Regulatory Commission (FERC) relicensing of Oglethorpe Power Corporation's Rocky Mountain Pumped Storage Hydroelectric Project (FERC No. 2725) (Rocky Mountain Project, or the Project) in Floyd County, Georgia. The study was conducted according to OPC's Final Study Plan for the Project distributed in August 2022 and following consultation with Georgia SHPO. OPC will use the information generated by this study to evaluate the potential effects of its proposed action on historic resources from continued project operation and maintenance and project-related recreation in the Draft License Application.

The Rocky Mountain Project has an installed generating capacity of 904 megawatts (MW). Construction of the Project began in 1978 with official commercial operation beginning in 1995. The Project is co-owned by Oglethorpe Power Corporation (An Electric Membership Corporation) (OPC), with a 74.61 percent undivided interest, and Georgia Power Company (GPC), with a 25.39 percent undivided interest (OPC and Kleinschmidt 2021). Currently, OPC, GPC, Rocky Mountain Leasing Corporation, and U.S. Bank National Association are co-licensees for the Project. OPC is not proposing to add capacity or make any major alterations to the Project, and the Project does not occupy any federal lands. The current license expires December 31, 2026.

This architectural survey of the Rocky Mountain Project was conducted in compliance with Section 106 of the National Historic Preservation Act of 1966 (as amended) as part of the FERC relicensing effort. Section 106 requires federal agencies to consider the effects of their actions on properties listed as eligible for listing in the National Register of Historic Places (NRHP) located within the Project's Area of Potential Effects (APE). The APE for this architectural assessment is defined as the FERC project boundary. The project boundary includes: a 221-acre Upper Reservoir; a 600-acre Lower Reservoir on Heath Creek; two Auxiliary Pools (Auxiliary Pool I and Auxiliary Pool II) adjacent to the Lower Reservoir totaling about 600 acres; a three-unit powerhouse; a substation located 1.5 miles from the powerhouse; three 230-kV transmission lines comprising a total of 1.5 miles, known as the Primary Transmission Line; access roads; and associated facilities.[1] A map showing the APE for this survey, which coincides with the FERC project boundary, is presented below in Figure 1.

Chapter 2 discusses methods used to conduct the background research and architectural survey. A history of hydroelectric development at the Rocky Mountain Project is included in Chapter 3. Results of the architectural survey, including background research and an in-depth project description, are provided in Chapter 4 followed by the NRHP evaluation Chapter 5 and recommendations in Chapter 6. References are cited at the end of the report.

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[1] OPC is proposing to remove from the principal project works and the project boundary the substation, which is commonly referred to as the "Switching Station" of the Project, and the three 230-kV transmission lines comprising a total of approximately 1.5 miles.

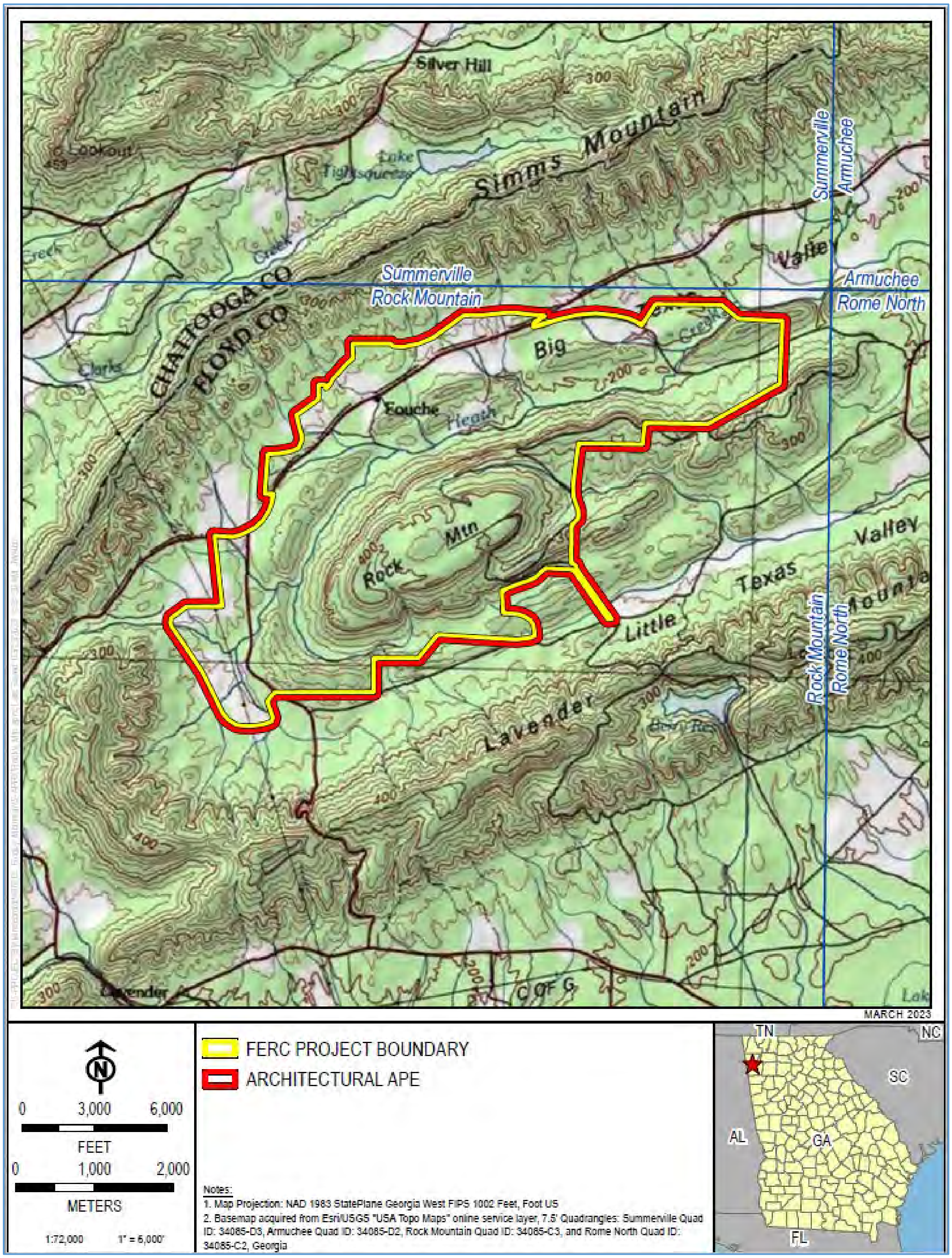

Figure 1: FERC Project Boundary and the area of potential effect at the Rocky Mountain Project.

2. Survey Methods

Background Research

TRC completed site file research in the Rome-Floyd County Library vertical files and in the archives of the Rocky Mountain powerhouse the week of October 24, 2022. Primary and secondary sources referenced include annual reports, construction drawings, photographs, maps, board meeting minutes, newspapers, and more. A historic context of Floyd County was compiled using these available resources. Online research and field work were conducted to determine the settlement and development of the area and the construction dates of each resource found in the FERC project boundary.

Architectural Survey

TRC completed the background research and field work for this assessment during the week of October 24, 2022, under the direction of Kerri Ross, Architectural Historian. The survey was completed using the guidelines in the *Georgia Historic Resources Survey Manual* (GA SHPO 2022), the National Register Bulletin 24, *Guidelines for Local Surveys: a Basis for Preservation Planning* (Derry et al. 1985), and National Register Bulletin 15, *How to Apply the National Register Criteria for Evaluation* (NPS 1995). The project area was photographed with a high-resolution digital camera, including multiple views of each dam, powerhouse, substation, transmission line, and operations area within the APE. At the powerhouse, all accessible interior spaces, equipment, and architectural details were documented with digital photographs and written notes on their functions and histories. Additional interior spaces included communication buildings, warehouses, and the Main Dam control building. Information recorded in the field included a brief description of each resource, identification of secondary or related structures, dates of construction, physical integrity, and historic context. Survey information maintained throughout the course of the inventory included field notes, topographic field maps, and overview and detailed photographs.

NRHP Eligibility Criteria

Sufficient data were compiled during background research and survey to make recommendations regarding eligibility for listing in the NRHP for the project works. According to 36 CFR 60.4, cultural resources eligible for listing on the NRHP are defined as buildings, structures, objects, sites, and districts that have "integrity," and that meet one or more of the criteria outlined below.

- Criterion A (Event). Association with one or more events that have made a significant contribution to the broad patterns of national, state, or local history.
- Criterion B (Person). Association with the lives of persons significant in the past.
- Criterion C (Design/Construction). Embodiment of distinctive characteristics of a type, period, or method of construction; or representation of the work of a master; or

possession of high artistic values; or representation of a significant and distinguishable entity whose components may lack individual distinction.

- Criterion D (Information Potential). Properties that yield, or are likely to yield, information important in prehistory or history. Criterion D is most often (but not exclusively) associated with archaeological resources. To be considered eligible under Criterion D, sites must be associated with specific or general patterns in the development of the region. Therefore, sites become significant when they are seen within the larger framework of local or regional development.

For a property to be eligible for listing in the NRHP it must exhibit qualities of physical integrity. This rule also applies to historic districts. The seven NRHP aspects of integrity are as follows:

- Location: the place where the historic property (or properties) was/were constructed or where the historic event(s) occurred; Design: the combination of elements that create the form, plan, space, structure, and style of a property (or properties);
- Setting: the physical environment of the historic property (or properties);
- Materials: the physical elements that were combined to create the property (or properties) during the associated period of significance;
- Workmanship: the physical evidence of the crafts of a particular culture or people during any given period in history or prehistory;
- Feeling: the property's (or properties') expression of the aesthetic or historic sense of the period of significance; and
- Association: the direct link between the important historic event(s) or person(s) and the historic property (or properties).

3. Historic Context

American Hydroelectric Development, 1880-1945

In his two-volume work, *Hydroelectric Development in the United States, 1880-1940*, Duncan Porter Hay defined three broad periods in the evolution of hydroelectricity in the United States prior to World War II: a pioneering period (1880-1895); a period of innovation and experimentation (1895-1915); and a period of standardization (1920-1930) (Hay 1991). The standardization of hydroelectric development continued through the World War II and post-war periods as small private power companies consolidated into large corporations that created the foundation of modern power transmission and distribution systems.

The pioneering phase began with Thomas Edison's work with electricity in the late 1870s and 1880s, which spurred the development of waterpower to generate electricity. The earliest hydroelectric plants were direct current (DC) stations built to power arc and incandescent lighting. The first hydroelectric development in America occurred in 1880, when a dynamo was connected to a water turbine by Michigan's Grand Rapids Electric Light and Power Company to power arc lights. The first hydroelectric plant for large-scale commercial power generation in the United States was located at Niagara Falls, New York, where a central powerhouse with a Brush dynamo was installed in 1881 to power the city's street lamps (Bureau of Reclamation 2003).

By the mid to late 1880s, there were approximately 50 electrical generation plants operating or under construction in the U.S. and Canada to meet the demand for electricity for lights and motors. The largest plants were located in Rochester and Niagara Falls, New York; Holyoke and West Somerville, Massachusetts; Lynchburg, Virginia; Columbus, Georgia; and Laconia, Maine. Of the 560 electric companies in the United States listed in the 1889 American Electrical Directory, 200 utilized waterpower for generation of part or all of their current (Hay 1991:15–16).

The true potential of hydroelectric power, however, would not be realized until after the successful commercial demonstration of the use of alternating current (AC) at Niagara Falls in 1895. Nikola Tesla and George Westinghouse won the contract to develop a system for delivering power from their Adams Power Plant at Niagara Falls to Buffalo, New York, some 26 miles away (Figure 2 and Figure 3). Tesla and Westinghouse proposed an AC system, over Thomas Edison's proposal for a direct current (DC) system. Unlike direct current, alternating current allowed electricity to be generated at one voltage, increased through transformers to a higher voltage for transmission, and then decreased through transformers for distribution to consumers. AC was also more economical since it could transmit high voltages via copper wires over long distances. This allowed for the possibility of electrical generation at one source, and the transmission of current to consumers in urban areas or to industrial clients. Thus, household lights that operated at 110 volts could be served by the same power source that provided 240 to 2,000 volts for industrial applications. Although many of the design features of the Niagara plant, such as outward flow turbines and external revolving field alternators, were later abandoned, the practical and financial success of the Niagara plant changed the power generation industry and set in motion the electrical revolution in the U.S. (Hay 1991:22, 24–25).

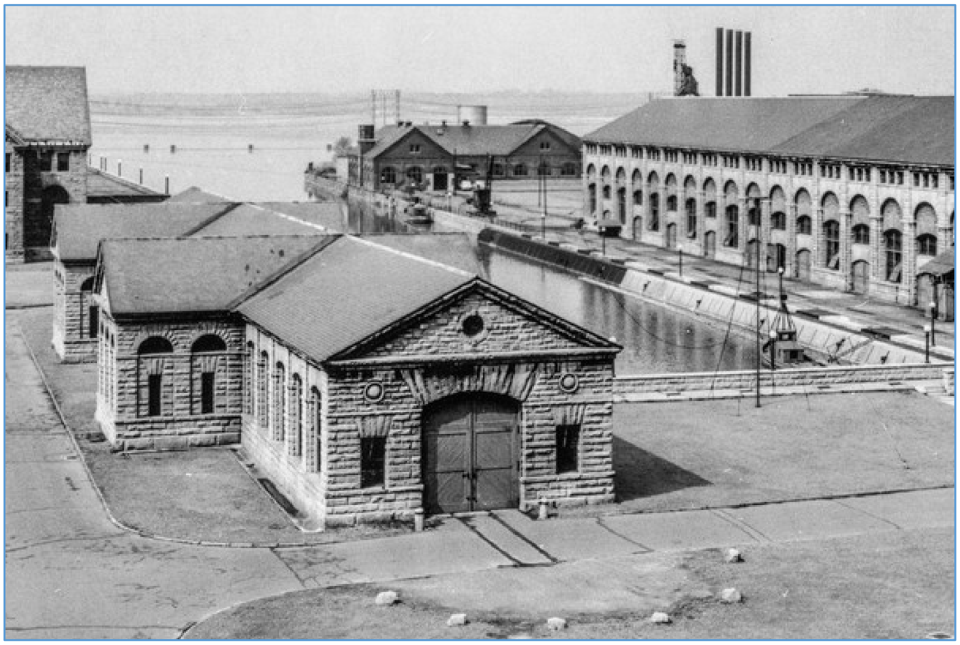

Figure 2: The 1895 Adams Power Plant in Niagara Falls, New York (Source: www.teslauniverse.com).

