Alabama Power

Jim Heilbron
Senior Vice President and Senior Production Officer

600 North 18th Street
Post office Box 2641
Birmingham, AL 35203
205 257 1000 tel

June 1, 2018

VIA ELECTRONIC FILING

Project No. 2628
R.L. Harris Hydroelectric Project
Notice of Intent to File and Pre-Application Document

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

Dear Secretary Bose,

Alabama Power Company (Alabama Power), Licensee for the R.L. Harris Hydroelectric Project (FERC No. 2628) (Project), hereby files with the Federal Energy Regulatory Commission (Commission) the original and two (2) paper copies of its Notice of Intent (NOI) to relicense the Project and the Pre-Application Document (PAD) required by 18 C.F.R. § 5.5 and § 5.6. In addition, Alabama Power is filing Volume 1 and 2 of the PAD, which contain the PAD appendices. Volume 1 contains the PAD Appendices A-N. Volume 2 contains the PAD Appendices O-T. Appendix R, which includes cultural resources reports, is being filed as "Privileged" and is not available to the public as it includes sensitive cultural resources location information.

In accordance with § 5.5 and § 16.8 of the Commission's regulations, Alabama Power is also transmitting a notice of availability of the PAD to relevant resource agencies, Tribes, non-governmental organizations, and other stakeholders. The NOI, PAD, and public PAD appendices are available on the Project relicensing website at www.harrisrelicensing.com. Stakeholders may also request an electronic copy or hard copy of these documents from Alabama Power. All materials related to the current Project license, including the NOI, PAD, PAD appendices, and PAD references, are available for inspection at the offices of Alabama Power Company, 600 North 18th Street, Birmingham, AL 35203. A copy of the PAD and appendices are also available at the following public libraries near the Project: Scottsboro Public Library, Cleburne County Public Library, Lineville Public Library, and Annie L. Awbrey Public Library.

If there are any questions on the NOI, PAD, or PAD appendices, please contact Angie Anderegg at 205-257-2251 or by email at ARSEGARS@southernco.com.

Sincerely,

Jim Heilbron
Senior Vice President and Senior Production Officer
Alabama Power Company

Enclosures
cc: Harris Project Stakeholder Distribution List

UNITED STATES OF AMERICA

BEFORE THE

FEDERAL ENERGY REGULATORY COMMISSION

NOTIFICATION OF INTENT

R.L. HARRIS HYDROELECTRIC PROJECT (FERC) NO. 2628

Notice of Intent to File Application for New License and Request for Designation as Non-Federal Representative and for Authorization to Initiate Consultation under Section 106 of the National Historic Preservation Act and Section 7 of the Endangered Species Act

I. NOTIFICATION OF INTENT

Alabama Power Company (Alabama Power) hereby notifies the Commission of its intent to file an application for a new license for the R.L. Harris Hydroelectric Project (Project).

The following information is provided pursuant to 18 C.F.R. § 5.5.

1) **THE LICENSE APPLICANT NAME AND ADDRESS:**

Alabama Power Company
600 North 18th Street
PO Box 2641
Birmingham, Alabama 35203

2) **PROJECT NUMBER:**

Federal Energy Regulatory Commission (FERC) No. 2628

3) **LICENSE EXPIRATION DATE:**

FERC issued a license for the Project on December 27, 1973, which expires on November 30, 2023. Alabama Power will file its Application for New License on or before November 30, 2021.

4) **APPLICANT'S STATEMENT OF INTENTION TO FILE AN APPLICATION FOR A NEW LICENSE:**

Alabama Power hereby declares its intent to apply for a new license for the Project. Alabama Power further declares its intent to utilize FERC's Integrated Licensing Process (ILP) to develop the new license application for the Project.

The Project liaison for all correspondence:

Ms. Angie Anderegg, Harris Relicensing Project Manager
Alabama Power Company
600 North 18th Street
Birmingham, AL 35203
205-257-2251
ARSEGARS@southernco.com

Agent for Alabama Power:

Mr. Jim Heilbron, Senior Vice President and Senior Production Officer
Alabama Power Company
600 North 18th Street
Birmingham, AL 35203
205-257-1000

5) PRINCIPAL PROJECT WORKS:

Harris Reservoir

The Harris Reservoir extends up the Tallapoosa River and Little Tallapoosa River approximately 29 miles with approximately 367 miles of shoreline. The reservoir surface area is approximately 9,870 acres at normal full pool elevation of 793 feet mean sea level (msl) and has a mandatory drawdown of 8 feet in the winter months. The normal tailwater elevation with one-unit operating is 664.9 msl; with two units operating, it is 667.7 msl. The gross storage capacity of Harris Reservoir is approximately 425,721 acre-feet, and the usable storage capacity is approximately 207,317 acre-feet.

Harris Dam

The Harris Dam consists of a concrete gravity dam, topographic saddles (800 feet and 300 feet each), and an earth dike section totaling 3,243 feet long with a maximum height of 151.5 feet.

The dam consists of a:

- 310-foot-long arched concrete gravity spillway,
- 186-foot-long concrete gravity intake structure,
- 400 foot-long and 95-foot-high west embankment,
- 600 foot-long and 95-foot-high east embankment,
- 331-foot-long, 112-foot-high west non-overflow section,
- 315.5-foot-long concrete 150-foot-high gravity east non-overflow section,
- 800 feet west saddle dike, and
- 300 feet east saddle dike

The dam has five radial gates for passing floodwaters in excess of turbine capacity and one radial trash gate. Each radial gate measures 40 feet 6 inches high and 40 feet wide.

Headworks

There are six intake gates, a penstock, and a headworks crane with 75-ton capacity.

Powerhouse

The Harris powerhouse is a concrete structure and is integral with the intake facilities. It houses two units totaling 135 megawatts (MW), which are comprised of two vertical generators each rated at 71,740 kilovolt-amps (kVA) and two vertical

Francis turbines each rated at 95,000 horsepower (hp). The building measures 186 feet long by 95 feet wide by 150 feet high.

Project Transmission

The Harris Project includes two (2) 115 kV transmission lines that extend approximately 1.5 miles to the northwest from Harris Dam to the Crooked Creek Transmission Substation.

6) PROJECT LOCATION:

The Harris Reservoir is located above the Harris Dam, which is located on the Tallapoosa River at River Mile (RM) 139.1. The reservoir is north of the mouth of the Tallapoosa River near Lineville, Alabama. Harris Dam is approximately 78 RMs upstream from the Martin Dam and 86 RMs upstream from the Yates Dam. The Harris Project also contains 15,063 acres of land within the James D. Martin-Skyline Wildlife Management Area (Skyline WMA) located in Jackson County, Alabama. These lands are located approximately 110 miles north of Harris Reservoir.

7) THE INSTALLED PLANT CAPACITY:

Harris Dam has two vertical generators rated at 67.5 MW and two vertical Francis turbines (95,000 hp each) for a total authorized installed capacity of 135 MW.

8) THE NAMES AND MAILING ADDRESSES OF:

(i) Any county in which the Project, or relevant federal facility, is located, and:

The Project is located in four counties: Clay County, Cleburne County, Randolph County, and Jackson County.

Tammy Sprayberry
Clay County Clerk
25 Court Square
Ashland, AL 36251

Warren G. Sarrell III
Cleburne County Circuit Clerk's Office
120 Vickery Street, Suite 202
Heflin, AL 36264

Cathy Breed
Randolph County Clerk's Office
PO Box 249
Wedowee, AL 36278

Donna Barksdale
Jackson County Circuit Clerk
102 East Laurel Street
Scottsboro, AL 35768

(ii) Any city, town or similar political subdivision in which the Project, or relevant federal facility is located, or that has a population of 15,000 people or more and is located within 15 miles of the Project.

There are no federal facilities used by the Project.

There are no cities, towns, or similar political subdivisions with a population of 15,000 or more people located within 15 miles of the Harris reservoir.

The City of Wedowee (less than 1,000 people) flanks the eastern and southeastern shores of the Lake. The City of Heflin, the largest city in Cleburne County and the entire watershed, is roughly 30 miles north of Harris Reservoir, while the City of Lineville in Clay County is nearly 10 miles west of the Harris Reservoir. Although Heflin and Lineville are the only cities with populations of 1,000 or more, the watershed is located just south of I-20 and is only 65 miles east of downtown Birmingham, Alabama and 65 miles west of downtown Atlanta, Georgia. Anniston, Alabama is located about 42 miles from Harris Reservoir, and Montgomery and Auburn, Alabama are also located within 100 miles of Harris Reservoir.

The Project lands located in the Skyline WMA are approximately 110 miles north of the Harris Reservoir in Jackson County, Alabama. There are no city, towns, or similar political subdivisions with a population of 15,000 or more people located within 15 miles of Skyline. Scottsboro, the largest city in Jackson County is located approximately 18 miles from the Skyline Project lands and has a population of 14,770.

(iii) Every special purpose subdivision in which the Project, or relevant federal facility, is located or that owns, operates or uses any facility that is proposed to be used by the Project.

There are no special purpose subdivisions that are likely to be interested in or affected by the Project.

(iv) Any parties affected by the Project or who would likely be interested in the Project.

Alabama Power has developed a stakeholder list that is attached to the cover letter and Pre-Application Document.

(v) Affected Indian Tribes

While there are no federally recognized tribal lands within the Project Boundary, Alabama Power identified the following federally recognized tribes that may have an interest in the Project relicensing.

Chief Oscola Clayton Sylestine
Alabama-Coushatta Tribe of Texas
571 State Park Road 56
Livingston, TX 77351

Chief Nelson Harjo
Chief
Alabama-Quassarte Tribal Town
101 East Broadway
Wetumka, OK 74883

Bill John Baker
Principal Chief and THPO
Cherokee Nation
P.O. Box 948
Tahlequah, OK 74465

Karen Brunso
Tribal Historic Preservation Officer
Chickasaw Nation
P.O. Box 1548
Ada, OK 74821

Ian Thompson PhD, RPA
THPO, Tribal Archaeologist
Director, Historic Preservation Dept.
Choctaw Nation of Oklahoma
P.O. Drawer 1210
Durant, OK 74702

Linda Langley
Tribal Historic Preservation Officer
Coushatta Tribe of Louisiana
P. O. Box 10
Elton, LA 70532

Alina Shively
THPO
Jena Band of Choctaw Indians
P.O. Box 14
Jena, LA 71342

Jeremiah Hobia
Town King
Kialegee Tribal Town
P.O. Box 332
108 N. Main Street
Wetumka, OK 74883

Ken Carleton
THPO/Tribal Archaeologist
Mississippi Band of Choctaw Indians
P.O. Box 6010
Choctaw, MS 39350

RaeLynn Butler
Tribal Historic Preservation Officer
Muscogee (Creek) Nation of Oklahoma
P.O. Box 580
Okmulgee, OK 74447

Carolyn White
Tribal Historic Preservation Officer
Poarch Band of Creek Indians
5811 Jack Springs Road
Atmore, AL 36502

Natalie Harjo
Tribal Historic Preservation Officer
Seminole Nation of Oklahoma
P.O. Box 1498
Wewoka, OK 74884

Paul Backhouse
Seminole Tribe of Florida
30290 Josie Billie Hwy, PMB 1004
Clewiston, FL 33440

Emman Spain
Tribal Historic Preservation Officer
Thlopthlocco Tribal Town
P. O. Box 188
Okemah, OK 74859

Mr. Eric Oosahwee-Voss
THPO
United Keetowah Band of Cherokee Indians
P.O. Box 1245
Tahlequah, OK 74465

II. DESIGNATION AS NON-FEDERAL REPRESENTATIVE AND AUTHORIZATION TO INITIATE CONSULTATION

Pursuant to 18 C.F.R. § 5.5(e)), Alabama Power requests that FERC designate it as the non-federal representative for purposes of consultation under Section 7 of the Endangered Species Act and the joint agency regulations thereunder at 50 CFR Part 402, section 305 (b) of the Magnuson-Stevens Fishery Conservation and Management Act and the implementing regulations at 50 CFR 600.920. In addition, Alabama Power requests authorization to initiate consultation under section 106 of the National Historic Preservation Act and to implement regulations at 36 CFR Section 800.2(c)(4).

CERTIFICATE OF SERVICE

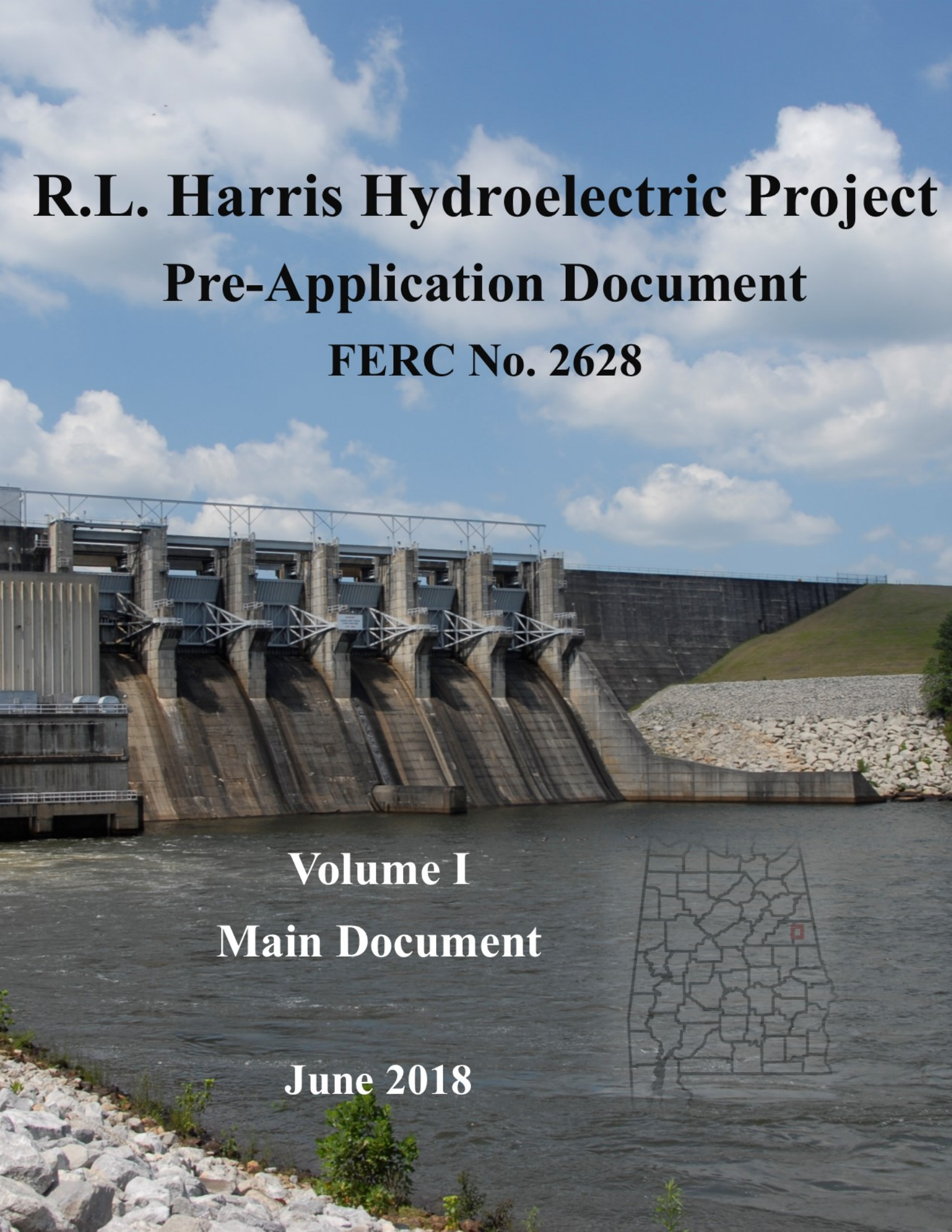
I hereby certify that I have this day served the foregoing document upon each person designated on the official service list in the captioned proceedings in accordance with the requirements of Rule 2010 of the Commission's Rules of Practice and Procedure, 18 CFR § 385.2010.

June 1, 2018
Jim Heilbron, Senior Vice President and Senior Production Officer
Alabama Power Company

R.L. Harris Hydroelectric Project

Pre-Application Document

FERC No. 2628



Volume I

Main Document

June 2018

PRE-APPLICATION DOCUMENT

R.L. HARRIS HYDROELECTRIC PROJECT

FERC PROJECT NO. 2628

Prepared by:

Alabama Power

Birmingham, Alabama

Kleinschmidt

Birmingham, Alabama
www.KleinschmidtGroup.com

June 2018

PRE-APPLICATION DOCUMENT

R.L. HARRIS HYDROELECTRIC PROJECT
FERC PROJECT NO. 2628

ALABAMA POWER COMPANY
BIRMINGHAM, ALABAMA

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ACRONYMS AND ABBREVIATIONS

µs/cm	microsiemens per centimeter
µg/L	micrograms per liter

A

ASSF	Alabama State Site File
A&I	Agricultural and Industrial
ACFWRU	Alabama Cooperative Fish and Wildlife Research Unit
ACT	Alabama-Coosa-Tallapoosa (River Basin)
ADCNR	Alabama Department of Conservation and Natural Resources
ADECA	Alabama Department of Economic and Community Affairs
ADEM	Alabama Department of Environmental Management
ADROP	Alabama-ACT Drought Response Operations Plan
Alabama Power	Alabama Power Company
AMP	Adaptive Management Plan
ALNHP	Alabama Natural Heritage Program
APE	Area of Potential Effects
ATV	All-Terrain Vehicle
AWIC	Alabama Water Improvement Commission

B

B.A.S.S.	Bass Anglers Sportsmen Society
BCC	Birds of Conservation Concern

C

°C	Degrees Celsius
Cahaba Consulting	Cahaba Consulting, LLC
CEII	Critical Energy Infrastructure Information
CFR	Code of Federal Regulation
cfs	Cubic Feet per Second
CLEAR	Community Livability for the East Alabama Region
CWA	Clean Water Act

D

DIL	Drought Intensity Level
DO	Dissolved Oxygen
dsf	day-second-feet

E

EA	Environmental Affairs
EAP	Emergency Action Plan
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act

F

°F	Degrees Fahrenheit
F&W	Fish and Wildlife
FERC	Federal Energy Regulatory Commission
FOIA	Freedom of Information Act
FPA	Federal Power Act

G

GSA	Geological Survey of Alabama
GPS	Global Positioning Systems

H

Harris Project	R.L. Harris Hydroelectric Project
HATs	Harris Action Teams
HC	Hillabee Creek
HEC-RAS	Hydrologic Engineering Center's River Analysis System
hp	Horsepower

I

IBI	Index of Biotic Integrity
IIC	Intercompany Interchange Contract
IVM	Integrated Vegetation Management
ILP	Integrated Licensing Process
IPaC	Information Planning and Conservation

K

kV	Kilovolt
kVA	Kilovolt-amp
Kleinschmidt	Kleinschmidt Associates

L

LWF	Limited Warm-water Fishery
LWPOA	Lake Wedowee Property Owners' Association

M

mg/L	milligrams per liter
ml	milliliter
M&I	Municipal and Industrial
mgd	Million Gallons per Day
MOU	Memorandum of Understanding
MRLC	Multi-Resolution Land Characteristics
msl	Mean Sea Level
MT	Middle Tallapoosa
MW	Megawatt
MWh	Megawatt Hour

N

NEPA	National Environmental Policy Act
NGO	Non-governmental Organization
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NTU	Nephelometric Turbidity Unit
NWI	National Wetlands Inventory

O

OAR	Office of Archaeological Resources
OAW	Outstanding Alabama Water
ORV	Off-road Vehicle
OWR	Office of Water Resources

P

PAD	Pre-Application Document
PDF	Portable Document Format
pH	Potential of Hydrogen
PID	Preliminary Information Document
PLP	Preliminary Licensing Proposal

Project	R.L. Harris Hydroelectric Project
PURPA	Public Utility Regulatory Policies Act
PWC	Personal Water Craft
PWS	Public Water Supply

R

RM	River Mile
RTE	Rare, Threatened and Endangered
RV	Recreational Vehicle

S

S	Swimming
SCORP	State Comprehensive Outdoor Recreation Plan
SCP	Shoreline Compliance Program
SD1	Scoping Document 1
SH	Shellfish Harvesting
SHPO	State Historic Preservation Office
Skyline WMA	James D. Martin-Skyline Wildlife Management Area
SMP	Shoreline Management Plan

T

T&E	Threatened and Endangered
TMDL	Total Maximum Daily Load
TNC	The Nature Conservancy
TSI	Trophic State Index
TVA	Tennessee Valley Authority
TSS	Total Suspended Solids

U

UT	Upper Tallapoosa
USDA	U.S. Department of Agriculture
USGS	U.S. Geological Survey
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service

W

WCM	Water Control Manual
WMP	Wildlife Management Plan
WQC	Water Quality Certification

PRE-APPLICATION DOCUMENT

R.L. HARRIS HYDROELECTRIC PROJECT
FERC PROJECT NO. 2628

ALABAMA POWER COMPANY
BIRMINGHAM, ALABAMA

1.0 INTRODUCTION

Alabama Power Company (Alabama Power) is initiating the Federal Energy Regulatory Commission (FERC) relicensing of the 135-megawatt (MW) R.L. Harris Hydroelectric Project (Harris Project), FERC Project No. 2628. The Harris Project consists of a dam, spillway, powerhouse, and those lands and waters necessary for the operation of the hydroelectric project and enhancement and protection of environmental resources. These structures, lands, and water are enclosed within the FERC Project Boundary. Under the existing Harris Project license, the FERC Project Boundary encloses two distinct geographic areas, described below.

Harris Reservoir is the 9,870-acre reservoir (Harris Reservoir) created by the R.L. Harris Dam (Harris Dam). Harris Reservoir is located on the Tallapoosa River, near Lineville, Alabama. The lands adjoining the reservoir total approximately 7,392 acres and are included in the FERC Project Boundary. This includes land to 795 feet mean sea level (msl)[1], as well as natural undeveloped areas, hunting lands, prohibited access areas, recreational areas, and all islands.

The Harris Project also contains 15,063 acres of land within the James D. Martin-Skyline Wildlife Management Area (Skyline WMA) located in Jackson County, Alabama. These lands are located approximately 110 miles north of Harris Reservoir and were acquired and incorporated into the FERC Project Boundary as part of the FERC-approved Harris Project Wildlife Mitigative Plan and Wildlife Management Plan. These lands are leased to, and managed by, the State of Alabama for wildlife management and public hunting and are part of the Skyline WMA (ADCNR 2016b).

For the purposes of this Pre-Application Document (PAD), "Lake Harris" refers to the 9,870-acre reservoir, adjacent 7,392 acres of Project land, and the dam, spillway, and powerhouse. "Skyline" refers to the 15,063 acres of Project land within the Skyline WMA in Jackson County. "Harris Project" refers to all the lands, waters, and structures enclosed within the FERC Project Boundary, which includes both Lake Harris and Skyline. Harris Reservoir refers

[1] Also includes a scenic easement (to 800 feet msl or 50 horizontal feet from 793 feet msl, whichever is less, but never less than 795 feet msl).

to the 9,870-acre reservoir only; Harris Dam refers to the dam, spillway, and powerhouse. The Project Area refers to the land and water in the Project Boundary and immediate geographic area adjacent to the Project Boundary. The Project Vicinity refers to a larger geographic area near a hydroelectric project, such as a county. Terms and definitions used in the PAD are provided in Appendix A.

All non-federal hydroelectric projects in the United States operate under licenses issued by FERC. FERC[2] issued a license to Alabama Power on December 27, 1973, which expires on November 30, 2023. For Alabama Power to continue operating the Harris Project, Alabama Power must obtain a new operating license from FERC.[3] Obtaining a new operating license requires Alabama Power to complete a multi-year application process and file a final license application on or before November 30, 2021. Presented below is a summary of the relicensing process with a detailed description in Section 2.0.

Harris Dam, Powerhouse, and Reservoir

Source: Alabama Power Company, Birmingham, AL.1983

A letter from FERC dated February 10, 2016[4], requested that Alabama Power notify FERC as to the process it would select to relicense the Harris Project. Alabama Power responded by email on May 2, 2016, that it would use the Integrated Licensing Process (ILP) to relicense the Harris Project. The ILP is FERC's default licensing process. The ILP includes an early scoping process pursuant to the National Environmental Policy Act (NEPA), a FERC-approved study plan, and distribution of a preliminary licensing proposal. There are many opportunities for the public to participate in the ILP. Alabama Power anticipates working closely with resource agencies and interested persons (stakeholders) to identify and resolve potential issues related to continued operation of the Harris Project.

1.1 PRE-APPLICATION DOCUMENT AND NOTICE OF INTENT

In 2017, Alabama Power prepared a Preliminary Information Document (PID) to educate stakeholders on the current operation of the Harris Project and to prepare stakeholders for an Issue Identification Workshop held October 19, 2017. The Issue Identification Workshop,

[2] The Federal Power Commission was established in 1920 and issued the Harris license in 1973. In 1977, the Federal Power Commission became the Federal Energy Regulatory Commission.

[3] Article 38 of Harris license provides for annual licenses with existing terms and conditions until FERC issues a licensing decision.

[4] Accession number 20160210-3032.

attended by over 100 stakeholders, gave Alabama Power an opportunity to identify stakeholders who wanted to participate in the relicensing process and to identify issues and information needs, which assisted in developing the PAD and draft study plans. Although not a requirement of FERC's ILP, Alabama Power distributed copies of the PID to federal and state agencies, local governments, Native American tribes, non-governmental organizations (NGOs), members of the public, and other parties potentially interested in the relicensing proceeding and made the PID available to stakeholders on the Harris relicensing website at www.harrisrelicensing.com.

Following the distribution of the PID, a series of one-on-one meetings with agencies and other key stakeholders, and the Issue Identification Workshop, Alabama Power developed this PAD, which is a compilation of existing information regarding the Harris Project and its associated environmental, recreation, land use, cultural, and socioeconomic resources. The information required in the PAD is specified in 18 Code of Federal Regulations (CFR) §5[5].6 (c) and (d). Alabama Power filed the PAD with FERC on June 1, 2018. The PAD distribution list is in Appendix B.

Concurrent with filing the PAD, Alabama Power filed its Notice of Intent (NOI) with FERC, according to 18 CFR §5.5. The NOI notified FERC that Alabama Power intends to file an application for a new license.

1.2 FERC TRIBAL MEETING, PUBLIC SCOPING MEETINGS, AND SITE VISIT

According to 18 CFR §5.7, FERC will schedule a meeting with each Native American tribe likely to be affected by the potential license application no later than 30 days following the filing of the NOI or no later than July 2, 2018.

Within 60 days of the filing of the NOI and PAD, FERC will issue a notice of commencement of proceeding and Scoping Document 1[6] (SD1). Within 30 days of the notice, FERC will hold public scoping meetings and a site visit. The purposes of the public meetings and site visit are to:

- Initiate scoping of issues and alternatives pursuant to the NEPA;
- Review and discuss existing conditions and resource management objectives;

PUBLIC SCOPING MEETINGS AND SITE VISIT

Date:
Tuesday, August 28 -
Wednesday, August 29, 2018

Location:
Wedowee Marine South
9681 Highway 48
Lineville, AL 36266

[5] This is the official citation for FERC's Integrated Licensing Process regulations under 18 CFR §5.

[6] "Scoping" is the process used to identify issues, concerns, and opportunities associated with a proposed action; the process, according to NEPA, should be conducted early in the planning stages of the project. FERC issues a Scoping Document in accordance with 18 CFR § 5.8 (a), (b), (c).

- Review and discuss existing information and make preliminary identification of information and study needs;
- Review, discuss, and finalize the process plan and schedule for pre-filing activities that incorporates the time periods provided for in 18 CFR §5 and, to the extent reasonably possible, maximizes coordination of federal, state, and tribal permitting and certification processes, including consultation under Section 7 of the Endangered Species Act (ESA), consultation under Section 106 of the National Historic Preservation Act (NHPA)[7], and water quality certification (WQC) or waiver thereof under Section 401 of the Clean Water Act (CWA); and
- Discuss the appropriateness of any federal or state agency or Native American tribe acting as a cooperating agency for development of an environmental document pursuant to NEPA.

The public scoping meetings and site visit are tentatively scheduled for August 28, 2018 and August 29, 2018, at Wedowee Marine South, Lineville, Alabama.

1.3 AGENTS FOR ALABAMA POWER

The following person is authorized to act as agent for Alabama Power pursuant to 18 CFR § 5.6(d)(2)(i):

Mr. Jim Heilbron
Senior Vice President and Senior Production Officer
Alabama Power Company
600 North 18th Street
Birmingham, AL 35203
(205) 257-1000

1.4 DOCUMENT PURPOSE AND CONTENT

As previously mentioned, during 2017 Alabama Power worked with stakeholders to identify information needed to finalize the PAD. The PAD has eight sections that are structured according to FERC's regulations in 18 CFR §5.6. The following list describes the content of each section of the PAD.

Section 1.0 Introduction, Background, PAD and NOI Description; FERC Tribal Meeting, Public Scoping Meetings and Site Visit; and, Document Purpose and Content

Section 2.0 Integrated Licensing Process Description; Harris Relicensing Schedule, and Proposed Communication Plan

Section 3.0 General Description of the River Basins in which the Harris Project is Located

Section 4.0 Description of Harris Project Location, Facilities, and Operation

[7] Section 106 of the National Historic Preservation Act of 1966 (54 U.S.C. 306108; hereinafter, 'Section 106').

Section 5.0 Description of the Existing Environment by Resource Area
Section 6.0 Existing Programs
Section 7.0 Preliminary Issues and Draft Study Plans
Section 8.0 Public Utility Regulatory Policies Act (PURPA)
Section 9.0 References
Section 10.0 References by Section

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2.0 INTEGRATED LICENSING PROCESS

Alabama Power will use FERC's[8] ILP for relicensing the Harris Project. The ILP provides an efficient and streamlined process while providing opportunity to evaluate all resources potentially affected by the continued operation of the Harris Project. The ILP begins with early issue identification and FERC's study plan process to fill information gaps, which help prevent the need for additional studies once the application is filed with FERC. The ILP process encourages collaboration and integrates other stakeholders in the relicensing process, including state and federal resource agencies, NGOs, applicable Native American tribes, and members of the public. Alabama Power will document the relicensing process, including any information received from stakeholders. Alabama Power will also provide a dedicated relicensing website to host Harris Project documents as well as a calendar of events during the relicensing process. FERC's ILP schematic, including the pre-application activities through post-filing activities, is presented in Appendix C.

FERC'S INTEGRATED LICENSING PROCESS

For more information please visit: www.ferc.gov

The draft Harris Project Relicensing Process Plan and Schedule outlines actions to be performed by FERC, Alabama Power, and other participants in the relicensing process up to the filing of the license application with FERC (***Table 2-1).*** Alabama Power developed the draft Process Plan and Schedule using the timeframes set forth in 18 CFR §5. The proposed dates consider FERC's timeline for the ILP milestones, federal holidays, and, where necessary, consider the weekends (as some of the due dates within the process fall on a weekend day).

Alabama Power must file the license application no later than two years prior to the license expiration, which is November 30, 2023 (18 CFR §5.17(a)). In developing the Draft Process Plan and Schedule, Alabama Power included timeframes for a Formal Dispute Resolution (18 CFR §5.14); however, study disputes may be resolved through informal dispute resolution. Following the filing of the PAD and NOI, FERC will issue SD1 within 60 days. Additionally, pursuant to 18 CFR §5.8(b)(3)(viii), FERC will provide public notice of Alabama Power's filing of the PAD and NOI, schedule a public scoping meeting, and participate in a site visit (if feasible) within 30 days of issuing SD1. To avoid Labor Day weekend scheduling conflicts at the proposed scoping meeting location, Wedowee Marine South, Alabama Power requests that FERC hold their scoping meeting on August 29, 2018.

The **bold items** represent principal milestones in the ILP. Indented items are intermediary steps that must be taken by Alabama Power, agencies, FERC, or stakeholders to facilitate FERC's ILP process.

[8] For more details on the FERC licensing processes go to www.ferc.gov or 18 CFR §5.6.

TABLE 2-1 DRAFT R.L. HARRIS PROJECT RELICENSING PROCESS PLAN AND SCHEDULE

TASK	RESPONSIBLE ENTITY	SCHEDULE MILESTONES	FERC REGULATION
File NOI/PAD with FERC	Alabama Power	06/01/18	§5.5; §5.6
Request FERC designate Alabama Power as Non-federal Representative for Section 106 consultation with the SHPO	Alabama Power	06/01/18	§5.5(e)
Request FERC designate Alabama Power as Non-federal Representative for Endangered Species Act consultation	Alabama Power	06/01/18	§5.5(e)
Issue Notice of NOI/PAD	Alabama Power	06/01/18	§5.3(d)(2)
FERC Tribal Meeting	FERC	07/02/18	§5.7
FERC Notice of Commencement of Proceeding and SD1 Issued	FERC	07/31/18	§5.8(a)(c)
FERC designates applicant as non-federal representative to initiate Section 106 consultation with the SHPO and Section 7 consultation with the USFWS	FERC	07/31/18	
FERC Holds Scoping and Site Visit	FERC	8/29/18	§5.8(b)(viii)
All Comments and Study Requests Due from All Stakeholders on NOI, PAD and SD1	Stakeholders	09/28/18	§5.9(a)(b)
FERC issues SD2, if necessary	FERC	11/12/18	§5.10
Applicant Files Proposed Study Plan	Alabama Power	11/12/18	§5.11(a)
Applicant hosts Study Plan meeting	Alabama Power	12/12/18	§5.11(e)
All comments on Proposed Study Plan due	Stakeholders	02/11/19	§5.12
Applicant files Revised Proposed Study Plan	Alabama Power	03/13/19	§5.13(a)
All comments on Revised Proposed Study Plan due	Stakeholders	03/28/19	§5.13(b)
FERC Director's Study Plan Determination	FERC	04/12/19	§5.13(c)
If disputes arise, see: §5.14a – 5.14(l)		05/02/19 - 07/11/19	§5.14a – 5.14(l)
Applicant Conducts First Study Season	Alabama Power	05/02/19	§5.15(a)

TASK	RESPONSIBLE ENTITY	SCHEDULE MILESTONES	FERC REGULATION
Applicant Files Initial Study Report	Alabama Power	05/01/20	§5.15(c)(1)
All Stakeholders Attend Initial Study Report Meeting	Alabama Power	05/18/20	§5.15(c)(2)
Applicant files Initial Study Report Meeting Summary	Alabama Power	06/02/20	§5.15(c)(3)
Disputes on the study report summary or requests to modify the Study Plan are due	Stakeholders	07/02/20	§5.15(c)(4)
Responses to disputes or request for modifications of Study Plan due	All	08/03/20	§5.15(c)(5)
FERC Director resolves disagreements and amends the approved Study Plan, as appropriate	FERC	09/02/20	§5.15(c)(6)
Applicant Conducts Second Study Season, if needed	Alabama Power	06/10/20	§5.15(a)
Applicant Files Updated Study Report	Alabama Power	04/12/21	§5.15(f)
Applicant Files Preliminary Licensing Proposal	Alabama Power	04/15/21	§5.16(a)
Applicant Hosts Updated Study Report Meeting	Alabama Power	04/27/21	§5.15(f)
Applicant files Updated Study Report Meeting summary	Alabama Power	05/12/21	§5.15(f)
Disputes or requests to modify the Study Plan are due	Stakeholders	06/11/21	§5.15(f)
Responses to disputes or request for modifications of Study Plan due	All	07/12/21	§5.15(f)
FERC makes Director's Study Plan determination	FERC	08/11/21	§5.15(f)
Comments on Preliminary Licensing Proposal from All Stakeholders Due	Stakeholders	07/14/2021	§5.16(e)
Applicant files License Application	Alabama Power	11/30/21	§5.17
Applicant files, if licensee did not file during pre-filing process, for 401 WQC Application with ADEM within 60 dates following FERC's notice of License Application ready for environmental analysis § 5.22	Alabama Power		
Public Notice of License Application filing	Alabama Power	12/14/21	§5.17(d)(2)

2.1 DOCUMENT CONTROL AND WEBSITE

Effective communication is essential when managing a multi-year, multi-party, relicensing process. The relicensing process is lengthy and involves large amounts of correspondence, including face-to-face meetings, written documents, emails, and telephone conversations. To account for and manage Harris Project communications, Alabama Power has developed and will implement during the relicensing process a document control and communication plan. Descriptions of the communication tools and procedures that may be used by Alabama Power are provided in the following sections.

2.1.1 DISTRIBUTION LIST

Alabama Power has developed a stakeholder distribution list that will be updated throughout the relicensing process as new stakeholders request to be added. A list of known stakeholders to date is provided in Appendix B.

2.1.2 WEBSITE

Alabama Power developed a relicensing website for the Harris Project at www.harrisrelicensing.com. The relicensing website will contain the following:

- a summary of the Harris Project and ILP relicensing process;
- meeting notices and schedules;
- final meeting summaries;
- relicensing documents (e.g., NOI, PAD and appendices, draft documents that are too large to email, final study plans, draft and final study reports, draft license application, and preliminary licensing proposal); and
- links to relevant websites.

Communication Summary

- http://www.harrisrelicensing.com
- Angie Anderegg,
  Harris Relicensing Project Manager
- 205-257-2251
- ARSEGARS@southernco.com
- harrisrelicensing@southernco.com

All stakeholders should use the website to obtain current information regarding the Harris Project and the relicensing process.

2.1.3 PUBLIC REFERENCE FILE AND ELIBRARY

Alabama Power will maintain a public reference file that contains a list of materials used to develop the PAD including background reference material, relevant studies, data references used in the PAD, and the current FERC license. For a nominal copying fee, hard copies of

these documents are available upon request[9]. Documents are available at Alabama Power's office at 600 North 18th Street, Birmingham, Alabama 35203 during regular business hours. Appointments to view documents may be made by contacting harrisrelicensing@southernco.com.

Members of the public may view official FERC documents in FERC's Public Reference Room located at: Federal Energy Regulatory Commission, Room 2-A, Commission Headquarters, 888 First Street, NE, Washington, DC 20426, which is available Monday through Friday, 8:00 a.m. to 5:00 p.m. eastern (closed on federal holidays). The FERC Public Reference Room, along with e-Library (online document repository), are FERC's primary channels for disseminating information. Interested parties may use public workstations to access FERC's website and to view FERC filings and official documents free of charge. Fees for printing and photocopying official documents are charged.

2.1.4 RESTRICTED DOCUMENTS

Certain Harris Project related documents are restricted from public viewing in accordance with FERC regulations. Critical Energy Infrastructure Information (CEII) documents and drawings (18 CFR § 388.112b (1)) related to the design and safety of dams and appurtenant facilities are restricted to protect national security and public safety. In hydropower relicensing, only Exhibit F of the license application is classified as CEII material. Exhibit F consists of design drawings of hydroelectric structures and the engineering Supporting Design Report. All other hydropower relicensing documents contain only public information and would not be filed as CEII. Anyone seeking CEII information from FERC must file a CEII request. FERC's website contains additional details related to CEII.

Additionally, information related to protecting sensitive archeological or other culturally important information is restricted under Section 106 of the NHPA. Similarly, certain information on federally protected species and their habitats under Section 7 of the ESA is also restricted. Anyone seeking this information from FERC must file a Freedom of Information Act (FOIA) request. Information for FOIA requests is available on FERC's website at https://www.ferc.gov/legal/ceii-foia/foia/foia-new-form/FOIARequest.aspx.

2.2 COMMUNICATION PLAN

The relicensing process typically spans several years. The Harris Project relicensing process will include numerous meetings and discussions with stakeholders to identify and subsequently resolve Harris Project issues. Alabama Power anticipates using electronic filing for distribution of official relicensing documents and communications with FERC. Additionally, Alabama Power anticipates distributing such documents and/or filings primarily by email to the distribution list (and Service List after the license application is accepted by FERC). Alabama Power anticipates that most relicensing participants will use electronic filing whenever possible for documents they file with FERC, with hard copy or electronic copies delivered to

[9] Any copyrighted material must be viewed at the Alabama Power corporate office and is not permitted to be copied.

FERC's Service List. To facilitate communications and cooperation among Alabama Power and stakeholders, Alabama Power has developed a Communications Plan, as described in the following sections.

2.2.1 DOCUMENT DISTRIBUTION

Alabama Power will distribute all documents electronically in standard Microsoft Office format or portable document format (PDF). Alabama Power will use electronic filing for FERC documents and will post these documents on the Harris Project relicensing website. Alabama Power may distribute hard copies of documents for convenience or by request to accommodate individuals who do not have immediate access to email or computer. Alabama Power will provide email notification for items posted to the relicensing website. Distribution of information will follow the guidelines presented in ***Table 2-2***.

TABLE 2-2 DOCUMENT DISTRIBUTION FOR THE HARRIS PROJECT RELICENSING

DOCUMENT	METHOD
Public Meeting Notices	Initial meeting by U.S. Mail*, Newspapers, and Website. Thereafter by Email, Website
Meeting Agendas	Website, Email, and Direct Mail*
Meeting Summaries	Website, Email, and Direct Mail*
Process Plan and Schedule	Website
Major Documents: PAD and appendices, FERC Scoping Documents, Proposed and Final Study Plans, Final Study Reports, Draft License Application, and Preliminary Licensing Proposal	Website, Email, and Alabama Power Corporate Office
PAD Support Documents	Alabama Power Corporate Office
FERC License	Website via the PAD

*For those individuals without computer access.

2.2.2 PROVIDING DOCUMENTS TO ALABAMA POWER COMPANY

Alabama Power requests that it receive all documents electronically in either PDF or an appropriate format compatible with Microsoft Office (e.g., Microsoft Word, Excel) format. Email documents to ARSEGARS@southernco.com and harrisrelicensing@southernco.com.

Hard copies may be mailed to Angie Anderegg, Harris Relicensing Project Manager, Alabama Power Company, 600 North 18th Street, 16N-8180, Birmingham, Alabama 35203. In either case, all documents received become part of the relicensing consultation record.

2.2.3 MEETINGS

Alabama Power wants to ensure that stakeholders are meaningfully involved in the relicensing process. Alabama Power will work with stakeholders to develop meeting schedules that accommodate the majority of the participants. These meetings will be scheduled between 8:00 AM and 5:00 PM at least 2 weeks in advance, when possible. The meeting agenda and any information that would be relevant to the meeting will be provided on the Harris Project relicensing website. FERC regulations (18 CFR §5) require that specific ILP meetings be held during the relicensing process. These meetings are identified in the Draft Harris Project Relicensing Process Plan and Schedule (***Table 2-1***). Alabama Power anticipates that other meetings will be necessary, particularly during the development of the study plans and potential protection, mitigation, and enhancement measures.

2.2.4 FEDERAL ENERGY REGULATORY COMMISSION SCOPING MEETING

Approximately 90 days following distribution of the PAD, FERC staff will organize and conduct a day and an evening Scoping Meeting, pursuant to NEPA, near the Lake Harris location. Scoping is the process used to identify issues, concerns, and opportunities associated with a federal agency's proposed action, such as the issuance of a new license for a hydropower project. The scoping process will likely include an opportunity to tour the Harris Dam Powerhouse and view a presentation on Lake Harris and Skyline. Details confirming the date and time of the meetings will be provided on the relicensing website.

A court reporter will record the Scoping Meetings; all statements provided at the meetings, both verbal and written, will become part of FERC's public record for the relicensing. Alabama Power intends to advertise the Scoping Meetings on its relicensing website; FERC will publish NEPA Scoping Meeting notices in local newspapers and in the Federal Register and will provide notice to its FERC Harris Project No. 2628 Mailing List.

2.2.5 GENERAL COMMUNICATIONS

Communications include written hard-copy correspondence, emails, notes from a single party, multi-party telephone calls, and/or face-to-face meetings. Alabama Power's goal is to keep communication open during the relicensing process and to make it easy for relicensing stakeholders and the public to obtain information related to the Harris Project relicensing and the interests or issues of other stakeholders.

2.2.5.1 Email

Alabama Power anticipates that communication among interested parties will occur primarily through email. This may include, for example, coordination of meetings, distribution of draft and final documents, meeting summaries, schedule updates, and general correspondence.

2.2.5.2 Telephone and Video Conference

Alabama Power anticipates using telephone and video conference (e.g., Skype) for informal conversations and for hosting telephone conference calls. Most conversations will be treated informally with no written documentation required; however, in the event of a scheduled telephone or video conference call with stakeholders, Alabama Power will prepare and distribute meeting summaries and post to the relicensing website. Prior to FERC's Notice of Acceptance of the license application, FERC will distribute summaries of any telephone conversations where FERC staff participates and deems the discussion as "decisional". Once the license application has been accepted, FERC will provide prior public notice of any phone call in which it will participate so that all stakeholders may be included should they choose to participate.

2.3 STUDY REQUESTS

Comments on the PAD and FERC's SD1 must be filed with FERC within 60 days following FERC's notice issued pursuant to §5.8. Comments (including those from FERC) must be accompanied by any information gathering and study requests. Comments should include information and studies needed for consultation under Section 7 of the ESA and water quality certification under Section 401 of the CWA, as needed. Stakeholders requesting studies must include the following information:

- description of the goals and objectives of each study proposal and the information to be obtained;
- if applicable, explanation of the relevant resource management goals of the agencies or Native American tribes with jurisdiction over the resource to be studied;
- if the requester is not a resource agency, explanation of any relevant public interest considerations with regard to the proposed study;
- description of existing information concerning the subject of the proposal and the need for additional information;
- explanation of any nexus between Harris Project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied and how the study results would inform the development of relicensing requirements;
- explanation of how any proposed study methodology (including any preferred data collection and analysis techniques or objectively quantified information and a schedule including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge; and
- description of the considerations of the level of effort and cost, as applicable, and why any proposed alternative studies would not be sufficient to meet the stated information needs.

The FERC provides guidelines for understanding and applying the ILP study criteria at https://ferc.gov/industries/hydropower/gen-info/guidelines/guide-study-criteria.pdf. Alabama Power also included FERC's guidance document on the Harris relicensing website at www.harrisrelicensing.com. Alabama Power will meet with stakeholders to discuss Alabama

Power's proposed study plans during the 90-day period provided in §5.12. This time is provided to clarify and resolve any outstanding issues with respect to the proposed study plans. Tentative dates for study plan requests, modifications, and meetings can be viewed in the Draft Process Plan and Schedule, ***Table 2-1***.

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3.0 GENERAL BASIN DESCRIPTIONS

Lake Harris and Skyline are located within two river basins: the Tallapoosa and Tennessee River Basins, respectively. The only waterbody managed by Alabama Power as part of its FERC license for the Harris Project is the Harris Reservoir. In compliance with FERC's PAD regulations, Alabama Power is providing a description of both river basins.

3.1 TALLAPOOSA RIVER BASIN

Harris Reservoir is located on the Tallapoosa River, near the towns of Lineville and Wedowee, in east central Alabama.

Sunset at Lake Harris

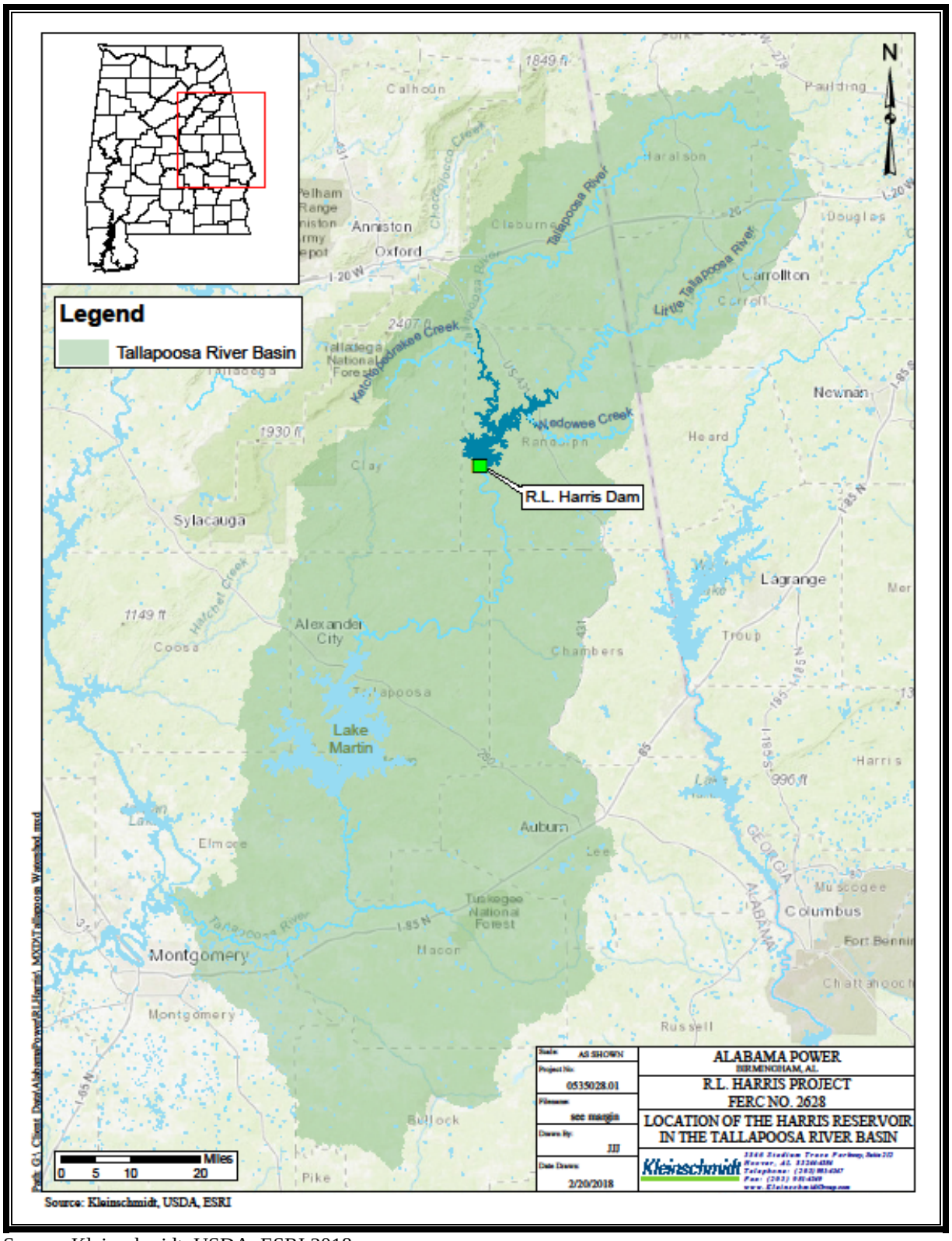
Source: Alabama Power Company. 2017. Shorelines, Harris. Birmingham, AL. [Online] URL: https://apcshorelines.com/our-lakes/harris/.

The Tallapoosa River runs 265 miles from the southern end of the Appalachian Mountains in Georgia, southward and westward into Alabama and is formed by the confluence of McClendon Creek and Mud Creek in Paulding County, Georgia. The Tallapoosa River Basin is a sub-basin of the Mobile River Basin that begins in western Georgia and flows southwesterly through east central Alabama. Harris Reservoir is a 9,870-acre (17 square mile) impoundment located in Clay, Cleburne, and Randolph counties, on the Tallapoosa River. Harris Reservoir has approximately 367 miles of shoreline. The Tallapoosa River Basin is approximately 4,687 square miles; approximately 15 percent of this basin's drainage area lies in Georgia (CH2MHILL 2005).

The headwaters of the Tallapoosa and the Little Tallapoosa rivers begin in the Georgia counties of Paulding and Carroll (at approximately 1,150 feet msl), respectively, and enter Alabama in Randolph County southwest of the city of Atlanta, Georgia to form the main stem of the Tallapoosa River. From this point, the Tallapoosa River meanders southwesterly through four Alabama Power hydroelectric developments (Harris Dam, Martin Dam, Yates Dam, and Thurlow Dam) before joining the Coosa River to create the Alabama River (at approximately 113 feet msl). ***Figure 3-1*** shows the location of the Harris Reservoir within the Tallapoosa River Basin.

Two smaller creeks (Wedowee and Ketchepedrakee) serve as main tributaries of Harris Reservoir. The City of Wedowee flanks the eastern and southeastern shores of Harris

Reservoir. The City of Heflin, the largest city in Cleburne County, is roughly 30 miles north of Harris Reservoir, while the City of Lineville in Clay County is nearly 10 miles west of the reservoir. Although Heflin and Lineville are the only cities with populations of 1,000 or more, the watershed is located just south of I-20 and is only 65 miles east of downtown Birmingham, Alabama, and 65 miles west of downtown Atlanta, Georgia. Anniston, Alabama, is located about 42 miles from Harris Reservoir, and Montgomery and Auburn, Alabama, are also located within 100 miles of Harris Reservoir.

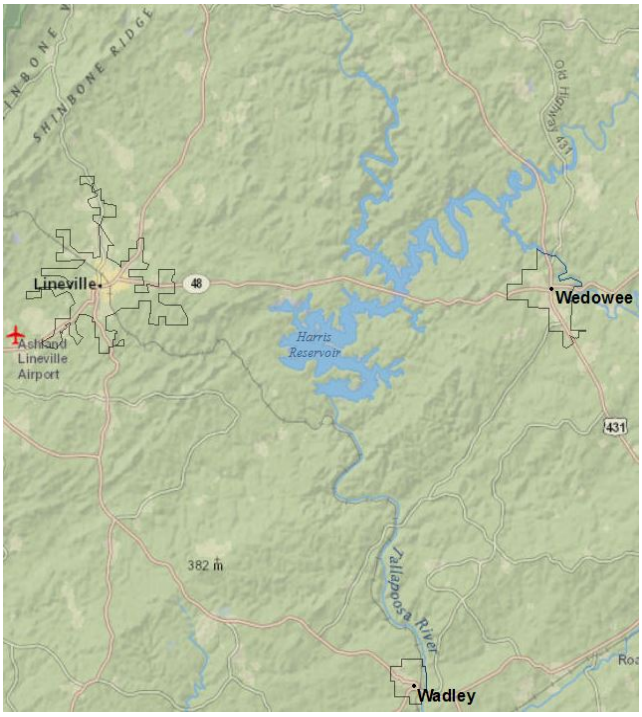


Source: Kleinschmidt, USDA, ESRI 2018

FIGURE 3-1 LOCATION OF HARRIS RESERVOIR IN THE TALLAPOOSA RIVER BASIN

3.1.1 MAJOR LAND AND WATER USES

Riparian water doctrine serves as the legal basis for water use in the eastern United States and is the foundation for the state's water resources management policy as codified in the 1993 Alabama Water Resources Act (AL Code § 9-10B 2017). Accordingly, the Tallapoosa River Basin's water resources are managed to serve both conjunctive and competing beneficial uses within the basin, as well as demands downstream of the basin. Current uses include water supply for municipal and industrial (M&I), agricultural, hydropower, navigation (downstream flow augmentation for the Alabama River), water quality (e.g., assimilative capacity for wastewater discharges), flood control, fish and wildlife habitat, and recreation (CH2MHILL 2005).



Location of Lineville, Wedowee, and Wadley near Harris Reservoir

Consumptive and non-consumptive demands are demand categories for these various uses. Consumptive uses, or "out-of-stream" uses, are water withdrawals that return only a portion or no portion of withdrawn water back to the Tallapoosa River Basin. Examples of consumptive uses are M&I and agricultural water supplies. The M&I water demands include all water uses, both publicly supplied and self-supplied, including residential, commercial, governmental/institutional, industrial, manufacturing, and other demands such as unaccounted-for water use (system losses and firefighting). Under Alabama law, human consumption is a priority such that "…no limitation upon the use for human consumption shall be imposed except in emergency situations…" (AL Code § 9-10B-2.2 2017) (CH2MHILL 2005). Non-consumptive water demands are those where water is withdrawn for use that is not consumed. Examples of non-consumptive uses include hydroelectric generation, and boating or fishing where the water is available for other uses at the same site.

Water use generally follows a seasonal pattern. Peak water demands are from June through September, when irrigation and residential water demand peaks with the warm temperatures (Davis et al. 1996). Seasonal demands on surface water affect management of Alabama Power's hydroelectric operations in the Tallapoosa River Basin.

Nearly half of the surface water withdrawals in the Tallapoosa River Basin are from reservoirs, with Lake Martin, downstream of Lake Harris, being the main source. Drinking water supplies

for livestock, irrigation of crops and orchards, and aquaculture account for most of the agricultural water demand in the Tallapoosa River Basin (CH2MHILL 2005).

