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March 13, 2019

VIA ELECTRONIC FILING

Project No. 2628-065
R.L. Harris Hydroelectric Project
Transmittal of Revised Proposed Study Plans

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

Dear Secretary Bose,

Alabama Power Company (Alabama Power) is the Federal Energy Regulatory Commission (FERC) licensee for the R.L. Harris Hydroelectric Project (Harris Project) (FERC No. 2628). On November 13, 2018, Alabama Power filed 10 proposed study plans for the Harris Project. On December 13, 2018, Alabama Power hosted a study plan meeting to take questions and comments from stakeholders and FERC staff. Attachment A contains the December 13, 2018 study plan meeting summary.

Comments on Alabama Power's November 13, 2018 study plans were to be filed with FERC by February 11, 2019. Three stakeholders filed comments with FERC: the Lake Wedowee Property Owners Association (LWPOA), the Muscogee (Creek) Nation, and the Alabama Historical Commission (AHC)[1] (Attachment B). Alabama Power reviewed all of the December 13, 2018, and February 11, 2019 stakeholder comments and developed the revised proposed study plans (Attachment C).

In the December 13, 2018 study plan meeting, FERC staff requested that Alabama Power address in the cover letter transmitting the revised proposed study plans any issues or comments that were not addressed through revisions to the study plans. Alabama Power received numerous comments on the pre-application document (PAD), most of which were addressed in the November 13, 2019 study plan filing. The LWPOA's comments filed on February 2, 2019 had previously been addressed in the proposed study plans; therefore, no further edits were required to the revised study plans. Alabama Power is responding to the February 11, 2019 Muscogee (Creek) Nation comment letter regarding their information request and will address remaining comments during the development of the Historic Properties Management Plan. The AHC's February 21, 2019 letter indicated support for the relicensing process; therefore, Alabama Power did not make additional edits to the revised study plans as a result of the AHC's letter.

[1] The Alabama Historical Commission (AHC) comments were filed out of time on February 21, 2019; however, Alabama Power considered the AHC's comment in developing the revised proposed study plans.

In comments provided on the draft study plans that were included with the PAD, a stakeholder requested Alabama Power evaluate “an action alternative in which the operations of Harris Dam are modified from a peaking/storage facility to a “run-of-reservoir” facility, where the instantaneous inflow into the project reservoir is roughly equivalent to the outflow.” As noted in the November 13, 2018 study plan filing, Alabama Power does not consider this a reasonable alternative and did not include this alternative in the November 13, 2018 proposed study plans, or the revised proposed study plans. Additional explanation is provided below.

Operating the Harris Project as “run-of-reservoir” (sic) would not meet the purpose and need of the project and is therefore not considered a reasonable alternative. Specifically, this change would adversely affect the following: 1) current operations and system reliability; 2) downstream property owners; 3) downstream navigation and drought operations; 4) the operations of other Alabama Power hydroelectric projects on the Tallapoosa River; 5) spillway gates; and 6) generation reserves. A “run-of-reservoir” operation would also jeopardize the integrity of the turbines, require Alabama Power to pass flows through the spillway gates more often, and would eliminate peaking operations, affecting power generation. We further explain the anticipated effects of this alternative below.

Alabama Power does not consider “run-of-reservoir” operations a reasonable alternative because operating in this manner would eliminate all peaking operations and significantly reduce or eliminate use of the Harris Project for voltage support and system reliability, including black start operations. These are vital purposes of, and services provided by, the Harris Project and ensure critical benefits to Alabama Power’s customers and the electric system as a whole. To support compliance with the North American Electric Reliability Corporation’s (NERC) Reliability Standards, the Harris Project current operations provide a corrective action plan to mitigate system deficiencies that have been identified over the long-term planning horizon. “Run-of-reservoir” operations would reduce or eliminate Alabama Power’s flexibility to mitigate system reliability concerns when they occur in the future.

Based on the inherent nature of a “run-of-reservoir” operation, converting Harris Dam to “run-of-reservoir” would substantially decrease, if not eliminate, the flood control benefits of the Harris Project. Modifying operations from a flood storage project to a “run-of-reservoir” project would require a major overhaul of the U.S. Army Corps of Engineers (USACE) Harris Reservoir Regulation Manual that describes Alabama Power’s flood control operations for Harris Dam. And, even if such an overhaul were possible, Alabama Power does not believe that significantly reducing the flood control benefits of the Harris Project is in the public interest. Without flood control, flood protection for Wadley, Alabama, as well as property owners in the unincorporated areas along the Tallapoosa River would be severely jeopardized. Further, the Federal Emergency Management Agency flood insurance maps would likely need to be revised, resulting in unknown financial consequences for those in any affected areas downstream of Harris.

Further, converting Harris Dam to “run-of-reservoir” would adversely impact navigation downstream and the ability to mitigate drought conditions in the Alabama-Coosa-Tallapoosa (ACT) basin. The navigation support

release template in the ACT Master Water Control Manual was developed based on historical use of storage out of the Harris reservoir. Operating in a “run-of-reservoir” mode would be releasing flows inconsistent with that template. During low flow periods, storage in the reservoir is utilized to supplement flows downstream for these purposes and other interests such as environmental and ecological resources. Of course, releasing water held in storage is contrary to “run-of-reservoir” operations. Without support from storage in Harris during low flow periods, these interests either will be under served or will have to be made up with additional flows from other reservoirs in the Tallapoosa and/or Coosa basins with additional impacts to those reservoirs. The Alabama-ACT Drought Response Operations Plan (ADROP) includes a trigger based on composite storage, which uses the Harris project drought curve. Operating in a “run-of-reservoir” mode during drought would be inconsistent with the triggers defined in ADROP.

Operating the Harris Project as “run-of-reservoir” would also result in changing operations at the Martin Dam Project (FERC No. 349), since inflows to Martin would likely be much greater. In fact, operating the Harris Project as “run-of-reservoir” would cause adverse consequences on the operations of all the hydroelectric power projects on the Tallapoosa, including the Martin Dam and the Yates and Thurlow (FERC No. 2407) Projects. Higher inflows to Martin would decrease available storage and increase outflows resulting in a higher frequency of spilling which would then require spilling through the two downstream run-of-river projects (Yates and Thurlow).

In addition to impacts to flood control, navigation, drought operations, and downstream flooding, the Harris Project turbines are not designed to operate when the “instantaneous inflow into the project reservoir is roughly equivalent to the outflow.” Average inflows into the Harris Project are typically less than the turbines can physically pass; therefore, flows would be required to pass through the spillway gates. Spillway gates are not designed for constant use and modulation as continuous water release devices. Constant use of spillway gates would result in damage to seals and trunnion bearings, skin panel damage, especially near the bottom of the gate, and scour of concrete on the spillway bottom. When the inflow volumes are high enough to pass through the turbines, matching inflow and outflow instantaneously would require constant ramping of the turbines, causing extreme cavitation and significantly reducing the lifecycle of the turbines.

Finally, having the storage at the Harris Project increases generation reserves at critical times for the bulk power system. These reserves are needed to support non-flexible resources such as solar and wind. With the addition of more non-flexible resources to the system in the future, the generation reserves inherent in the design/current operations at the Harris Project become even more important to Alabama Power’s ability to maintain reliability in its bulk power system.

In addition to “run-of-reservoir” operations, the stakeholder also proposed an alternative in which the Harris Project is “operated in a modified “run-of-river” or “run-of-reservoir” mode that allowed slight modifications to accommodate flood control requirements and downstream minimum flow requirements.” This alternative is also not feasible because “run-of-reservoir” and flood control are two distinct project purposes that cannot be accomplished concurrently. However, Alabama Power notes that it is proposing to evaluate in the

Downstream Release Alternatives study plan (Attachment C), an operational alternative that provides a continuous minimum flow while maintaining peaking operations and flood control capabilities.

If there are any questions concerning this filing, please contact me at arsegars@southernco.com or 205-257-2251.

Sincerely,

Angie Anderegg
Harris Relicensing Project Manager

Attachments (3)

cc: Harris Stakeholder List

Attachment A
December 13, 2018 Study Plan Meeting Summary

Meeting Summary
R.L. Harris Project Study Plan Meeting
December 13, 2018
9:00 AM to 1:30 PM
Oxford Civic Center, Oxford, AL

Participants: See Attachment A

Action Items:

- General
  - Alabama Power will define what will be included in the Initial and Final Study Reports.
  - Alabama Power will file HAT meeting notes/summaries with the revised Study Plans.
- Erosion and Sedimentation:
  - Alabama Power will request stakeholder input on erosion and sedimentation sites.
  - Alabama Power will distribute a list and map of the sites identified to date to the Harris Action Team (HAT) 2.
  - Alabama Power will describe the criterion used to distinguish between Project and non-Project related erosion/sedimentation and explain the assumptions for evaluating identified sites.
  - Alabama Power will expand the evaluation sheet to include more specific information, such as: water level, soil types, soil depth, and add a note to Item 9 on the evaluation sheet instructing the evaluator to circle all the potential erosion causes that may apply.
  - Alabama Power will include GIS data with the Draft and Final Study Reports.
- Water Quality:
  - Alabama Power will discuss the location and logging intervals of the Alabama Department of Environmental Management's (ADEM) monitor at Malone and will describe how it may be used in the Study Plan, if appropriate.
  - Alabama Power will include location information for the non-generation monitor, once it is determined.
- Threatened and Endangered Species
  - Alabama Power will ensure analyses consider the effects of all aspects of Project operation (recreation sites, shoreline management, etc.).
- Aquatic Resources
  - Alabama Power will provide additional detail on the study components, as needed, and describe the output for the bioenergetics model.
- Downstream Aquatic Habitat
  - Alabama Power will include a map depicting a general location of the twenty sites where the level loggers were deployed into the revised Study Plan and explain the rationale for site selection.

- Project Lands Evaluation
    - Alabama Power will revise Phase 2 under Shoreline Management Program (SMP) item 4 to include provisions for any sensitive species buffer zones (e.g., northern long-eared bat) near the Project Boundary.
    - Alabama Power will change item 1 of both Phases 2A and 2B to specify that a working group or "sub-HAT" will be formed for persons interested in working on the SMP and Wildlife Management Plan (WMP), replacing the text "Form a HAT 4."
    - Alabama Power will clarify the timing of incorporating results from other studies into this Study Plan.
    - Alabama Power will revise the last sentence in Section 1.2 to add "from a change in reservoir levels."
    - Alabama Power will include specific methods for the Botanical Inventory and clarify that it is an inventory and not a survey.
- Recreation Evaluation
    - Alabama Power will add a map of the study sites and determine if a reservoir survey component will be added.
    - Alabama Power will confirm details on the downstream recreation survey in the Study Plan.
    - Alabama Power will ensure clarity when referring to Project sites and non-Project sites.
    - Alabama Power will consider including survey questions regarding suggestions of additional access ramps downstream.
- Operating Curve Change Feasibility Analysis
    - Alabama Power will clarify "zone of operational influence" in Table 3-1 with a clearer description.
    - Alabama Power will replace "qualitatively evaluate" in Table 4-1.
    - Alabama Power will determine whether a CE-QUAL-W2 model or an Environmental Fluid Dynamics Code (EFDC) model will be used in the revised Study Plan.
    - Alabama Power will incorporate provisions to analyze the frequency and duration of inundation Wetlands in Section 4.1.6 (Terrestrial Wetlands).
    - Alabama Power will define item number 4: "unsteady state" in Appendix A: Models and Datasets.
- Downstream Release Alternatives
    - Alabama Power will explain what the Phase 2 output will be comprised of once it is determined.
    - Alabama Power will define "advection-dispersion module" in Section 4.2.4.
    - Alabama Power will provide a rationale for not analyzing a run-of-reservoir scenario and more information on flood control and navigation in the Alabama River.
    - Alabama Power will discuss rationale of why an alternative continuous minimum flow, if requested by a stakeholder, was not part of the Study Plan; Alabama Power will include this discussion in the cover letter transmitting the revised Study Plans.
    - Alabama Power will consider adding a schematic or diagram of how alternative flows will be evaluated with results from other relicensing studies.

    - Alabama Power will add information discussing uncertainty of models.
    - Alabama Power will make the hydrologic models available to the public and provide a summary of outputs of the Hydro Budget model.
    - Alabama Power will clarify the meaning of "modified Green Plan operations."
- Cultural Resources
    - Alabama Power will revise the schedule to show that the Draft Programmatic Agreement (PA) will be issued with FERC's Draft National Environmental Policy Act (NEPA) document and the Final PA with FERC's Final NEPA document.
    - Alabama Power will explain the methodology of surveys that will be conducted.
    - Alabama Power will ensure the Study Plan does not pre-determine a PA.
    - Alabama Power will revise the geographic scope to read "the APE, as defined by HAT 6."
    - Alabama Power will revise the Study Plan to note that a Final Historic Properties Management Plan (HPMP) will be filed with the Final License Application.

Notes:

Introduction – Angie Anderegg (Alabama Power)

Angie gave an introduction and discussed safety and the meeting objectives. Sarah Salazar (Federal Energy Regulatory Commission (FERC)) thanked everyone, encouraged participation in the meeting and reminded the group of the comments in Scoping Document 2.

Erosion and Sedimentation – Henry Mealing (Kleinschmidt)

Henry noted there were not many updates since the September 20, 2018 HAT meeting. Primary updates included the addition of details on the geographic scope at Skyline, the types of soil/erosion professionals that would be performing soil surveys, and a bank erosion susceptibility analysis. Henry noted that a complete survey will take place from Harris Dam through Horseshoe Bend. The focus of this study is to identify a baseline of erosion and sedimentation areas in the reservoir and downstream and to determine the causes. Angie noted that Alabama Power will ask for stakeholder input on erosion and sedimentation sites. Henry explained that the homeowners know where the erosion and sedimentation sites are located. He noted the importance of providing as precise a location as possible, as well as photographs. Barry Morris (Lake Wedowee Property Owners Association (LWPOA)) asked if there was already a list of sedimentation sites around the reservoir. Angie noted that stakeholders marked erosion and sedimentation areas on maps during the Issue Identification Workshop in October 2017. FERC staff requested that Alabama Power describe the criteria used to distinguish between Project and non-Project related issues and explain the assumptions for evaluating erosion and sedimentation sites. Henry noted that Alabama Power will go to each site and examine the slope, soil types, wind fetch, etc. Alabama Power will use this baseline information for evaluating potential changes associated with a change to the Harris Project Operating Curve. Sheila Smith (Alabama Power) explained that to date, Alabama Power has not conducted any shoreline stabilization at the Harris Project. FERC staff requested that Alabama Power provide narrative descriptions of the erosion and sedimentation site evaluation criteria provided in the data sheet. Brad Mitchell (LWPOA) asked what makes a site "problematic", and Henry explained that stakeholders should provide information on any sites that may need to be evaluated, and Alabama Power will note these sites for evaluation during the relicensing study. Sarah noted that the FERC license will last 40 to 50 years, and, as such, FERC is identifying issues (including sites that may develop) that could occur through the entire license term. Henry explained that in

addition to stakeholder input, Alabama Power surveillance contractors will also identify sites on the reservoir, and Trutta (downstream contractor) will evaluate the area downstream of Harris Dam through Horseshoe Bend. Rachel McNamara (FERC) explained that FERC can only protect, enhance, or mitigate those resources that are affected by Project operations. Taconya Goar (Alabama Department of Conservation and Natural Resources (ADCNR)) inquired whether there have been previous erosion studies to date downstream of Harris Dam. Angie Anderegg stated that, to the best of Alabama Power's knowledge, none have been conducted, so the information collected will be baseline information. Henry noted that Alabama Power could provide any GIS data collected and would provide water level on the site evaluation form. In addition, Henry explained that for the downstream evaluation, oral histories and photographs may also be of value, but Alabama Power will work with a contractor who will float the area to evaluate active and potential erosion sites and provide a GIS overlay for the baseline condition.

Water Quality – Jason Moak (Kleinschmidt)

Jason M. noted that Alabama Power revised the geographic scope to include tributaries to Harris Reservoir, Little Coon Creek, and Crow Creek. In addition, Alabama Power added non-generation monitoring. Jason also noted that a different water quality model may be used than originally noted in the November 2018 Study Plans. Allan Creamer (FERC) asked about sampling intervals for the water quality monitors downstream of Harris Dam. Jason Carlee (Alabama Power) noted that the downstream location was remote, and, due to battery life and quality control, it would be difficult for Alabama Power to collect data at intervals of less than one hour. Jason M. described an additional dissolved oxygen (DO) monitor that Alabama Department of Environmental Management (ADEM) placed at Malone during 2018. ADEM staff noted that data at the Malone monitor is likely recording measurements at 15-30 minute intervals. Keith Chandler (Alabama Power) explained that ADEM requires Alabama Power to monitor at one-hour intervals for compliance purposes. There was discussion on defining generation versus non-generation data and the location of the tailrace monitor(s). Jason Carlee noted that Alabama Power would provide a continuous data set from the non-generation monitor and attempt to distinguish between generation and non-generation data recorded by that monitor. FERC staff requested Alabama Power provide the location of the monitor in the Study Plan, once it is determined. In addition, Rachel noted that if Alabama Power is using data from the ADEM monitor at Malone, Alabama Power will need to include those details in the Study Plan.

Threatened and Endangered Species – Henry Mealing

Henry described the edits to the Study Plan, which included revisions to the geographic scope to include the Tallapoosa River from Harris Dam downstream through Horseshoe Bend, the inclusion of species that were historically present in the Project area but are now gone, and the addition of new species provided by FERC in the Scoping Document. Ken Wills (Alabama Glade Conservation Coalition) asked about reintroduction of the pool sprite, and Henry noted that reintroduction may be possible as a Protection, Mitigation, and Enhancement (PM&E) measure. FERC staff requested that Alabama Power include criteria for field sampling in the Study Plan and noted that FERC looks at comprehensive Project uses including vegetation management, maintenance, and recreation facilities, not just Project operations. Henry noted that the primary criteria for field sampling will be based on requests from U.S. Fish and Wildlife Service.

Aquatic Resources – Jason Moak
Jason described the edits to this Study Plan, which included expanding the study to include a comprehensive characterization of aquatic resources within the Project Area (the reservoir and downstream of Harris Dam through Horseshoe Bend), a desktop assessment of aquatic resources and a field survey portion (conducted primarily by Auburn University), an updated schedule to conform to FERC-approved Integrated Licensing Process (ILP) schedule, and added study cost information. In addition, the study will include both game and non-game species. The group discussed the use of Alabama Water Watch data from citizen monitors. Barry commented that all the information for the last 15 years is available on the Alabama Water Watch site with Auburn University. Alabama Power noted they would use the data, if applicable, and Henry noted that this study will mostly focus on fish growth and fish temperature requirements. Allan requested that Alabama Power provide more details on the study components in the Study Plan and describe the output for the bioenergetics model. Jason and Henry again explained that the study will primarily look at fish growth. The group discussed target fish species and the use of macroinvertebrates in the study. Jason noted that channel catfish are used as a representative species for the catfish family and that the previous macroinvertebrate work in the Harris Project was summarized in the Harris Pre-Application Document (PAD).

Downstream Aquatic Habitat – Henry Mealing
Henry explained that since the last meeting, Alabama Power increased the number of level loggers and will incorporate existing HEC-RAS transect data into the study. The group discussed the revised geographic scope, noting that this study will build a HEC-RAS model and gather baseline information that will be used for effects analyses in other studies Although only three level loggers are deployed to date, Alabama Power determined a tentative location for twenty level loggers and will include a map with general level logger locations in the Study Plan. One of the twenty level loggers may be substituted with an already existing USGS gage at Horseshoe Bend.

