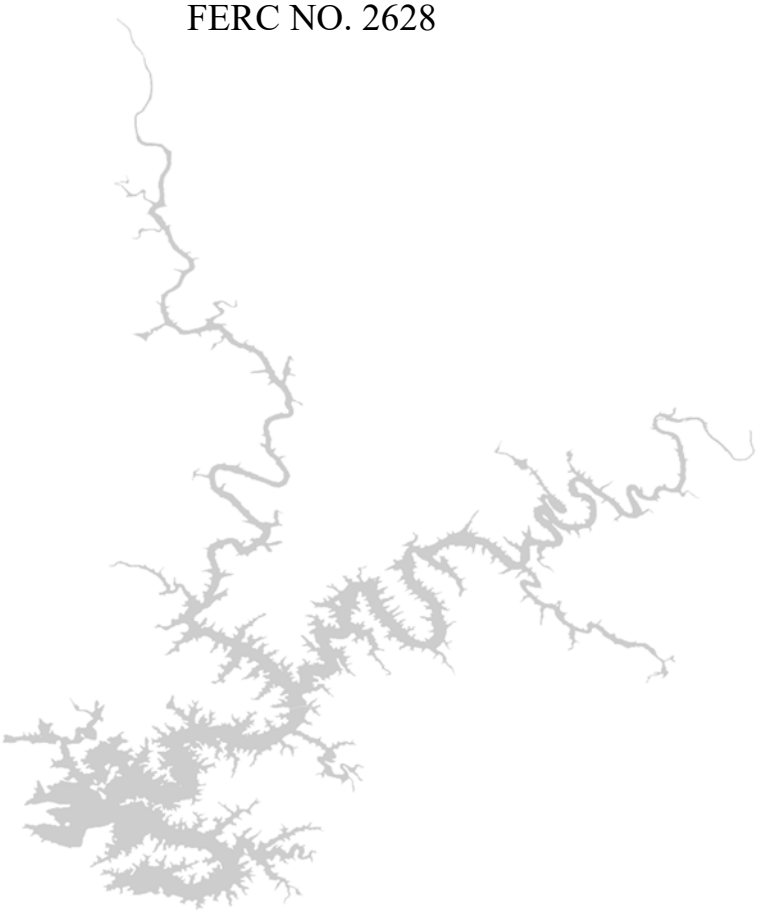
HARRIS DAM
RELICENSING

DOWNSTREAM AQUATIC HABITAT STUDY PLAN

R. L. HARRIS HYDROELECTRIC PROJECT

FERC NO. 2628



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FINAL May 2019

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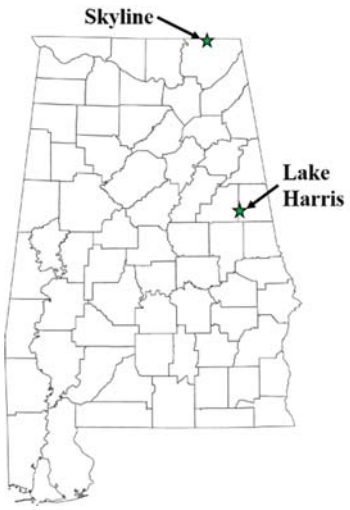
DOWNSTREAM AQUATIC HABITAT STUDY PLAN

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 study plan, "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 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 (Alabama Power Company 2018).

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 their FERC license for the Harris Project is the Harris Reservoir.

[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)

Background and Existing Information

Alabama Power began operating the Harris Project in 1983. Initially, the Project only operated in peaking mode with no intermittent flows between peaks. In the late 1990s, agencies and non-governmental organizations requested that Alabama Power modify operations to potentially enhance downstream habitat. In 2005, based on recommendations developed in cooperation with stakeholders, Alabama Power implemented a pulsing scheme for releases from Harris Dam known as the Green Plan (Kleinschmidt 2018a). The purpose of the Green Plan was to reduce the effects of peaking operations on the aquatic community downstream. A copy of the Green Plan Release Criteria is provided in Appendix A.

Monitoring conducted since initiation of the Green Plan has indicated a positive fish community response due to increased shoal habitat availability (Irwin et al. 2011); however, there is little existing information characterizing the extent that the Green Plan has enhanced the aquatic habitat from Harris Dam downstream through Horseshoe Bend.

1.1 Resource Management Goals

FERC has a responsibility to evaluate project impacts. The goal of the Alabama Department of Conservation and Natural Resources (ADCNR) and other resource agencies/stakeholders is to protect and enhance the health of populations of game and non-game species of fish and other aquatic fauna and their habitats.