Most of the land in the Tallapoosa River Basin is still undeveloped. Approximately 84 percent of the basin is forested, and 13 percent is agricultural. Less than 1 percent of the Tallapoosa River Basin is urban (CH2MHILL 2005). The closest population centers to Lake Harris are the town of Wedowee, the city of Lineville, and the town of Wadley, with populations of 742; 2,590; and 890 respectively, based on the 2016 Census estimate (Census Bureau 2017).

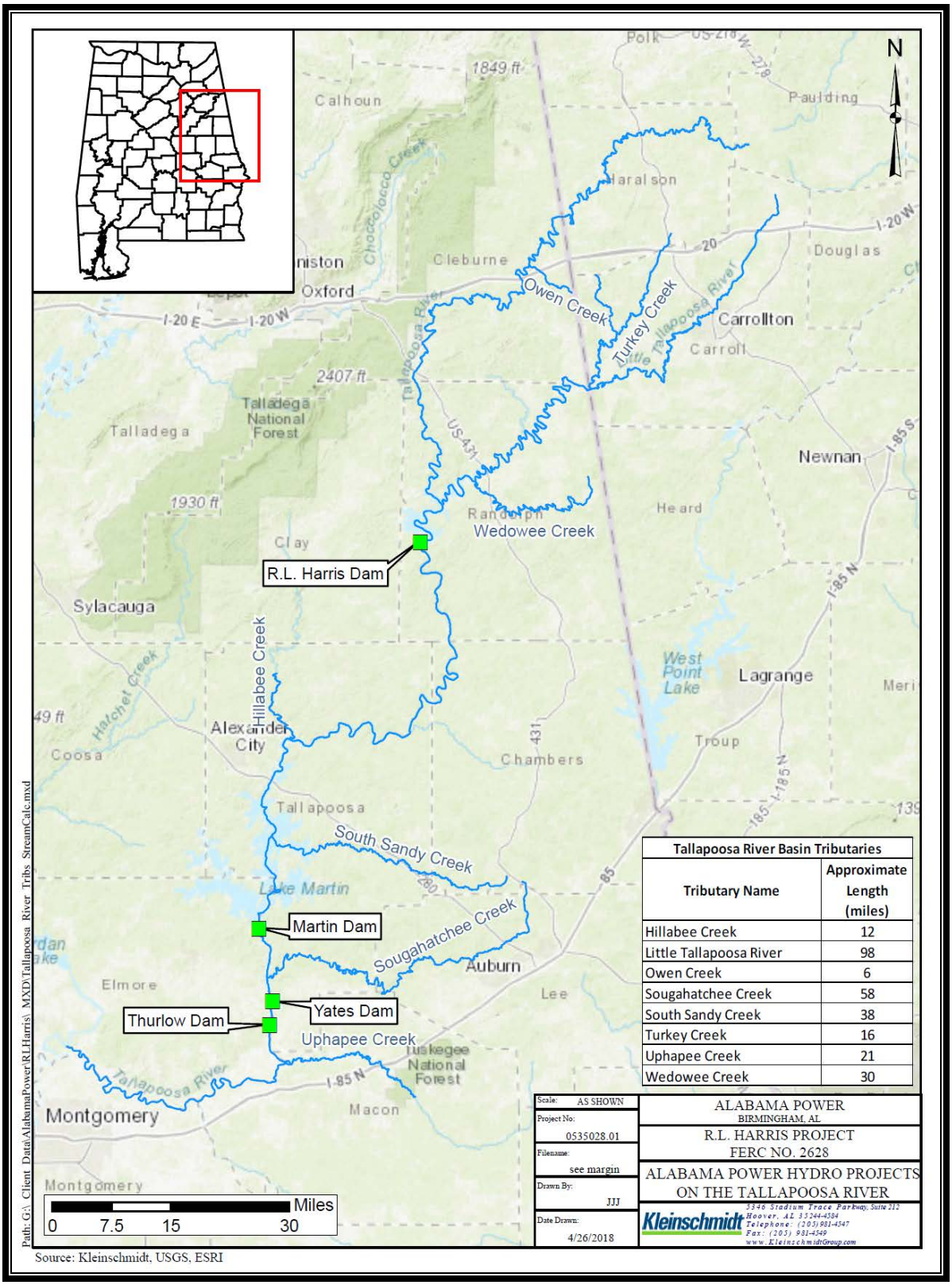
Although the downstream Alabama River provides for navigation for commercial barge traffic, the Tallapoosa River does not contain locks on any of the dams. There are no large metropolitan centers within the Tallapoosa River Basin; however, the city of Birmingham is located 65 miles west of Harris Reservoir. The Upper, Middle, and Lower Tallapoosa River areas are dominated by forest/woodland, 83.8 percent, 84.4 percent, and 64.1 percent, respectively, and agriculture, 13.1 percent, 8.4 percent, and 19.6 percent, respectively (CH2MHILL 2005). A description of the Upper, Middle, and Lower Tallapoosa River areas is located in Section 5.2.1.6.

3.1.2 OTHER DIVERSION STRUCTURES

All four hydroelectric generating dams on the Tallapoosa River are owned and operated by Alabama Power and include Harris Dam located at River Mile (RM) 139.1; Martin Dam located at RM 60.6; Yates Dam at RM 52.7; and Thurlow Dam at RM 49.7 (***Figure 3-2***).

3.1.3 TRIBUTARIES

The principal tributary streams in the Tallapoosa River Basin are the Little Tallapoosa River, which has a drainage area of 605 square miles in Georgia and Alabama, and Sougahatchee, South Sandy, Uphapee, and Hillabee creeks in Alabama. Other tributaries include Wedowee Creek, Owen Creek, and Turkey Creek (GADNR 1998).



Tallapoosa River Basin Tributaries

Tributary Name	Approximate Length (miles)
Hillabee Creek	12
Little Tallapoosa River	98
Owen Creek	6
Sougahatchee Creek	58
South Sandy Creek	38
Turkey Creek	16
Uphapee Creek	21
Wedowee Creek	30

Scale: AS SHOWN	ALABAMA POWER BIRMINGHAM, AL
Project No: 0535028.01	R.L. HARRIS PROJECT FERC NO. 2628
Filename: see margin	ALABAMA POWER HYDRO PROJECTS ON THE TALLAPOOSA RIVER
Drawn By: JJJ	Kleinschmidt 5346 Stadium Trace Parkway, Suite 212 Hoover, AL 35244-4584 Telephone: (205) 981-4547 Fax: (205) 981-4549 www.KleinschmidtGroup.com
Date Drawn: 4/26/2018	

Source: Kleinschmidt, USGS, ESRI 2018

FIGURE 3-2 ALABAMA POWER TALLAPOOSA RIVER PROJECTS

3.1.4 CLIMATE

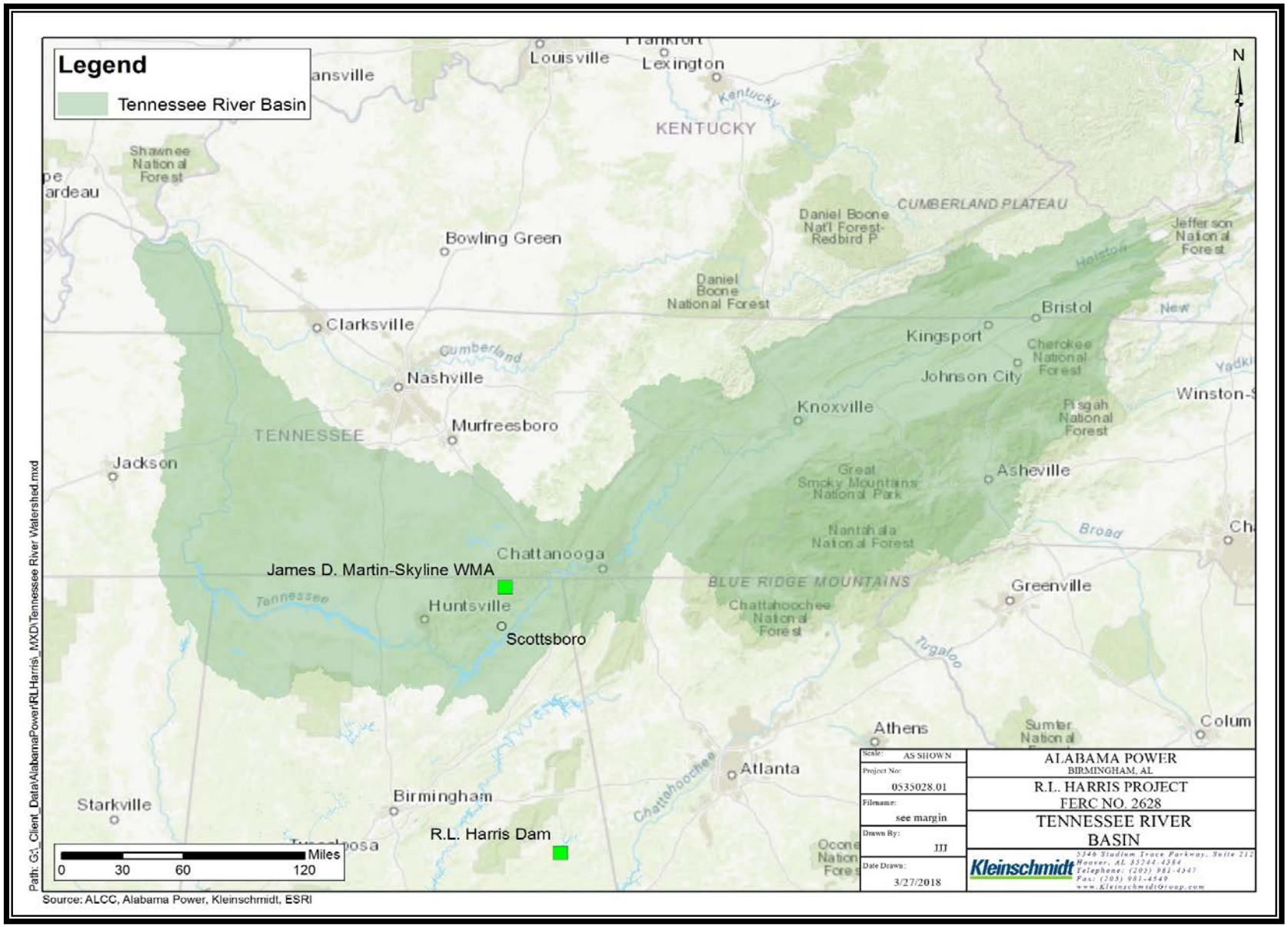
The general climate in the Tallapoosa River Basin is conducive to agriculture, outdoor leisure and recreation activities, and industries that require year-round outdoor work. This basin generally has a moist yet temperate climate. Precipitation is usually in the form of rain. Snowfall is rare. Insufficient rainfall may occur every 10 to 15 years. Rainfall is not evenly distributed throughout the Tallapoosa River Basin. Annual rainfall amounts typically range from 46 to 64 inches, with the higher amounts occurring in the Upper and Lower Tallapoosa River Basin segments, respectively. The average normal daily temperatures range from a high of 58 degrees Fahrenheit (°F) to a low of 35 °F in January. During the month of July, temperatures vary from 92 °F to 67 °F. Although the monthly average highs in June, July, and August exceed 90 °F, this temperature range generally occurs, on average, only 87 days per year. Historic records show that freezing temperatures occur on an average of only 51 days per year.

3.2 TENNESSEE RIVER BASIN

Skyline is located near Scottsboro, Alabama, in the Tennessee River Basin (***Figure 3-3***). The Tennessee River runs 652 miles from the confluence of the French Broad and Holston Rivers in Knoxville, Tennessee. The Tennessee River Basin is a sub-basin of the Ohio River Basin that begins in Pittsburgh, Pennsylvania and flows westward to Cairo, Illinois.

The headwaters of the Tennessee River begin at RM 652 where the French Broad River meets the Holston River in the Tennessee county of Knox, east of Knoxville, Tennessee, at an approximate source elevation of 813 feet msl (USGS 1955). The Tennessee River enters Alabama in Jackson County northeast of the city of Bridgeport, Alabama, passing Skyline on the east. From this point, the Tennessee River meanders southwesterly to the city of Guntersville, Alabama, and then proceeds northwesterly through Decatur to Florence, Alabama. The Tennessee River hosts 29 power-generating dams that power the Tennessee Valley Authority's (TVA) hydroelectric fleet before ending at the Ohio River in Livingston/McCracken counties near Paducah, Kentucky, at an approximate source elevation of 302 feet msl (USDOI 1968). The portion of the Tennessee River Basin in Alabama drains approximately 6,826 square miles, which represents 13 percent of the land area in northern Alabama (Clean Water Partnership 2003). The drainage area covers all 15 of the northern counties in Alabama.

The largest cities in northern Alabama within the Tennessee River Basin include Decatur, Florence, and Huntsville, each having a population of more than 30,000 residents. The closest large city to Skyline is Huntsville, which lies approximately 37 miles west, with an estimated population of 190,528. Huntsville is the largest city within the Tennessee River Basin in Alabama (Census Bureau 2015). Decatur, Alabama, is located approximately 60 miles west of Skyline, and Florence, Alabama, is located about 95 miles west of Skyline.



Source: ALCC, Alabama Power, Kleinschmidt, ESRI 2018

FIGURE 3-3 TENNESSEE RIVER BASIN

3.2.1 MAJOR LAND AND WATER USES

Current uses of the Tennessee River Basin include surface water withdrawals for all purposes (domestic, industrial, agricultural). Approximately 87 percent of this annual withdrawal is used for agricultural (irrigation) purposes; 8 percent is withdrawn for industrial use; and the remaining 5 percent for domestic use.

Consumptive and non-consumptive demands are demand categories for various uses. Consumptive uses or "out-of-stream" uses are water withdrawals that return only a portion or none of the withdrawn water back to the Tennessee River Basin. Consumptive uses include municipal, industrial, and agricultural water supplies. The M&I water demands comprise water uses, both publicly supplied and self-supplied, including residential, commercial, governmental/institutional, industrial, manufacturing, and other demands such as unaccounted-for water use (system losses and firefighting) (CH2MHILL 2005). Non-consumptive water demands are those where water is withdrawn for use that is not consumed. Examples of non-consumptive uses include hydroelectric generation, and boating or fishing where the water is available for other uses at the same site. Under Alabama law, human consumption is a priority such that "…no limitation upon the use for human consumption shall be imposed except in emergency situations…" (AL Code § 9-10B-2.2 2017). Water withdrawals in the Tennessee River Basin during 2000 averaged about 12,211 million gallons per day (mgd) of freshwater for out-of-stream uses and is projected to increase to 13,990 mgd by 2030 (USGS 2004). The reuse potential of water from the Tennessee River is high because most of the water withdrawn for out-of-stream use is returned to the river system (Hutson et al. 2004).

Four major reservoirs are located on the Tennessee River. These reservoirs are operated and managed by the TVA for a variety of purposes including flood control, navigation, water supply, recreation, hydroelectric power, and economic development. Additionally, the reservoirs serve recreational uses such as fishing and swimming (Clean Water Partnership 2003). Water use generally follows a seasonal pattern. Peak water demands are during the summer months, when TVA's generating load increases (USGS 2004).

The Tennessee River Basin is predominantly woodland and agricultural land. Urban/suburban and bare areas used as mine lands and construction areas are also common (Clean Water Partnership 2003). Between 1982 and 1997, a significant change occurred in land use distributions in the Tennessee River Basin from farmland to developed lands (e.g., subdivisions, commercial, industrial uses) (Clean Water Partnership 2003). The closest rural towns to Skyline are Hytop and Stevenson in Alabama and Sherwood in Tennessee, with a combined total population of approximately 2,941 residents (Census Bureau 2000; Census Bureau 2010a; Census Bureau 2010b).

3.2.2 OTHER DIVERSION STRUCTURES

The main stem of the Tennessee River is highly regulated with few free-flowing stream reaches (USGS 1998). There are 30 dams (29 hydroelectric and 1 non-power dam) on the Tennessee River: Appalachia, Blue Ridge, Boone, Chatuge, Cherokee, Chickamauga, Douglas, Fontana,

Fort Loudoun, Fort Patrick Henry, Great Falls, Guntersville, Hiwassee, Kentucky, Melton Hill, Nickajack, Norris, Nottely, Ocoee (1, 2 and 3), Pickwick Landing, Raccoon Mountain, South Holston, Tims Ford, Watauga, Watts Bar, General Joe Wheeler, Wilbur, and Wilson. All 29 hydroelectric generating dams on the Tennessee River are owned and operated by TVA. Of those 29 dams, three are located in Alabama: Guntersville, General Joe Wheeler, and Wilson dams at RMs 349.0, 274.9 and 259.4, respectively (USACE 2013a).

3.2.3 TRIBUTARIES

The principal tributary streams are the Holston River and the French Broad River, both of which are in Tennessee. The French Broad River has a drainage area of 5,124 square miles in North Carolina and Tennessee. The Holston River has a drainage area of 3,776 square miles and includes Virginia and Tennessee (USGS 2000).

3.2.4 CLIMATE

The Lower Tennessee River Basin is about 19,500 square miles, of which 57 percent is in Tennessee, 35 percent in Alabama, and 1 percent in Georgia. This area is made up of three physiographic regions: Coastal Plain Province, Cumberland Plateau Section of the Appalachian Plateaus Province, and Interior Low Plateaus. Annual precipitation varies from 47 inches in the Coastal Plain to 63 inches in the Cumberland Plateau. The general area has a temperate climate with an average annual temperature of about 58 degrees ^{o}F (USGS 1998). Skyline is located within the Cumberland Plateau Section of the Appalachian Plateaus Province in the northeastern corner of Alabama. The rainfall in the drainage area varies annually with much of rainfall occurring in the mountainous areas along the headwaters of the tributaries where mean annual rainfall can be as high as 90 inches (USGS 2004). The Tennessee River Basin is conducive to agriculture, outdoor leisure and recreation activities, and industries that require year-round outdoor work.

4.0 PROJECT INTRODUCTION, LOCATION, FACILITIES AND OPERATIONS

FERC issued a preliminary permit to Alabama Power for the R.L. Harris Project on July 7, 1967. On November 1, 1968, Alabama Power submitted to FERC an application for an original license. FERC granted an order issuing a major license for the Crooked Creek Project on December 27, 1973, for a 50-year period, effective December 1, 1973[10].

Alabama Power began construction on the Harris Project in 1974; however, due to poor economic conditions during the 1970s construction was delayed. Alabama Power began service at the Harris Project on April 20, 1983. The Harris Project infrastructure consists of:

- a concrete gravity dam, powerhouse, and spillway totaling 1,142 feet long with a maximum height of 151.5 feet;
- five radial gates for passing floodwaters in excess of turbine capacity and one radial trash gate;
- a reservoir with a surface area of 9,870 acres at normal full pool elevation of 793 feet msl;
- headworks containing six intake gates and a penstock;
- a concrete powerhouse, 186-feet-long, and 150-feet-high, two vertical generators and two vertical Francis turbines, for a total authorized installed capacity of 135 MW; and
- transmission lines and appurtenant facilities.

Additional details on the project works are discussed in the following sections.

4.1 PROJECT BOUNDARY AND FACILITIES

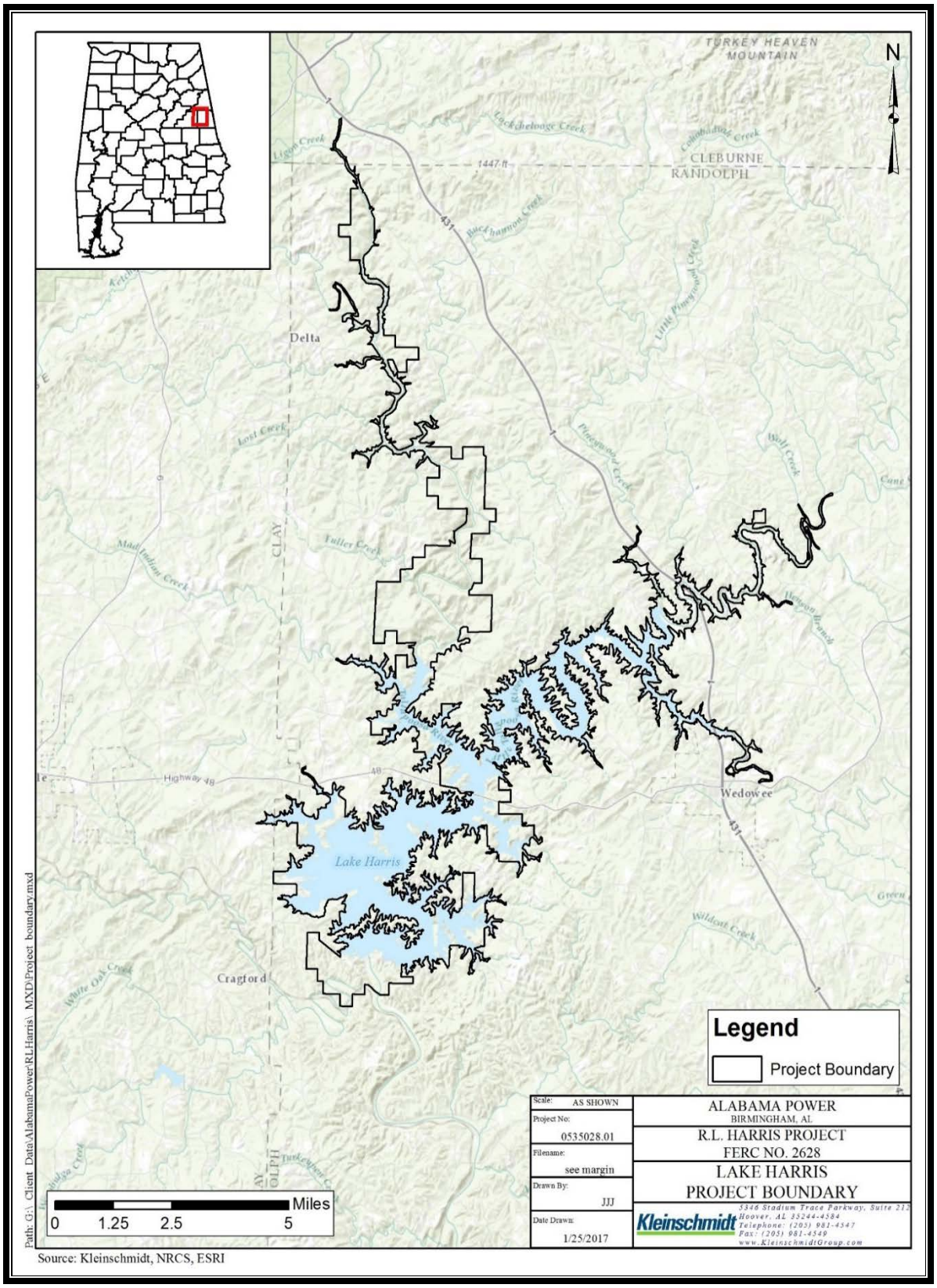
FERC defines a project boundary as the area enclosing the land and waters necessary to operate a FERC-licensed hydroelectric project (***Figure 4-1*** and ***Figure 4-2***). Alabama Power is responsible for managing only those activities within the FERC Harris Project Boundary.

As discussed in Section 1.0, Lake Harris refers to the 9,870-acre reservoir, adjacent 7,392 acres, and the dam, spillway, and powerhouse. Skyline refers to the 15,063 acres of Project land within the Skyline WMA in Jackson County. The FERC Harris Project Boundary encompasses both Lake Harris and Skyline, and for the purposes of this document, those areas are referred to as the Lake Harris Project Boundary and the Skyline Project Boundary.

What is a FERC project boundary?

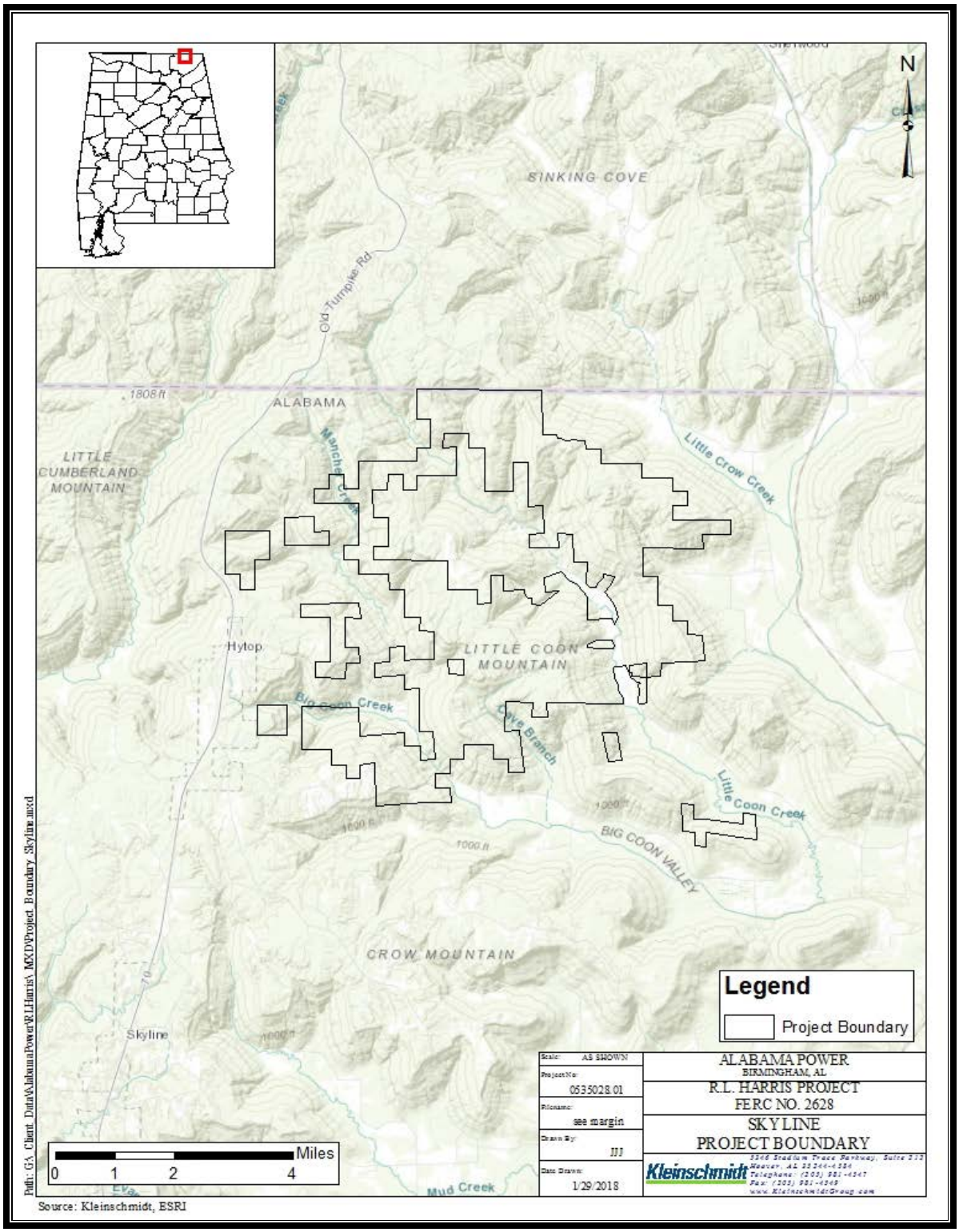
A project boundary encloses the lands, waters, and structures necessary for project operation.

[10] The preliminary permit was issued by the Federal Power Commission, which was established in 1920 and became the Federal Energy Regulatory Commission in 1977. In addition, the Crooked Creek Project was officially changed to the R.L. Harris Project on November 6, 1974.



Source: Kleinschmidt, NRCS, ESRI 2017

FIGURE 4-1 LAKE HARRIS PROJECT BOUNDARY



Source: Kleinschmidt, ESRI 2018

FIGURE 4-2 SKYLINE PROJECT BOUNDARY

4.1.1 RESERVOIR

Harris Reservoir extends up the Tallapoosa River approximately 29 miles from Harris Dam, which is located at RM 139.1. The Harris Dam is approximately 78 RMs upstream from the Martin Dam, and 86 RMs upstream from the Yates Dam (Alabama Power 2018).

Harris Reservoir has approximately 367 miles of shoreline. The reservoir surface area is approximately 9,870 acres at normal full pool elevation of 793 feet msl and has a mandatory 8-foot drawdown to 785 feet msl from December to April. The normal tailwater elevation with one unit operating is 664.9 feet msl; with two units operating, it is 667.7 feet msl. The gross storage capacity of Harris Reservoir is approximately 425,721 acre-feet and the usable storage capacity is approximately 207,317 acre-feet.

4.1.1.1 Dependable Capacity and Average Annual Generation

"Dependable capacity" is the Intercompany Interchange Contract (IIC) summer full gate rating. This value was chosen because it most closely reflects the definition of dependable capacity. To calculate this value, the plant rating is adjusted to the expected July reservoir elevations. Then, using average July inflow, all units at all plants are modeled to operate simultaneously for 4 consecutive hours for 5 consecutive days. The resulting 20 hours of capacity are averaged to provide the capacity that can be supported during the system peak. The Project has a dependable capacity of 133 MW and produces an average of 151,878 MWh[11] annually.

4.1.2 DAM

Harris Dam consists of a concrete gravity dam, topographic saddles (800-feet and 300-feet long), and earth dike section totaling 3,243-feet-long with a maximum height of 151.5-feet. The dam consists of a:

- 310-foot-long arched concrete gravity spillway;
- 186-foot-long concrete gravity intake structure;
- 400-foot-long and 95-foot-high west embankment;
- 600-foot-long and 95-foot-high east embankment;
- 331-foot-long, 112-foot-high concrete gravity west non-overflow section; and
- 315.5-foot-long, 150-foot-high concrete gravity east non-overflow section.

The dam has five radial gates for passing floodwaters in excess of turbine capacity and one radial trash gate. Each radial gate measures 40-feet 6-inches high and 40-feet-wide.

4.1.3 POWERHOUSE

The Harris powerhouse is a concrete structure and is integral with the intake facilities. It houses two flow units totaling 135 MW. There are two vertical generators each rated at 71,740

[11] Average MWh over five years.

kilovolt-amps (kVA) and two vertical Francis turbines each rated at 95,000 horsepower (hp) under a net head of 121 feet and each with a maximum hydraulic capacity of 8,000 cubic feet per second (cfs). Harris Project intake structures are located at 746 feet msl and are equipped with a skimmer weir that can incrementally raise the effective intake elevation approximately 18 feet to a maximum of approximately 764 feet msl. The intake structures are 47 feet below full pool elevation and 39 feet below the winter pool elevation.

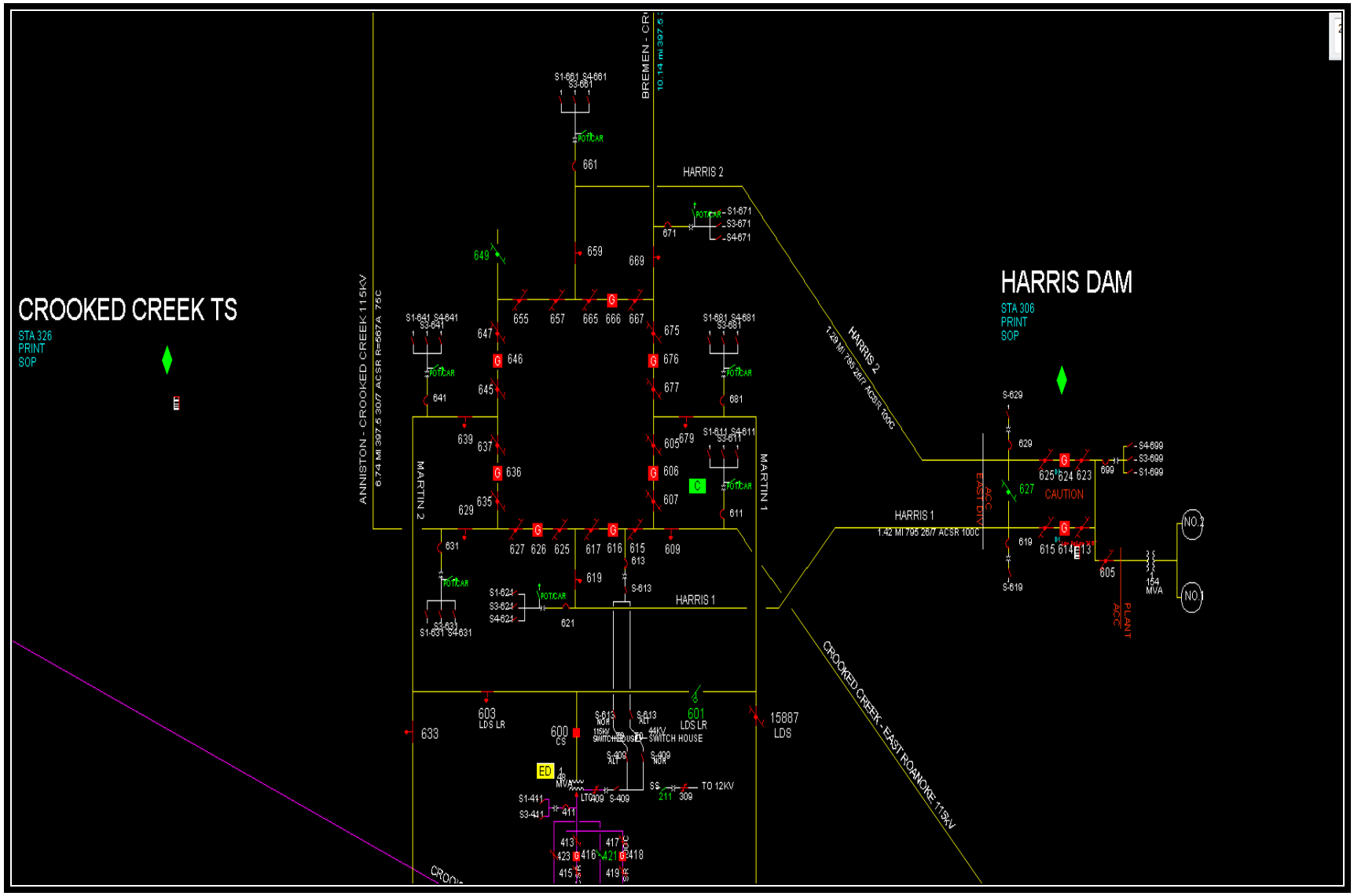
4.1.4 TRANSMISSION

Alabama Power supplies electric power throughout a large part of Alabama and exchanges electric power with other operating subsidiaries of Southern Company in Florida, Mississippi, and Georgia, and with TVA by means of physical connections of the transmission systems of each.

The Harris Project includes two (2) 115 kilovolt (kV) transmission lines which extend approximately 1.5 miles to the northwest from Harris Dam to the Crooked Creek Transmission Substation. A single line diagram is provided in ***Figure 4-3***.

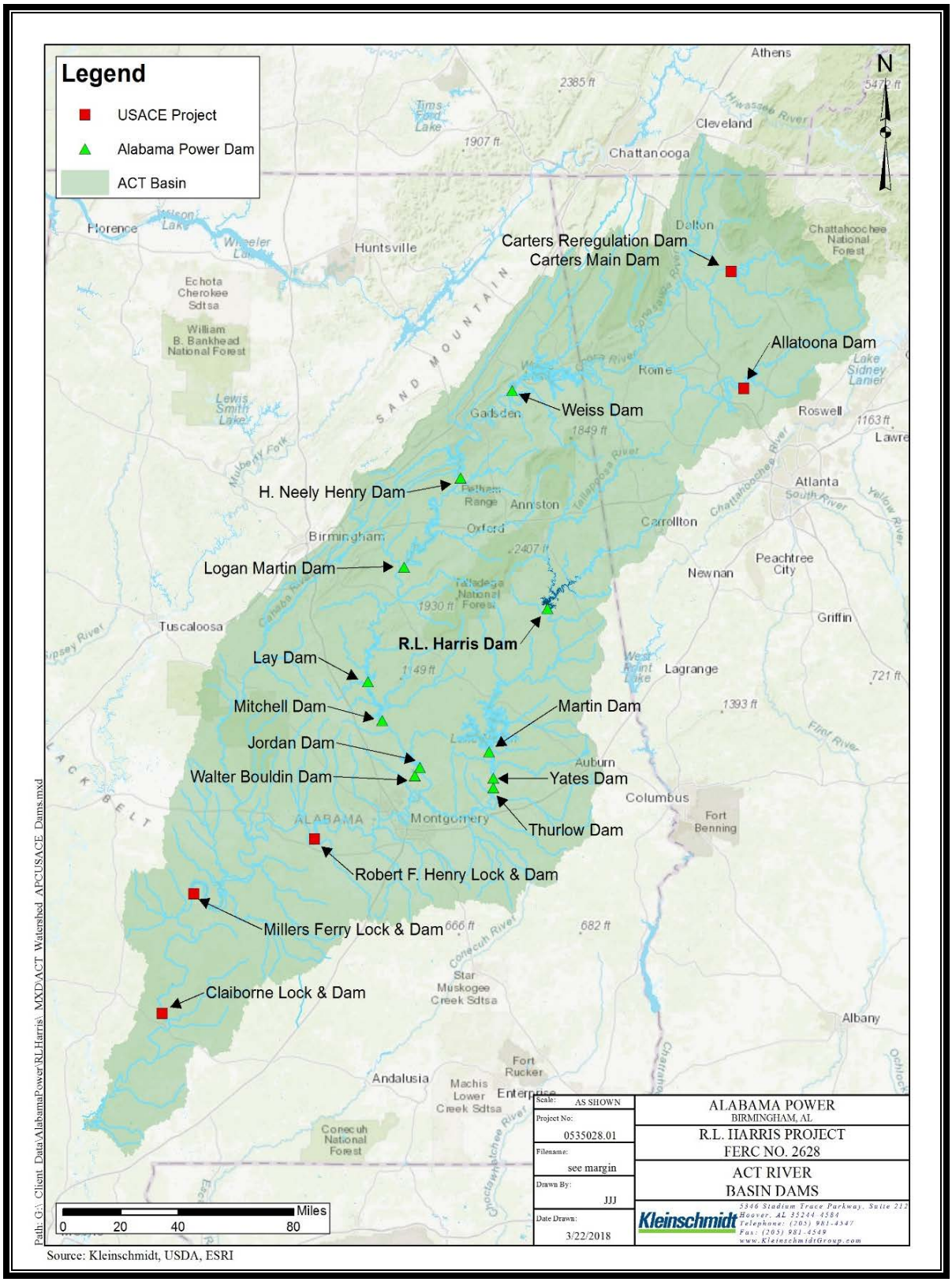
4.2 THE ALABAMA-COOSA-TALLAPOOSA BASIN

Before describing Alabama Power's Harris Project operations, it is important to discuss the relationship between Alabama Power and the U.S. Army Corps of Engineers (USACE) in the Alabama-Coosa-Tallapoosa (ACT) River Basin. The ACT basin originates just north of the Tennessee-Georgia border, extends into central north Georgia, crosses the Georgia-Alabama state line into north Alabama, and continues across central and southern Alabama before terminating in Mobile Bay (USACE 2011). The basin covers 32 counties in Alabama, 18 counties in Georgia, and two counties in Tennessee. The basin drains 22,800 square miles, extending approximately 320 miles. The USACE owns and maintains five projects in the ACT basin, and Alabama Power Company owns and maintains eleven developments (***Figure 4-4***).



Source: Alabama Power 2017

FIGURE 4-3 HARRIS SINGLE LINE DIAGRAM



Source: Kleinschmidt, USDA, ESRI 2018

FIGURE 4-4 ACT RIVER BASIN DAMS

4.2.1 USACE WATER CONTROL MANUAL

The USACE's Master Water Control Manual (Master WCM) provides a general reference for day-to-day, real-time water management decision making for the five federal projects operated by USACE and the 11 non-federal developments operated by Alabama Power in the ACT basin. Projects in the ACT basin are operated in a coordinated manner to manage the often-competing uses, meet all authorized uses, ensure that enough water is available to at least minimally satisfy project purposes during droughts, and to maintain a balanced use of storage (USACE 2013b). The Master WCM contains nine appendices that describe specific regulations for individual projects in the ACT basin.

Alabama Power operates Harris Reservoir in accordance with the operating plan in Appendix I of the Master WCM issued October 2014. This Harris Water Control Manual (Harris WCM) describes flood management regulations, navigational support plans, and drought contingency operations specific to the Harris Project (USACE 2014a).

A Multi-Purpose Storage Reservoir Provides For:

- Hydroelectric Power
- Flood Storage
- Recreation
- M&I Water Supply
- Water Quality Enhancement
- Aquatic Flow Maintenance
- Navigation Flow Support

4.3 CURRENT PROJECT OPERATIONS

Harris Reservoir is a multi-purpose storage reservoir. Water levels in Harris Reservoir fluctuate seasonally to provide the many benefits the Harris Project was built to support, including upstream and downstream uses and hydroelectric power, which directly affects many people throughout the state.

The Harris Operating Curve (the black line in ***Figure 4-5***) is a graph of target normal daily lake levels. Harris Reservoir is maintained at or below the elevations specified by the Harris operating curve, except when storing floodwater. From May 1 through October 1, Harris Reservoir is maintained at or below elevation 793 feet msl, depending on inflow conditions, which corresponds to a storage of 425,721 acre-feet. Between October 1 and December 1, the operating curve elevation drops to elevation 785 feet msl. The pool level remains at or below elevation 785 feet msl until April 1. From April 1 to May 1, the operating curve elevation rises to full pool at elevation 793 feet msl. During high flow conditions, USACE-approved flood control procedures in the Harris WCM are implemented. During low flow conditions, the drought contingency curve (the red line labeled "lower operating curve" in ***Figure 4-5***) is intended to be used as one of several factors in evaluating drought reservoir operations consistent with approved drought plans.

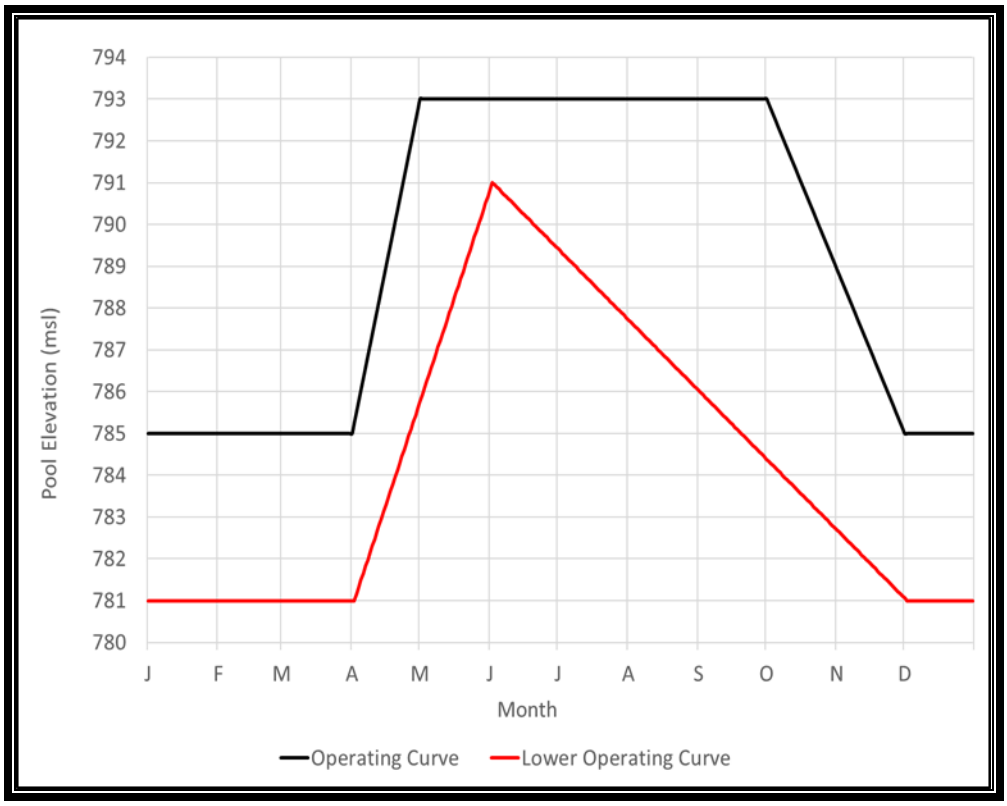


FIGURE 4-5 HARRIS OPERATING CURVE

4.3.1 FLOOD CONTROL OPERATIONS

The objective of flood control at Harris Dam is to store excess water during high flow events to maintain water levels below flood stage downstream and to not cause stages higher than would occur naturally. The Harris WCM provides procedures to be used by Alabama Power to carry out the operation of the Harris Project during floods.

The Harris Project will operate to pass the inflow up to approximately 13,000 cfs by releasing water through the powerhouse to maintain the reservoir near the operating curve (USACE 2014a). If the reservoir rises above the operating curve (or is predicted to in the near future) but is below elevation 790 feet msl, the Harris Project will operate to discharge 13,000 cfs or an amount that will not cause the USGS stream gage at Wadley, Alabama (gage No. 02414500), to exceed 13.0 feet, unless greater discharge amounts are required by the induced surcharge curves. When the reservoir rises above elevation 790 feet msl, the powerhouse discharge will be increased to the larger of approximately 16,000 cfs or the amount indicated by the induced surcharge curves. Once the reservoir level begins to fall, all spillway gate openings and the powerhouse discharge will be maintained at those settings until the Harris Reservoir level returns to the operating guide curve. If a second flood enters the reservoir prior to the complete evacuation of the stored flood waters, the release will be as directed by the induced surcharge curve operation plan outlined in the WCM (USACE 2014a).

The spillway gates at Harris Dam are generally operated in accordance with the gate opening schedule described in the WCM (USACE 2014a). The schedule specifies the gate step and gate position based on the induced surcharge curve.

4.3.2 NAVIGATION

Alabama Power operates the Harris Project, along with other hydroelectric projects on the Coosa and Tallapoosa rivers, to support a predictable minimum navigable channel (i.e., a minimum water depth) in the Alabama River.

As outlined in the USACE Master WCM for the ACT basin, Alabama Power's Coosa River and Tallapoosa River projects are operated to provide a minimum 7-day average flow of 4,640 cfs (32,480 day-second-feet (dsf)/7 day) to the Alabama River at Montgomery. This flow is subject to being increased for navigation or decreased due to drought, generally described as follows:

> The ACT Master WCM includes a template for Alabama River navigation support, subject to development of a "navigational MOU," or navigation memorandum of understanding, between Alabama Power and the USACE. This template provides for the use of specified amounts of storage from Alabama Power's reservoirs to support navigation during the June-December period, under certain conditions, including adequate basin inflow. Also, navigation is not supported during drought operations, as defined by the ACT Basin Drought Contingency Plan (USACE 2014a).

4.3.3 DROUGHT MANAGEMENT

Droughts vary in duration, magnitude, degree of severity, and geographical extent, and, as a result, are difficult to predict and manage. Significant impacts to hydroelectric projects may occur despite Alabama Power's efforts to conserve water during periods of low rainfall. Effects of drought on hydroelectric operations can be classified into three broad categories: ecological impacts (e.g., changes to water quality and minimum flows), reduced electric generating capacity, and reduced recreational opportunities.

4.3.3.1 Alabama Drought Response Operations Plan

The Alabama-ACT Drought Response Operations Plan (ADROP) describes the management of Alabama Power's reservoirs within the ACT basin during drought conditions. It was developed by Alabama Power, stakeholders, and state and federal agencies in response to the 2007 drought, which is the drought of record for the ACT basin (Alabama Power 2013a). ADROP defines three drought triggers: (1) low basin inflow; (2) low composite conservation storage; and (3) low state line flow. If any one of these triggers is met, navigation support is suspended, and the 4,640 cfs Alabama River flow at Montgomery may be reduced consistent with the plan, depending on the severity of the drought conditions. Under the plan, the "drought triggers" are used to define three incremental Drought Intensity Level (DIL) responses. The DIL responses describe a range of operations for the hydroelectric projects within the ACT basin as a function of the DIL and month. Alabama Power, Alabama Office of Water Resources

(OWR), and other relevant state and federal agencies monitor specific precipitation and stream flow indicators within the ACT basin. The precipitation indicator is based on the average of normal monthly rainfall at the following airport rain gauges: Rome, Anniston, Shelby County, and Montgomery. The stream flow indicator is based on specific percentile ranges of stream flow from eleven USGS gages in the Coosa River basin and seven gages in the Tallapoosa River Basin (Alabama Power 2013a). Alabama Power evaluates the DIL using the ADROP Decision Tool that was developed by Alabama Power and the USACE Mobile District to implement portions of the WCM in real time operations. ADROP has been incorporated into the WCM and ACT Basin Drought Contingency Plan. A full description of ADROP and associated operational responses for its projects on the Coosa and Tallapoosa Rivers during periods of drought is included in Appendix D.

4.3.4 GREEN PLAN FLOWS

In the 1990s, resource agencies and other stakeholders expressed concern about impacts to aquatic resources associated with peaking operations and minimum flows at Harris Dam. Alabama Power worked with stakeholders including, among others, Alabama Department of Conservation and Natural Resources (ADCNR), the U.S. Fish and Wildlife Service (USFWS), and the Alabama Cooperative Fish and Wildlife Research Unit (ACFWRU) at Auburn University to address those concerns. Following a 2003 adaptive management workshop, a core group of stakeholders worked with Alabama Power to explore potential solutions that maximized benefits to biological, economic, and recreation resources.

Alabama Power evaluated several methods to provide continuous flows or re-regulation of peaking flows from Harris Dam, including geotubes, a re-regulation dam, and structural modification to Harris Dam. Alabama Power performed numerous hydraulic modeling runs (HEC-RAS[12]) of various flow scenarios in evaluating potential re-regulation structures. Many of the methods evaluated were deemed unfeasible at that time due to engineering (structural), cost, and/or ecological considerations.

After ruling out potential physical modifications to the dam and river downstream, the stakeholder group and Alabama Power devised a plan for specific pulsing releases from Harris Dam, which was deemed the "Green Plan." Generally, the Green Plan specifies short (10 to 30 minute) pulses from Harris Dam, with the pulse duration determined by conditions at a gage on an unregulated section of the Tallapoosa River upstream of Harris Reservoir.

In 2005, Alabama Power began implementing the Green Plan and, along with ADCNR, began funding research by ACFWRU to determine the response of the aquatic community in the Tallapoosa River downstream of Harris Dam. Alabama Power continued to support those research efforts through 2017. In 2018, to support the relicensing process and provide baseline information for this PAD, Kleinschmidt Associates (Kleinschmidt) summarized the history of the development of the Green Plan and the research conducted from 2005-2017 as part of monitoring efforts in the Tallapoosa River below Harris Dam in a report entitled "*Summary of R.L. Harris Downstream Flow Adaptive Management History and Research*" (Kleinschmidt

[12] Hydrologic Engineering Center's River Analysis System

2018a and Appendix E). A full description of the Harris Adaptive Management Plan (AMP) Process and Green Plan operations is provided in Appendix E.

4.4 CURRENT LICENSE REQUIREMENTS

FERC issued Alabama Power a new 50-year license for the operation of the Harris Project on December 27, 1973, effective December 1, 1973. Articles 1–65 were either in the FERC Order issuing the license or in subsequent proceedings. Some of the license articles are related to dam construction or other completed activities and are now considered expired. Articles have been added and revised since the original license was issued. The current license articles include provisions for circumstances that may occur throughout the life of the license, including abandoning or retiring the project, consulting on cultural resources discoveries, and granting permission for types of use and occupancy of project lands and waters without prior FERC approval. Current license requirements are included in Appendix F.

4.5 CURRENT NET INVESTMENT

The estimated current net investment of the Harris Project is approximately $135 million (year 2018 dollars). When the current project license expires in 2023, Alabama Power expects that its net investment in the Harris Project will be approximately $128 million dollars.

4.6 COMPLIANCE HISTORY OF THE HARRIS PROJECT

Alabama Power has reviewed the compliance history for the Harris Project and found no non-compliance violations within the last 10 years. Regular dam safety inspections are required by FERC and are conducted by an independent consultant in accordance with Part 12 of FERC regulations. FERC's Atlanta Regional Office conducts an annual Operation Inspection as well. In addition, FERC's Division of Hydropower Administrative and Compliance conducts periodic Environmental and Public Use Inspections; FERC inspected the Harris Project on July 19, 2016. There are no outstanding issues to be addressed at the Harris Project arising from FERC inspections during the past 10 years.

Safety

Alabama Power has a robust dam safety inspection program that goes beyond the Federal Energy Regulatory Commission monitoring and inspections.

- Staff receives annual training on the identification of conditions that could lead to problems.
- Every five years, an independent expert conducts an audit of the condition and stability of each dam.
- Annual inspections are conducted.
- Twice weekly Alabama Power employees complete a checklist for inspection of each dam.
- Each hydroelectric dam has emergency action plans for the unlikely event of a failure.

4.6.1 SAFETY REQUIREMENTS

Alabama Power has an Emergency Action Plan (EAP) that provides a system for public notice and warning to downstream property owners along the Tallapoosa River in the event of a dam failure. Alabama Power conducted an EAP drill in October 2017 and submitted an assessment of the drill to FERC on December 21, 2017. Alabama Power conducted an EAP functional exercise for Harris Dam in 2017. In addition, on October 31,

2012, Alabama Power filed a Public Safety Plan with FERC, which details the safety measures that Alabama Power implements at Lake Harris.

An independent engineering consultant, specializing in dam safety, inspects the Harris Dam and associated facilities every five years as required by Part 12 of FERC's regulations to identify any potential structural issues with the Harris Project. Alabama Power submits the consultant's findings and recommendations to FERC and implements the appropriate corrective actions to respond to the recommendations. Alabama Power submitted the latest Part 12 inspection report to FERC on April 2, 2018. The next Part 12 inspection report is due in March 2023.

4.6.2 SUMMARY OF HARRIS PROJECT GENERATION AND OUTFLOW RECORDS

On average, the Harris Project generates approximately 18 percent of the electricity of Alabama Power's Tallapoosa River fleet of dams. Average annual generation for the Harris Project is approximately 152,000 megawatt hours (MWh). Because of the Harris Project's operational flexibility, it can store water during low electrical usage periods and then generate with the stored water during periods of high electrical usage when production costs would normally be higher. This results in lower production costs to Alabama Power and a savings for its customers. All the electric energy generated by the Harris Project is used in the interconnected system of Alabama Power for public utility purposes.

Table 4-1 shows the 5-year average monthly generation from the Project.

TABLE 4-1 HARRIS DAM PROJECT AVERAGE ACTUAL GENERATION FROM 2013–2017

Month	KWH
January	20,287,400
February	18,471,800
March	15,479,400
April	17,075,600
May	13,576,200
June	10,341,400
July	9,439,000
August	6,247,800
September	4,673,000
October	7,629,400
November	9,752,800
December	18,904,000
Year	151,877,800

Source: Peeples 2018

4.6.3 DELIVERY OF WATER FOR NON-POWER USES

On April 1, 1988, under the delegated authority provisions of Article 61 of the Harris Project License, Alabama Power granted an easement to the Town of Wedowee-Water, Sewer and Gas Board[13], allowing for construction, operation, and maintenance of a new floating water intake system and related facilities. The easement limits the intake to a maximum withdrawal of 0.5 mgd. This withdrawal is used to meet the water supply needs for Northeast Randolph County Service District by way of the John Swann Water Treatment Plant. The average daily withdrawal was 0.34 mgd for the period of 2010 through 2015. The Town of Wedowee-Water, Sewer and Gas Board withdrawal is subject to the provisions, terms, conditions, and time duration of any new or modified license issued by FERC.

4.6.4 FLOW STATISTICS

The primary source of information relating to flow statistics downstream of Harris Dam is the U.S. Geological Survey's (USGS) Wadley gage. Maximum monthly flow has historically occurred in May. The peak instantaneous daily flow at Wadley gage was 125,000 cfs on May 8, 2003 (USGS 2016a). Mean, maximum, and minimum monthly flow statistics for Wadley gage (for the period of record from October 1, 1983 to December 31, 2016) are presented in ***Table 4-2*** (USGS 2016b). Annual and monthly flow-duration-exceedance curves for Wadley gage are presented in Appendix G.

TABLE 4-2 MEAN, MAXIMUM, AND MINIMUM MEAN MONTHLY FLOW STATISTICS FOR THE TALLAPOOSA RIVER AT WADLEY, AL

MONTH*	MEAN DISCHARGE[1]	MAXIMUM MEAN DISCHARGE[1]	MINIMUM MEAN DISCHARGE[1]
January	3,342	6,757	299
February	4,244	10,890	1,581
March	4,686	13,270	1,294
April	2,540	5,848	471
May	2,533	14,320	381
June	1,735	4,819	521
July	1,803	7,058	450
August	1,265	4,331	281
September	1,010	3,180	202
October	1,327	5,599	234
November	2,114	6,434	185
December	2,587	8,425	220

Source: USGS 2016b
*Period of Record: 10/1/1983-12/31/2016
[1] Measured in cubic feet per second (cfs)

[13] Town of Wedowee-Water, Sewer and Gas Board was formerly named the Town of Wedowee Utility Board.