Project Lands – Dave Anderson (Alabama Power)
Dave explained a few major changes, which included expanding the methods (i.e., detailed description of vegetation management (existing tree removal, etc.)), an added section on habitat suitability for bobwhite quail, an updated schedule, and the addition of study cost information. Dave stated that Alabama Power will present the initial Project Lands proposal (potential land use category changes) in Q2 2019. The group discussed the Sensitive Resources classification and the lands that are part of the proposed botanical survey. Dave explained that the Sensitive Resources overlay is usually used for the shoreline, and Alabama Power may need a unique Project Lands classification for the “glades” area. Taconya asked if Alabama Power has a target percentage for each classification. Tina Mills (Alabama Power) noted that Alabama Power reviews Project lands parcel by parcel and that the goal is to classify the land correctly, rather than meet a specific percentage. Next, the group discussed quail habitat, and Ken Wills indicated that the Grass Land Initiative would be interested in working on any quail habitat surveys. Jason Carlee explained that The Nature Conservancy determined that there was not much quail habitat available in the Project Area. ADCNR staff stated that declines in quail population are too complicated to be explained by declines in habitat alone and that studies have shown a lack in predator control has contributed to reductions in quail populations. FERC staff stated that they need a record of all the stakeholders interested in quail habitat. In addition, Alabama Power will

look for any buffer zone overlap for sensitive species (e.g., northern long-eared bat - 150 feet for a roost and a quarter mile for hibernaculum) within the Project Boundary. FERC staff noted that Alabama Power needs to clarify the schedule in the Study Plan to detail what methods FERC is approving and what Alabama Power will file as part of the Initial and Updated Study Report, including what will be filed with the Shoreline Management Program (SMP) and Wildlife Management Plan (WMP). In addition, FERC staff clarified the use of "Form HAT 4" in the schedule, which should read "Form sub-HAT." Finally, FERC requested some clarification on how Alabama Power classifies lands, the study schedules, and language used in the Study Plan. Dave explained that there are existing classifications at Harris, and Alabama Power will align the land classifications for Harris with those of other Alabama Power hydroelectric projects. In addition, Dave noted that Alabama Power would try to provide a more precise schedule and clarify how all the studies will coordinate and interact. Dave also confirmed that Alabama Power would revise Section 1.2 of the study to include "from a change in reservoir levels," and Alabama Power will distinguish between "inventory" and "survey" with regards to the methods for the Botanical Inventory.

Recreation – Dave Anderson

Dave explained the primary updates of the Study Plan, which include a description of the tools that will be used to evaluate reservoir elevations at which boat launches become inoperable, modifications to the section describing creel surveys to include a study of downstream use and boatability as well as creel estimates, elimination of references to Form 80, an updated schedule that conforms to the FERC-approved ILP schedule, and added study cost information. Dave also explained that for the reservoir portion of the study, the counts will be conducted as summarized in Appendix B. For each month, sites on the reservoir (including the tailrace fishing platform) will be counted a minimum of six weekdays (from 8 am to 5 pm) and three weeknights (after 5 pm) at varying times of day and days of the week. Two weekend days and one weekend night will be observed each month, and one count will be conducted during each holiday weekend (Memorial Day, Fourth of July, and Labor Day). For the downstream portion of the study, Alabama Power proposes to conduct counts and user surveys for 36 days between May and October of 2019. Alabama Power will retain the creel portion as part of the survey and work with Mississippi State University on developing additional details regarding the survey. FERC staff requested a copy of the brochure displaying canoe trail maps. Next, the group discussed conducting surveys in the reservoir. Rachel commented that recreation user surveys are typically included in these types of studies during relicensing. Dave stated that Alabama Power will be looking at public ramps and private docks to determine the percentage of usable ramps and docks at each proposed water level. Rachel commented that data about Project sites versus non-Project sites need to be clarified. Barry Morris asked how Alabama Power will account for people that would like to go to the lake for recreation if there was better access. Dave replied that Alabama Power uses existing information to estimate demand and incorporates information from the Statewide Comprehensive Outdoor Recreation Plan (SCORP). Additionally, Alabama Power relies on input from state agencies, such as the Alabama Department of Conservation and Natural Resources (ADCNR) and the Alabama Department of Economic and Community Affairs (ADECA), Dave also mentioned the Issue Identification Workshop in which stakeholders identified where they would like more parks and that this would be considered. Fred Couch asked if part of the study would show where proposed access ramps in the river downstream of Harris Dam are being suggested, and Dave answered that questions regarding access ramps can be included on the survey.

Operating Curve Change Feasibility Analysis – Henry Mealing
Henry noted that the only Study Plan edit was to revise the geographic scope to read "through Horseshoe Bend." FERC staff asked for clarification on a few of the Study Plan components. Alabama Power explained that the "zone of operational influence" refers to how far downstream flows attenuate, the water quality qualitative assessment in Table 4-1 refers to the CE-QUAL-W2 model, and the Environmental Fluid Dynamics Code (EFDC) may possibly replace the CE-QUAL-W2 model. Next, the group discussed the resources that Alabama Power will review as part of the study. FERC staff requested that the analysis of effects on wetlands include an assessment of the frequency and duration of inundation. Henry noted that these are not listed in any particular order, and Alabama Power staff noted that each resource will be given equal consideration but not necessarily equal weight when making a determination. Parameters such as flood control are considered more critical than some of the other resources. In addition, Alabama Power noted that any changes to the operating curve would have to be approved by the United States Army Corps of Engineers (USACE) and FERC.

Downstream Release Alternatives – Henry Mealing and Jason Moak
Jason explained that the purpose of this study is to develop simulation models for analyzing proposed alternatives to the existing downstream pulsing releases (i.e., the Green Plan) and noted that the geographic scope of this Study Plan is Harris Reservoir and the Tallapoosa River downstream of Harris Dam through Horseshoe Bend. Jason explained that the methods to this study consisted of two phases. In Phase 1, modeling simulations would be performed using the USACE HEC-RAS and HEC-Statistical Software Package (HEC-SSP), HEC-Reservoir Simulation Model (HEC-ResSim), the Alabama-Coosa-Tallapoosa (ACT) unimpaired flow data set developed by the USACE and other stakeholders, and Alabama Power's Hydro Budget model. Phase 2 would use the results of Phase 1 and other FERC-approved Harris relicensing studies to conduct qualitative and quantitative evaluations of the effect(s) of different downstream release alternatives. Jason explained that pre-Green Plan, Green Plan, a continuous minimum flow (150 cfs), and a "modified" Green Plan (possibly changing the timing of the existing volume of the Green Plan pulses) would be examined using the models. Jason described the methods used to determine the potential effects of these alternatives on water quality, water use, erosion, aquatic resources, wildlife, threatened and endangered species, recreation resources, and cultural resources. Jason and Henry explained that the output of Phase 2 will depend on both quantitative and qualitative data and that the goal is to have Phase 2 results ready before the Final License Application. Though not specifically related to the Study Plan, Sarah asked if Alabama Power is considering changing the position of the penstock skimmer weir. Angie replied that results from the study will be used to respond to FERC's question. FERC staff asked that Alabama Power clarify a few of the terms used in the Study Plan, provide additional information in some sections, and justify its reasons for not including run-of-reservoir as an alternative and to quantify the amount of effort that would be needed to analyze run-of-reservoir. Though not related to the current Study Plan, Ken Wills noted he could provide information for inclusion of the shoal lily in the Tallapoosa River downstream of Harris Dam into the modeling. Allan asked if alternatives to the proposed 150 cfs would be included in models. Angie responded that no alternatives have been recommended by stakeholders. Curt Chaffin (Alabama Rivers Alliance) commented that no alternative minimum flows have been suggested, because stakeholders were waiting to see the results of other Project relicensing studies before formulating any suggestions. Alabama Power staff stated that they would need to receive any

suggestions on downstream flows as soon as possible. Jason stated that suggestions do not have to be a specific flow number, but could be a specific goal, such as a target wetted habitat percentage. The group discussed the feasibility of a minimum flow of 150 cfs, namely in scenarios where reservoir inflow is low.

General Comment for all Study Plans with Modeling:
FERC staff asked about the difficulty in running a "new" alternative through the model once it is developed and about how each of the models relate to one another, namely when the output of one model becomes the input of another model. The group also discussed possible uncertainties associated with each model. Alabama Power commented that uncertainties would be identified in each of the study reports. The group discussed accessibility of the models by the public. Ashley McVicar (Alabama Power) stated that summaries of outputs from the Hydro Energy model are not proprietary, have been shared for previous projects, and can be shared for Harris. Rachel recommended that any off-record discussions or negotiations with HATs needed to be disclosed to FERC and filed with the revised Study Plans.

Cultural Resources – Amanda Fleming (Kleinschmidt)
Amanda explained the purpose of the study is to define the area of potential effects (APE), work with FERC to develop the programmatic agreement (PA), and with stakeholders to develop a Historic Properties Management Plan (HPMP). The edits to the Study Plan included a list of Native American tribes that have been consulted, an updated schedule to comply with the FERC-approved ILP, and the addition of cost information. Rachel noted that the revised FERC policy includes issuing the Draft PA with the Draft National Environmental Policy Act (NEPA) document and the Final PA with the Final NEPA document. In addition, Rachel explained that Alabama Power should note that surveys will abide by state standards and explain that the APE will be defined in HAT 6. Amanda noted that Alabama Power would revise the Study Plan to include the suggested edits. Amanda announced that the first HAT 6 meeting is January 25th. This meeting will include a tour of the Harris reservoir (by boat) during the winter operating curve; it will not include Skyline or downstream properties.

The meeting adjourned at 1:30 p.m.

ATTACHMENT A – MEETING PARTICIPANTS

Harris Study Plan Meeting Participants
December 13, 2018
9:00 AM to 1:30 PM
Oxford Civic Center, Oxford, AL

Name	Organization
Damon Lee Abernethy	Alabama Department of Conservation and Natural Resources
Steve Bryant	Alabama Department of Conservation and Natural Resources
Taconya Goar	Alabama Department of Conservation and Natural Resources
Chris Greene	Alabama Department of Conservation and Natural Resources
Keith Henderson	Alabama Department of Conservation and Natural Resources
Mike Holley	Alabama Department of Conservation and Natural Resources
Nick Nichols	Alabama Department of Conservation and Natural Resources
Jennifer Haslbauer	Alabama Department of Environmental Management
Michael Len	Alabama Department of Environmental Management
David Moore	Alabama Department of Environmental Management
Angela Anderegg	Alabama Power
Dave Anderson	Alabama Power
Jeff Baker	Alabama Power
Jason Carlee	Alabama Power
Keith Chandler	Alabama Power
Bill Gardner	Alabama Power
Steve Krotzer	Alabama Power
Ashley McVicar	Alabama Power
Tina Mills	Alabama Power
Alan Peeples	Alabama Power
Shelia Smith	Alabama Power
Thomas St. John	Alabama Power
Ken Wills	Alabama Glade Conservation Coalition
Curt Chaffin	Alabama Rivers Alliance
Martha Hunter	Alabama Rivers Alliance
Fred Couch	Alabama Scenic River Trail
Kristie Coffman	Auburn University
Elise Irwin	Auburn University

Name	Organization
Allan Creamer	Federal Energy Regulatory Commission
Rachel McNamara	Federal Energy Regulatory Commission
Sarah L. Salazar	Federal Energy Regulatory Commission
Monte Terhaar (phone)	Federal Energy Regulatory Commission
Kyrstin Wallach (phone)	Federal Energy Regulatory Commission
Butch Jackson	Keller Williams Realty
Nancy Burnes	Lake Wedowee Property Owners Association
Gene Crouch	Lake Wedowee Property Owners Association
Sylvia French	Lake Wedowee Property Owners Association
Tom Garland	Lake Wedowee Property Owners Association
Brad Mitchell	Lake Wedowee Property Owners Association
Barry Morris	Lake Wedowee Property Owners Association
Roger McNeil	National Weather Service
Richard Burnes	Stakeholder
Donna Matthews	Stakeholder
Jerry and Mary Lee Poss	Stakeholder
Kate Cosnahan	Kleinschmidt Associates
Colin Dinken	Kleinschmidt Associates
Amanda Fleming	Kleinschmidt Associates
Henry Mealing	Kleinschmidt Associates
Jason Moak	Kleinschmidt Associates

Attachment B
Stakeholder Comments on November 13, 2018 Study Plans

Lake Wedowee Property Owners' Association Relicensing Requests

1. The number one concern of the Lake Wedowee Property Owners' Association (LWPOA) is the winter pool level. LWPOA respectfully requests the lake level not be dropped to the 785 feet during the winter. The Association and its members recommend a winter pool of 789 feet. Many reasons contribute to this request. The vast majority of docks on Harris Reservoir/Lake Wedowee have transitioned to floating structures as previous construction was stationary. This transition no longer requires the lower level for winter maintenance or repair. With the approval of the 789 feet level, sea wall construction and repair will not be negatively affected.

2. The LWPOA members support and request the ability to increase the number of daily campground/picnic facilities, with beach areas, boat launch access, and adequate parking.

3. Sedimentation is another concern of the LWPOA and our stakeholders. Numerous local water tributaries are depositing soil sediments and other debris into the reservoir, therefore, making boating difficult and hazardous in many areas.

4. So many areas of the lake have silted in due to runoff from shorelines. In many places, main waterways (creek and river runs) have silted in making navigation difficult during the day but difficult and hazardous to those on the lake at night. LWPOA requests lighted hazard buoys for safer night time navigation.

5. In conjunction with sedimentation, another concern is the runoff from pasturelands and chicken houses located along waterways or close to waterways so that runoff in the form of chemicals, pesticides, etc. find their way into the Tallapoosa and Little Tallapoosa finally ending up in Lake Wedowee. LWPOA requests stricter guidelines for agricultural areas/businesses along the waterways feeding into the reservoir.

6. Many LWPOA members request stricter regulations for wake boats that would seek to minimize the damage they cause to shorelines, boat ramps, and personal docks. These boats generate fierce wakes that torque docks where their ramps are attach to the shoreline. Occupants on the docks can and have been injured as a result of these huge wakes. Community boat ramps have suffered significant erosion around the adjoining shoreline. Natural shorelines are eroding and causing more dirt/silt, trees/vegetation and debris to wash into the lake and redefine the shoreline water depths.

THE
MUSCOGEE (CREEK) NATION

Historic and Cultural Preservation Department
PO Box 580 | Okmulgee, OK 74447
T 918.732-7733 | F 918.758-0649

JAMES R. FLOYD
PRINCIPAL CHIEF
LOUIS A. HICKS
SECOND CHIEF

February 11, 2019

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

Dear Ms. Bose,

The Muscogee (Creek) Nation has reviewed the Pre-Application Document (PAD) and the Proposed Study Plan (PSP) for the R.L. Harris Hydroelectric Project (Project No. 2628-065). This project area is located in an area that is culturally significant to our Tribe. We have the following comments and request for the HAT 6 document: "Cultural Resources Programmatic Agreement and Historic Properties Management Study Plan."

General Comments:

- We ask that any information that is disseminated from our Tribe is kept confidential between FERC and the Tribes involved in this project. Tribes have sensitive information that should not be distributed to other parties.

- In regards to the Area of Potential Effect (APE), the Muscogee (Creek) Nation should be consulted on the APE before a boundary is established.

- All future archaeological or cultural resource surveys must be conducted by individuals that meet the Secretary of Interior Standards for Archaeology (36 CFR Part 61). Also, the CV/resume of all personnel involved in the fieldwork and lab work should be given to the Tribes to review.

- All future surveys must be conducted with Tribal input and should be done in consultation in advance of the relicensing.

- Background research for the project and the establishment of the Historic Properties Management Plan (HPMP) should consider all previously recorded sites that are present within the APE. This should include any sites that have been inundated due to the addition of the dam. All of this information should be distributed among the Tribes. The plan mentions that 16 cultural resource studies were conducted in the Harris Project Area in the 70s and 327 archaeological sites are within the project area. The Muscogee (Creek) Nation requests copies of all previous surveys and a list that summarizes the 327 sites by name, eligibility determination, and site components for better reference. Please include a map of the archaeological sites within the project boundary.

THE
MUSCOGEE (CREEK) NATION

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- Muscogee (Creek) Nation requests aerial photos of the fishing weir sites that were inundated by the Harris Reservoir. We were told on the boat tour that over 60 sites were documents previously. We are unsure of the locations and would like to see the aerial maps.

- We also request GIS files of the proposed project boundary.

- Muscogee (Creek) Nation requests that a Tribal Monitoring Plan be developed and agreed upon by the Tribes and Alabama Power concerning the presence of Tribal Monitors during future archaeological surveys and archaeological site monitoring.

- A Traditional Cultural Property (TCP) Identification Plan should be developed in consultation and coordination early on with Tribes for use in the HPMP.

- An Inadvertent Discovery Plan should be in place before any future surveying of the APE. This should include the steps to take if human remains are discovered during excavation. The Muscogee (Creek) Nation insists that, if remains are found, that no photos of the remains and/or associated funerary objects be taken. Also, that the remains are covered and left in place until the proper individuals, including Tribes, are notified. This plan should be done in consultation and coordination with the Tribes.

- The Muscogee (Creek) Nation prefers to be contacted by email at raebutler@mcn-nsn.gov and section106@mcn-nsn.gov for all Section 106 undertakings and tribal consultation.

Should further information or comment be needed, please do not hesitate to contact me at (918) 732-7678 or by email at raebutler@mcn-nsn.gov.

Mvto

RaeLynn Butler

RaeLynn A. Butler
Historic and Cultural Preservation Manager
Muscogee (Creek) Nation

ALABAMA HISTORICAL COMMISSION

468 South Perry Street
P.O. Box 300900
Montgomery, Alabama 36130-0900
334-242-3184 / Fax: 334-240-3477

Lisa D. Jones
Executive Director
State Historic Preservation Officer

February 6, 2019

William S. Gardner
Alabama Power Company
600 North 18th Street
Birmingham, AL 35291

Re: AHC 2017-1147
R.L. Harris Cultural resources Study Plan
FERC No 2628
Clay and Randolph Counties

Dear Mr. Gardner:

Upon review of the proposed Harris Project (FERC No 2628) Cultural Resources Study Plan, the Alabama Historical Commission does not have any comments at this time. We look forward to working with Alabama Power throughout the Harris relicensing.

We appreciate your commitment to helping us preserve Alabama's historic archaeological and architectural resources. Should you have any questions, please contact Amanda McBride at 334.230.2692 or Amanda.McBride@ahc.alabama.gov. Have the AHC tracking number referenced above available and include it with any future correspondence.