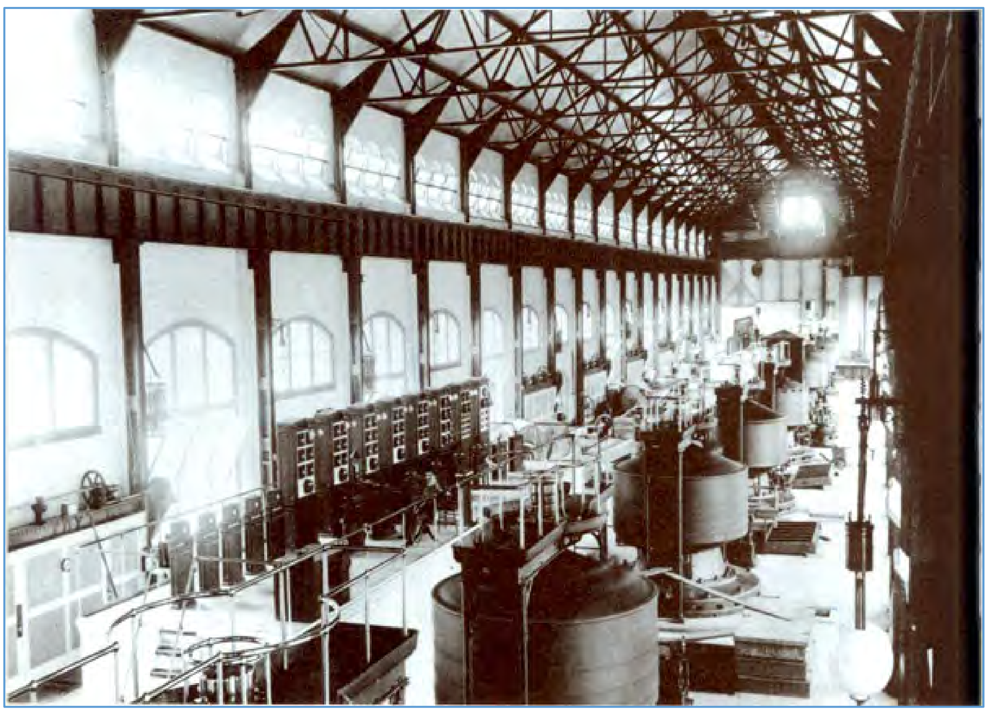

Figure 3: Generators at the 1895 Adams Power Plant, Niagara Falls, New York (Source: www.teslauniverse.com).

Tesla and Westinghouse's "universal" system proved to be the most practical solution to providing hydroelectric power to any location, regardless of the availability of an adequate water source. Before AC electric power, factories required a prime mover, such as a waterwheel or steam engine. This source turned "line shafts" with pulleys and leather belts. The shafts were often three inches in diameter, suspended from the ceiling, and ran the entire length of the building. Power was distributed to other floors via holes in the ceiling. Because these shafts were a fire hazard, many factories opted to build expensive belt towers. The entire system worked continuously throughout the building no matter what machines were in use or disuse. If any problems occurred with the system, a full room of machines or the entire factory shut down until repairs could be made (Devine 1983:352). In addition, regular maintenance of the system was time-consuming.

Following this early pioneering phase, hydroelectric projects were constructed at a rapid pace following the successful application of AC systems, and the pace continued up until the beginning of World War I as new developments were introduced and demand increased. By 1896, there were as many as 300 AC plants operating in the United States (Hay 1991:20). At the turn of the century most factories still depended on costly and cumbersome power from steam or coal, which was sometimes used to power electric motors. Only four percent of manufacturing power came from electricity. However, by the 1920s, more than half of industry used electricity, and manufacturing used more power than municipalities, business, and homes combined (Woolfe 1982:230; DuBoff 1967:510).

With the possibility of U.S. involvement in the war in Europe looming, President Woodrow Wilson recognized the potential benefits of hydroelectric power for military purposes and promoted the government-sponsored construction of a dam on the Tennessee River at Muscle Shoals, Alabama, to power nitrate plants there. Between World War I and World War II, hydroelectric dam construction continued with increased standardization of design. Hydroelectric facilities, which could be brought online almost immediately, emerged as producers of power during periods of peak load demand, while coal or gas-powered steam plants were built to cover base load production.

The hydroelectric industry evolved considerably during the 1930s. New Deal legislation in the wake of the Depression was of particular significance to the future of large-scale hydroelectric projects. The Tennessee Valley Authority (TVA), created in 1933, began an ambitious plan to harness the waterpower of the entire Tennessee River and its tributaries, bringing inexpensive electrical service to industries, towns, and residents of the South, where it had previously only been available in limited areas. At the same time, private electrical companies, which had formed piecemeal prior to World War I to serve individual manufacturers or local governments, were being consolidated into large entities. These companies developed networks to share power across systems for greater efficiency, and often included transportation and manufacturing services in addition to power generation. At the same time, industry fears of government regulation and nationalization of utility services discouraged large investments in private hydroelectric projects (Hay 1991:xii).

On the eve of America's entry into World War II, the share of U.S. electrical power from hydroelectric generating facilities had dropped to about one-third in favor of coal and gas-powered plants. Still, the hydroelectric industry played a key role in the country's efforts during the war. Fontana Dam in western North Carolina, Douglas Dam in eastern Tennessee, and other power projects were rushed to completion to supply vital industries with the power necessary to produce war materiel and conduct nuclear power research at Oak Ridge National Laboratory in East Tennessee. After the war, U.S. efforts to maintain military superiority over the Soviet Union and its allies contributed to a further expansion of hydroelectric capacity, both nationwide and in the Southeast.

The increased demand for power after World War II eventually outstripped the available supply of practical hydroelectric power, accelerating the shift that had begun in the 1930s toward coal- and gas- powered plants as major sources of electricity in the U.S. By the 1950s, most of the nation's large hydroelectric installations were owned and operated by federal or state authorities and the lack of available sites for new facilities hindered additional public developments. There remained, however, smaller hydroelectric opportunities built by private power companies around the nation. Small- capacity plants were viewed with favor by private utilities because they could be built faster than large plants and still play an important part of a state or region's power system (EDAW, Inc. 1993)

The Atomic Energy Act of 1954 ushered in a new chapter in the history of electric power production and the utility industry. The act expanded nuclear power development, which was at first limited to the federal government, to include private utilities and industrial groups. The introduction of nuclear power into the power systems of utility companies redefined the future role of traditional power sources, including hydroelectricity. In 1964, Parr Nuclear Station in South Carolina, a joint venture of four utility companies in the Carolinas and Virginia, including Duke Power, was the first nuclear-powered generating station built in the Southeast. More nuclear power stations were constructed in the 1970s and 1980s to meet increasing demand and reduce American reliance on foreign oil (EDAW, Inc. 1993).

Added to this changing landscape of power production in the 1960s was the widespread development of pumped storage hydroelectric technology. First developed in Germany in 1908, pumped storage facilities offered a uniquely effective way to meet demand fluctuations between baseload power production and times of peak demand. These facilities use power during non-peak load times to pump water from a lower reservoir up to a reservoir at a higher elevation, and then use this stored potential energy to generate power during peak demand periods. The essential element in modern pumped storage systems is the reversible Francis-type turbine which, as a single hydraulic unit, performs both pumping and generating functions with a high degree of efficiency and reliability. During times of peak power demand, water is drawn from the upper reservoir through a hydroelectric dam to generate electricity. During the off-peak or baseload times the turbine/generator is reversed and used as a pump to return the water to the upper reservoir. Power for operating the pumps is often furnished by off-peak steam-generated energy or secondary hydroelectric energy (GPCn.d.[a]:1- 2).

The construction of pumped storage facilities accelerated in the 1960s and 1970s as national population and economic growth increased the demand ratio between electrical peak and baseload periods. These trends combined with the widespread use of air conditioning in the

South to create more distinct seasonal demand peaks for electricity. Pumped storage dams were ideal for daily peak demand periods due to their nature as fast-response facilities that could be turned on and off as needed, a quality that larger fossil-fuel and nuclear plants could not match. Pumped storage was also increasingly attractive as part of multi-purpose hydroelectric projects that enhanced the economics of individual sites. Many projects required the construction of new upper reservoirs, but engineers also sought to use existing reservoirs or bodies of water for pumped storage facilities. The use of existing reservoirs was encouraged due to construction cost savings and fewer environmental impacts to project areas (Dames and Moore 1981: 2-8).

Hydroelectric Development in Georgia, 1904-1960s

GPC's first foray into hydroelectric power was in 1904, when the Georgia Railway and Electric Company, a precursor of GPC, entered into an agreement with S. Morgan Smith to purchase power from the Atlanta Water and Electric Power Company's Bull Sluice Hydroelectric Plant, which was then under construction on the Chattahoochee River. Prior to that time, the Georgia Railway and Electric Company had relied on local steam generators to power the city of Atlanta's street cars and streetlights, as well as a provide electrical service to a limited number of commercial and residential customers. The rapid increase in demand for electricity at the turn of the twentieth century, however, strained the capacity of these units and made it clear that new power sources were necessary (GPC 2016).

Under the guidance of President Preston Arkwright, who took over as president in 1902, the Georgia Railway and Electric Company began acquiring regional power companies to boost its capacity and increase its customer base. In 1912, the company purchased the Bull Sluice/Morgan Falls facility, as well as the ambitious but financially struggling Tallulah Falls Hydroelectric Plant (Figure 4) under construction by GPC, which was formed in 1908. The combined entities were renamed the Georgia Railway and Power Company (GR&PC). The company constructed a 100-mile high-voltage transmission line from the Tallulah plant to an outdoor substation in Atlanta. Both the line and the substation were among the first such features in the country (GPC 2016).

By 1914, five of the six 12,000-kilowatt (kW) units at the Tallulah plant were in operation, with a sixth unit added in 1919. The Tallulah Falls project was a remarkable achievement for the time. It included a 126-foot tall, 426-foot-long masonry dam, a 1.25-mile tunnel cut through solid rock, and steel penstocks that drop water 608 feet to the powerhouse. At its completion, it was the third largest hydroelectric facility in the country. Over the next 13 years, five additional dams and powerhouses were completed above and below Tallulah Falls to capture the full 1,200-foot fall of the Tallulah and Tugalo rivers between the head of Lake Burton and the tailrace of Yonah Dam (GPC 2016).

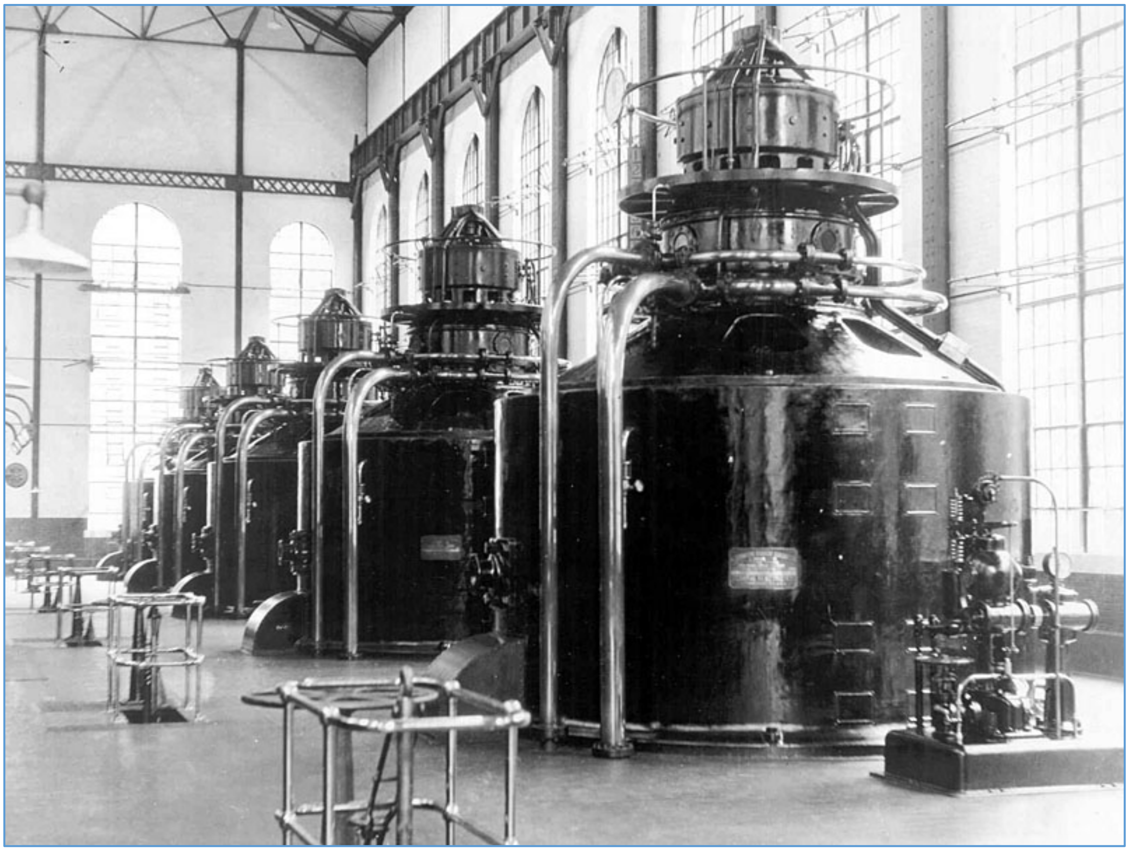

Figure 4: Tallulah Falls Hydroelectric Plant Generators, 1914 (Source: GPC Archives).

In the 1920s, the GR&PC began to consolidate with utilities in other states to create an interconnected transmission network that allowed power to be transferred where it was most needed. In 1926, the GR&PC joined several other regional utilities under a holding company called the Southeastern Power & Light Company, the predecessor of the current Southern Company. At that time, GR&PC became GPC. The acquisition of the Central Georgia Power Company in 1927 and the Columbus Electric and Power Company in 1930 added four new hydroelectric facilities to GPC’s inventory. Lloyd Shoals Dam, on the Ocmulgee River about 15 miles above Macon, was completed in 1910 by the Central Georgia Power Company to supply the city of Macon. Constructed primarily using mules and wagons, the concrete masonry Lloyd Shoals dam was the largest in the country at the time. The Bartletts Ferry, Goat Rock, and North Highlands plants, acquired from Columbus Electric and Power Company, were located on the Chattahoochee River near Columbus (GPC 2016; Calhoun 2015).

The expansion of the GPC transmission grid, combined with a campaign urging customers to conserve power, helped the company weather a severe drought that peaked in 1925 with only periodic interruptions of service. As a result of the crisis, GPC shifted its focus to coal-fired steam plants for its base load power generation, with hydroelectric power gradually becoming a supplemental source during peak demand. In 1930, the first of four units was constructed at Plant Atkinson on the Chattahoochee River northwest of Atlanta, followed by new steam plants at Plant Arkwright near Macon and Plant Mitchell near Albany (Manganiello 2015:62–65;

GPC 2016).

The shift away from privately funded hydroelectric power that began in the late 1920s continued in the 1930s, as the federal government began a program of multi-use projects under the Tennessee Valley Authority (TVA), the Bureau of Reclamation, and the U.S. Army Corps of Engineers (Corps). Prior to the Flood Control Act of 1928, the federal government had restricted its water control projects to those that benefitted navigation under the commerce clause and improved harbors as part of national defense. Increasing hostility toward monopolistic industries, coupled with the destruction caused by the Mississippi Flood of 1927, bolstered the position of progressive-minded leaders who envisioned large-scale federally funded projects that would provide flood protection and resource conservation in addition to improved navigation and hydroelectric power, while improving social and economic conditions through employment and rural electrification.

Private power companies and manufacturing interests fought hard against these federal actions and claimed the TVA experiment would never extend beyond the Tennessee River Valley. However, increased federal involvement in industry prior to and during World War II led to a modified postwar federalism, in which large-scale, multiuse projects were government funded, and the electricity generated was sold to private utilities. Under this model, the Corps constructed hundreds of reservoirs around the Southeast after World War II for a number of purposes, including hydroelectric power. Among these were Clarks Hill (now Thurmond), Russell, and Hartwell lakes on the Savannah River; Lanier, West Point, and George on the Chattahoochee River; and Allatoona on the Etowah River (Manganiello 2015:73–84, 94, 99–101).