4.7 PROPOSED OPERATION

Alabama Power proposes to continue baseline operations at the Harris Project, as defined in Section 4.3, including peaking operations and Green Plan flows. Some stakeholders have requested that Alabama Power raise the winter operating curve at the Harris Project to provide additional access to the Harris Reservoir during the winter months. Alabama Power has developed a study plan to evaluate the feasibility of providing a change in the winter operating curve of up to 4 feet. This study will evaluate the effects of a 1-foot to 4-foot change of the Harris operating curve on lake and downstream environmental, recreational, cultural, and socioeconomic resources, flood control, and power generation. Alabama Power, through existing information and results from the FERC approved study plans, will develop any operational changes and associated protection, mitigation, and enhancement measures, as appropriate, to include in the Preliminary Licensing Proposal (PLP) and Final License Application.

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5.0 DESCRIPTION OF EXISTING ENVIRONMENT

As described in Section 1.0, the Harris Project is located in two geographic areas. Lake Harris is located in the Tallapoosa River Basin and consists of the dam, spillway, powerhouse and a 9,870-acre reservoir (Harris Reservoir), as well as approximately 7,392 acres of Project land around the reservoir, managed by Alabama Power. Throughout this document, this portion of the Project is described as Lake Harris (***Figure 4-1***).

Project Boundary – refers to the land and water contained in the area defined by the FERC as the lands and waters necessary to operate the Project.

Project Area – refers to the land and water in the Project Boundary and immediate geographic area adjacent to the Project Boundary.

Project Vicinity – refers to a larger geographic area near the Project, for example, a county.

The Harris Project also contains 15,063 acres of land within the Skyline WMA located in Jackson County, Alabama, in the Tennessee River Basin. Skyline is located approximately 110 miles north of Lake Harris and was acquired and incorporated into the Project Boundary as part of the FERC-approved Project Wildlife Mitigation Plan (Alabama Power 1988) and Wildlife Management Plan (Alabama Power 1989). These lands are leased to and managed by the State of Alabama for wildlife management and public hunting and are part of the Skyline WMA. Throughout this document, this portion of the Project is described as Skyline (***Figure 4-2***). Alabama Power does not own or manage any water or hydroelectric infrastructure at Skyline.

For this section, Alabama Power describes the Lake Harris resource first, followed by the Skyline resource. Some resource sections for Skyline (e.g., water resources) will be very brief, because no managed waters, hydroelectric infrastructure, or project operations are within this location. Specific references to the Harris Reservoir will be identified as Harris Reservoir; specific reference to the dam will be identified as Harris Dam. The "Project Area" refers to the land and water in the Project Boundary and immediate geographic area adjacent to the Project Boundary. The "Project Vicinity" refers to a larger geographic area near a hydroelectric project, such as a county. Terms and definitions used in the PAD are provided in Appendix A.

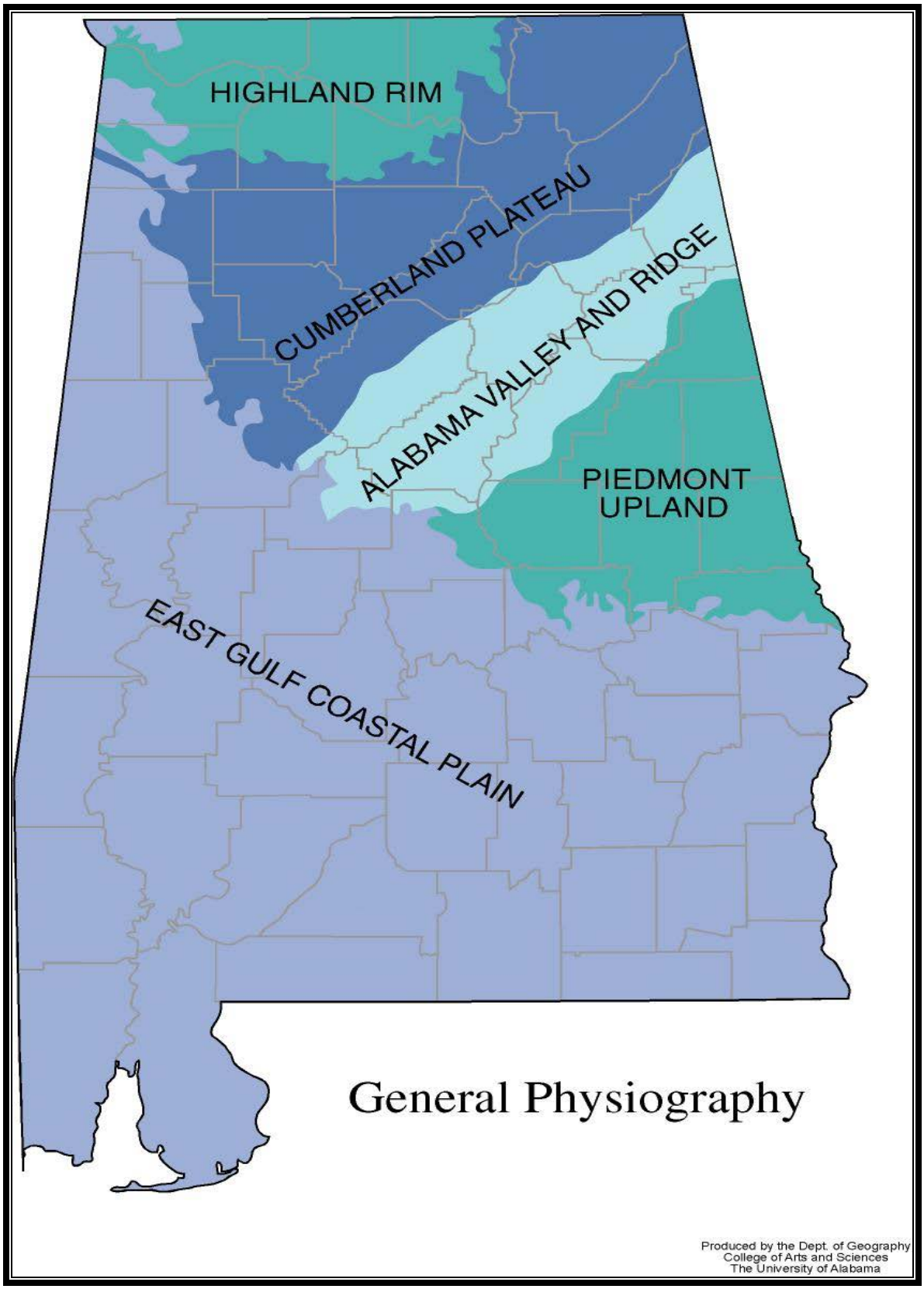
5.1 GEOLOGY AND SOILS

5.1.1 LAKE HARRIS

5.1.1.1 Bedrock Geology and Physiography

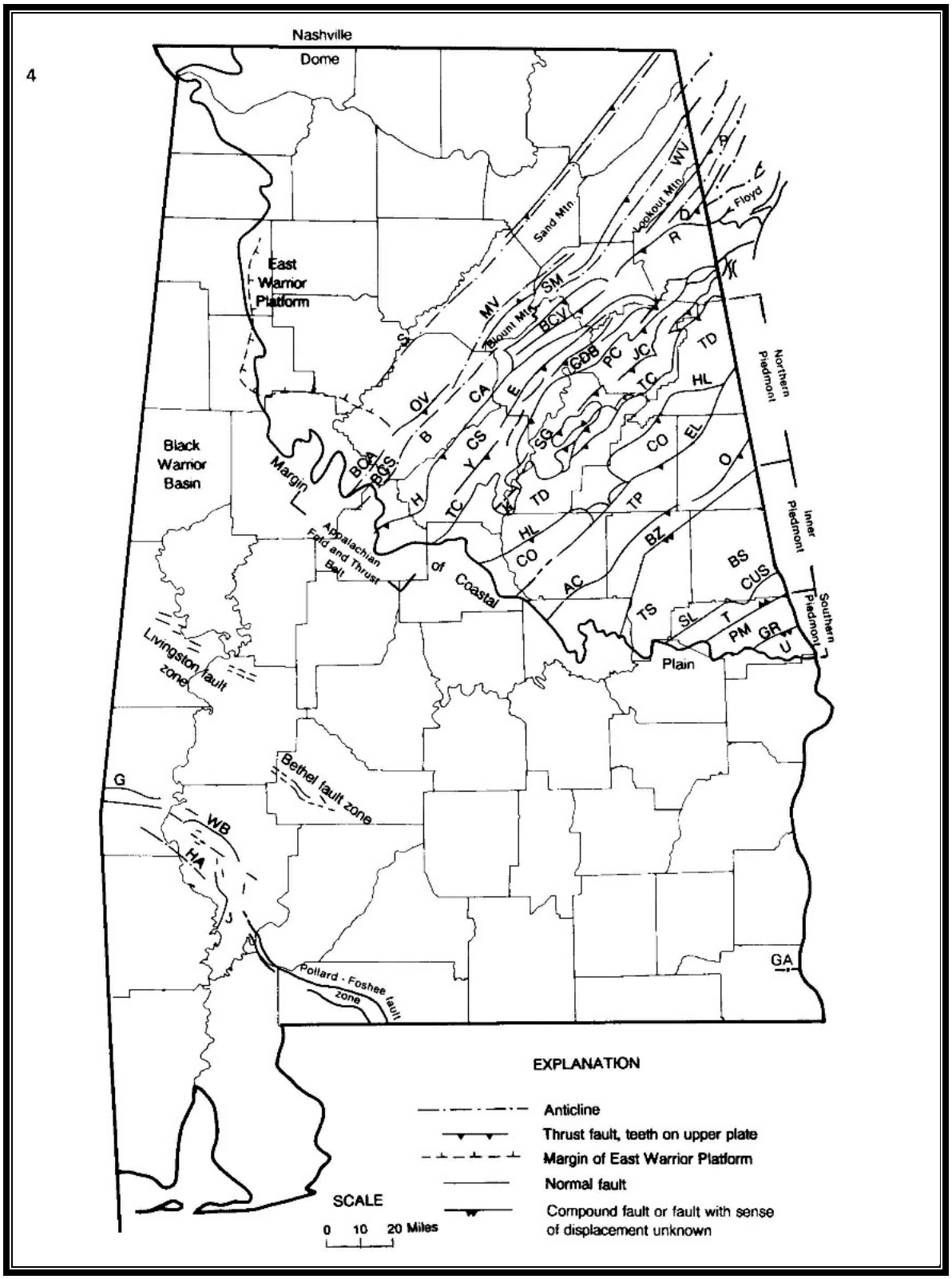
Harris Reservoir and surrounding lands are located within the Piedmont Upland Physiographic Section (***Figure 5-1***). The Piedmont Upland Section consists of the Northern, Inner, and Southern Piedmont Upland districts. The Brevard Fault Zone, a narrow zone of intensely sheared rocks, separates the Northern and Inner Piedmont Upland districts. The Towaliga fault separates the Inner and Southern Piedmont Upland districts (***Figure 5-2***).

Well-dissected uplands developed over metamorphic and igneous rocks characterize the Northern Piedmont Upland district. In the northern portion, elevations generally range from 500 to 1,100 feet msl (***Figure 5-3***). Cheaha Mountain, Alabama's highest elevation point at 2,407 feet, is located on the northeastern end of a prominent northeast-trending ridge that occurs in this district. Tributaries of the Tallapoosa River incise the upland surfaces (Sapp and Emplaincourt 1975; Neilson 2013b). A detailed summary of physiographic regions, including physiographic sections, dominant structural features, and mineral resources is presented in Appendix H.



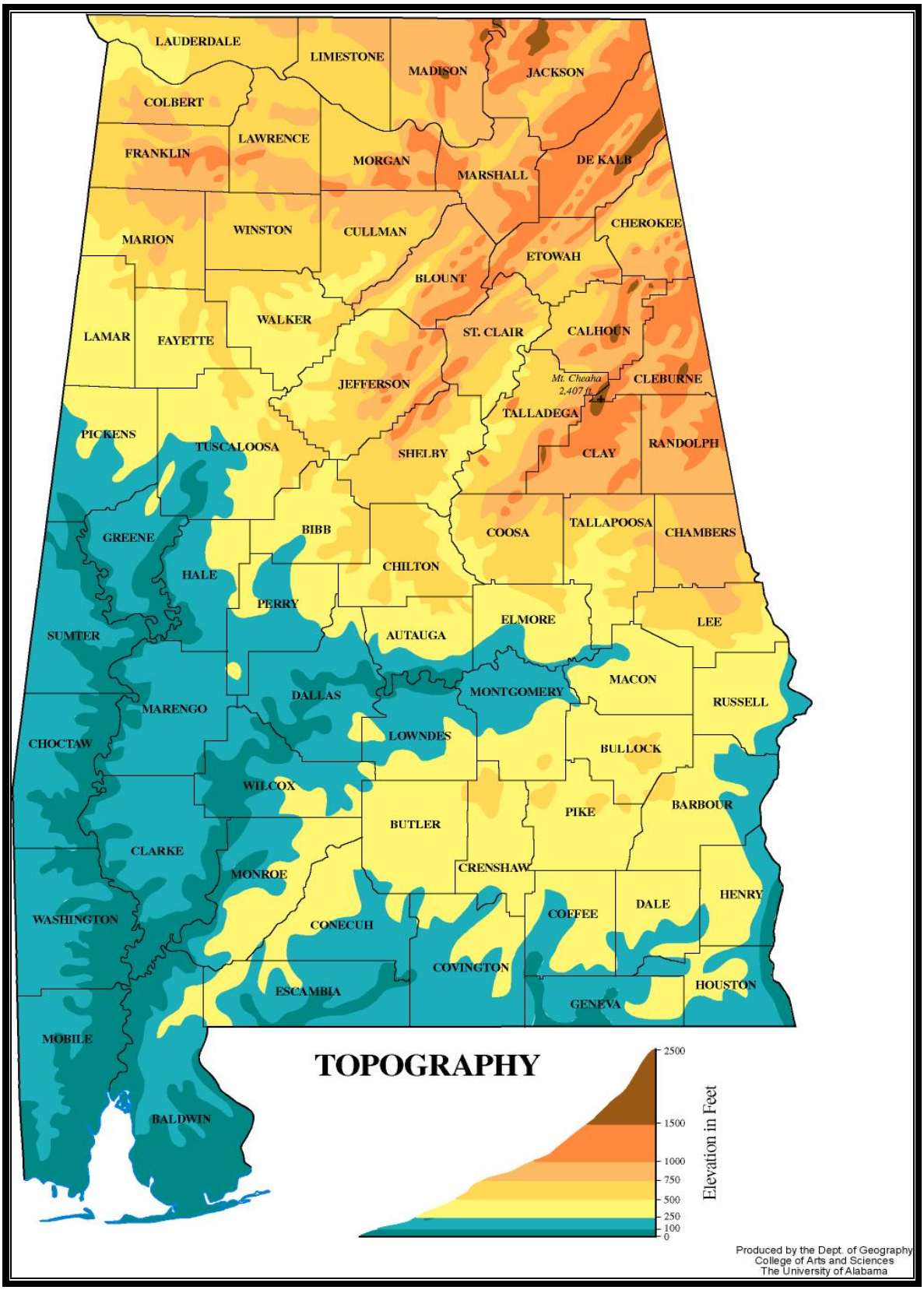
Source: University of Alabama 2016a

FIGURE 5-1 PHYSIOGRAPHIC REGIONS OF ALABAMA



Source: Raymond et al 1988

FIGURE 5-2 STRUCTURAL GEOLOGY OF THE PIEDMONT UPLAND PHYSIOGRAPHIC REGION



Source: University of Alabama 2016b

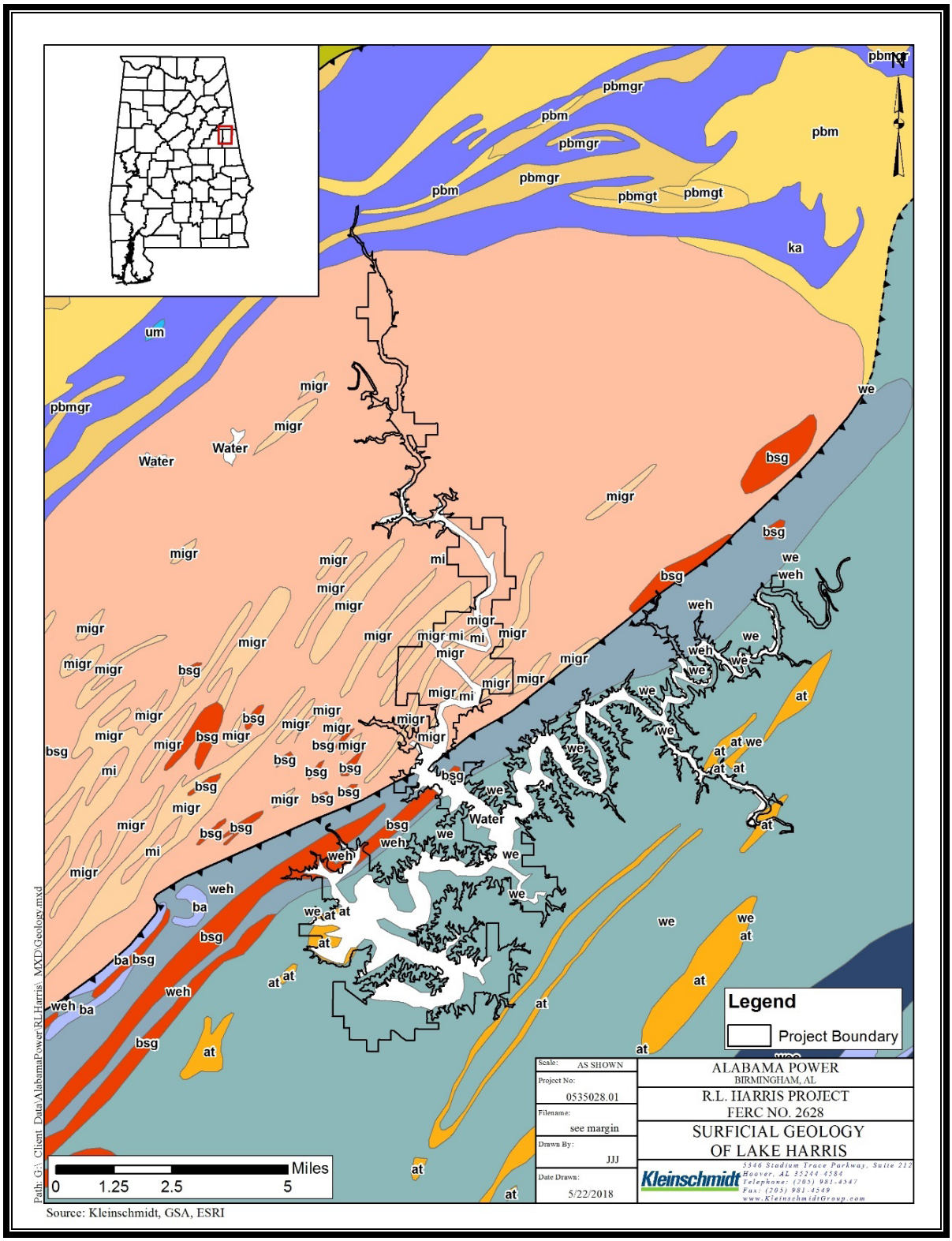
FIGURE 5-3 TOPOGRAPHY OF ALABAMA

Lake Harris is predominantly located in Randolph County. A small amount of the extreme western portion of the lake is located in Clay County, and a small part of the northern portion lies in Cleburne County. The counties in the Lake Harris Project Area are underlain by igneous and metamorphosed rocks of Precambrian to Paleozoic age. ***Figure 5-4*** shows the bedrock geology of the lands in the Lake Harris Project Area and ***Table 5-1*** provides the legend for the bedrock geology.

TABLE 5-1 LEGEND FOR THE LAKE HARRIS PROJECT VICINITY SURFICIAL GEOLOGY

SYMBOL	NAME
Dtjc	Jemison Chert and Chulafinnee Schist undifferentiated
at	Almond Trondhjemite
ba	Beaverdam Amphibolite
bsg	Bluff Springs Granite
em	Emuckfaw Group undifferentiated in part
hgs	Hillabee Greenstone
ka	Ketchepedrakee Amphilbolite
mi	Mad Indian Group
migr	Mad Indian Group graphitic unit
pbm	Poe Bridge Mountain Group
pbmgr	Poe Bridge Mountain Group graphitic unit
pbmgt	Poe Bridge Mountain Group garnet quartzite unit
tld	Lay Dam Formation
um	Ultramafic rock
we	Wedowee Group undifferentiated
wec	Cornhouse Schist
weh	Hackneyville Schist

Source: GSA 2006



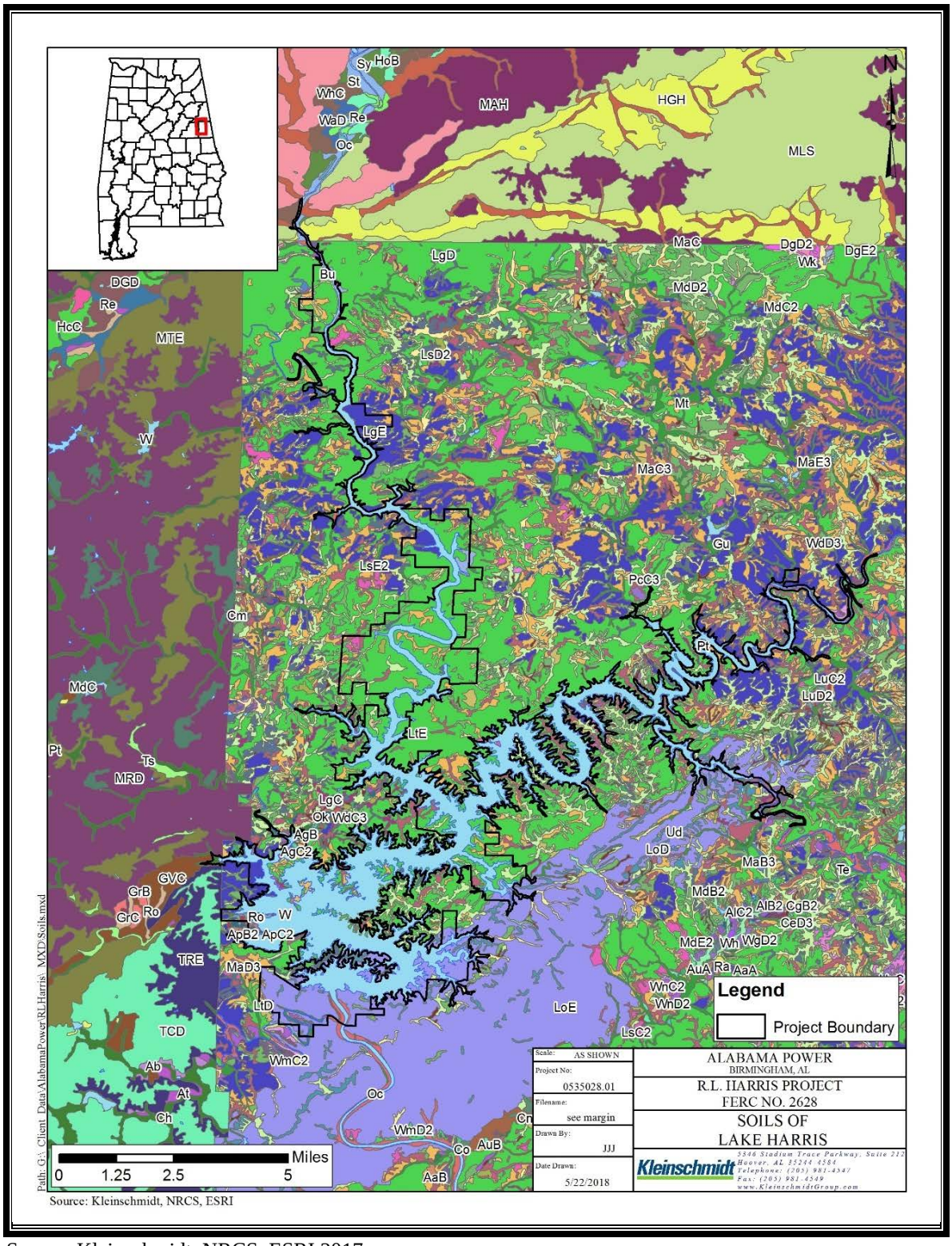
Source: Kleinschmidt, GSA, ESRI 2017

FIGURE 5-4 SURFICIAL GEOLOGY OF LAKE HARRIS

5.1.1.2 Soils

Soils in the Lake Harris Project Area were derived from metamorphic, sedimentary, and igneous rock. Soil productivity has greatly decreased over much of the area due to poor farming practices in the 1800s and early 1900s. Many areas of depleted soils have reverted to forest, but productivity is often low.

Table 5-2 shows the soil types in the Lake Harris Project Boundary by county, including a legend of the soil types. Note that while the counties may have the same soils, each county has named the soils differently. ***Figure 5-5*** shows the soil types in the Lake Harris Project Area, including those soils within the Lake Harris Project Boundary. Note that for the tables presented below, there may be a discrepancy in the total number of acres reported as Lake Harris Project acres due to map inconsistencies. Appendix I contains a detailed description of the soil types in the Lake Harris Project Vicinity.



Source: Kleinschmidt, NRCS, ESRI 2017

FIGURE 5-5 SOILS OF LAKE HARRIS

TABLE 5-2 SOIL TYPES WITHIN THE LAKE HARRIS PROJECT BOUNDARY

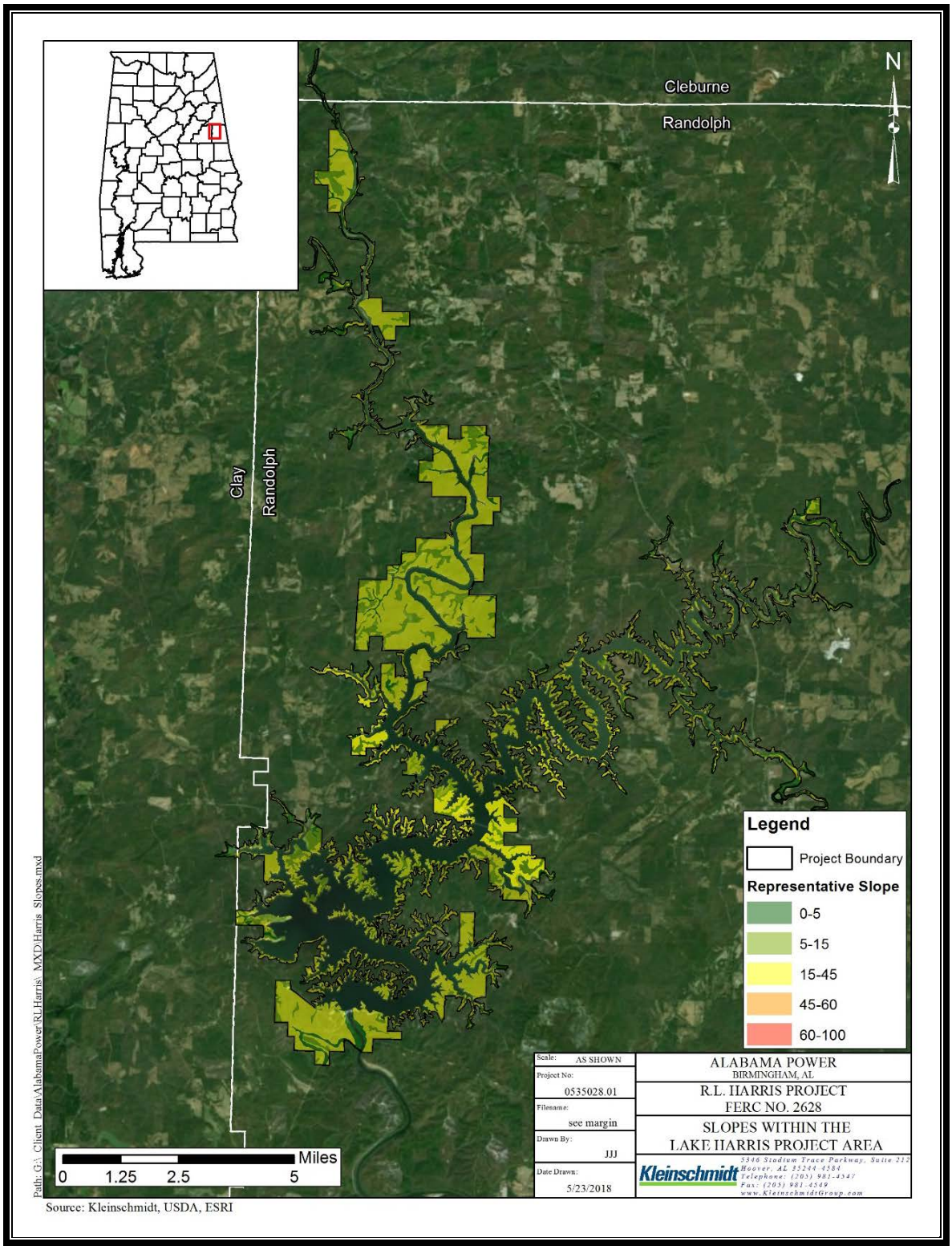
MAP UNIT SYMBOL	MAP UNIT NAME	ACRES IN PROJECT BOUNDARY	PERCENT OF PROJECT
Clay County, Alabama (AL027)			
Ch	Chewacla-Riverview complex	19.1	0.1%
GVC	Grover association, rolling	4.2	0.0%
MRD	Madison-Riverview association, hilly	0.6	0.0%
TRE	Tatum-Tallapoosa-Riverview association, steep	0.8	0.0%
W	Water	3.8	0.0%
Subtotals for Soil Survey Area		**28.5**	**0.1%**
Totals for Project Boundary		**19,194.0**	**100.0%**
Cleburne County, Alabama (AL029)			
HGH	Hiwassee-Gwinnett association, hilly	1.1	0.0%
MLS	Madison-Louisa association, steep	1.1	0.0%
Rs	Riverview-State-Sylacauga complex	2.7	0.0%
St	State fine sandy loam	6.8	0.0%
W	Water	15.1	0.1%
WhC	Waynesboro-Holston complex, 2 to 10 percent slopes	3.4	0.0%
Subtotals for Soil Survey Area		**30.2**	**0.2%**
Totals for Project Boundary		**19,194.0**	**100.0%**
Randolph County, Alabama (AL111)			
AaB	Altavista fine sandy loam, 2 to 6 percent slopes	3.5	0.0%
AgB	Altavista gravelly fine sandy loam, 2 to 6 percent slopes	5.2	0.0%
AgC2	Altavista gravelly fine sandy loam, 6 to 10 percent slopes, eroded	20.7	0.1%
AlB2	Appling gravelly sandy loam, 2 to 6 percent slopes, eroded	1.1	0.0%
AlC2	Appling gravelly sandy loam, 6 to 10 percent slopes, eroded	2.2	0.0%
ApB2	Appling sandy loam, 2 to 6 percent slopes, eroded	13.9	0.1%
ApC2	Appling sandy loam, 6 to 10 percent slopes	35.8	0.2%
AuA	Augusta fine sandy loam, 0 to 2 percent slopes	1.5	0.0%
Bu	Buncombe loamy sand	47.7	0.2%
Cn	Chewacla silt loam, 0 to 2 percent slopes, occasionally flooded	14.0	0.1%
Co	Congaree silt loam	3.7	0.0%
DaC3	Davidson gravelly clay loam, 6 to 10 percent slopes, severely eroded	8.8	0.0%
DaD3	Davidson gravelly clay loam, 10 to 15 percent slopes, severely eroded	7.1	0.0%
LgC	Louisa gravelly sandy loam, 6 to 10 percent slopes	42.3	0.2%
LgD	Louisa gravelly sandy loam, 10 to 15 percent slopes	62.2	0.3%
LgE	Louisa gravelly sandy loam, 15 to 40 percent slopes	620.8	3.2%
LoD	Louisa slaty loam, 10 to 15 percent slopes	52.9	0.3%
LoE	Louisa slaty loam, 15 to 40 percent slopes	1,429.5	7.4%
LsC2	Louisa stony sandy clay loam, 6 to 10 percent slopes, eroded	0.8	0.0%
LsD2	Louisa stony sandy clay loam, 10 to 15 percent slopes, eroded	21.8	0.1%
LsE2	Louisa stony sandy clay loam, 15 to 40 percent slopes, eroded	81.8	0.4%
LtD	Louisa stony sandy loam, 10 to 15 percent slopes	64.3	0.3%
LtE	Louisa stony sandy loam, 15 to 40 percent slopes	5,671.7	29.5%

MAP UNIT SYMBOL	MAP UNIT NAME	ACRES IN PROJECT BOUNDARY	PERCENT OF PROJECT
LuC2	Louisburg stony sandy loam, 6 to 10 percent slopes, eroded	6.9	0.0%
LuD2	Louisburg stony sandy loam, 10 to 25 percent slopes, eroded	27.9	0.1%
MaC3	Madison gravelly clay loam, 6 to 10 percent slopes, severely eroded	174.0	0.9%
MaD3	Madison gravelly clay loam, 10 to 15 percent slopes, severely eroded	612.9	3.2%
MaE3	Madison gravelly clay loam, 15 to 25 percent slopes, severely eroded	3.2	0.0%
MdB2	Madison gravelly fine sandy loam, 2 to 6 percent slopes, eroded	11.6	0.1%
MdC2	Madison gravelly fine sandy loam, 6 to 10 percent slopes, eroded	224.4	1.2%
MdD2	Madison gravelly fine sandy loam, 10 to 15 percent slopes, eroded	142.7	0.7%
Mt	Mantachie fine sandy loam	284.1	1.5%
Oc	Ochlockonee fine sandy loam (toccoa)	221.7	1.2%
Ok	Ochlockonee fine sandy loam, local alluvium (toccoa)	22.7	0.1%
Pt	Pits	6.6	0.0%
Ro	Rock land	41.8	0.2%
Sr	Stony rough land	107.9	0.6%
Te	Terrace escarpment	1.2	0.0%
W	Water	8,787.5	45.8%
WgD2	Wedowee gravelly sandy loam, 10 to 15 percent slopes, eroded	1.7	0.0%
Wh	Wehadkee fine sandy loam	6.2	0.0%
Wk	Wehadkee and Mantachie soils	145.1	0.8%
WmB2	Wickham fine sandy loam, 2 to 6 percent slopes, eroded	6.0	0.0%
WmC2	Wickham fine sandy loam, 6 to 10 percent slopes	14.4	0.1%
WmD2	Wickham fine sandy loam, 10 to 15 percent slopes, eroded	12.2	0.1%
WnC2	Wickham gravelly fine sandy loam, 6 to 10 percent slopes, eroded	41.6	0.2%
WnD2	Wickham gravelly fine sandy loam, 10 to 15 percent slopes, eroded	17.8	0.1%
Subtotals for Soil Survey Area		**19,135.4**	**99.7%**
Totals for Project Boundary		**19,194.0**	**100.0%**

Source: NRCS 2016
NOTE: There may be a discrepancy in the total number of acres reported as Lake Harris Project acres due to map inconsistencies

5.1.1.3 Reservoir Shoreline and Stream Banks

Most of the Project Area surrounding Lake Harris consists of relatively steep slopes ranging from 15 percent to 45 percent, as depicted in ***Figure 5-6*** (NRCS 2016).



Source: Kleinschmidt, USDA, ESRI 2018

FIGURE 5-6 SLOPES WITHIN THE LAKE HARRIS PROJECT AREA

Shorelines surrounding Lake Harris are subject to anthropogenic disturbances including roadways, recreational facilities, and homes. The shorelines are predominantly forested with some developed areas primarily on the eastern shoreline. Shorelines in the more developed areas may contain seawalls or rip-rap armoring. The forested shorelines are primarily Southern Piedmont Dry Oak forest (NatureServe 2009). Their composition is described in detail in Section 5.5. Portions of the Harris Reservoir's shoreline are exposed bedrock or fabricated erosion control structures; therefore, shoreline erosion in these areas generally does not occur.

5.1.1.4 Erosion and Sedimentation

Shoreline erosion and reservoir sedimentation were raised as issues by stakeholders at the Issues Identification Workshop held in October 2017. While there is not a formal erosion monitoring program on Lake Harris, Alabama Power contractors conduct routine surveillance of the shoreline. During the workshop, stakeholders identified preliminary areas of erosion along Lake Harris shorelines and downstream of the Project. Some of the areas include developed areas in the lower lake area as well as in the upper lake near the Highway 431 bridge. Examples of erosion areas are illustrated in ***Figure 5-7*** and ***Figure 5-8***. Stakeholders also identified sedimentation issues in the upper lake area (***Figure 5-9***). An erosion and sedimentation study plan is being developed by Alabama Power to identify any erosion and sedimentation areas and their potential causes (Section 7.0).

Source: Alabama Power 2007

FIGURE 5-7 LAKE HARRIS EROSION

Source: Alabama Power 2007

FIGURE 5-8 LAKE HARRIS EROSION

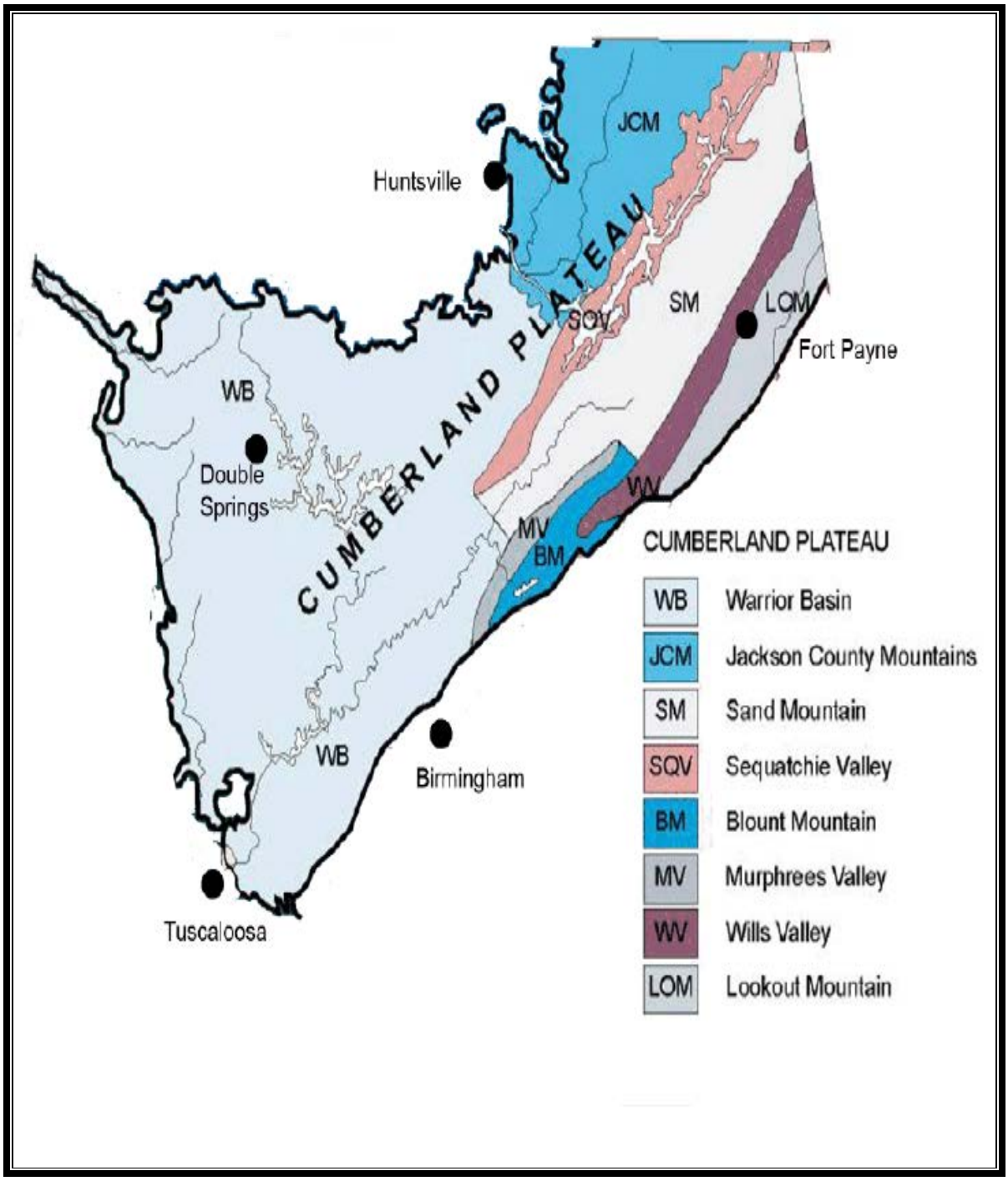
Source: Alabama Power 2005

FIGURE 5-9 SEDIMENTATION NEAR HIGHWAY 431 BRIDGE

5.1.2 SKYLINE

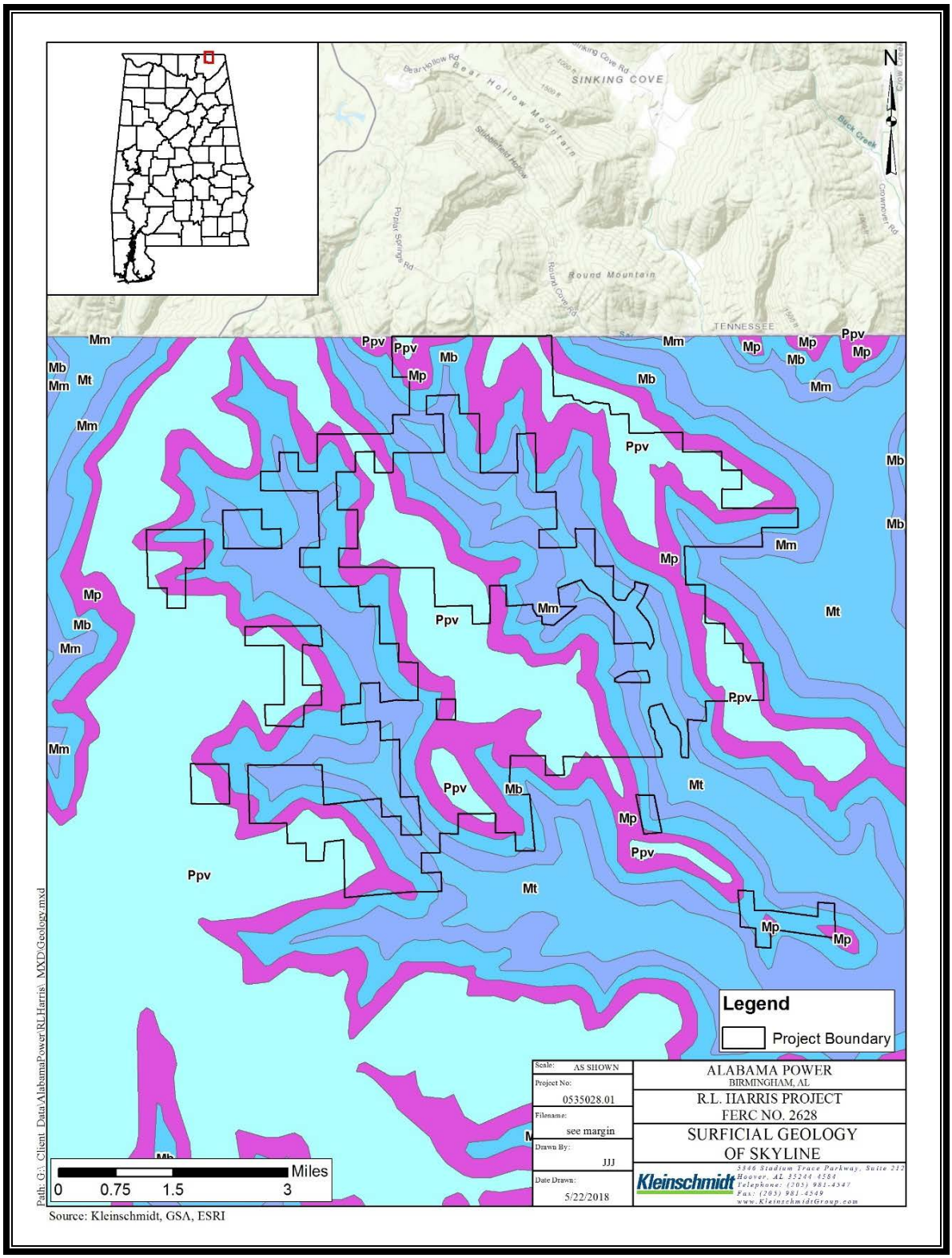
5.1.2.1 Bedrock Geology and Physiography

Skyline falls within the Cumberland Plateau. The Cumberland Plateau is divided into eight districts: Sand Mountain, Lookout Mountain, Blount Mountain, Warrior Basin, Jackson County Mountains, Murphrees Valley, Wills Valley, and Sequatchie Valley. Lands within Skyline fall within the Jackson County Mountains district (***Figure 5-10***). The Jackson County Mountains district is characterized by a highly irregular surface consisting of isolated, flat-topped remnants of the former plateau cut by steep-sided valleys (Neilson 2013a). Skyline is underlain by Paleozoic sedimentary rocks that range from Mississippian to Pennsylvanian in age. ***Figure 5-11*** shows the surficial bedrock geology of the lands in the Skyline Project Area and ***Table 5-3*** provides the legend for the bedrock geology. A detailed summary of physiographic regions, including physiographic sections, dominant structural features, and mineral resources is presented in Appendix H.



Source: Neilson 2013a

FIGURE 5-10 PHYSIOGRAPHIC DISTRICTS OF THE CUMBERLAND PLATEAU



Source: Kleinschmidt, GSA, ESRI 2017

FIGURE 5-11 SURFICIAL GEOLOGY OF SKYLINE

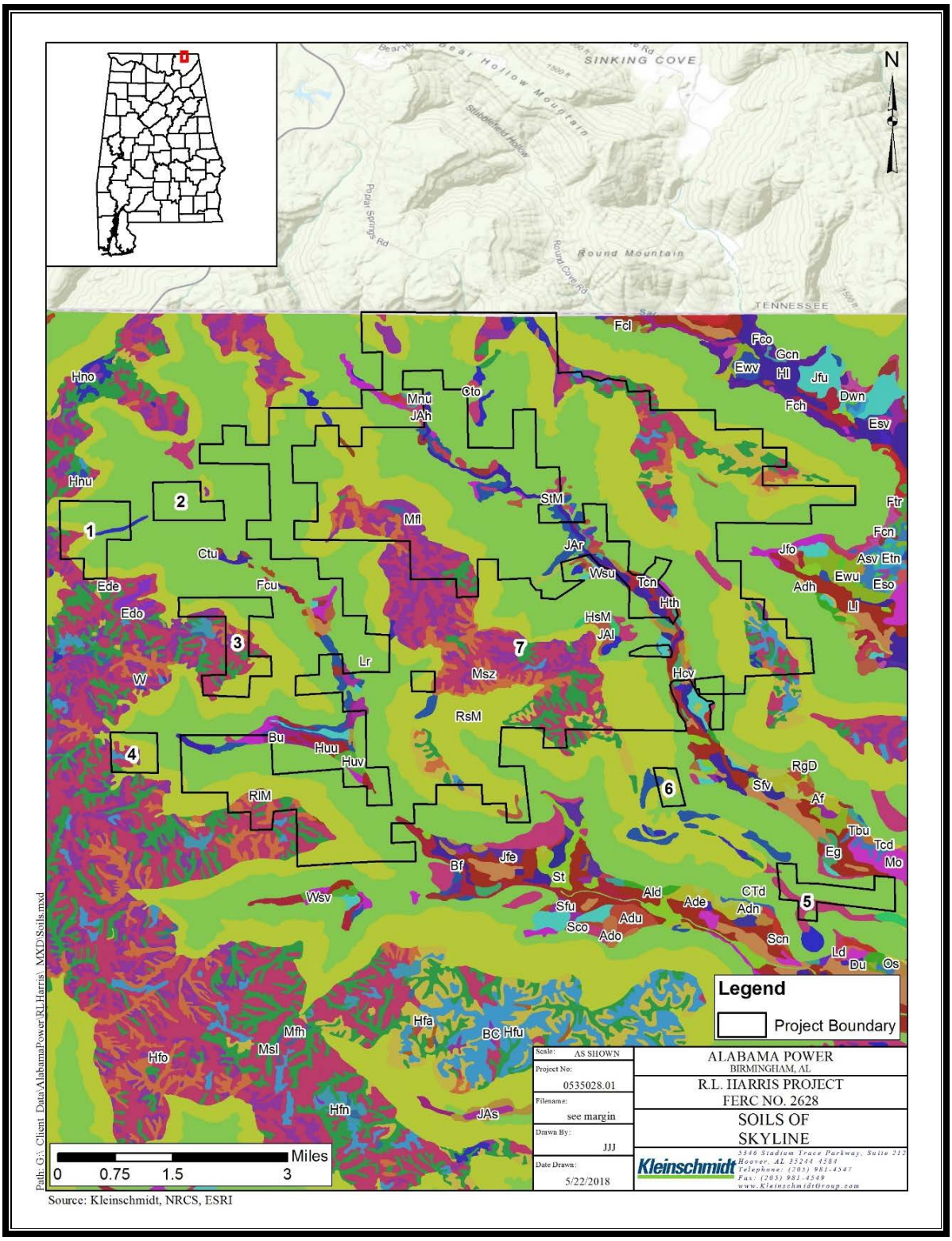
TABLE 5-3 SURFICIAL GEOLOGY LEGEND FOR THE SKYLINE PROJECT AREA

SYMBOL	NAME
Mb	Bangor Limestone
Mm	Monteagle Limestone
Mp	Pennington Formation
Mt	Tuscumbia Limestone
Ppv	Pottsville Formation

Source: GSA 2017

5.1.2.2 Soils

Skyline is located entirely within Jackson County, Alabama, and borders Tennessee. ***Figure 5-12*** and ***Table 5-4*** contain a map and legend of soil types within the Skyline Project Area. Note that for the table presented below, there may be a discrepancy in the total number of acres reported as Skyline Project acres due to map inconsistencies. Appendix J contains descriptions of each soil type in Skyline.



Source: Kleinschmidt, NRCS, ESRI 2017

FIGURE 5-12 SOILS OF SKYLINE

TABLE 5-4 SOILS TYPES WITHIN THE SKYLINE PROJECT BOUNDARY

MAP UNIT SYMBOL	MAP UNIT NAME	ACRES IN PROJECT BOUNDARY	PERCENT OF PROJECT BOUNDARY
#1, Jackson County, Alabama (AL071)			
Hfm	Hartsells fine sandy loam, undulating, shallow phase	0.7	0.0%
Hfo	Hartsells (Nauvoo) fine sandy loam, 6 to 10 percent slopes	26.6	0.1%
Lr	Limestone rockland rough	228.6	1.2%
Mfl	Muskingum (Gorgas) fine sandy loam, 10 to 20 percent slopes	0.5	0.0%
Msl	Muskingum (Gorgas) stony fine sandy loam, 10 to 20 percent slopes, very stony	3.8	0.0%
Msz	Muskingum (Gorgas) stony fine sandy loam, 20 to 45 percent slopes, very stony	1.7	0.0%
RsC	Rolling stony land, Colbert soil material	11.9	0.1%
RsM	Rough stony land, Muskingum soil material	88.9	0.5%
Subtotals for #1		**362.8**	**1.9%**
Totals for Project Boundary		**18,694.1**	**100.0%**
#2, Jackson County, Alabama (AL071)			
Lr	Limestone rockland rough	199.4	1.1%
RsM	Rough stony land, Muskingum soil material	2.7	0.0%
Subtotals for #2		**202.1**	**1.1%**
Totals for Project Boundary		**18,694.1**	**100.0%**
#3, Jackson County, Alabama (AL071)			
Hfn	Hartsells (Nauvoo) fine sandy loam, 6 to 10 percent slopes, eroded	0.0	0.0%
Hfo	Hartsells (Nauvoo) fine sandy loam, 6 to 10 percent slopes	91.6	0.5%
Lr	Limestone rockland rough	83.1	0.4%
Mfl	Muskingum (Gorgas) fine sandy loam, 10 to 20 percent slopes	24.5	0.1%
Msl	Muskingum (Gorgas) stony fine sandy loam, 10 to 20 percent slopes, very stony	25.4	0.1%
#4, Jackson County, Alabama (AL071)			
Hfo	Hartsells (Nauvoo) fine sandy loam, 6 to 10 percent slopes	32.1	0.2%
Hfu	Hartsells fine sandy loam, undulating phase	7.8	0.0%
Lr	Limestone rockland rough	26.0	0.1%
Mfl	Muskingum (Gorgas) fine sandy loam, 10 to 20 percent slopes	6.4	0.0%
Msl	Muskingum (Gorgas) stony fine sandy loam, 10 to 20 percent slopes, very stony	6.8	0.0%
RsM	Rough stony land, Muskingum soil material	86.8	0.5%
Subtotals for #4		**165.9**	**0.9%**
Totals for Project Boundary		**18,694.1**	**100.0%**

MAP UNIT SYMBOL	MAP UNIT NAME	ACRES IN PROJECT BOUNDARY	PERCENT OF PROJECT BOUNDARY
#5, Jackson County, Alabama (AL071)			
Lh	Limestone rockland, hilly	47.7	0.3%
Ll	Lindside silt loam	0.6	0.0%
Lr	Limestone rockland rough	230.4	1.2%
Mo	Melvin silty clay loam	0.3	0.0%
Subtotals for #5		**278.9**	**1.5%**
Totals for Project Boundary		**18,694.1**	**100.0%**
#6, Jackson County, Alabama (AL071)			
JAr	Jefferson-Allen loams, severely eroded, hilly phases	5.3	0.0%
Lr	Limestone rockland rough	28.2	0.2%
RsM	Rough stony land, Muskingum soil material	43.1	0.2%
Subtotals for #6		**76.5**	**0.4%**
Totals for Project Boundary		**18,694.1**	**100.0%**
#7, Jackson County, Alabama (AL071)			
Ade	Allen fine sandy loam, eroded, undulating phase	8.0	0.0%
Adn	Allen fine sandy loam, eroded, rolling phase	21.9	0.1%
Ado	Allen fine sandy loam, rolling phase	2.3	0.0%
Adu	Allen fine sandy loam, undulating phase	2.8	0.0%
BC	Barbourville-Cotaco fine sandy loams	1.7	0.0%
Bf	Bruno fine sandy loam	59.2	0.3%
Bu	Bruno loamy fine sand	11.9	0.1%
CTd	Colbert-Talbott stony silty clay loams, severely eroded, rolling phases	5.0	0.0%
Cto	Colbert silty clay loam, rolling phase	11.8	0.1%
Du	Dunning silty clay	5.6	0.0%
Eg	Egam silt loam	34.8	0.2%
Hcv	Hollywood silty clay, level phase	38.4	0.2%
Hfg	Hartsells fine sandy loam, rolling, shallow phase	280.7	1.5%
Hfo	Hartsells (Nauvoo) fine sandy loam, 6 to 10 percent slopes	1,432.4	7.7%
Hfu	Hartsells fine sandy loam, undulating phase	89.4	0.5%
Hl	Huntington silt loam	51.7	0.3%
Hno	Hanceville fine sandy loam, rolling phase	52.5	0.3%
Hnu	Hanceville fine sandy loam, undulating phase	7.4	0.0%
HsM	Hilly stony land	35.4	0.2%
Hth	Hermitage cherty silty clay loam, eroded, hilly phase	2.2	0.0%
Huu	Holston loam, 2 to 5 percent slopes	0.4	0.0%
JAh	Jefferson-Allen loams, eroded, hilly phases	19.4	0.1%
JAl	Jefferson-Allen loams, hilly phases	77.4	0.4%
JAn	Jefferson-Allen loams, eroded, rolling phases	33.3	0.2%
JAr	Jefferson-Allen loams, severely eroded, hilly phases	210.7	1.1%
JAs	Jefferson-Allen loams, severely eroded, steep phases	33.0	0.2%
Jfe	Jefferson fine sandy loam, eroded, undulating phase	9.7	0.1%
Jfn	Jefferson fine sandy loam, eroded, rolling phase	43.3	0.2%
Jfu	Jefferson fine sandy loam, undulating phase	44.4	0.2%

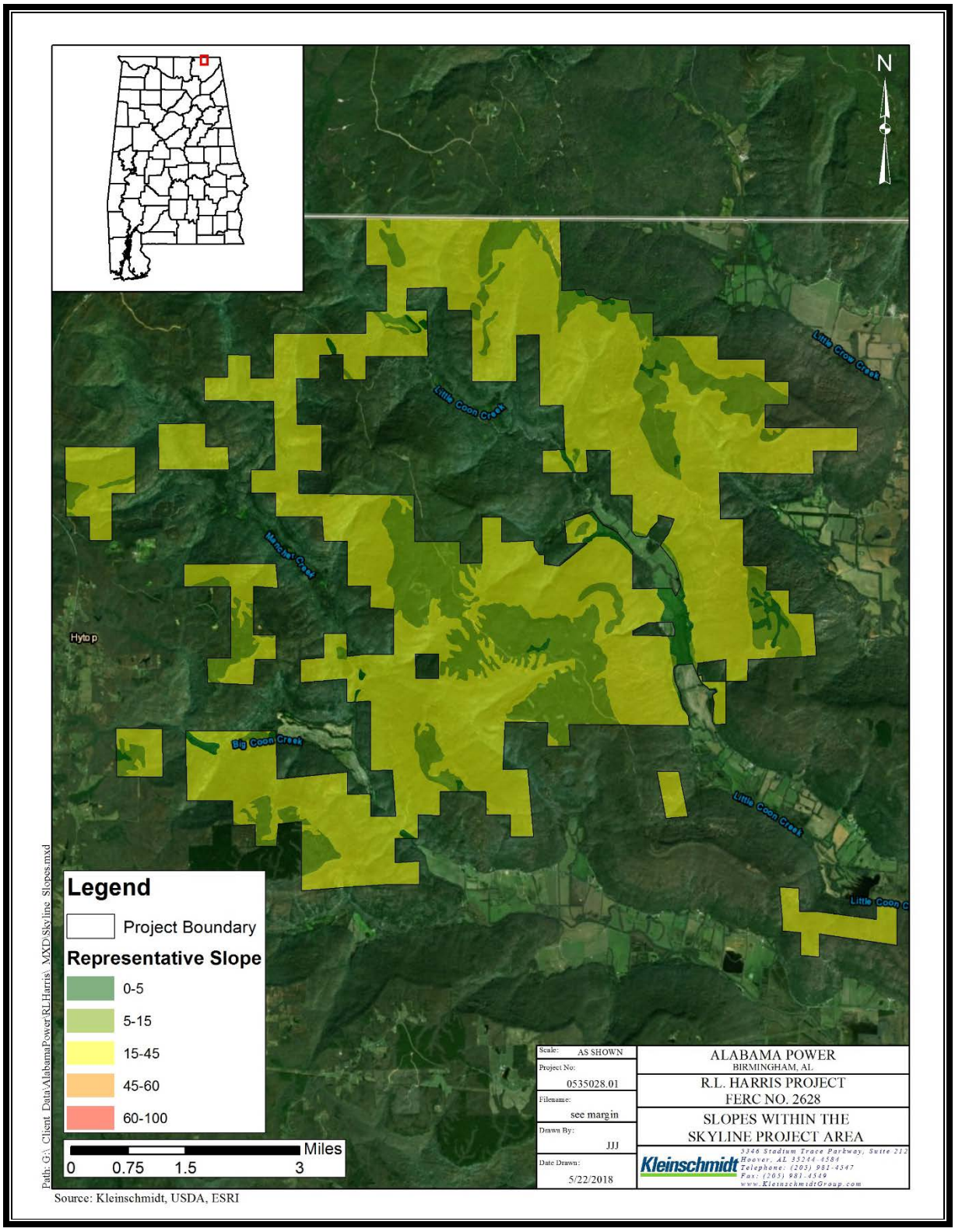
MAP UNIT SYMBOL	MAP UNIT NAME	ACRES IN PROJECT BOUNDARY	PERCENT OF PROJECT BOUNDARY
Lh	Limestone rockland, hilly	140.7	0.8%
Ll	Lindside silt loam	18.7	0.1%
Lr	Limestone rockland rough	6,987.7	37.4%
Mfh	Muskingum (Gorgas) fine sandy loam, 10 to 20 percent slopes, eroded	24.0	0.1%
Mfl	Muskingum (Gorgas) fine sandy loam, 10 to 20 percent slopes	639.7	3.4%
Ml	Melvin silt loam	0.0	0.0%
Mnu	Monongahela loam, undulating phase	4.7	0.0%
Msl	Muskingum (Gorgas) stony fine sandy loam, 10 to 20 percent slopes, very stony	628.4	3.4%
Msz	Muskingum (Gorgas) stony fine sandy loam, 20 to 45 percent slopes, very stony	480.3	2.6%
RlM	Rolling stony land, Muskingum soil material	20.4	0.1%
RsC	Rolling stony land, Colbert soil material	52.7	0.3%
RsM	Rough stony land, Muskingum soil material	5,221.2	27.9%
Sce	Swaim silty clay loam, eroded, undulating phase	0.7	0.0%
Scn	Swaim silty clay loam, eroded, rolling phase	26.3	0.1%
Sco	Swaim silty clay loam, rolling phase	9.4	0.1%
Scu	Swaim silty clay loam, undulating phase	15.6	0.1%
Sfv	Sequatchie fine sandy loam, level phase	5.9	0.0%
StM	Stony alluvium	156.8	0.8%
Tcn	Talbott silty clay loam, eroded, rolling phase	16.5	0.1%
W	Water	0.9	0.0%
Wsu	Wolftever silt loam, undulating phase	3.6	0.0%
Subtotals for #7		**17,140.4**	**91.7%**
Totals for Skyline Project Boundary		**18,694.1**	**100.0%**

Source: NRCS 2016

NOTE: There may be a discrepancy in the total number of acres reported as Skyline Project acres due to map inconsistencies.