Sincerely,

Lee Anne Wofford
Deputy State Historic Preservation Officer

LAW/amh/amh

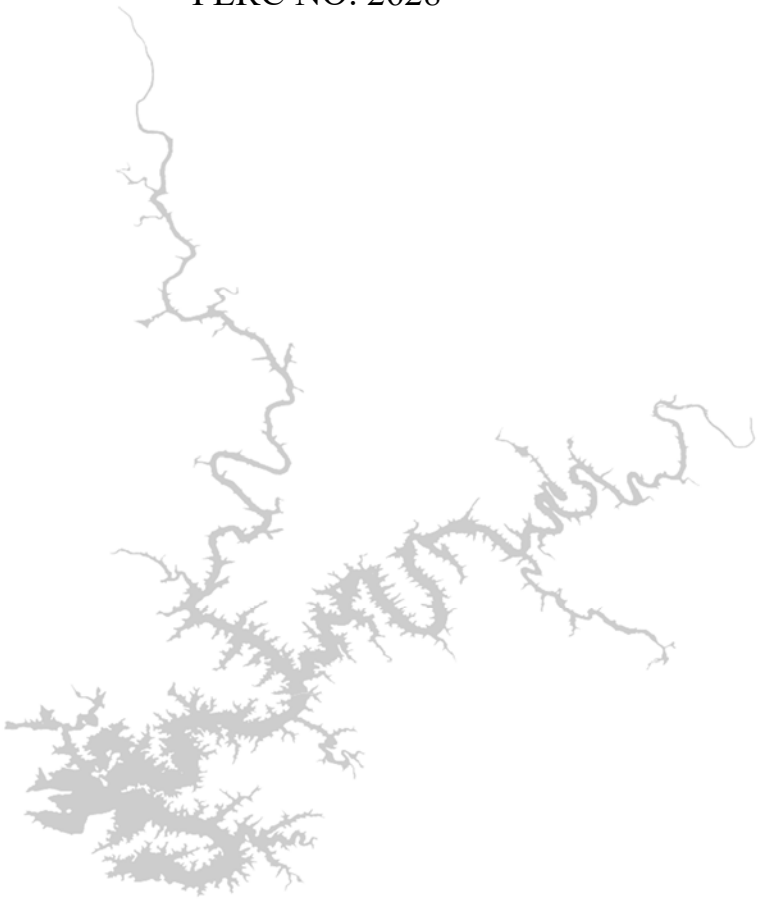
Attachment C
Proposed Study Plans

HARRIS DAM
RELICENSING

DOWNSTREAM RELEASE ALTERNATIVES STUDY PLAN

R. L. HARRIS HYDROELECTRIC PROJECT

FERC NO. 2628



Prepared by:

ALABAMA POWER COMPANY
BIRMINGHAM, ALABAMA

Alabama Power

March 2019

ALABAMA POWER COMPANY
BIRMINGHAM, ALABAMA

R. L. HARRIS HYDROELECTRIC PROJECT
FERC NO. 2628

DOWNSTREAM RELEASE ALTERNATIVES STUDY PLAN

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DOWNSTREAM RELEASE ALTERNATIVES 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. Agencies and non-governmental organizations requested that Alabama Power modify operations to potentially enhance downstream aquatic 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. Although Green Plan operations are not required by the existing license, Alabama Power has operated Harris Dam according to its guidelines since 2005. A copy of the Green Plan Release Criteria is provided in Appendix A.

1.1 Resource Management Goals

FERC has a responsibility to evaluate project impacts to determine the best comprehensive development of a waterway. Some stakeholders have requested that Alabama Power evaluate the Green Plan releases compared to the pre-Green Plan peaking flows. Stakeholders also commented that alternative downstream release scenarios should be evaluated as part of the relicensing process. Alabama Power will consult with agencies and other stakeholders to ensure that management goals for individual resource areas are considered and any applicable environmental, cultural, or recreational resource analyses examine and discuss effects of any proposed change in downstream releases.

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; Appendix A). The purpose of the Green Plan was to, within the physical and regulatory limits of the plant and equipment, reduce the effects of various hydropower operations on the downstream aquatic and environmental resources. Prior to 2005, peaking flows were the primary releases from the Harris Dam during normal operations. From 2005 to 2017, the Alabama Cooperative Fish and Wildlife Research Unit (ACFWRU) conducted monitoring of shallow-water fish and benthic macroinvertebrate communities which has indicated a positive fish community response and increased shoal habitat availability (Irwin et al. 2011). However, some stakeholders have noted that the temperature of the turbine releases could have potential effects on aquatic resources in the Tallapoosa River below Harris Dam. These possible effects are being evaluated in the Aquatic Resources Study Plan.

Based on stakeholder input, the Downstream Release Alternatives study will evaluate and compare the effects of pre and post Green Plan operations, a continuous minimum flow of 150 cfs (which is roughly the equivalent daily volume of three ten-minute pulses) and an alternative/modified Green Plan operation (i.e., changing the time of day in which Green Plan pulses are released), on Project resources. Any effects on downstream flows from potential changes in the operating curve will be analyzed in the R.L. Harris Project Operating Curve Change Feasibility Study.

2.0 GOALS AND OBJECTIVES OF STUDY

The goal of this study is to evaluate the effects of current (Green Plan) and historic (peaking only) operations and alternative downstream release alternatives on Project resources. During this study, Alabama Power will use existing information from the PAD and technical reports, as well as the results of Alabama Power's FERC-approved studies, as applicable, to conduct qualitative and quantitative evaluations of the effects of downstream release alternatives on Project operational parameters and resources, identified below.

- Reservoir levels
- Hydropower generation
- Flood control
- Navigation
- Drought operations (ADROP)
- Water quality and water use
- Erosion and sedimentation (including invasive species)
- Downstream aquatic resources (temperature and habitat)
- Wildlife and terrestrial resources
- Threatened and endangered species
- Recreation resources
- Cultural resources

3.0 PROJECT NEXUS AND GEOGRAPHIC SCOPE

The Harris Project operations have direct, indirect, and potential cumulative effects on Harris Lake and downstream Tallapoosa River resources. The area of project influence is the Harris Reservoir and Tallapoosa River downstream of Harris Dam through Horseshoe Bend.

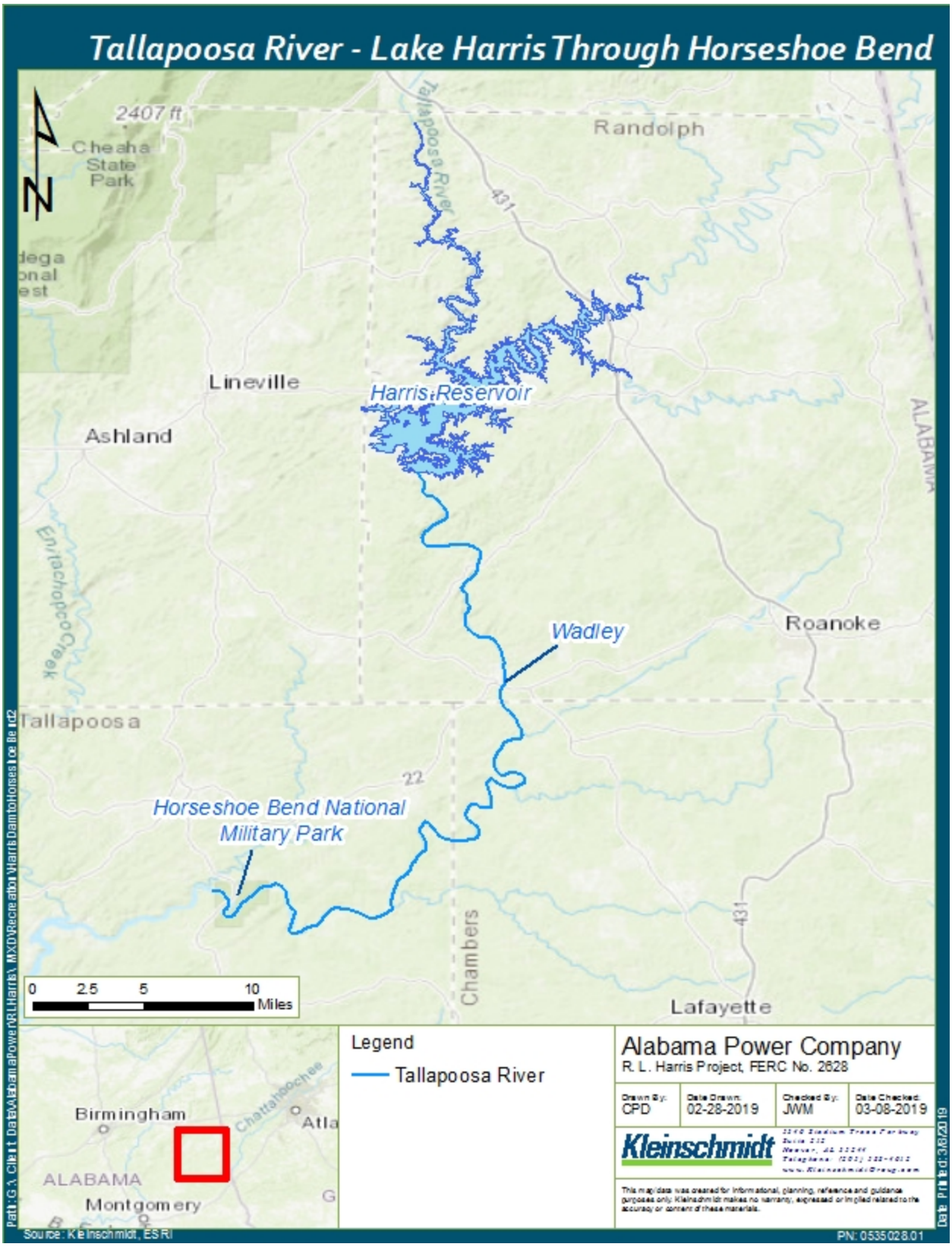


FIGURE 3-1 STUDY AREA MAP- LAKE HARRIS THROUGH HORSESHOE BEND

4.0 METHODS

This study will be conducted in two phases. In Phase 1, Alabama Power will use models developed in other Harris Project FERC-approved studies and conduct modeling simulations using specific methods, tools, and processes described in Appendix B. The models will be developed early in the relicensing process and will be used to evaluate and describe the effects of downstream releases. For the Phase 2 analyses, Alabama Power has developed specific methodologies for the potentially affected resources, which are discussed below.

4.1 Phase 1 – Development of Models

1. Alabama Power will present the proposed methodology to the Harris Action Team (HAT) 1 for review and comment. Alabama Power may modify the methodology based on HAT 1 comments/recommendations.

2. Once Alabama Power has completed the model(s) according to the methods described in Appendix B, Alabama Power will present the models and assumptions to HAT 1. This review may result in additional simulations or refinement of the alternatives.

3. Upon completing the model runs, Alabama Power will develop a Draft Downstream Release Alternatives Phase 1 Report for HAT 1 review and comment that will include impacts to existing operational parameters: Harris operating curve, navigation, flood control, drought operations, and hydropower generation.

4. Based on comments, Alabama Power will develop a Final Downstream Release Alternatives Phase 1 Report.

4.2 Phase 2 - Effects Analysis Methods

Analysis of the effects of each downstream release alternative will be accomplished using a combination of existing information, results from other FERC-approved studies, and model results developed in Phase 1. The sections below provide descriptions of the specific methods for each potentially affected Project resource.

4.2.1 Water Quality

Alabama Power will use existing data from the PAD, Baseline Water Quality Report, and results from the Water Quality Study to qualitatively describe potential effects on dissolved oxygen in the tailrace that may occur due to changes in downstream releases. This information will inform Alabama Power on possible additional measures needed to meet its 401 water quality certification. The effects of the downstream release alternatives on the downstream water temperature regime are discussed in the Aquatic Resources section.

4.2.2 Water Use

Alabama Power will use the results of the HEC-RAS modeling to determine effects on existing and potential water withdrawals in the Tallapoosa River downstream of Harris Dam through

Horseshoe Bend. Alabama Power may also use existing information in the PAD and the Water Quantity, Water Use, and Discharges Report (Kleinschmidt 2018b) to describe effects.

4.2.3 Downstream Erosion

Alabama Power will use the assessments for downstream sites from the FERC-approved Erosion and Sedimentation Study and outputs from the HEC-RAS model to qualitatively assess the effects of downstream release alternatives on erosion.

4.2.4 Aquatic Resources

Alabama Power will use the HEC-RAS model and outputs developed within the Downstream Aquatic Habitat Study to evaluate potential effects on aquatic resources in the Tallapoosa River downstream of the Harris Dam through Horseshoe Bend. Specifically, outputs from the HEC-RAS model will be used to compare the amount, type, and persistence of wetted habitat associated with each model output from the downstream release alternatives. Alabama Power will use data collected during the Aquatic Resources Study and the HEC-RAS model (using the water quality module), to evaluate the relative effects of downstream release alternatives on downstream water temperature.

4.2.5 Wildlife, Terrestrial, and Threatened, and Endangered Species

Alabama Power will use information from the PAD, and results from the FERC-approved Threatened and Endangered (T&E) Species Study to examine the potential effects of downstream release alternatives on terrestrial wildlife and federally listed species, if any, located in and around the Tallapoosa River downstream of Harris Dam through Horseshoe Bend. Alabama Power will qualitatively assess the relative potential for alternative downstream releases to affect preferred habitats of wildlife and federally listed species, if any. Alabama Power will use the HEC-RAS model to evaluate effects on downstream terrestrial resources.

4.2.6 Recreation

Alabama Power will use the information from the FERC-approved Recreation Evaluation Study to determine how downstream releases affect boating in the Tallapoosa River from Harris Dam through Horseshoe Bend. This task will be accomplished by correlating data collected from Tallapoosa River users with any flow information available for the day and time the user was on the water. Next, the HEC-RAS model will be used to determine how boatable flows may change for each alternative. Boatable flows will be evaluated in consultation with HAT 5 members based on a variety of sources, including the Tallapoosa River user surveys and previous research available from the monitoring of Green Plan flows.

4.2.7 Cultural Resources

Alabama Power will use existing information, the HEC-RAS model, and any other relevant information from the FERC-approved studies to evaluate sites identified in the Cultural Resources Study that may be impacted by downstream release alternatives and the resulting potential change

in erosion. Undercut and eroded banks along the shoreline can expose artifacts and features, making a site more visible and, therefore, more susceptible to looters. Alabama Power will use elevation data (LIDAR), aerial imagery, and expert opinions provided by persons familiar with the study area to qualitatively determine the effects of downstream release alternatives on specific cultural resources sites. The primary point of interest is the Miller Covered Bridge piers.

A summary of the resources to be studied and proposed study methods is presented in **Table 4-1**.

TABLE 4-1 SUMMARY OF THE RESOURCES AND STUDY METHODS

Resource	Method
Water Quality	• HEC-RAS model • Existing information – Water Quality Baseline Report • Results from the FERC-approved Water Quality Study • Qualitatively evaluate potential effects on dissolved oxygen in the tailrace
Water Use	• HEC-RAS model • Existing information - Water Quantity, Water Use, and Discharges Report
Erosion	• HEC-RAS model • FERC-approved Erosion and Sedimentation Study (erosion portion only) • LIDAR, aerial imagery, historic photos
Aquatic Resources	• HEC-RAS model • HEC-RAS to evaluate effects on wetted habitat • HEC-RAS to evaluate effects on water temperature in the Tallapoosa River below Harris Dam • FERC-approved Downstream Aquatic Habitat Study • FERC-approved Aquatic Resources Study
Wildlife and Terrestrial Resources - including Threatened, and Endangered Species	• HEC-RAS model • FERC-approved Threatened and Endangered Species Study
Recreation Resources	• HEC-RAS model • FERC-approved Recreation Evaluation Study • Existing information on boatable flows
Cultural Resources	• HEC-RAS model LIDAR, aerial imagery, and expert opinions

5.0 REPORTS

As the various components of this study are completed, Alabama Power will share the results with HAT 1 through stakeholder meetings and written documentation. As part of the 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).

6.0 SCHEDULE

This schedule corresponds to the FERC-approved Harris Project Process Plan and Schedule. Consultation meeting dates will be finalized with HAT 1 members upon FERC approval of the study plan.

FERC Study Plan Determination	April 2019
Consultation with HAT 1	April 2019 – November 2021
Phase 1 - Modeling	April 2019 – April 2020
Phase 2 – Effects Analysis	April 2020 – November 2021
Initial Study Report	April 2020
Initial Study Report Meeting	April 2020
Updated Study Report	April 2021
Updated Study Report Meeting	April 2021
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 Phase 1 modeling, Phase 2 analysis, and Draft and Final Reports, is $625K.

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, 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

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.
4. Two units may come online with less than 30-minute difference in their start times if there is a system emergency need.
5. Spawning Windows: Spring and Fall spawning windows will scheduled as conditions permit. The operational criteria during spawning windows will supersede the above criteria.

APPENDIX B

MODEL METHODOLOGY

PROPOSED HYDROLOGIC AND HYDRAULIC STUDY

Alabama Power plans to use the following data and models to conduct the analysis of the downstream release alternatives. The primary tool for this study is HEC-River Analysis System (HEC-RAS); however, Alabama Power will use other HEC models to address the effects of downstream release alternatives.

1) Alabama-Coosa-Tallapoosa (ACT) unimpaired flow database – this database was developed by the United States Army Corps of Engineers (USACE) with input and data from other stakeholders in the ACT comprehensive study, including both the states of Georgia and Alabama, Alabama Power, and others. This dataset is average daily flows from 1939 – 2016 with regulation influences removed.
2) Other data – Other data sources will include United States Geological Survey (USGS), USACE, and Alabama Power records.
3) HEC-River Analysis System (HEC-RAS) – this model will route flows in the unsteady state[2] along the river. This model will be used to assess effects of alternative release scenarios on boatable days, wetted perimeter, and temperature. Model inputs include the data from 20 level loggers, temperature monitors, and dissolved oxygen grab samples
4) HEC-Reservoir Simulation Model (HEC-ResSim) – this model will look at operational changes at the Harris Project in conjunction with downstream release alternatives on an hourly timestep. This model in conjunction with the HEC-RAS model, will show impacts, if applicable, to the Martin Dam Project operations.
5) HEC-DSSVue – This is the USACE's Data Storage System that is designed to efficiently store and retrieve scientific data that is typically sequential. Data in HEC-DSS database files can be graphed, tabulated, edited, and manipulated with HEC-DSSVue. This program will be used to display some of the output of the other HEC models.
6) Alabama Power Hydro Energy Model – This model is a proprietary model that will be used to evaluate the net economic gains or losses that could result from downstream flow alternatives at the Harris Project.

Methodology

Resulting impacts to the Harris Project will be evaluated by routing normal operations combined with each downstream release alternative through the HEC Res-Sim model. The outflow hydrograph from HEC-ResSim will then be routed downstream using HEC-RAS to assess effects on boatable days, wetted perimeter, and temperature.

Coordination and Evaluation

Through consultation with the Harris relicensing stakeholders, Alabama Power has developed a list of downstream flow alternatives to model including the following:

[2] In hydraulic modeling, simulations run in the unsteady state consider the variance of flow with respect to time.

1. Model the following downstream release alternatives:
   a. Pre-Green Plan operations (peaking only)
   b. Green Plan operations
   c. Modified Green Plan operations
   d. Continuous minimum flow of 150 cfs

2. Downstream impacts will be evaluated by developing an HEC-RAS model for downstream release alternatives. HEC-ResSim will be used to generate outflow hydrographs in operational criteria at Harris.

3. Total cost associated with each downstream release alternative will be documented and presented. The Hydro Energy Model analysis will provide economic gains and/or losses associated with power generation with the respective operational procedural changes.

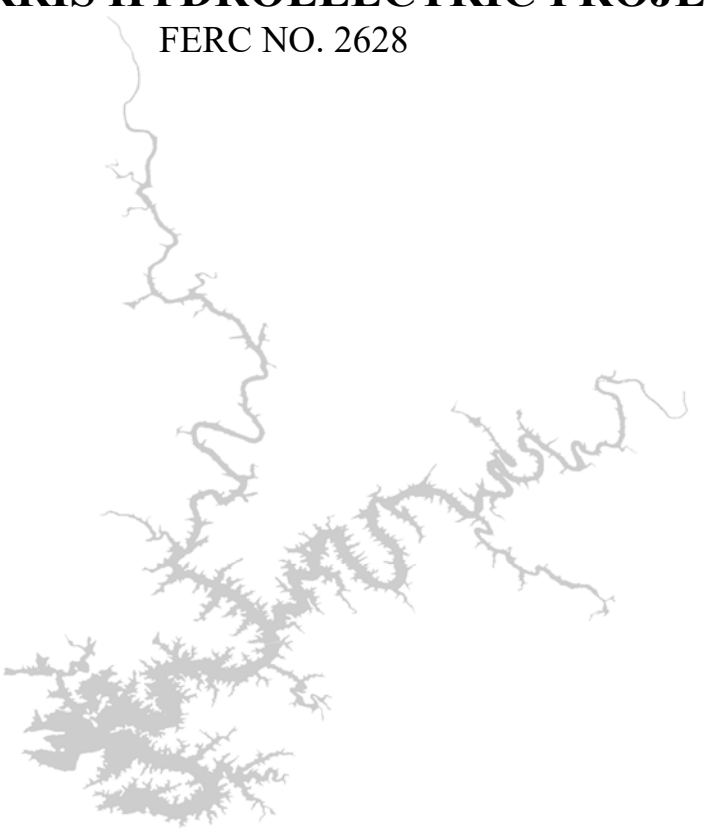
4. All analyses, procedures, modeling, and coordination will be properly documented and discussed with the Harris Action Team (HAT) 1. HAT 1 members will be provided documentation of the analysis for review throughout the study process[3].