After World War II, GPC revived its Furman Shoals project on the Oconee River, which was previously halted in 1930 by the Great Depression. During this time, power demand was increasing exponentially, and GPC was constructing steam plants to meet its customers' needs. The development of hydroelectric power held promise as a source of peak load power that could be rapidly brought online and taken off as needed and involved no additional fuel costs.

Once completed, the Furman Shoals project was renamed Sinclair Dam and Lake. The generators began operation in 1953 with a capacity of 45,000 kW. Lake Sinclair served an additional role in GPC's generation plan by providing cooling water for Plant Branch, a 1-million-kW coal-fired generator constructed in the 1960s. The last active unit at Plant Branch was retired from service in 2015 in response to Environmental Protection Agency rules requiring additional environmental controls that were considered cost prohibitive (Manganiello 2015:81–82, 100; Fabian 2015; GPC 2016).

The last of GPC's conventional hydroelectric generating projects was Oliver Dam on the Chattahoochee River above Columbus, which went into commercial operation in 1959. The power plant was equipped with three 18,000-kW generating units and one 6,000-kW unit, and was the first completely automatic, remotely controlled hydroelectric plant in Georgia. By the 1960s, few suitable locations for large hydroelectric dams remained, and the returns on investment were low. While peak load generation was still needed, it became increasingly difficult to justify the expenditure for such facilities. In addition, public opposition to these projects had increased as a result of environmental and social concerns (Maganiello 2015:141–145).

Pumped Storage Hydroelectricity in Georgia

Pumped storage hydroelectric development offered a successful economic alternative that mitigated the environmental and social concerns of conventional hydroelectric projects. With support from numerous investors, GPC began the construction of the Wallace Dam Pumped Storage Hydroelectric Project (Wallace Dam Project) in 1971. Located upstream of Lake Sinclair and just east of Eatonton, Georgia, Wallace Dam was the first pumped storage hydroelectric facility constructed by GPC. It is part of the Central Georgia Hydroelectric Group, which also includes the Sinclair Hydroelectric Project (1953) on the Oconee River and the Lloyd Shoals Hydroelectric Project (1911) on the Ocmulgee River.

When the last of its units was brought online in early 1980, the Wallace Dam Project's 321-MW generating capacity nearly doubled the total electrical output of GPC's hydroelectric system. At the time of its construction, the dam's pump turbines were the largest ever manufactured by Allis-Chalmers (now Voith Hydro). The turbines featured innovative individual servomotors for each wicket gate, which open and close to allow water into the turbine. Four of its six turbines are reversible to pump water from Lake Sinclair (lower reservoir) up into Lake Oconee (upper reservoir), which more than doubles Lake Oconee's energy potential (GPC n.d.[b]).

The Wallace Dam Project had a substantial positive impact on the state's need for new power sources. In addition to the dam's power generation capabilities, 19,050-acre Lake Oconee provided numerous recreational opportunities. "Completion of this installation," stated Edwin I. Hatch, President of GPC, "will result in one of Georgia's most beautiful and outstanding recreation areas. We are predicting that Laurens Shoals will become known throughout the Southeast as a focal point for thousands of boating, swimming, camping and picnicking enthusiasts… Because of the plant's pumped storage feature the lake level will be extremely stable, enhancing recreation use" (GPC 1970: 1). It was clear, the completion of the Wallace Dam Project added an essential new hydroelectric generation source to the GPC network during a time of ongoing population growth and rising demand for electricity.

During the preliminary planning of the Wallace Dam Project, GPC was also planning a pumped storage facility in the northwest part of Georgia near Rome. As early as 1967, GPC officials had been studying Rock Mountain as a location for a second pumped storage facility due to the topography and its location near a major transmission line (RNT 1972). Investment in a new pumped storage facility at the Rock Mountain site offered supplemental power generated at will for the northwest region of Georgia. As seen in the following sections, however, the new pumped storage hydroelectric power facility at the Rock Mountain site involved construction delays and deactivation, court fillings, public opposition, and the partial sale of the Project before its final completion in 1995.

Permitting for the Rocky Mountain Project

By 1970 the demand for electrical energy had increased tremendously in Georgia, driven by rapid population growth, increased industrial development, and the spread of air conditioning technology. In an effort to meet these demands, GPC worked on expanding their power portfolio to include more innovative hydroelectric power plants. The pumped storage hydroelectric project would allow GPC to expand their network and generate more power in an environmentally conscious way. In 1972, GPC met with a number of environmental and government agencies to ensure an expeditious approval process because few locations within the state had the appropriate topography for the pumped storage system while also providing enough recreational land. During the preliminary stages, GPC met with the Game and Fish Division of the Georgia Department of Natural Resources (GDNR), the U.S. Bureau of Outdoor Recreation, the U.S. Environmental Protection Agency, and the Rome-Floyd County Planning Commission to assist in planning the development of the pumped storage facility (RNT 1972).

Following the internal plan and design approval, GPC submitted a permit application to the Federal Power Commission (FPC; predecessor to FERC) to begin construction of the Rocky Mountain Project. On October 5, 1978 GPC was issued an order of affirmation from the FPC to begin construction on the Project on October 15, 1978 (GPC 1978). However, the license was quickly contested before being resubmitted and re-licensed on October 5, 1978, with a construction start date of October 15, 1978 (GPC 1978). While the issuance of this license did not include recommendations from the FPC for or against the project, it did indicate FPC agreement with GPC's reasons for constructing the generating plant (Craw n.d.). The company initially estimated the cost of the Project as $72 million (subsequently revised multiple times throughout the development of the Project) with approximately 300 workers involved in the construction for a commercial start date of 1985 (RNT 1972, RNT 1980).

Hydroelectric Development at the Rocky Mountain Hydroelectric Plant

Due to the escalating costs of the Rocky Mountain Project, GPC suspended construction multiple times before ultimately deciding to sell a portion of the Project to OPC. In 1988, OPC purchased a majority share of the Project from GPC for $158 million (Willis 1991). Originally named Oglethorpe Electric Membership Corporation, OPC was incorporated in 1974 following the formation of Georgia's Electric Membership Corporations (EMCs) (OPC 2022). With a mission to provide environmentally responsible, safe, reliable, and affordable electricity, and seek innovative energy solutions, OPC is one of the nation's largest power supply cooperatives and a primary energy producer for 38 electric membership corporations and approximately 4.4 million people by nuclear, gas, coal, and hydroelectric resources (OPC 2022). As of 2022, OPC has ownership of 14 generating facilities across Georgia with 10 percent of its generating capacity, approximately 904 MW of power, generated from the Rocky Mountain Project, OPC's only hydroelectric facility (OPC 2022) (Figure 5).

Figure 5: OPC Generating Facilities in Georgia. Coal facilities are labelled in orange; gas facilities labelled in green; hydro facility (Rocky Mountain Project) labelled in blue; nuclear facilities labelled in purple. The green shaded area represents the power coverage area (Source: OPC 2022).

Rocky Mountain Hydroelectric Design

Located approximately ten miles northwest of Rome, Georgia, the Rocky Mountain Project is on Heath Creek in the Armuchee Creek tributary system of the Oostanaula River in the Coosa River basin in Floyd County, Georgia. The Project is co-owned by OPC (74.61 percent) and GPC (25.39 percent) with Rocky Mountain Leasing Corporation and U.S. Bank National Association as additional co-licensees (OPC and Kleinschmidt 2021). Figure 6 shows the location of the Rocky Mountain Project.

As of December 31, 2020, GPC has provided power to 2,635,402 customers with nuclear power, fossil fuels, natural gas, hydropower, and solar power (Figure 7) (Southern Power 2022). Hydropower is GPC's most widely used renewable resource and produces less pollution than fuel-burning methods, while commonly creating public recreational areas and diverse wildlife habitats. Of GPC's 19 hydropower plants in operation, two are pumped storage facilities. Rocky Mountain is GPC's second pumped storage project, following Wallace Dam, which was constructed between 1971 and 1980. Energy reports indicate hydroelectric facilities in Georgia produced a generating capacity of 1,099,882 kW during the 2020 fiscal year, with Rocky Mountain providing 229,362 kW (Southern Power 2022).

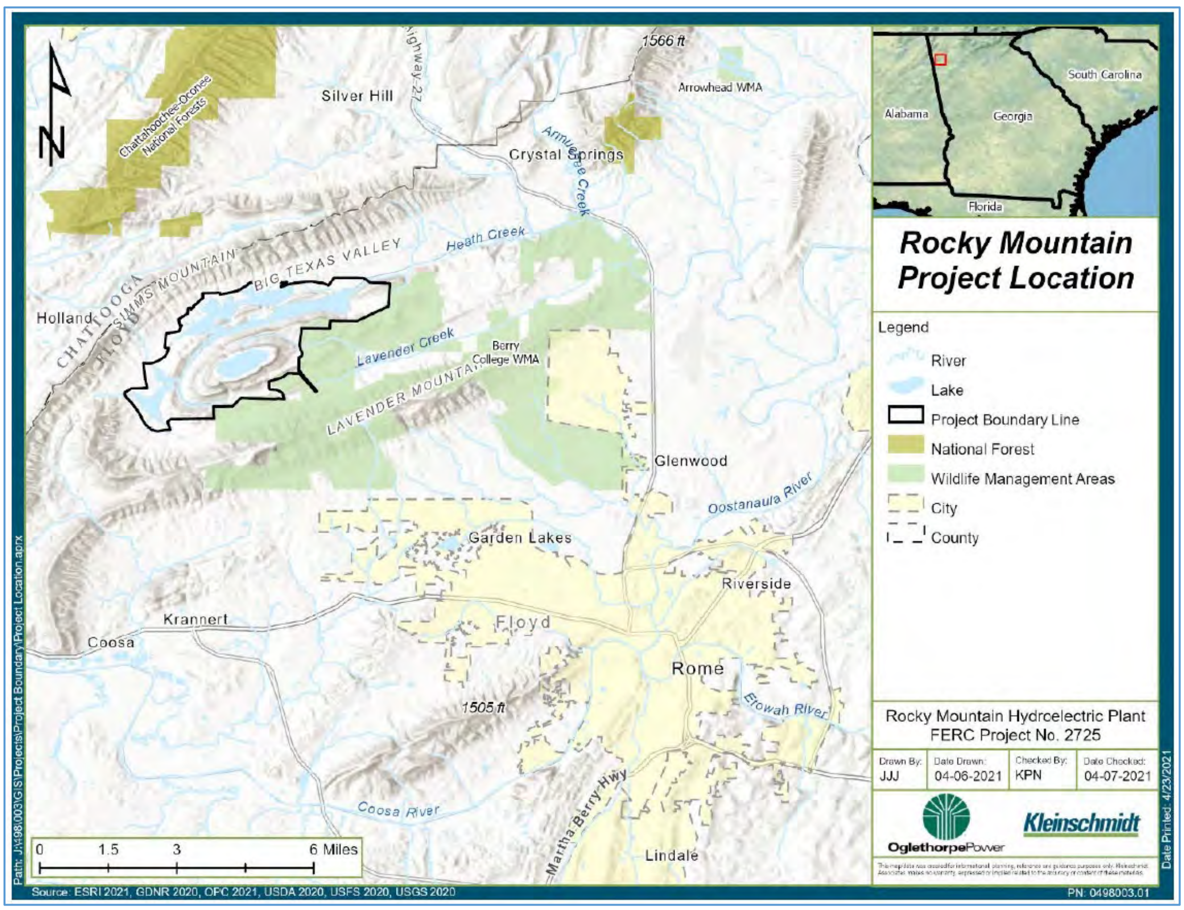

Figure 6: Topographic map showing project location, provided by OPC.

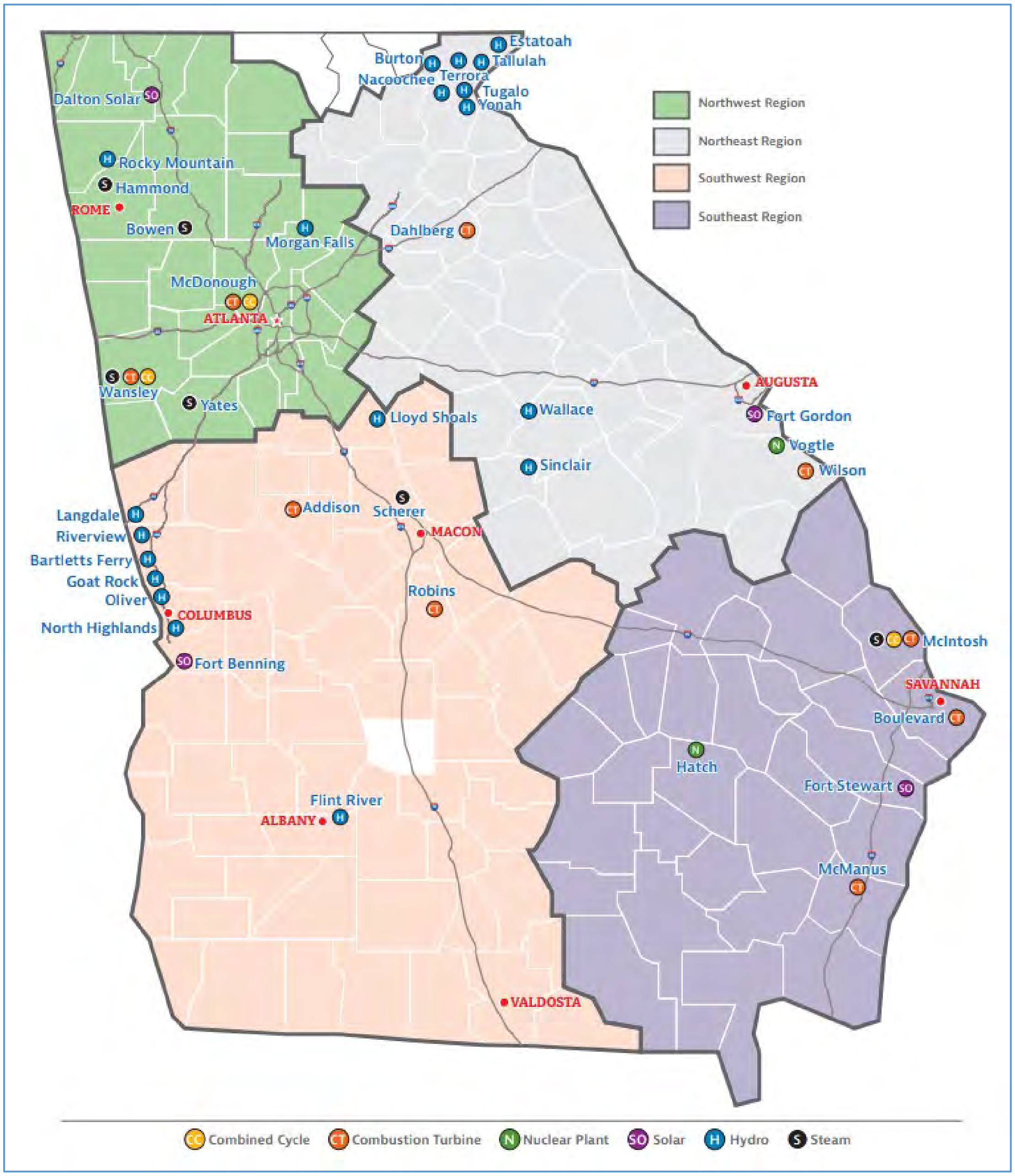

Figure 7: Map of GPC facilities and regions they serve (Source: Southern Power 2022).