5.1.2.3 Skyline Stream Banks

Most of the Project Area surrounding stream banks, particularly Little Coon Creek, within Skyline consist of relatively shallow slopes ranging from 0 percent to 5 percent. However, slopes of 15 percent to 45 percent are most predominant throughout the Project Area (***Figure 5-13***) (NRCS 2016).



Source: Kleinschmidt, USDA, ESRI 2018

FIGURE 5-13 SLOPES WITHIN THE SKYLINE PROJECT AREA

Stream banks within the Skyline WMA are not subject to many anthropogenic disturbances, aside from occasional logging practices and agriculture. The stream banks are predominantly forested with small areas of agriculture and clear cutting. The forested shorelines are primarily South-Central Interior Mesophytic forest (NatureServe 2009). Their composition is described in detail in Section 5.5. One stream that drains into Skyline, Little Coon Creek, has been identified as an impaired stream (ADEM 2016a).

5.1.2.4 Erosion and Sedimentation

Erosion and sedimentation have not been identified as issues within Skyline. However, Little Coon Creek, which drains portions of Skyline, is currently listed as impaired due to siltation. The sources of this impairment include non-irrigated crop production and pasture grazing. Currently, assessments of erosion and sedimentation of lands and waters within the Project Boundary are being restricted to Lake Harris and the Tallapoosa River downstream of the Project.

5.2 WATER RESOURCES

5.2.1 LAKE HARRIS

5.2.1.1 Drainage Area

The Tallapoosa River drainage basin (Section 3.1) encompasses approximately 4,687 square miles, including 1,454 square miles above Lake Harris. Approximately 15 percent of the basin's drainage area lies in Georgia. The remaining 85 percent of the basin's drainage area is located in Alabama (CH2MHILL 2005). The Tallapoosa River Basin precipitation typically ranges from 46-64 inches annually. Approximately 80 percent of the flood-producing storms occur in the winter and spring months, of which approximately 27 percent occur in the month of March (Alabama Power 2015b). The principal tributaries to Lake Harris are the Tallapoosa River, Little Tallapoosa River, Wedowee Creek, and Ketchepedrakee Creek.

5.2.1.2 Existing and Proposed Water Uses

Harris Reservoir is a multi-purpose storage reservoir. Water levels in Harris Reservoir fluctuate seasonally to provide the many benefits the Harris Project was built to support, including upstream and downstream uses and hydroelectric power, which directly affects many people throughout the state. The Harris Project also provides flood control and navigation support. Harris Reservoir waters are used for public water supply and to support a diverse array of fish and wildlife habitat, as well as for recreational fishing and boating, swimming, hiking, picnicking, and various other outdoor activities around the reservoir. Under normal conditions, Alabama Power operates the Harris Project during daily peak-load periods to maintain reservoir levels according to the operating curve. The current license requires Alabama Power to operate the Harris Project in the interest of flood control based on agreement between the USACE and Alabama Power. Navigation is not supported during drought operations, as defined in the ACT Basin Drought Contingency Plan (Kleinschmidt 2018b). Details of the Harris Project operations are provided in Section 4.3 and the *Water Quantity, Water Use, and Discharge Report* for the R.L. Harris Project (Kleinschmidt 2018b) (Appendix K).

Article 14 of the existing FERC license for the Harris Project states that, upon the application by any person, association, corporation, federal agency, state, or municipality, Alabama Power will permit reasonable use of its reservoir in the interest of the comprehensive development of the waterway as ordered by FERC (FERC 1973).

Alabama Power granted an easement to the Town of Wedowee-Water, Sewer, and Gas Board[14] on April 1, 1988, allowing a water withdrawal within the Harris Project Boundary, with an intake maximum withdrawal of 0.5 mgd (Kleinschmidt 2018b). This withdrawal meets the water supply needs for Northeast Randolph County Service District by way of the John Swann Water Treatment Plant. The average daily withdrawal for the period of 2010 to 2015 was 0.34 mgd. The Town of Wedowee Water, Sewer and Gas Board's withdrawal is subject to the

[14] Town of Wedowee-Water, Sewer and Gas Board was formerly named the Town of Wedowee Utility Board.

provisions, terms, conditions, and time duration of any new or modified license issued by FERC.

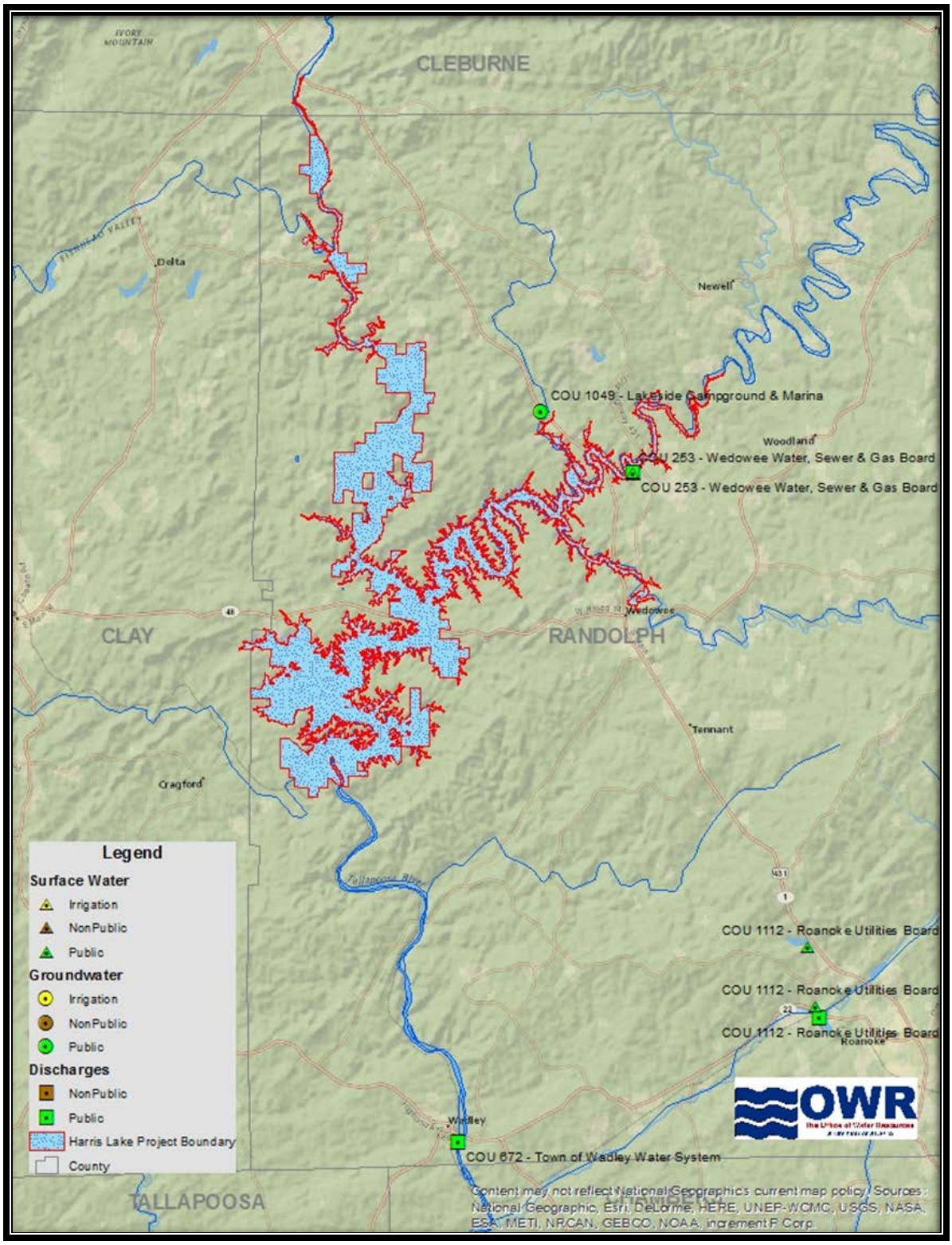
Table 5-5 contains a list and ***Figure 5-14*** shows the locations of the currently known water withdrawals and discharges near Lake Harris. Only the Town of Wedowee-Water, Sewer, and Gas Board withdrawal is within the Lake Harris Project Boundary. The list does not include single homeowner withdrawals but rather those of a larger commercial or municipal nature that require a Certificate of Beneficial Use from the Alabama Office of Water Resources (Alabama OWR) (Kleinschmidt 2018b).

With very little industrial and agricultural use in the Lake Harris area, most of the demand for water comes from municipal use. The population of Randolph and Clay counties are projected to decrease by 2.7 percent and 12.8 percent, respectively, between 2015 and 2040; the population of Cleburne County is projected to increase 3.3 percent. Additional information on water uses, quantity, and discharges is provided in the *Water Quantity, Water Use, and Discharge Report* for the R.L. Harris Project (Kleinschmidt 2018b) (Appendix K).

TABLE 5-5 WATER WITHDRAWAL AND DISCHARGES REGISTERED UNDER THE ALABAMA WATER USE REPORTING PROGRAM

Name	Owner	Groundwater/ Surface Water/ Discharge Name	Average Daily (MGD)	Maximum Daily (MGD)
Cohobadiah Creek	Lakeside Campground & Marina	Well No. 1	0.003	0.02
Upper Little Tallapoosa River	Wedowee Water, Sewer, and Gas Board	John G. Swann Water Treatment Plant - No. 1	0.411	0.75
Highpine Creek	Roanoke Utilities Board	Roanoke Filter Plant No. 1 - Crystal Lake	0.822	1.96
Highpine Creek	Roanoke Utilities Board	Roanoke Filter Plant No. 2 - Jones Creek Lake	0.000	1.96
Upper Little Tallapoosa River	Wedowee Water, Sewer, and Gas Board	Lagoon	0.045	0.15
Hurricane Creek	Town of Wadley Water System	Wadley Lagoon AL0062847	0.123	0.15
Highpine Creek	Roanoke Utilities Board	Roanoke HCR	0.395	3.50

Source: Kleinschmidt 2018b



Source: Kleinschmidt 2018b

FIGURE 5-14 WATER WITHDRAWAL AND DISCHARGE LOCATIONS NEAR LAKE HARRIS

5.2.1.3 Existing Instream Flow Uses and Water Rights

Releases from Harris Dam flow into the Tallapoosa River. Article 13 of the existing Harris Project FERC license identifies several instream flow uses. To protect and develop the downstream aquatic habitat, Alabama Power is required to meet a minimum flow of 45 cfs, as measured at the downstream Wadley gage near Wadley, Alabama (FERC 1973).

Wadley Gage Station

Photo credits: Alabama Power 2017
USGS Stream Gages. Alabama Power Company

5.2.1.4 Flow Statistics

The primary source of information relating to flow statistics downstream of Harris Dam is the USGS's Wadley gage. The highest flows typically occur in late winter and early spring, and the lowest flows typically occur in the fall. The peak instantaneous daily flow at the Wadley gage was 125,000 cfs on May 8, 2003 (USGS 2016a). Mean, maximum, and minimum monthly flow statistics for the Wadley gage (for the period of record from October 1, 1983 to December 31, 2016) are presented in ***Table 5-6*** (USGS 2016b). Annual and monthly flow-duration-exceedance curves for the Wadley gage are presented in Appendix G.

TABLE 5-6 MEAN, MAXIMUM, AND MINIMUM MEAN MONTHLY FLOW STATISTICS FOR THE TALLAPOOSA RIVER AT WADLEY, AL

MONTH*	MEAN DISCHARGE[1]	MAXIMUM MEAN DISCHARGE[1]	MINIMUM MEAN DISCHARGE[1]
January	3,342	6,757	299
February	4,244	10,890	1,581
March	4,686	13,270	1,294
April	2,540	5,848	471
May	2,533	14,320	381
June	1,735	4,819	521
July	1,803	7,058	450
August	1,265	4,331	281
September	1,010	3,180	202
October	1,327	5,599	234
November	2,114	6,434	185
December	2,587	8,425	220

Source: USGS 2016b
Period of Record: 10/1/1983-12/31/2016
[1] Measured in cubic feet per second (cfs)

5.2.1.5 Reservoir Characteristics

Lake Harris has a surface area of 9,870 acres and a gross storage volume of 425,721 acre-feet at the normal (full) pool level of 793 feet. The reservoir is 29 miles long, has a maximum depth of 121 feet, and a mean depth of 110 feet. The average flushing rate (residence time) for the reservoir is estimated to be approximately 109 days. The reservoir has a total shoreline length of 367 miles. Reservoir substrates are comprised of bedrock, sand, and silt.

5.2.1.6 Gradient of Downstream Reaches

Releases from Harris Dam flow into the Tallapoosa River approximately 78 miles upstream of Martin Dam. The Upper Tallapoosa River Basin stretches from the Tallapoosa River headwaters to Harris Dam. The Middle Tallapoosa River Basin stretches from Harris Dam to Martin Dam. The river descends at an average rate of 3.4 feet per mile in the upper and middle segments of the basin. The lower Tallapoosa River Basin, from Martin Dam to the Tallapoosa River's confluence with the Coosa River, has more gradual gradient averaging 1.6 feet per mile (CH2MHILL 2005).

5.2.1.7 Federally Approved Water Quality Standards

The CWA gives States the authority to set, implement, and enforce water quality standards. Specifically, Sections 303(d) and 305(b) of the CWA direct States to monitor and report the condition of their water resources. Alabama's assessment and listing methodology establishes a process to assess the status of surface waters in Alabama relative to the designated uses assigned to each waterbody (ADEM 2016a). Water bodies not attaining set standards are placed on the State of Alabama's list of water bodies impaired pursuant to Section 303(d) of the CWA, and the State of Alabama designs a program which establishes total maximum daily loads (TMDLs) to bring water quality to within set criteria. Pursuant to Section 305(b) of the CWA, the State of Alabama provides biennial reports to Congress as to the condition and status of statewide water quality, including a list of waters impaired pursuant to Section 303(d) of the CWA.

Additionally, Section 314(a)(2) of the CWA requires States to assess the water quality of publicly-owned lakes and report the findings as part of the biennial 305(b) report to Congress. The State of Alabama classifies publicly-owned lakes (including reservoirs) as water bodies that are managed for multiple-uses, publicly accessible, and exhibit physical/chemical characteristics typical of impounded waters (ADEM 2016a).

Alabama's water quality standards consist of three components: designated uses, numeric and narrative criteria, and an antidegradation policy (ADEM 2016a). Designated use is a classification system designed to identify the best uses of individual waterways. Alabama Department of Environmental Management (ADEM) Administrative Code r. 335-6-11 outlines seven designated uses, as follows:

1. Outstanding Alabama Water (OAW)
2. Public Water Supply (PWS)
3. Shellfish Harvesting (SH)
4. Swimming and Other Whole-Body Water-Contact Sports (S)
5. Fish and Wildlife (F&W)
6. Limited Warmwater Fishery (LWF)
7. Agricultural and Industrial Water Supply (A&I)

The primary designations for best use of Harris Reservoir are for swimming (S) and fish and wildlife (F&W) (see ADEM Admin. Code r. 335-6-11-.02(11)) (ADEM 2017). From Highway 431 to Wolf Creek, the Little Tallapoosa River has the additional classification of public water supply (PWS). The Harris tailrace is classified as S and F&W.

Numeric and narrative criteria have been established for the State of Alabama to measure the degree to which the quality of waters is consistent with their designated uses. Narrative criteria generally describe minimum conditions necessary for all uses, and numeric criteria include pollutant concentrations or physical characteristics necessary to protect a specific designated use. The State of Alabama's narrative and numeric criteria are defined in ADEM Admin. Code r. 335-6-10 (ADEM 2017). ***Table 5-7*** provides the specific water quality criteria that apply to State of Alabama waters with a PWS, F&W, and S designation.

TABLE 5-7 SPECIFIC WATER QUALITY CRITERIA FOR STATE OF ALABAMA WATERS WITH THE DESIGNATION OF FISH AND WILDLIFE/SWIMMING, PUBLIC WATER SUPPLY

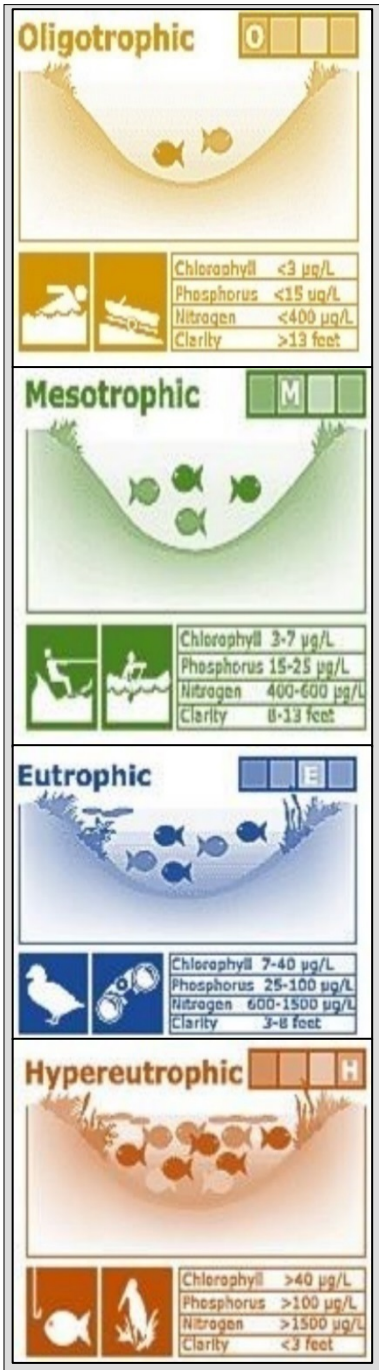
VARIABLE	STANDARD FOR FISH AND WILDLIFE AND SWIMMING	STANDARD FOR PUBLIC WATER SUPPLY
pH	Between 6.0 and 8.5	Between 6.0 and 8.5
Dissolved Oxygen	Not less than 5.0 mg/L at a depth of 5 feet	Not less than 5.0 mg/L at a depth of 5 feet
Water Temperature	Not greater than 90 degrees F	Not greater than 90 degrees F
Turbidity	Not greater than 50 NTUs	Not greater than 50 NTUs
Bacteria	*E. coli*: 126 colonies/100 ml geometric mean; 235/100 ml in any sample (swimming) 548 colonies /100 ml geometric mean; 2507 colonies/100 ml in any sample (fish & wildlife)	*E. coli*: 548 colonies/100 ml geometric mean; 2,507 colonies/100 ml in any sample

Source: ADEM 2016a

Additionally, ADEM's regulations contain a specific standard for Chlorophyll *a* (corrected, as described in *Standard Methods for the Examination of Water and Wastewater*, 20th Edition, 1998) for Harris Reservoir:

> The mean of photic-zone composite chlorophyll *a* samples collected monthly, April through October, shall not exceed 10 micrograms per liter (µg/l), as measured at the deepest point, main river channel, dam forebay; or 12 ug/l, as measured at the deepest point, main river channel, immediately upstream of the Tallapoosa River – Little Tallapoosa River confluence (see ADEM Admin. Code r. 335-6-10-.11(h)4) (ADEM 2017).

Criteria for metal concentrations can be calculated using formulas provided in ADEM Admin. Code r. 335-6-10-.07, *Toxic Pollutant Criteria Applicable to State Waters*. The Designated Uses (ADEM Admin. Code r. 335-6-11) (ADEM 2017) and the Water Quality Criteria (ADEM Admin. Code r. 335-6-10) (ADEM 2017) are reviewed once every three years pursuant to U.S. Environmental Protection Agency (EPA) regulations at 40 CFR Part 131.20.



What is a Trophic State?

Scientists organize lakes and reservoirs by their different trophic states. "-trophy" means nutrients and the grouping of the lakes depends on the level of available nutrients. The trophic nature of the lake may also depend on other factors including area, depth, climate, and adjacent land use.

Oligotrophic lakes and reservoirs have few nutrients such as phosphorus and nitrogen: there is a lot of oxygen available from the surface to the bottom of the lake or reservoir.

Mesotrophic lakes and reservoirs have an intermediate or middle amount of nutrients and are typically good for fishing. Mesotrophic lakes typically stratify or separate into layers during the summer.

Eutrophic lakes and reservoirs have a large number of plants and algae and a large number of nutrients.

Source: RMB Environmental Laboratories, Inc. 2017. Lake Trophic States. Detroit Lakes, MN. [Online] URL: http://rmbel.info/lake-trophic-states-2/.

Lake County Water Authority. 2017. Lake County Wateratlas. Tavares, FL. Online] URL: http://www.lake.wateratlas.usf.edu/shared/learnmore.asp?toolsection=lm_tsi.

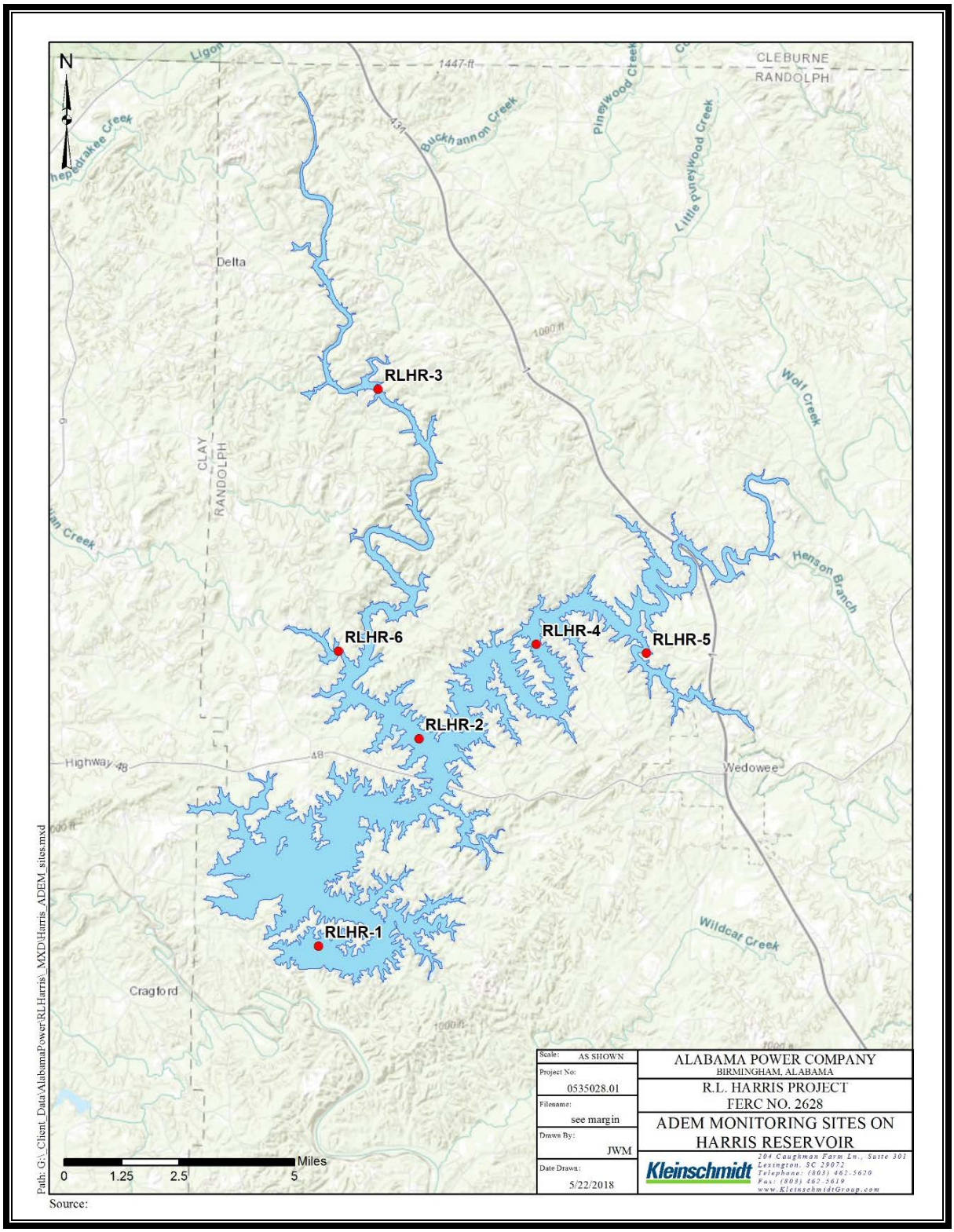
5.2.1.8 Existing Water Quality Information

The ADEM performed water quality sampling at several Harris Reservoir sites, including the forebay. ADEM's 2013 report for Harris Reservoir includes a presentation of water quality data collected in 2010, with comparisons to previous years extending back to 1997 (ADEM 2013a). In the 2013 report, ADEM noted that concentrations of nutrients (nitrogen and phosphorus), chlorophyll *a*, and total suspended solids (TSS) were generally lower than samples collected in 2005. Long-term monitoring of water quality indicates that Harris Reservoir is currently mesotrophic with an average Trophic State Index (TSI) value of 49 (ADEM 2016a). Data collected by ADEM in 2015 indicated a TSI value of 38, which is in the oligotrophic range. A mesotrophic or oligotrophic classification indicates that substantial nutrient loading does not normally occur in Harris Reservoir.

ADEM collected and analyzed monthly surface water samples for numerous parameters at six stations on Harris Reservoir in April through October during its sampling years between 2005 and 2015 (***Figure 5-15***). As part of its monitoring program, ADEM collected basic water quality data throughout a vertical profile from the reservoir surface to the bottom at regular depth intervals (approximately 3 feet). Water temperature and dissolved oxygen data from the forebay profiles at Station 1 (RLHR-1) collected between 2005 and 2015 are presented in ***Figure 5-16*** and ***Figure 5-17***. Additional information on water temperature, dissolved oxygen, pH, and conductivity data from these forebay profiles collected between 2005 and 2015 are presented in the *Baseline Water Quality Report* (Kleinschmidt 2018c) in Appendix L. Generally, during the spring and summer, the Harris Reservoir stratifies into three layers:

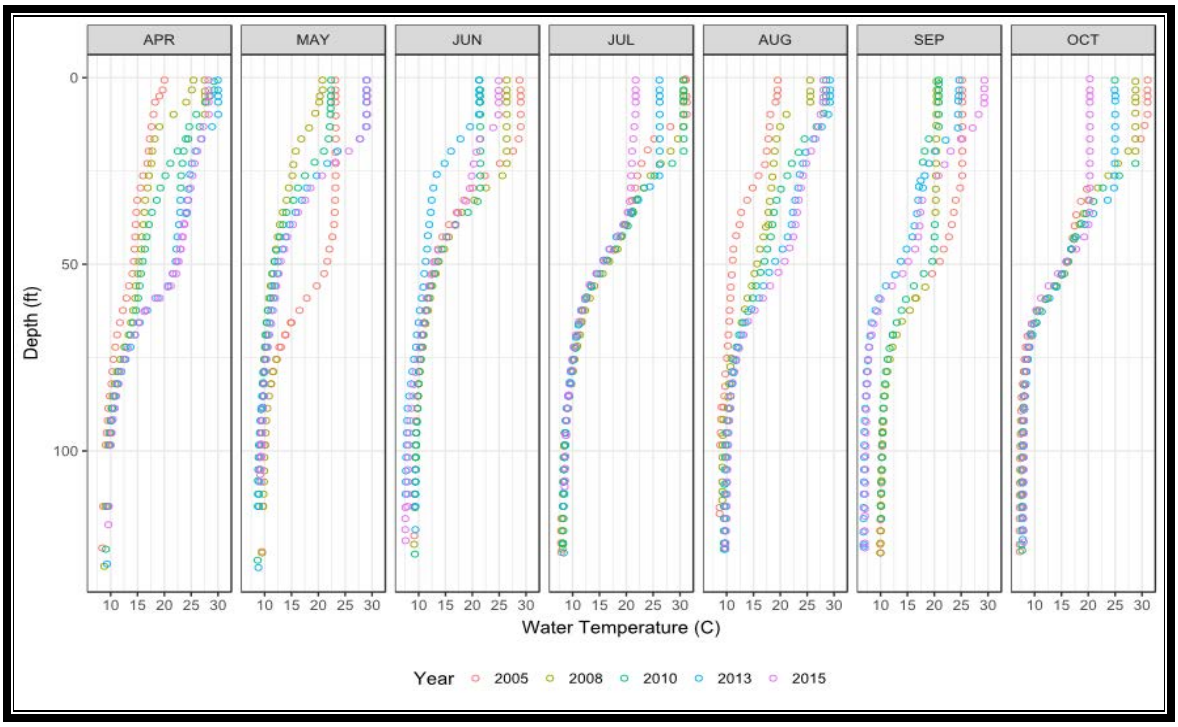
- an epilimnion, which is fairly uniform in temperature and is well oxygenated,
- a hypolimnion, a cold, less oxygenated bottom layer, and
- a metalimnion or thermocline, which is a transition layer between the epilimnion and hypolimnion.

Water clarity, as measured by mean Secchi Disk depth, is typically higher in the lower reaches of the reservoir and lower in the upper reaches, ranging from 8.9 feet at RLHR-1 to 4.3 feet at RLHR-3. Similarly, concentrations of nutrients such as nitrogen and phosphorus, as well as chlorophyll *a* concentrations, were higher at the upper reservoir stations (RLHR-3 and RLHR-5) (Kleinschmidt 2018c). ***Table 5-8*** provides the parameter results for ADEM water quality monitoring stations on Harris Reservoir (Kleinschmidt 2018c and Appendix L).



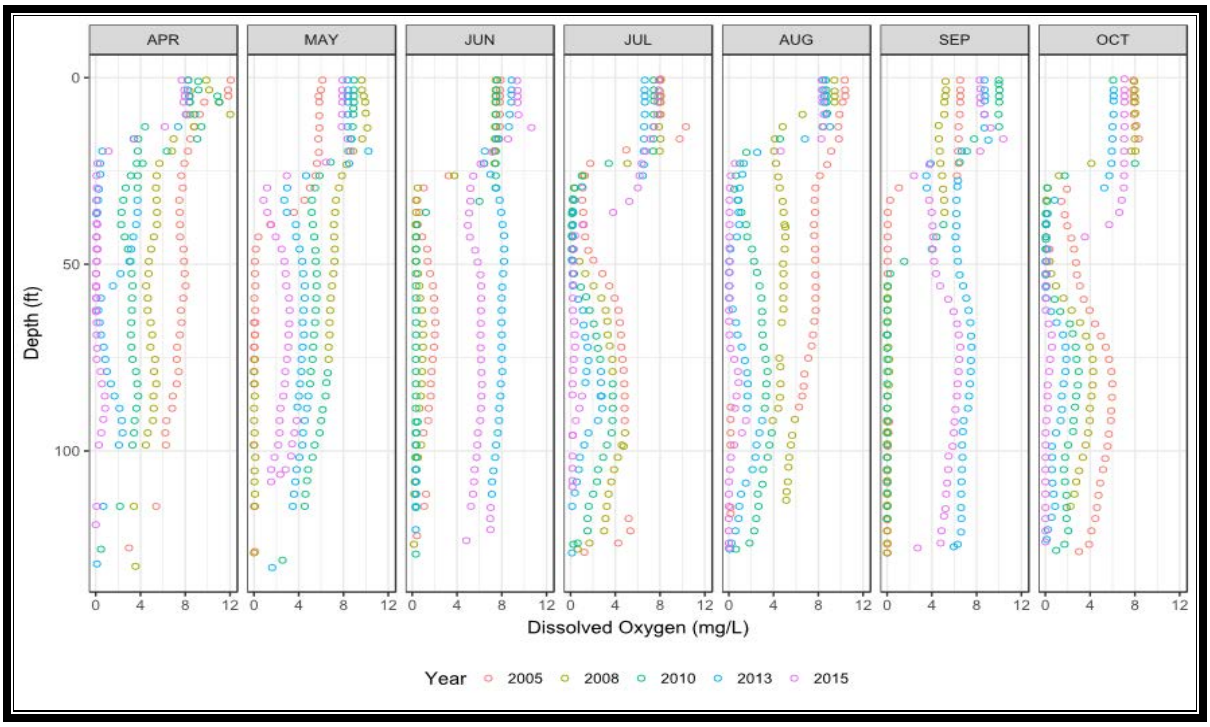
Source: Kleinschmidt 2018b

FIGURE 5-15 ADEM MONITORING SITES ON HARRIS RESERVOIR



Source: Kleinschmidt 2018c

FIGURE 5-16 VERTICAL WATER TEMPERATURE PROFILE RESULTS FROM HARRIS FOREBAY (STATION 1)



Source: Kleinschmidt 2018c

FIGURE 5-17 VERTICAL DISSOLVED OXYGEN PROFILE RESULTS FROM HARRIS FOREBAY (STATION 1)

TABLE 5-8 SUMMARY OF PARAMETER RESULTS FOR ADEM WATER QUALITY MONITORING STATIONS AT HARRIS RESERVOIR

PARAMETER	RLHR LOCATION						UNITS
	1	2	3	4	5	6	
Algal growth potential	2.6	2.6	6.4	4.9	6.2	3.5	MSC
Alkalinity, total	11.8	13.2	14.7	13.0	12.9	12.7	mg/L
Ammonia-nitrogen	0.012	0.015	0.019	0.014	0.016	0.023	mg/L
5-day BOD	0.1	0.0	0.0	0.6	0.2	0.3	mg/L
Calcium (Ca)	2.46	2.57	2.76	2.57	2.32	2.49	mg/L
Chloride	2.4	2.5	2.0	3.5	3.4	2.2	mg/L
Chlorophyll *a*	6.4	7.6	12.5	10.4	11.2	7.9	mg/m3
Depth, bottom	37.4	26.9	8.1	18.4	11.3	12.8	m
Secchi disk depth	2.7	2.0	1.3	1.8	1.7	1.9	m
Escherichia coli	3.7	1.1	29.4	5.0	8.6	3.2	MPN/100 mL
Fecal Coliform	1.0	1.0	6.5	1.0	20.0	23.0	cfu/100 mL
Hardness, Ca, Mg	10.6	11.5	12.2	11.7	10.8	10.8	mg/L
Nitrate + Nitrite	0.024	0.027	0.055	0.066	0.060	0.036	mg/L
Kjeldahl nitrogen	0.244	0.298	0.381	0.366	0.400	0.324	mg/L
Photic Zone Depth	6.8	5.4	3.3	4.8	4.7	4.9	m
Magnesium (Mg)	1.16	1.22	1.32	1.27	1.20	1.20	mg/L
Orthophosphate	0.005	0.006	0.006	0.005	0.004	0.005	mg/L
Phosphorus	0.014	0.018	0.028	0.023	0.026	0.018	mg/L
Total dissolved solids	26.6	32.2	35.0	37.7	32.7	286.3	mg/L
Total suspended solids	2.6	2.6	5.5	4.7	4.7	3.3	mg/L
Turbidity	2.2	3.0	7.6	4.0	4.1	4.3	NTU

Source: Kleinschmidt 2018c

Key:

BOD Biochemical Oxygen Demand
Ca Calcium
cfu Colony Forming Unit
m Meter
m3 Cubic Meter
mg Milligram
Mg Magnesium
mg/L Milligram per liter
MPN Most Probable Number
MSC Maximum Standing Crop
NTU Nephelometric Turbidity Unit

ADEM also performed monitoring in the Tallapoosa River at three sites downstream of Harris Reservoir from 2005 through 2016 (***Figure 5-18***). The site immediately downstream of Harris Dam (MARE-12) was sampled monthly in 2015 from April to October (***Table 5-9***). Dissolved oxygen levels at this station were lowest in October but remained above the state standard of

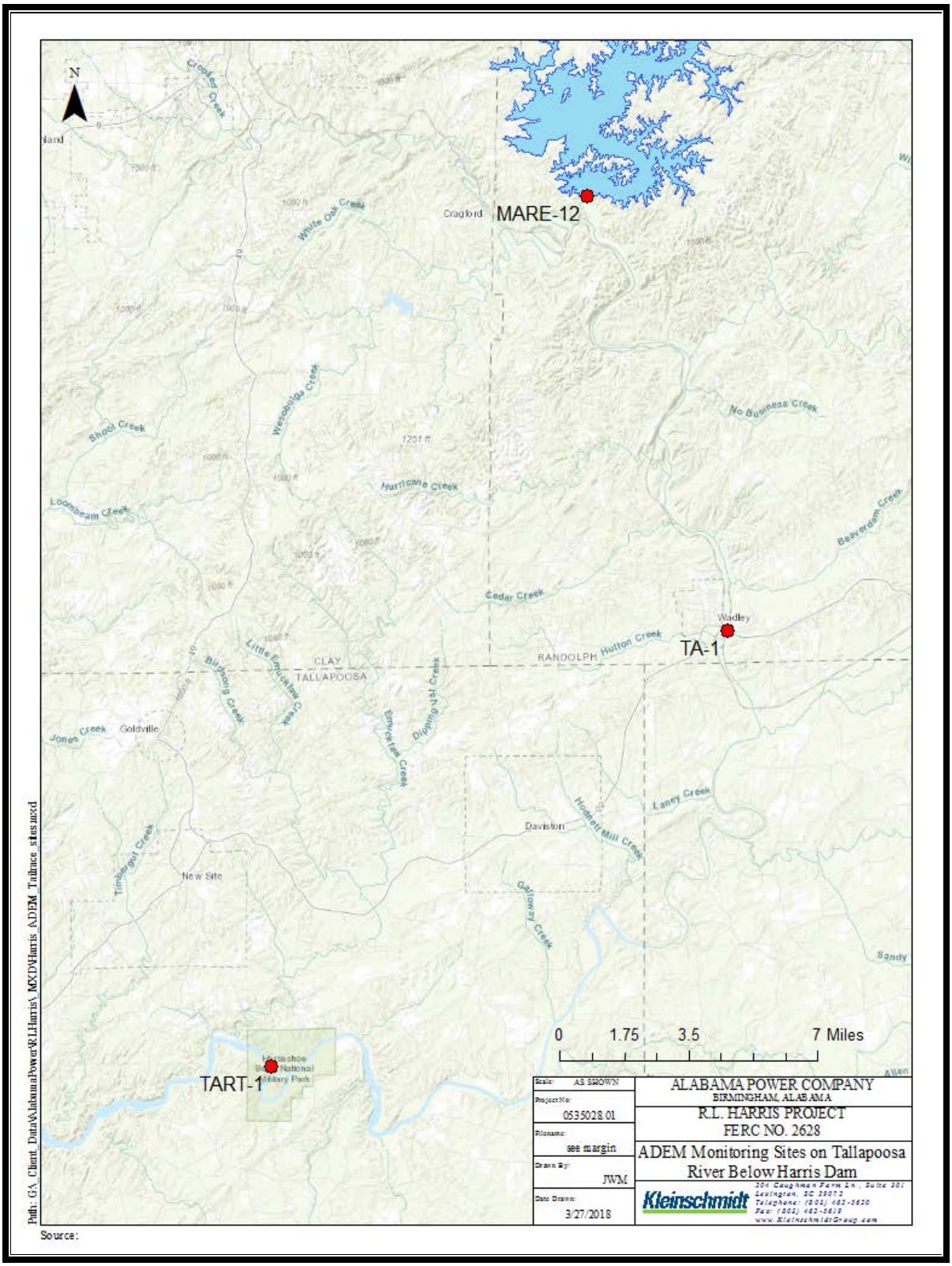
5 milligrams per liter (mg/L). Results of in-stream measurements indicated the highest water temperatures occurred in July and August.

TABLE 5-9 ADEM WATER QUALITY DATA FROM HARRIS DAM TAILRACE (MARE-12)

Date	Water Temperature (°C)	DO (mg/L)	pH	Specific Conductance (µs/cm)
4/29/2015	16.92	7.58	6.62	38
5/28/2015	18.76	5.74	6.43	38
6/16/2015	21.35	7.39	6.98	38
7/28/2015	24.23	7.92	6.31	36
8/27/2015	25.56	7.90	6.34	39
9/30/2015	22.26	6.40	6.33	39
10/29/2015	18.89	5.24	6.45	41

Source: Kleinschmidt 2018c

Key: DO dissolved oxygen
C Centigrade
mg/L milligrams per liter
µs/cm microsiemens per centimeter



Source: Kleinschmidt 2018c

FIGURE 5-18 ADEM MONITORING SITES ON TALLAPOOSA RIVER BELOW HARRIS DAM

5.2.1.9 Alabama Power Monitoring Information

On May 5, 1972, the Alabama Water Improvement Commission (AWIC) (predecessor agency to ADEM) issued a certificate pursuant to Section 21(b) of the Federal Water Pollution Control Act (CWA) for Alabama Power's Crooked Creek Hydroelectric Development (now referred to as Harris Project). AWIC's certificate concluded as follows:

> *The Alabama Water Improvement Commission, being reasonably assured that construction and operation of the Alabama Power Company's Crooked Creek Hydroelectric Project will not violate applicable water quality standards for the Tallapoosa River, hereby certifies the project according to the provisions of Section 21(b)(1) of the Federal Water Pollution Control Act, as amended; and, that the validity of this certification is hereby made dependent upon the Crooked Creek project being constructed and operated in a manner that: (1) will not violate applicable water quality standards for the Tallapoosa River; and (2) will maintain a minimum continuous flow of not less than forty-five (45) cubic feet per second at the gaging station on the Tallapoosa River at the bridge on Alabama State Highway 22 at Wadley, Alabama.*

Article 51 of the 1973 License for the Harris Project required Alabama Power to "review its heat budget analysis of the reservoir for optimum design and placement of the project intake structures to permit withdrawal of water from selected levels of the reservoir to control the water quality of the discharges from the powerhouse" and to show the design and placement of the intake structures on Exhibit L drawings to be filed for FERC approval prior to construction. Article 52 of the 1973 License required Alabama Power to file for FERC approval a revised Exhibit S that included "a description of measures being taken to maintain or enhance the water quality of the Tallapoosa River downstream from the project."

To enhance water quality in the discharge from Harris Dam, Alabama Power incorporated a turbine aeration system into the turbine design to provide up to 2 mg/L increase in dissolved oxygen (Alabama Power 1980). Additionally, the Harris Dam intake structure includes a skimmer weir, which can be raised or lowered to meet water quality needs (Alabama Power 1980).

Alabama Power employs a surveillance program at Harris Dam to assess water quality and to ensure compliance with State of Alabama water quality standards. Beginning in May of each year, Alabama Power begins monitoring dissolved oxygen in the tailrace of the Harris Dam during generation every two weeks using a handheld instrument. To ensure dissolved oxygen levels are maintained at or above 5.0 mg/L, the turbine aeration system is turned on when dissolved oxygen levels approach 5.5 mg/L. Beginning September 1 of each year, Alabama Power again begins measuring dissolved oxygen in the Harris Dam tailrace every two weeks using a handheld instrument during generation. When dissolved oxygen levels are maintained at or above 6.0 mg/L, turbine aeration is turned off.

From May to October 2016, in anticipation of relicensing, Alabama Power conducted a study to help identify an appropriate location for installing a monitor to record dissolved oxygen and

WHAT IS NPDES?

A National Pollutant Discharge Elimination System (NPDES) permit is required by the Clean Water Act for discharging any "pollutants" through a "point source" into a "water of the United States". The permit limits both what can be discharged and in what quantities, as well as establishing monitoring and reporting requirements.

Source: U.S. Environmental Protection Agency. 2017. National Pollutant Discharge Elimination System Permit Basics. Washington, DC. [Online] URL: https://www.epa.gov/npdes/npdes-permit-basics.

temperature data during generation to support an application for a Section 401 Water Quality Certificate from ADEM. The hydroelectric generation period of each hydroelectric unit is defined as the time from turbine start until turbine shut down. Results from four different monitoring locations found that dissolved oxygen concentrations ranged from 5.39 mg/L to 11.01 mg/L. The average temperature recording during this study ranged from 21.65 to 22.02 degrees Celsius (Kleinschmidt 2018c). For more detailed information on the water quality at the Harris Project, see the *Baseline Water Quality Report* in Appendix L.

The continued operation of the Harris Project requires a National Pollutant Discharge Elimination System (NPDES) permit for the nine existing discharge points at the powerhouse: three for cooling water discharges; two for discharges from sumps and drains; one for plant and unit oil/water separators; one for uncontaminated stormwater; one for uncontaminated stormwater from bulk petroleum secondary containment areas; and one for wastewater resulting from maintenance and repair activities. General NPDES Permit Number ALG360017 was reissued effective March 1, 2017 for a period of five years (ADEM 2016b) (Kleinschmidt 2018b).

5.2.1.10 Other Lake Harris Related Monitoring Information

The Lake Wedowee Property Owners Association (LWPOA) became involved with Alabama Water Watch in 1998. Several association members have become certified monitors and have collected water quality data from 36 sites on the lake and its tributaries. Parameters monitored by the volunteers typically include water temperature, dissolved oxygen, pH, alkalinity, hardness, turbidity, and Secchi depth. Results generated by this program are generally similar to those obtained by ADEM and represent a useful surveillance system that provides an enhanced ability to identify potential water quality issues that may arise.

ALABAMA WATER WATCH

Alabama Water Watch (AWW) is a water quality monitoring program based on citizen volunteers established in 1992. AWW has a program covering every major river basin in Alabama and offers training and certification in water chemistry monitoring, bacteriological monitoring, and stream biomonitoring.

Source: Alabama Water Watch. 2007. History and Mission. Auburn, AL (Online) URL:http://www.alabamawaterwatch.org/

5.2.2 SKYLINE

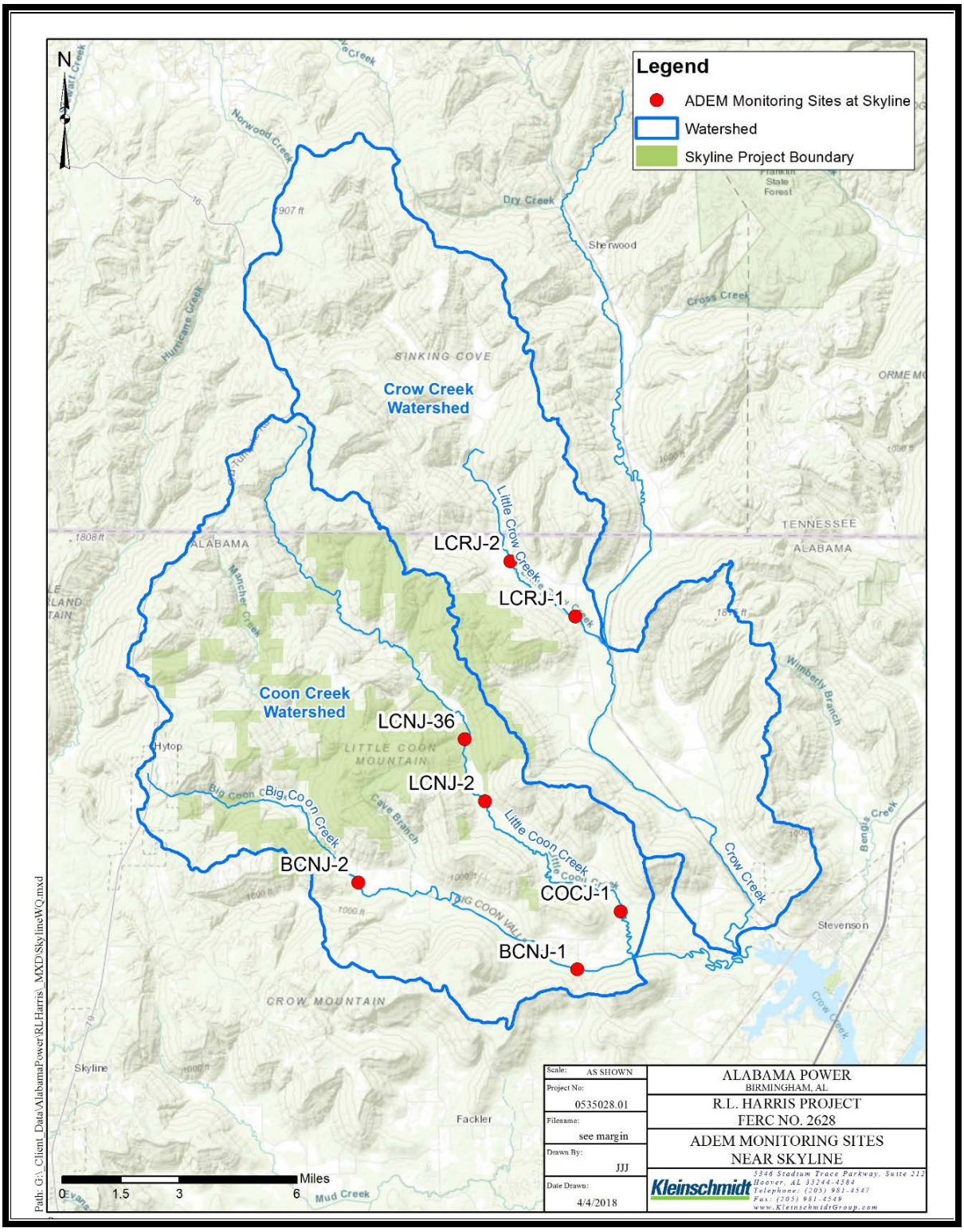
Skyline is located within two watersheds: Coon Creek and Crow Creek watersheds. Streams within the Coon Creek watershed include Coon Creek, Big Coon Creek, and Little Coon Creek. Streams within the Crow Creek watershed include Crow Creek and Little Crow Creek.

The state of Alabama designated uses for Coon Creek from Guntersville Lake upstream to its source are S/F&W (ADEM 2017). These waters are best suited for swimming or other whole-body water contact sports and for fish and wildlife habitat. Of these streams, only the Little Coon Creek is currently included in Alabama's 303(d) impaired waters list. The stream is listed as impaired for siltation/habitat alteration. The source of siltation is listed as non-irrigated crop production (ADEM 2016a).

The state of Alabama designated uses for Crow Creek from Guntersville Lake to the Alabama-Tennessee state line are F&W (ADEM 2017). These waters are best suited for fish and wildlife habitat. No waters in the Crow Creek watershed are included in Alabama's 303(d) Impaired Waters List (ADEM 2016a).

The 2014 ADEM 303(d) list identifies 49 stream segments in the Tennessee River Basin as partially or not supporting designated uses for fish and wildlife, agriculture and industry, swimming, and public water supply (ADEM 2014). Pollutants including organic enrichment and dissolved oxygen, siltation, and pathogens are the most frequently cited reasons for the 49 streams not meeting Alabama's water quality standards (ADEM 2014).

ADEM performed periodic sampling at six stream sites that drain land within the Skyline portion of the Harris Project Boundary (***Figure 5-19)***; however, there is no recently published data for LCNJ. A summary of results from common parameters that were tested at each site is presented in ***Table 5-10***.