[3] Alabama Power will provide a summary of the model outputs including a summary of the Hydro budget model output.

OPERATING CURVE CHANGE FEASIBILITY ANALYSIS STUDY PLAN

R. L. HARRIS HYDROELECTRIC PROJECT

FERC NO. 2628



Prepared by:

ALABAMA POWER COMPANY
BIRMINGHAM, ALABAMA

Alabama Power

March 2019

ALABAMA POWER COMPANY
BIRMINGHAM, ALABAMA

R. L. HARRIS HYDROELECTRIC PROJECT
FERC NO. 2628

OPERATING CURVE CHANGE FEASIBILITY ANALYSIS
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OPERATING CURVE CHANGE FEASIBILITY ANALYSIS 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.

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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 Data

During stakeholder one-on-one meetings and at the October 19, 2017 Issue Identification Workshop, stakeholders requested that Alabama Power investigate changing the winter operating curve for the Harris Project. Stakeholders believe that a higher winter operating curve will enhance recreation opportunities on Harris Reservoir during the winter, or typical drawdown period. Alabama Power has performed similar analyses at several of their hydroelectric projects as part of the FERC relicensing process. Alabama Power has developed this study plan to investigate this requested change and the potential impacts of a winter operating curve change on other resource areas within Harris Reservoir and in the Tallapoosa River downstream of Harris Dam. Alabama Power does not have any existing information that would address this request without performing extensive modeling and analysis of the hydrologic record and baseline information for the Project. This study plan provides a list of tools, methods, and analyses that will be performed to address this request.

1.1 Resource Management Goals

The Harris Project is licensed by FERC. All proposed operational changes must be disclosed, and any identified effects must be addressed in the license application to FERC. The Operating Curve Change Feasibility Analysis will assist Alabama Power with developing an operations proposal to include in the Preliminary Licensing Proposal (PLP) and will assist with FERC's analysis in determining new license conditions for the Harris Project. Alabama Power will work with agencies and other stakeholders to ensure that resource management goals for individual resource areas are considered and any applicable environmental, cultural, or recreational resource analyses examine and discuss effects of any proposed operating curve change.

1.2 Current Operations and Operational Alternatives

Stakeholders have requested that Alabama Power investigate 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. The Operating Curve Change Feasibility Analysis study will evaluate, in increments of 1 foot from 786 feet msl to 789 feet msl (i.e., 786, 787, 788, and 789 msl), Alabama Power's ability to increase the winter pool elevation and continue to meet Project purposes (**Figure 1-1**). This study will use information from the Pre-Application Document (PAD), technical reports, and the results of Alabama Power's proposed relicensing studies, as applicable, to examine the effects of a winter operating curve change on the following operational parameters and resources:

- Hydropower generation
- Green Plan flows[2]
- Downstream Release Alternatives
- Flood control
- Navigation

[2] See *Summary of R.L. Harris Downstream Flow Adaptive Management History and Research* Technical Report (Kleinschmidt 2018a).

- Drought operations (ADROP)
- Water quality and water use
- Erosion and sedimentation (including invasive species)
- Aquatic species (reservoir and tailwater)
- Wildlife and terrestrial resources (including wetlands)
- Threatened and endangered species
- Recreation resources
- Cultural resources

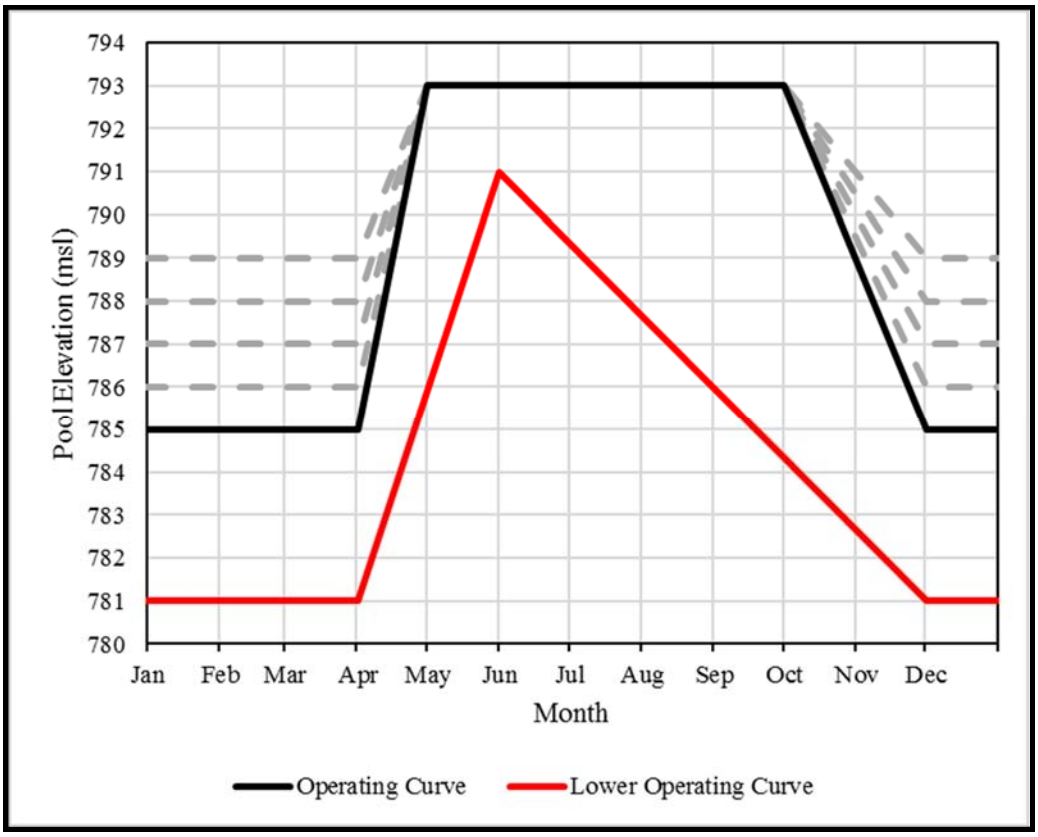


FIGURE 1-1 HARRIS OPERATING CURVE WITH PROPOSED 1-FOOT INCREMENTAL CHANGES

2.0 GOALS AND OBJECTIVES

The Operating Curve Change Feasibility Analysis will assist Alabama Power in determining the feasibility of proposing an operating curve change as part of its license application. Changes to the operating curve must be approved by FERC, with consultation by the U.S. Army Corps of Engineers (USACE) relating to flood control issues. The current license requires the Project to be operated in the interest of flood control based on agreement between USACE and Alabama Power, and the current operating guide curve and flood control operations are included in the USACE-issued Water Control Manual (WCM) for the Harris Project. Changes to the operating curve and

flood control operations would also require changes to the WCM to make it consistent with the requirements in the new license.

The objective of this study is to use industry-accepted methods to develop simulation models for analyzing proposed alternatives to the existing (baseline) winter operating curve. Simulation models will provide the tools to evaluate feasibility, identify impacts, and provide data to compare existing operations with potential increases to the winter operating curve on an incremental basis.

The modeling simulations will be performed in **Phase 1** of this study. Tools and models may include, but not be limited to, the USACE HEC-RAS[3] and HEC-SSP, HEC-ResSim, the Alabama-Coosa-Tallapoosa (ACT) unimpaired flow data set developed by the USACE and other stakeholders, and Alabama Power's Hydro Energy model. Descriptions of these models and data sets are included in Appendix A.

Phase 2 of this study will use the results of the simulation models developed in Phase 1 in conjunction with the results of the other FERC-approved Harris relicensing studies and existing information (e.g., PAD, technical reports) to conduct qualitative and quantitative evaluations of the effect(s) of an operating curve change on resources listed in Section 1.2. Methods for the analyses in Phase 1 and Phase 2 are presented in Section 4.0.

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 (i.e., the study area) of Phases 1 and 2 of this study corresponds with the physical area and/or resources influenced by the proposed operational change, which may or may not be consistent with the Harris Project boundary. The geographic scope of analyses for each operational parameter and resource is listed in **Table 3-1**. **Figure 3-1** displays a map of Lake Harris and Tallapoosa River through Horseshoe Bend. Alabama Power used stream gages to review and determine the geographic area where effects of Harris Project operations can be measured downstream of Harris Dam; this exercise resulted in developing the downstream geographic scope. For the Lake Harris geographic scope, the area of operating influence is in and around the Harris Reservoir due to Project operations.

[3] These models were developed by the USACE's Hydrologic Engineering Center (HEC). Use of these models is described in greater detail in Appendix A of this Study Plan. Additional information can be found at: http://www.hec.usace.army.mil/.

TABLE 3-1 SUMMARY OF OPERATIONAL PARAMETERS, RESOURCES, GEOGRAPHIC SCOPE AND RATIONALE

Operational Parameter/Resource	Geographic Scope	Rationale
Hydropower Generation	Alabama Power's Coosa and Tallapoosa Projects	Effects on hydropower generation would impact system-wide operations
Flood Control	Lake Harris and Harris Dam to Montgomery Water Works	Model parameters are set to evaluate flood operation effects to Montgomery Water Works
Navigation	ACT Basin	Model parameters are set to evaluate effects on the ACT Basin per the USACE Master Water Control Manual
Drought Operations	ACT Basin	Model parameters are set to evaluate effects on the ACT Basin per the USACE Master Water Control Manual
Green Plan Flows	Tallapoosa River downstream from Harris Dam through Horseshoe Bend	Operational influence of the Harris Project occurs from Harris Dam through Horseshoe Bend.
Downstream Release Alternatives	Tallapoosa River downstream from Harris Dam through Horseshoe Bend	Operational influence of the Harris Project occurs from Harris Dam through Horseshoe Bend.
Water Quality (DO)	Lake Harris; Downstream from Harris Dam through Horseshoe Bend	Operational influence of the Harris Project occurs in and around Harris Reservoir and from Harris Dam through Horseshoe Bend.
Water Use	Lake Harris; Downstream from Harris Dam through Horseshoe Bend	Operational influence of the Harris Project occurs in and around Harris Reservoir and from Harris Dam through Horseshoe Bend
Erosion and Sedimentation (and invasive species)	Lake Harris; Downstream from Harris Dam through Horseshoe Bend	Operational influence of the Harris Project occurs in and around Harris Reservoir and from Harris Dam through Horseshoe Bend
Aquatic Resources	Lake Harris; Downstream from Harris Dam through Horseshoe Bend	Operational influence of the Harris Project occurs in and around Harris Reservoir and from Harris Dam through Horseshoe Bend

Operational Parameter/Resource	Geographic Scope	Rationale
Wildlife and Terrestrial Resources, including Threatened, and Endangered Species	Lake Harris; Downstream from Harris Dam through Horseshoe Bend	Operational influence of the Harris Project occurs in and around Harris Reservoir and from Harris Dam through Horseshoe Bend
Wetlands	Lake Harris; Downstream from Harris Dam through Horseshoe Bend	Operational influence of the Harris Project occurs in and around Harris Reservoir and from Harris Dam through Horseshoe Bend
Recreation Resources	Lake Harris; Downstream from Harris Dam through Horseshoe Bend	Operational influence of the Harris Project occurs in and around Harris Reservoir and from Harris Dam through Horseshoe Bend
Cultural Resources	Lake Harris; Downstream from Harris Dam through Horseshoe Bend	Operational influence of the Harris Project occurs in and around Harris Reservoir and from Harris Dam through Horseshoe Bend, especially at the Miller Covered Bridge piers

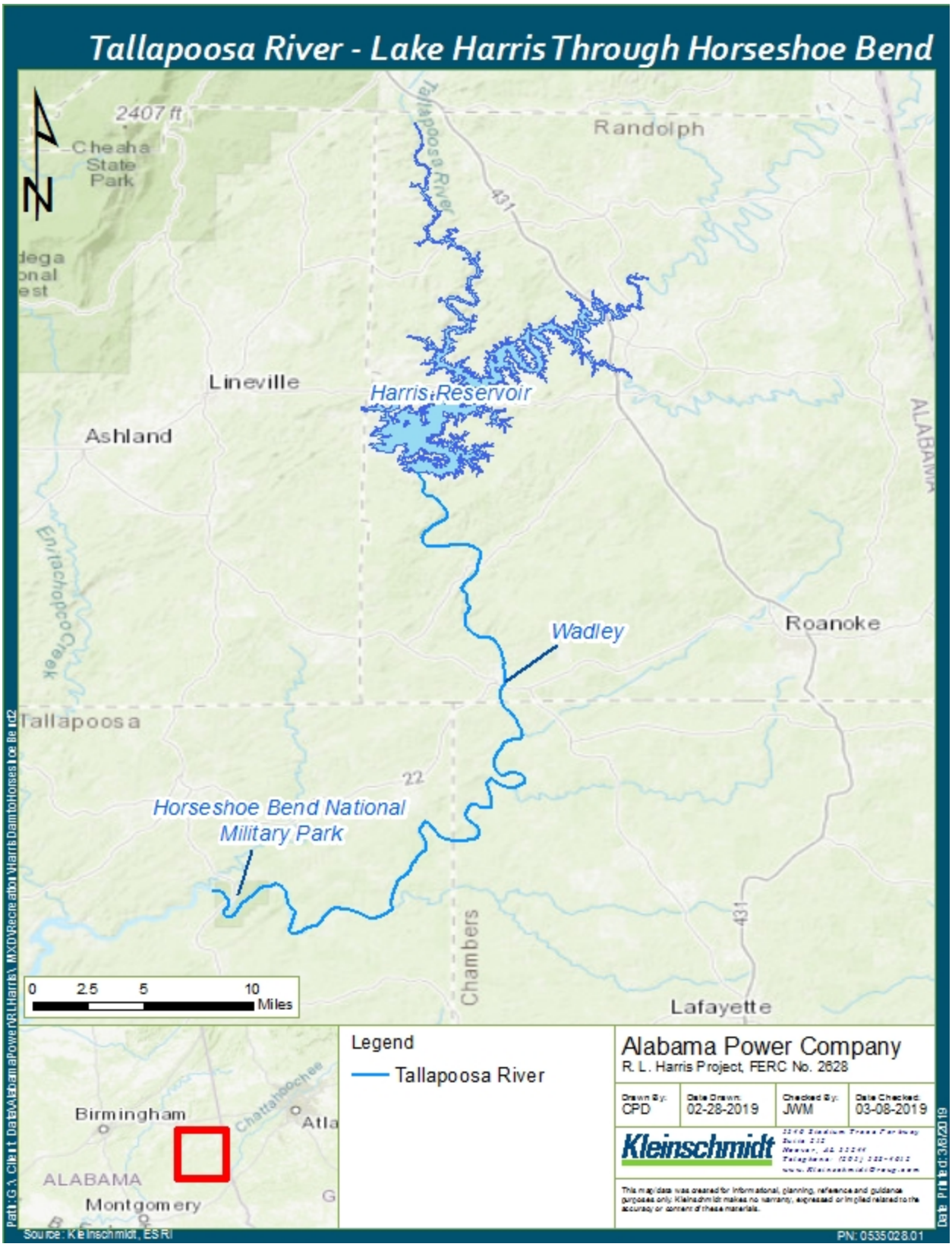


FIGURE 3-1 TALLAPOOSA RIVER - LAKE HARRIS THROUGH HORSESHOE BEND

4.0 METHODS

This study is divided into two phases. In Phase 1, Alabama Power will conduct modeling simulations using specific methods, tools, and processes that are described in Appendix A and in Section 2.0. Alabama Power has previous experience with this overall process, because it was used and accepted by FERC in the analysis for the Martin Dam Project rule curve change (FERC No. 349), conducted from 2010 through 2014.

The detailed process for completing Phase 1 will be as follows:

1. Alabama Power will present the proposed methodology to the Harris Action Team (HAT) 1 (including USACE representatives) for review and comment. Alabama Power may modify the methodology based on HAT 1 comments/recommendations.
2. Once Alabama Power has completed the model(s) according to the methods described in Appendix A, Alabama Power will present the models and assumptions to HAT 1. The review may result in additional simulations or refinement of the alternatives.
3. Initial screening of each alternative's ability to manage significant flood events will be accomplished by subjecting each alternative to a representative flood with a 1 percent recurrence probability. These models will utilize hourly time steps.
4. Impacts to navigation, flood control, drought operations, ability to provide downstream releases, and hydropower generation will be evaluated using long term models with daily time steps.
5. Upon completing the model runs, Alabama Power will develop a Phase 1 Draft Harris Operating Curve Change Feasibility Analysis Report for HAT 1 review and comment.
6. Based on comments, Alabama Power will develop a Phase 1 Final Harris Operating Curve Change Feasibility Analysis Report.

Phase 2 will use the modeling results from Phase 1 along with FERC-approved relicensing study results and existing information to conduct quantitative and qualitative evaluations of potential resource impacts.

The detailed process for completing Phase 2 will be as follows:

1. Gather information/results from FERC-approved relicensing studies, existing information (PAD and technical reports), and results from Phase 1 analyses to incorporate into the Phase 2 resource analysis.
2. Conduct resource analyses according to the FERC-approved study plan (as described below).
3. Develop a Phase 2 Draft Harris Operating Curve Change Effects Analyses Report for HAT 1 (and other affected HAT resource groups) review and comment.
4. Based on comments, Alabama Power will develop a Phase 2 Final Harris Operating Curve Change Effects Analyses Report.

4.1 Effects Analysis Methods

For the Phase 2 analyses, Alabama Power has developed specific methodologies for the potentially affected resources, which are discussed below.

4.1.1 Water Quality

Alabama Power proposes to use an Environmental Fluid Dynamics Code (EFDC) model to evaluate and describe the relationship between Harris Reservoir water quality and potential changes to downstream dissolved oxygen and temperature from a potential change to rule curve operations. The EFDC is a water quality and hydrodynamic model in 2D (longitudinal-vertical) for rivers, estuaries, lakes, reservoirs, and river basin systems. The EFDC models can be used to evaluate basic eutrophication processes such as temperature-nutrient-algae-dissolved oxygen-organic matter and sediment relationships in stratified and non-stratified systems. The model will be calibrated and verified with existing water quality data. Proposed rule curve operations will then be modeled to determine if a potential change in the lake stratification would have an impact on the resulting downstream water quality.

Data from the Baseline Water Quality Report (Kleinschmidt 2018), FERC-approved Water Quality Study, and other pertinent information that becomes available will be used in the model to assess potential changes to water quality in the reservoir forebay and resulting turbine discharges. In addition, HEC-ResSim will be used to quantify the lake retention time for operations under the current/existing license and for operations that would result from each incremental 1-foot increase in the winter operating curve. Areas of water quality concern identified and evaluated in the FERC-approved Water Quality Study Plan will also be considered in this analysis.

Alabama Power will use the quantitative data in the EFDC to evaluate potential downstream effects on dissolved oxygen that may occur due to changes in forebay water quality.

4.1.2 Water Use

Alabama Power will use the results of the Phase 1 modeling to determine if there are any effects (direct, indirect, and/or cumulative) on existing and potential water withdrawals in Harris Reservoir and the Tallapoosa River downstream of Harris Dam through Horseshoe Bend. Alabama Power will also use existing information in the Water Quantity, Water Use, and Discharges Report (Kleinschmidt 2018b).

4.1.3 Erosion and Sedimentation

Alabama Power will review data (e.g., soil types, slope) from the FERC-approved Erosion and Sedimentation Study. These data will help identify the risk of erosion hotspots or sedimentation areas that could potentially change with each incremental winter operating curve elevation. In addition, Alabama Power will use information to determine the potential increase in recreation user days from higher winter operating curve elevations and its impact on erosion hotspots and sedimentation areas. Alabama Power will also use the results of the FERC-approved Erosion and Sedimentation Study to determine if the risk for occurrence of nuisance aquatic vegetation may

improve or worsen due to changes in erosion and sedimentation areas resulting from changes to the operating curve. Areas of sedimentation in the reservoir and near creek mouths will be qualitatively assessed, and Light Detection and Ranging (LIDAR) and a Geographic Information System (GIS) will be used for Harris Reservoir to estimate the area that could be impacted at each site by each 1-foot change in the operating curve.