GPC conducted engineering design work with Harza Engineering Company (Harza). Incorporated in 1920, Harza was founded by Leroy Francis Harza and Samuel Insull as a water resource development firm focused on dam and electrical power plant designs (Harza n.d.; Press 1996; Encyclopedia.com 2022). Notable projects completed at the onset of Harza's career included the design of the Dix Dam in Kentucky and the construction of numerous dams and power plants across America as part of the rural electrification program (Harza n.d.; Press 1996; Encyclopedia.com 2022). The company worked extensively in the U.S. and abroad including Iraq, Iran, and Venezuela until merging with Montgomery Watson in 2000 to become Montgomery Watson Harza (MWH), a corporation dedicated to creating global energy, utility, and environmental engineering (Harza n.d.; Press 1996; Encyclopedia.com 2022; MWH 2021). In 2016, Stantec acquired MWH as part of MWH Global (MWH 2021).

With its team in place, GPC began the construction of the Rocky Mountain Project. Located on 5,000 acres of land, the primary project facilities comprise 1,300-acres, with the remaining 3,700 available acreage used as public recreational space. The pumped storage facility functions similar to a battery, providing stored power to customers at times of high demand. In essence, when power demand is high, water drains down the water conduit from the Upper Reservoir through the penstocks and powerhouse turbines into the Lower Reservoir. The Project's water conduit consists of a concrete-lined vertical shaft 567 feet long and 35 feet in diameter; a 1,935-foot-long, 35-foot diameter, horizontal concrete lined tunnel; two horizontal concrete-lined bifurcations; three 19-foot-diameter reinforced concrete-lined penstock connections of varying lengths; and three steel-lined penstocks, each about 470 feet long and each starting with a 19-foot diameter and ending with a 10-foot, 8-inch diameter (OPC and Kleinschmidt Associates 2021). The water runs down the vertical shaft, and through the power tunnel, bifurcations, and penstocks before running through one of three reversible Francis type pump-turbines (Unit 1, Unit 2, Unit 3) each connected to a synchronous motor/generator. Figure 8 shows a drawing of the Rocky Mountain water passage profile between the intake/outlet structure in the Upper Reservoir and the powerhouseat the Lower Reservoir. According to OPC and Kleinschmidt (2021) in the Pre-Application Document,

> The pump-turbines and the motor-generator were manufactured by Hitachi, Ltd.… The water flows through the turbines, producing power, and is stored in the Lower Reservoir. The Project has an installed generating capacity of 904 MW at 650 ft best-gate net head and a dependable generating capacity of 851 MW at 613 ft best-gate net head. The maximum hydraulic (discharge) capacity of the powerhouse in generating mode at best gate is 18,086 cubic feet per second (cfs). (p. 3-6 and 3-7)

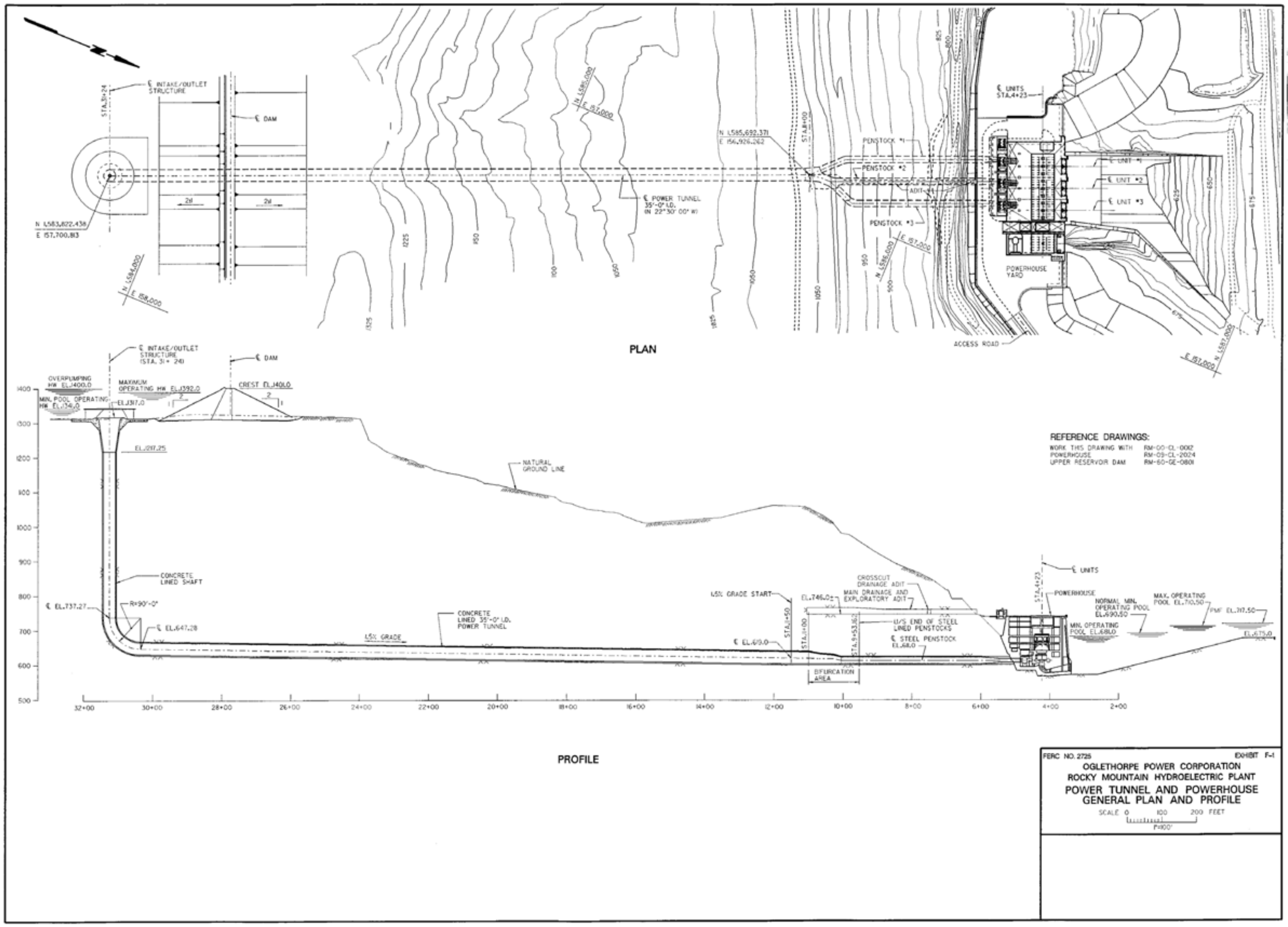

Figure 8. OPC Rocky Mountain Project Power Tunnel and Powerhouse General Plan and Profile, provided by OPC.

Power generated from the pump-turbines runs from the powerhouse transformers, along the transmission line to the substation, located 1.5-miles southwest of the powerhouse. At the substation, the generated power voltage is lowered before it is distributed to the power grid and then consumers. Conversely, power is taken from the grid and runs to the substation where the voltage level is increased for long-distance transmission and transmitted back to the powerhouse for industrial use (Figure 9). At night, when power demand is low, electricity is sent from the substation back through the generators, the turbines are reversed, and water is pumped back to the Upper Reservoir. The primary goal for the construction of the Project was to provide a boost to the local economy, increase tax revenue, enhance employment opportunities, and increase power generation without having to build multiple fossil-fuel energy plants (RNT 1975).

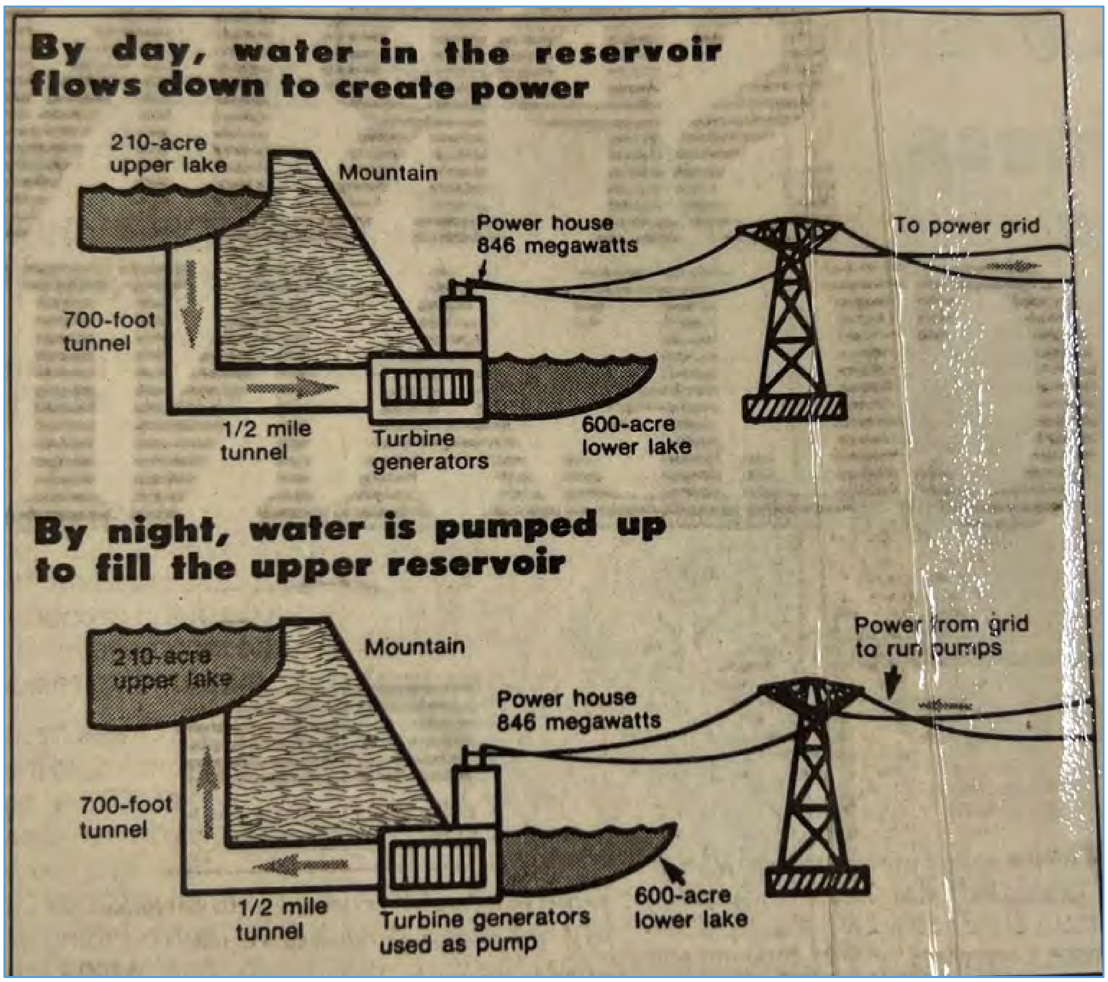

Figure 9: Diagram of power generation and distribution at the Rocky Mountain Project (Source: The Atlantic Journal and Constitution 1985).

Adjacent to the Lower Reservoir are two Auxiliary Pools that function practically and recreationally. According to OPC and Kleinschmidt (2021) in the Pre-Application Document, the primary purpose of the pools are to provide: (1) a total of 5,800 acre-ft of reserve storage for drought periods; (2) recreational opportunities concentrated at developed facilities; and (3) wildlife management and lower-density recreational use. (p. 3-6)

Auxiliary Pool I and II are maintained at a constant elevation of 715 feet above mean sea level. Both Auxiliary Pools are public recreational areas which are maintained by the Georgia Department of Natural Resources (GDNR) as part of the Rocky Mountain Recreation and Public Fishing Area (Rocky Mountain PFA). Additional information regarding the recreational areas is in Chapter 4 under the section, *Rocky Mountain Recreation.*

First Construction Period, 1978-1985

GPC launched plans in 1978 to construct the Rocky Mountain Project. Project plans for the facility included the development of 5,300 acres at an estimated cost of $72 million (RNT 1972, RNT 1980). Following approval from the regional office of FPC, GPC was permitted a construction date of October 15, 1978, and preliminary work began (GPC 1978). Building activities at the plant site began in October 1978 with land purchasing and land clearing of the construction office area (Figure 10). Prior to the construction of any dam facilities, exploratory work was completed to study the water, soils, and topography of the locations of each dam site. Devices used to complete this work included piezometers, inclinometers, weir readings and weather station readings. Along with environmental studies, land was cleared and graded, and access roads were established by survey crews.

Figure 10: Photo of worker fabricating the construction office slab forms, taken October 18, 1978 (Source: GPC 1978).

By 1979, GPC had acquired 5,495 acres of land for the Project and was continuing to relocate and demolish the buildings still extant on these purchased lands (GPC 1979). However, opposition from the local community and court filings posed a major obstacle during the Project's initial phases of construction. Newspapers across the state of Georgia documented the court proceedings between landowners and GPC, following claims the power company had exceeded its right to obtain property through eminent domain (David 1979; Rome New-Tribune 1979 and 1980). GPC ultimately prevailed in the state courts and the Georgia Supreme Court (Royal 1980). These court cases did not slow down the construction of the Project. By the end of 1979 and the beginning of 1980, underground construction of the power tunnel and the powerhouse had commenced (Figures 11). Land blasting, clearing, and grading continued at the site of each dam and the waste disposal area was established. Additionally, bore samples were being taken to test the soils at each dam site and reservoir site.

Figure 11: Workers shoring material supporting side walls of Powerhouse tunnel (Source: GPC 1979).

GPC reached their first milestone in 1981 when they completed the construction of the switching station. Additionally, the 790-foot elevation benchmark and all drainage ditches were completed for the powerhouse and the concrete helicopter pad was constructed (Figure 12) (GPC 1981). Soil testing, land clearing, excavation, and land grading continued around the multiple dam and reservoir sites. Between 1982 and 1985, work on the hydroelectric power plant consisted of bifurcation and penstock construction, drilling and soil testing, and site excavation (Figure 13).

Companies working for GPC included Al Johnson Construction Company, Purdy and Easter Electric Company, Chicago Bridge and Iron, Engineers International, J.O. Kendricks, Gilbert Corporation of Delaware, Stevens Brothers, and McDowell Construction Inc (GPC 1982). By the end of 1984, GPC had spent approximately $133.3 million on the hydroelectric plant with the Project reaching 15 percent completion (RNT 1985). GPC indefinitely halted work on the plant in 1985 and met with multiple utility companies to discuss the sale of part or all of the Project. After four years of negotiations, GPC reached a sale agreement on the Project. Ultimately, OPC purchased 74.61 percent of the Rocky Mountain Project and by 1989 construction was relaunched at the hydroelectric site.