Source: ADEM 2017

FIGURE 5-19 ADEM MONITORING SITES NEAR SKYLINE

TABLE 5-10 SUMMARY OF ADEM SAMPLING RESULT MEANS FOR WATER QUALITY STATIONS AT SKYLINE

	Big Coon Creek		Little Coon Creek		Little Crow Creek		
Parameter	**BCNJ-1**	**BCNJ-2**	**COCJ-1**	**LCNJ-36**	**LCRJ-2**	**LCRJ-1**	**Units**
Alkalinity, total	112	126	136	124	75	101	mg/L
Ammonia-nitrogen	0.014	-	0.042	-	-	-	mg/L
Calcium	38.06	45.20	46.04	-	-	-	mg/L
Chloride	3.05	1.97	2.36	1.10	3.53	3.72	mg/L
Dissolved oxygen (DO)	8.55	9.66	7.29	9.66	9.40	9.00	mg/L
Escherichia coli	150.3	53.5	205.8	-	-	-	MPN/100 mL
Fecal Coliform	109.2	33.0	163.3	-	45.0	72.0	CFU/100 mL
Hardness, Ca, Mg	111	138	140	-	112	112	mg/L
Nitrate + Nitrite	0.758	0.144	0.380	0.079	0.368	0.517	mg/L
Kjeldahl nitrogen	0.249	0.241	0.359	0.187	-	-	mg/L
Magnesium	4.74	6.39	6.72	-	-	-	mg/L
pH	7.70	7.86	7.62	7.87	7.99	7.67	
Phosphorus	0.011	0.015	0.018	0.009	0.018	0.017	mg/L
Specific conductance	221.3	257.4	271.4	224.2	251.2	210.8	µs/cm
Temperature, water	16.91	16.71	17.89	16.87	17.00	18.00	C
Total dissolved solids	146.5	202.0	166.6	143.0	118.0	101.0	mg/L
Total suspended solids	4.4	2.5	5.0	10.8	5.0	4.0	mg/L
Turbidity	6.7	3.0	9.2	3.1	3.7	4.4	NTU

Source: Kleinschmidt 2018c

Key:

µs/cm microsiemens per centimeter
BOD Biochemical Oxygen Demand
Ca Calcium
cfu Colony Forming Unit
m Meter
m3 Cubic Meter
mg Milligram
Mg Magnesium
mg/L Milligram per liter
MPN Most Probable Number
NTU Nephelometric Turbidity Unit

5.3 FISH AND AQUATIC RESOURCES

5.3.1 LAKE HARRIS

Harris Reservoir is located primarily in Randolph County, Alabama. At 9,870 acres, it is the second largest reservoir on the Tallapoosa River (Lake Martin is the largest reservoir in the basin at approximately 41,150 acres). The reservoir is approximately 29 miles long, with 367 miles of shoreline and a depth of 121 feet at full pool; it is cold, relatively clear, and the same temperature top to bottom during the winter months. During the spring and early summer, thermal stratification occurs, with strong stratification occurring by late summer.

Releases from Harris Dam into the tailrace are relatively cold, clear, and well oxygenated during the winter months and less oxygenated during the summer months (USACE 2014b). Gamefish species (including black bass and sunfish) are found downstream of the dam (Travnichek and Maceina 1994).

5.3.1.1 Fish

The reservoir supports several sport fisheries. Anglers frequently seek Largemouth Bass (*Micropterus salmoides)*; a number of bass fishing tournaments occur on Harris Reservoir annually. There is a 13-inch to 16-inch slot limit for Largemouth Bass on the reservoir (meaning that all fish 13 inches to 16 inches must be released). The reservoir provides one of the top bass fisheries in the state of Alabama, with anglers reporting relatively high catch rates. The percentage of Largemouth Bass in Harris Reservoir that are greater than 20 inches (12 percent) exceeds the statewide average (7 percent) for Alabama reservoirs. However, there was low recruitment to age one in 2015, with just 2 percent of the population reaching this age class. Growth rates for Largemouth Bass in their first four years of life are similar to growth rates for Largemouth Bass found in other reservoirs throughout the state (ADCNR 2015).

Alabama Bass (*Micropterus henshalli*) are present in Harris Reservoir; however, there are no size limits associated with the harvest of this species. There appears to be a high Alabama Bass annual mortality in Harris Reservoir, but relatively low Largemouth Bass mortality, as compared to other reservoirs in the state (ADCNR 2015).

Relative weight of black bass species in the reservoir is low. This low condition rating is likely associated with the relatively low primary productivity of Harris Reservoir (ADCNR 2016a).

Common Fish Species Found in Lake Harris

Largemouth Bass

Channel Catfish

White Crappie

White Bass

University of Wisconsin Sea Grant Institute. 2017. Fish and Fisheries. [Online] URL: http://seagrant.wisc.edu/home/Default.aspx?tabid=39.

During 1983 and 1984, ADCNR stocked White Bass x-Striped Bass hybrids, Largemouth Bass, Channel Catfish (*Ictalurus punctatus)*, and Bluegill (*Lepomis macrochirus)* in Harris Reservoir (ADCNR 1983 and 1984). Currently, the reservoir provides a fishery for crappie, catfish, White Bass (*Morone chrysops)*, and sunfish species, along with Largemouth Bass; however, Striped Bass (*Morone saxatilis)* and hybrids are not commonly observed in the reservoir. There are fish consumption advisories for Blue Catfish (*Ictalurus furcatus)* (2 meals per month) and Alabama Bass (1 meal per month) associated with mercury contamination (AL Department of Public Health 2016). A list of fish species documented in Harris Reservoir, as well as in the reaches upstream and downstream of the reservoir, is presented in ***Table 5-11.***

TABLE 5-11 FISHES KNOWN OR EXPECTED TO OCCUR IN THE LAKE HARRIS PROJECT VICINITY

FAMILY	SCIENTIFIC NAME	COMMON NAME
Petromyzontidae (Lampreys)	*Ichthyomyzon gagei*	Southern Brook Lamprey
Amiidae (Bowfins)	*Amia calva*	Bowfin
Clupeidae (Herrings and Shads)	*Dorosoma cepedianum*	Gizzard Shad
	Dorosoma petenense	Threadfin Shad
Cyprinidae (Minnows and Carps)	*Campostoma oligolepis*	Largescale Stoneroller
	Cyprinella callistia	Alabama Shiner
	Cyprinella gibbsi	Tallapoosa Shiner
	Cyprinella venusta	Blacktail Shiner
	Cyprinus carpio	Common Carp
	Hybopsis lineapunctata	Lined Chub
	Luxilus chrysocephalus	Striped Shiner
	Luxilus zonistius	Bandfin Shiner
	Lythrurus bellus	Pretty Shiner
	Macrhybopsis etnieri	Coosa Chub
	Nocomis leptocephalus	Bluehead Chub
	Notemigonus crysoleucas	Golden Shiner
	Notropis amplamala	Longjaw Minnow
	Notropis atherinoides	Emerald Shiner
	Notropis baileyi	Rough Shiner
	Notropis stilbius	Silverstripe Shiner
	Notropis texanus	Weed Shiner
	Notropis xaenocephalus	Coosa Shiner
	Phenacobius catostomus	Riffle Minnow
	Pimephales promelas	Fathead Minnow
	Pimephales vigilax	Bullhead Minnow
	Semotilus atromaculatus	Creek Chub
	Semotilus thoreauianus	Dixie Chub
Catostomidae (Suckers)	*Hypentelium etowanum*	Alabama Hog Sucker
	Minytrema melanops	Spotted Sucker
	Moxostoma carinatum	River Redhorse
	Moxostoma duquesnei	Black Redhorse
	Moxostoma erythrurum	Golden Redhorse
	Moxostoma poecilurum	Blacktail Redhorse
Ictaluridae (Catfishes)	*Ameiurus melas*	Black Bullhead
	Ameiurus natalis	Yellow Bullhead
	Ameiurus nebulosus	Brown Bullhead
	Ictalurus furcatus	Blue Catfish
	Ictalurus punctatus	Channel Catfish
	Noturus funebris	Black Madtom
	Noturus leptacanthus	Speckled Madtom
	Pylodictis olivaris	Flathead Catfish

FAMILY	SCIENTIFIC NAME	COMMON NAME
Fundulidae (Topminnows and Killifishes)	*Fundulus bifax*	Stippled Studfish
	Fundulus olivaceus	Blackspotted Topminnow
Poeciliidae (Livebearers)	*Gambusia affinis*	Western Mosquitofish
Cottidae (Sculpins)	*Cottus tallapoosae*	Tallapoosa Sculpin
Moronidae (Temperate Basses)	*Morone chrysops*	White Bass
	Morone saxatilis	Striped Bass
	Morone chrysops x saxatilis	White Bass X Striped Bass Hybrid
Centrarchidae (Sunfishes)	*Ambloplites ariommus*	Shadow Bass
	Lepomis auritus	Redbreast Sunfish
	Lepomis cyanellus	Green Sunfish
	Lepomis gulosus	Warmouth
	Lepomis macrochirus	Bluegill
	Lepomis megalotis	Longear Sunfish
	Lepomis microlophus	Redear Sunfish
	Lepomis miniatus	Redspotted Sunfish
	Micropterus tallapoosae	Tallapoosa Bass
	Micropterus henshalli	Alabama Bass
	Micropterus salmoides	Largemouth Bass
	Pomoxis annularis	White Crappie
	Pomoxis nigromaculatus	Black Crappie
Percidae (Perches)	*Etheostoma chuckwachatte*	Lipstick Darter
	Etheostoma parvipinne	Goldstripe Darter
	Etheostoma stigmaeum	Speckled Darter
	Etheostoma swaini	Gulf Darter
	Etheostoma tallapoosae	Tallapoosa Darter
	Percina kathae	Mobile Logperch
	Percina nigrofasciata	Blackbanded Darter
	Percina palmaris	Bronze Darter
	Percina smithvanizi	Muscadine Bridled Darter

Source: Travnichek and Maceina 1994; Mettee et al. 1996

5.3.1.2 Summary of Harris Fisheries Data

As described in Section 4.3, Alabama Power and ADCNR have funded research to assess the effects of current [or existing] project operations on the fishery in the Tallapoosa River downstream of Harris Dam. As part of that assessment, ACFWRU conducted fish assemblage studies from 2005-2015. These efforts are described in greater detail in a 2018 report entitled "*Summary of R.L. Harris Downstream Flow Adaptive Management History and Research*" (Kleinschmidt 2018a and Appendix E). This section provides an overview of the results of those efforts.

The ACFWRU performed fishery surveys at six sites. Four of the sites were located on the Tallapoosa River between Harris Dam and Lake Martin: Malone, Wadley, Griffin Shoals, and Peters Island (known collectively as Middle Tallapoosa or MT). Two unregulated sites were sampled as reference sites – one upstream of Harris on the Tallapoosa River near Heflin, Alabama (Upper Tallapoosa or UT) and one on Hillabee Creek (HC), a tributary to the Tallapoosa River near Alexander City, Alabama (***Figure 5-20***). Reaches sampled at each of these sites generally consisted of shallow reaches of riffles and shoals. These surveys employed prepositioned area electrofishing grid sampling one to two times per year, typically in the late spring or early summer and/or late summer or fall. The methods utilized during the study generally collected fish in riffle and run habitats, as opposed to pools and backwaters, which could have influenced the family composition of the samples, as centrarchids and ictalurids are less likely to utilize riffle habitats as compared to cyprinids and percids.

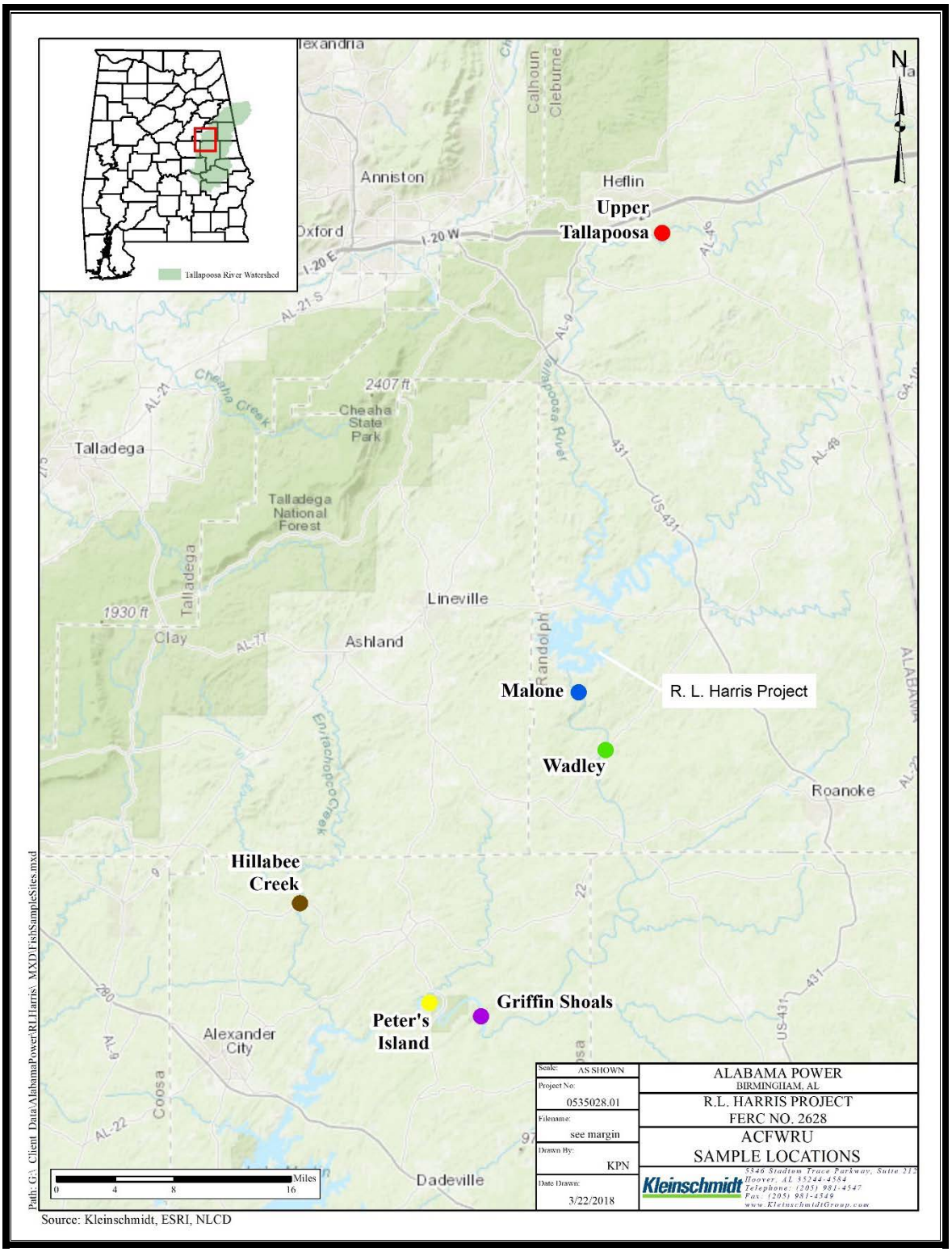
A total of 45 fish species were collected at the Hillabee Creek site, 43 species were collected at the Middle Tallapoosa sites, and 42 species were collected at the Upper Tallapoosa site (***Table 5-12***). The most abundant species collected from 2005 - 2015 included Alabama Shiner (*Cyprinella callistia)* (n=12,949), Lipstick Darter (*Etheostoma chuckwachatte*) (n=12,710), and Bronze Darter (*Percina palmaris)* (n=11,730). Combined, these three species comprised almost 50 percent of all fish collected (***Table 5-13*).** The most abundant species collected during the study were generally abundant both upstream and downstream of Harris Dam. However, Threadfin Shad (*Dorosoma petenense)* were only observed downstream of Harris Dam. Gamefish species collected downstream of Harris Dam included Channel Catfish (*Ictalurus punctatus),* Bluegill, Redbreast Sunfish (*Lepomis auritus*), Flathead Catfish (*Pylodictis olivaris),* and Largemouth Bass. Ictalurids collected during the study include Speckled Madtom (*Noturus leptacanthus),* Black Madtom (*Noturus funebris),* Channel Catfish, and Flathead Catfish (Irwin 2016). Reaches of Hillabee Creek sampled during the study had a similar species composition to the upstream and downstream sites, with cyprinids and percids as the most abundant species collected across years and sites.

According to the Geological Survey of Alabama's (GSA) protocols (GSA 2011), Index of Biotic Integrity (IBI) scores were calculated based on ACFWRU fish collections at the upstream, downstream, and Hillabee Creek sites for each collection year. Although ACFWRU's collection methods differed from the protocols required by the GSA, they were consistently applied at each site and over time. Therefore, IBI scores could be calculated and used to compare sites and years within this robust dataset. According to the protocol, IBI scores are classified into one of five ranges:

- Very Poor ≤ 26
- Poor 27 – 34
- Fair 35 – 42
- Good 43 – 50
- Excellent ≥ 50

IBI scores for the upstream and downstream sites appeared similar, with Hillabee Creek having consistently higher scores. The upstream site (Heflin) had an average score of 36 over the 11-year period, while the downstream sites (Wadley and Malone) had average scores of 35. Hillabee Creek had an average score of 43. There do not appear to be any clear long-term trends in the IBI scores.

Alabama Power sampled fish communities in 2017 using standardized methods developed by GSA and ADCNR known as the "30+2" method (GSA 2011). Samples were collected at the Malone and Wadley sites along the Middle Tallapoosa in the spring and fall and the Upper Tallapoosa site in July and October. A total of 23 species representing 7 families were collected at the Middle Tallapoosa sites during the spring and fall of 2017 compared with a total of 31 species, representing 8 families, collected at the Upper Tallapoosa site. The most common species collected along the Middle Tallapoosa were the Redbreast Sunfish (n=112), Lipstick Darter (n=105), and Bronze Darter (n=62). The most common species collected at the upstream site were Speckled Darter (*Etheostoma stigmaeum*) (n=98), Tallapoosa Shiner (*Cyprinella gibbsi*) (n=87), Redbreast Sunfish (n=61), Muscadine Darter (*Percina smithvanizi*) (n=56), and Lipstick Darter (n=46). IBI scores at the Middle Tallapoosa sites during the spring and fall ranged from 30 (Poor) to 38 (Fair). However, three of the four collections resulted in poor scores. Scores at the upstream site were 40 (Fair) and 36 (Fair) during the summer and fall, respectively.



Source: Kleinschmidt, ESRI, NLCD 2018

FIGURE 5-20 ACFWRU SAMPLE LOCATIONS

TABLE 5-12 TALLAPOOSA RIVER FISH SPECIES COLLECTED AT THE ACFWRU FISH SAMPLE LOCATIONS

COMMON NAME	SCIENTIFIC NAME	UT	MT	HC
Clupeidae				
Gizzard Shad	*Dorosoma cepedianum*		X	
Threadfin Shad	*Dorosoma petenense*		X	
Cyprinidae				
Largescale Stoneroller	*Campostoma oligolepis*	X	X	X
Alabama Shiner	*Cyprinella callistia*	X	X	X
Tallapoosa Shiner	*Cyprinella gibbsi*	X	X	X
Blacktail Shiner	*Cyprinella venusta*	X	X	X
Lined Chub	*Hybopsis lineapunctata*	X	X	X
Striped Shiner	*Luxilus chrysocephalus*			X
Pretty Shiner	*Lythrurus bellus*	X		X
Coosa Chub	*Macrhybopsis etnieri*		X	X
Bluehead Chub	*Nocomis leptocephalus*	X		X
Golden Shiner	*Notemigonus crysoleucas*		X	
Burrhead Shiner	*Notropis asperifrons*			X
Rough Shiner	*Notropis baileyi*	X	X	X
Silverstripe Shiner	*Notropis stilbius*	X	X	X
Weed Shiner	*Notropis texanus*	X	X	
Riffle Minnow	*Phenacobius catostomus*	X	X	X
Creek Chub	*Semotilus atromaculatus*	X		X
Bullhead Minnow	*Pimephales vigilax*	X	X	X
Catostomidae				
Alabama Hog Sucker	*Hypentelium etowanum*	X	X	X
Spotted Sucker	*Minytrema melanops*	X		X
Black Redhorse	*Moxostoma duquesnei*	X	X	X
Golden Redhorse	*Moxostoma erythrurum*	X	X	X
Blacktail Redhorse	*Moxostoma poecilurum*	X	X	X
Ictaluridae				
Yellow Bullhead	*Ameiurus natalis*	X	X	X
Channel Catfish	*Ictalurus punctatus*	X	X	X
Speckled Madtom	*Noturus leptacanthus*	X	X	X
Black Madtom	*Noturus funebris*	X	X	X
Flathead Catfish	*Pylodictis olivaris*	X	X	X
Fundulidae				
Stippled Studfish	*Fundulus bifax*	X	X	X
Blackspotted Topminnow	*Fundulus olivaceus*	X	X	X
Poeciliidae				
Western Mosquitofish	*Gambusia affinis*	X	X	X
Cottidae				
Tallapoosa Sculpin	*Cottus tallapoosae*	X	X	X

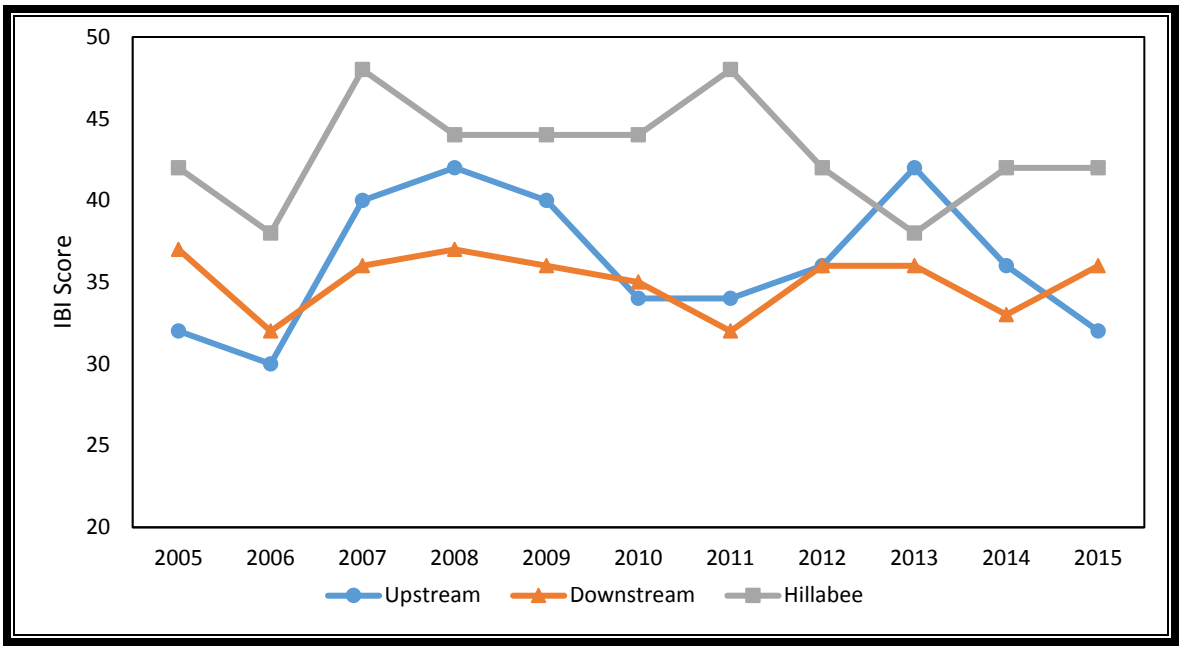
COMMON NAME	SCIENTIFIC NAME	UT	MT	HC
Percidae				
Lipstick Darter	*Etheostoma chuckwachatte*	X	X	X
Speckled Darter	*Etheostoma stigmaeum*	X	X	X
Tallapoosa Darter	*Etheostoma tallapoosae*	X	X	X
Yellow Perch	*Perca flavescens*	X		
Mobile Logperch	*Percina kathae*	X	X	X
Bronze Darter	*Percina palmaris*	X	X	X
Muscadine Darter	*Percina smithvanizi*	X	X	X
Centrarchidae				
Shadow Bass	*Ambloplites ariommus*	X	X	X
Redbreast Sunfish	*Lepomis auritus*	X	X	X
Green Sunfish	*Lepomis cyanellus*	X	X	X
Warmouth	*Lepomis gulosus*			X
Bluegill	*Lepomis macrochirus*	X	X	X
Longear Sunfish	*Lepomis megalotis*		X	X
Redear Sunfish	*Lepomis microlophus*	X	X	X
Tallapoosa Bass	*Micropterus tallapoosae*	X	X	X
Alabama Bass	*Micropterus henshalli*	X	X	X
Largemouth Bass	*Micropterus salmoides*	X	X	X
Black Crappie	*Pomoxis nigromaculatus*		X	
	TOTAL # of SPECIES	**42**	**43**	**45**

Source: Kleinschmidt 2018a

TABLE 5-13 RELATIVE ABUNDANCE OF 10 MOST COMMON FISH SPECIES COLLECTED DURING ACFWRU SURVEYS, 2005-2015

Common Name	Upper Tallapoosa (upstream)	Middle Tallapoosa (downstream)	Hillabee Creek	Total
Alabama Shiner	12.59%	21.22%	16.92%	17.16%
Lipstick Darter	11.45%	19.64%	18.85%	16.84%
Bronze Darter	8.30%	25.72%	10.90%	15.54%
Largescale Stoneroller	16.01%	3.56%	7.45%	8.67%
Bullhead Minnow	12.59%	0.42%	8.32%	6.74%
Speckled Darter	11.89%	3.18%	3.67%	6.04%
Tallapoosa Shiner	3.10%	1.47%	9.27%	4.48%
Muscadine Darter	3.55%	6.01%	2.68%	4.18%
Silverstripe Shiner	1.87%	3.06%	6.02%	3.64%
Alabama Hog Sucker	6.43%	2.56%	1.29%	3.36%

Source: Kleinschmidt 2018a



Source: Kleinschmidt 2018a

FIGURE 5-21 COMPARISON OF IBI SCORES FROM TALLAPOOSA RIVER FISH SAMPLES

5.3.1.3 Fish Entrainment

Fish entrainment and mortality rates were estimated for the R.L. Harris Project through a desktop fish entrainment and mortality study (Kleinschmidt 2018d). The study employed the same methodology used on previous hydro relicensing projects in Alabama (e.g., Martin – FERC No. 349, Coosa River – FERC No. 2146, Warrior River – FERC No. 2165, and Holt Project – FERC No. 2203). Fish entrainment is estimated to be highest during the winter (263,847 fish entrained) and lowest during the summer (3,714 fish entrained) (***Table 5-14***). Clupeids (*i.e.*, gizzard shad and threadfin shad) make up the majority of estimated fish losses associated with entrainment at the Harris Project (***Table 5-15***). Details about the entrainment and mortality at the Harris Project is included in Appendix M, *Desktop Fish Entrainment and Turbine Mortality Report* (Kleinschmidt 2018d).

TABLE 5-14 ESTIMATED SEASONAL NUMBER OF ENTRAINED FISH BY FAMILY/GENUS GROUP AT THE HARRIS PROJECT

Family/Genus Group	Winter	Spring	Summer	Fall	Total
Catostomidae	18	9	1	0	28
Sunfish	461	1,479	468	158	2,566
Bass	5	51	2	5	63
Clupeidae	253,752	13,649	3,108	8,926	279,435
Cyprinidae	287	154	22	68	531
Ictaluridae	9,324	231	113	2,136	11,804
Total	**263,847**	**15,573**	**3,714**	**11,293**	**294,427**

Source: Kleinschmidt 2018d

TABLE 5-15 ESTIMATED NUMBER OF ENTRAINED FISH LOST DUE TO TURBINE MORTALITY BY SEASON AND FAMILY/GENUS GROUP AT THE HARRIS PROJECT

Family/Genus Group	Winter	Spring	Summer	Fall	Total
Catostomidae	5	2	0	0	**7**
Sunfish	135	483	152	44	**814**
Bass	2	16	0	2	**20**
Clupeidae	13,606	734	169	488	**14,997**
Cyprinidae	45	25	3	10	**83**
Ictaluridae	2,273	55	28	531	**2,887**
Total	**16,066**	**1,315**	**352**	**1,075**	**18,808**

Source: Kleinschmidt 2018d

5.3.1.4 Migratory Fish

Alabama Power owns four hydroelectric developments (R. L. Harris Dam, Martin Dam, Yates Dam, and Thurlow Dam) on the Tallapoosa River upstream of its confluence with the Coosa River. The four dams are located on the Tallapoosa River at: R. L. Harris Dam at River Mile RM 139.1; Martin Dam at RM 60.6; Yates Dam at RM 52.7; and Thurlow Dam at RM 49.7. In addition to the dams, Tallassee Falls, a natural bedrock outcrop, exists between RM 49 to RM 47. The river channel drops approximately 9 feet in elevation over this two-mile section. This change in elevation was likely a natural barrier to fish movement even before the impoundments were built. None of the dams on the Tallapoosa River have locks that would allow passage for fish. Use of the Tallapoosa River by migratory fish species has also been impeded and/or blocked by the construction of navigation and hydropower projects in the Alabama River system including the USACE's Claiborne Dam and Millers Ferry Dam. Mettee (1996) noted that there are 144 species of fish in the Alabama River, and 30 of these species are migratory (***Table 5-16***). Alabama Power has conducted fisheries studies in the Tallapoosa

River downstream of Thurlow Dam since 1984. Anadromous, catadromous, and diadromous fish species collected during those surveys or believed by the USFWS to be present in the Tallapoosa River below Thurlow Dam are listed in ***Table 5-17***.

TABLE 5-16 MIGRATORY FISH SPECIES COLLECTED IN THE ALABAMA RIVER

SPECIES	MOVEMENT CHARACTERISTICS
Gulf Sturgeon (*Acipenser oxyrinchus desotoi*)	Anadromous
Alabama Sturgeon (*Scaphirhynchus suttkusi*)	Diadromous
Mooneye (*Hiodon tergisus*)	Diadromous
Paddlefish (*Polyodon spathula*)	Diadromous
Alligator Gar (*Atractosteus spatula*)	Diadromous
American Eel (*Anguilla rostrata*)	Catadromous
Alabama Shad (*Alosa alabamae*)	Anadromous
Skipjack Herring (*Alosa chrysochloris*)	Diadromous
Southeastern Blue Sucker (*Cycleptus meridionalis*)	Diadromous
Alabama Hog Sucker (*Hypentelium etowanum*)	Diadromous
Smallmouth Buffalo (*Ictiobus bubalus*)	Diadromous
Quillback (*Carpiodes cyprinus*)	Diadromous
Highfin Carpsucker (*Carpiodes velifer*)	Diadromous
Spotted Sucker (*Minytrema melanops*)	Diadromous
River Redhorse (*Moxostoma carinatum*)	Diadromous
Black Redhorse (*Moxostoma duquesnei*)	Diadromous
Golden Redhorse (*Moxostoma erythrurum*)	Diadromous
Blacktail Redhorse (*Moxostoma poecilurum*)	Diadromous
Channel Catfish (*Ictalurus punctatus*)	Diadromous
Blue Catfish (*Ictalurus furcatus*)	Diadromous
Flathead Catfish (*Pylodictis olivaris*)	Diadromous
Atlantic Needlefish (*Strongylura marina*)	Diadromous
White Bass (*Morone chrysops*)	Diadromous
Striped Bass (*Morone saxatilis*)	Anadromous
Spotted Bass (*Micropterus punctulatus*)	Diadromous
Largemouth Bass (*Micropterus salmoides*)	Diadromous
Southern Walleye (*Sander vitreus*)	Diadromous
Freshwater Drum (*Aplodinotus grunniens*)	Diadromous
Hogchoker (*Trinectes maculatus*)	Diadromous
Striped Mullet (*Mugil cephalus*)	Diadromous

Source: Mettee et al. 1996

TABLE 5-17 MIGRATORY FISH SPECIES COLLECTED OR BELIEVED TO BE PRESENT DOWNSTREAM OF THURLOW DAM IN THE TALLAPOOSA RIVER

SPECIES	MOVEMENT	COLLECTED IN TALLAPOOSA BY ALABAMA POWER
Alabama Sturgeon (*Scaphirhynchus suttkusi*)	Diadromous	No
Paddlefish (*Polyodon spathula*)	Diadromous	Yes
American Eel (*Anguilla rostrata*)	Catadromous	Yes
Mooneye (*Hiodon tergisus*)	Diadromous	Yes
Alabama Shad (*Alosa alabamae*)	Anadromous	No
Skipjack Herring (*Alosa chrysochloris*)	Diadromous	Yes
"Shoal Chub" (*Machrybopsis sp. cf. M. aestivalis* "A")	*	Yes (as *M. aestivalis)*
"Shoal Chub" (*Machrybopsis sp. cf. M. aestivalis* "B")	*	Yes (as *M. aestivalis)*
Silver Chub (*Macrhybopsis storeriana*)	*	Yes
Southeastern Blue Sucker (*Cycleptus meridionalis*)	Diadromous	Yes
River Redhorse (*Moxostoma carinatum*)	Diadromous	Yes
Shadow bass (*Ambloplites ariommus*)	Diadromous	Yes
Redspotted sunfish (*Lepomis miniatus*)	*	Yes
Crystal Darter (*Crystallaria asprella*)	*	Yes
Freckled Darter (*Percina lenticula*)	*	Yes
Southern Walleye (*Sander vitreus*)	Diadromous	Yes

Source: Alabama Power 2011

*These species may exhibit migratory patterns but reseach has not confirmed; therefore, no movement has been defined.

5.3.1.5 Anadromous Fish

Anadromous fish are species that migrate from the ocean into freshwater environments to spawn. Historically, several species migrated from Gulf Coast waters to inland Alabama rivers to spawn. The Alabama Shad (*Alosa alabamae*), Gulf Sturgeon (*Acipenser oxyrinchus desotoi*), Alabama Sturgeon (*Scaphirhynchus suttkusi*), and Striped Bass (*Morone saxatilis*) are anadromous fish species that are currently or historically known to use portions of the Alabama River during this spawning migration (Mettee et al. 1996). The Striped Bass population present in the drainage (downstream of Harris Reservoir) was produced and is maintained by ADCNR fish stocking. No other species of anadromous fish are known to be present in the Lake Harris Project Area at this time.

5.3.1.6 Catadromous Fish

Catadromous fish are species that live most of their lives in freshwater environments and, upon reaching sexual maturity, migrate to the ocean to spawn. The juvenile offspring of catadromous fish migrate through the ocean to the mouths of rivers and move upstream to various habitats to live until adulthood. The American Eel (*Anguilla rostrata*) is the only catadromous species native to the Tallapoosa River system (Mettee et al. 1996). The American Eel has been observed in the Alabama River and lower portions of the Tallapoosa River system below Thurlow Dam, but its status in the upper river is unknown. No individuals have been collected at the Harris Dam or in the Lake Harris Project Area.

Anadromous, Catadromous, and Diadromous Fish

- ***Anadromous*** fish migrate from saltwater to spawn in freshwater
- ***Catadromous*** fish spawn in saltwater and spend part of their life in freshwater, before migrating back to saltwater to spawn
- ***Diadromous*** fish spend portions of their life in both saltwater and freshwater (includes both anadromous and catadromous fish)

5.3.1.7 Benthic Macroinvertebrate Species Communities

The ADEM sampled the benthic macroinvertebrate community in the Tallapoosa River at Wadley, Alabama, in July 2010, using standardized methodology. Sample results indicated a total of 38 taxa, with 11 of those taxa in the Ephemeroptera (mayfly), Plecoptera (stonefly), or Trichoptera (caddisfly) orders (i.e., Ephemeroptera, Plecoptera, Trichoptera species). Based on metrics that compare sample results to those expected for the region, this sample was assessed a rating of Fair/Poor (ADEM 2010).

The ACFWRU has sampled benthic macroinvertebrate communities since 2005 at the same 6 fish sampling sites (***Figure 5-20***) using a surber sampler. A total of 151 taxa were identified in the 2005 and 2014 samples, 62 of which were from the family Chironomidae. ***Table 5-18*** provides a summary of the benthic macroinvertebrate taxa by class and order. Generally, more individuals and taxa were collected in 2005 samples versus 2014. Differences in species composition between sites and years were variable. At the unregulated sites (Heflin and Hillabee), Plecoptera (stoneflies) made up a larger percentage of insect order composition in comparison with the regulated sites (Malone and Wadley). The unregulated sites appeared to consist of a higher percentage of Ephemeroptera (mayflies) in comparison with the regulated sites (Kleinschmidt 2018a).

TABLE 5-18 NUMBER OF INDIVIDUAL BENTHIC MACROINVERTEBRATES COLLECTED BY TAXON IN 2005 AND 2014

	Heflin		Hillabee		Malone		Wadley	
Taxa	**2005**	**2014**	**2005**	**2014**	**2005**	**2014**	**2005**	**2014**
Arachnida								
Trombidiformes	10		6		16	5	5	2
Bivalvia								
Veneroida	12	3	11	21	72	5	38	12
Clitellata								
Lumbriculida	1	2			37	37	17	16
Tubificida	17	4	12	8	216	28	19	17
Gastropoda								
Basommatophora	16							
Neotaenioglossa	5	27	6	95	1	3	90	14
Insecta								
Coleoptera	14	97	85	170	49	25	15	25
Diptera	331	23	230	87	648	113	109	96
Ephemeroptera	43	9	125	52	111	150	70	228
Megaloptera	1	2	3	1			2	
Odonata	2	1	5			1		1
Plecoptera	55	34	56	59	5		2	4
Trichoptera	53	22	129	19	103	96	56	29
Malacostraca								
Amphipoda					1			
Isopoda					5			
Nematoda	2		4		10		1	1
Turbellaria								
Tricladida					12			2
Total	**562**	**224**	**672**	**512**	**1286**	**463**	**424**	**447**

Source: Kleinschmidt 2018a

Freshwater Unionids

The portion of the Tallapoosa River above Harris Reservoir is the last unimpounded and unregulated habitat in the watershed. Thirty-five mussel species were documented in the Tallapoosa River and its tributaries (***Table 5-19***) (Williams et al. 2008). Only 14 of these species occur or were known to occur above the Fall Line.

Delicate spike

Southern clubshell

Alabama moccasinshell

Source: Moak, J. 2017. Personal communication with Matthew Patterson, United States Fish and Wildlife. Columbia, SC.

TABLE 5-19 MUSSEL SPECIES DOCUMENTED IN THE TALLAPOOSA RIVER AND ASSOCIATED TRIBUTARIES

SPECIES	SPECIES
Amblema plicata	*Pleurobema decisum*
Amphinaias asperata	*Pleurobema perovatum*
Anodontoides radiatus	*Potamilus purpuratus*
Ellipsaria lineolata	*Pyganodon cataracta*
Elliptio arca	*Pyganodon grandis*
Elliptio arctata	*Quadrula apiculata*
Elliptio crassidens	*Quadrula rumphiana*
Fusconaia cerina	*Tritogonia verrucosa*
Hamiota altilis	*Strophitus connasaugaensis*
Lampsilis ornata	*Toxolasma corvunculus*
Lampsilis straminea	*Toxolasma parvum*
Lampsilis teres	*Truncilla donaciformis*
Lasmigona alabamensis	*Uniomerus tetralasmus*
Leptodea fragilis	*Utterbackia imbecillis*
Ligumia recta	*Utterbackia suborbiculata*
Medionidus acutissimus	*Villosa lienosa*
Megalonaias nervosa	*Villosa vibex*
Obliquaria reflexa	

Source: Williams et al. 2008

5.3.1.8 Essential Fish Habitat As Defined Under Magnuson-Stevens Fishery Conservation and Management Act

There are no current records of federally managed fish habitat within the Lake Harris Project Area. However, as required by the 1999 Fish Habitat Conservation Mandate, consultation will be conducted with the National Marine Fisheries Service (NMFS) (NMFS 2010).

5.3.2 SKYLINE

Little information is available relative to fish communities within the Skyline Project Boundary. The small amount of aquatic habitat available on Skyline is comprised primarily of intermittent or first order streams. A study by the Geological Survey of Alabama in nearby Hurricane Creek found fish assemblages dominated by cyprinids, small catastomids, and darters (GSA 2013).

5.3.2.1 Benthic Macroinvertebrates Communities

ADEM sampled the benthic macroinvertebrate community in Little Coon Creek, Alabama, in June 2013, using standardized methodology. The sample site is located approximately 4 miles downstream of the Skyline Project Boundary. Sample results indicated a total of 72 taxa, with 13 of those taxa in the Ephemeroptera (mayfly), Plecoptera (stonefly), or Trichoptera (caddisfly) orders (i.e., EPT species). Based on metrics that compare sample results to those expected for the region, this sample was assessed a rating of Fair (ADEM 2013b).

5.4 WILDLIFE RESOURCES

5.4.1 LAKE HARRIS

Source: Cornell Lab of Ornithology. 2017. All About Birds. Ithaca, NY, [Online] URL: https://www.allaboutbirtds.org/

Wild Turkey

Source: Cornell Lab of Ornithology. 2017. All About Birds. Ithaca, NY, [Online] URL: https://www.allaboutbirtds.org/

Mourning Dove

Source: Cornell Lab of Ornithology. 2017. All About Birds. Ithaca, NY, [Online] URL: https://www.allaboutbirtds.org/

Downy Woodpecker

Harris Reservoir lies within the Northern Piedmont Upland district of the Piedmont Upland Physiographic Section (Section 5.1). Harris Reservoir and surrounding woodland, agricultural, and residential areas provide high quality habit for a variety of upland and semi-aquatic wildlife species. In addition to typical southeastern species, such as gray fox, white-tailed deer, Virginia opossum, and gray squirrel, the area supports species characteristic of the Piedmont region, such as the wood frog and copperhead (Alabama Power 2008a). Birdlife typical of Lake Harris Project Area uplands includes games species such as bobwhite quail, wild turkey, and mourning dove; resident songbirds include downy woodpecker, American robin, eastern bluebird, and eastern meadowlark, and an abundance of neotropical migrants, including numerous warblers, vireos, and hummingbirds (Alabama Power 2008a). A number of raptors are known to occur in the Lake Harris Project Vicinity including osprey, American kestrel, broad-winged and red-tail hawk, bald eagle, and barred, great horned, and screech owls. Typical small mammals of uplands include least shrew, southern flying squirrel, eastern woodrat, and eastern red and big brown bat. Reptiles and amphibians found in the Lake Harris Project Area uplands include American and eastern spadefoot toad; marbled and slimy salamander; green anole and Southern fence lizard; five-lined and broad-headed skink; copperhead, black racer, and gray rat snake; and eastern box turtle (Alabama Power 2008a).

Although limited, Harris Reservoir's littoral zone provides habitat for river otter, mink, muskrat, and beaver, as well as seasonal and year-round habitat for waterfowl and wading birds including mallard, gadwall, wood duck, hooded merganser, great blue heron, green heron, and great egret. Birds such as ring-billed

Source: Alabama Department of Conservation and Natural Resources. 2017. Outdoor Alabama. Montgomery, AL. [Online] URL: http://outdooralabama.com/.

Eastern Woodrat

Source: Alabama Department of Conservation and Natural Resources. 2017. Outdoor Alabama. Montgomery, AL. [Online] URL: http://outdooralabama.com/.

Big Brown Bat

Source: Alabama Department of Conservation and Natural Resources. 2017. Outdoor Alabama. Montgomery, AL. [Online] URL: http://outdooralabama.com/.

American Toad

Source: Alabama Department of Conservation and Natural Resources. 2017. Outdoor Alabama. Montgomery, AL. [Online] URL: http://outdooralabama.com/.

Eastern Box Turtle

gull, osprey, purple martin, and belted kingfisher are also common in areas of open water. Littoral areas provide potential breeding habitat for aquatic and semi-aquatic amphibian species including red-spotted and central newt, Northern red and Northern dusky salamander, bullfrog, spring peeper, and Southern leopard frog (Alabama Power 2008a). Reptile species typical of the littoral zone include cottonmouth and red- and yellow-bellied water snake, Alabama map turtle, river cooter, and red-eared and pond slider. Currently, no invasive wildlife species are being managed within the Lake Harris Project Area.

Representative wildlife species (mammals, birds, amphibians, and reptiles) found in the Lake Harris Project Vicinity, including their common and scientific names, are listed in Tables 1 through 3 in Appendix N. Lists of birds of conservation concern (BCC) are provided in ***Table 5-20***.

As part of the original license, Alabama Power developed a Wildlife Mitigation Plan (Alabama Power 1988) in consultation with ADCNR and USFWS that FERC approved on July 29, 1988. The Wildlife Mitigation Plan outlined specific measures to mitigate for the impacts to wildlife and habitats caused by the development of the Harris Project. The Wildlife Mitigation Plan included provisions for the management of 5,900 acres of existing project lands and acquisition of 779.5 additional acres of land in the vicinity of the Harris Reservoir. In addition, the Wildlife Mitigation Plan included provisions for Alabama Power to purchase and subsequently lease to ADCNR, over 15,000 acres of land in the Skyline Wildlife Management Area. The Wildlife Mitigation Plan required Alabama Power to install wood duck boxes, install osprey nesting platforms, develop and implement a Canada goose restoration project, manage wildlife openings, and create artificial nesting structures. The Wildlife Mitigation Plan resulted in the

development of a Skyline Wildlife Management Plan (WMP) (Alabama Power 1989) to guide the development and maintenance of wildlife habitat, timber management, and recreational access. The WMP was approved by FERC on June 29, 1990.

As part of the management activities, Alabama Power identified 263 acres of suitable wood duck habitat and installed over 100 wood duck boxes. Alabama Power also released Canada geese to establish a population in and around Lake Harris. Additionally, Alabama Power constructed osprey nesting platforms along the reservoir shoreline. Finally, Alabama Power managed forest lands within the Lake Harris Project Area and established 105 acres of permanent openings to provide diverse habitat that benefits both game and nongame species.

Alabama Power conducts annual monitoring and maintenance of 104 wood duck boxes installed around Lake Harris. Maintenance activities include repair and replacement of broken boxes, as well as the relocation of underutilized boxes. Double boxes were installed in higher use areas. Since 2010, an average of 37 wood ducks have been hatched from the wood duck boxes per year. Annual wood duck hatchlings ranged from 28 hatchings in 2011 to 47 hatchlings in 2017. Other wildlife found utilizing the boxes included screech owls, squirrels, and great-crested flycatchers.

Alabama Power installed osprey platforms around Lake Harris. The platforms are constructed of concrete poles with a galvanized steel ring at the top to serve as a nesting platform. Due to construction materials, the platforms require minimal maintenance. While many of the platforms are actively used by osprey, they are not included in a monitoring program.

TABLE 5-20 BIRDS OF CONSERVATION CONCERN FOUND IN THE LAKE HARRIS PROJECT VICINITY

COMMON NAME	SCIENTIFIC NAME	SEASON
American Bittern	*Botaurus lentiginosus*	Wintering
Bachman's Sparrow	*Aimophila aestivalis*	Year-round
Bald Eagle	*Haliaeetus leucocephalus*	Year-round
Blue-winged Warbler	*Vermivora cyanoptera*	Breeding
Brown-headed Nuthatch	*Sitta pusilla*	Year-round
Chuck-will's-widow	*Antrostomus carolinensis*	Breeding
Fox Sparrow	*Passerella iliaca*	Wintering
Kentucky Warbler	*Geothlypis formosa*	Breeding
Le Conte's Sparrow	*Ammodramus leconteii*	Wintering
Least Bittern	*Ixobrychus exilis*	Breeding
Loggerhead Shrike	*Lanius ludovicianus*	Year-round
Louisiana Waterthrush	*Parkesia motacilla*	Breeding
Prairie Warbler	*Setophaga discolor*	Breeding
Prothonotary Warbler	*Protonotaria citrea*	Breeding
Red-headed Woodpecker	*Melanerpes erythrocephalus*	Year-round
Rusty Blackbird	*Euphagus carolinus*	Wintering
Short-eared Owl	*Asio flammeus*	Wintering
Swainson's Warbler	*Limnothlypis swainsonii*	Breeding
Wood Thrush	*Hylocichla mustelina*	Breeding
Worm Eating Warbler	*Helmitheros vermivorum*	Breeding

Source: USFWS 2016a

5.4.2 SKYLINE

As part of the original license, Alabama Power developed a Wildlife Mitigation Plan (Alabama Power 1988) in consultation with ADCNR and USFWS that FERC approved on July 29, 1988. The Wildlife Mitigation Plan outlined specific measures to mitigate for the impacts to wildlife and habitats caused by the development of the Harris Project. The Wildlife Mitigation Plan included provisions for the management of 5,900 acres of existing project lands and acquisition of 779.5 additional acres of land in the vicinity of the Harris Reservoir. In addition, the Wildlife Mitigation Plan included provisions for Alabama Power to purchase and subsequently lease to ADCNR, over 15,000 acres of land in the Skyline Wildlife Management Area. The Wildlife Mitigation Plan required Alabama Power to install wood duck boxes, install osprey nesting platforms, develop and implement a Canada goose restoration project, manage wildlife openings, and create artificial nesting structures. The Wildlife Mitigation Plan resulted in the development of a Skyline Wildlife Management Plan (WMP) (Alabama Power 1989) to guide the development and maintenance of wildlife habitat, timber management, and recreational access. The WMP was approved by FERC on June 29, 1990.

Skyline provides quality habitat for a variety of upland wildlife species. Alabama Power leases Skyline lands to ADCNR and provides funding for the wildlife management activities on Skyline lands. ADCNR is responsible for the management activities (Alabama Power 1988).

Representative wildlife species (mammals, birds, amphibians, and reptiles) found in the Skyline area are listed in Tables 1 through 3 in Appendix N. Lists of BCC are provided in ***Table 5-21***. Currently, invasive wildlife species are not being managed within the Skyline Project Area.

TABLE 5-21 BIRDS OF CONSERVATION CONCERN FOUND IN THE SKYLINE PROJECT VICINITY

COMMON NAME	SCIENTIFIC NAME	SEASON
Bald Eagle	*Haliaeetus leucocephalus*	Year-round
Blue-winged Warbler	*Vermivora cyanoptera*	Breeding
Chuck-will's-widow	*Antrostomus carolinensis*	Breeding
Dickcissel	*Spiza americana*	Breeding
Fox Sparrow	*Passerella iliaca*	Wintering
Kentucky Warbler	*Geothlypis formosus*	Breeding
Least Bittern	*Ixobrychus exilis*	Breeding
Loggerhead Shrike	*Lanius ludovicianus*	Year-round
Louisiana Waterthrush	*Parkesia motacilla*	Breeding
Prairie Warbler	*Setophaga discolor*	Breeding
Prothonotary Warbler	*Protonotaria citrea*	Breeding
Red Crossbill	*Loxia curvirostra*	Year-round
Red-headed Woodpecker	*Melanerpes erythrocephalus*	Year-round
Rusty Blackbird	*Euphagus carolinus*	Wintering
Short-eared Owl	*Asio flammeus*	Wintering
Wood Thrush	*Hylocichla mustelina*	Breeding
Worm Eating Warbler	*Helmitheros vermivorum*	Breeding

Source: USFWS 2016b

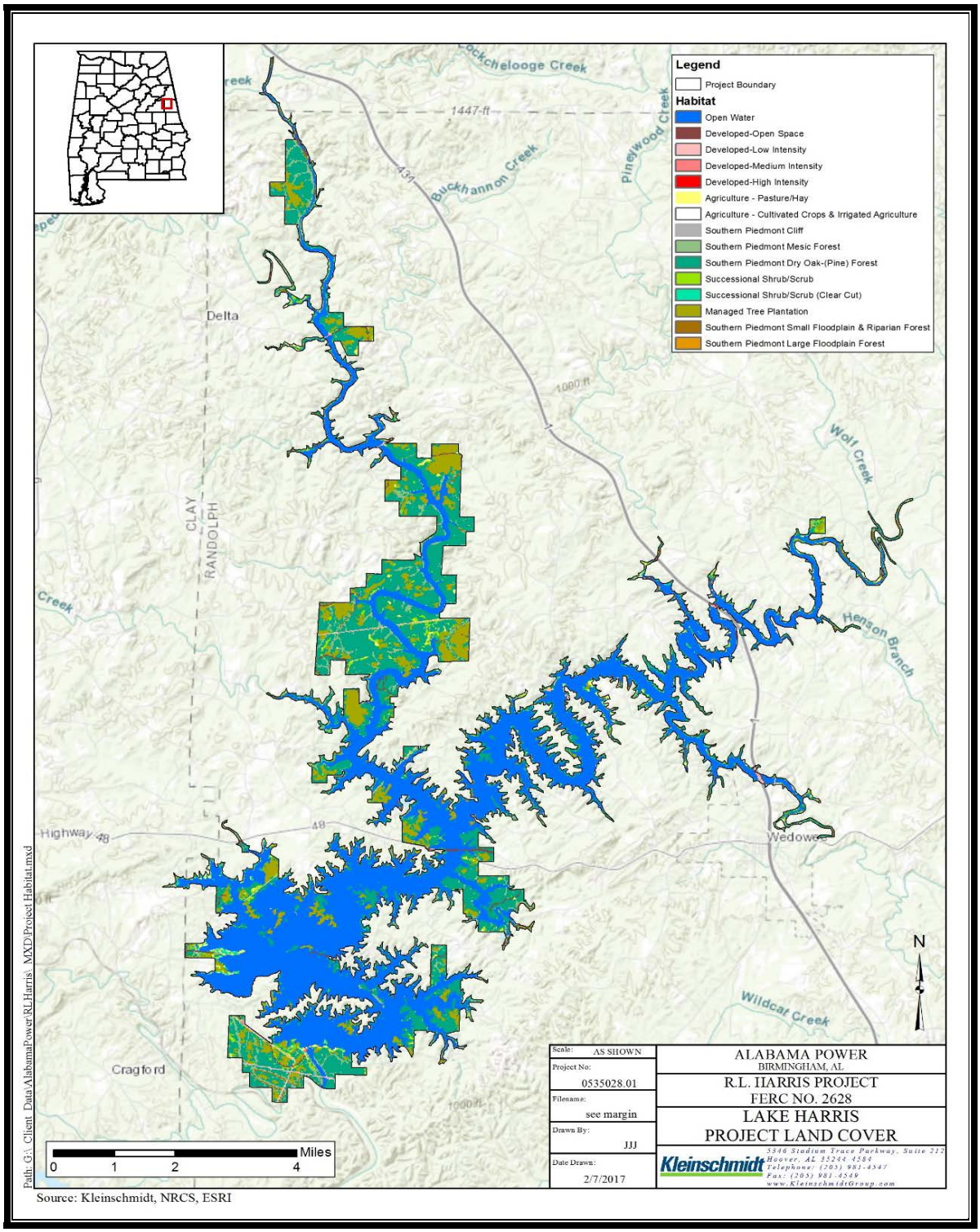
5.5 BOTANICAL RESOURCES

5.5.1 LAKE HARRIS

Harris Reservoir is located predominantly in the Northern Piedmont Upland Region of Alabama. The Lake Harris Project Area is comprised of an impounded portion of the Tallapoosa River and includes mainly open water, deciduous, and evergreen forests with only small areas of agricultural and residential development (***Figure 5-22***). Ecological systems of the United States were classified (described, qualitatively modeled, and mapped) by The Nature Conservancy (TNC) and LandFire using information from NatureServe. This ecological classification system was developed using information from a variety of publications and other classifications along with consultations with many agencies and individuals. ***Table 5-22*** lists the acres and percentage of land cover types based on the NatureServe (2009) ecological systems classification for Lake Harris Project Boundary. Note that acreages in the tables may not match the Lake Harris Project acres due to map inconsistences.

5.5.1.1 Southern Piedmont Dry Oak-(Pine) Forest

The Southern Piedmont Dry Oak forest occurs in upland ridges and mid-slopes and is typically comprised of upland oaks; pines may be a significant component, especially in the southern part of the range. Overstory vegetation commonly found within this forest type includes upland oaks such as white oak (*Quercus alba*), northern red oak (*Quercus rubra*), black oak (*Quercus velutina*), post oak (*Quercus stellata*), scarlet oak (*Quercus coccinea*), and southern red oak (*Quercus falcata*) as well as hickory species such as pignut hickory (*Carya glabra*) and mockernut hickory (*Carya alba*). Other common species include loblolly pine (*Pinus taeda*), shortleaf pine (*Pinus echinata*), Virginia pine (*Pinus virginiana*), red maple (*Acer rubrum*), American sweetgum (*Liquidambar styraciflua*), and tulip tree (*Liriodendron tulipifera*). Generally, there is a well-developed shrub layer, and species vary with soil chemistry. Shrub species may include mountain laurel (*Kalmia latifolia*), common sweetleaf (*Symplocos tinctoria*), flowering dogwood (*Cornus florida*), deerberry (*Vaccinium stamineum*), and farkleberry (*Vaccinium arboretum*). The herb layer is typically sparse (NatureServe 2009).