1.2 Current Operations and Operational Alternatives

As discussed in Section 1.0, Alabama Power implemented a pulsing scheme in 2005 for releases from Harris Dam known as the Green Plan (Kleinschmidt 2018a). The purpose of the Green Plan was to reduce the effects of peaking operations on the aquatic community downstream. Any effects on aquatic habitat from potential changes in operations will be analyzed in the R.L. Harris Project Reservoir Operating Curve Change Feasibility Study and in the Downstream Release Alternatives Study.

2.0 GOALS AND OBJECTIVES OF STUDY

The goal of this study is to develop a model that describes the relationship between Green Plan operations and aquatic habitat. This will be accomplished by collecting water level, discharge, and channel profile data and combining it with existing information and models.

3.0 PROJECT NEXUS AND GEOGRAPHIC SCOPE

The Harris Project operations have direct, indirect, and potential cumulative effects on lake and downstream resources. The geographic scope for the Downstream Aquatic Habitat Study is the Tallapoosa River below Harris Dam through Horseshoe Bend.

4.0 METHODS

This Downstream Aquatic Habitat Study Plan consists of three primary tasks. These tasks will be accomplished under the direction of a recognized expert in the field of hydraulics and hydrology, and will include opportunities for HAT 3 members to provide input throughout the study process.

Task 1 – Mesohabitat Analysis

A desktop analysis of the types of available habitat in the Tallapoosa River will be conducted using Geographic Information Systems (GIS) and aerial imagery such as the U.S. Department of Agriculture National Agriculture Imagery Program (NAIP). Habitats will be classified into the following categories:

- Riffle: shallow, moderate velocity, turbulent, high gradient, moderate to large substrates (cobble/gravel)
- Run: shallow, moderate to high velocity, turbulent, chutes and eddies present, high gradient, large substrates, or bedrock
- Pool: deep, low velocity, well defined hydraulic control at outlet

Habitat characterizations will be verified with field observations obtained during the performance of Task 2 (see below), depicted graphically using GIS, and quantitatively summarized in tabular format.

Task 2 – Water Level, Channel Profile and Discharge Data Collection and Analysis

Water level loggers will be installed at up to 20 sites along the 43-mile section of the Tallapoosa River from Harris Dam downstream through Horseshoe Bend (i.e., the study area) (**Figure 4-1**). A preliminary review of the river indicates that 20 areas is sufficient to understand how aquatic habitat changes in relation to stream flow. Loggers will be deployed in each mesohabitat within the study reach. The level loggers will be securely anchored in the river and will record depth measurements at 15-minute intervals for a 12-month period, beginning in fall 2018[2]. The location and elevation of the loggers, and the water surface elevation at the time of deployment, will be determined using survey-grade GPS. Logger data will be downloaded at approximately 3-month intervals. Additionally, bed elevation and flow data will be collected using an Acoustic Doppler Current Profiler (ADCP) during current operations to provide information for Task 3.

Depth data from the water level loggers will be converted to water surface elevations (WSELs). Data will be depicted in tables and figures to show the wetted perimeter changes and durations associated with various operations. Data will also be depicted in a format that shows attenuation of various operations as the release moves further downstream from the dam.

[2] Due to high flow conditions in the Tallapoosa River, only three level loggers were deployed in fall 2018; all remaining level loggers will be deployed in the spring 2019 and locations will be provided to the HAT following deployment; the level loggers will be in place for 12 months.

Task 3 - Modeling

The HEC-RAS model being utilized in the R.L. Harris Project Operating Curve Change Feasibility Study will be used and supplemented with data generated by Tasks 1 and 2 of this study. The model will be used to evaluate the effect of current operations on the amount and persistence of wetted aquatic habitat, especially shoal/shallow-water habitat. Modeling results will be presented in graphical and tabular format to describe the amount and persistence of wetted habitat for each habitat type in the study reach.