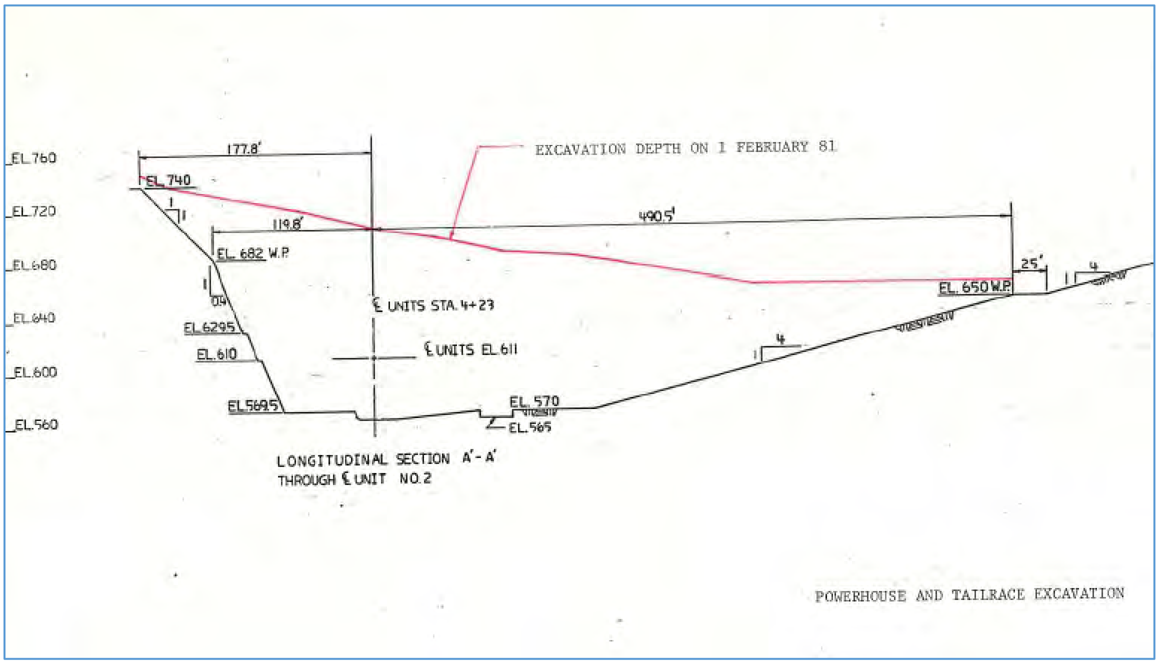

Figure 12: Elevation of Powerhouse and Tailrace Excavation progress in 1981 (Source: GPC 1981).

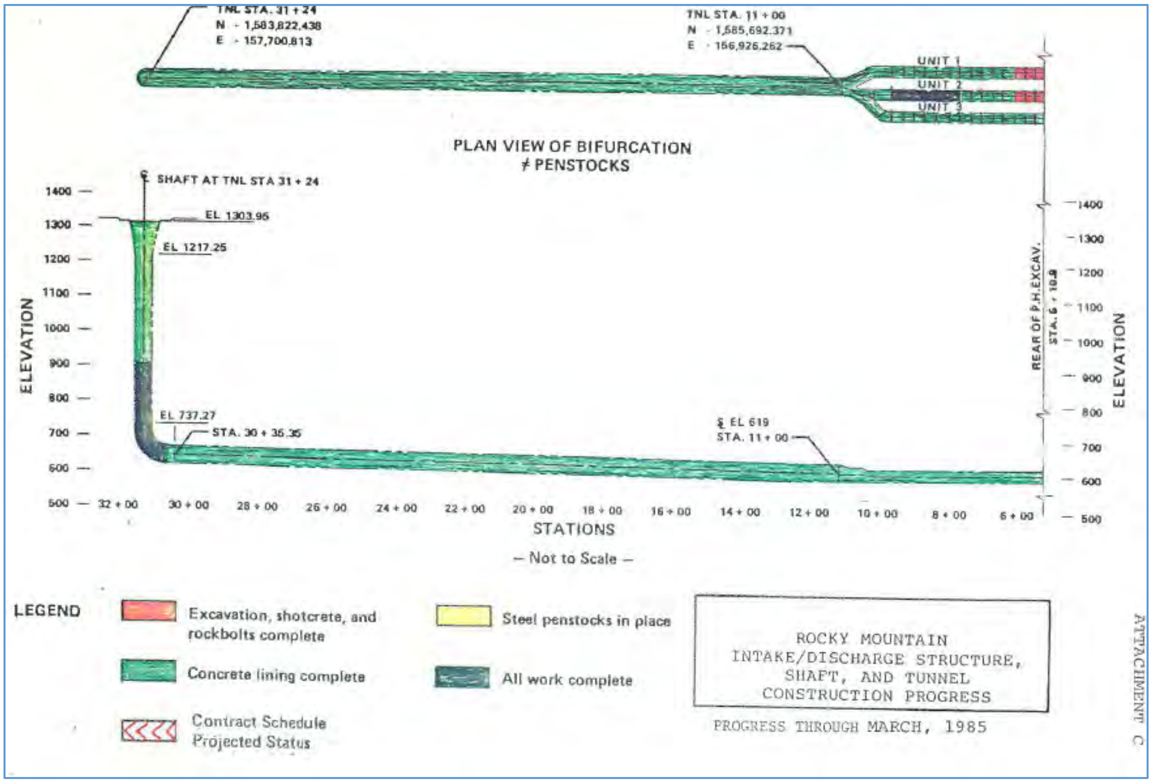

Figure 13: Construction progress of Power Tunnel bifurcation as of March 1985, before GPC halts construction on the Project (Source: GPC 1985).

Second Construction Period and Full Commercial Operation, 1985-1995

The first reference to OPC's purchase of the Project in the company construction archives is in the 1989 Annual Report. The report mentions personnel on site coming from OPC, Harza Engineering Company, Clement Brothers Company, and Boyles Brothers Drilling Company (OPC 1989). OPC's first undertaking as the primary owner of the Project consisted of taking stock of what aspects of work were completed by GPC and what was still in progress. Quickly, it was determined the excavation of each dam site, reservoirs, and powerhouse was still necessary before construction work could commence.

A majority of the construction work was completed by OPC between 1990 and 1993. OPC made steady progress each fiscal year on the construction of the Powerhouse, Main Dam and Spillway, the excavation and preparation of each auxiliary dam, and the excavation and fill activities for the Lower and Upper Reservoirs and the Auxiliary Pools (Figure 14). By the end of 1992, the Project was 68 percent complete.

The company's swift work led to the Project running ahead of schedule and projections of OPC completing construction with the plant on schedule for commercial operation by 1995 (Willis 1993). According to Jim Hobgood, OPC's community relations manager in 1993, "When the plant is in peak operation in 1995, the Rocky Mountain Project will create enough electric power to serve 290,000 homes" (Willis 1993). OPC was dedicated to reaching these goals by meeting onsite worker demands and recruiting and training the plant's operating staff prior to the 1995 commercial operating date (Willis 1993). According to the *Rome News-Tribune* (1993), OPC was averaging between 800 and 950 construction workers on site to increase speed of construction at the power plant. The final milestones to be completed before power generation included finishing construction of the Main Dam, Dam A, Dam D, the Lower and Upper Reservoirs, and the Powerhouse (Figure 15-20).

Figure 14: Construction progress of Powerhouse, view from Tailrace (Source: OPC 1992).

Figure 15: Construction progress of Dam A looking along centerline from left abutment (Source: OPC 1992).

Figure 16: Construction progress of Dam C looking north from right abutment (Source: OPC 1992).

Figure 17: View of Dam E from left abutment curing construction in 1992 (Source: OPC 1992).

Figure 18: Construction progress of Main Dam Spillway looking downstream (Source: OPC 1993).

Figure 19: Construction progress of the Powerhouse Generator Bay from the erection bay (Source: OPC 1994).

Figure 20: Construction progress of the Lower Reservoir in 1993 (Source: OPC 1993).

OPC successfully reached commercial operation with all three units fully operational on July 15, 1995 (OPC 1995). According to the 1995 *Construction Progress Report*, substantial work was completed to permit the impoundment of water in the Lower Reservoir by December 1, 1993, and July 1, 1994, for the Upper Reservoir. Efforts to meet the maximum water elevation for generation quickly followed. The first effort to pump water from the Lower Reservoir to the Upper Reservoir with Unit 3 was successful on February 19, 1995, granting Unit 3 a partial completion certificate on January 27, 1995, and becoming fully operational on April 13, 1995 (OPC 1995). Subsequently, Unit 2 and Unit 1 became fully operational on May 13, 1995, and July 15, 1995, respectively (OPC 1995).

The construction of the Rocky Mountain Project took significantly longer and was far more costly than originally planned in the 1970s. The plant's completion in 1995 added a hydroelectric generation source to the OPC and GPC networks during a time of ongoing population growth and rising demand for electricity. In 2005, OPC and GPC filed a license amendment application with FERC to upgrade the Rocky Mountain turbines (Marr 2005). According to the submitted application, although the plant had only been in commercial operation for 10 years, the turbines themselves were almost 20 years old. The replacement of the turbines would not only increase efficiency but would also increase generating capacity by approximately 70 MW (Marr 2005). After completing National Environmental Policy Act review of OPC's application, FERC granted approval for the license amendment and the turbines were replaced in 2007 (Figure 21). Apart from the turbines, the Project has undergone no other major structural or mechanical alterations.

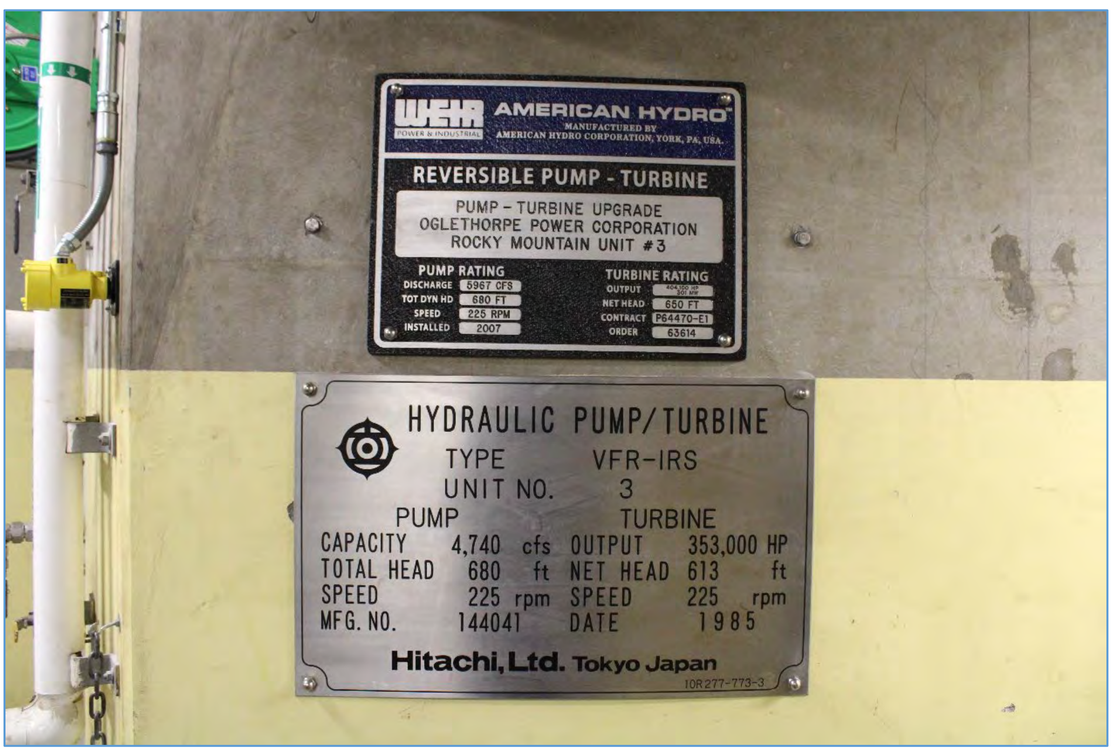

Figure 21: Turbine Operational Rating Markers located outside the turbine pit shaft.

4. Survey Results

TRC conducted the architectural survey of the Rocky Mountain Project in October 2022. This study included background research and the photographic documentation of the Rocky Mountain powerhouse, control buildings, two reservoirs, two auxiliary pools, switchyard and substation, 230-kilovolt (kV) transmission line, support buildings, and the ancillary recreation areas within the Rocky Mountain PFA. The assessment of both interior and exterior spaces revealed that the Project is in excellent condition and has not undergone any major structural alterations since its completion in 1995. The following chapter provides architectural descriptions and photographs of the surveyed resources at the Rocky Mountain Project. Figure 22 is an aerial map showing the FERC project boundary, which coincides with and encompasses the APE, and the locations of surveyed resources within the APE.

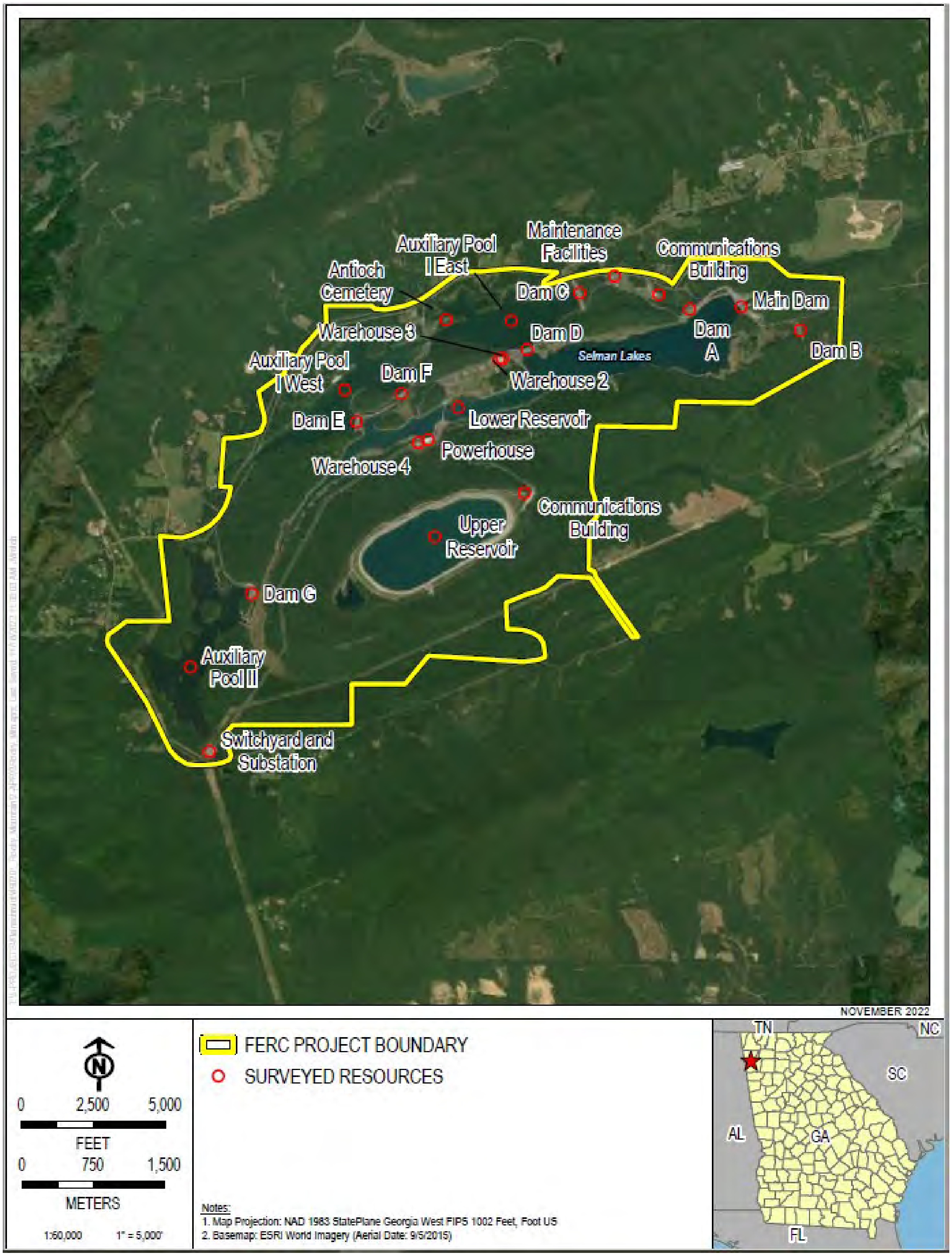

Figure 22: Aerial map showing Project APE (FERC Boundary) and surveyed resources.