Source: Kleinschmidt: NRCS, ESRI 2017

FIGURE 5-22 LAKE HARRIS PROJECT LAND COVER

TABLE 5-22 ACRES AND PERCENTAGES OF LAND COVER TYPES IN THE LAKE HARRIS PROJECT BOUNDARY

LAND COVER TYPE	ACRES*	PERCENT OF TOTAL
Open Water	9375.5	48.87
Southern Piedmont Dry Oak-(Pine) Forest	5708.3	29.75
Managed Tree Plantation	1798.2	9.37
Southern Piedmont Mesic Forest	858.3	4.47
Successional Shrub/Scrub	505.7	2.64
Agriculture - Pasture/Hay	232.2	1.21
Developed-Open Space	214.2	1.12
Successional Shrub/Scrub (Clear Cut)	170.3	0.89
Southern Piedmont Small Floodplain and Riparian Forest	163.4	0.85
Developed-Low Intensity	137.2	0.72
Developed-Medium Intensity	9.8	0.05
Southern Piedmont Cliff	6.4	0.03
Agriculture - Cultivated Crops and Irrigated Agriculture	4.2	0.02
Developed-High Intensity	0.67	0.003
Southern Piedmont Large Floodplain Forest	0.67	0.003

Source: NatureServe 2009
*Approximate acreage
Note: There may be a discrepancy in the total number of acres reported as Harris Project acres due to map inconsistencies.

5.5.1.2 Noxious Weeds, Invasive Plants and Mosquito Control

Noxious botanical species occur in Alabama (USDA 2016). Several invasive plants are located in the nearby Lake Martin area and may be located in or near the Lake Harris Project Area, including silk tree, Japanese honeysuckle, kudzu, Chinese privet, giant cut grass (millet), torpedo grass, and golden bamboo (Alabama Power 2008b). Aquatic plant surveys are performed annually via boat. Because hydrilla (*Hydrilla verticillata*) was confirmed to be present upstream of the Harris Project in 2010, the upper reaches of the Tallapoosa River are surveyed more intensely using an airboat and canoe/kayak to monitor the spread of hydrilla. In addition, as part of Alabama Power's vector control program, six mosquito stations are checked monthly from May to November. Any sites requiring larvicide applications are treated on an as needed basis. Typically, only two sites need minimal product each year. Only a couple of vegetation control applications have been made over the last few years. One was for duckweed and the other was for control of various aquatic species in an area that was identified as a highly productive mosquito breeding site near a mosquito monitoring station. Other noxious plants that could potentially occur in the Lake Harris Project Boundary are presented in ***Table 5-23.***

Hydrilla

Source: Alabama Power. United States Department of Agriculture. 2017. Aquatic Species, Hydrilla. Beltsville, MD. [Online] URL: https://www.invasivespeciesinfo.gov/aquatics/hydrilla.shtml.

Hydrilla was introduced into the United States in the 1950s, likely from the aquarium trade. Hydrilla crowds out native species and as a result impedes boating and irrigation. It is fast growing and can reduce the dissolved oxygen available for aquatic organisms and protect mosquito larvae.

Alabama Power distributes information to the public on aquatic invasive species through its Aquatic Plant Management Program and Shorelines website (apcshorelines.com). Many of the species included in the aquatic plant management program are regulated under the Alabama Non-indigenous Aquatic Plant Control Act. Information is provided to help the public with the identification and reporting of invasive species. Some of the species identified by the management program include hydrilla, water lettuce (*Pistia stratiotes*), water hyacinth (*Eichhornia crassipes*), and water milfoil (*Myriophyllum spicatum*) (Alabama Power 2013b, Alabama Power 2015c).

TABLE 5-23 NOXIOUS WEED SPECIES THAT COULD POTENTIALLY OCCUR IN THE LAKE HARRIS PROJECT BOUNDARY

COMMON NAME	SCIENTIFIC NAME	GROWTH PATTERN	HABITAT/INVASIVE CHARACTERISTICS
Garlic mustard	*Alliaria petiolata*	Herb	Forms dense stands that can displace native vegetation. This plant has a high shade tolerance that allows it to invade high-quality woodlands.
Alligatorweed	*Alternanthera philoxeroides*	Emergent or rooted floating plant	Forms thick mats that can displace native vegetation. Occurs in open water.
Silk Tree/Mimosa	*Albizia julibrissin*	Small tree	Aggressive invasive that occurs in a variety of disturbed habitats such as old fields, stream banks, roadsides, right-of-ways, and waste places.
Balloonvine	*Cardiospermum halicacabum*	Emergent or rooted floating plant	Forms dense stands that can crowd out native vegetation. Occurs in wet soils or shallow water and may grow into open water.
Air-potato	*Dioscorea bulbifera*	Vine	Forms dense masses of vines that may cover and kill native vegetation. Occurs in disturbed areas such as forest edges.
Brazilian waterweed	*Egeria densa*	Submerged aquatic plant	Forms thick mats that can displace native vegetation. Occurs in both still and flowing water ecosystems.
Common water hyacinth	*Eichhornia crassipes*	Floating aquatic plant	Forms thick floating mats that can crowd out native vegetation. Occurs in lakes, ponds, rivers, and wetlands.
Mulberryweed	*Fatoua villosa*	Annual herb	Invades wetlands and other moist, shaded areas.
Chinese privet	*Ligustrum sinense*	Shrub/small tree	Forms dense thickets that can shade out native vegetation. Occurs along roadsides, fencerows, fields, rights-of-way, and bottomland forests.
Hydrilla	*Hydrilla verticillata*	Aquatic perennial	Aggressive aquatic invasive that forms thick beds and may displace native submersed vegetation. Able to choke waterways and water supplies.
Brazilian satintail	*Imperata brasiliensis*	Perennial grass	Invades pine and oak-pine communities.
Cogongrass	*Imperata cylindrica*	Perennial grass	Forms a dense monoculture that exhibits allelopathic tendencies and can outcompete native vegetation.
Japanese honeysuckle	*Lonicera japonica*	Vine	Aggressive invasive that mostly occurs in disturbed habitat such as roadsides, fencerows, fields, and rights-of-way.
Japanese climbing fern	*Lygodium japonicum*	Vine	Forms dense masses that that can cover and kill understory vegetation, shrubs, and trees. Invades disturbed areas such as roadside and forest edges but can also invade natural areas.
Old world climbing fern	*Lygodium microphyllum*	Perennial climbing fern	Forms dense masses the can smother native vegetation. Occurs in swamps, glades, and hammocks.
Purple loosestrife	*Lythrum salicaria*	Herb	Forms thick stands that can displace native generation. Occurs in many types of wetlands including wet meadows and river and stream banks.
Japanese stiltgrass	*Microstegium vimineum*	Annual grass	Very shade tolerant, and can displace native vegetation. Occurs in forested floodplains, ditches, forest edges, fields, and trails.

COMMON NAME	SCIENTIFIC NAME	GROWTH PATTERN	HABITAT/INVASIVE CHARACTERISTICS
Parrotfeather	*Myriophyllum aquaticum*	Emergent or rooted floating plant	Forms monocultures that disrupt the growth of native aquatic plants.
Eurasian water-milfoil	*Myriophyllum spicatum*	Rooted floating plant	Forms dense mats that disrupt the growth of native aquatic plants.
Brittleleaf naiad	*Najas minor*	Aquatic annual	Forms dense stands that can cover or clog stream.
Star-of-Bethlehem	*Ornithogalum umbellatum*	Herb	Found along the banks of rivers and streams, in disturbed landscapes, forest edges, floodplain forests, and wet meadows. May displace native plants.
Skunk-vine	*Paederia foetida*	Perennial vine	Forms dense masses that that can cover and kill understory vegetation as well as overstory trees. Occurs in both disturbed and high-quality habitats.
Torpedograss	*Panicum repens*	Perennial grass	Occurs in a wide variety of habitats, but commonly in damp soils.
Mile-a-minute vine	*Persicaria perfoliata*	Annual vine	Forms dense masses that that can cover and kill native vegetation. Occurs in open disturbed areas.
Common reed	*Phragmites australis*	Perennial grass	Forms dense thickets in or near shallow water. Occurs in wetlands and can displace native vegetation, alter hydrology, and block sunlight to aquatic community.
Chamber bitter	*Phyllanthus urinaria*	Herb	Can occur in a variety of disturbed habitats such as dry fields, roadsides, wastelands, and forest edges.
Golden bamboo	*Phyllostachys aurea*	Bamboo	Forms thick stands from underground rhizomes; was widely planted for fishing canes. Occurs in old home sites.
Water lettuce	*Pistia stratiotes L.*	shrub	Forms dense mats that can clog channels and disrupt native vegetation.
Curly-leaved pondweed	*Potamogeton crispus*	Submerged aquatic plant	Occurs in deep, still, or flowing water and can grow in fresh or slightly brackish water.
Kudzu	*Pueraria lobata*	Vine	Aggressive invasive that forms a dense mat of leaves that can cover and kill native vegetation.
Japanese knotweed	*Reynoutria japonica*	Herb	Forms dense thickets that can cover and kill native herbaceous species. It occurs in riparian areas, roadsides, and waste places.
Multiflora rose	*Rosa multiflora*	Perennial shrub	Forms dense thickets that can displace native vegetation. Occurs in pastures, fields, and forest edges.
Water soldier	*Stratiotes aloides L.*	Aquatic perennial	Forms thick, floating mats that crowds out native plant species.
European water chestnut	*Trapa natans*	Rooted, floating herb	Forms thick, floating mats that crowds out native plant species.
Coltsfoot	*Tussilago farfara*	Perennial herb	Forms large colonies that can displace native species. Occurs in moist, open, disturbed areas.

Source: USDA 2016; DPI 2003

5.5.1.3 Vegetation Management Practices

Alabama Power utilizes integrated vegetation management (IVM) to maintain transmission rights-of-way. IVM balances the use of mechanical, chemical, cultural, and biological

treatments to establish and maintain a vegetative cover type that is compatible with the environment (Alabama Power 2010). IVM allows Alabama Power to control tall-growing vegetation while promoting the growth of more compatible low-growing vegetation. This enhances wildlife habitat while not compromising the safety and reliability of the transmission lines. IVM is an approved method by the EPA as well as other relevant federal and state agencies (EPA 2017).

5.5.2 SKYLINE

Skyline is located in Jackson County, in the Cumberland Plateau Region of Alabama. This area is underlain by sandstones along with siltstones, shales, and coal. The landscape consists of flat-topped, high-elevation plateaus separated by deep, steep-sided valleys. The plateaus slope gently from the northeast to the southwest. Most of the area is forested, with Southern Ridge and Valley/Cumberland Dry Calcareous Forest and South-Central Interior Mesophytic Forest types. Each of the predominant forest types is described below. ***Figure 5-23*** shows the land cover types at Skyline and ***Table 5-24*** provides the acres and percentages of land cover types in the Skyline Project Area. Note that acreages in the tables may not match the Skyline Project acres due to map inconsistences.

5.5.2.1 Southern Ridge and Valley / Cumberland Dry Calcareous Forest

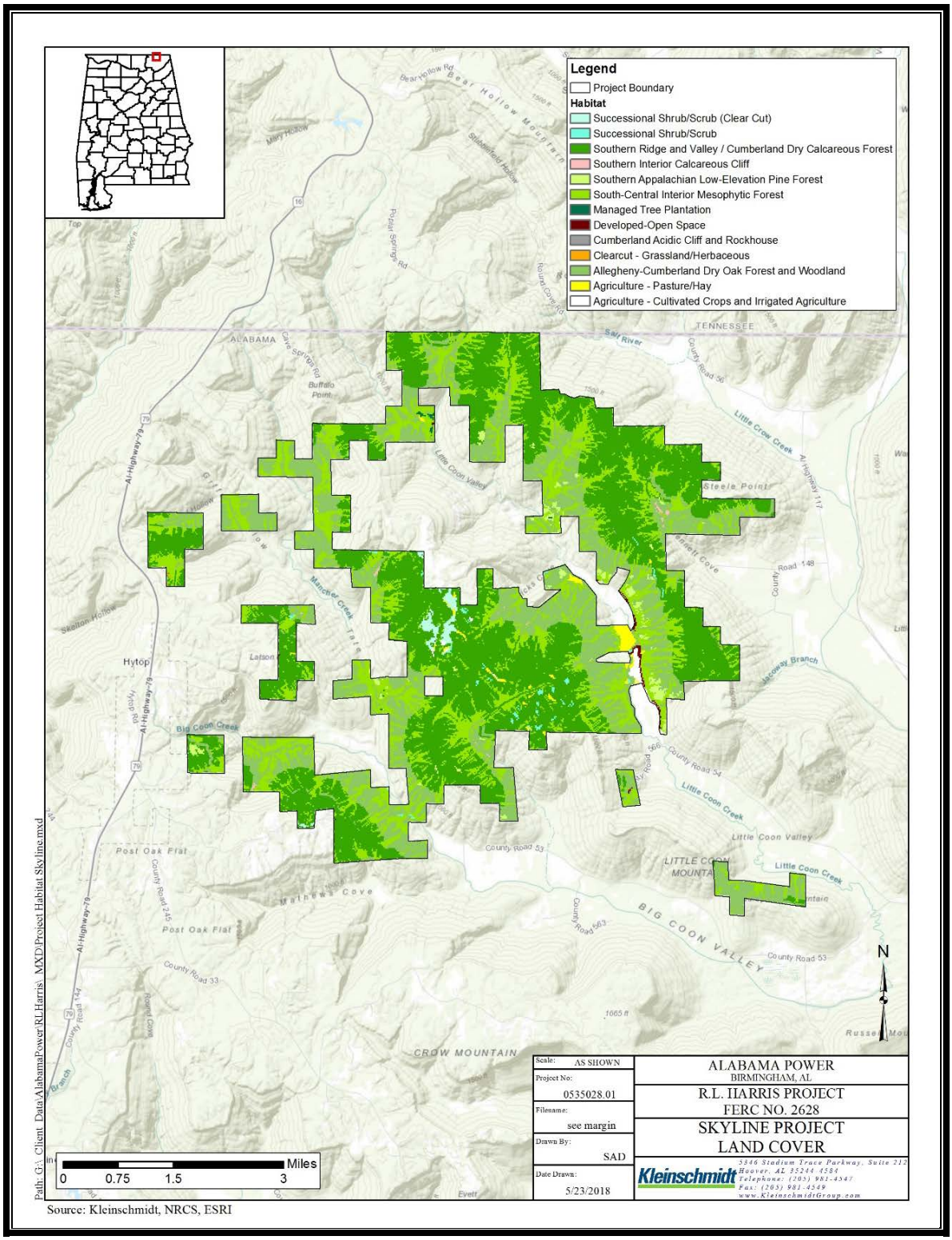
The Southern Ridge and Valley/Cumberland Dry Calcareous forest is comprised of dry-to-dry mesic calcareous forests in a variety of landscape positions, including ridge tops and upper and mid-slopes. They dominate vegetation type under natural conditions. High quality examples are characteristically dominated by white oak, chinkapin oak (*Quercus muehlenbergii*), post oak, and Shumard's oak (*Quercus shumardii*), with varying amounts of hickory, sugar maple (*Acer saccharum*), southern sugar maple, chalk maple (*Acer leucoderme*), red maple, and other species. This system also includes successional communities resulting from logging or agriculture and are dominated by tulip tree, pine, eastern red cedar (*Juniperus virginiana*), and black locust (*Robinia pseudoacacia*) (NatureServe 2009).

5.5.2.2 South-Central Interior Mesophytic Forest

The South-Central Interior Mesophytic forest is primarily deciduous forests that typically occur in deep, enriched soils in protected landscape settings such as covers or lower slopes. This forest is generally highly diverse and is dominated by sugar maple, American beech, tulip tree, American basswood (*Tilia americana*), northern red oak, cucumber tree (*Magnolia acuminata*), and eastern black walnut (*Juglans nigra*). Eastern hemlock (*Tsuga canadensis*) may be present in some stands. Common shrubs include coralberry (*Symphoricarpos orbiculatus*), bladdernut (*Staphylea trifolia*), bursting-heart, and flowering dogwood. The herb layer is often very plentiful and may include licorice bedstraw (*Galium circaezans*), black cohosh (*Actaea racemosa*), southern lady fern (*Athyrium filix-femina ssp. asplenioides*), and crownbeard (*Verbesina alternifolia*).

5.5.2.3 Allegheny-Cumberland Dry Oak Forest and Woodland

The Allegheny-Cumberland Dry Oak forest and woodland consists of dry hardwood forests found in nutrient-poor or acidic substrates on plateaus or ridges. Typical dominants include white oak, southern red oak, chestnut oak (*Quercus prinus*), scarlet oak, with lesser amounts of red maple, pignut hickory, and mockernut hickory. Shortleaf pine (*Pinus echinata*) and/or Virginia pine may occur in smaller amounts, particularly adjacent to steep cliffs or slopes or in area impacted by fire. White pine (*Pinus strobus*) may be prominent in some stands in the absence of fire. American chestnut (*Castanea dentata*) saplings may be found where it was once a common tree. The shrub layer may include lowbush blueberry (*Vaccinium angustifolium*), bear huckleberry (*Gaylussacia ursina*), deerberry (*Vaccinium stamineum*), hillside blueberry (*Vaccinium pallidum),* oakleaf hydrangea (*Hydrangea quercifolia*), and mapleleaf viburnum (*Viburnum acerifolium*). Common herbs include Boott's sedge (*Carex picta*), black seed speargrass (*Piptochaetium avenaceum*), nakedflower tick trefoil (*Desmodium nudiflorum*), longleaf woodoats (*Chasmanthium sessiliflorum*), and dwarf violet iris (*Iris verna var. smalliana*).



Source: Kleinschmidt, NRCS, ESRI 2017

FIGURE 5-23 SKYLINE PROJECT LAND COVER

TABLE 5-24 ACRES AND PERCENTAGES OF LAND COVER TYPES IN THE SKYLINE PROJECT BOUNDARY

LAND COVER TYPE	ACRES*	PERCENT OF TOTAL
Southern Ridge and Valley/Cumberland Dry Calcareous Forest	6745.0	44.8
South-Central Interior Mesophytic Forest	3938.7	26.1
Allegheny-Cumberland Dry Oak Forest and Woodland	1798.2	9.4
Southern Appalachian Low-Elevation Pine Forest	145.4	0.1
Agriculture - Pasture/Hay	106.6	2.6
Successional Shrub/Scrub (Clear Cut)	95.7	0.6
Successional Shrub/Scrub	55.3	0.4
Agriculture - Cultivated Crops and Irrigated Agriculture	36.6	0.2
Developed-Open Space	27.1	0.2
Southern Interior Calcareous Cliff	15.1	0.1
Managed Tree Plantation	9.1	0.1
Cumberland Acidic Cliff and Rockhouse	3.1	0.02
Clearcut - Grassland/Herbaceous	1.6	0.02

Source: NatureServe 2009

*Approximate acreage

Note: There may be a discrepancy in the total number of acres reported as Skyline Project acres due to map inconsistencies.

5.6 RIPARIAN, WETLAND, AND LITTORAL HABITAT

5.6.1 LAKE HARRIS

5.6.1.1 Wetlands

Alabama Power contracted Cahaba Consulting, LLC (Cahaba Consulting) to conduct a study of potential wetland areas located in the Lake Harris Project Boundary (Appendix O). According to the USACE, identification of wetlands is based on a three-factor approach involving indicators of hydrophytic vegetation, wetland hydrology, and hydric soil. Jurisdictional wetlands were mapped in the winter of 2012 and spring of 2013, and wetland quality was assessed and assigned a "good", "moderate", or "poor" rating based on the following criteria:

- Coverage/Continuity of Lacustrine fringe segment;
- Plant species diversity;
- Shoreline stability;
- Topography;
- Location;
- Wildlife usage;
- Presence or absence of development.

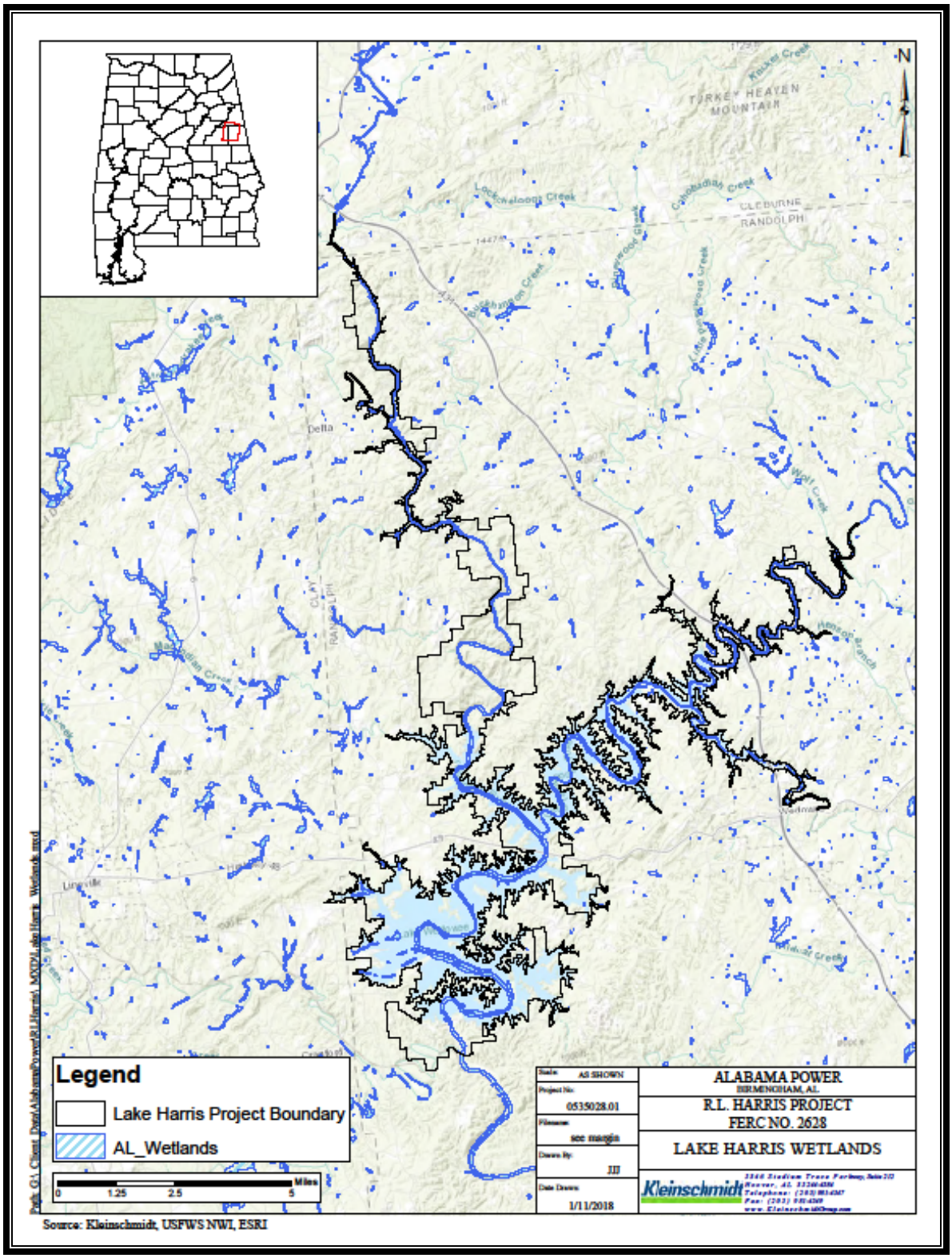
Source: Cahaba Consulting. 2017. Harris Wetlands. Birmingham, Alabama.

Small Forested Wetland

The following describes the quality assessment criteria assigned by Cahaba Consulting:

1 **Poor Quality Wetland**
   A wetland that consists primarily of a single species of noxious or invasive vegetated plants/stems in an emergent shallow water condition
2 **Moderate Quality Wetland**
   A wetland that consists of noxious or invasive vegetation where there is a minimum of two additional hydrophytic plant species present
3 **Good Quality Wetland**
   A wetland of native hydrophytic vegetation that consists typically of three or more species; generally, high quality wetlands would include two layers of strata (i.e., herbaceous, scrub shrub, forested). Noxious or invasive species may be present but are not dominant within the evaluated wetland area (Cahaba Consulting 2016).

Cahaba Consulting identified three types of wetlands along the Harris Reservoir shoreline, including riverine wetlands, emergent/lacustrine fringe wetlands, and alluvial forested or scrub-shrub wetlands. ***Figure 5-24*** illustrates the National Wetlands Inventory (NWI) summary map of wetlands around Lake Harris. Detailed maps of delineated wetlands are provided in Appendix O.



Source: Kleinschmidt, USFWS NWI, ESRI 2018

FIGURE 5-24 LAKE HARRIS WETLANDS

Source: Cahaba Consulting. 2017.

Forested and Emergent Wetland

Riverine Wetlands

Riverine wetlands are associated with the floodplains and riparian corridors of streams and rivers. In the Lake Harris Project Boundary, the riverine wetlands occur where perennial streams flow into the reservoir. Primary hydrological inputs include overbank flow from the stream or river or groundwater connections between the stream channel and wetland. Other hydrological sources may include overland flow from neighboring uplands, tributary inflow, or precipitation. Riverine wetlands are typically associated with first order streams; however, perennial flow is not required for a riverine classification (Cahaba Consulting 2016).

Emergent/Lacustrine Fringe

Emergent/lacustrine fringe wetlands are located along the edge of a large water body. The water surface elevation of the emergent/lacustrine fringe wetlands are determined by the adjacent body of water. Usually, the emergent/lacustrine fringe wetlands are located in topographic depressions or flat shorelines. True fringe wetlands lack trees, shrubs, or persistent emergents with more than 30 percent areal coverage and extend from the shoreward boundary of the system to a depth of 6.6 feet below low water or to the maximum extent of non-persistent emergents. The emergent/lacustrine fringe wetlands occur within the Lake Harris Project Boundary.

Source: Cahaba Consulting. 2017.

Forested Wetland with Emergent Lacustrine Fringe

Alluvial Forested, Scrub-Shrub Wetlands

Alluvial forested, scrub-shrub wetlands are part of the palustrine system, dominated by trees, shrubs, and persistent emergent vegetation. Typically, in the Lake Harris Project Boundary, these wetlands are found in areas where perennial or intermittent streams flow into the reservoir. As sediment and other organic debris accumulate, land mass is formed, which allows

for the formation of these wetlands. These areas are at or near the surface elevation of the reservoir (Cahaba Consulting 2016).

One hundred eighty-nine wetlands were identified and mapped in the Lake Harris Project Boundary. Included in this area are 11.35 miles (14.89 acres) that were characterized as wetland habitat (***Table 5-25***). Most wetlands rated as moderate to good quality. The report did not identify specific vegetation in each wetland. However, common wetland emergent species include: three-way sedge (*Dulichium arundinaceum*), Barratt's sedge (*Carex barrattii*), longhair sedge (*Carex comosa*), cypressknee sedge (*Carex decomposita*), taperleaf water horehound (*Lycopus rubellus*), needle beaksedge (*Rhynchospora capillacea*), smallfruit spikerush (*Eleocharis microcarpa*), cattail (*Typha* spp.), lesser creeping rush (*Juncus repen*), rice cutgrass (*Leersia oryzoides*), fowl mannagrass (*Glyceria striata*), and reed canary grass (*Phalaris arundinacea*). Common wetland shrubs include common buttonbush (*Cephalanthus occidentalis*) and black willow (*Salix nigra*). Overstory species may include oak species (*Quercus* spp.), American sycamore (*Platanus occidentalis*), green ash (*Fraxinus pennsylvanica*), silver maple (*Acer saccharinum*), tupelo species (*Nyssa* spp.), sweetgum (*Liquidambar styraciflua*), and red maple (*Acer rubrum*) (NatureServe 2009).

TABLE 5-25 ACRES, LINEAR FEET, AND QUALITY OF WETLAND TYPES AT HARRIS RESERVOIR

QUALITY	LACUSTRINE/LITTORAL ON SHORELINE		SHORELINE AND ALLUVIAL WETLANDS
	LINEAR FEET	MILES	WETLAND ACRES
Poor	5268	1.00	2.16
Moderate	24,258	4.59	3.45
Good	30,430	5.76	9.28
Total	**59,956**	**11.35**	**14.89**

Source: Cahaba Consulting 2016

5.6.1.2 Riparian and Littoral Habitat

Riparian habitat is the vegetated zone that serves as a buffer between the upland vegetation community and the riverine environment. This zone provides streambank stability and sediment filtration. Based on the ecological systems classification developed by NatureServe (2009), much of the riparian areas for the streams within the Lake Harris Project Boundary are classified as Southern Piedmont Small Floodplain and Riparian Forest (Section 5.5.1). This habitat type is often dominated by tulip tree (*Liriodendron tulipifera*), American sweetgum, and red maple along with representative alluvial and bottomland species such as American sycamore (*Platanus occidentalis*), river birch (*Betula nigra*), box elder (*Acer negundo*), sugarberry (*Celtis laevigata*), green ash (*Fraxinus pennsylvanica*), swamp chestnut oak

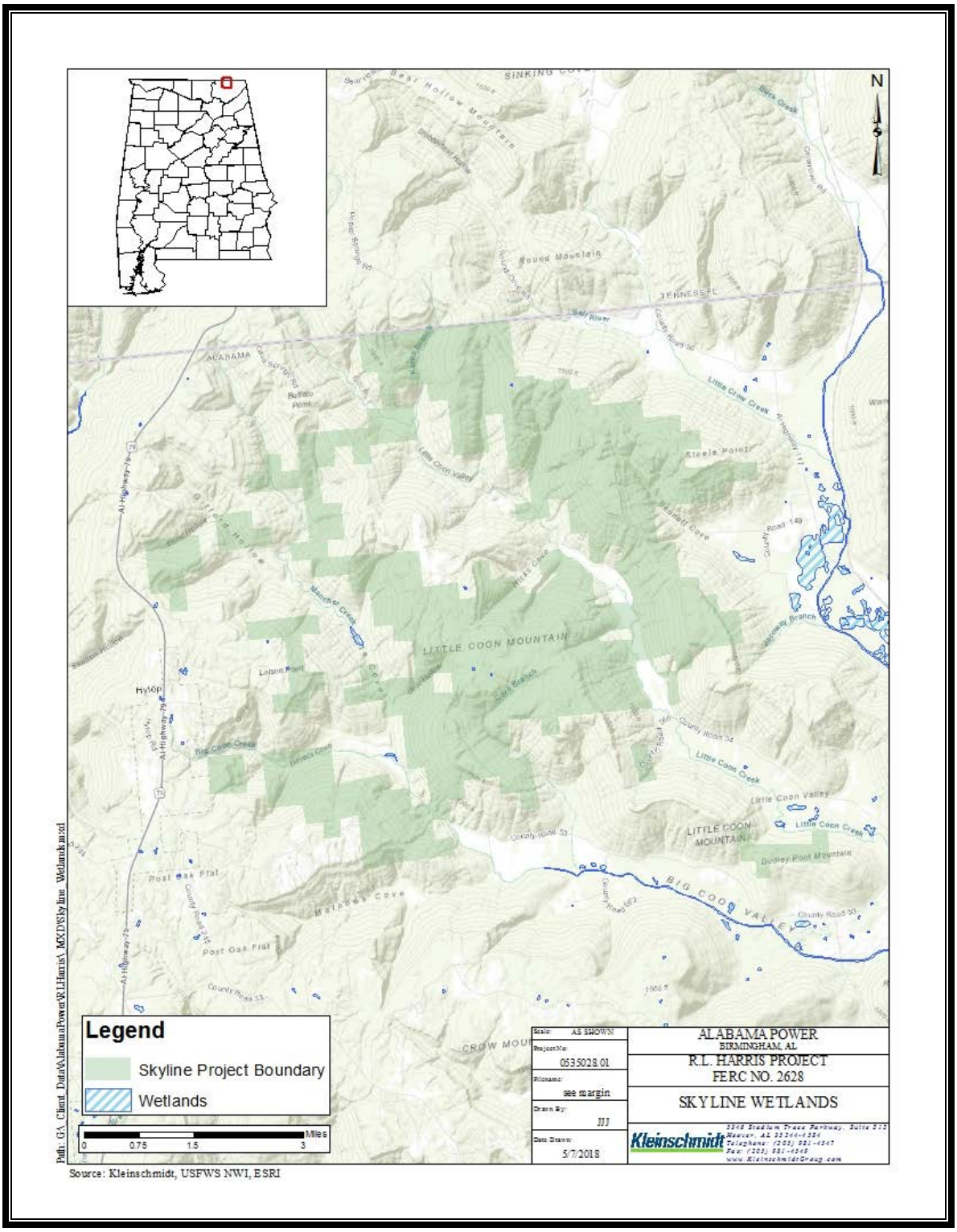
(*Quercus michauxii*), and cherrybark oak (*Quercus pagoda*). American beech (*Fagus grandifolia*) may be present in drier areas. Loblolly pine (*Pinus taeda*), Virginia pine (*Pinus virginiana*), American sweetgum, and tulip tree are dominant in successional areas (Appendix P). The shrub layer is typically dominated by mountain laurel (*Kalmia latifolia*), American witch-hazel (*Hamamelis virginiana*), possumhaw (*Ilex decidua*), spicebush (*Lindera benzoin*), and yaupon holly (*Ilex vomitoria*). Wandflower (*Galax urceolata*), jack-in-the-pulpit (*Arisaema triphyllum*), sensitive fern (*Onoclea sensibilis*), and fringed sedge (*Carex crinita*) may be dominant in the herb layer (NatureServe 2009).

5.6.2 SKYLINE

5.6.2.1 Wetlands

Alabama Power contracted Cahaba Consulting to conduct a study of potential wetland areas and streams located in the Skyline Project Boundary. According to the USACE, identification of wetlands is based on a three-factor approach involving indicators of hydrophytic vegetation, wetland hydrology, and hydric soil. Cahaba Consulting completed the desktop study utilizing the best available stream and wetland information to identify and quantify jurisdictional wetlands in 2018. Sources included the USFWS NWI, USGS Quadrangle Topographic Maps, and U.S. Department of Agriculture (USDA) Web Soil Survey (Cahaba Consulting 2018).

Results of the desktop assessment found it unlikely that large areas of wetlands occur in Skyline Project Boundary due to steep terrain and smaller floodplains. The NWI data shows no wetlands and only a few freshwater ponds within Skyline. Forty-nine streams were identified within Skyline, totaling approximately 237,425 linear feet or 44.97 miles. Stream classifications are varied and include perennial, intermittent, and ephemeral streams. In general, the streams are typical medium steep gradient streams with minimal narrow flood plains. These streams are comprised of cobble, bolder, and bed rock substrate. The intermittent (seasonal) streams on site are primarily first and second order tributaries to larger perennial streams and generally are not as steep. It appears that many of the streams in the upper reaches would be considered ephemeral, transitioning into intermittent until they converge with the larger perennial streams. The perennial streams are flat with relatively wide floodplains; however, only a few of these exist within the Project. The perennial streams are considered receiving waters to the upper tributaries (Cahaba Consulting 2018). ***Figure 5-25*** illustrates a summary of NWI wetlands at Skyline. Detailed NWI maps are provided in Appendix O.



Source: Kleinschmidt, USFWS NWI, ESRI 2018

FIGURE 5-25 SKYLINE WETLANDS

5.6.2.2 Riparian and Littoral Habitat

Cahaba Consulting described the stream riparian zone as consisting of primarily mature forest vegetation. Riparian habitat is the vegetated zone that serves as a buffer between the upland vegetation community and the riverine environment. This zone provides streambank stability and sediment filtration. Based on the ecological systems classification developed by NatureServe (2009), much of the riparian areas for the streams within the Skyline Project Boundary are classified as Allegheny-Cumberland Dry Oak Forest and Woodland, South-Central Interior Mesophytic Forest, and Southern Ridge and Valley/Cumberland Dry Calcareous Forest (Section 5.5.1). The Southern Ridge and Valley is dominated by white oak, chinkapin oak (*Quercus muehlenbergii*), post oak, and Shumard's oak (*Quercus shumardii*), with varying amounts of hickory, sugar maple (*Acer saccharum*), southern sugar maple, chalk maple (*Acer leucoderme*), red maple, and other species. The South-Central Interior is dominated by sugar maple, American beech, tulip tree, American basswood (*Tilia americana*), northern red oak, cucumber tree (*Magnolia acuminata*), and eastern black walnut (*Juglans nigra*). The Allegheny-Cumberland is dominated by white oak, southern red oak, chestnut oak (*Quercus prinus*), scarlet oak, with lesser amounts of red maple, pignut hickory and mockernut hickory (NatureServe 2009).

5.7 RARE, THREATENED, ENDANGERED AND SPECIAL STATUS WILDLIFE SPECIES

5.7.1 LAKE HARRIS

The Information Planning and Conservation (IPaC) Trust Resources Report is an online tool developed by USFWS. This tool is used to generate lists of species that should be considered for projects occurring within a geographic area. The IPaC was used to develop an unofficial federal species list for the Lake Harris Project Vicinity (***Table 5-26***).

Special Protection for RTE Species

Rare, threatened and endangered (RTE) species are afforded special protection under the Endangered Species Act. During relicensing, FERC must consider impacts to RTE species from continued operation of the Project.

TABLE 5-26 FEDERALLY THREATENED AND ENDANGERED WILDLIFE SPECIES THAT POTENTIALLY OCCUR IN THE LAKE HARRIS PROJECT VICINITY

SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS[1]
Birds		
Picoides borealis	Red-cockaded woodpecker	E
Mussels		
Hamiota (=Lampsilis) altilis	Finelined pocketbook	T
Mammals		
Myotis sodalis	Indiana bat	E
Myotis septentrionalis	Northern long-eared bat	T

Source: USFWS 2016a
[1]Note: E = Endangered, T = Threatened

5.7.1.1 Red-Cockaded Woodpecker

The red-cockaded woodpecker is a federally listed endangered species that potentially occurs in Clay and Randolph counties (USFWS 2016e). This woodpecker requires open pine woodlands and savannahs with large old pines for nesting and roosting habitat. Large old pines, preferably longleaf pine, are required as cavity trees. The excavated cavities within inactive heartwood are free of resin, which can entrap the birds (USFWS 2016e). Consequently, the resin that comes out of the tree (from outer vascular tissue) after excavation may provide protection for woodpeckers against climbing snakes or other predators. The cavity trees are located in open stands with little or no hardwood mid-story and few or no over-story

hardwoods. The woodpeckers require abundant native bunchgrass and groundcovers suitable for foraging within their habitat (USFWS 2016e).

Source: Alabama Department of Conservation and Natural Resources. 2017. Outdoor Alabama. Montgomery, AL. [Online] URL: http://outdooralabama.com/.

Red-Cockaded Woodpecker

The USFWS has both a Recovery Plan (USFWS 2003) and a Five-year Review (USFWS 2006) for the red-cockaded woodpecker. Alabama Power implements a recovery management plan for red-cockaded woodpeckers at the Coosa River Project - Mitchell development in Coosa and Chilton counties, Alabama. The Mitchell development lands provide habitat for the largest red-cockaded woodpecker population on a single private holding in Alabama (Bailey 2003). There are no published reports of red-cockaded woodpeckers occurring within the Lake Harris Project Boundary.

5.7.1.2 Finelined Pocketbook Mussel

The finelined pocketbook mussel is a threatened mussel found in Clay County. The finelined pocketbook is a suboval shaped mussel that has a maximum length of approximately 3⅜ inches (Mirarchi et al. 2004). This mussel lives in large to small streams in habitats above the fall line having stable sand/gravel/cobble substrates and moderate to swift currents. Historically, this mussel was found in the Alabama, Tombigbee, Black Warrior, Cahaba, Tallapoosa, and Coosa Rivers, and their tributaries (USFWS 2004). Regarding reproduction, the finelined pocketbook mussel releases glochidia as a super-conglutinate from March through June, and confirmed host species include blackspotted topminnow, redeye bass, spotted bass, largemouth bass, and green sunfish (Mirarchi et al. 2004). Reasons for the decline and status of the species include habitat modification, sedimentation, eutrophication, and water quality degradation (USFWS 2000).

The Nature Conservancy. 2017. 2014 Highlights. Arlington, VA. [Online] URL: http://www.nature.org/ourinitiatives/regions/northamerica/unitedstates/georgia/georgia-2014-year-end-slideshow.xml.

Finelined Pocketbook

The USFWS has both a Recovery Plan (USFWS 2000) and a Five-Year Review (USFWS 2008) for the finelined pocketbook. Critical habitat was designated for this species in 2004 (USFWS 2004). The Lake Harris Project Area does not encompass critical habitat areas identified by the USFWS (USFWS 2004); no populations were identified within the Lake Harris Project Boundary.

5.7.1.3 Indiana Bat

The USFWS listed the Indiana bat as an endangered species in 1976. Habitat conducive to the Indiana bat is located in the northern and eastern portions of Alabama. This species hibernates in caves, mostly in tight clusters. In the summer, females form small maternity colonies in tree hollows and behind loose bark. A single pup is born in June or early July and weaned in 25-35 days. The diet of this species includes small, soft-bodied insects, including moths, flies, and beetles (Mirarchi 2004). The Indiana bat is vulnerable to extinction due to habitat loss and white nose syndrome.

Source: Alabama Department of Conservation and Natural Resources. 2017. Outdoor Alabama. Montgomery, AL. [Online] URL: http://outdooralabama.com/

Indiana Bat

The USFWS has a 2007 Draft Recovery Plan (USFWS 2007b) for the Indiana bat, as well as a 1977 final correction and augmentation of critical habitat (USFWS 1977). While the Harris Project falls within the range of the Indiana bat, there have been no reports of overwintering or summer roosting occurrences within the Lake Harris Project Boundary.

Source: Alabama Department of Conservation and Natural Resources. 2017. Outdoor Alabama. Montgomery, AL. [Online] URL: http://outdooralabama.com/

Northern Long-eared Bat

5.7.1.4 Northern Long-eared Bat

The USFWS listed the northern long-eared bat as threatened on April 2, 2015, with a final rule published in the Federal Register on January 14, 2016. On April 27, 2016, the USFWS determined that the designation of critical habitat for the species was not prudent; therefore, critical habitat has not been established for the northern long-eared bat (USFWS 2016f). The northern long-eared bat may be found statewide; however, there is only low occurrence, if at all, in southwestern region of Alabama (Mirarchi 2004). The northern long-eared bat feeds on invertebrates and is known to glean prey from vegetation and water surfaces. The northern long-eared bat winters in groups in underground caves and cave like structures, but in the summers, it roosts singularly or in small colonies in cavities, under bark, or in hollows of live and dead trees typically greater than 3 inches in diameter. Suitable roosting trees possess exfoliating bark, cavities, or cracks

(USFWS 2016f). The northern long-eared bat has a single pup born in late spring or early summer with the offspring weaned approximately one month after birth (Mirarchi 2004).

The USFWS does not have a Recovery Plan, Five-Year Review, or designated critical habitat for the northern long-eared bat at this time. While the Lake Harris Project Boundary falls within the range of the northern long-eared bat, there have been no reports of overwintering or summer roosting occurrences within the Lake Harris Project Boundary.

5.7.2 SKYLINE

The IPaC Trust Resources Report was used to develop an unofficial federal species list for the Skyline Project Vicinity (USFWS 2016b, USFWS 2016f). A list of federally threatened and/or endangered species potentially occurring in Jackson County is included in ***Table 5-27***.

TABLE 5-27 FEDERALLY THREATENED AND ENDANGERED WILDLIFE SPECIES IN JACKSON COUNTY, ALABAMA THAT POTENTIALLY OCCUR IN THE SKYLINE VICINITY

SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS[1]
Mussels		
Lampsilis virescens	Alabama lampmussel	E
Villosa trabalis	Cumberland bean (pearlymussel)	E
Fusconaia cuneolus	Fine-rayed pigtoe	E
Toxolasma cylindrellus	Pale lilliput (pearlymussel)	E
Quadrula cylindrica	Rabbitsfoot	T
Fusconaia cor	Shiny pigtoe	E
Epioblasma triquetra	Snuffbox mussel	E
Pleuronaia dolabelloides	Slabside pearlymussel	E
Mammals		
Myotis sodalis	Indiana bat	E
Myotis septentrionalis	Northern long-eared bat	T
Myotis grisescens	Gray bat	E

Source: USFWS 2016a, 2016b
[1]Note: E = Endangered, T = Threatened, and C = Candidate species

5.7.2.1 Alabama Lampmussel

The Alabama lampmussel was listed as endangered in 1976 (Mirarchi et al. 2004) and is found in shoals in small to medium rivers (Parmalee and Bogan 1998). The Alabama lampmussel is endemic to the Tennessee River system and historically occurred from its headwaters downstream to Muscle Shoals (Ortmann 1925, Parmalee and Bogan 1998). Now, it is only known to occur in upper reaches of the Paint Rock River system, Jackson County, Alabama (Ahlstedt 1995). The Alabama lampmussel has a moderately thin shell with a maximum length of 2 ¾ inches, elliptical to long ovate in outline, and somewhat inflated. Although unknown, this species is thought to be a long-term brooder (Mirarchi et al. 2004). This species is imperiled due to severely restricted distribution, rarity, and vulnerability to habitat degradation (Mirarchi et al. 2004).

Source: Alabama Department of Conservation and Natural Resources. 2017. Outdoor Alabama. Montgomery, AL. [Online] URL: http://outdooralabama.com/.

Alabama Lampmussel

The USFWS has both a Recovery Plan (USFWS 1985) and Five-Year Review (USFWS 2012) for the Alabama lampmussel. There are no published reports of Alabama lampmussel occurrences within the Project Boundary at Skyline.

5.7.2.2 Cumberland Bean

The USFWS listed the Cumberland bean as endangered in 1976 (USFWS 2016c). This species can be found in swift riffles of small rivers and streams with gravel or mixture of sand and gravel substrate (Parmalee and Bogan 1998). This species is endemic to the upper Cumberland River system in Kentucky and the Tennessee River system from headwaters downstream to Muscle Shoals, Alabama. The Cumberland bean has not been reported in Alabama since impoundment of the Tennessee River (Parmalee and Bogan 1998). This species has a solid, elongated shell with a maximum length of 2 1/8 inches. Females grow slightly larger than males (Mirarchi et al. 2004). The Cumberland bean uses fish hosts to distribute glochidia. These hosts include barcheek, fantail, Johnny, rainbow, snub-nose, dirty, striped, and stripetail darters (Parmalee and Bogan 1998). Fragmentation is the leading cause of the decline for this species. Limited distribution and rarity make it vulnerable to extinction (Mirarchi et al. 2004).

Source: Alabama Department of Conservation and Natural Resources. 2017. Outdoor Alabama. Montgomery, AL. [Online] URL: http://outdooralabama.com/.

Cumberland Bean

The USFWS has both a Recovery Plan (USFWS 1984a) and Five-Year Review (USFWS 2010) for the Cumberland bean. There are no published reports of Cumberland bean occurrences within the Project Boundary at Skyline.

5.7.2.3 Fine-rayed Pigtoe Mussel

ARKive. 2017. Fine-rayed pigtoe. Washington, DC. [Online] URL: http://www.arkive.org/

Fine-rayed Pigtoe

The USFWS listed the fine-rayed pigtoe mussel as endangered in 1976. This species lives in the shoal habitat of medium to large rivers. Typically, the fine-rayed pigtoe lives in stable, mixed substrate, with particle sizes ranging from sand to cobble (Neves 1991). Endemic to the Tennessee River system, this species historically occurred from the Virginia headwaters, downstream to Muscle Shoals, Alabama, and in some tributaries (Parmalee and Bogan 1998). This species was extirpated from Tennessee River proper (Garner and McGregor 2001). A population in Paint Rock River, Jackson County, Alabama (Ahlstedt 1995), appears to be the only one extant in Alabama. The fine-rayed pigtoe mussel shell is solid, somewhat inflated, with a maximum length of 3 1/8 inches, subtriangular to rhomboidal in outline (Mirarchi 2004). This species is a short-term brooder, spawning in May, with females gravid until late July (Ortmann 1925, Bruenderman and Neves 1993). This mussel distributes glochidia; hosts include river chub, central stoneroller, fathead minnow, mottled sculpin, and whitetail, white, telescope, and Tennessee shiners (Bruenderman and Neves 1993). Decline in this species is attributed to limited distribution, specialized habitat requirements, and declining population (Mirarchi et al. 2004).

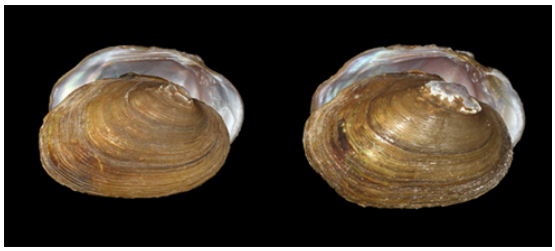
Source: California Academy of Sciences. 2017. iNaturalist.org. [Online] URL: https://www.inaturalist.org/

Fine-rayed Pigtoe

The USFWS has both a Recovery Plan (USFWS 1984b) and Five-Year Review (USFWS 2013a) for the fine-rayed pigtoe. There are no published reports of fine-rayed pigtoe occurrences within the Project Boundary at Skyline.

5.7.2.4 Pale Lilliput Mussel

The USFWS listed the pale lilliput mussel as endangered in 1976. This species is found in large creeks and small rivers, typically in gravel and in moderate current (Parmalee and Bogan 1998). This species was thought to be eliminated, except in Paint Rock River system, Jackson County, Alabama, where it is rare (Ahlstedt 1995). The shell is moderately solid with a maximum length of 1 3/8 inches, elongate and elliptical in outline, and inflated in some older species (Mirarchi et al. 2004). It is said to be a long-term brooder; however, the host is unknown (Mirarchi et al. 2004). The pale lilliput mussel is vulnerable to extinction due to extremely limited distribution, rarity, and susceptibility to habitat degradation (Mirarchi et al. 2004).



Source: Alabama Department of Conservation and Natural Resources. 2017. Outdoor Alabama. Montgomery, AL. [Online] URL: http://outdooralabama.com/.

Pale Lilliput

The USFWS has both a Recovery Plan and a Five-Year Review for the pale lilliput (USFWS 1984c, USFWS 2011). There are no published reports of pale lilliput occurrences within the Project Boundary at Skyline.

5.7.2.5 Rabbitsfoot Mussel

The USFWS listed the rabbitsfoot mussel as threatened in 2013 (USFWS 2015). The rabbitsfoot mussel is found in creeks and small rivers along margins of riffles and runs. In lotic reaches of larger rivers, this species may be found at depths greater than 19 ¾ feet, as well as upon marginal shelves in shallower waters (Mirarchi et al. 2004). In Alabama, extant populations are known to exist only in the Paint Rock River system, Jackson County, Alabama (Ahlstedt 1995), and a short reach of Bear Creek, Colbert County (Mirarchi et al. 2004). This species has a solid shell with a maximum length of 4 ¾ inches, elongated and rhomboidal to rectangular in outline. The rabbitsfoot mussel is a short-term brooder. Widespread distribution reductions, rarity, and declining population trends make it vulnerable to extirpation (Mirarchi et al. 2004).

Sources: U.S. Fish and Wildlife Service. 2017. Endangered Species. Bloomington, MN. [Online] URL: https://www.fws.gov/midwest/endangered/index.html

Rabbitsfoot

The USFWS designated critical habitat for the rabbitsfoot in 2015 (USFWS 2015). There are no published reports of rabbitsfoot occurrences within the Project Boundary at Skyline.

5.7.2.6 Shiny Pigtoe Mussel

The USFWS listed the shiny pigtoe mussel as endangered in 1976 (Mirarchi et al. 2004). The shiny pigtoe mussel lives in shoal and riffle habitat of medium to large rivers. Endemic to the Tennessee River system, this mussel historically occurred from the headwaters downstream to Muscle Shoals, Alabama, and in some of its large tributaries (Parmalee and Bogan 1998). Although this mussel was extirpated from the Tennessee River proper (Garner and McGregor 2001), it still occurs in several tributaries, including Paint Rock River, Jackson County, Alabama (Ahlstedt 1995). The shiny pigtoe mussel has a solid and somewhat inflated shell with a maximum length of 3 1/8 inches, subtriangular in outline, with anterior margin broadly rounded and somewhat obliquely truncate above, and posterior margin nearly straight but obliquely angled; doral and ventral margins nearly straight (Mirarchi et al. 2004). This species is a short-term brooder, spawning from late May to early June and gravid from mid-May to mid-July (Ortmann 1921; Kitchel 1985). Glochidia use fish in the family Cyprinidae (including telescope, warpaint, and common shiners) as hosts (Kitchel 1985). This species is imperiled due to restricted distribution, specialized habitat requirements, and declining population trends (Mirarchi et al. 2004).

Sources: U.S. Fish and Wildlife Service. 2017. Endangered Species. Bloomington, MN. [Online] URL: https://www.fws.gov/midwest/endangered/index.html

Shiny Pigtoe

The USFWS has both a 1984 Recovery Plan (USFWS 1984b) and a Five-Year Review (USFWS 2013a) for the shiny pigtoe. There are no published reports of shiny pigtoe occurrences within the Project Boundary at Skyline.

White, Daniel. 2017. Wade into the Watery World of Imperiled Freshwater Mussels. Nature Conservancy, Charlottesville, Virginia. [Online] URL: http://www.nature.org/ourinitiatives/regions/northamerica/unitedstates/virginia/explore/mussels-count-clinch-powell-clean-rivers-initiative.xml.

Snuffbox

5.7.2.7 Snuffbox Mussel

The USFWS listed the snuffbox mussel as endangered in 2012. It is found in large creeks to large rivers, generally in gravel and sand substrate in shoal and riffle habitats. Individual mussels often are completely buried or with only their posterior slopes exposed (Parmalee and Bogan 1998). In Alabama, the snuffbox mussel once occurred in the Tennessee River and several of its tributaries. However, the snuffbox mussel is assumed to persist only in Paint Rock River system, Jackson County (Mirarchi et al. 2004). The snuffbox mussel is a long-term brooder with

gravid females observed from September to May, with glochidial discharge in late May (Ortmann 1919). Hosts include logperch, Roanoke darter, and banded and black sculpins (Yeager and Saylor 1995). Long-term survival of this species is questionable; distribution-wide decline makes the snuffbox mussel vulnerable to extirpation (Mirarchi et al. 2004).

The snuffbox mussel does not have a Recovery Plan, Five-Year Review, or designated critical habitat at this time. There are no published reports of snuffbox mussel occurrences within the Project Boundary at Skyline.

5.7.2.8 Slabside Pearlymussel

Source: USFWS. 2005. [Online] URL: http://digitalmedia.fws.gov/FullRes/natdiglib/191_1_01_TN0830.JPG

Slabside Pearlymussel

The USFWS listed the slabside pearlymussel as endangered with designated critical habitat in 2013 (USFWS 2016d). The slabside pearlymussel historically occurred in Alabama in the Tennessee River and several of its tributaries. This species subtriangular in shape, reaches an average length of 3.5 inches, and has dense, moderately inflated valves and a white nacre. This species typically inhabits large creeks and rivers in shallow riffles comprised of sand, gravel, and cobble substrates with moderate current. The slabside pearlymussel is a short-term, summer brooder that is known to use several species in the shiner family as glochidial hosts (USFWS 2013b). The U.S. Department of Interior designated 13 critical habitat units encompassing approximately 970 miles of stream channel in Alabama, Mississippi, Tennessee, and Virginia for the slabside pearlymussel. In Jackson County, the designated critical habitat includes the Paint Rock River, Larkin Fork, Estill Fork, and Hurricane Creek.

There are no published reports of slabside pearlymussel occurrences within the Project Boundary at Skyline.

5.7.2.9 Indiana Bat

Listing and life-history information for the Indiana bat are discussed in Section 5.7.1.3. While Skyline falls within the range of the Indiana bat, there have been no reports of overwintering or summer roosting occurrences within the Project Boundary at Skyline.

5.7.2.10 Northern Long-eared Bat

Listing and life history information for the Northern long-eared bat are discussed in Section 5.7.1.4. While Skyline falls within the range of the northern long-eared bat, there have been no reports of overwintering or summer roosting occurrences within the Project Boundary at Skyline.

5.7.2.11 Gray Bat

The gray bat was listed as endangered on April 28, 1976. The gray bat is distinguished from other bats by the uni-colored fur on its back. This species molts in the summer, when its dark gray fur turns to a chestnut brown (USFWS 1997). This species can be found in caves year-round, using them both in the summer roosting and winter hibernating periods. Typically, these caves are scattered along rivers or lakes where the gray bat can feed on flying aquatic and terrestrial insects (USFWS 1997). Breeding takes place in the fall, with a single pup born in late May or early June (Mirarchi 2004, USFWS 1997).