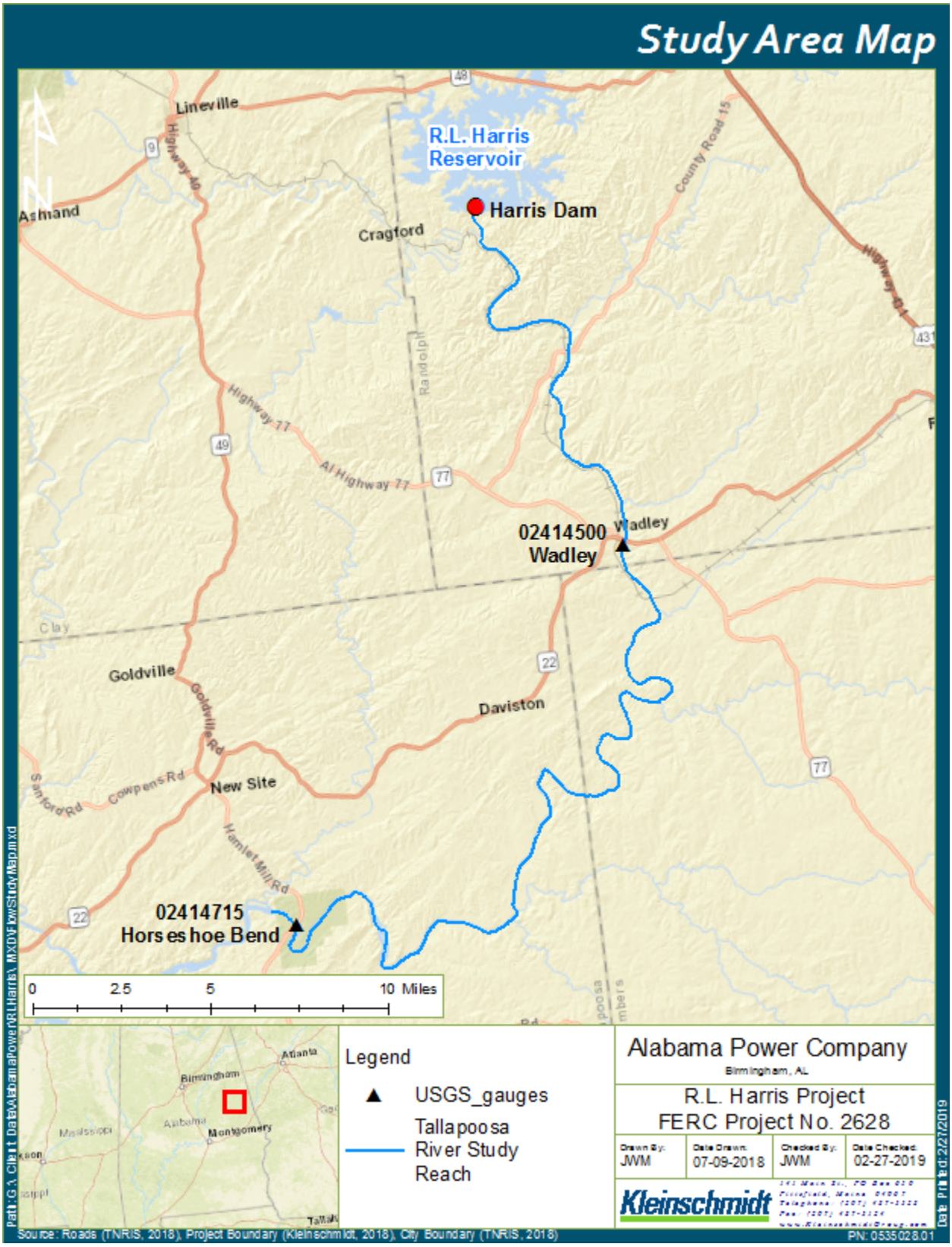


FIGURE 4-1 STUDY AREA MAP

5.0 REPORTS

As the various components of this study are completed and available for review and comment, Alabama Power will share results with HAT 3 through written documentation and stakeholder meetings, as discussed in Section 2.0 of the PAD. Stakeholders will have between 7-30 days to review and comment on documents, depending on the document length and complexity. Additional meetings (in-person and via conference call) will be held as necessary to discuss study results and solicit stakeholder input. Draft and final reports, if applicable to the study, will be filed with FERC as well as provided to the HAT members and posted to the Harris relicensing website for access by the general public.

As part of the Integrated Licensing Process (ILP), FERC requires licensees to file two status reports: the Initial Study Report and Updated Study Report. These reports provide a status update on all the FERC-approved relicensing studies. Alabama Power will prepare these FERC reports per the requirements of 18 CFR 5.15(c) and (f).

While not required in FERC's ILP process, Alabama Power will also file two Progress Updates during the relicensing process to provide additional updates to FERC, stakeholders, and the general public on the status of the relicensing studies, any interim work products, and any draft and final reports issued. The Progress Update will also include HAT meeting summaries. The first Progress Update will be distributed (and filed with FERC) in October 2019, approximately six months prior to the Initial Study Report; the second update will be distributed (and filed with FERC) in October 2020, approximately six months prior to the Updated Study Report.