Rocky Mountain Project Facility Descriptions

Powerhouse

The exterior of the powerhouse is divided into three sections: the main facility, the backup diesel generator, and the transformers. Connecting these three sections is a poured concrete and metal deck. Designed like a steamboat, the portion of the main facility above ground is a small one-story rectangular building clad in textured concrete panels with a flat concrete roof decorated with a faux smokestack and wheelhouse (Figures 23-25). Oriented northeast, the façade of the powerhouse is recessed and pierced with a double-leaf doorway filled with single-light and metal doors surrounded by single-light metal sashes. The northwest elevation contains a secondary pedestrian entrance filled with a single-leaf doorway and stationary single-light and metal sash windows. The southeast elevation is pierced by a pair of three-panel ribbon windows with metal sashes. Adjacent to the southwest elevation is a steel frame crane that travels on a track along the deck to move materials and equipment in and out of the main facility for maintenance, see Figure 23. There is a one-story, one-room concrete clad building approximately 100 feet north of the main structure that houses a backup diesel generator (Figure 26). There are four transformers 41 feet southeast of the main lobby; three of the transformers connect to a generating unit located below the main floor (Figure 27 and Figure 28). The fourth transformer is a backup unit and not currently in operation. The interior of the main lobby includes a front desk, waiting area, bathrooms, and access to stairs and an elevator. The elevator descends to an elevation of 570 feet, approximately 7 floors, and provides entry to the remainder of the powerhouse. Construction of the powerhouse was completed in 1994 (OPC 1995).

The seven stories of the powerhouse below ground consist of the turbines, the generator bays, control room, a full-service maintenance shop, office space, storage space, break rooms and restrooms. The powerhouse contains three vertical shaft reversible Francis type pump-turbines (Unit 1, 2, 3) each connected to a synchronous generator. The pump-turbines and motor generators were manufactured by Hitachi, Ltd. The Project currently has a total installed generating capacity of 904 MW at 650 feet best-gate net head and a dependable generating capacity of 851 MW at 613 feet best-gate net head. The powerhouse has a maximum hydraulic capacity of 18,086 cfs. All three turbines became fully operational in 1995 (OPC 1995). Figure 29 through Figure 40 are photographs of the various components and machines located in the powerhouse. The control room inside the powerhouse contains multiple monitors, gauges and equipment, maps, and office space that are all essential in monitoring and controlling the various powerhouse components.

Figure 23: Northwest elevation of the main lobby and steel crane, looking south.

Figure 24: Northeast facade of main lobby, looking west.

Figure 25: Southeast elevation of main lobby, looking north.

Figure 26: Southeast and northeast elevation of building storing back up diesel generator, looking northwest.

Figure 27: Overview of four transformers, looking west.

Figure 28: Transformer connected to Unit 2 generator and turbine, looking north.

Figure 29: Valve gallery and valve gallery crane.

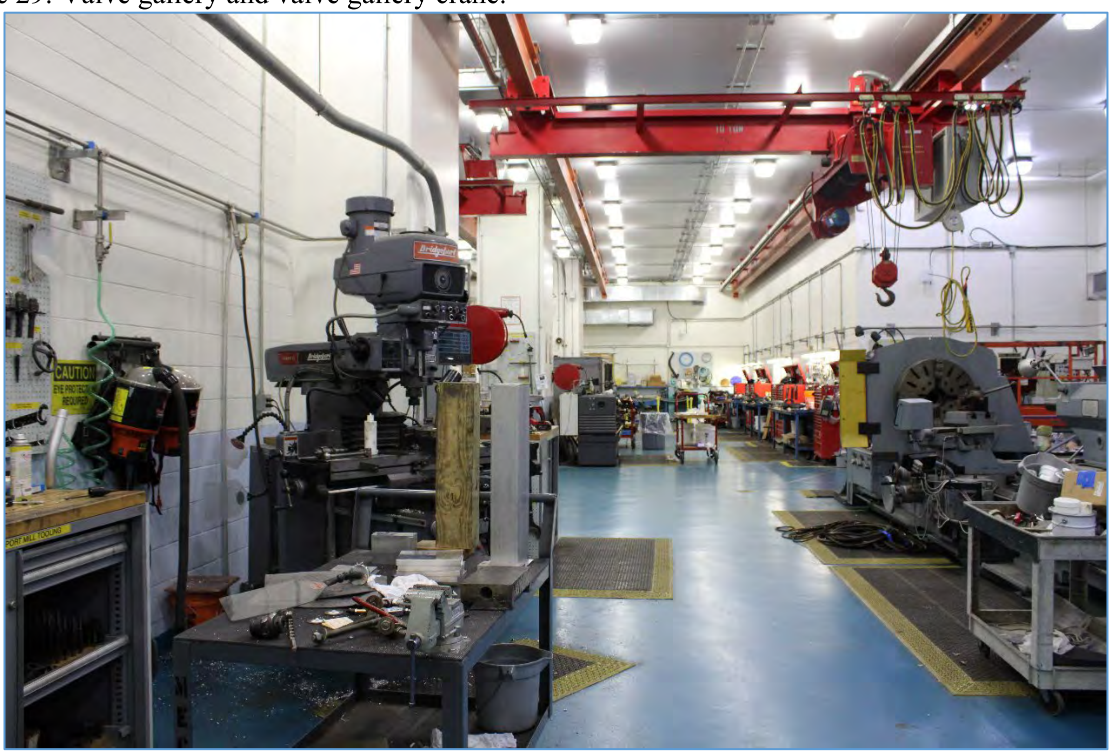
Figure 30: In-house machine maintenance shop.

Figure 31: Primary and backup fire water system.

Figure 32: In-house substation that provides power to generators.


Figure 33: Governor Actuator Cabinet.

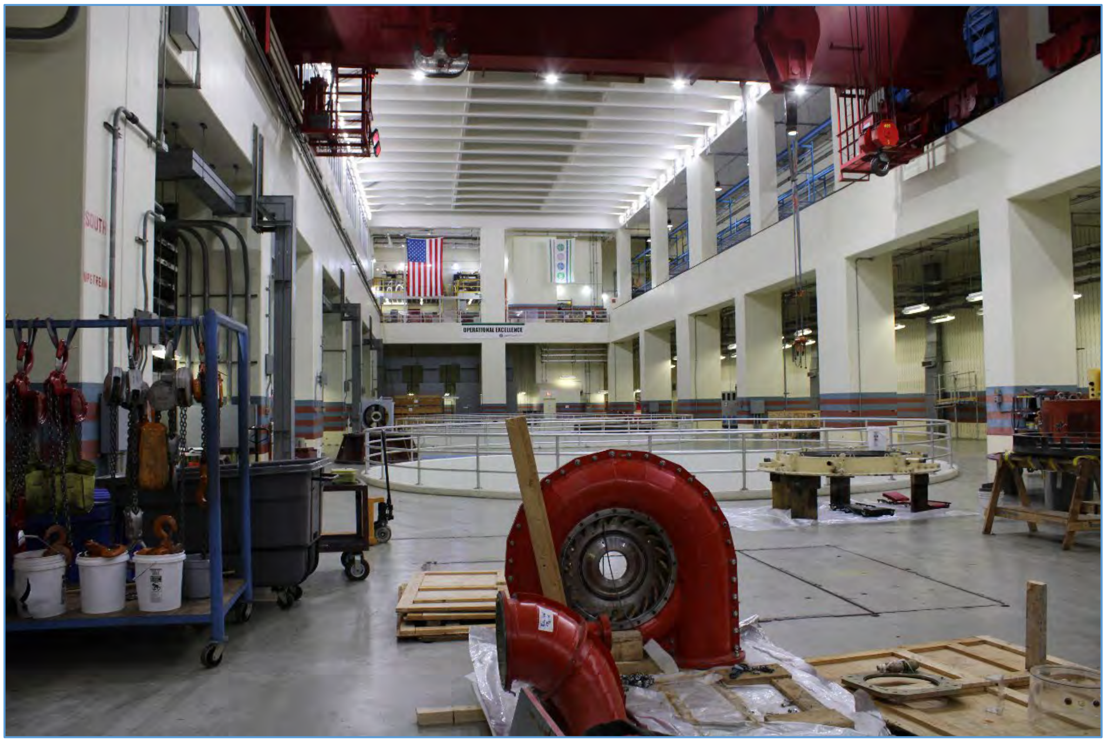
Figure 34: Overview of generator bay.


Figure 35: Top of Unit 2 and Unit 3 generator.

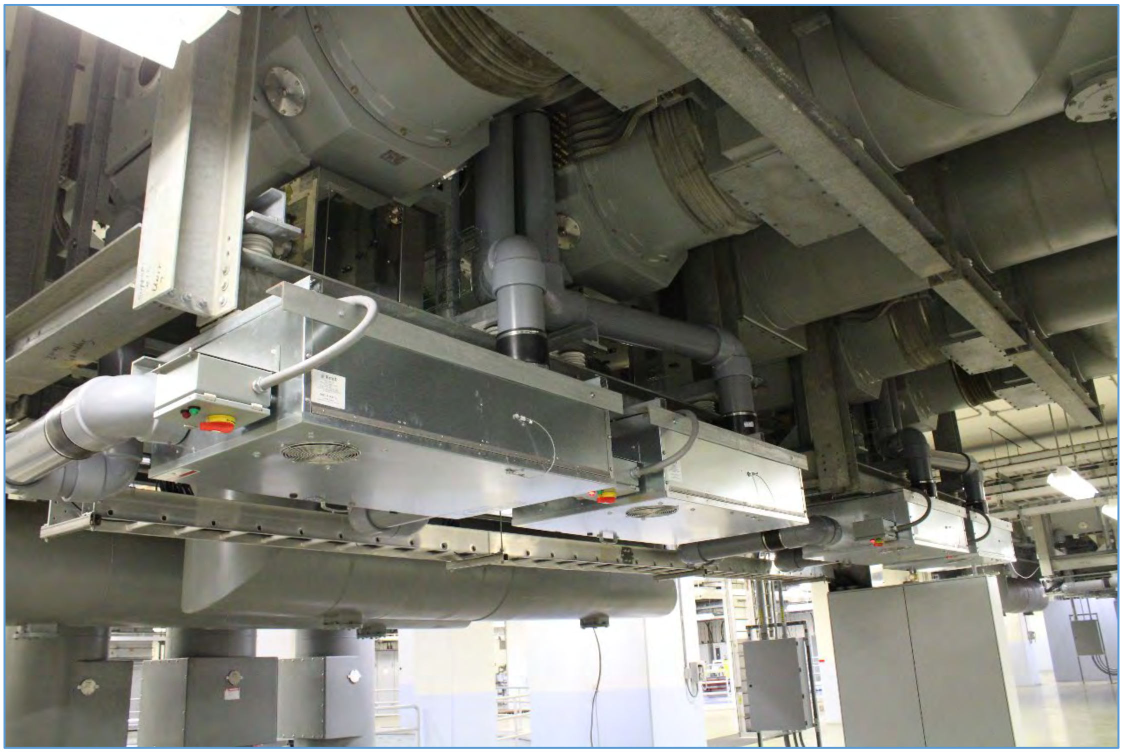
Figure 36: Phase reversal switch for individual unit. Used to switch the direction the turbine is moving.

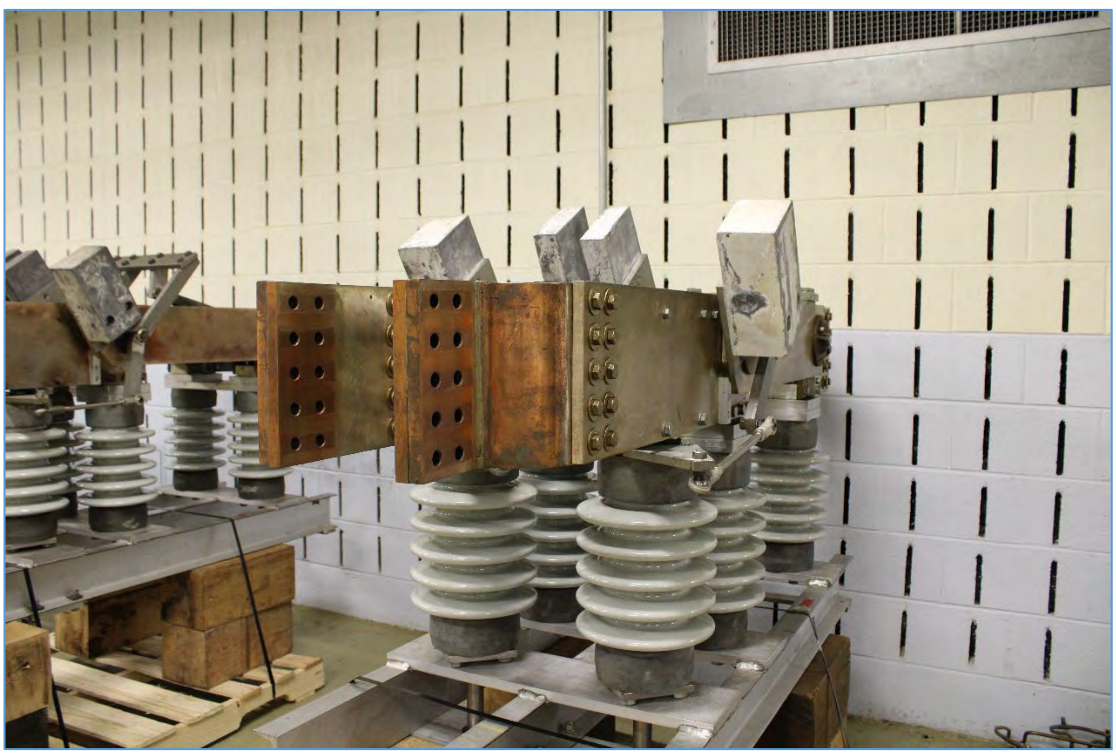
Figure 37: Old phase reversal switch.

Figure 38: Inlet valve of Unit 3. Water flows through inlet valve before entering the turbine.


Figure 39: Turbine Pit Shaft.


Figure 40: Interior of the Francis-type turbine.

Upper Reservoir

Located on top of Rock Mountain, the Upper Reservoir is formed by a 120-feet high, 12,895-feet long rockfill dam (Figure 41-43). The reservoir covers 221 acres and contains 10,650 acre-feet of gross storage. Its normal maximum pool elevation is 1,392 feet above mean sea level. A one-lane gravel vehicular drive surrounds the perimeter of the reservoir. Located on the southeast elevation of the of the Upper Reservoir is a gravel and formed concrete over-pump spillway. Water overflow would run down the spillway to be recycled back into the Lower Reservoir. Construction of the Upper Reservoir was completed on July 1, 1994 (OPC 1995). There has not been an overflow incident from the Upper Reservoir since its completion in 1994.

Figure 41: View of Upper Reservoir, rockfill dam, and gravel drive surrounding the reservoir, looking southwest.

Figure 42: Overview of over-pump spillway and Upper Reservoir, looking northeast.


Figure 43: Gravel and formed concrete over-pump spillway, looking east.