Source: Alabama Department of Conservation and Natural Resources. 2017. Outdoor Alabama. Montgomery, AL. [Online] URL: http://outdooralabama.com/.

Gray Bat

The USFWS has both a Recovery Plan (USFWS 1982) and Five-Year Review (USFWS 2009) for the gray bat. While Skyline falls within the range of the gray bat, there have been no reports of overwintering or summer roosting occurrences within the Project Boundary at Skyline.

5.8 FEDERALLY THREATENED AND ENDANGERED BOTANICAL SPECIES

5.8.1 LAKE HARRIS

Currently, twenty-five Alabama plant species are listed as threatened or endangered by the USFWS (Davenport and Oberholster 2015). An unofficial federal species list generated using the IPaC Trust Resources Report tool provided a list of federally threatened and/or endangered species in Alabama. The list indicates there are two threatened botanical species potentially occurring in the Lake Harris Project Vicinity: the little amphianthus (*Amphianthus pusillus*) and the white fringeless orchid (*Platanthera integrilabia*).

5.8.1.1 Little Amphianthus

Source: University of Texas at Austin. 2017. Lady Bird Johnson Wildflower Center. Austin, TX. [Online] URL: http://www.wildflower.org/.

Little Amphianthus

The little amphianthus was listed as threatened in 1988 under the ESA. Historically, this species is known from 57 sites in Georgia, Alabama, and South Carolina. In Alabama, limited populations occur in Randolph (two sites) and Chambers (one site) counties. This species is a small, aquatic annual herb with floating and submerged leaves. The tiny white to pale purple flowers are found among both the floating and submerged leaves. An ephemeral species, the entire life cycle of this plant may be completed within three to four weeks in the spring. This species has a very specific habitat that is restricted to vernal pools on granite outcrops in the southeastern Piedmont. Optimal habitat has been described as a shallow, flat-bottomed pool with a rock rim (NatureServe 2015a). In 1993, the USFWS prepared a recovery plan (USFWS 1993b) which identified threats to the species including: quarrying activities; conversion of habitat to pasture for farm animals; dumping of waste material; vehicular traffic including off-road vehicles, motorbikes, automobiles, and logging equipment; recreation impacts including foot traffic, littering, or vandalism; and, insufficient regulations. Little amphianthus will be considered for delisting when 20 viable, geographically separate populations (at least two in Alabama) have been permanently protected. A population is considered viable when it has the reproductive fitness to maintain itself. To protect the species, the recovery plan suggests that the little amphianthus population in Alabama should be monitored yearly by noting approximate number, vigor, and areal extent, as well as any negative developments that occur such increasing competition and dumping. Additional protective measures include:

- protecting the publicly owned populations;
- safeguarding plants on private property through agreements with private landowners or land acquisition;

- preserving the genetic integrity and conducting germination experiments;
- monitoring existing populations to determine trends and increasing threats;
- searching for undocumented populations;
- reestablishing or enhancing populations at protected sites;
- using management techniques to maintain or enhance existing populations;
- and educating the public about the species and its habitat (USFWS 1993a).

A five-year review conducted in 2007 by the USFWS concluded that the population of little amphianthus is declining (USFWS 2007a). Surveys found that 44 of the 65 original populations are still known to be intact. Since the recovery plan has been implemented, sixteen (25 percent) of the populations have been extirpated, and four populations have become tremendously degraded, and are at risk of being extirpated (USFWS 2007a). There are no published reports of little amphianthus occurrences within the Lake Harris Project Boundary.

5.8.1.2 White Fringeless Orchid

The white fringeless orchid was listed as threatened under the ESA in September of 2016 (USFWS 2016). There has been one extant[15] population identified in Clay County in Talladega National Forest. This species is a slender, erect, perennial herb that grows in colonies. The fragrant, white flowers grow in a loose, round to elongated, terminal clusters with 6 to 15 flowers in each cluster. The stem is light green, smooth, and can grow up to 23.6 inches. The orchid blooms from late July to early September with fruits maturing in October. *Platanthera integrilabia* typically occurs in wet, flat, or boggy areas with acidic muck or sand. This plant prefers partially shaded areas at the head of streams or seepage slopes. Common associated species include *Sphagnum* spp., *Osmunda cinnamonea*, *Woodwardia areolata*, and *Thelyptris novaboracensis* (NatureServe 2015b). The primary threat to this species is the destruction and alteration of its habitat including excessive shading, soil disturbance, altered hydrology, and the spread of invasive species. Other threats include unauthorized collection for recreational or commercial purposes, herbivory, and small population sizes (Federal Register 2016). A recovery plan has not been completed for this species. There are no published reports of white fringeless orchid occurrences within the Lake Harris Project Boundary.

Source: Thomas G. Barnes, hosted by the USDA-NRCS PLANTS Database.

White Fringeless Orchid

[15] An extant population is still surviving; not extinct.

5.8.2 SKYLINE

Currently, twenty-five Alabama plant species are listed as threatened or endangered by the USFWS (Davenport and Oberholster 2015). The IPaC Trust Resources Report tool indicates there is one threatened botanical species potentially occurring in the Skyline Project Vicinity: the white fringeless orchid (*Platanthera integrilabia*).

5.8.2.1 White Fringeless Orchid (Platanthera integrilabia)

Listing and life history information for this species are discussed in Section 5.8.1.2. There are no published reports of white fringeless orchid occurrences within the Project Boundary at Skyline.

5.8.3 BOTANICAL SPECIES OF SPECIAL CONCERN

5.8.3.1 Lake Harris

In addition to federal threatened and endangered species, there are currently 25 botanical species of special concern that occur in Clay, Cleburne and/or Randolph counties and could potentially occur in the Lake Harris Project Vicinity (ALNHP 2013; ***Table 5-28***). There are no reported occurrences of these species within the Lake Harris Project Boundary.

TABLE 5-28 FEDERALLY LISTED BOTANICAL SPECIES OF SPECIAL CONCERN POTENTIALLY OCCURRING IN THE LAKE HARRIS PROJECT VICINITY

SCIENTIFIC NAME	COMMON NAME	GROWTH PATTERN	COUNTY OF OCCURRENCE
Chelone obliqua var. obliqua	Red turtlehead	Perennial herb	Randolph
Clethra acuminata	Mountain pepper-bush	Shrub	Clay
Didymoglossum petersii	Dwarf filmy-fern	Perennial herb	Cleburne
Geum lobatum	Lobed barren strawberry	Perennial herb	Randolph
Helianthus porteri	Confederate daisy	Perennial herb	Randolph
Heuchera longiflora	Long-flower alumroot	Perennial herb	Clay
Hymenocallis coronaria	Shoals spider-lily	Perennial herb	Randolph
Hypericum lloydii	Lloyd's St. John's-wort	Matted shrub	Randolph
Isoetes virginica	Piedmont quillwort	Perennial graminoid	Randolph, Cleburne
Jamesianthus alabamensis	Jamesianthus	Perennial herb	Cleburne
Juncus georgianus	Georgia rush	Perennial herb	Randolph
Lathyrus venosus	Smooth veiny peavine	Vine	Clay
Parnassia asarifolia	Kidneyleaf grass-of-parnassus	Perennial herb	Clay, Cleburne
Phacelia dubia var. georgiana	Outcrop small-flower phacelia	Annual herb	Randolph
Plantanthera integrilabia	White fringeless orchid	Perennial herb	Cleburne
Platanthera lacera	Green-fringed orchid	Perennial herb	Cleburne
Platanthera peramoena	Purple fringeless orchid	Perennial herb	Clay
Pycnanthemum curvipes	Mountain mint	Perennial herb	Randolph
Pyrularia pubera	Buffalo-nut	Perennial herb	Cleburne
Rhododendron cumberlandense	Cumberland azalea	Shrub	Clay
Sabatia capitata	Rose gentian	Annual herb	Clay, Cleburne
Salix humilis	Tall prairie willow	Perennial shrub	Clay, Cleburne
Stachys eplingii	Epling's hedgenettle	Perennial herb	Clay
Symphyotrichum georgianum	Georgia aster	Perennial herb	Clay
Trillium rugelii	Southern nodding trillium	Perennial herb	Clay

Source: ALNHP 2013; NatureServe 2016

5.8.3.2 Skyline

In addition to federal threatened and endangered species, there are currently 84 botanical species of special concern that occur in Jackson County and could potentially occur in the Skyline Project Vicinity (ALNHP 2013; ***Table 5-29***). There are no reported occurrences of these species within the Project Boundary at Skyline.

TABLE 5-29 FEDERALLY LISTED BOTANICAL SPECIES OF SPECIAL CONCERN POTENTIALLY OCCURRING IN THE SKYLINE PROJECT VICINITY

SCIENTIFIC NAME	COMMON NAME	GROWTH PATTERN
Allium speculae	Little River Canyon onion	Perennial herb
Allium tricoccum	Wild leek	Perennial herb
Aralia racemosa	American spikenard	Perennial herb
Asclepias exaltata	Poke milkweed	Perennial herb
Asplenium abscissum	Cutleaf spleenwort	Perennial herb
Asplenium bradleyi	Bradley's spleenwort	Perennial herb
Asplenium ruta-muraria	Wall rue spleenwort	Perennial herb
Asplenium scolopendrium var. americanum	American Hart’s-tongue fern	Perennial herb
Asplenium trichomanes	Maidenhair spleenwort	Perennial herb
Bigelowia nuttallii	Nuttall's rayless goldenrod	Perennial herb
Blephilia subnuda	Smooth blephilia	Perennial herb
Carex austrocaroliniana	South Carolina sedge	Perennial graminoid
Carex decomposita	Cypress-knee sedge	Perennial graminoid
Carex eburnea	Ebony sedge	Perennial graminoid
Carex purpurifera	Purple sedge	Perennial graminoid
Castilleja coccinea	Scarlet Indian paintbrush	Annual herb
Chelone lyonii	Pink turtlehead	Perennial herb
Cololejeunea ornata	Liverwort	Nonvascular
Comandra umbellata	Bastard toad-flax	Perennial herb
Corallorhiza wisteriana	Spring coralroot	Perennial herb
Coreopsis pulchra	Woodland tickseed	Perennial herb
Cotinus obovatus	American smoke-tree	Perennial shrub
Cuscuta harperi	Harper's dodder	Annual vine
Cystopteris tennesseensis	Tennessee bladderfern	Perennial herb
Diarrhena americana	American beakgrain	Perennial graminoid
Dicentra cucullaria	Dutchman's breeches	Perennial herb
Diervilla rivularis	Mountain bush-honeysuckle	Shrub
Didymoglossum petersii	Dwarf filmy-fern	Perennial herb
Diphasiastrum tristachyum	Deep-root clubmoss	Perennial herb
Enemion biternatum	False rue-anemone	Perennial herb
Equisetum arvense	Field horsetail	Perennial herb
Eurybia surculosa	Creeping aster	Perennial herb
Fothergilla major	Mountain witch-alder	Shrub
Frullania riparia	Liverwort	Nonvascular
Geum virginianum	Pale avens	Perennial herb

SCIENTIFIC NAME	COMMON NAME	GROWTH PATTERN
Helianthus glaucophyllus	White-leaved sunflower	Perennial herb
Helianthus longifolius	Longleaf sunflower	Perennial herb
Hydrastis canadensis	Golden seal	Perennial herb
Hydrophyllum appendiculatum	Appendage waterleaf	Biennial herb
Isotria verticillata	Large whorled pogonia	Perennial herb
Jeffersonia diphylla	Twinleaf	Perennial herb
Juglans cinerea	Butternut	Tree
Lilium canadense	Canada lily	Perennial herb
Lilium superbum	Turk's-cap lily	Perennial herb
Liparis liliifolia	Lily-leaved twayblade	Perennial herb
Mitella diphylla	Miterwort	Perennial herb
Monarda clinopodia	Basil bee-balm	Perennial herb
Muhlenbergia sobolifera	Cliff muhly	Perennial graminoid
Neviusia alabamensis	Alabama snow-wreath	Shrub
Orobanche uniflora	One-flowered broomrape	Annual herb
Osmunda claytoniana	Interrupted fern	Perennial herb
Oxalis grandis	Giant wood-sorrel	Annual herb
Parnassia asarifolia	Kidneyleaf grass-of-parnassus	Perennial herb
Polygala senega var. latifolia	Seneca snakeroot	Perennial herb
Polymnia laevigata	Tennessee leafcup	Perennial herb
Prosartes maculata	Spotted mandarin	Perennial herb
Rhododendron cumberlandense	Cumberland azalea	Shrub
Rhododendron minus	Carolina rhododendron	Shrub
Ribes curvatum	Granite gooseberry	Shrub
Ribes cynosbati	Prickly gooseberry	Shrub
Salix humilis	Tall prairie willow	Perennial shrub
Sarracenia oreophila	Green pitcher-plant	Perennial herb
Schistidium alpicola	Rock moss	Nonvascular
Schoenolirion croceum	Yellow sunnybell	Perennial herb
Silene rotundifolia	Roundleaf catchfly	Perennial herb
Silphium brachiatum	Cumberland rosinweed	Perennial herb
Silphium mohrii	Mohr's rosinweed	Perennial herb
Stewartia malacodendron	Silky camellia	Shrub/tree
Stewartia ovata	Mountain camellia	Shrub/tree
Stylophorum diphyllum	Celandine poppy	Perennial herb
Synandra hispidula	Guyandotte beauty	Perennial herb
Tradescantia ernestiana	Ernest’s spiderwort	Perennial herb
Trillium flexipes	Nodding trillium	Perennial herb

SCIENTIFIC NAME	COMMON NAME	GROWTH PATTERN
Trillium grandiflorum	Large-flowered trillium	Perennial herb
Trillium lancifolium	Narrow-leaved trillium	Perennial herb
Trillium pusillum var. 1	Alabama least trillium	Perennial herb
Trillium sessile	Toadshade	Perennial herb
Trillium sulcatum	Southern red trillium	Perennial herb
Triosteum angustifolium	Yellowleaf tinker's-weed	Perennial herb
Valeriana pauciflora	Valerian	Perennial herb
Viburnum bracteatum	Limerock arrowwood	Shrub
Veratrum parviflorum	Small-flowered false Hellebore	Perennial herb
Viola canadensis	Canada violet	Perennial herb

Source: ALNHP 2013; NatureServe 2016

5.9 RECREATION

5.9.1 LAKE HARRIS

The Lake Harris Project Area provides both reservoir and riverine recreation opportunities. Harris Reservoir is located on the upper Tallapoosa River and provides reservoir-based and shoreline recreational opportunities. The Lake Harris Project Boundary extends upstream on the Tallapoosa River, providing additional riverine boating and fishing opportunities.

5.9.1.1 Recreation Facilities and Opportunities in the Project Vicinity

Reservoirs along the Tallapoosa River downstream of Harris Reservoir include Martin, Yates, and Thurlow reservoirs. Reservoirs located to the west of the Lake Harris along the Coosa River include Weiss, Neely Henry, Logan Martin, Lay, Mitchell, and Jordan. West Point Lake is located approximately 30 miles southeast of Harris Reservoir. These reservoirs provide a variety of public recreational amenities and access, including boating, fishing, picnicking, and camping opportunities.

Source: Alabama Power Company (Alabama Power). 2016. Recreation. Alabama Power Company, Birmingham, AL.

Recreation on Lake Harris

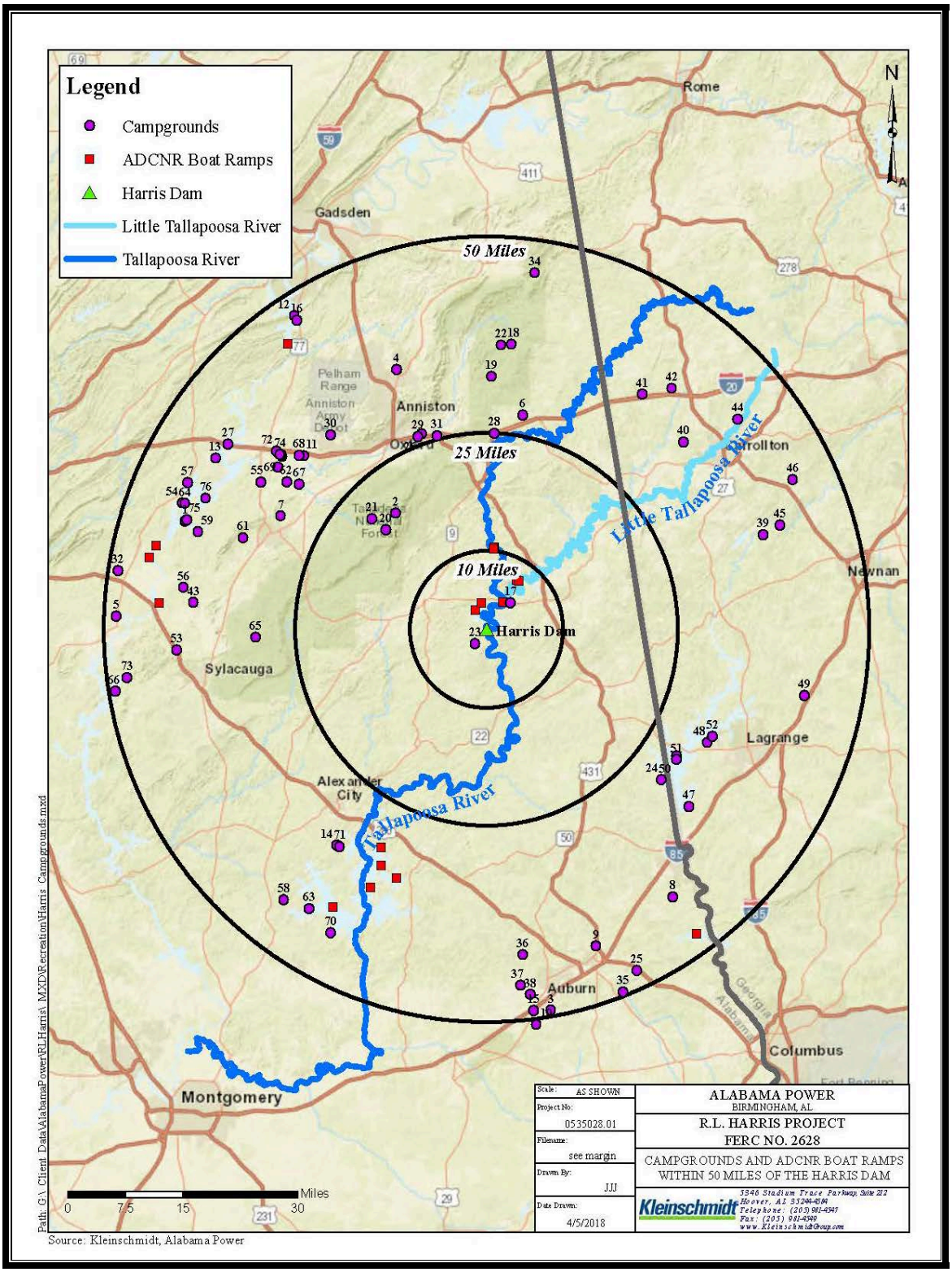
A variety of public recreation facilities and opportunities are available within an approximate 50-mile radius of Lake Harris, including state parks, campgrounds, wilderness areas, and state forests. Over 70 recreational vehicle (RV) parks and campgrounds are within 50 miles of Lake Harris (Reserve America 2017); two campgrounds are within 10 miles, six campgrounds are within 10 to 25 miles, and 65 campgrounds are within 25 to 50 miles (***Figure 5-26)***. Several of the campgrounds did not identify the specific number of RV or camp sites; however, of those campgrounds that did identify the number of sites available, there are over 3,700 RV sites and over 550 campsites. Most campgrounds are to the west and northwest of the Harris Project near the city of Talladega, Alabama, and near the Talladega National Forest. Additionally, campgrounds are located near the city of Auburn, Alabama, Lake Martin, and West Point Lake. Fifteen ADCNR-managed boat launches are located within 50 miles of the Harris Project (ADCNR 2016c).

The Talladega National Forest and Cheaha State Park are both located to the northwest of Harris Reservoir. The Talladega National Forest encompasses approximately 392,567 acres at the southern edge of the Appalachian Mountains and includes the 7,245-acre Cheaha

Wilderness Preserve. Recreational opportunities within the Forest include hiking, off-road vehicle (ORV), and mountain biking trails, campgrounds, scenic viewing, and hunting opportunities (U.S. Forest Service 2016). The 2,799-acre Cheaha State Park, located on the top of Cheaha Mountain, features the highest point in Alabama and provides hiking and ORV trails, a day use area, cabins and lodge, campgrounds, and a restaurant (Alabama State Parks 2016).

The Alabama Scenic River Trail, a designated National Recreation Trail, portions of which extend along the Coosa River, is located approximately 70 miles south of the Harris Project (National Recreation Trails 2017). The Tallapoosa River connects to the Alabama Scenic River Trail; however, since it was added as an expansion to the Alabama Scenic River Trail system, the approximately 200-mile Tallapoosa River segment is not an officially designated National Recreation Trail. The Tallapoosa River provides both riverine and reservoir flatwater boating opportunities (Alabama Newscenter 2014). The riverway extends from upstream of Lake Harris and downstream through the riverine reach past Horseshoe Bend National Military Park. It then reaches Lake Martin and ultimately extends below Yates and Thurlow dams through the downstream reaches to the confluence of the Tallapoosa River with the Coosa River. This is where it joins the Alabama Scenic River Trail (Alabama Scenic River Trail 2017). Portage access is available around the Harris, Martin, Yates, and Thurlow Project dams, including the 0.45-mile-long portage near Harris Dam. All the portages, including the one near Harris Dam, are managed by the Alabama Scenic River Trail.

The Horseshoe Bend National Military Park, managed by the National Park Service (NPS) and located downstream approximately 20 miles (approximately 40 river miles) from Harris Dam, preserves the site of the Battle of the Creek War (1813-1814). The Horseshoe Bend National Military Park is comprised of approximately 2,040 acres of mixed hardwood forest and extends approximately 3.5 miles along the Tallapoosa River. The Park includes a 3-mile long tour road along the edge of the battlefield, a 2.8-mile-long hiking trail, two picnic areas, a visitor center, and a boat launch area. Recreational opportunities include hiking, boating, fishing (at the boat ramp area only), nature study, and historic/cultural interpretive exhibits and activities at the visitor center (NPS 2017a). Annual recreation visitation in 2016 at the Horseshoe Bend National Military Park was 83,370 recreation visitors, with the greatest use occurring during the month of March (NPS 2017b).



Source: Kleinschmidt, Alabama Power 2018

FIGURE 5-26 CAMPGROUNDS AND ADCNR BOAT RAMPS WITHIN 50 MILES OF HARRIS DAM

TABLE 5-30 RV PARKS AND CAMPGROUNDS WITHIN 50 MILES OF LAKE HARRIS

Number on Map	Facility Name	Town	Distance (miles)	Ownership	RV Camping	Tent Camping	Primitive Camping
1	Clear Creek Harbor	Talladega	25-50	Commercial	Available	Available	
2	Cheaha State Park (Talladega National Forest)	Delta	10-25	State	72	Available	Available
3	Chewacla State Park	Auburn	25-50	State	36		10
4	Michael Tucker Park & Campground	Anniston	25-50	Commercial			16
5	Yellowleaf Campground	Harpersville	25-50	Commercial	Available		
6	Cane Creek RV Park & Campground	Heflin	25-50	Commercial	39		5
7	Top Trails OHV Park	Talladega	25-50	Commercial	50		Available
8	B&B RV Park	Valley	25-50	Commercial	25		
9	Bakers Trailer Park and Campground	Opelika	25-50	Commercial	Available		
10	Bar-W RV Park	Auburn	50	Commercial	37		40
11	Bows Family RV Park	Eastaboga	25-50	Commercial	9		
12	Caloosahatchee Campground	Ohatchee	25-50	Commercial	Available		
13	Knox Landing Campgrounds	Pell City	25-50	Commercial			30
14	Lake Hill RV & Mobile Home Park	Alexander City	25-50	Commercial			
15	Auburn RV Park at Leisure Time Campground	Auburn	25-50	Commercial	Available	60	
16	Coosa Willow Point Campground & Marina	Ohatchee	25-50	Commercial	Available	74	
17	Hilltop Campground	Wedowee	<10	Commercial			
18	Coleman Lake Recreation Area (Talladega National Forest)	Heflin	25-50	Federal	39		39
19	Pine Glen Recreation Area (Talladega National Forest)	Heflin	25-50	Federal	21		
20	Turnipseed Campground (Talladega National Forest)	Lineville	10-25	Federal			8
21	Chinnabee Recreation Area (Talladega National Forest)	Talladega	10-25	Federal			8
22	Warden Station Camp (Talladega National Forest)	Heflin	25-50	Federal	45		
23	Alabama Gold Camp	Lineville	<10	Commercial	Available	Available	Available
24	Amity Campground	Lanett	25-50	Commercial	96		Available

Number on Map	Facility Name	Town	Distance (miles)	Ownership	RV Camping	Tent Camping	Primitive Camping
25	Lakeside RV Park	Opelika	25-50	Commercial	86		Available
26	Country Court RV Park	Anniston	25-50	Commercial	46		
27	Safe Harbor RV Park	Riverside	25-50	Commercial	32		
28	Georgia-Bama RV Park	Heflin	25-50	Commercial	12		
29	KOA Anniston	Anniston	25-50	Commercial	59		Available
30	Anniston Army Depot RV Park	Anniston	25-50	Commercial	8		8
31	Scenic Drive RV Park and Campground	Heflin	25-50	Commercial			
32	Coosa River Camp Retreat	Harpersville	25-50	Commercial	3		
33	Talladega RV Park	Lincoln	25-50	Commercial	298		
34	Chief Ladiga Trail Campground	Borden Springs	25-50	Commercial	160		Available
35	Spring Villa Park	Opelika	25-50	Commercial	30		
36	Serenity Stables RV Park	Waverly	25-50	Commercial	15		
37	Auburn Legends Resort	Auburn	25-50	Commercial	40		
38	Eagle Landing RV Park	Auburn	25-50	Commercial	60		
39	Chattahoochee Bend State Park	Newnan, GA	25-50	State	25		26
40	John Tanner State Park	Carrolton, GA	25-50	State	32		Available
41	Big Oak RV Park	Tallapoosa, GA	25-50	Commercial	51		4
42	Yogi Bear Jellystone Park	Bremen, GA	25-50	Commercial	106		Available
43	De Soto Caverns Park	Childersburg	25-50	Commercial	16	5	Available
44	Little Tallapoosa Park	Carrolton, GA	25-50	Commercial	23		32
45	McIntosh Reserve Park	Whitesburg, GA	25-50	Commercial			30
46	Banning Mills RV Park	Whitesburg, GA	25-50	Commercial	40		
47	R. Shaefer Heard COE	West Point, GA	25-50	USACE	117		
48	3 Creeks Campground	LaGrange, GA	25-50	Commercial	48		
49	Flat Creek Campground	Hogansville, GA	25-50	Commercial	5		
50	Whitetail Ridge	LaGrange, GA	25-50	USACE	58		

Number on Map	Facility Name	Town	Distance (miles)	Ownership	RV Camping	Tent Camping	Primitive Camping
51	Holiday Campground/West Point Lake COE	LaGrange, GA	25-50	USACE	163		
52	Highland Marina Resort	LaGrange, GA	25-50	Commercial	Available		
53	Down in the Boondocks RV Park	Sylacauga	25-50	Commercial	10		
54	General Lee Marina & Campground	Cropwell	25-50	Commercial	111	Available	Available
55	Kudzu Campground	Talladega	25-50	Commercial	50		
56	Kymulga Grist Mill & Park	Childersburg	25-50	Commercial	12	12	
57	Lakeside Landing RV Park and Marina	Cropwell	25-50	Commercial	193	193	
58	Lakeway Campground	Equality	10-25	Commercial	Available		
59	Logan Landing RV & Cabin Resort	Alpine	25-50	Commercial	172		
60	Memory Lane RV Park and Campground	Lincoln	25-50	Commercial	50		Available
61	Old Shocco RV Park	Talladega	25-50	Commercial	24	Available	
63	Real Island Marina and Campground	Equality	10-25	Commercial			
64	Sundance Marina	Cropwell	25-50	Commercial	52		
65	Talladega National Forest	Talladega	25-50+	Federal			
66	Sunset Marina	Sylacauga	10-25	Commercial	13		
67	Talladega Creekside Resort	Talladega	25-50	Commercial	10	Available	
68	Talladega Taz RV Park and Campground	Lincoln	25-50	Commercial	100	Available	Available
69	Wazoo Campground	Lincoln	25-50	Commercial	>250		
70	Whispering Springs	Eclectic	25-50	Commercial			
71	Wind Creek State Park	Alexander City	25-50	State	586		
72	Shady Oaks Campground	Lincoln	25-50	Commercial	Available	Available	
73	Cedar Creek Campground	Fayetteville	25-50	Commercial			
74	R & R Campground	Lincoln	25-50	Commercial			
75	Clear Creek Cove RV Resort	Talladega	25-50	Commercial	150		
76	Powell's RV Park & Campground	Pell City	25-50	Commercial	Available	Available	

Source: Alabama RV Parks; Georgia RV Parks; All Campgrounds and AllStays, 2017

5.9.1.2 Recreation Facilities and Opportunities in the Lake Harris Project Boundary

Project recreation sites provide for a variety of recreational opportunities (e.g., boating, fishing, swimming, picnicking, hiking, sightseeing, and hunting). Targeted species for fishing in Harris Reservoir include Crappie, Largemouth Bass, Alabama Bass, Striped Bass, hybrid Striper, Channel Catfish, and Flathead Catfish (Completefish 2016).

Table 5-31 summarizes the Project recreation sites, and ***Figure 5-27*** denotes the location of these sites. ***Table 5-32*** provides additional information regarding the type of amenities at the Project recreation sites. These sites provide several boat launches along the Harris Reservoir shoreline and upstream of the reservoir along the Tallapoosa River. Several of the boat launch areas are managed in conjunction with ADCNR. Day use facilities are provided at Flat Rock Park, Wedowee Marine South, and the Harris Tailrace Fishing Platform.

In addition to the developed facilities, Alabama Power identified in the Project Land Use Plan (Alabama Power 2008a and Section 5.10) additional lands within the Project Boundary designated for future recreation development. These sites include Recreational Use Area No. 2 (approximately 139 acres[16]), Recreational Use Area No. 3 (approximately 75 acres), and Recreation Use Area No. 4 (approximately 68 acres). These sites would be developed if additional facilities were determined to be necessary due to future recreational demand and needs. In the interim, these lands are managed in accordance with the Wildlife Mitigation Plan for the Project.

Project lands provide hunting opportunities on lands near Harris Dam and north along the Tallapoosa River. Alabama Power collaborates with Alabama's Hunting and Fishing Trail for People with Disabilities to provide accessible hunting sites on portions of these lands near the Dam. Additionally, "Natural Undeveloped" lands, as identified in the Project Land Use Plan, are available for public use, including hiking, picnicking, primitive camping, backpacking, and wildlife observation.

[16] Wedowee Marine South comprises 20.7 acres of the 139 acres set aside for future recreation use.

TABLE 5-31 HARRIS PROJECT RECREATION SITES

RECREATION SITE NAME	TYPE OF FACILITY	OWNERSHIP	MANAGEMENT
Lee's Bridge Boat Ramp	Boat Launch	Alabama Power	Alabama Power
Foster's Bridge Boat Ramp	Boat Launch	Alabama Power	Alabama Power and ADCNR
Swagg Boat Ramp	Boat Launch	Alabama Power	Alabama Power and ADCNR
Lonnie White Boat Ramp	Boat Launch	Alabama Power	Alabama Power and ADCNR
Crescent Crest Boat Ramp	Boat Launch	Alabama Power	Alabama Power
Highway 48 Bridge Boat Ramp	Boat Launch	Alabama Power	Alabama Power and ADCNR
Wedowee Marine South	Marina	Alabama Power/ Wedowee Marine	Private
Little Fox Creek Boat Ramp	Boat Launch	Alabama Power	Alabama Power and ADCNR
Big Fox Creek Boat Ramp	Boat Launch	Alabama Power	Alabama Power and ADCNR
Flat Rock Park	Day Use Park	Alabama Power	Alabama Power
R. L. Harris Management Area	Hunting	Alabama Power	Alabama Power and ADCNR
Harris Tailrace Fishing Platform	Fishing Access	Alabama Power	Alabama Power

Source: Alabama Power 2008a; Alabama Power 2015a; ADCNR 2016c

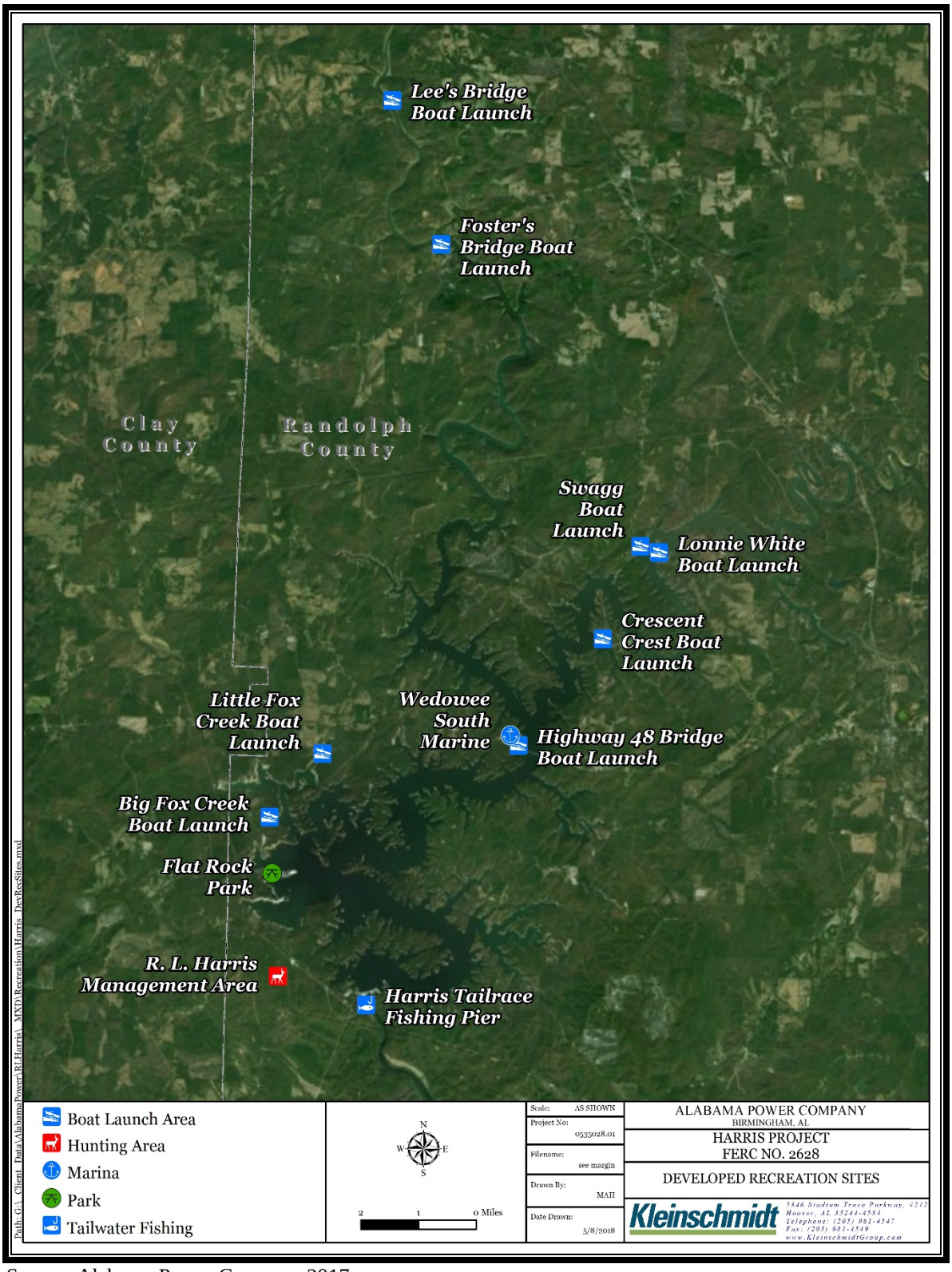
TABLE 5-32 EXISTING HARRIS PROJECT RECREATION FACILITIES AND AMENITIES

Recreation Site Name	Picnic Area	Picnic Tables	Grills	Trails	Interpretive Display	Restrooms	Swim Area	Marina	Boat Dock	Fishing Pier/Platform	Boat Launch Lanes	Lighting	Parking (spaces)	ADA Facilities
Lee's Bridge									1		1	No	4	No
Foster's Bridge									2		2	Yes	18	No
Swagg									1		2	Yes	*	No
Lonnie White									1		2	Yes	21	No
Crescent Crest									1		2	Yes	9	No
Highway 48 Bridge									2		2	Yes	28	Yes
Wedowee Marine South[17]	1	4				Yes	Yes	Yes			3	Yes	132	Yes
Little Fox Creek									1		2	No	16	Yes
Big Fox Creek									2		2	Yes	26	No
Flat Rock Park	1			1	Yes	Yes	Yes			1		No	*	No
R. L. Harris Management Area												No	4	Yes
Harris Tailrace Fishing Platform										1		Yes	9	Yes

Source: Alabama Power 2016; ADCNR 2016b

* parking lot is not striped

[17] Note that the Wedowee Marine South was not constructed in 2014 and therefore was not accounted for in the FERC Form 80.



Source: Alabama Power Company 2017a

FIGURE 5-27 HARRIS PROJECT DEVELOPED RECREATION SITES

5.9.1.3 RECREATION USE POLICIES, SAFETY, AND COMMUNICATION PROCEDURES

Alabama Power provides information to the public about Lake Harris and the Harris Project operations and Project-related recreation opportunities via the Shorelines website (www.apcshorelines.com), social media platforms (e.g., Facebook and Twitter), a smartphone app, and a toll-free phone number (1-800-LAKES11). Alabama Power's Shorelines website and smartphone app provide general information about Lake Harris, including reservoir elevations, operating schedules, fishing information, lake maps (i.e., showing public use areas, boat launches, fishing pier, and fishing spots), safety information, and a shorelines blog. Individuals can sign up on the Shorelines website to receive emails about lake conditions and operational schedules (Alabama Power 2017a).

The Alabama Marine Police, a division of the Alabama Law Enforcement Agency, patrol public waterways and supervise the registration of non-commercial boats and boat operator licensing. The Alabama Marine Police educate the public about boating safety and regulations through various programs and enforce the state boating regulations (Alabama Law Enforcement Agency 2017b).

Alabama Code, Title 33, Chapter 6A-3.1 prohibits the use of certain vessels on Lake Harris (in addition to Lake Martin on the Tallapoosa River and Weiss Lake on the Coosa River), including: any vessel longer than 30 feet 6 inches; any houseboat; and, any vessel longer than 26 feet 11 inches that can exceed 60 miles per hour (AL Code § 9-10B-2.2 2017). Vessels that are used for law enforcement, public safety, search and rescue, scientific research, dam operation or maintenance, or medical vessels are excluded from the restrictions. In addition, sailboats equipped with mast and sails that are dependent on wind for propulsion in normal course of operation are excluded from the prohibitions (Alabama Marine Police 2009).

Woody stumps and debris provide valuable fisheries and aquatic habitat; however, depending on the location of the debris, they can also provide boating safety hazards. If floating debris is identified, Alabama Power will notify the Alabama Marine Police, and it is the responsibility and determination of the Marine Police as to whether a buoy marker is deployed.

As stipulated in the USACE Alabama Power Programmatic General Permit, debris may be removed from any waterway for navigational or drainage purposes only. Debris includes but is not limited to stumps, tree limbs, appliances, lumber, and metal objects. Living vegetation attached to the substrate would not be considered debris. All debris must be properly placed in an approved landfill. Examples of authorized activities include, but are not limited to: removal of polystyrene foam, picking up debris materials by hand, and removal of other materials in a manner that does not alter the water bottom (USACE 2017).

Alabama Power protects and manages Project lands for public use opportunities. As a result, Alabama Power only allows for shoreline modifications or bank stabilization in areas of erosion as to preserve as much natural shoreline habitat as possible. The preferred methods of erosion control include natural bank stabilization and rip rap. The use of seawalls is evaluated by Alabama Power personnel on a case-by-case basis. Seawall construction is limited to the

existing shoreline for the sole purpose of erosion prevention. Any backfill used must be approved by Alabama Power and placed only to the contour of the natural slope of the existing shoreline. Rip rap must be placed at the toe of any newly constructed seawall. The use of debris, foreign materials, or creosote products is not allowed as a means of shoreline stabilization (Appendix Q).

5.9.1.4 Current Project Recreation Use Levels and Capacities

The most recent recreational use information for the Project is provided in the FERC Form No. 80 (Form 80) report. Pursuant to Order No. 330, FERC requires licensees to file Form 80 recreation reports for each Project development every six years, unless the licensee obtains an exemption from FERC. The Form 80 report includes summaries of annual use and average use on peak weekends for both daytime and nighttime periods to characterize use of these facilities during the calendar year preceding the year when the reports were filed. The Form 80 report also includes an assessment of the capacity utilization of the identified recreation amenities (FERC 2014, FERC 2015). Alabama Power filed the most recent Form 80 report for the Project in 2015, reporting recreational use data for the 2014 calendar year period (Alabama Power 2015a).

Table 5-33 provides a summary of the type of amenities and the estimated capacity utilization by amenity type at the Project as identified in the Project's Form 80 report. This summary identifies public recreation amenities within the Project Boundary and identifies which of those recreation amenities are FERC-approved amenities (Project recreation sites). FERC-approved amenities within the Project required by FERC in a license or license amendment. While ***Table 5-31*** and ***Table 5-32*** offer information on Project recreation sites, ***Table 5-33*** provides information on all public recreation amenities within the Project Boundary.

TABLE 5-33 HARRIS PROJECT 2014 FORM 80
TYPE OF AMENITIES AND CAPACITY ESTIMATES

RECREATION AMENITY TYPE	TOTAL NUMBER AMENITIES	FERC-APPROVED AMENITIES	CAPACITY UTILIZATION
Boat Launch	9	8	32
Marinas	2	-	58
Tailwater Fishing	1	1	9
Reservoir Fishing	6	6	18
Swim Areas	1	1	56
Trails	2	1	5
Picnic Areas	1	1	76
Overlooks/Vistas[18]	51	51	4
Visitor Center	1	1	1
Hunting Area	1	1	32
Informal Use Areas	5	5	35
Access Points	4	4	9
Total	**84**	**80**	**NA**

Source: Alabama Power 2015a

Alabama Power calculated the capacity utilization by dividing the estimated daily capacity by the estimated daily use for each recreation amenity type. During 2014, total annual recreation use included 302,194 day-time and 121,305 nighttime recreation days.[19] Alabama Power estimated that peak weekend average for daytime use was 5,898 recreation days and peak weekend average nighttime use was 2,384 recreation days (Alabama Power 2015a).

5.9.2 SKYLINE

The Skyline Project Boundary includes approximately 15,063 acres of lands located in Jackson County, Alabama, that provide hunting opportunities. In addition to the Skyline Project Boundary lands, an additional 44,000 acres of land exists within the James D. Martin-Skyline WMA. These lands are managed by the State of Alabama for wildlife management and public hunting (ADCNR 2016b). Notable recreation opportunities in addition to hunting in this area (but not in the Skyline Project Boundary) include the "Walls of Jericho" and a stop on the Alabama Birding Trail.

[18] Although listed as overlooks/vistas on FERC Form 80, these 51 areas are wildlife openings maintained by Alabama Power.

[19] FERC defines a recreation day as "each visit by a person to a development for recreational purposes during any portion of a 24-hour period."

5.9.3 RECREATION NEEDS IDENTIFIED IN MANAGEMENT PLANS

Recreation planning for the Project is provided in Alabama Power's Land Use Plan for the Project (Alabama Power 2008b). Refer to Section 5.10, *Land Use and Aesthetics*, for additional information.

5.9.4 ALABAMA STATEWIDE COMPREHENSIVE OUTDOOR RECREATION PLAN

The Alabama 2013-2018 State Comprehensive Outdoor Recreation Plan (SCORP) (ADECA 2013b) provides information about the use and demand for outdoor recreation facilities and trails within Alabama and includes the four counties where the Harris Project is located. As part of the 2013 SCORP update, the Alabama Department of Economic and Community Affairs (ADECA) conducted surveys, presentations to conferences and user groups, and one-on-one interviews of recreation providers and stakeholders to identify and define recreation trends, issues, benefits, and effects, as well as recreation needs throughout the state.

According to the statewide ranking reported in the SCORP, the top 10 activities by frequency of participation are walking for pleasure, jogging /running for exercise, gardening, soccer, bicycling, hunting, 4-wheel drive activities, viewing scenery, playground activities, and tennis. Within the region where Lake Harris Project Area is located (SCORP Planning Region 4), the SCORP identified the top 10 recreation activities to include:

- walking for pleasure (67.1 percent)
- freshwater beaches (59.7 percent),
- pool swimming (53.9 percent),
- football (45.6 percent),
- visiting historical sites (42.0 percent),
- saltwater beaches (38.3 percent)[20],
- freshwater bank fishing (35.2 percent),
- camping at developed sites (24.7 percent),
- soccer (23.3 percent), and
- all-terrain vehicle (ATV) trail (19.4 percent) (ADECA 2013b).

The Skyline Project Area lands are located within Planning Region 12[21], and the top recreation activities in this region include: walking for pleasure (59.5 percent), pool swimming (50.8 percent), visiting historical sites (42.7 percent), freshwater beaches (42.7 percent), and saltwater beaches (32.2 percent)[22].

[20] Note that Planning Region 4 does not contain any coastal areas.
[21] Planning Region 12 is within the Top of Alabama Regional Council of Governments and includes DeKalb, Jackson, Limestone, Madison, and Marshall Counties.
[22] Note that Planning Region 12 does not contain any saltwater beaches.

The SCORP also identifies recreation needs, both statewide and within each of the regions. For statewide needs, Alabama residents indicated a need for:

- additional hiking trails (10.6 percent);
- equestrian trails and facilities (10.0 percent);
- motorized trails and facilities (9.4 percent);
- linear parks, rail trails, and bikeways (7.5 percent);
- parks and park improvements (6.3 percent);
- bicycle trails (6.3 percent);
- bike/pedestrian facilities (6.3 percent); and
- access to public waters (5.6 percent).

Within Region 4 where the Lake Harris Project Area is located, the top recreation needs identified included parks, picnic areas, and playgrounds, and, within Region 12 where the Skyline Project Lands are located, the top recreation needs identified included playgrounds, walking/jogging trails, and parks (ADECA 2013b).

5.9.5 NATIONAL WILD AND SCENIC AND STATE PROTECTED RIVER SEGMENTS

There are no nationally designated wild and scenic areas, wilderness areas, or trails within or adjacent to the Project Boundary, nor are there any locations within the Harris Project Boundary that are under study for such designations.

5.9.6 NATIONAL TRAILS AND WILDERNESS AREAS

There are no National Trail Systems or Wilderness Areas within the Harris Project Boundary, and no lands within the Harris Project Boundary under study for inclusion in the National Trails System or designated as, or under study for, inclusion as a Wilderness Area. The closest National Wilderness areas are the Cheaha Wilderness Preserve and the Pinhoti National Recreation Trail, both located within the Talladega National Forest approximately 30 miles northwest of the Lake Harris Project Area (U.S. Forest Service 2016; Wilderness. net 2016).

5.10 LAND USE AND AESTHETIC RESOURCES

5.10.1 LAKE HARRIS

5.10.1.1 Overview of Land Uses

Lake Harris is located on the Tallapoosa River in Clay, Cleburne, and Randolph counties, Alabama. The county seat of Randolph, Wedowee, is located approximately 5 miles east, and the city of Lineville is located approximately 6 miles west of Lake Harris.

The majority of Lake Harris lands are located within Randolph County, with a small portion of Lake Harris lands located in Clay and Cleburne counties. There are 4.9 acres of federal lands within the Lake Harris Project Boundary. These lands are owned by the Bureau of Land Management (BLM).

The general region surrounding Lake Harris is primarily rural in character with forested lands and limited commercial and private residential development. ***Table 5-34*** summarizes the percentages of land use by classifications for the counties in which the Lake Harris lands are located. The land use classifications are derived from the National Land Cover Database 2011 created by the Multi-Resolution Land Characteristic (MRLC) Consortium (MRLC 2016). The data are based on satellite images at a resolution of 98.4 feet and, therefore, provide general major land use categories within Randolph, Clay, and Cleburne counties. As indicated in the table, predominate land use within all three counties is forested (deciduous and evergreen), followed by pasture/hay.

HARRIS PROJECT PERMITTING INFORMATION

Alabama Power offers permits for various residential and non-residential work on shorelines of Alabama Power reservoirs. Projects include:

- dredging,
- bank stabilization,
- boat ramps, and
- docks.

Each reservoir has its own permitting requirements. As part of the permitting process, Alabama Power may require or suggest the use of Shoreline Best Management Practices (BMPs). Additional information on permits and BMPs can be found at: https://apcshorelines.com/shoreline-management/.

Source: Alabama Power Company. 2017. Shoreline Management Practices. Alabama Power Company, Birmingham, AL. [Online] URL: http://apcshorelines.com/pdfs/Shoreline_bmp.pdf.

TABLE 5-34 PERCENTAGES OF LAND USE CLASSIFICATIONS BY COUNTIES IN THE LAKE HARRIS PROJECT VICINITY

DESCRIPTION[1]	RANDOLPH	CLAY	CLEBURNE
Open Water	3. 0	0. 3	0. 4
Developed, Open Space	3. 7	3. 3	3. 5
Developed, Low Intensity	1. 3	0. 2	0. 6
Developed, Medium Intensity	0. 2	0. 1	0. 1
Developed, High Intensity[2]	0. 1	0. 0	0. 0
Barren Land (Rock/Sand/Clay)	0. 3	0. 3	0. 2
Deciduous Forest	36. 6	46. 5	43. 9
Evergreen Forest	20. 5	27. 0	28. 0
Mixed Forest	0. 4	0. 7	1. 4
Shrub/Scrub	8. 4	5. 6	6. 3
Grassland/Herbaceous	7. 9	6. 9	5. 8
Pasture/Hay	17. 1	7. 7	8. 9
Cultivated Crops[2]	0. 0	0. 0	0. 0
Woody Wetlands	0. 6	1. 2	0. 8
Emergent Herbaceous Wetlands[2]	0. 1	0. 0	0. 0

Source: MRLC 2016

[1] For a description of land use types, see http://www.mrlc.gov/nlcd11_leg.php.

[2] For values of 0.0, although present, these areas represent less than 0. 1%.

5.10.1.2 Existing Shoreline Management Plan

The Harris Land Use Plan was most recently revised in June 2008 and approved by FERC Order on May 26, 2010. ***Figure 5-28*** provides the land uses of the Lake Harris Project Boundary. The Land Use Plan describes land use classifications for management of Harris Project lands located within the existing Harris Project Boundary. Harris Reservoir does not currently have a Shoreline Management Plan (SMP) but does maintain policies that keep shoreline management consistent with other Alabama Power hydro projects. For example, there are shoreline permitting guidelines, including easement and guidelines, and public education programs, including encouraging BMPs that minimize the impacts of construction to existing resources.

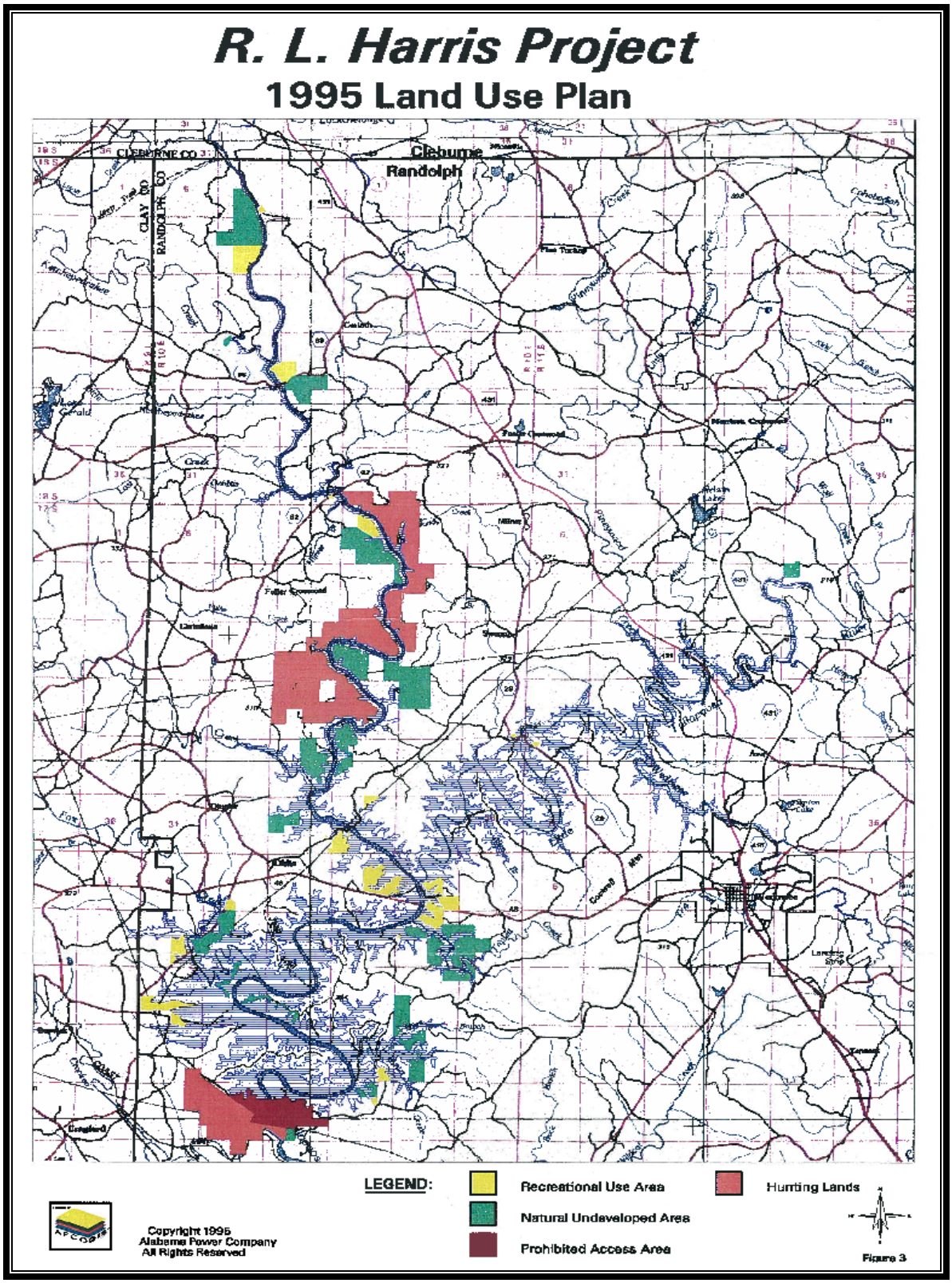
Shoreline Management Plans

Alabama Power updates their Shoreline Management Plans for each project during relicensing. Information regarding Alabama Power Shoreline Management is located at https://apcshorelines.com/shoreline-management/.

In 2012, Alabama Power implemented a Shoreline Compliance Program (SCP) to ensure that shoreline encroachments are resolved. The SCP also addresses shoreline permitting, structure

identification and assessment, public education, surveillance, and shoreline preservation. Alabama Power files annual reports of progress under the SCP with FERC. During 2017, Alabama Power resolved 53 encroachments on Harris Reservoir[23].

[23] At Harris, "encroachments" may include activities that a property owner begins before receiving a permit. Alabama Power's permitting program started at Harris in 1986 and expanded to the remainder of Alabama Power's hydroelectric projects on the Coosa, Warrior, and Tallapoosa Rivers in 1992.



Source: Alabama Power 2008b

FIGURE 5-28 HARRIS LAND USE PLAN

The Land Use Plan identifies four land use categories for the Lake Harris Project lands. ***Table 5-35*** summarizes the estimated acreages of project lands by category for those lands that are within the Lake Harris Project Boundary.