Using the erosion hotspots identified downstream and other information gathered in the Tallapoosa River from Harris Dam through Horseshoe Bend in the FERC-approved Erosion and Sedimentation Study, Alabama Power will overlay LIDAR data with the results of the Phase 1 study to determine the potential impacts to erosion and sedimentation associated with a change in magnitude and frequency of flood events predicted with each 1-foot increment of operating curve change.

4.1.4 Aquatic Resources

Alabama Power will use existing reservoir fishery data and the results of Phase 1 to qualitatively evaluate potential changes to the reservoir fishery associated with potential changes to the operating curve. Alabama Power will also use the results of Phase 1 and the results of the other FERC-approved studies to assess the direct, indirect, and/or cumulative effects of the operating curve change on aquatic resources in the Tallapoosa River downstream of Harris Dam through Horseshoe Bend.

4.1.5 Wildlife, Threatened, and Endangered Species

Using information in the PAD and information gathered in the FERC-approved Threatened and Endangered (T&E) Species Study, Alabama Power will examine the potential effects of an operating curve change on wildlife and T&E, if any, species located in and around the Harris Reservoir and in the Tallapoosa River downstream of Harris Dam through Horseshoe Bend. Alabama Power will compare the habitats of T&E species at the existing winter operating curve to each of the 1-foot increments of a possible winter lake level change to identify whether these habitats may be potentially affected.

4.1.6 Terrestrial Wetlands

Alabama Power will use existing wetlands data (as identified in the PAD) in and around Harris Reservoir and downstream of Harris Dam in the Tallapoosa River through Horseshoe Bend. These data will be incorporated into GIS, and the evaluation of changes to the winter operating curve (in 1-foot increments) will indicate if the reservoir wetland areas will be inundated or dry with a change in magnitude and frequency of flood events for each of the possible winter operating curve changes.

4.1.7 Recreation

Alabama Power proposes to examine the potential effects of a change in the winter operating curve on recreational use in Lake Harris by using the information gathered in the FERC-approved Recreation Evaluation Study. This information includes data on recreational access points (the

number of private docks useable during the current winter drawdown and the lowest possible elevation that public boat ramps can be used). Alabama Power will then compare the number of access points (both private docks and public boat ramps) available at each 1-foot increment change in winter operating curve elevation. Alabama Power will use LIDAR data and field observations to make quantitative determinations.

For recreation access downstream of Harris Dam (Tallapoosa River through Horseshoe Bend), Alabama Power will identify recreational access points affected by the estimated changes in downstream flows and/or water levels. These access points will be assessed for the magnitude and frequency of high flow events resulting from the proposed operational curve changes (e.g., additional days that access roads or access areas are underwater).

4.1.8 Cultural Resources

Alabama Power will use existing information to evaluate sites identified in the Cultural Resources Study that may be impacted by reservoir fluctuation and the resulting potential change in erosion and sedimentation. Undercut and eroded banks along the shoreline can expose artifacts and features, making a site more visible and, therefore, more susceptible to looters. Alabama Power will use elevation data (LIDAR), aerial imagery, and expert opinions provided by persons familiar with the study area to determine (in 1-foot increments) the quantitative effects of any operational curve changes to specific cultural resources sites.

Undercut and eroded banks along the river can expose artifacts and features, making a site more visible and, therefore, more susceptible to looters. Alabama Power will use elevation data (LIDAR), aerial imagery, and expert opinions provided by persons familiar with the study area to qualitatively determine the effects of an operating curve change to specific cultural resources sites. The primary point of interest is the Miller Covered Bridge piers located at Horseshoe Bend National Military Park.

A summary of the resources to be studied, geographic scope, and study methods are described in **Table 4-1**.

TABLE 4-1 SUMMARY OF THE RESOURCES, GEOGRAPHIC SCOPE AND STUDY METHODS

Resource	Method	
	Lake Harris	**Tallapoosa River Downstream of Harris Dam through Horseshoe Bend**
Water Quality	• Phase 1 results • Existing information • EFDC and HEC-ResSim	• Existing information • EFDC to evaluate potential effects on dissolved oxygen from unit discharge in the tailrace
Water Use	• Phase 1 results • Existing information - Water Quantity, Water Use, and Discharges Report	• Phase 1 results • Existing information - Water Quantity, Water Use, and Discharges Report
Erosion and Sedimentation (including invasive species)	• Phase 1 results • FERC-approved Erosion and Sedimentation Study • LIDAR, aerial imagery, historic photos, GIS • Quantitative and qualitative evaluation of areas most susceptible to increase in nuisance aquatic vegetation	• Phase 1 results • FERC-approved Erosion and Sedimentation Study • LIDAR, aerial imagery, historic photos, GIS
Aquatics	• Phase 1 results • Existing information on the Harris Reservoir fishery	• Phase 1 results • Other FERC approved studies as appropriate
Wildlife and Terrestrial Resources-including Threatened, and Endangered Species	• Phase 1 results • FERC-approved Threatened and Endangered Species Study • GIS	• Phase 1 results • FERC-approved Threatened and Endangered Species Study • GIS
Terrestrial Wetlands	• Existing reservoir wetland data • Phase 1 results • LIDAR, aerial imagery, expert opinions, and GIS	• Existing wetlands data • National Wetland Inventory maps • Phase 1 results • LIDAR, aerial imagery, expert opinions, and GIS
Recreation Resources	• Phase 1 results • FERC-approved Recreation Evaluation Study • LIDAR data	• Phase 1 results • FERC-approved Recreation Evaluation Study • LIDAR data
Cultural Resources	• Phase 1 results • LIDAR, aerial imagery, expert opinions, and GIS	• Phase 1 results • LIDAR, aerial imagery, expert opinions, and GIS

5.0 REPORTS

As the various components of this study are completed, Alabama Power will share the results with HAT 1 through stakeholder meetings and written documentation. As part of the 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).

6.0 SCHEDULE

This schedule corresponds to the FERC-approved Harris Project Process Plan and Schedule. Consultation meeting dates will be finalized with HAT 1 members upon FERC approval of the study.

FERC Study Plan Determination	April 2019
Consultation with HAT 1	April 2019 – November 2021
Phase 1 Modeling Analysis	Fall 2018 – 2019
Phase 2 Effects Analysis and Consultation	Fall 2019 – Spring 2021
Initial Study Report	April 2020
Initial Study Report Meeting	April 2020
Updated Study Report	April 2021
Updated Study Report Meeting	April 2021
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 all modeling and developing the Draft and Final Reports, is $1.1M.

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.

Alabama Power Company. 2018. Preliminary Application Document for the R.L. Harris Hydroelectric Project (FERC No. 2628). Alabama Power Company, Birmingham, AL.

Kleinschmidt Associates. 2018a. *Summary of R.L. Harris Downstream Flow Adaptive Management History and Research* Technical Report. Birmingham, AL.

APPENDIX A

MODEL METHODOLOGY

PROPOSED HYDROLOGIC AND HYDRAULIC STUDY

Models and Datasets

Alabama Power plans to use the following data and models to conduct the analysis of the operating curve study at Lake Harris.

1) Alabama-Coosa-Tallapoosa (ACT) unimpaired flow database – this database was developed by the United States Army Corps of Engineers (USACE) with input and data from other stakeholders in the ACT comprehensive study, including both the states of Georgia and Alabama, Alabama Power, and others. This dataset is average daily flows from 1939 – 2016 with regulation influences removed. This dataset will be utilized in the HEC-SSP[4] and HEC-ResSim.
2) Other data – Other data sources will include United States Geological Survey (USGS), USACE, and Alabama Power records.
3) HEC-Statistical Software Package (HEC-SSP) – this model is the USACE's newest version of the Flood Frequency Analysis. This model will be used to determine the statistical frequency of flooding on a monthly basis.
4) HEC-River Analysis System (HEC-RAS) – this model will be utilized in the flood study portion of evaluating the operating curve. It will route flows in the unsteady state[5] along the river.
5) HEC-Reservoir Simulation Model (HEC-ResSim) – this model will look at operational changes at the Harris Project in conjunction with operating curve change on a daily timestep. It will also be used to focus on the hourly flood study operations. This model in conjunction with the HEC-RAS model, will show impacts, if applicable, to the Martin Dam Project operations.
6) HEC-DSSVue – This is the USACE's Data Storage System that is designed to efficiently store and retrieve scientific data that is typically sequential. Data in HEC-DSS database files can be graphed, tabulated, edited, and manipulated with HEC-DSSVue. This program will be used to display some of the output of the other HEC models.
7) Alabama Power Hydro Energy Model – This model is a proprietary model that will be used to evaluate the net economic gains or losses that could result from proposed operating curve changes at the Harris Project.

Methodology

For the flood study portion of the analysis, Alabama Power will utilize the USACE's unimpaired flow data set in the HEC-SSP model to determine the statistical frequency of historical floods in the Tallapoosa Basin. The historical flood closest to the 100-year frequency will then be increased or lowered to approximate the 100-year flood in peak flow and 1, 3, and 5-day volume. The inflow hydrograph will then be routed thru the Harris Dam using the HEC-ResSim model for both the baseline existing operating curve as well as each alternative (1-4 ft change). The resulting outflow hydrographs will then be routed downstream using the HEC-RAS model below Harris Dam, and

[4] Hydrologic Engineering Center (HEC)
[5] In hydraulic modeling, simulations run in the unsteady state consider the variance of flow with respect to time.

impacts from resulting elevations will be evaluated (based on the flood stage at Wadley). The HEC-RAS model may also be used to evaluate effects on other resources.

Coordination and Evaluation

Through consultation with the Harris relicensing stakeholders, Alabama Power has developed a list of operating curve changes to model including the following:

1. Model a rise in elevation of the winter operating curve in 1-foot increments from 785 ft msl to 789 ft msl (i.e., 786, 787, 788, and 789 msl).

2. Downstream impacts, with respect to flooding, will be evaluated by developing an approximate 100-year Flood and comparing peak elevations generated by the downstream HEC-RAS model for each 1-foot increment in the winter operating curve to the peak elevations for the existing operating curve. A probability analysis (seasonal or monthly comparisons) will also be incorporated in the analysis. HEC-ResSim will be used to generate outflow hydrographs in operational criteria at Harris.

3. Magnitude, frequency, and duration of flood events downstream of Harris Dam can be analyzed using HEC-Res-Sim.

4. Total cost associated with the proposed operating curve changes will be documented and presented. The Hydro Energy Model analysis will provide economic gains and/or losses associated with power generation with the respective operational procedural changes.

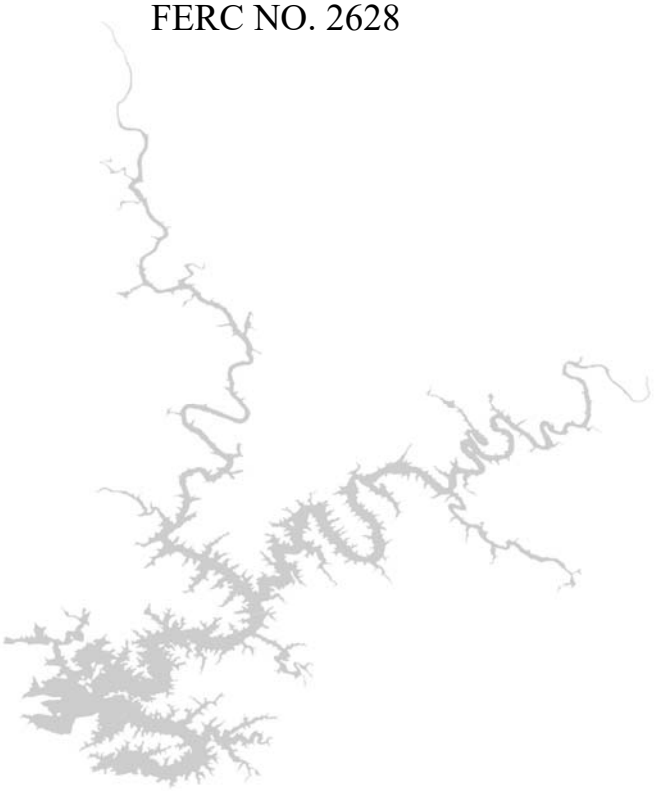
5. All analyses, procedures, modeling, and coordination will be properly documented and discussed with the Harris Action Team (HAT) 1. HAT 1 members will be provided documentation of the analysis for review throughout the study process.

HARRIS DAM
RELICENSING

EROSION AND SEDIMENTATION STUDY PLAN

R. L. HARRIS HYDROELECTRIC PROJECT

FERC NO. 2628



Prepared by:

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March 2019

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R. L. HARRIS HYDROELECTRIC PROJECT
FERC NO. 2628

EROSION AND SEDIMENTATION STUDY PLAN

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EROSION AND SEDIMENTATION 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

During the October 19, 2017 issue identification workshop, several stakeholders noted the location of some possible erosion areas and suggested causes. Erosion areas were located both around Lake Harris as well as downstream of Harris Dam. Specific causes cited by stakeholders included wave action from boats, construction adjacent to the Project Boundary, and the effect of Harris Project operations in the Tallapoosa River downstream. Information provided by the Natural Resources Conservation Service (NRCS) describes the erodibility of soils around the Harris Project shoreline as slight to moderate (NRCS 2017a). The NRCS also describes the erodibility of soils downstream of the Harris Project as slight to moderate, with a small area of severe erodibility downstream of the confluence of Chikasanoxee Creek (NRCS 2017b).

Stakeholders also noted the location of areas on Harris Reservoir where sedimentation may be a problem. Although no existing information sources regarding sedimentation rates or amounts have been identified, Alabama Power does have Light Detection and Ranging (LIDAR) data and aerial photography for Lake Harris that may provide some value in evaluating sedimentation issues. In addition, Alabama Power has an Aquatic Vegetation Control group that periodically inspects Lake Harris for nuisance aquatic vegetation. Nuisance aquatic vegetation may occur in areas where excessive sedimentation has occurred.

Little Coon Creek, which flows through portions of Skyline, is currently listed as impaired due to siltation. The sources of this impairment include non-irrigated crop production and pasture grazing (ADEM 2016).

1.1 Resource Management Goals

The Alabama Department of Conservation and Natural Resources (ADCNR) and Alabama Department of Environmental Management (ADEM) regulate recreational fishing and water quality resources, respectively, at the Harris Project. As part of that responsibility, their goals are to limit Project related shoreline erosion and its impacts on water quality; to identify areas of sedimentation; to identify areas that currently have or could potentially have nuisance aquatic vegetation; and to identify ways to reduce adverse impacts related to Project operation on these issues.

1.2 Current Operations and Operational Alternatives

The erosion and sedimentation study will involve collecting and summarizing information under baseline operations. Any effects on erosion and sedimentation from potential changes in operations will be analyzed in the R.L. Harris Project Operating Curve Change Feasibility Study and the Downstream Release Alternatives Study.

2.0 GOALS AND OBJECTIVES

The goals of this study are to identify any problematic erosion sites and sedimentation areas and determine the likely causes. Alabama Power will consult with stakeholders to identify erosion and sedimentation areas around Lake Harris, along the Tallapoosa River downstream of Harris Dam through Horseshoe Bend, and at Skyline. Once areas 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 cause(s). Additionally, Alabama Power will assess sedimentation areas for the presence of nuisance or invasive aquatic vegetation.

3.0 PROJECT NEXUS AND GEOGRAPHIC SCOPE

Erosion sites may occur along the lake shoreline or in the Tallapoosa River downstream of Harris Dam due to Project operations and/or other causes. Sedimentation of eroded materials often deposits along the lake (upstream river channel and tributary mouths) and can create areas that are prone to the establishment of nuisance aquatic vegetation and hinder recreation use. In addition, Little Coon Creek, which flows through portions of Skyline, is listed as impaired on Alabama's 2018 303(d) list due to siltation. According to the list, the impairment is due to non-irrigated crop production and pasture grazing. The geographic scope for this study includes Little Coon Creek and Crow Creek Watersheds at Skyline, Lake Harris, and the Tallapoosa River from Harris Dam downstream through Horseshoe Bend.

4.0 METHODS

4.1 Erosion Data Collection and Analysis

Erosion sites on Lake Harris, its tributaries, Skyline, and downstream of Harris Dam through Horseshoe Bend will be identified by stakeholders and will be investigated during low water elevations in the fall through spring (during the fall/winter pool drawdown). Stakeholders can submit locations of potential erosion areas via e-mail submissions, traditional mail, and in-person at Harris Action Team 2 (HAT) meetings. In addition, Alabama Power will perform an assessment of bank erosion susceptibility in the Tallapoosa River from Harris Dam through Horseshoe Bend.

Each identified site will be photographed, georeferenced, and examined to determine the cause of erosion – Harris Project operation, land disturbance (development), or natural processes. Erosion site assessments will be completed under the direction of a qualified Erosion and Sediment Control Professional. Alabama Power will also have a soil scientist provide a Quality Assurance/Quality Control (QA/QC) of the erosion site inventory. The site evaluation form (Appendix A) will be used as a tool to perform and document the assessments. The evaluation form includes the following components:

1. Location: Each assessed site will be assigned a unique identification number/code along with GPS coordinates.
2. Position in Landscape: the general position of the site relative to dominant landscape features.
3. Physical Properties: the length, width, shape, and slope of the site.
4. Erosion Process: the mode of erosion, which may include:
    a. Direct scour from river or tributary flows;
    b. Piping, or internal erosion, where voids in soils are caused by seepage;
    c. Slumping due to undercutting of the bank;
    d. Gully or rill erosion resulting from surface runoff; or
    e. Other processes.
5. Adjacent Land Use and Vegetative Cover: classification of the predominant adjacent land use and type/extent of vegetation.
6. Hydrologic Impact information: classification of when/if the erosion occurs during extreme flooding, above normal water levels, or within the range of normal water levels.
7. Description of the exposed soils.
8. General comments about the erosion site.
9. Potential cause(s) of erosion/sedimentation, including:

a. Project operations (i.e., water level fluctuations or construction/maintenance activities on/at Project facilities or lands);
b. Natural factors such as seasonal flooding, riverine processes, etc.;
c. Land use practices such as agriculture, mining, residential/commercial development, etc.; and
d. Anthropogenic or human-induced such as foot/bike paths, vehicle traffic, boat traffic, etc.

Once each erosion site has been evaluated, Alabama Power will present findings, including the field evaluation forms, to HAT 2 for review and comment.

4.2 Sedimentation Data Collection and Analysis

Sedimentation areas will be identified by stakeholders and assessed by examining available lake photography and LIDAR[2] data. The LIDAR data will be analyzed using a Geographic Information System (GIS) to identify elevation or contour changes around the reservoir from historic conditions. Changes in lake surface area can be quantified to estimate sedimentation rates and volumes within the reservoir. Identified sedimentation areas will likely be limited to areas exposed during reservoir winter-pool elevations as LIDAR cannot penetrate the reservoir water surface. The GIS exercise will be accompanied by field observations to verify sedimentation areas. Each of these areas will be surveyed for nuisance aquatic vegetation. In addition, Alabama Power will review its records to determine if treatment for nuisance vegetation of these areas has occurred. Alabama Power will prepare a summary of surveys and recommendations and present to HAT 2 members for review and comment.

5.0 REPORTS

As the various components of this study are completed, Alabama Power will share the results, including maps and associated GIS data with HAT 2 through stakeholder meetings and written documentation. As part of the 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).

6.0 SCHEDULE

This schedule corresponds to the FERC-approved Harris Project Process Plan and Schedule. Consultation meeting dates will be finalized with HAT 2 members upon FERC approval of the study plan.