Lower Reservoir

The Lower Reservoir is formed by three dams: the Main Dam, Dam A, and Dam B. The reservoir covers 600 acres and contains 18,800 acre-feet of gross storage (Figure 44 and Figure 45). Its normal maximum pool elevation is 710.5 feet above mean sea level. Construction of the Lower Reservoir was completed in December 1993 (OPC 1995).

Figure 44: Lower Reservoir, looking southwest.

Figure 45: Concrete boat ramp located adjacent to Dam D, looking west.

Main Dam and Spillway

Oriented southwest towards the powerhouse, the Main Dam is the largest dam in the APE at 120 feet high and 942 feet in length (Figure 46-49). The dam is a cast concrete structure and contains an earth and rockfill embankment with an impervious core. Associated with the Main Dam is a formed concrete gated spillway with two Tainter gates, 10-inch and 40-inch jet flow gates, a minimum flow outlet and south abutment cut off structure, a flume at the base of the spillway, and a concrete boat ramp. If the Lower Reservoir exceeds the maximum pool elevation, the spillway gate would be manually opened to allow water to drain from the Lower Reservoir into the retention area adjacent to the northeast elevation of the Main Dam. Construction of the Main Dam and Spillway were completed in 1994 (OPC 1994).

The Main Dam control building is a one-story, two room, flat roof building clad in formed concrete siding and rests on a concrete slab foundation (Figures 50-52). The southwest façade is pierced by three double-leaf entryways and a ribbon of metal sash stationary windows. The southeast elevation features a metal vent and exterior metal stairs extending from the ground level to the roof. The northeast elevation contains a metal vent and a ribbon of metal sash stationary windows. The northwest elevation features a ribbon of metal sash stationary windows. The first interior room of the building contains a back-up diesel generator, used if the powerhouse facility goes offline. The second interior room contain electric panels that control the Main Dam gates, water pressure, pumping system, and oil reserves.

Figure 46: View of the Main Dam, control building, spillway, and flume looking southwest.

Figure 47: View of spillway and two Tainter gates and control building at Main Dam, looking west.

Figure 48: Minimum flow outlet at base of spillway at the Main Dam.

Figure 49: Photo looking down into spillway.

Figure 50: Southwest facade and southeast elevation of Main Dam control building, looking northeast.

Figure 51: Diesel powered back-up generator in control building of Main Dam.

Figure 52: Control panels inside control building of Main Dam.

Dam A

During preliminary planning, the location of Dam A was originally the location of the Main Dam and Spillway. Following site testing and investigation, it was determined the soil and rock components in the area were not suitable for the Main Dam construction. Subsequently, the Main Dam and Spillway were relocated approximately 1,795 feet east (downstream) of its originally planned location.

Oriented southeast toward the Lower Reservoir, Dam A is an earth and rockfill structure with an impervious core (Figure 53 and Figure 54). The dam is 70 feet high and 1,260 feet in length. A gravel vehicular lane extends along the top of the dam. Located at the base of the dam are concrete and metal flumes used to monitor the water seepage from the dam. Construction of Dam A was completed in 1994 (OPC 1994).

Figure 53: Overview of Dam A, looking west from the Main Dam.


Figure 54: Base of Dam A at the southwest corner looking up.

Dam B

Oriented southwest toward the Lower Reservoir, Dam B is used as flood security for property east of the Lower Reservoir. Dam B is an earthfill structure (Figure 55 and Figure 56). The dam is 10 feet high and 690 feet in length. A rock and gravel vehicular lane extends along the top of the dam. Construction of Dam B was completed between 1991 and 1992 (OPC 1991; OPC1992).

Figure 55: East side of Dam B, looking southeast.

Figure 56: Rock vehicular lane along top of Dam B, looking south.

Dam C

Oriented southwest towards the powerhouse, Dam C is an earth and rockfill structure (Figure 57). The dam is 65 feet high and 1,024 feet in length. Dam C is bounded by Auxiliary Pool I East to the southwest and a dense forested area to the northeast. A rock and gravel vehicular lane extends along the top of the dam. Construction of Dam C was completed in 1993 (OPC 1993).

Figure 57: Overview of Dam C from the top of Dam D, looking northeast.

Dam D

Dam D is bounded by Auxiliary Pool I East on the northwest and the Lower Reservoir to the southeast. The dam is an earth and rockfill structure and stands at 20 feet high and 775 feet in length (Figure 58 and Figure 59). A two-lane asphalt vehicular road extends along the top of the dam. Located at the northeast corner of the dam and extending into the Auxiliary Pool I East is an outlet works. The outlet works structure is a closed conduit under or through a dam for controlled discharge of the water retained by the dam. Construction of Dam D was completed in 1994 (OPC 1994).

Figure 58: Northwest elevation of Dam D and abutting Auxiliary Pool I East, looking southwest.

Figure 59: Outlet works extending from Dam D, looking north.

Dam E

Oriented southeast towards the powerhouse, Dam E is bounded by Auxiliary Pool I West on the northwest and the Lower reservoir to the southeast (Figure 60). The dam is an earth and rockfill structure and stands 50 feet high and 405 feet in length. A two-lane asphalt vehicular road extends along the top of the dam. Construction of Dam E was completed in 1993 (OPC 1993).

Figure 60: Overview of Dam E overlooking Auxiliary Pool I West, looking southeast from beach area.

Dam F

Oriented southeast towards the powerhouse, Dam F is bounded by Auxiliary Pool I West on the northwest and the Lower Reservoir to the southeast. The dam is an earth and rockfill structure and stands 50 feet high and 405 feet in length (Figure 61 and Figure 62). A two-lane asphalt vehicular road extends along the top of the dam. Construction of Dam F was completed in 1993 (OPC 1993).

Figure 61: Two-lane vehicular road on top of Dam F, looking south.

Figure 62: Rockfill on northwest elevation of Dam F adjacent to Auxiliary Pool I West, looking south.

Dam G

Dam G is bounded by Heath Lake to the west and southwest and a dense forested area to the north, east, and south. The dam is an earth and rockfill structure with a height of 30 feet and a length of 405 feet (Figure 63-66). A two-lane asphalt vehicular road extends along the top of the dam. Approximately 790 feet south of Dam G is a formed concrete spillway with a metal frame and wood plank bridge. Overflow from the Heath Lake spills into the adjacent property southeast of the spillway. Approximately 690 feet southwest of Dam G is a low-level outlet works. Construction of Dam G was completed in 1993 (OPC 1993).

Figure 63: Overview of Dam G, looking east from Heath Lake public parking area.

Figure 64: Northwest elevation of Dam G adjacent to Heath Lake, looking south.

Figure 65: Formed concrete spillway at Auxiliary Pool II (Heath Lake), looking south.


Figure 66: Low-level outlet works extending into Auxiliary Pool II (Heath Lake), looking west.

Auxiliary Pools

Auxiliary Pool I, also known as Antioch Lake, is divided into two sections, east and west (Figure 67 and Figure 68). Auxiliary Pool I covers 400 acres and is contained by an ungated spillway and four dams: Dam D, Dam C, Dam E, and Dam F. Construction of Auxiliary Pool I was completed in 1993 (OPC 1993).

Auxiliary Pool II, also known as Heath Lake, covers 200 acres and is contained by Dam G (Figure 69). South of Dam G on the east side of Heath Lake is an ungated, formed concrete spillway with a low-level outlet works. Construction of Auxiliary Pool II was completed in 1993 (OPC 1993).

Figure 67: Overview of Auxiliary Pool I (Antioch Lake), looking southwest.


Figure 68: Overview of Auxiliary Pool I (Antioch Lake), looking south.


Figure 69: Overview of Auxiliary Pool II (Heath Lake), looking southwest.

Substation and Transmission Line

Approximately 1.5 miles southwest of the powerhouse is a dual transmission and distribution substation (Figures 70-74). Enclosed in a barbed wire fence, the substation consists of switchgears, power transformers, protection, control, and monitoring equipment, and lightning arrestors. The substation is composed of three components, the primary system, secondary system, and auxiliary supply system. The primary system includes all equipment in service during the nominal voltage system. The secondary system includes all the control, protection, measurement, and monitoring equipment. Lastly, the auxiliary supply system is all equipment that enables the protection, control, measurement, and monitoring equipment to function. At the northeast corner of the switchyard is a control building clad in vertical synthetic exterior siding and a metal gabled roof resting on a poured concrete foundation. Interior access to the substation was prohibited at the time of the survey. There are three 230-kV transmission lines extending along the 1.5-mile corridor between the substation and powerhouse. Construction of the Switchyard was completed in 1981 (GPC 1981).

Figure 70: Overview of substation, looking northwest.

Figure 71: Overview of substation, looking northeast.

Figure 72: Lightening arrestor in substation.

Figure 73: Control building at northeast corner of substation, looking northeast.

Figure 74: Primary Transmission line extending between the powerhouse transformers and substation, looking west.

Other Support Buildings

Communications Buildings

There are two communications buildings located within the APE. One building is located adjacent to the northwest side of the Upper Reservoir; the second communications building is approximately 1,150 feet northeast of Dam A (Figures 75-78). Of concrete block construction, both buildings have a metal clad hip roof with moderate overhang and rest on a poured concrete slab. Fenestration includes single-light, stationary wood sash windows. The interior of each building contains two rooms. One room has a back-up diesel generator; the second room contains various electrical and radio equipment. Associated with each building is a steel frame radio tower enclosed in a chain link and barbed wire fence.

Figure 75: Communications Building located 1,150 feet northeast from Dam A, looking northeast.

Figure 76: Communications building adjacent to Upper Reservoir, looking northeast.

Figure 77: Back-up diesel generator located in communications buildings.

Figure 78: Radio tower at communications building adjacent to Upper Reservoir.

Maintenance Facilities

Approximately 1,265 feet northeast of Dam C are a group of maintenance buildings used by GDNR and OPC. Building One is used for vehicle maintenance. The building is clad in transition metal and rests on a poured concrete slab. The north elevation features a partial-length gable overhang supported by square steel beams (Figure 79). Building Two a side-gable frame shed. Oriented south, the façade of the building is open with four vehicular bays. The roof is clad in metal and the exterior has plywood siding (Figure 80). Building Three features a metal clad side gabled roof with transition metal exterior siding resting on a poured concrete slab foundation (Figure 81). Fenestration includes sliding track metal sash windows. Oriented north, the façade features one metal pedestrian entrance and one meal vehicular bay. Directly adjacent to the façade of the building is a prefabricated frame shed with a gable metal roof clad in metal and a metal frame carport (Figure 82).

Figure 79: West and south elevation of Building One, looking northeast.

Figure 80: South façade and east elevation of Building Two, looking north.


Figure 81: North façade of Building Three, looking south.


Figure 82: Metal carport adjacent to north façade of Building Three, looking southeast.

There are four frame storage sheds located centrally between the three main buildings (Figure 83). Of frame construction, each open bay shed has a gable roof clad in metal and rests on a poured concrete slab foundation.

Figure 83: Open storage sheds east of Building One and south of Building Two, looking northeast.

Adjacent to the open bay sheds is a vacant, one-room stone building (Figure 84). Oriented north, the building has a replacement gabled roof clad in metal. The façade features a vertical wood plank door; the south elevation is pierced by a replacement stationary four-light vinyl sash window. The door was nailed shut and access was not possible at the time of the survey.

Figure 84: North façade of vacant stone building, looking southeast.

Warehouse 2

Approximately 800 feet southwest of the Dam D is Warehouse 2 (Figure 85 and Figure 86). The one room building has a front gable roof clad in metal with transition metal siding. The southeast façade features three vehicular bays. Warehouse 2 is used for storage.

Figure 85: Southeast facade and northeast elevation of Warehouse 2, looking northwest.

Figure 86: Interior of Warehouse 2.

Warehouse 3

Approximately 660 feet southwest of the Dam D is Warehouse 3 (Figure 87 and Figure 88). The one room building has a front gable roof clad in metal with transition metal siding. The southeast façade features three vehicular bays. Warehouse 3 is used for storage.

Figure 87: Southwest and southeast facade of Warehouse 3, looking northeast.

Figure 88: Interior of Warehouse 3.

Warehouse 4

Approximately 140 feet west of the Powerhouse is Warehouse 4 (Figure 89). This building has a salt-box roof clad in metal with transition metal siding and rests on a poured concrete slab foundation. The southeast façade features one vehicular bay; the southwest façade has a shed partial-length shed roof addition.

Figure 89: Southeast facade of Warehouse 4, looking northwest.

Rocky Mountain Recreation

Approximately 3,700 acres of land and water within the APE, centered primarily around the Auxiliary Pools and outside of the project works, are managed by GDNR as the Rocky Mountain PFA. OPC and GDNR entered into a Memorandum of Agreement in 1997 through which OPC provides funding to GDNR to manage the recreation, fish, and wildlife resources, including the project recreation facilities. All project recreation facilities were built after 1997 and are less than 50 years in age. OPC prohibits recreational use on the Project’s Upper and Lower Reservoirs and their shorelines due to public safety concerns.

Recreation facilities managed by GDNR include a swimming beach with a sand beach, bathhouse, and restrooms; a large picnic area with group shelter, tables, and grills; concrete boat launches on the Auxiliary Pools and associated docks; parking; picnic areas; restrooms; playground; a family campground with RV and tent sites and a comfort station; a sanitary dump facility; a group camping area with parking, walk-in tent sites, and a picnic shelter; hiking and biking trails; and the Visitor Center at the main entrance to the Project. (Figures 90-97). While the Auxiliary Pool I, east and west, are open year-round, Auxiliary Pool II (Heath Lake) is only open the first 10 days of every month for largemouth bass trophy fishing. The Auxiliary Pool I (Antioch Lake) West campground map is presented in Figure 98; public recreation facilities are represented in Figure 99.

Figure 90: Public beach located on northwest shoreline of Auxiliary Pool I (Antioch Lake) West, looking southeast.

Figure 91: Picnic area with tables, benches, and grills adjacent to Auxiliary Pool I (Antioch Lake) West, looking northeast.

Figure 92: RV Parking Spot with connected picnic area in Auxiliary Pool I (Antioch Lake) West RV Park, looking northwest.

Figure 93: Tent only camp site at Auxiliary Pool I (Antioch Lake) West, looking southeast.

Figure 94: Playground at Auxiliary Pool I (Antioch Lake) West, looking north.

Figure 95: Restroom and shower facility in in Auxiliary Pool I (Antioch Lake) West RV Park, looking northwest.

Figure 96: Pit toilet at Auxiliary Pool II (Heath Lake), looking southeast.

Figure 97: Boat dock and fishing dock at Auxiliary Pool II (Heath Lake), looking southwest.