TABLE 5-35 LAND USE DESIGNATIONS WITHIN THE LAKE HARRIS PROJECT BOUNDARY

LAND USE PLAN – LAND USE DESIGNATION	ESTIMATED ACRES WITHIN LAKE HARRIS PROJECT BOUNDARY
Recreational Use Areas (Public Use Area)	900
Hunting	2,721
Prohibited Access	312
Natural Undeveloped	2,460
Total	**6,393[1]**

Source: Alabama Power 2018

[1] This acreage total does not include the scenic easement (to 800 feet msl or 50 horizontal feet from 793 feet msl, whichever is less, but never less than 795 feet msl)

The following is a description of the land use categories identified in the existing Harris Land Use Plan (Alabama Power 2008b):

- Recreational Use (Public Use Areas) – Includes lands where existing public recreation access and facilities occur and those lands set aside for future recreational use access depending on future recreation demand and needs. Within these areas, specific locations are identified as "Quasi-Public Use Areas" to provide potential use by non-profit groups, such as scouts, youth organizations, and educational groups, for outdoor recreational activities.
- Hunting – Includes lands that are managed to provide hunting opportunities either through hunting leases or individual permits as prescribed in accordance with the existing Harris Project WMP. Public access is allowed from May 1 until September 30 of each year (outside of the hunting season) for hiking, backpacking, camping, wildlife observation, and bank fishing opportunities.
- Prohibited Access – Includes lands where public use and access is prohibited to avoid hazards to the public and to prevent interference or damage to Harris Project facilities and operations. (The tailrace fishing area is one exception to this area where public access is allowed).
- Natural Undeveloped – Includes lands to remain in an undeveloped state to serve as protective buffer zones around public recreation areas and shoreline areas, preserve natural aesthetic qualities, prevent overcrowding, as well as to protect environmentally sensitive areas. These lands allow public access for hiking and primitive camping activities and are managed for timber production in accordance with the existing Harris WMP.

As stated in the Land Use Plan, a portion of Harris Project lands are managed in accordance with the Harris WMP. Section 5.9, *Wildlife Resources*, contains additional information.

Permitting Program

Alabama Power maintains a shoreline permitting program for management of lands within the Lake Harris Project Boundary. Alabama Power provides general guidelines for shoreline permitting, including: guidelines for residential shoreline permitting (Alabama Power 2017a), guidelines for non-residential use of Project lands and waters (such as public marinas, restaurants, apartments and other rental properties, overnight campgrounds, other commercial businesses) (Alabama Power 2017b), and guidelines for multiple single-family type dwelling use of Project lands and waters (Alabama Power 2017c). All activities within the Lake Harris Project Boundary must be preapproved and permitted by Alabama Power. The purpose of the shoreline permitting program is to manage development activities and monitor the shoreline areas on a regular basis to preserve the scenic, recreational, and environmental values of the Lake Harris Project Area.

The residential shoreline permitting guidelines provide information about the permissible activities and necessary requirements for shoreline development activities, such as construction of piers, ramps, boathouses, boat slips, shoreline bank stabilization, and dredging activities. A written permit must be obtained by Alabama Power prior to any construction on or within Project lands and/or waters. Shoreline lots with less than 100 linear feet of shoreline may be restricted or may not be eligible for structures. Appendix Q provides Alabama Power's residential shoreline permitting guidelines (Alabama Power 2017a).

Before beginning construction or maintenance activities on facilities or shorelines, lakeshore owners must obtain a permit from Alabama Power in accordance with its FERC license and its USACE Programmatic General Permit. The Alabama Power Shoreline Management office reviews permits to determine if the proposed activities would occur in a section of shoreline that is classified as a Sensitive Area. Sensitive Areas are identified based on the presence of wetlands, cultural resources, and/or federally protected species. Upon determination that a proposed activity would occur within a Sensitive Area, the application is provided to Alabama Power's Environmental Affairs (EA) department for further review. Alabama Power's EA department determines if the application can be approved or if it will require further consultation with appropriate state and/or federal resource agencies.

A permit is required for any work within the scenic easement and approval must be granted prior to any construction activities, such as building of a gazebo, decks, or walkways (one walkway, 4-foot-wide maximum restriction). Certain types of activities are restricted within the scenic easement, including: removal of trees over three inches in diameter, clearing of shrubs over four feet tall, sod and grass, habitable structures, fences, wells, gardens, garbage, or foreign materials. Any lake front property construction (i.e., piers, ramps, boathouses, wet slips, personal water craft [PWC] flotation) must be set a minimum of 15 feet from extension of the property line into the lake. Boat ramps must not exceed 20 feet in width, and length is determined by Alabama Power depending on the boat ramp location.

For shoreline stabilization, Alabama Power promotes use of rip rap and natural bank stabilization as the preferred methods of erosion control; however, use of seawalls are evaluated on a case-by-case basis. Typically, Alabama Power requires rip rap be installed at the base of the seawall if a seawall is permitted. Additional shoreline stabilization construction requirements are described in the permitting guidelines. Any dredging of material from the lakebed must be approved by Alabama Power prior to removal; applications are reviewed on a case-by-case basis and may require additional documentation or approvals.

Alabama Power initiated the Legacy Structure permit program to transition existing, non-compliant structures into the permitting and compliance program. A Legacy Structure is an existing structure that generally has not been previously permitted by Alabama Power and is not compliant with Alabama Power's permitting guidelines due to the nature, size, or dimensions of the structure or its location is on or within the Project lands and/or waters. The residential permitting guidelines provide information for specific criteria and procedures for legacy permits and structures (Alabama Power 2017a).

Pursuant to the existing FERC license, Alabama Power may permit facilities that can accommodate up to a total of 10 watercraft on one property. For facilities that accommodate more than 10 watercraft, Alabama Power must obtain FERC authorization prior to permitting such facilities. For multiple single-family type dwelling use permits (for community piers, landings, boat docks, or similar structures intended to serve non-commercial multiple single-family type dwellings on Project lands and waters), Alabama Power requires the site to have a minimum of 100 feet of shoreline and a minimum 25-foot side-lot setback, and the total footprint area of the structure can be no more than 1,000 square feet per 100 feet of shoreline. The permitting guidelines also require specific length and spacing criteria and restrict use of boat lifts, roofs, and canopies. Docks, boat slips, and piers can be floating or fixed, and all floatation materials must be encased or closed cell construction (Alabama Power 2017b). For non-residential permits, Alabama Power applies similar guidelines and general site conditions criteria as under the multiple single-family type dwelling guidelines; however, boat lifts and canopies may be allowed for marinas although not allowed in other non-residential developments (Alabama Power 2017c).

Alabama Power provides information to the public about Lake Harris and the Harris Project operations, shoreline management and permitting, and Project-related recreation opportunities via website, smartphone app, and a toll-free phone number (1-800-LAKES 11), as well as an annual open house held at the Harris Shoreline Management office.

Alabama Power developed the publication *Shoreline Management Practices*, which includes general information about shoreline permitting guidelines and shoreline best management practices for shoreline property owners. Shoreline BMPs include recommended measures to help improve water quality, minimize shoreline erosion, stabilize shoreline banks, create fish and wildlife habitat, and improve shoreline aesthetics. Examples of specific recommended measures include maintaining a 15-foot vegetative buffer, selection of native plants and shrubs for shoreline plantings, avoiding use of fertilizers and pesticides, use of permeable paving materials for constructed walkways, maintaining septic tanks and drain fields, and discouraging livestock from entering project waters and tributaries. The publication also

provides examples of BMPs that can be implemented during construction activities. Appendix Q provides Alabama Power's residential shoreline permitting guidelines (Alabama Power 2017c).

Alabama Power also publishes the *Shorelines* magazine four times each year which includes regional information for the Coosa, Tallapoosa, and Warrior River areas, including the Lake Harris Project Area. The *Shorelines* magazine provides information about recreational opportunities, regional interests and events, cultural history, environmental resources, lake safety information, and shoreline permitting information. In addition, as part of one *Shorelines* publication, Alabama Power include a Shoreline Management Customer Survey to allow the opportunity for shoreline owners and lake recreation visitors to provide feedback to Alabama Power's Shoreline Management staff about shoreline management services (Alabama Power 2017c).

5.10.1.3 Aesthetics

Harris Reservoir and the surrounding forested hilly terrain dominate the Lake Harris Project Area. The views within the Lake Harris Project Area include the reservoir, recreation areas, forested shoreline, and some areas of shoreline residential development, including boat docks and boat houses. Additional views include the Harris Dam and associated facilities. The reservoir provides views of open waterway and many coves with vegetated shoreline areas. The northern portion of the Lake Harris Project Area along the Tallapoosa River is more riverine in character. ***Figure 5-29*** provides views of the Lake Harris Project facilities, and ***Figure 5-30*** and ***Figure 5-31*** provide characteristic views of the Harris Reservoir. ***Figure 5-32*** and ***Figure 5-33*** provide views of the tailrace area below Harris Dam. The banks of the tailrace area are naturally armored with exposed bedrock and lined with rip rap in several areas.

Source: Alabama Power 2016

FIGURE 5-29 AERIAL VIEW OF HARRIS DAM AND POWERHOUSE

Source: Alabama Power 2016

FIGURE 5-30 AERIAL VIEW OF HARRIS RESERVOIR

Source: Alabama Power 2016

FIGURE 5-31 AERIAL VIEW OF HARRIS RESERVOIR SHORELINES

Source: Alabama Power 2017

FIGURE 5-32 VIEW OF HARRIS DAM TAILRACE AREA

Source: Alabama Power 2017

FIGURE 5-33 VIEW OF TAILRACE AREA FROM HARRIS DAM

Other scenic attractions in the region include scenic views from Cheaha State Park and Talladega National Forest, both located approximately 30 miles northwest of Harris Reservoir in the foothills of the Appalachian Mountains. One other scenic attraction near Harris Reservoir is the Horseshoe Bend National Military Park. The land on which the park is located was originally owned by Alabama Power but donated to the United States government for the park. The park is the site of the battle with the Creek Nation, known as the Battle of Horseshoe Bend, and offers an overlook of the battlefield, a visitor center, and several miles of walking trails.

5.10.1.4 Management Plans

The State of Alabama encompasses 12 regional planning councils that are affiliated with the Alabama Association of Regional Councils. Lake Harris is included within the Region 4 planning district and controlled by the East Alabama Regional Planning and Development Commission, which includes Calhoun, Chambers, Cherokee, Clay, Cleburne, Coosa, Etowah, Randolph, Talladega, and Tallapoosa counties. Randolph, Clay, and Cleburne counties do not have any zoning ordinances or management plans that would affect land uses in the Lake Harris Project Area (Clay County 2016; Cleburne County 2016; Randolph County 2016). The Towns of Ashland and Lineville, both located in Clay County about 10 and 15 miles, respectively, to the west and outside of the Lake Harris Project Boundary, have limited zoning ordinances (Clay County 2016). Within Randolph County, the City of Roanoke has zoning ordinances but

is located about 15 miles south of Lake Harris, and the Town of Wedowee, adjacent to Lake Harris Project Area, has limited zoning ordinances (City of Roanoke 2016).

The East Alabama Regional Planning and Development Commission established a consortium of various regional entities and businesses to support regional planning efforts. The consortium supports regional development, including housing integration, land use, economic development, transportation, and infrastructure investments. The consortium established a regional plan for promoting these efforts: the Community Livability for the East Alabama Region (CLEAR) Plan 2030. The CLEAR Plan focuses on guiding principles for sustainable development that include housing, education, economic, community engagement, transportation, and healthcare (EARPDC 2014).

5.10.2 SKYLINE

5.10.2.1 Land Use

Skyline Project lands included in the Harris WMP are located approximately 110 miles north of Lake Harris in Jackson County, Alabama. Skyline lands total 15,063 acres and are leased to and managed by the State of Alabama for wildlife management and public hunting. Additionally, the Project lands at Skyline are part of the James D. Martin-Skyline WMA (ADCNR 2016b) and are designated as hunting lands. ***Table 5-36*** provides percentages of land use classifications for Jackson County. The land use classifications are derived from the National Land Cover Database 2011 created by the MRLC Consortium (MRLC 2016). The data are based on satellite images at a resolution of 98.4 feet; and, therefore, provide general major land use categories within Jackson County. As indicated in the table, predominant land use within Jackson County is forested (deciduous and evergreen), followed by pasture/hay.

TABLE 5-36 PERCENTAGES OF LAND USE CLASSIFICATIONS FOR JACKSON COUNTY, ALABAMA

DESCRIPTION[1]	JACKSON COUNTY
Open Water	4. 4
Developed, Open Space	2. 8
Developed, Low Intensity	1. 2
Developed, Medium Intensity	0. 3
Developed, High Intensity[2]	0. 1
Barren Land (Rock/Sand/Clay)	0. 2
Deciduous Forest	48. 3
Evergreen Forest	4. 0
Mixed Forest	6. 1
Shrub/Scrub	4. 9
Grassland/Herbaceous	2. 3
Pasture/Hay	16. 8
Cultivated Crops[2]	0.0
Woody Wetlands	2. 1
Emergent Herbaceous Wetlands[2]	0. 1

Source: MRLC 2016

[1] For a description of land use types, see http://www.mrlc.gov/nlcd11_leg.php.

[2] For values of 0.0, although present, these areas represent less than 0.1%.

5.10.2.2 Aesthetics

The Skyline area lands include predominantly forested lands with some areas of agriculture. Distant views include rolling forested hills and agricultural lands within the valley. Foreground views within the Skyline area include wooded forests, rock outcroppings, and streams with rocky substrates and vegetative riparian areas along the stream banks. ***Figure 5-34***, ***Figure 5-35***, *and* ***Figure 5-36*** provide views of the Skyline area.

Source: Alabama Power 2017

FIGURE 5-34 AERIAL VIEW OF SKYLINE AREA

Source: Alabama Power 2017

FIGURE 5-35 VIEW OF SKYLINE AREA ROCK OUTCROPS

Source: Alabama Power 2017

FIGURE 5-36 LITTLE COON CREEK

5.11 CULTURAL RESOURCES

5.11.1 LAKE HARRIS

The Lake Harris Project Area has been subject to dramatic shifts in climate over the past 15,000 years that have affected the nature and presence of aboriginal peoples. The warming trends that occurred at the end of the Pleistocene dramatically changed the forests of the South and resulted in dynamic changes to the hydrology and morphology of the river valleys. The Holocene witnessed fluctuations as well with the colder and drier climate of the Younger Dryas gradually transitioning to the warmer and wetter period of the Holocene Climatic Optimum (Hypsithermal). The effects of long-term climate fluctuations on occupants of the Tallapoosa River Valley are evident in the changing technology, settlement patterns, and lifeways recorded in the archaeological record.

Lake Harris is situated in eastern Alabama in the Tallapoosa River drainage. Archaeological evidence suggests that humans have occupied the area for approximately 11,000 years, since the Middle Paleoindian Period.

Field Investigation

Source: Alabama Power Company. 2014. Historic Properties Presentation. Alabama Power Company, Birmingham, AL.

The earliest evidence of human occupation in the southeastern United States is identified as the Paleoindian Stage, which began approximately 11,500 B.C. and continued to approximately 8,000 B.C. There is scant evidence of Early Paleoindian occupation in the Tallapoosa River Basin. Based on current records, prehistoric populations did not reach the basin until the Middle Paleoindian Period. The archaeological record thus far indicates a larger influx of prehistoric peoples to the Tallapoosa River Basin during the Late Paleoindian Period (c. 8,500-8,000 B.C.).

During the Archaic Stage (c. 8,000-1,200 B.C.), the region's climate gradually trended toward that of modern weather patterns, and the forests of the South changed to the oak, chestnut, hickory, and pine forest of the historic record. Hunting and gathering remained the primary subsistence strategy throughout the Archaic, but diversification is obvious in the records from both basins. The Early Archaic Period toolkit expanded to include knives, adzes, end scrapers, and celts, while the invention of the atlatl (spear thrower) was an important technological advancement during this period. There is also evidence of woven fiber used to make baskets and netting. Archaeological research on the Middle Archaic suggests increased sedentism and greater exploitation of riverine environments during this period. Technological advances during the Middle Archaic Period include ground and polished stone, such as atlatl weights, grooved axes, net-sinker weights, and tools made of bone and shell such as awls, needles, and atlatl hooks. The

subsequent Late Archaic Period sites occur with greater frequency and have a wider physiographic dispersion than earlier periods. Sedentism continued to increase, as flood plain base camps grew and upland resource extraction sites were used on a seasonal basis. Archaeological excavations of Late Archaic sites have identified house floors, hearths, and storage pits in higher frequencies. Extensive trade networks of raw materials existed, yet Late Archaic artifacts demonstrate increasing regional variation of stylistic and technologic traits. Burial mounds, exotic ornamental grave goods, commodity trading of raw materials, and increasingly specialized craftsmanship indicate a growing social hierarchy and the ever-intensifying trend towards territoriality.

Projectile Points and Pottery

Source: Alabama Power Company. 2014. Historic Properties Presentation. Alabama Power Company, Birmingham, AL.

Spanning from c. 1,200 B.C. to 300 B.C., the Gulf Formational Stage is contemporaneous with the Early Woodland Period in other parts of the South. Originating in coastal areas along the Atlantic shore, the Gulf Formational is identified by the presence of specific technologies and settlement patterns defined for a region that extends from the Georgia coast to the Tennessee Valley, to the Tombigbee drainage. In Alabama, the earliest manifestation is the Middle Gulf Formational Period, which is marked by the introduction of pottery tempered with organic fibers. The Late Gulf Formational includes a transition to sand and grit tempered pottery of the Alexander series. The Gulf Formational occupation appears to have been relatively scarce in the Tallapoosa River Basin. Geoarchaeological studies of core samples and profiles have identified increased fluctuation of the environment with greater intensity and frequency of precipitation events evidenced by increased sediment deposition. These conditions resulted in changing availability of resources, particularly in the river basins of the South. Shellfish populations appear to have declined and resource exploitation intensified with what would typically be considered marginal resources along the fringes of swamps and lowlands. Large storage silos used for holding acorn and hickory nuts are found on Late Gulf Formational sites. Such use of storage facilities indicates long-term use of one location and territorial behavior designed to allow groups to exploit known ranges and resources.

The Woodland Stage (c. 300 B.C. to A.D. 1,200) is typically associated with an increased reliance on agriculture. Domesticates begin to appear in the

archaeological record. The introduction of the bow and arrow occurred during this stage, as reflected in the development of smaller triangular projectile points. Populations continued to grow. Fish weirs associated with Woodland villages are common in the Tallapoosa River drainage. Pottery series were mixed with sand tempered wares exhibiting similar surface treatments in the Tallapoosa Basin. However, the regional pottery trends indicate a greater association with North Georgia cultures in the Tallapoosa and Coosa River drainages.

During the Late Woodland, the occupants of the Tallapoosa Basin appear to have resisted assimilation and focused instead on regional specialization with possible ties to the Autauga phase of Central Alabama known locally as the Dadeville phase.

The Mississippian period (c. AD 1000-1450) represents the last pre-contact cultural traditions prior to the introduction of European settlers and the introduction of diseases that decimated native populations. Mississippian societies were based upon an agrarian economy and densely populated fertile river valleys. Mississippian settlements included large village sites, many of which contained large earthen mounds. Mound sites are considered to have been cultural hubs with extensive political, religious, and socio-economic influence. Mississippian cultures witnessed a high degree of social stratification, with evidence of a ruling elite, extensive trade networks for exotic goods, specialized craftsmen, and artisans. However, Mississippian sites are not particularly well represented in the Tallapoosa River Basin; Mississippian sites in the Tallapoosa River Basin show a distinctly different association, primarily with the Etowah sphere of influence.

5.11.1.1 Historic Overview

The Spanish explorers of the early sixteenth century were the first Europeans to generate a written record of their contact with Native Americans in present day Alabama, and Hernando de Soto's entrada through the Southeast had a profound impact on the people and cultures of the region. The chronicles of his travels through the region speak of grand villages with massive structures lined with pearls and marked by carved wooden statuaries. Based on the stories of the survivors, the de Soto expedition was followed quickly by the de Luna and Pardo expeditions that sought to find wealth and new lands for settlement in the region. However, the populations they encountered decades after the entrada had already been affected by the introduction of disease and its effects on the population and cultures of the region.

Source: TheFamousPeople. 2017. Hernando de Soto. [Online] URL: http://www.thefamouspeople.com/profiles/hernando-de-soto-6472.php.

Hernando de Soto

The Spanish attempts at long-term settlement in Alabama were unsuccessful, and the French were the first Europeans to establish a permanent presence with native groups. After settling at what is now Biloxi in 1699, the French, in 1717, established Fort Toulouse at the point where the Coosa and Tallapoosa Rivers meet to form the Alabama River. The lands that would

become Alabama remained in contention between the Spanish, the French, and the British throughout the seventeenth and early eighteenth centuries. Because of the expansion of the British colonies along the east coast and their dominance of the deer skin trade, British influence increased throughout the eighteenth century, and numerous factories (trading posts) and supply depots were established. By the late 1700s the newly formed United States began to put settlement pressure on the region. Despite the strong Creek presence in the interior of Alabama slowing the advance of settlement, Euro-Americans continued to venture into the area after the Treaty of Paris in 1783.

The fledgling American government established the Mississippi Territory in 1798 under the provisions of the Northwest Ordinance. The newly formed Territory became unstable after the creation of a Federal Road from Washington D.C. to New Orleans as the road brought new American settlers to the region, infuriating aboriginal groups who had made agreements and treaties to protect their traditional lands. In 1813, a series of attacks and counterattacks between Americans and the British-supported Creeks blossomed into a war throughout the territory. The war came to a formal, and violent, end in 1814 when General Andrew Jackson, with support of the Cherokee, defeated the Creeks at Horseshoe Bend on the Tallapoosa River. Their defeat forced the secession of all Creek land east of the Mississippi River, and the remainder of the Red Stick Creeks retreated south to join the Seminole in their resistance of American expansion. Conflict continued throughout the remainder of the decade with the Seminole Wars fought between the American military and Native Americans armed and trained by British marines. Regardless, American settlers continued to pour into the area, and Alabama achieved statehood in 1819. The same Andrew Jackson that defeated the Creeks became president in 1829 on a platform of anti-corruption in banking and American expansionism. He signed the Indian Removal Act in 1830 forcing the remaining Native Americans to be sent to lands set aside for them in Oklahoma. Their forced removal came to be known as the Trail of Tears. Even the Cherokee, who had aided Jackson in his campaign against the Creeks, were forced from their lands.

The tide of early American settlers rapidly occupied the former Cherokee and Creek lands, expanding farms, clearing plantations, and intensifying the timbering of the region's forests. The power of streams was harnessed for the machinery that operated grist and sawmills. The rugged hills of the east central part of Alabama saw relatively slow development through the outbreak of the Civil War in 1861. Stagnation of industry and agriculture existed throughout the State of Alabama until 1885 when the coal, iron, steel, and textile industries experienced rapid growth. The rural areas along the Tallapoosa, however, remained primarily agricultural. Small farmsteads dotted the hills and hollows of these two regions as Scotch/Irish and German immigrants came to occupy the southern end of the Appalachians.

Throughout the nineteenth century, power development in Alabama was confined almost entirely to streams. By the early twentieth century, prospective waterpower sites along the Tallapoosa River began to attract the attention of hydraulic engineers. In 1907, the founding president of Alabama Power, Captain William Patrick Lay, received congressional approval to construct the company's first dam and electric generating plant on the Coosa River (Lay Dam). The area, however, remained primarily agricultural.

Alabama Power began hydropower construction on the Tallapoosa River in 1923 at the Cherokee Bluffs site. James Mitchell and Thomas Martin, the other two founders of Alabama Power, overcame several engineering and design issues to start construction of the dam, finally completing the Martin Project in 1926. In addition, Alabama Power constructed two hydropower dams near Tallassee, Alabama, on the Tallapoosa River: Yates (in-service 1928) and Thurlow (in-service 1930). The Harris Dam was the final Alabama Power dam constructed on the Tallapoosa River (Atkins 2006).

5.11.1.2 Historic Properties

The Harris Dam facilities, completed in 1983, are less than 50 years of age, and, therefore, are not yet eligible for listing to the NRHP. The 50-year requirement is a "general estimate of the time needed to develop historical perspective and to evaluate significance" according to the *National Register Bulletin: How to Apply the National Register Registration Form* (NPS 1997). The National Register Criteria does allow the listing of properties less than 50 years of age if they are "of exceptional importance" (NPS 1997). For property less than 50 years of age to be evaluated, a "sufficient historical perspective" must exist to determine that the property is exceptionally significant (NPS 1997). In the case of the Harris Dam facilities, a demonstrable body of scholarly literature evaluating the facility's outstanding contributions to local, regional, economic, and agricultural arenas has yet to be published. When the Harris Dam facilities reach the minimum age criterion for listing to the NRHP (in 2033), the facilities will be evaluated for significance and recommendations determined with regard to guidelines set forth by NPS for NRHP eligibility criteria (NPS 1997).

NATIONAL HISTORIC PRESERVATION ACT OF 1966 SECTION 106

The National Historic Preservation Act of 1966 (Section 106) requires that Federal agencies determine the effects of an action on historic properties. Historic Properties include both properties that are included on the National Register of Historic Places or that meet the criteria for the National Register. Section 106 requires that the State Historic Preservation officer (for Alabama that is the Alabama Historical Commission) and Native American Tribes with an interest in the action be consulted and the federal agency must work to resolve any adverse effects.

Source: Advisory Council on Historic Preservation. 2013. Section 106 Regulations Summary. Washington, DC. [Online] URL: http://www.achp.gov/106summary.html

Article 62 of the existing Harris Project license requires Alabama Power to do the following with respect to cultural resources:

> ".... consult with the SHPO[24], before construction of any project works, about the need for any cultural resource surveys and if previously unrecorded archaeological or historical sites are discovered, construction activity in the vicinity shall be halted, a qualified archaeologist shall be consulted to determine the significance of the sites, and Alabama Power shall consult

[24] SHPO is the State Historic Preservation Office

with the SHPO to develop a mitigative plan for the protection of significant archaeological or historical resources. Finally, if Alabama Power authorizes other persons to undertake any construction or development on Project lands, Alabama Power shall ensure that such construction or development is carried out in compliance with the provisions of this article.

To date, no comprehensive systematic cultural resources survey of the entire Lake Harris has been performed. However, a recent review of the Alabama Cultural Resources Online Database, housed at the Office of Archaeological Research (OAR) and consisting of the National Archaeological Database Bibliography, the Alabama State Site File (ASSF) (OAR 2017) and the Alabama Phase I Surveys Website (OAR 2014) identified 16 previous surveys and 327 sites within the Lake Harris Project Area. Of the 327 total sites, 10 sites[25] are considered potentially eligible for listing to the NRHP, 191 are listed as undetermined with regard to NRHP eligibility, and 126 are considered not eligible for listing to the NRHP.

Four of the ten potentially eligible sites (1Ra32, 1Ra307, 1Ra362, and 1Ra408) are located directly in the reservoir. Site 1Ra32 is an unknown aboriginal site, located on a thin peninsula that stretches into the reservoir. Based on its location and approximate elevation (790 feet msl), the site may be inundated or partially inundated but would be exposed when the reservoir level is dropped to low pool (785 feet msl). Site 1Ra307 is a Middle Woodland (Crooked Creek Complex) site located on a small inlet of the reservoir. Based on its location and approximate elevation (795 feet msl), the site may be exposed year-round and/or portions could be subject to partial inundation when the reservoir is at full pool. Site 1Ra362 is a Late Archaic through Middle Woodland site, situated on a small island within the reservoir. Based on its location and approximate elevation (795 feet msl), the site may be exposed year-round and/or portions could be subject to partial inundation when the reservoir is at full pool. Finally, Site 1Ra408 is an unknown aboriginal site containing a single rock mound, located on the southern shore of the reservoir. Based on its location and approximate elevation (900 feet msl), the site is exposed year-round.

The remaining six potentially eligible sites (1Ra313, 1Ra381, 1Ra393, 1Ra394, 1Ra437, and 1Ra438) are located off the main reservoir. Site 1Ra313 is a Middle Archaic through Early Woodland site at an approximate elevation of 810 feet msl, and Site 1Ra381 is a Late Mississippian (Nelsons Bend) site at an approximate elevation of 795 feet msl. Both sites are located well north of the reservoir along drainages and/or tributaries feeding into the west side of Tallapoosa River. Site 1Ra313 is not inundated, whereas Site 1Ra381 may be partially inundated. Site 1Ra393 is an unknown aboriginal site consisting of a single rock mound at an approximate elevation of 1,050 feet msl, and Site 1Ra394 is an unknown aboriginal and historic nonaboriginal site consisting of three rock mounds at an approximate elevation of 1,040 feet msl. Both sites are located north of the reservoir located along the east side of the Tallapoosa River and are not inundated. Site 1Ra437 is a Woodland and 20th Century nonaboriginal site at an approximate elevation of 750 feet msl, and Site 1Ra438 is a nonaboriginal site at an approximate elevation of 750 feet msl. Both sites are located outside of the reservoir just west of the Harris Dam facility and are not inundated.

[25] 1Ra32, 1Ra307, 1Ra313, 1Ra362, 1Ra381, 1Ra393, 1Ra 394, 1Ra408, 1Ra437, and 1Ra438.

Of the 191 sites listed as undetermined, 89 are located on the main reservoir. Of these 89 sites, 70 sites[26] are fully inundated within the reservoir between approximate elevations of 660 feet msl to 780 feet msl and would not be exposed during low pool; an additional six sites[27] may be partially to fully inundated; and 13 sites[28] are located along the shore, or in close proximity to the main reservoir, between the approximate elevations of 770 feet msl to 920 feet msl, and do not appear to be inundated.

The remaining 102 sites listed as undetermined are located to the north, northeast, or south of the main reservoir, falling within the Project Boundary as it encompasses the Tallapoosa River and portions of its tributaries to the north, the Little Tallapoosa and Wedowee Creek to the northeast, and the Tallapoosa River to the south (downstream) of the Harris Dam facilities.

There are 81 undetermined sites within the Project Boundary along the Tallapoosa River and portions of its tributaries to the north of the reservoir. Of these 81 sites, 51 sites[29] are inundated; 7 sites[30] are likely partially inundated; and, 23 sites[31] do not appear to be inundated.

There are 17 undetermined sites within the Project Boundary along the Little Tallapoosa River and Wedowee Creek located to the northeast of the reservoir. Of these 17 sites, 11 sites[32] are inundated; 2 sites[33] are likely partially inundated; and, 4 sites[34] do not appear to be inundated.

Finally, there are four undetermined sites located along the Tallapoosa River to the south of the Harris Dam facilities. All four sites[35] do not appear to be inundated.

It is worth noting that erosion is a factor on any watercourse, including reservoirs. Sites located "below the average annual drawdown," of a reservoir are generally those that are "inundated by the initial reservoir-filling episode" and which remain inundated "except in instances of severe drawdown," such as severe drought (Lenihan et al. 1981) or as part of dam maintenance

[26] 1Ra12, 1Ra15, 1Ra20, 1Ra21, 1Ra22, 1Ra23, 1Ra24, 1Ra27, 1Ra28, 1Ra29, 1Ra33, 1Ra63, 1Ra66, 1Ra72, 1Ra76, 1Ra77, 1Ra78, 1Ra156, 1Ra157, 1Ra158, 1Ra160, 1Ra161, 1Ra162, 1Ra163, 1Ra168, 1Ra169, 1Ra170, 1Ra171, 1Ra172, 1Ra176, 1Ra179, 1Ra180, 1Ra189, 1Ra193, 1Ra194, 1Ra196, 1Ra197, 1Ra198, 1Ra199, 1Ra200, 1Ra202, 1Ra204, 1Ra205, 1Ra206, 1Ra207, 1Ra208, 1Ra209, 1Ra210, 1Ra211, 1Ra212, 1Ra213, 1Ra214, 1Ra215, 1Ra216, 1Ra217, 1Ra219, 1Ra220, 1Ra223, 1Ra243, 1Ra255, 1Ra256, 1Ra257, 1Ra260, 1Ra261, 1Ra262, 1Ra268, 1Ra278, 1Ra283, 1Ra284, and 1Ra285.
[27] 1Ra6, 1Ra7, 1Ra65, 1Ra70, 1Ra218, and 1Ra263.
[28] 1Ra164, 1Ra165, 1Ra166, 1Ra167, 1Ra173, 1Ra174, 1Ra175, 1Ra178, 1Ra203, 1Ra269, 1Ra411, 1Ra412, and 1Ra413.
[29] 1Cb19, 1Cb21, 1Ra36, 1Ra37, 1Ra39, 1Ra44, 1Ra45, 1Ra46, 1Ra50, 1Ra51, 1Ra52, 1Ra57, 1Ra60, 1Ra61, 1Ra112, 1Ra113, 1Ra114, 1Ra115, 1Ra116, 1Ra118, 1Ra119, 1Ra120, 1Ra121, 1Ra122, 1Ra123, 1Ra124, 1Ra125, 1Ra126, 1Ra128, 1Ra135, 1Ra136, 1Ra137, 1Ra138, 1Ra141, 1Ra142, 1Ra144, 1Ra146, 1Ra147, 1Ra148, 1Ra149, 1Ra150, 1Ra151, 1Ra153, 1Ra154, 1Ra155, 1Ra264, 1Ra279, 1Ra281, 1Ra282, 1Ra290, and 1Ra292.
[30] 1Ra47, 1Ra49, 1Ra56, 1Ra59, 1Ra143, 1Ra145, and 1Ra400.
[31] 1Ra35, 1Ra38, 1Ra48, 1Ra53, 1Ra55, 1Ra58, 1Ra117, 1Ra127, 1Ra134, 1Ra270, 1Ra380, 1Ra395, 1Ra396, 1Ra397, 1Ra398, 1Ra399, 1Ra401, 1Ra402, 1Ra403, 1Ra404, 1Ra405, 1Ra409, and 1Ra410.
[32] 1Ra93, 1Ra95, 1Ra97, 1Ra98, 1Ra99, 1Ra100, 1Ra102, 1Ra103, 1Ra104, 1Ra106, and 1Ra291.
[33] 1Ra68 and 1Ra69.
[34] 1Ra41, 1Ra83, 1Ra107, and 1Ra109.
[35] 1Ra9, 1Ra10, 1Ra11, and 1Ra441.

protocols. For these sites, unless they are situated on the outside bend of a main channel, mechanical erosion is generally low, while the accumulation of sediments on top of the site is more prevalent. This layer of sedimentation can act as a barrier to help protect the site from mechanical erosion (Lenihan et al. 1981).

The effects of erosion are decidedly different for sites located within the area of shoreline fluctuation of a reservoir. Sites within the area of fluctuation are "periodically exposed" during the annual drawdown of the reservoir (Lenihan et al. 1981). Excluding impacts to these sites caused by looting and artificial modifications, the fluctuation of water levels, exposure to weathering effects from precipitation and/or wind events, as well as watercraft activities are the most influential forces in the erosion of these sites (Fay 1987). The forces of streambank erosion are discussed in a technical report by Keown et al. (1977) and classified into six major categories:

A) Attack on the toe of an underwater slope;
B) Erosion of soil along the bank by current action;
C) Sloughing off of saturated bank due to rapid drawdown;
D) Flow slides (liquification) in saturated silty or sandy soil;
E) Erosion of soil by seepage of soil out of banks at low channel velocities;
F) Erosion of upper bank, river bottom, or both due to wave action caused by boats or wind (Keown et al 1977).

The vertical sequence of sediment deposits along reservoir shorelines plays an influential role in the extent and impact of erosion. Areas of shoreline consisting of homogeneous sediments erode at a much slower rate than areas of heterogeneous sediments that are susceptible to differing levels of weathering and erosion. An example of this is large scale slumping which results from the undercutting of banks comprised of a vertical sequence of heterogeneous sediments (Fay 1987). Undercut and eroded banks along the shoreline can also expose artifacts and features, making a site more visible and therefore more susceptible to looters.

5.11.2 SKYLINE

Skyline lies 110 miles north of Lake Harris and drains into the Tennessee River. The archaeological evidence for Paleoindian occupation of the Tennessee Valley suggests it was one of the most densely occupied areas in North America from about 13,500 years ago. The following compares the history of the Tennessee River Valley, associated with Skyline, compared to the prehistory and history of the Tallapoosa River Basin.

The earliest evidence of human occupation in the southeastern United States is labeled the Paleoindian Stage, which began approximately 11,500 B.C. and continued to approximately 8,000 B.C. There are numerous Early Paleoindian Clovis sites within the Tennessee Valley region of northern Alabama.

During the Middle Archaic Period, most sites were smaller camp sites; however, many larger riverine sites containing hearths, storage pits, and large shell middens indicative of intensive

harvesting and processing events, existed in the Tennessee Valley. During the Late Archaic Period, populations increased rapidly evidenced by the extensive number of sites in the region. The middle Tennessee Valley includes extensive evidence of Gulf Formational occupation; further upriver, the sites are fewer, indicating likely cultural barriers. In contrast to the middle Tennessee Valley, Gulf Formational occupation appears to have been relatively scarce in the Tallapoosa River Basin.

Populations continued to grow, as did the size of village sites, and both the Tallapoosa and Tennessee River Valleys are marked by the remnants of large Middle Woodland sites lining the banks of the rivers. Shell middens were again developed near the shoals and fast-moving waters of the Tennessee. Limestone became the most prevalent pottery tempering agent of the Middle Woodland in the Tennessee River Basin with plain and fabric impressed surface treatments being common. By the end of the Middle Woodland at circa A.D. 700, the variations between the Tennessee Valley and the Tallapoosa River Basin are even more obvious with the Middle Eastern tradition dominating the majority pottery types in the Tallapoosa and the Flint River Culture of the Tennessee Valley making inroads into the upper Coosa River Valley, but not as far as the Tallapoosa.

The grog tempered Baytown pottery came to be prevalent in the Tennessee Valley during the Late Woodland.

During the Mississippian Stage, the Tennessee Valley shows ties to the Mississippi and Black Warrior Basins, while the Tallapoosa sites indicate ties to the Etowah region.

A recent review of the Alabama Cultural Resources Online Database, housed at OAR and consisting of the National Archaeological Database Bibliography, the ASSF (OAR 2017) and the Alabama Phase I Surveys Website (OAR 2014) identified two previous surveys and 142 sites within the Skyline Wildlife Management Area. All 142 sites are listed as undetermined with regard to NRHP eligibility.

A detailed description of the relevant cultural resources surveys, including site description tables (with a description of inundation status), is included in Appendix R, which contains information on sensitive cultural materials and is marked “Privileged”.

5.11.3 TRIBAL RESOURCES

There are no federally recognized tribal lands within the Harris Project Boundary but some tribes may have a historic interest in the Project relicensing. FERC will provide a list of federally recognized Native American tribes for consultation pursuant to Section 106 of the NHPA.

5.12 SOCIOECONOMIC RESOURCES

5.12.1 LAKE HARRIS

The Lake Harris Project Area is located within Clay, Cleburne, and Randolph counties, Alabama. The following is a summary of socioeconomic data for these counties, including population patterns, average household income, and employment sectors.

5.12.1.1 Population Patterns

Table 5-37 summarizes the population estimates for the three counties in which Lake Harris Project lands are located and for the state of Alabama as reported in the 2000 and 2010 Census and as estimated by the U.S. Census Bureau for 2016 (Census Bureau 2018). All counties except for Cleburne experienced a slight decrease in population. The closest population centers to Lake Harris Project Area are the town of Wedowee, the city of Lineville, and the town of Wadley, with populations of 742, 2,590, and 890 respectively, based on the 2016 Census estimate (Census Bureau 2018).

TABLE 5-37 ESTIMATED POPULATION OF CLAY, CLEBURNE, AND RANDOLPH COUNTIES AND THE STATE OF ALABAMA

COUNTY/ STATE	2000 CENSUS	2010 CENSUS	PERCENT CHANGE 2000-2010	2016 ESTIMATES	PERCENT CHANGE 2010-2016
Clay	14,254	13,932	-2.3	13,492	-3.26
Cleburne	14,123	14,972	6.0	14,924	- 0.32
Randolph	22,380	22,913	2.4	22,652	-1.15
Alabama	4,447,100	4,779,736	7.5	4,863,300	1.67

Source: Census Bureau 2018

Based on population estimates for 2017, Randolph County had a population density of 39 people per square mile, which is lower than the state average density of 98 people per square mile. The population density for Clay County was 23 people per square mile, and Cleburne County was 27 people per square mile. In terms of total population in 2017, Randolph County ranked 45 of the total 67 counties in Alabama. Clay County ranked 57, and Cleburne ranked 55 (Alabama Hometownlocator.com 2017).

5.12.1.2 Households/Family Distribution and Income

Table 5-38 provides the household and family distribution and income for Randolph, Clay, and Cleburne counties.

TABLE 5-38 HOUSEHOLD INCOMES AND DISTRIBUTIONS FOR RANDOLPH, CLAY, AND CLEBURNE COUNTIES

	RANDOLPH COUNTY	CLAY COUNTY	CLEBURNE COUNTY
2016 Households[1]	8,691	5,363	5,834
2016 Percentage of Population in Civilian Labor Force[1]	51%	54%	53%
2016 Median Household Income[3]	$37,496	$38,815	$ 36,316
2016 Population Below Poverty Level[1]	22%	19%	17%
October 2017 Unemployment Rate[2]	3.6	3.7	3.5
2015 Approximate Number of Persons per Household[1]	2.5	2.5	2.5

Source: 1 Census Bureau 2018
2 Alabama Department of Labor 2017a

5.12.1.3 Project Vicinity Employment Sources

Randolph, Clay, and Cleburne counties are in the East Alabama Works region as classified by the Alabama Labor Department Workforce Division, which also includes Etowah, Cherokee, Calhoun, and Talladega counties. The top five employers in this region are manufacturing, health care and social assistance, retail trade, educational services, and accommodation and food services (Alabama Department of Labor 2017c)

Employment industries within the counties where the Lake Harris Project Vicinity is located are predominantly in the manufacturing, health care and social assistance, retail trade industries, and educational services industries. ***Table 5-39*** summarizes the percent distribution of employment industries within each of the counties within the Lake Harris Project Vicinity.

TABLE 5-39 2015 PERCENT INDUSTRY EMPLOYMENT BY COUNTIES IN THE LAKE HARRIS PROJECT VICINITY

INDUSTRIES	CLAY	CLEBURNE	RANDOLPH
Manufacturing	9.0	17.5	24.7
Educational Services	9.7	15.6	16.1
Health Care and Social Assistance	12.6	7.7	12.8
Retail Trade	7.0	13.7	13.3
Public Administration	4.5	9.8	6.9
Accommodation and Food Services	2.5	6.6	5.6
Transportation and Warehousing	2.2	N/A	3.6
Finance and Insurance	2.1	N/A	3.3
Wholesale Trade	N/A	2.5	N/A
Construction	N/A	15.3	2.3
Other	10.1	11.3	11.4

Source: Alabama Department of Labor 2017b

According to the 2012 Census of Agriculture, 611 farms were located in Randolph County. 401 farms were located in Clay County and 341 farms within Cleburne County. The average annual production per farm was $182,510 in Randolph County, $144,851 in Clay County, and $247,169 in Cleburne County (USDA 2017).

5.12.2 SKYLINE

The Skyline Project Area is located within Jackson County, Alabama. The following is a summary of socioeconomic data for Jackson County, including population patterns, average household income, and employment sectors.

5.12.2.1 Population Patterns

Table 5-40 summarizes the population estimates for Jackson County and for the state of Alabama as reported in the 2000 and 2010 Census and as estimated by the U.S. Census Bureau for 2016 (Census Bureau 2018). Based on population estimates for 2017, Jackson County had a population density of 50 people per square mile, which is lower than the state average density of 98 people per square mile. Jackson County ranked 26 out of the 67 counties in Alabama in terms of total population in 2017 (Alabama Hometownlocator.com 2017).

5.12.2.2 Households/Family Distribution and Income

Table 5-41 provides the household and family distribution and income for Jackson County as compared to Alabama and the United States.

TABLE 5-40 ESTIMATED POPULATION BY COUNTY IN THE SKYLINE PROJECT VICINITY

COUNTY/ STATE	2000 CENSUS	2010 CENSUS	PERCENT CHANGE 2000-2010	2016 ESTIMATES	PERCENT CHANGE 2010-2016
Jackson	53,926	53,227	-1.3	52,138	-2.0
Alabama	4,447,100	4,779,736	7.5	4,863,300	1.67

Source: Census Bureau 2018

TABLE 5-41 HOUSEHOLD INCOMES AND DISTRIBUTIONS FOR JACKSON COUNTY

	JACKSON COUNTY
2016 Households[1]	19,945
2016 Percentage of Population in Civilian Labor Force[1]	54%
2016 Median Household Income[3]	$38,422
2016 Population Below Poverty Level[1]	18%
October 2017 Unemployment Rate[2]	3.8
2016 Approximate Number of Persons per Household[1]	2.6

Source: Census Bureau 2018

1 Census Bureau 2018

2 Alabama Department of Labor 2017a

5.12.2.3 Project Vicinity Employment Sources

Jackson County is in the North Alabama Works workforce region as classified by the Alabama Labor Department Workforce Division, which also includes Limestone, Madison, Morgan, Cullman, Marshall, DeKalb, Lauderdale, Colbert, Franklin, Lawrence, Marion, and Winston counties. The top five employers in this region are manufacturing, retail trade, health care and social assistance, professional, scientific and technical services, and educational services (Alabama Department of Labor 2017d).

Employment industries within Jackson County are located predominantly in the manufacturing, retail trade, health care and social services, and educational services industries**.** ***Table 5-42*** summarizes the percent distribution of employment industries within the Skyline Project Vicinity.

TABLE 5-42 2015 PERCENT INDUSTRY EMPLOYMENT IN THE SKYLINE PROJECT VICINITY

INDUSTRIES	JACKSON COUNTY
Manufacturing	35.8
Educational Services	8.9
Health Care and Social Services	11.1
Retail Trade	13.1
Public Administration	5.1
Accommodation and Food Services	5.7
Transportation and Warehousing	2.5
Finance and Insurance	N/A
Wholesale Trade	4.0
Construction	2.8
Other	11
Total	100.0

Source: Alabama Department of Labor 2017b

According to the 2012 Census of Agriculture, 1,376 farms were located in Jackson County, and the average annual production per farm was $85,181 (USDA 2017).

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6.0 EXISTING PROGRAMS

6.1 VOLUNTARY FISH HABITAT ENHANCEMENT PROGRAM

In 1992, Bass Anglers Sportsmen Society (B.A.S.S.) signed a memorandum of understanding (MOU) with Alabama Power to initiate programs aimed to enhance the fisheries resources within Alabama Power managed reservoirs. The first project was initiated in January of 1993 with the installation of recycled Christmas trees as fish habitat. Initially the sites were marked with metal signs on the shore, but, since 1999, a global positioning system (GPS) has been used to record the sites. Alabama Power installed recycled Christmas trees at six sites on Harris Reservoir in 2017.

This program has enlisted the aid of countless anglers and the personnel of ADCNR to assist with deployment of these habitat units. Most recently, Alabama Power conducted one habitat enhancement project in Harris Reservoir near the Highway 48 bridge and deployed Christmas trees in six areas.

6.2 LAKE CLEAN UP

Renew Our Rivers is the largest river system cleanup held in the southeastern United States. Renew Our Rivers cleanups typically occur in the fall and spring. During the October 2017 Renew Our Rivers event on Harris Reservoir, a record number of volunteers (142) collected 6.8 tons of trash.

Source: Alabama Power 2017

River Clean Up

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7.0 PRELIMINARY ISSUES AND DRAFT STUDY PLANS

7.1 PRELIMINARY ISSUES

During 2017, Alabama Power met with federal, state, and local resource agencies, NGOs, and other interested groups to introduce the FERC relicensing process and provide background information on the Harris Project. These meetings were instrumental in developing a preliminary list of issues. On October 19, 2017, Alabama Power held a public Issues Identification Workshop attended by federal and state resource agencies, NGOs, and other stakeholders with interest in the Harris Project. In January 2018, Alabama Power sent a compilation of the comments, concerns, and questions raised in the October 19, 2017 Workshop (Appendix S) to the stakeholders on the distribution list, and posted the issues compilation on the Harris relicensing website. Based on the Issues Identification Workshop, Alabama Power recognized the need to educate stakeholders on how the Harris Project is operated during normal, low flow, and flood conditions, including the Green Plan operations. Alabama Power hosted an informational meeting on January 31, 2018, to address questions regarding project operations and to provide a history of the Adaptive Management Process and Green Plan flows; videos of these two presentations are available on the Harris Relicensing website. At this meeting, Alabama Power introduced the concept of relicensing teams, called Harris Action Teams (HATs), that will be comprised of a smaller group of interested stakeholders organized around specific resource issues (e.g., project operations, water quality). The HATs will be active throughout the relicensing process in reviewing existing information, study plans, and reports, and working together with Alabama Power to develop protection, mitigation, and enhancement measures, where applicable.

Based on the stakeholder meetings in 2017 and 2018, Alabama Power identified information gaps for specific resources that would likely require additional study and developed draft relicensing study plans to address those information gaps. Alabama Power held a stakeholder meeting on April 24, 2018, to discuss FERC's study plan process and present an overview of each of Alabama Power's eight proposed relicensing studies, listed below. The draft study plans are included in Appendix T.

7.2 ONGOING AND PROPOSED STUDIES

Alabama Power has been involved in the Harris Adaptive Management Plan since 1998. The Green Plan was implemented in 2005 and has been evaluated since implementation (Section 4.3.4 and Appendix E).

Alabama Power is performing additional fishery collections using the "30+2" IBI methods developed by the Geological Survey of Alabama. These collections will lend further insight to the current condition of the Tallapoosa River downstream of Harris Reservoir in relation to other unregulated streams/rivers in the vicinity. Alabama Power is also collecting flow and stream temperature data during 2018 to assess whether changes in the timing of Green Plan flow pulses affect downstream temperatures.

Along with these on-going studies, Alabama Power proposes to implement relicensing studies based on input from agencies, NGOs, and other interested stakeholders. Alabama Power developed the following draft study plans in consultation with stakeholders (Appendix T):

- Operating Curve Change Feasibility Analysis
  - Examine the feasibility of modifying the current winter operating curve at the Harris Project annually from October through March to enhance recreation access on Harris Reservoir. This study will evaluate potential changes in the winter pool level of Harris Reservoir, in increments of 1 foot, elevations from 785 feet msl to 789 feet msl, and Alabama Power's ability to increase the winter pool elevation and continue to meet project purposes. This study will also examine the effects of a winter operating curve change on operational parameters and resources, including: hydropower generation, Green Plan flows, flood control, navigation, drought operations, water quality and water use, erosion and sedimentation, aquatic species, wildlife and terrestrial resources, T&E species, recreational resources, and cultural resources.
- Tallapoosa River Fisheries Study
  - Address research questions including: 1) the status of the gamefish population in the Tallapoosa River below Harris Dam to Horseshoe Bend; 2) the temperature requirements of fish species of importance to the ADCNR management goals; 3) compare differences between water temperatures of regulated and unregulated sites; 4) evaluate existing information and research to characterize the condition of the fishery and potential effects of water temperatures or other factors; 5) and evaluate use of a bioenergetics model for select species to help determine if, and to what extent, temperature fluctuations affect fish reproduction, growth, and recruitment.
- Water Quality Study
  - Supplement the 2018 Baseline Water Quality Report to characterize water quality under current conditions. Alabama Power will collect additional water quality data and compile and append that information to the 2018 Report. Alabama Power will use the results of this study to develop an application for a Section 401 Water Quality Certification for the Harris Project. Alabama Power will also work with stakeholders to identify and assess potential areas of water quality concern on Harris Reservoir.
- Erosion and Sedimentation Evaluation for Lake Harris and Tallapoosa River
  - Identify problematic erosion sites and sedimentation areas and determine likely causes. Once these hotspots are identified, Alabama Power will perform assessments and collect additional information, as necessary, to describe and categorize each area according to its severity and potential causes(s).
- Threatened and Endangered Species Study
  - Assess the probability of populations of threatened and endangered species and/or their critical habitat(s) occurring within the Harris Project Boundary or in the Tallapoosa River downstream of Harris Dam to Horseshoe Bend and determine if they are affected by existing operations. Information will be used to inform the Section 7 ESA process.

- Project Lands Evaluation
  - Phase 1 of this study will evaluate the existing Project lands and their project purposes. The goal of this study is to evaluate the need for adding and/or removing lands from the Project Boundary and modifying land classifications.
  - Phase 2 of this study will use results of Phase 1 to develop a Shoreline Management Plan for Lake Harris and a WMP for Lake Harris and Skyline.
  - This study will evaluate existing and future timber management practices and incorporate results of the Threatened and Endangered Species Study, as well as BMPs.
- Recreation Evaluation (Lake Harris and downstream)
  - Evaluate existing recreation use and potential future recreation use at the Harris Project including access and facilities (in Lake Harris and downstream of Harris Dam to Horseshoe Bend)
- Cultural Resources
  - Define the Area of Potential Effects (APE) and identify the need for archaeological surveys at the Harris Project. The goal of this study is to develop the Programmatic Agreement and Historic Properties Management Plan.

7.3 RELEVANT QUALIFYING FEDERAL AND STATE OR TRIBAL COMPREHENSIVE WATERWAY AND RESOURCE PLANS

Section 10(a) of the Federal Power Act (FPA), 16 U.S.C. § 803(a)(2)(A), requires FERC to consider the extent to which a project is consistent with federal or state comprehensive plans for improving, developing, or conserving a waterway or waterways affected by the project. On April 27, 1988, FERC issued Order No. 481-A, revising Order No. 481 issued October 26, 1987, establishing that FERC will accord FPA Section 10(a)(2)(A) comprehensive plan status to any federal or state plan that:

- Is a comprehensive study of one or more of the beneficial uses of a waterway or waterways;
- Specifies the standards, the data, and the methodology used; and
- Is filed with the Secretary of the Commission[36].

FERC currently lists comprehensive plans for the State of Alabama and United States. Of these listed plans, 12 are potentially relevant to the Project, as listed below in ***Table 7-1***. These plans may be useful in the relicensing proceeding for characterizing desired conditions.

[36] Refers to the Federal Energy Regulatory Commission.

TABLE 7-1 LIST OF QUALIFYING FEDERAL AND STATE COMPREHENSIVE WATERWAY AND RESOURCE PLANS POTENTIALLY RELEVANT TO THE PROJECT

RESOURCE	COMPREHENSIVE PLAN
Wildlife Resources	Alabama Department of Conservation and Natural Resources. 1990. Wildlife Lands Needed for Alabama. Montgomery, Alabama. October 1990.
Wildlife Resources	Alabama Department of Conservation and Natural Resources. n.d. Alabama's Comprehensive Wildlife Conservation Strategy. Montgomery, Alabama.
Recreation Resources	Alabama Department of Economic and Community Affairs. Alabama Statewide Comprehensive Outdoor Recreation Plan (SCORP): 2008-2012. Montgomery, Alabama.
Fisheries Resources	Gulf States Marine Fisheries Commission. 2006. The Striped Bass Fishery of the Gulf of Mexico, United States: A Regional Management Plan. Ocean Springs, Mississippi. March 2006.
Fisheries Resources	National Marine Fisheries Service. 1995. Gulf sturgeon (*Acipenser oxyrhynchus desotoi*) Recovery/Management Plan. Prepared by the Gulf Sturgeon Recovery/Management Task Team. September 15, 1995.
Recreation Resources	National Park Service. The Nationwide Rivers Inventory. Department of the Interior, Washington, D.C. 1993.
Fisheries Resources	U.S. Fish and Wildlife Service. 2000. Recovery Plan for the Mobile River Basin Aquatic Ecosystem. Department of the Interior, Daphne, Alabama. November 17, 2000.
Fisheries Resources	U.S. Fish and Wildlife Service. n.d. Aquatic Resource Management Plan for the Alabama River Basin. Department of the Interior, Daphne, Alabama.
Fisheries Resources	U.S. Fish and Wildlife Service. Gulf States Marine Fisheries Commission. 1995. Gulf Sturgeon Recovery/Management Plan. Atlanta, Georgia. September 15, 1995.
Wildlife Resources	U.S. Fish and Wildlife Service. Canadian Wildlife Service. 1986. North American Waterfowl Management Plan. Department of the Interior. Environmental Canada. May 1986.
Wildlife Resources	U.S. Fish and Wildlife Service. 1990. Gulf Coast Joint Venture Plan: A Component of the North American Waterfowl Management Plan. June 1990.
Recreation Resources	U.S. Fish and Wildlife Service. n.d. Fisheries USA: The Recreational Fisheries Policy of the U.S. Fish and Wildlife Service. Washington, D.C.

Source: FERC 2017

8.0 PURPA BENEFITS

Alabama Power is not seeking benefits under PURPA (Pub.L. 95–617, 92 Stat. 3117, enacted November 9, 1978) for the Harris Project.

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10.0 REFERENCES BY SECTION

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