[2] Light Detection and Ranging or LIDAR uses an airborne laser scanner to collect 3-dimensional data and can be used to construct highly detailed terrain maps.

FERC Study Plan Determination	April 2019
Consultation with HAT 2	April 2019 – November 2021
Develop GIS Overlays and Maps	April 2019 – July 2019
Field Verification	Fall - Winter 2019 – 2020
Initial Study Report	April 2020
Initial Study Report Meeting	April 2020
Updated Study Report	April 2021
Updated Study Report Meeting	April 2021
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 to collect and review existing information, conduct site visits, and develop draft and final reports, is $300K.

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.

Alabama Department of Environmental Management (ADEM). 2016. 2016 Alabama §303(d) List. [Online] URL: http://adem.state.al.us/programs/water/wquality/2016AL303dList.pdf. Accessed December 5, 2017.

Alabama Power Company. 2018. Pre-Application Document for the Harris Hydroelectric Project (FERC No. 2628). Alabama Power Company, Birmingham, AL.

Natural Resources Conservation Service (NRCS). 2017a. Web Soil Survey. [Online] URL: http://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx. Accessed December 1, 2017.

Natural Resources Conservation Service (NRCS). 2017b. Web Soil Survey. [Online] URL: http://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx. Accessed December 5, 2017.

APPENDIX A – HARRIS PROJECT

EROSION & SEDIMENTATION STUDY
SITE EVALUATION FORM

R. L. HARRIS PROJECT

EROSION & SEDIMENTATION STUDY SITE EVALUATION FORM

Water Body: _____ Date: _____

Field Personnel: _____ Photo No.: _____

1. Erosion Area Location:
   ID: _____ Lat: _____ Long: _____ Time: _____

2. Position in Landscape:
   - ✎ Levee/Embankment
   - ✎ Steep bank
   - ✎ Floodplain Terrace
   - ✎ Main Channel/Main Body of Lake
   - ✎ Cove
   - ✎ Other: _____

3. Physical Properties:
   Length: _____
   Width: _____
   Shape: _____
   Slope:
   - ✎ Steep (> 20%)
   - ✎ Moderate (8% to 20%)
   - ✎ Gentle (< 8%)

4. Erosion Processes:
   - ✎ Direct scour from river or tributary flows
   - ✎ Piping
   - ✎ Slumping due to scoured toe of bank
   - ✎ Gully or rill erosion from overland flows towards lake
   - ✎ Other: _____

5. Adjacent Land Use / Vegetative Cover:
   - ✎ Agricultural
   - ✎ Undeveloped, Grassy
   - ✎ Undeveloped, Wooded
   - ✎ Road Crossing/Bridge
   - ✎ Roadway, Gravel
   - ✎ Roadway, Paved
   - ✎ Park
   - ✎ Unvegetated
   - ✎ Early successional vegetation
   - ✎ Exposed roots or root undercutting
   - ✎ Leaning or fallen trees
   - ✎ Other: _____

6. Hydrologic Impact Information (Erosion area affected during or by):
   - ✎ Extreme Floods
   - ✎ Above normal high-water level
   - ✎ Within range of normal water level fluctuations

7. Description of Exposed Soils including Types and Depths:
   _____
   _____
   _____

8. General Comments:
   _____
   _____
   _____ (Provide additional comments on back of sheet)

9. Potential Cause of Erosion/Sedimentation (check all that apply):
   - ✎ Project operations (water level fluctuations; maintenance/construction activities)
   - ✎ Natural factor independent of operations (e.g., seasonal flooding, riverine processes, etc.
   - ✎ Land use (e.g., farming, ranching, mining, development, etc.)
   - ✎ Anthropogenic (Foot/bike paths, vehicle traffic, waves from boats, etc.)
   - ✎ Other: _____

   Explain Reasoning for Potential Cause of Erosion/Sedimentation: _____
   _____
   _____

HARRIS DAM
RELICENSING

WATER QUALITY STUDY PLAN

R. L. HARRIS HYDROELECTRIC PROJECT

FERC NO. 2628

Prepared by:

ALABAMA POWER COMPANY
BIRMINGHAM, ALABAMA

Alabama Power

March 2019

ALABAMA POWER COMPANY
BIRMINGHAM, ALABAMA

R. L. HARRIS HYDROELECTRIC PROJECT
FERC NO. 2628

WATER QUALITY STUDY PLAN

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WATER QUALITY 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

An extensive amount of water quality data exists for the Harris Project. In preparation for the relicensing process, Alabama Power prepared a *Baseline Water Quality Report* (Kleinschmidt 2018c) that summarized water quality data collected by the Alabama Department of Environmental Management (ADEM) between 2005 and 2016. The report included data from six monitoring sites on Harris Reservoir, three sites on the Tallapoosa River below Harris Dam, and six sites on three streams that drain portions of Skyline.

Available data for Harris Reservoir sites consisted of vertical profiles of water temperature, dissolved oxygen, pH, and conductivity, which was collected at regular depth intervals (approximately 3 feet) from April to October in the years that samples were collected. The samples in the reservoir, Tallapoosa River, and at Skyline sites included analyses for over twenty additional parameters, such as chlorophyll *a*, nutrients, alkalinity, pathogens, and turbidity and were also summarized in the *Baseline Water Quality Report*.

The State of Alabama's 2018 303(d) list indicates Lake Harris is impaired due to mercury based on elevated levels in fish tested in 2016 (ADEM 2018). Impaired waters upstream of Lake Harris include the Little Tallapoosa River (from Wolf Creek upstream to the Alabama-Georgia state line) and the mainstem of the Tallapoosa River (from Cane Creek, near Heflin, upstream to the Alabama-Georgia state line) (ADEM 2018). Monitoring data collected in 2015 associated with Section 314 (a)(2) of the Clean Water Act show that Harris Reservoir is currently mesotrophic, which indicates that substantial nutrient loading is not occurring in the reservoir.

Little Coon Creek, which flows through portions of Skyline, is listed as impaired on Alabama's 2018 303(d) list due to siltation. According to the list, the impairment is due to non-irrigated crop production and pasture grazing. A list of impaired waters in the Project Area is provided in **Table 1-1**.

1.1 Resource Management Goals

FERC has the responsibility to evaluate project effects on water quality. The ADEM is vested with the authority to issue a Section 401 Water Quality Certification for the Harris Project to ensure that operation of the Project will not violate applicable water quality standards. Any conditions of the Water Quality Certification will become conditions of the FERC operating license. The U.S. Fish and Wildlife Service (USFWS) and Alabama Department of Conservation and Natural Resources (ADCNR) have similar goals to reduce or eliminate any water quality impacts to aquatic resources associated with the Harris Project. Both goals are relevant in protecting the public resources associated with the Harris Project.

1.2 Current Operations and Operational Alternatives

This water quality study will involve summarizing existing baseline information as well as any additional data that is collected during the study period. Any effects on water quality from potential changes in operations will be analyzed in the R.L. Harris Project Operating Curve Change Feasibility Study and in the Downstream Release Alternatives Study.

TABLE 1-1 IMPAIRED WATERS WITHIN THE PROJECT AREA

Waterbody Name	River Basin	Downstream	Upstream	Size	Type
Little Tallapoosa River	Tallapoosa	Wolf Creek	Alabama-Georgia state line	30.78	miles
Wolf Creek	Tallapoosa	Little Tallapoosa River	its source	5.53	miles
Tallapoosa River	Tallapoosa	1/2 mile upstream of Cleburne County Road 36	Cleburne County Road 19	3.82	miles
Tallapoosa River	Tallapoosa	dam at Cleburne County Road 36	1/2 mile upstream of Cleburne County Road 36	0.44	miles
Tallapoosa River	Tallapoosa	Cedar Creek	R. L. Harris Dam	10.68	miles
Tallapoosa River	Tallapoosa	Alabama Highway 77	Cedar Creek	3.15	miles
Tallapoosa River (R L Harris Lake)	Tallapoosa	R L Harris Dam	Little Tallapoosa River	5356.95	acres
Tallapoosa River	Tallapoosa	Cane Creek	Alabama-Georgia state line	31.60	miles
High Pine Creek	Tallapoosa	Tallapoosa River	Highway 431	13.74	miles
Little Coon Creek	Tennessee	Coon Creek	Alabama-Tennessee state line	16.30	miles

Source: ADEM 2018

2.0 GOALS AND OBJECTIVES

The goal of this study is to supplement the *Baseline Water Quality Report* (Kleinschmidt 2018c) to provide a robust characterization of water quality under current conditions. Alabama Power will collect additional water quality data and compile and append that information to the *Baseline Water Quality Report*. Relevant data collected as part of this study will be used to develop Alabama Power's 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.

3.0 PROJECT NEXUS AND GEOGRAPHIC SCOPE

Water quality at the Harris Project is influenced by point and non-point source pollution, land use, annual hydrology, and weather patterns. It is also affected by Harris Project operations. The geographic scope for the water quality study includes the following:

- Harris Reservoir and all tributaries within its drainage area,
- Tallapoosa River from Harris Dam downstream through Horseshoe Bend, and
- Little Coon Creek and Crow Creek Watersheds at Skyline.

4.0 METHODS

For purposes of developing an application for a Section 401 Water Quality Certification, per agreement with ADEM, Alabama Power is conducting dissolved oxygen and temperature monitoring in the tailrace at the monitor placed approximately 1400 feet downstream of the Harris Dam on the west bank of the river (Figure 4-1), from June 1 through October 31 (2017 through 2019). Measurements of dissolved oxygen and temperature are recorded continuously at 15-minute intervals during generation. Alabama Power will also collect monthly vertical profiles of temperature and dissolved oxygen in the Harris Reservoir forebay (**Figure 4-1**) between March and October of 2018 and 2019 to compare to historic profiles as well as profiles collected in 2017.

In addition to the monitoring to support the 401 Water Quality Certification, Alabama Power will monitor dissolved oxygen and temperature approximately 0.5 miles downstream of Harris Dam (Figure 4-1). Data will be recorded continuously at 15-minute intervals beginning March 1 through October 31, 2019. Alabama Power will also provide discharge data during the March 1 through October 31 monitoring period to allow for data comparison.

Alabama Power will work with stakeholders and resource agencies to identify areas on the reservoir where they believe degraded water quality conditions could exist and to determine if identified areas warrant further examination. Where appropriate and available, existing data will be used to assess these areas of water quality concern.

Additionally, Alabama Power will compile the water quality information available for the Harris Project collected by other credible sources, such as ADEM, U.S. Geological Survey (USGS), Auburn University, and Alabama Water Watch.

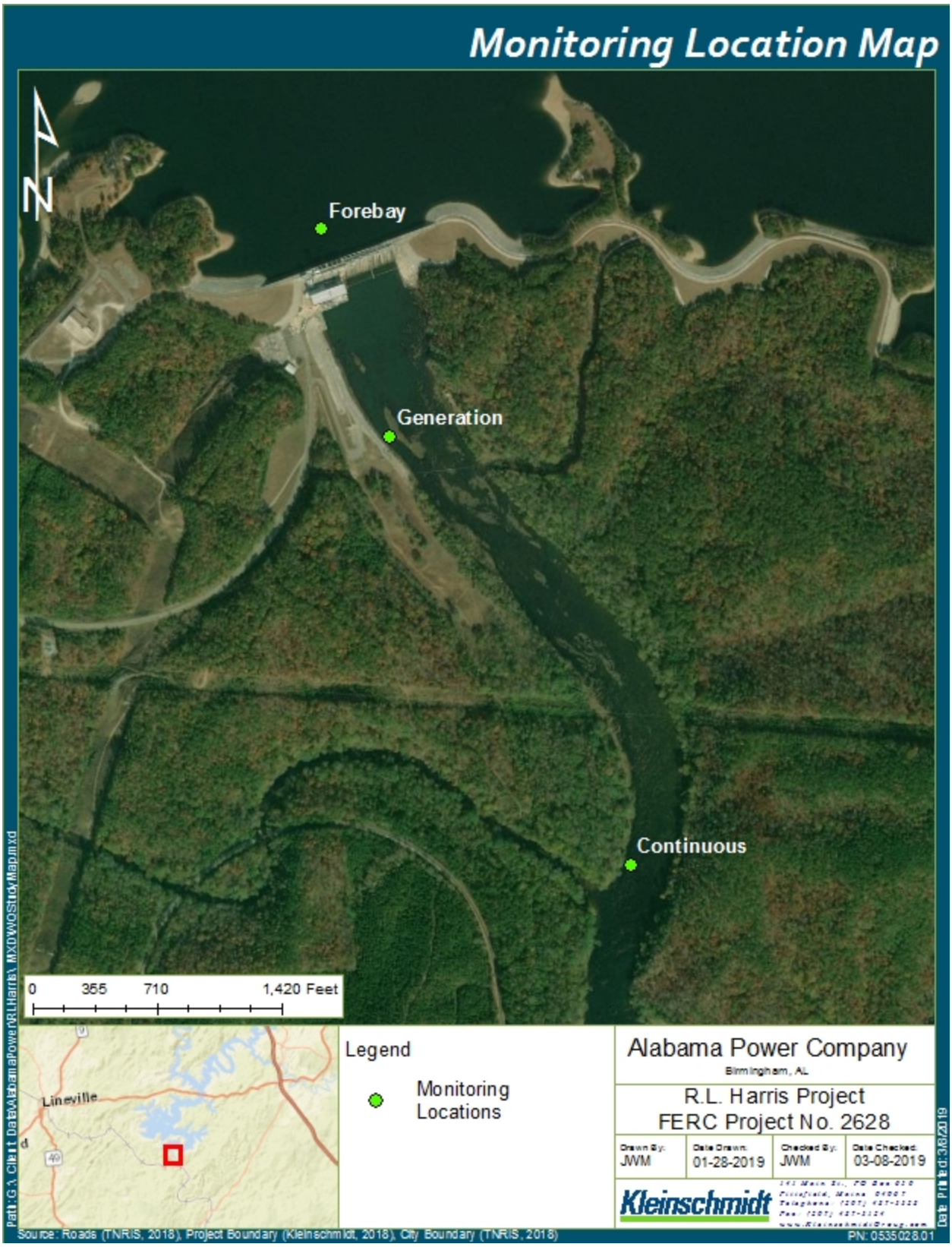

FIGURE 4-1 MONITORING LOCATION MAP

5.0 REPORTS

As the various components of this study are completed, Alabama Power will share the results with HAT 2 through stakeholder meetings and written documentation. As part of the 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).

6.0 SCHEDULE

This schedule corresponds to the FERC-approved Harris Project Process Plan and Schedule. Consultation meeting dates will be finalized with HAT 2 members upon FERC approval of the study plan.

FERC Study Plan Determination	April 2019
Consultation with HAT 2	April 2019 – November 2019
Forebay Monitoring	March 2019 – October 2019
Tailrace Monitoring	June 2019 – October 2019[2]
Continuous Downstream Monitoring	March 2019 – October 2019
Initial Study Report	April 2020
Initial Study Report Meeting	April 2020
Prepare and file 401 Water Quality Certification	April 2020
Updated Study Report	April 2021
Updated Study Report Meeting	April 2021
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 Addendum and application for Water Quality Certification, is $615K.

8.0 REFERENCES

Alabama Department of Environmental Management (ADEM). 2018. 2018 Integrated Water Quality Monitoring and Assessment Report-Water Quality in Alabama 2016-2018. Alabama Department of Environmental Management, Water Division-Water Quality Branch. Montgomery, AL.

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

[2] This schedule reflects study plan approval forward; however, Alabama Power has been monitoring since 2017.

Alabama Power Company. 2018. Pre-Application Document for the Harris Hydroelectric Project (FERC No. 2628). Alabama Power Company, Birmingham, AL.

Kleinschmidt Associates. 2018c. Baseline Water Quality Report for the R.L. Harris Project (FERC No. 2628). Kleinschmidt Associates, Hoover, AL.

HARRIS DAM
RELICENSING

AQUATIC RESOURCES STUDY PLAN

R. L. HARRIS HYDROELECTRIC PROJECT

FERC NO. 2628

Prepared by:

ALABAMA POWER COMPANY
BIRMINGHAM, ALABAMA

Alabama Power

March 2019

ALABAMA POWER COMPANY
BIRMINGHAM, ALABAMA

R. L. HARRIS HYDROELECTRIC PROJECT
FERC NO. 2628

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AQUATIC RESOURCES 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 completed construction and began operating the Harris Project in 1983. The creation of Lake Harris converted approximately 57 miles of the Tallapoosa and Little Tallapoosa Rivers to reservoir. Combined with the hydro projects located downstream of Harris (Martin, Yates, and Thurlow), approximately 25 percent of the 264-mile Tallapoosa River mainstem has been impounded. The unimpounded reach of the Tallapoosa River between Harris Dam and the headwaters of Lake Martin is approximately 52 miles in length.

Initially, the Project only operated in a peaking mode with no intermittent flows in between peaks. Agencies and non-governmental organizations requested that Alabama Power modify operations to enhance the downstream fishery. 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.

Numerous studies have been conducted in the Tallapoosa River below Harris Dam (see Appendix A). Monitoring conducted since initiation of the Green Plan has indicated a positive fish community response and 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. Some results indicated a positive response by some fish species, while other research indicates that cooler stream temperatures may be affecting the reproduction, growth, and recruitment of other fish species downstream of Harris Dam (Goar 2013; Irwin and Goar 2015). The Alabama Department of Conservation and Natural Resources (ADCNR) has noted the abundance of some species is below expected levels. This could be due to several factors including sampling methodologies, thermal regime, flow regime, and/or nutrient availability.

During the October 19, 2017 issue identification workshop and meetings with resource agencies, stakeholders noted that stream temperatures in the Tallapoosa River downstream of Harris Dam are generally cooler than other unregulated streams in the same geographic area and this portion of the Tallapoosa River experiences temperature fluctuations due to peaking operations at Harris Dam. There is concern that the lower stream temperatures and temperature fluctuations are impacting the aquatic resources (especially fish) downstream of Harris Dam. The ADCNR recommended use of a Bioenergetics Model to evaluate the potential effects of temperature fluctuations due to current Project operations on fish downstream of Harris Dam.

In addition to effects on downstream fish populations discussed above, the Harris Project may have effects on other aquatic fauna within the Project Area, including macroinvertebrates such as mollusks and crayfish. Comments received on the Pre-Application Document (PAD) and Scoping Document 1 recommended that Alabama Power investigate the effects of the Harris Project on these aquatic species. Additionally, commenters suggested Alabama Power perform an assessment of the Harris Project's effects on species mobility and population health.

1.1 Resource Management Goals

FERC has a responsibility to evaluate Project impacts. Some stakeholders believe that temperatures associated with Project operations are adversely affecting fishery resources

downstream of Harris Dam. The goal of 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, in 2005 Alabama Power implemented a pulsing scheme known as the Green Plan for releases from Harris Dam (Kleinschmidt 2018a). The purpose of the Green Plan was to reduce the effects of peaking operations on the downstream aquatic community. From 2005 to 2017, the Alabama Cooperative Fish and Wildlife Research Unit (ACFWRU) conducted monitoring of shallow-water fish and benthic macroinvertebrate communities in the Tallapoosa River downstream of Harris Dam, upstream of Harris Reservoir, and in an unregulated stream within the Tallapoosa Basin.

Any effects on aquatic resources from potential changes in operations will be analyzed in the R.L. Harris Project Operating Curve Change Feasibility Study and the Downstream Release Alternatives Study.

2.0 GOALS AND OBJECTIVES OF STUDY

The overall goal of this study is to evaluate the effects of the Harris Project on aquatic resources. This will be accomplished through desktop assessments, field studies, and laboratory studies. Alabama Power will compile and summarize data from existing information sources to provide a comprehensive characterization of aquatic resources within the Project Area. Alabama Power will conduct field and laboratory studies of the fish population in the Tallapoosa River downstream of Harris Dam through Horseshoe Bend and determine how Harris Dam may be affecting the fish community in this reach.