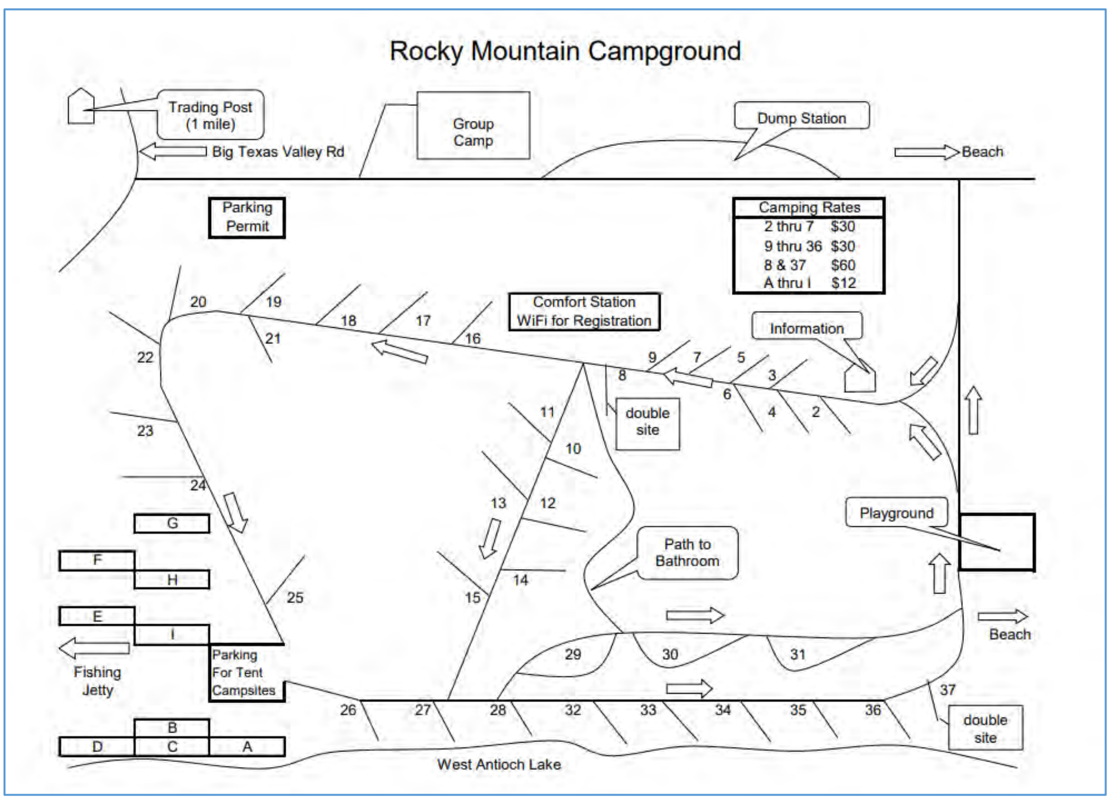

Figure 98: RV and tent Camp Site adjacent to Auxiliary Pool I (Antioch Lake) West managed by GDNR (Source: GDNR 2022).

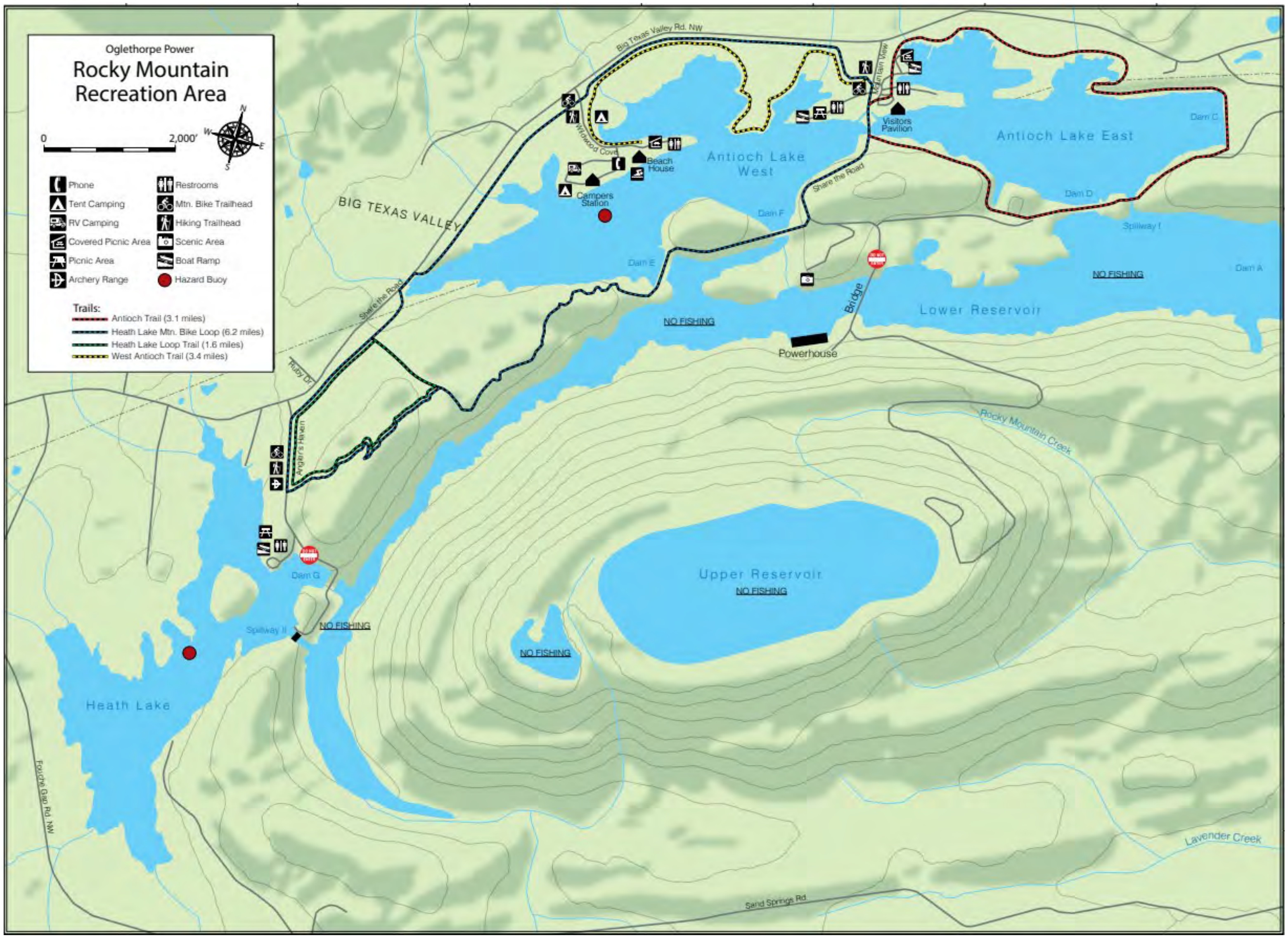

Figure 99: Rocky Mountain Recreation Area managed by GDNR (Source: GDNR 2022).

Visitor Center

Located at the main entrance of the Project on the northwest shoreline of Auxiliary Pool I (Antioch Lake) East is the Rocky Mountain Visitor Center. On the property is an original Pump Turbine, public restrooms, the Walter W. Harris Dam monument, the Cargle/Cordle Store, and interpretive signs explaining the history and various functions of the Rocky Mountain Project.

The Francis-type reversible pump turbine impeller was relocated to the Visitor Center in 2011. The 72-ton stainless steel turbine was manufactured in 1984 by Hitachi Ltd. and has more than 57,000 hours of service (Figure 100). The turbine had a capacity to produce 283 MW of power and consume 315 MW pumping and had a water flow rate of more than 5,700 cfs.

Figure 100: Francis-type reversible pump-turbine impeller located at the Visitor Center, looking west.

Approximately 100 feet southeast of the turbine is a public restroom with an attached open-air annex (Figures 101-103). The L-shaped building has a monitor-style roof clad in metal with stone veneer exterior siding. Each gable face is pierced by two single-light fixed windows and is clad in plywood panel siding. A gabled, one room addition extends from the northeast elevation of the building. The annex features interpretive posters describing the hydroelectric plant, the recreation area, and OPC.

Figure 101: Northwest façade of open annex attached to public bathroom at Visitor Center, looking southeast.

Figure 102: Northeast and northwest facade of public bathroom at Visitor Center, looking southwest.

Figure 103: Interpretive posters inside annex.

Approximately 110 feet northeast of the restrooms and annex is the Walter W. Harrison Dam monument (Figure 104). This stone slab features two plaques commemorating the Tallassee Shoals Hydroelectric Project, OPC's first hydroelectric project, which was completed October 13, 1986. Mentioned on the plaque are OPC's staff and board of directors at the time of the Walter Dam construction.

Figure 104: Walter W. Harrison Dam monument, looking southeast.

Approximately 335 feet northeast of the turbine is the Cargle/Cordle Store (Figures 105-107). Constructed in 1844 and moved to this location in the mid-1990s, the local general store was owned and operated by Rev. Will Cordle at the corner of Old Fouche Gap Road and Big Texas Valley Road until it was relocated following a land purchase for the Rocky Mountain plant development. Oriented southwest, the one room store is one-and-a-half-stories and rests on a reconstructed concrete block and stone pier foundation. The building has a metal gabled roof with gabled returns and board and batten exterior siding. The façade is pierced by one pedestrian entrance. The rear elevation contains one pedestrian entrance flanked by two window bays. The windows do not contain any window sashes and are covered by wood plank shutters. The half story is pierced by a hay loft door that was added after the store closed in 1942.

Figure 105: Southwest facade and southeast elevation of Cargle/Cordle general store, looking northeast.

Figure 106: Southeast elevation and northeast rear elevation of Cargle/Cordle general store, looking northwest.

Figure 107: Interior of Cargle/Cordle general store, looking southwest.

Old Antioch Cemetery

The Old Antioch Cemetery is located northeast of the Visitor Center (Figures 108-112). The cemetery was used by the local community prior to the land purchase for the Rocky Mountain Project. The earliest plots found date to the nineteenth century, while the cemetery also exhibits freshly turned dirt from recent interment. Grave markers present include vertical stone slabs and large horizontal stone ledgers. Multiple element markers include tab-and-slot markers, multiple elements secured with spacers and epoxy, stacked base markers, obelisks, and box tombs. The cemetery grounds are secured in a barbed-wire fence and are well maintained. Fresh flowers are present at many of the grave sites.

Figure 108: Overview of Old Antioch Cemetery, looking southeast.

Figure 109: Overview of Old Antioch Cemetery, looking northeast.


Figure 110: Photo of recent interment identified with small sign until formal grave marker is placed, looking southwest.


Figure 111: Broken box tomb in Old Antioch Cemetery, looking west.


Figure 112: Gentry family plots at Old Antioch Cemetery, looking west.

Integrity

In 2005, the Federal Regulation Commission approved the removal and replacement of one turbine at the Rocky Mountain Project. Turbine replacement is a necessary requirement to keep the powerhouse equipment running efficiently and to meet expended generating capacity demands. At the time OPC and GPC submitted the application for replacement, the turbines were close to 20 years old. Apart from the turbines, the Project has undergone no major structural or mechanical alterations. The major structural portions of each dam remain unaltered, including the earth dam abutments, spillways, outlet works, headworks, powerhouse, and non-overflow sections. The spillway Tainter gates, powerhouse crane and tracks, penstocks, in-house substation, electrical and power equipment, reservoirs, and auxiliary pools, and substation and primary transmission line have not been significantly altered. Similarly, the powerhouse structure and main dam control building retain their original design, floor plan, and finishes.

5. NRHP Evaluation

This architectural survey and evaluation of the Rocky Mountain Project was conducted as part of the FERC relicensing process and provides a historic context of the pumped storage facility's design and construction, and produced photographic documentation of the powerhouse, equipment, support buildings, each dam structure, the Upper and Lower Reservoirs, the Auxiliary Pools, and the public recreation areas.

The Rocky Mountain Project was completed in 1995 and is not yet 50 years old. As a result of background research and field survey, TRC recommends there are no architectural resources in the APE that are eligible for listing in the NRHP. TRC finds the Project is not eligible for listing in the NRHP under Criteria A, B, or C, and does not meet the registration requirements of Criteria Consideration G for properties that have achieved significance in the last 50 years. TRC found there are no non-project related architectural resources located within the APE. There is one building that predates the Project (Cargle/Cordle general store), but it was moved from its original location to the project visitor center in 1997 and is therefore not eligible for listing in the NRHP.

The Project is associated with the late-twentieth century history of hydroelectric development in Georgia, but eligibility requirements under Criterion A state that "mere association with historic events or trends is not enough, in and of itself, to qualify under Criterion A: the property's specific association must be considered important as well" (NPS 1995). Pumped storage hydroelectricity was first developed in the early twentieth century and accelerated nationally and in Georgia during the 1960s and 1970s. After years of planning and delays, the Rocky Mountain Project finally opened in 1995 and served northwest Georgia's growing population and demand for electricity. The Project came online well after other pumped storage facilities around the nation and after the first such project in Georgia at the Wallace Dam Hydroelectric Project, which opened in 1980. By 1995, Rocky Mountain's engineering, design, and equipment were widely used and conventional in the hydroelectric industry, both in Georgia and throughout the country. The Project was therefore not innovative in terms of engineering or hydroelectric industrial development. For these reasons, TRC finds the Project is not eligible under Criterion A and does not meet the requirements of Criteria Consideration G, which requires that a resource less than 50 years old must possesses "exceptional importance" or "belong to an entire category of resources so fragile that survivors of any age are unusual." The Rocky Mountain Project does not meet either threshold of exceptional importance. The Project is not an example of a fragile category of resources, and it will still be in place and operational when it turns 50 years of age in 2045. After that point, additional historical perspective and/or research may exist to re-evaluate the Project's eligibility for listing in the NRHP.

Background research did not reveal the Project is associated with a historically significant person or people and TRC recommends it not eligible under Criterion B. Architecturally, the Project is characterized by utilitarian industrial design and materials that emphasized engineering efficiency over architectural style or distinctiveness. The Project's design does not fall within a recognized architectural style or movement, is not associated with the work of a master architect or engineer, and it does not possess high artistic value. For these reasons, TRC recommends the Project is not eligible under Criterion C.

6. Conclusion

Under contract Kleinschmidt Associates, Inc., TRC conducted a historic architectural assessment of the Rocky Mountain Pumped Storage Hydroelectric Project (FERC No. 2725) (Rocky Mountain Project, or the Project) located in Floyd County, Georgia. The purpose of the architectural assessment was to document architectural resources located within the Project's APE and to evaluate the Rocky Mountain Project's eligibility for listing in the NRHP. The study was conducted according to OPC's Final Study Plan for the Project distributed in August 2022. OPC will use the information generated by this study to evaluate the potential effects of its proposed action on historic resources from continued project operation and maintenance and project-related recreation in the Draft License Application. The survey was performed in compliance with Section 106 of the NHPA and its implementing regulations at 36 CFR §800.

TRC conducted its evaluation of the Rocky Mountain Project during the week of October 24, 2022. The fieldwork investigated the powerhouse, control buildings, two reservoirs, two auxiliary pools, switchyard and substation, 230-kilovolt (kV) transmission line, support buildings, and the ancillary recreation areas within the Rocky Mountain PFA. The assessment of both interior and exterior spaces revealed that the Project is in excellent condition and has not undergone any major structural alterations since its completion in 1995.

Based on the results of the background research and fieldwork, it is the opinion of TRC that the Rocky Mountain Project is not eligible for listing in the NRHP under Criteria A, B, or C, and does not meet the registration requirements of Criteria Consideration G for properties that have achieved significance in the last 50 years. The Rocky Mountain Project does not meet the threshold of "exceptional important" or "belong to an entire category of resources so fragile that survivors of any age are unusual." The Project does not possess exceptional importance in the overall history of hydroelectric power development during its construction period. TRC recommends the plant should be evaluated for NRHP eligibility when it reaches 50 years of age in 2045.

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APPENDIX C

STUDY REPORTS

(FILED SEPARATELY AS PRIVILEGED)

Archaeological Assessment at the Rocky Mountain Hydroelectric Project, (FERC No. 2725), Floyd County, Georgia

(Privileged)