6.0 SCHEDULE

This schedule corresponds to the FERC-approved Harris Project Process Plan and Schedule. Consultation meeting dates will be finalized with HAT 3 members upon FERC approval of the study plan.

FERC Study Plan Determination	April 2019
Mesohabitat Analysis	April 2019-August 2019
Level Loggers Field Collection	Spring 2019 – Spring 2020
Progress Update	October 2019
HEC-RAS Modeling for habitat	Fall 2019 – Summer 2020
HAT 3 Meeting on habitat analysis to date	November/December 2019
HAT 3 Meeting on progress to date	February/March 2020
Initial Study Report	April 2020
Initial Study Report Meeting	April 2020
HAT 3 Meeting(s), as needed	April 2020 – April 2021[3]
Draft modeling report	June 2020
Progress Update	October 2020
Final modeling report	April 2021
Updated Study Report	April 2021
Updated Study Report Meeting	April 2021

[3] Meetings will be determined with the HAT 3 members based on results of the initial studies.

File Preliminary Licensing Proposal	By July 3, 2021
File Final License Application with FERC	November 2021

7.0 COST AND EFFORT

Alabama Power estimates the cost to consult on and implement this study plan, including costs for developing the draft and final Report, is $400K.

8.0 REFERENCES

Alabama Department of Conservation and Natural Resources (ADCNR). 2016b. Wildlife Management Areas. Available at: http://www.outdooralabama.com/wildlife-management-areas. Accessed November 2016.

Goar, Taconya Piper. 2013. Effects of hydrologic variation and water temperatures on early growth and survival of selected age-0 fishes in the Tallapoosa River, Alabama (Ph.D. dissertation). Available: https://etd.auburn.edu/bitstream/handle/10415/3604/Taconya%20Goar_Dissertation_2013b.pdf?sequence=2&isAllowed=y>. Accessed December 11, 2017.

Irwin, Elise, K.M. Kennedy, T.P. Goar, B. Martin, and M.M. Martin. 2011. Adaptive management and monitoring for restoration and faunal recolonization of Tallapoosa River shoal habitats. Alabama Cooperative Fish and Wildlife Research Unit, Auburn University, Alabama.

Irwin, E.R. and T.P. Goar. 2015. Spatial and temporal variation in recruitment and growth of Channel Catfish, Alabama Bass, and Tallapoosa Bass in the Tallapoosa River and associated tributaries. U.S. Department of Interior, Fish and Wildlife Service, Cooperator Science Series FWS/CSS -116, Washington, D.C.

Kleinschmidt Associates. 2018a. Summary of R.L. Harris Downstream Flow Adaptive Management History and Research. R.L. Harris Project, FERC No. 2628. Kleinschmidt Associates, Birmingham, Alabama.

APPENDIX A

R.L. HARRIS GREEN PLAN RELEASE CRITERIA

R. L. HARRIS GREEN PLAN RELEASE CRITERIA

1. Daily Release Schedule
   a. The required Daily Volume Release will be at least 75% of the prior day's flow at the USGS Heflin Gauge.
   b. In the event that the Heflin Gauge is not in service, the required Daily Volume Release will be at least one-fourth of the previous day's inflow into R L Harris Reservoir.
   c. The Daily Volume Release will not to be below 100 DSF.
   d. Operations to ensure that flows at Wadley remain above the 45 cfs minimum mark shall continue.
   e. The required Daily Volume Release will be suspended if R L Harris is engaged in flood control operations.
   f. The required Daily Volume Release will be suspended if it jeopardizes the ability to fill R L Harris.
2. Hourly Release Schedule
   a. If less than two machine hours are scheduled for a given day, then the generation will be scheduled as follows:
      i. One-fourth of the generation will be scheduled at 6 AM.
      ii. One-fourth of the generation will be scheduled at 12 Noon.
      iii. One-half of the generation will be scheduled for the peak load.
      iv. If the peak load is during the morning, one-fourth of the generation will be scheduled at 6 PM.
   b. If two to four machine hours are scheduled for a given day, then generation will be scheduled as follows:
      i. Thirty minutes of generation will be scheduled at 6 AM.
      ii. Thirty minutes of generation will be scheduled at 12 Noon.
      iii. The remaining generation will be scheduled for the peak load.
      iv. If the peak load is during the morning, thirty minutes of the generation will be scheduled at 6 PM.
3. Two Unit Operation
   a. On the average, there will be more than 30 minutes between the start times between the two units.
   b. Two units may come online with less than 30-minute difference in their start times if there is a system emergency need.
4. Spawning Windows
   Spring and fall spawning windows will scheduled as conditions permit. The operational criteria during spawning windows will supersede the above criteria.