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 of this study is Harris Reservoir, Tallapoosa River downstream of Harris Dam through Horseshoe Bend, and in selected unregulated reference streams (i.e., the Study Area) (**Figure 3-1**).

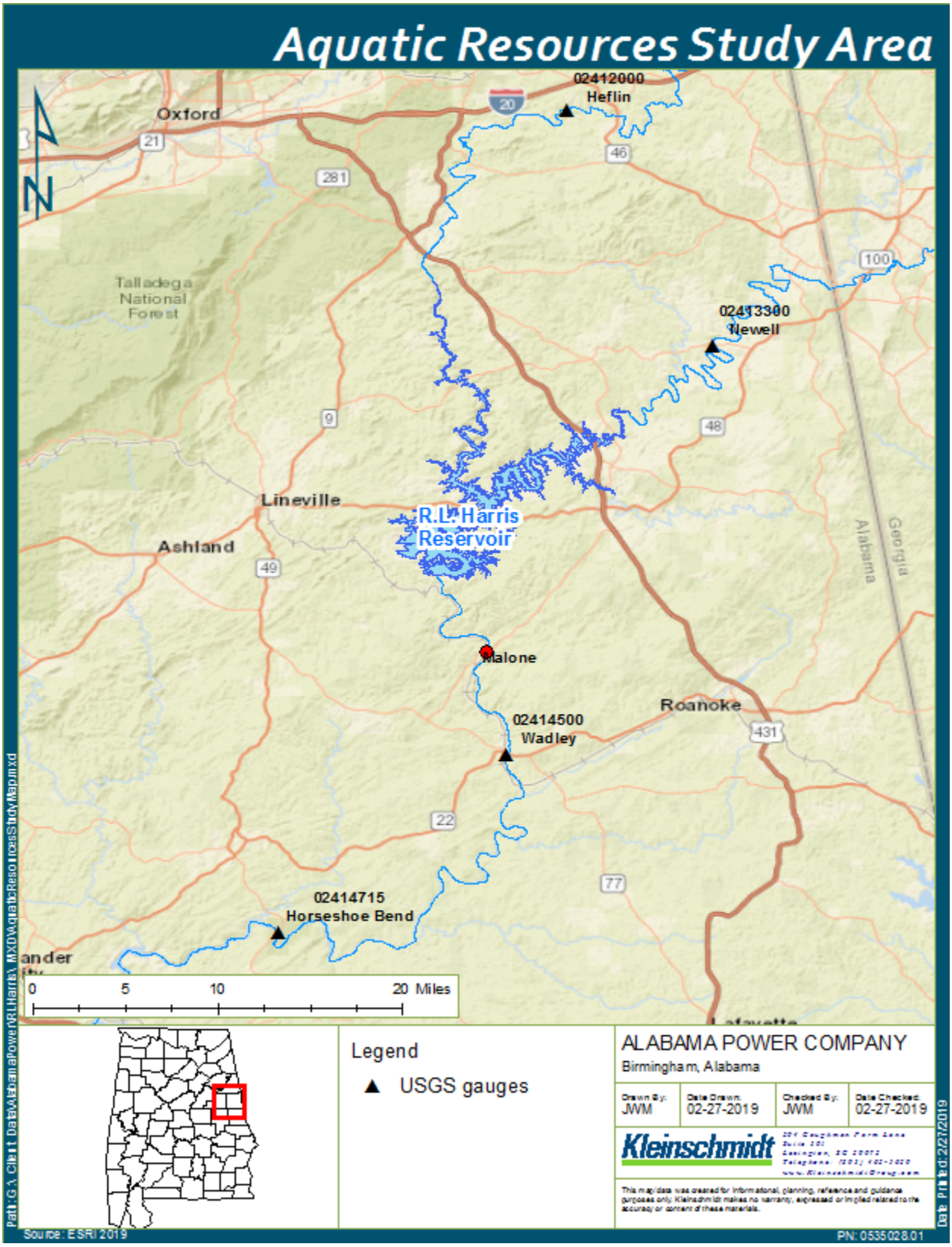

FIGURE 3-1 AQUATIC RESOURCES STUDY AREA

4.0 METHODS

Existing information, supplemented by field and laboratory data, may be used to accomplish the goals and objectives identified in Section 2.0.

4.1 Desktop Assessment of Aquatic Resources

Alabama Power will compile and summarize relevant current and historic information characterizing aquatic resources in the Study Area. Sources of information for this effort will include the following:

- Reservoir fisheries management reports;
- Scientific literature from aquatic resource studies conducted in the Study Area;
- ADCNR Natural Heritage Database data;
- Alabama Power faunal survey data; and
- State and Federal faunal survey data.

Additional sources of information and data identified by Harris Action Team (HAT) 3 will be included in the assessment.

The assessment will identify aquatic species and populations whose presence and/or sustainability within the Study Area may have been affected by the Harris Project. This assessment will describe the factors affecting their presence and sustainability.

4.2 Downstream Fish Population Study

Alabama Power and Auburn University (Auburn) will evaluate factors affecting fish populations in the Tallapoosa River below Harris Dam through field and laboratory studies. Although this study will include an assessment of the entire fish population, a subset of target species will be studied more intensively. The target species include Tallapoosa Bass (*Micropterus tallapoosae*), Channel Catfish (*Ictalurus punctatus*), and Redbreast Sunfish (*Lepomis auritus*).

Target Species for this study were selected based on several factors, including:

- The species are thought to be negatively impacted by current project operations;
- The species are common in unregulated rivers in geographical proximity;
- The species are present in sufficient numbers for collection;
- The species are hearty enough to withstand transport to laboratory and subsequent experimentation; and
- The target species are also considered recreationally important gamefish species.

4.2.1 Literature Based Temperature Requirements for Fish

Auburn will review existing information to determine preferred temperature ranges for target species, including data on specific life stages (e.g., spawning). Auburn researchers will prepare a summary of their findings and present them to the HAT 3 for review and discussion.

4.2.2 Comparison of Temperature Data in Regulated and Unregulated Portions of the Study Area

Auburn researchers will consolidate existing temperature data available for the Study Area and determine if data gaps exist. Existing temperature data is described in **Table 4-1.** Auburn will collect temperature data to address data gaps, if needed, to provide supplemental information for bioenergetics modeling (see Section 4.2.4). Auburn will compare temperatures at regulated sites (i.e., Tallapoosa River from Harris Dam to Horseshoe Bend) to unregulated sites (i.e., Newell and Heflin). The summaries and comparisons of temperature data will include metrics such as daily averages, degree days, daily range (delta), etc. Results of the temperature data analysis will be compared to the temperature requirements of target species (see Section 4.2.1) to determine how those species may be affected by baseline operations.

In addition, a subset of temperature data will be analyzed by comparing metrics from pre- and post-Green Plan temperature data.

TABLE 4-1 AVAILABLE TEMPERATURE DATA

Location	Entity	Availability
Tailrace	Alabama Power	2000 – present (Mar - Oct)
Tallapoosa River at Malone	Alabama Power	2000 – present (Mar - Oct)
Tallapoosa River at Wadley	Alabama Power	2000 – present (Mar - Oct)
	USGS	02/13/2018 - present
Tallapoosa River at Horseshoe Bend	USGS	03/02/2018 - present
Little Tallapoosa River near Newell	USGS	12/05/2017 - present
Tallapoosa River near Heflin	USGS	12/05/2017 - present

4.2.3 Description of Current Fish Population

Auburn and Alabama Power will perform field sampling to characterize the current fishery in deep and shallow water habitats in the Study Area and in unregulated portions of the Tallapoosa River. Wadeable, shallow water habitats will be sampled using a standardized protocol known as the 30+2 method (O'Neil et al. 2006). Backpack electrofishing will consist of 10 efforts each in riffle, run, and pool habitats, with an additional 2 shoreline efforts. Non-wadeable, deepwater habitats will be sampled using boat and barge electrofishing under standardized protocols (O'Neil et al. 2014).

Auburn will perform boat sampling quarterly for 7 events between fall 2018 and fall 2020 in reaches at varying distances downstream of Harris Dam, including sites in the tailrace, near Malone, Wadley, Horseshoe Bend, and at least one additional site on an unregulated reach. Auburn researchers may employ additional passive capture techniques as conditions warrant (e.g., hoop nets, minnow traps, etc.). Data from ADEM's 2018 fish surveys in the Tallapoosa River may be used to supplement collections by Auburn and Alabama Power.

At minimum, researchers will identify all collected fish species and record length and weight. A sub-sampling of length and weights may be used for highly abundant species. The gut contents, scales, otoliths, and spines of some species may be retained to obtain age, growth, and diet data

for use in bioenergetics modeling. Age and growth data for some species will be compared to data from similar streams. Common metrics such as abundance, diversity, evenness, etc. will be calculated for each study reach.

4.2.4 Bioenergetics Modeling

Auburn will develop a Bioenergetics Model for the three target fish species. The model will be used to assess the extent to which Harris Dam operations affect fish growth in the Tallapoosa River. The Bioenergetics Model will use a variety of inputs including: existing literature/studies, water temperature data (see Section 4.2.2), age, growth, and diet data (see Section 4.2.3), fish tracking data, and laboratory testing.

Auburn will perform a field telemetry study by implanting fish with electromyogram (EMG) coded radio tags. The EMG tags will measure fish movement, including tail-beat frequency, to provide an in-situ measure of energy expenditures across the range of flow conditions experienced during baseline Harris Dam operations for use in the bioenergetics model.

Auburn will perform respirometry testing in a laboratory facility to determine the relative effects of temperature regimes on fish energy expenditures. This testing will include an assessment of the effects of "rapid" temperature change on respiration. Testing scenarios will be developed by HAT 3 after the initial assessment of temperature data (see Section 4.2.2).

5.0 REPORTS

As the various components of this study are completed, Alabama Power will share the results with HAT 3 through stakeholder meetings and written documentation. As part of the 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).

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
Consultation with HAT 3	April 2019 – November 2021
Literature Review and Field Season 1	April – November 2019
Modeling	November 2019 – November 2020
ILP Initial Study Report	April 2020
Initial Study Report Meeting	April 2020
ILP Updated Study Report	April 2021
Updated Study Report Meeting	April 2021
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 to collect and review existing information, conduct field and laboratory studies, and to and develop draft and final reports, is $350K.

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APPENDIX A

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HARRIS DAM
RELICENSING

DOWNSTREAM AQUATIC HABITAT STUDY PLAN

R. L. HARRIS HYDROELECTRIC PROJECT

FERC NO. 2628

Prepared by:

ALABAMA POWER COMPANY
BIRMINGHAM, ALABAMA

Alabama Power

March 2019

ALABAMA POWER COMPANY
BIRMINGHAM, ALABAMA

R. L. HARRIS HYDROELECTRIC PROJECT
FERC NO. 2628

DOWNSTREAM AQUATIC HABITAT STUDY PLAN

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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, Alabama Power will share the results with HAT 3 through stakeholder meetings and written documentation. As part of the 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).

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
Consultation with HAT 3	April 2019 – November 2021
Level Loggers Field Collection	Spring 2019 – Spring 2020
HEC-RAS Modeling	Fall 2019 – Summer 2020
Initial Study Report	April 2020
Initial Study Report Meeting	April 2020
Updated Study Report	April 2021
Updated Study Report Meeting	April 2021
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

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APPENDIX A

R.L. HARRIS GREEN PLAN RELEASE CRITERIA

R. L. HARRIS GREEN PLAN RELEASE CRITERIA

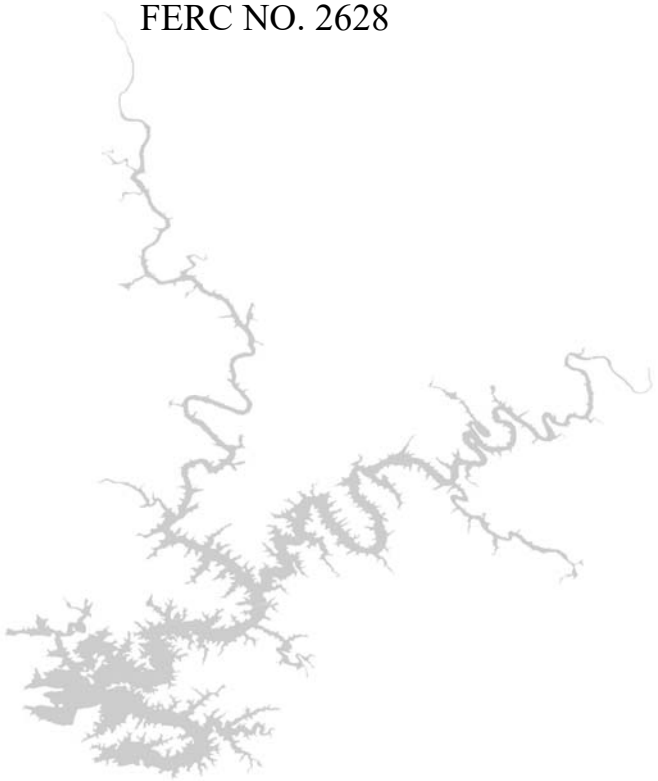
1. Daily Release Schedule
   a. The required Daily Volume Release will be at least 75% of the prior day's flow at the USGS Heflin Gauge.
   b. In the event that the Heflin Gauge is not in service, the required Daily Volume Release will be at least one-fourth of the previous day's inflow into R L Harris 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.

HARRIS DAM
RELICENSING

THREATENED AND ENDANGERED SPECIES STUDY PLAN

R. L. HARRIS HYDROELECTRIC PROJECT

FERC NO. 2628



Prepared by:

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March 2019

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R. L. HARRIS HYDROELECTRIC PROJECT
FERC NO. 2628

THREATENED AND ENDANGERED SPECIES STUDY PLAN

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THREATENED AND ENDANGERED SPECIES 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

During the October 19, 2017 issue identification workshop, representatives from the United States Fish and Wildlife Service (USFWS) and Alabama Department of Conservation and Natural Resources (ADCNR) noted that there may be several species of federally protected bats using Project lands around the Harris Project. The USFWS also noted that there may be some aquatic species of concern in the Project Area (areas adjacent to the Project Boundary that could be influenced by Project operations). The USFWS and ADCNR requested that potential impacts to threatened or endangered species currently in the Harris Project Boundary be addressed during the relicensing process.

During preparation of the Harris Pre-Application Document (PAD), research identified several federally protected species that are present in the counties where the Harris Project is located (**Table 1**). Additionally, research concluded a potential for federally protected species to be located within the Lake Harris or Skyline Project Areas.

1.1 Resource Management Goals

The FERC has a responsibility under Section 7 of the Endangered Species Act (ESA) to consult with USFWS on the presence of federally protected species that may be adversely impacted by operation of the Harris Project. FERC may require Alabama Power to implement measures to protect or enhance any critical habitat or populations of protected species impacted by the Project.

1.2 Current Operations and Operational Alternatives

The Threatened and Endangered (T&E) Species study will assess the presence of any Federal and/or State protected species occurring on Harris Project lands and waters and determine if Project operations would likely have an effect (positive or negative) on these species. If Harris Project effects are identified, Alabama Power will consult with USFWS and ADCNR to ensure adequate protection for these species. If Section 7 consultation is necessary, the study will also provide the basis for such need.

Any effects on T&E species from potential changes in operations will be analyzed in the R.L. Harris Project Operating Curve Change Feasibility Study and the Downstream Release Alternatives Study.

2.0 GOALS AND OBJECTIVES

The goals of this study are to assess the probability of populations of currently listed T&E species or their critical habitat occurring within the Harris Project Boundary or Project Area and determine if there are project related impacts (i.e., lake fluctuations, downstream flows, recreation and shoreline management activities, timber management, etc.). Section 7 of the ESA gives USFWS federal mandatory conditioning authority to identify and limit the impacts of the Harris Project on any species federally listed as threatened or endangered within the Harris Project Boundary or Project Area. ADCNR has developed a policy to enhance T&E species through protection of habitat, supplemental stocking, and/or reintroduction of species to historic habitats. If Project

related impacts are identified, ADCNR and USFWS have expressed interest in determining ways to limit those impacts.

This study will also include developing a list of extant species that may have been extirpated from the Project Vicinity and identify the factors that may have contributed to their extirpation.

Table 1 FEDERALLY THREATENED AND ENDANGERED SPECIES POTENTIALLY OCCURRING IN ALABAMA COUNTIES WITHIN THE R.L. HARRIS PROJECT

SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS[1]	COUNTY(IES) OF OCCURRENCE	OCCURRENCE	DOCUMENTED HISTORIC RANGE IN AL
Picoides borealis	Red-Cockaded Woodpecker	E	Clay & Randolph		Statewide in appropriate habitat
Notropis albizonatus	Palezone Shiner	E	Jackson		Tennessee River system
Erimonax monachus	Spotfin Chub	T	Jackson		Tennessee River system
Hamiota altilis	Fine-lined Pocketbook mussel	T	Cleburne	Yes	Coosa, Tallapoosa, Cahaba River systems
Lampsilis virescens	Alabama Lampmussel	E	Jackson		Tennessee River system
Villosa trabalis	Cumberland Bean	E	Jackson		Tennessee River system
Fusconaia cuneolus	Finerayed Pigtoe	E	Jackson		Tennessee River system
Toxolasma cylindrellus	Pale Lilliput	E	Jackson		Tennessee River system
Quadrula cylindrica	Rabbitsfoot	T	Jackson		Tennessee River system
Fusconaia cuneolus	Shiny Pigtoe	E	Jackson		Tennessee River system
Epioblasma triquetra	Snuffbox	E	Jackson		Tennessee River system
Pleurobema georgianum	Southern Pigtoe	E	Clay		Coosa River system
Pleuronaia dolabelloides	Slabside Pearlymussel	E	Jackson		Tennessee River system
Myotis sodalis	Indiana Bat	E	Clay, Cleburne, Randolph, Chambers, Tallapoosa, & Jackson	Yes	Statewide in appropriate habitat
Myotis septentrionalis	Northern Long-eared Bat	T	Clay, Cleburne, Randolph, Chambers, Tallapoosa, & Jackson	Yes	Piedmont and Cumberland regions
Myotis grisescens	Gray Bat	E	Jackson	Yes	Statewide in appropriate habitat
Amphianthus pusillus	Little Amphianthus	T	Randolph, Chambers, & Tallapoosa	Yes	Piedmont region (Bridges 1988)
Platanthera integrilabia	White Fringeless Orchid	T	Clay, Cleburne, Jackson, Chambers, & Tallapoosa		Talladega National Forest
Apios priceana	Price's Potato-bean	T	Jackson	Yes	Statewide in appropriate habitat
Clematis morefieldii	Morefield's Leather Flower	E	Jackson		Northern regions of state (USFWS 2007)

Source: Mirarchi et.al. 2004, USFWS 2016a, USFWS 2016b, Williams et.al. 2008, FERC 2018

[1] E = Federally listed as Endangered, T = Federally listed as Threatened

3.0 PROJECT NEXUS AND GEOGRAPHIC SCOPE

The study will assess the likelihood of currently listed aquatic and/or terrestrial T&E species occurring within the Harris Project Boundary or in the Tallapoosa River downstream of Harris Dam through Horseshoe Bend. The study will determine if Harris Project related activities impact these populations or habitat. The study will assess the likelihood of T&E species occurring within the Skyline Project Boundary, with an emphasis on potential impacts of current operations (timber management) on populations of bats or their habitats. This study will also assess the factors that may have contributed to the extirpation of some species from the Project Vicinity.

4.0 METHODS

Information will be collected from various sources, including ADCNR, USFWS, and Alabama Natural Heritage Program databases, to appropriately characterize the status of T&E species in the Project vicinity.

4.1 Threatened and Endangered Species

- Compile a list of T&E species and critical habitats documented as occurring in counties surrounding the Harris Project and the downstream reach of the Tallapoosa River from Harris Dam through Horseshoe Bend.
- Additional species of concern may be added at the request of USFWS and/or ADCNR if determined to be appropriate.
- Review literature of agreed upon species to gather habitat requirement data and to describe historical range of species (those existing and extirpated).
- Identify factors affecting the status of each species.
- Use a Geographic Information System (GIS) to map habitat information (land use, tree stand data, aquatic habitat data) to determine possible areas in the geographic scope that T&E species may utilize.

4.2 Data Analysis

- Summarize collected data of areas within the geographic scope that provide habitat requirements for T&E species.
- Determine if these areas are potentially impacted by Harris Project operations.
- Consult with stakeholders.
- Provide GIS overlays to consulting agencies.
- If applicable, recommend potential future field sampling. The specific methods for any future field sampling will be developed in consultation with USFWS.

5.0 REPORTS

As the various components of this study are completed, Alabama Power will share the results with HAT 3 through stakeholder meetings and written documentation. Detailed location data for T&E species will not be provided to the public without prior approval of USFWS. The results of the

study may serve as the basis for USFWS to determine the need for a Biological Assessment or formal Section 7 consultation.

As part of the 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).

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
Consultation with HAT 3	April 2019 – November 2021
Develop GIS Overlays and Maps	April 2019 – July 2019
Field Verification, if required	September 2019 – September 2020
Initial Study Report	April 2020
Initial Study Report Meeting	April 2020
Updated Study Report	April 2021
Updated Study Report Meeting	April 2021
File Preliminary Licensing Proposal	By July 3, 2021
File Final License Application with FERC	November 2021

7.0 COST AND EFFORT

Alabama Power estimates that the cost to consult on and implement this study plan, including costs to develop the T&E species database and prepare a draft and final report, is $50K.

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.

Alabama Power Company. 2018. Pre-Application Document for the Harris Hydroelectric Project (FERC No. 2628). Alabama Power Company, Birmingham, AL.

Federal Energy Regulatory Commission (FERC). 2018. List of Threatened, Endangered, Candidate, and Proposed Species Generated by ECOS-IPaC Website on July 27, 2018. Washington, D.C.

Mirarchi. Ralph E., ed. 2004. Alabama Wildlife, Volume One. A Checklist of Vertebrates and Selected Invertebrates: Aquatic Mollusks, Fishes, Amphibians, Reptiles, Birds and Mammals. The University of Alabama Press, Tuscaloosa, AL.

U.S. Fish and Wildlife (USFWS). 2016a. IPaC Trust Resources Report. R.L. Harris Project Lands Near Reservoir. Generated November 9, 2016.

U.S. Fish and Wildlife (USFWS). 2016b. IPaC Trust Resources Report. R.L. Harris Skyline Wildlife Management Area. Generated November 9, 2016.

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PROJECT LANDS EVALUATION STUDY PLAN

R. L. HARRIS HYDROELECTRIC PROJECT

FERC NO. 2628

Prepared by:

ALABAMA POWER COMPANY
BIRMINGHAM, ALABAMA

March 2019

ALABAMA POWER COMPANY
BIRMINGHAM, ALABAMA

R. L. HARRIS HYDROELECTRIC PROJECT
FERC NO. 2628

PROJECT LANDS EVALUATION STUDY PLAN

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PROJECT LANDS EVALUATION 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's current Harris Land Use Plan defines land use categories within the existing Project Boundary (Alabama Power 2008). Harris Project classifications are Recreational Use, Hunting, Prohibited Access, and Natural Undeveloped, as defined below.

- *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 Wildlife Mitigation Plan. Non-hunting related public access is allowed from May 1 until September 30 of each year for activities such as hiking, backpacking, camping, wildlife observation, and bank fishing opportunities.
- *Prohibited Access* – Includes lands where public use and access are 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 use type 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 Wildlife Mitigation Plan.

Additional information that will help inform this evaluation includes Alabama Power's shoreline permitting program for Harris and other Alabama Power FERC-approved Shoreline Management Plans (SMP) and Wildlife Management Programs (WMP). These documents will be used only as a reference to understanding the format and content that FERC approved.

1.1 Resource Management Goals

The FERC requires that project lands and waters be protected and maintained for their designated project purposes (as part of the Standard License Articles). In addition, hydroelectric power project licensees have an obligation to confirm that shoreline development, timber management, and wildlife management activities that occur within a project boundary are consistent with project license purposes and requirements.

1.2 Current Operations and Operational Alternatives

The Project Lands Evaluation Study Plan will involve evaluating baseline Harris Project lands information at the Harris Project. Any effects on project lands from potential changes in operations will be analyzed in the R. L. Harris Project Operating Curve Change Feasibility Analysis and the Downstream Release Alternatives Study Plans.

2.0 GOALS AND OBJECTIVES

The FERC is responsible for issuing licenses for the construction, operation, and maintenance of non-federal hydropower projects. Alabama Power, as Licensee, is responsible for operating and maintaining its FERC-licensed projects in accordance with the license requirements and Harris Project purposes (*i.e.*, power generation, public recreation, environmental protection, aesthetic values).

Alabama Power intends to conduct a Harris Project lands evaluation study to identify lands around Lake Harris and at Skyline that are needed for Harris Project purposes and to classify these lands. Alabama Power will also evaluate the land use classifications for Harris and determine if any changes are needed to conform to Alabama Power's current land classification system and other Alabama Power FERC-approved Shoreline Management Plans. The study will identify lands to be added to, or removed from, the current Harris Project Boundary and/or be reclassified.

Once this evaluation is complete, Alabama Power proposes to use the project lands evaluation information to develop a WMP and a SMP. Alabama Power will use the FERC guidance applicable at the time these plans are developed.

3.0 PROJECT NEXUS AND GEOGRAPHIC SCOPE

The proposed project lands evaluation study plan will identify lands necessary for the Harris Project. Additionally, the study plan will be used to develop a WMP and SMP, as required by FERC for hydroelectric projects under its jurisdiction.

The geographic scope for this study includes the Harris Project Boundary and the associated Project Area.

4.0 METHODS

This study is divided into two phases: Phase 1, project lands evaluation and Phase 2, developing the WMP and SMP based on the results of Phase 1. The detailed process for completing Phase 1 will be as follows:

1. Meet with Harris Action Team (HAT) 4 members to discuss potential changes to the Harris Project lands (add, delete, or reclassify). All proposed changes to the Harris Project lands will include a tract by tract description, rationale for the change, and will be presented in Geographic Information System (GIS) format.
2. All proposed land changes will consider the location of any threatened or endangered species (T&E), wetlands, and cultural resources (i.e., "Sensitive Areas"), timber management tracts and current practices, and the impaired waters GIS layer developed by the Alabama Department of Environmental Management (ADEM). No sensitive information will be shared with the public.
3. Alabama Power will develop a draft map using GIS to show all proposed changes to Harris Project Lands.

4. Conduct a botanical inventory of a 20-acre parcel at Flat Rock Park. This botanical inventory is intended to catalogue all plants present at a 20-acre parcel at the rare Blake's Ferry Pluton located adjacent to Alabama Power Company's Flat Rock Park. Information collected during this inventory will include a description of the biological setting, inventory dates and methods, results and conclusions (including a list of all species found in the study area and their conservation status), and an assessment of the biological significance or ecological quality of the project site in a local and regional context. Investigators will include a GIS map of all state and federally listed species found in the study area.
5. Alabama Power will evaluate acreage at Skyline to determine suitability for bobwhite quail habitat.
6. Alabama Power will develop a Phase 1 Draft Project Lands Evaluation Study Report for Hat 4 review and comment.
7. Alabama Power will develop a Phase 1 Final Project Lands Evaluation Study Report for use in Phase 2.

Phase 2 - Phase 2 includes developing a SMP (Phase 2A) and a WMP (Phase 2B) to file with the final license application. In addition to the results from the Phase 1 Land Use Evaluation, Alabama Power will also integrate information collected during other relicensing studies (e.g., T&E, water quality, and recreation studies), as appropriate, to the SMP and WMP.

Phase 2A – SMP

1. Form a HAT 4 work group for persons interested in working on the SMP.
2. Review existing and develop new, if applicable, Best Management Practices (BMPs) and evaluate how these BMPs would apply to the different land classifications.
3. Review the Harris Guidelines for Shoreline Permitting; discuss potential modifications.
4. Alabama Power will incorporate information regarding northern long-eared and Indiana bats by referencing the Alabama Natural Heritage Program and the U.S. Fish and Wildlife Service (USFWS) Alabama Ecological Services Field Office to determine locations of known maternity roost trees and hibernacula within the Project Vicinity (including determining buffer zones within a 150-foot radius of known maternity roost trees and buffer zones of 0.25 mile from known, occupied hibernacula that overlap with the Project Boundary) in order to develop provisions for regular and planned tree-removal activities (e.g., associated with timber management, shoreline management, recreation site maintenance or enhancement, etc.).
5. Incorporate the Aquatic Nuisance Vegetation and Vector Control Program into the SMP.
6. Alabama Power will develop a detailed description of existing vegetation management practices throughout the Project Area, which will include information on such practices at the project recreation sites, access roads, transmission line rights-of-way, and other project facilities. Additionally, information about the goals, objectives, and methods (e.g., manual, mechanical, or chemical treatments, regular plantings) used in each area, frequency of treatments, and any monitoring that is conducted will be complied and included in the Final Project Lands Evaluation Study Report.
7. Include existing Alabama Power policies for the Harris Project (i.e., dredging, primitive camping);

8. Incorporate results of the botanical inventory of a 20-acre parcel at Flat Rock Park (Inventory completed by February 2020) into the Draft SMP.
9. Develop a Draft SMP to file with the final license application (see Section 5.0).

Phase 2B - WMP

1. Form a HAT 4 work group for persons interested in working on the WMP. This HAT will likely include agency representatives from Alabama Department of Conservation and Natural Resources (ADCNR), ADEM, USFWS, and other interested groups/individuals.
2. In preparation for facilitated meetings, Alabama Power will prepare GIS overlays that depict the following:
   - lands within the Project Boundary and current land use classifications for those lands (from Phase 1);
   - forest stand data showing cover type, composition, and age of forest stands within the Project Boundary;
   - current timber management objectives and any existing BMPs;
   - locations of known populations of T&E species; Alabama Power will incorporate information regarding northern long-eared and Indiana bats by referencing the Alabama Natural Heritage Program and the USFWS Alabama Ecological Services Field Office to determine locations of known maternity roost trees and hibernacula within the Project Vicinity (including determining buffer zones within a 150-foot radius of known maternity roost trees and buffer zones of 0.25 mile from known, occupied hibernacula that overlap with the Project Boundary) in order to develop provisions for regular and planned tree-removal activities (e.g., associated with timber management, shoreline management, recreation site maintenance or enhancement, etc.);
   - acreage at Skyline that may be suitable for bobwhite quail habitat (if such habitat exists);
   - impaired waters list; and
   - characterization and composition of riparian, wetland, and littoral habitats within the Project Boundary.

   This information will provide the basis of knowledge for discussions about management goals to enhance wildlife resources at the Harris Project
3. Alabama Power will facilitate HAT 4 work group meetings to collaborate on developing a WMP using information obtained during this study.
4. Develop provisions for regular and planned tree-removal activities (e.g., associated with timber management, shoreline management, recreation site maintenance or enhancement, etc.).
5. Develop a WMP to file with the license application (see Section 5.0).

5.0 REPORTS

As the various components of this study are completed, Alabama Power will share the results with HAT 4 through stakeholder meetings and written documentation. As part of the 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).

6.0 SCHEDULE

This schedule corresponds to the FERC-approved Harris Project Process Plan and Schedule. Consultation meeting dates will be finalized with HAT 4 members upon FERC approval of the study plan.

FERC Study Plan Determination	April 2019
Consultation with HAT 4	April 2019 – November 2019
Phase 1 - Develop GIS Overlays and Maps	April 2019 – September 2019
Phase 2 A -SMP	2020 – 2021
Phase 2 B -WMP	2020 – 2021
Initial Study Report	April 2020
Initial Study Report Meeting	April 2020
Updated Study Report	April 2021
Updated Study Report Meeting	April 2021
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 completing Phase 1 and Phase 2A and 2B tasks, is $200K.

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.

Alabama Power Company. 2008. 1995 Land Use Plan for the R.L. Harris Project (Revised 2008) submitted to the Federal Energy Regulatory Commission by Alabama Power Company, on June 30, 2008. Alabama Power Company, Birmingham, AL.

Alabama Power Company. 2018. Pre-Application Document for the Harris Hydroelectric Project (FERC No. 2628). Alabama Power Company, Birmingham, AL.

HARRIS DAM
RELICENSING

RECREATION EVALUATION STUDY PLAN

R. L. HARRIS HYDROELECTRIC PROJECT

FERC NO. 2628

Prepared by:

ALABAMA POWER COMPANY
BIRMINGHAM, ALABAMA

Alabama Power

March 2019

ALABAMA POWER COMPANY
BIRMINGHAM, ALABAMA

R. L. HARRIS HYDROELECTRIC PROJECT
FERC NO. 2628

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RECREATION EVALUATION 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 intends to conduct a Recreation Evaluation study that will describe the existing Harris Project recreation facilities, discuss current and future use estimates, and evaluate the need for additional recreational facilities at the Harris Project in the future. The study has two main components: recreational use of the Harris Project and recreational use of the Tallapoosa River below Harris Dam.

The Lake Harris Project Area, located within Clay, Cleburne, and Randolph counties, Alabama, provides both reservoir and riverine recreation opportunities. The Project Boundary includes Lake Harris and extends upstream on the Tallapoosa River, providing additional, more riverine boating and fishing opportunities. Recreation within the Lake Harris Project Area typically includes boating (non-motorized and motorized), fishing, water sports, swimming, picnicking, and hiking. Project lands and waters are generally available for public recreational use.

The Skyline Project Area located in Jackson County, Alabama provides public hunting opportunities. Notable recreation opportunities in addition to hunting in this area (but not located in the Skyline Project Boundary) include the "Walls of Jericho" and a stop on the Alabama Birding Trail.

The following Project recreation sites located within the existing Project Boundary are currently on lands owned by Alabama Power and will be included in this Recreation Evaluation study (**Figure 1-1**).

TABLE 1-1 SUMMARY OF HARRIS PROJECT RECREATION SITES

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

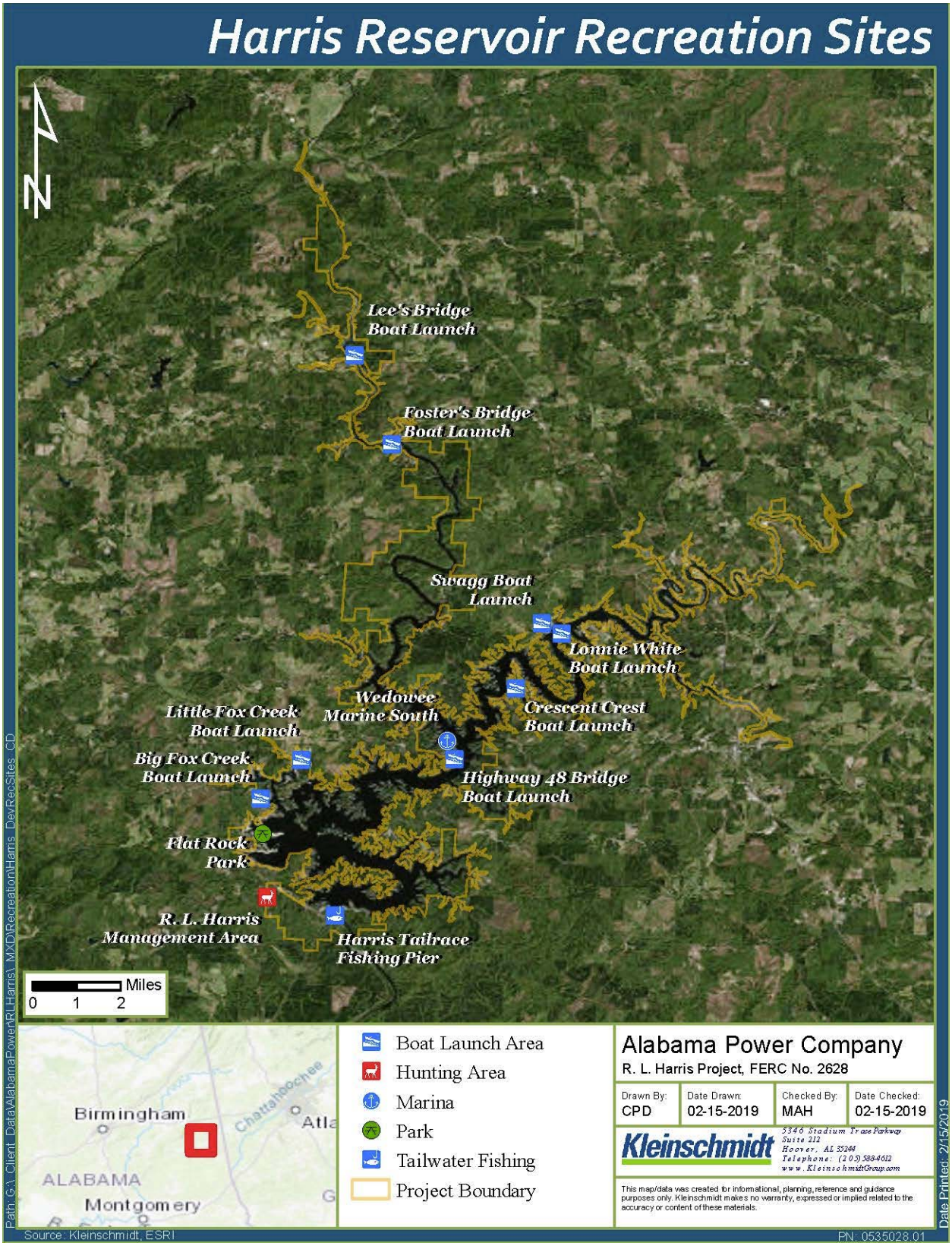


FIGURE 1-1 LOCATION OF HARRIS PROJECT RECREATION SITES

In addition to these Project recreation sites, the Harold Banks Canoe Trail (HBCT) on the Tallapoosa River and two sections of the Tallapoosa River immediately upstream from HBCT will be included in the study (i.e., Study Area). The HBCT includes the stretch of river from the Bibby's Ferry access point to Jaybird Landing (Appendix A).[2] The HBCT contains four access points: Bibby's Ferry, Germany Ferry, Horseshoe Bend, and Jaybird Landing (**Figure 1-2**). Jaybird Landing is an exit point for those floating downstream from Horseshoe Bend (or other upstream access points) but can also be used as an access point for traveling upstream to fish/recreate at and above Irwin Shoals. The two sections of the Tallapoosa River from the County Road 15 bridge in Malone to the Alabama Highway 22 bridge in Wadley, and from Wadley to Bibby's Ferry will also be included as part of the Study Area because some use is anticipated in these sections during the study. The section of river from the Harris Dam to Malone will not be sampled. Additionally, one access point between Horseshoe Bend and Jaybird Landing (Peters Island) was deemed unusable because it is remote, and a four-wheel drive vehicle is necessary to access it.

1.1 Resource Management Goals

Recreation is a recognized project purpose under Section 10(a) of the Federal Power Act. As part of 18 CFR § 5.6(viii), FERC requires a description of the existing and future recreation and land uses opportunities. The resource management goals are to identify and provide for long-term management and potential recreation enhancement of public recreational opportunities associated with the Harris Project.

1.2 Current Operations and Operational Alternatives

The Recreation Evaluation study will involve evaluating baseline recreation at the Harris Project. Any effects on recreation from potential changes in operations will be analyzed in the R.L. Harris Project Operating Curve Change Feasibility Analysis and the Downstream Release Alternatives Study Plan.

[2] Jaybird Landing, as identified in the Martin Dam Project (FERC No. 349) Recreation Plan (162 FERC ¶ 62,033) is noted as Jay Bird Creek on the HBCT brochure.

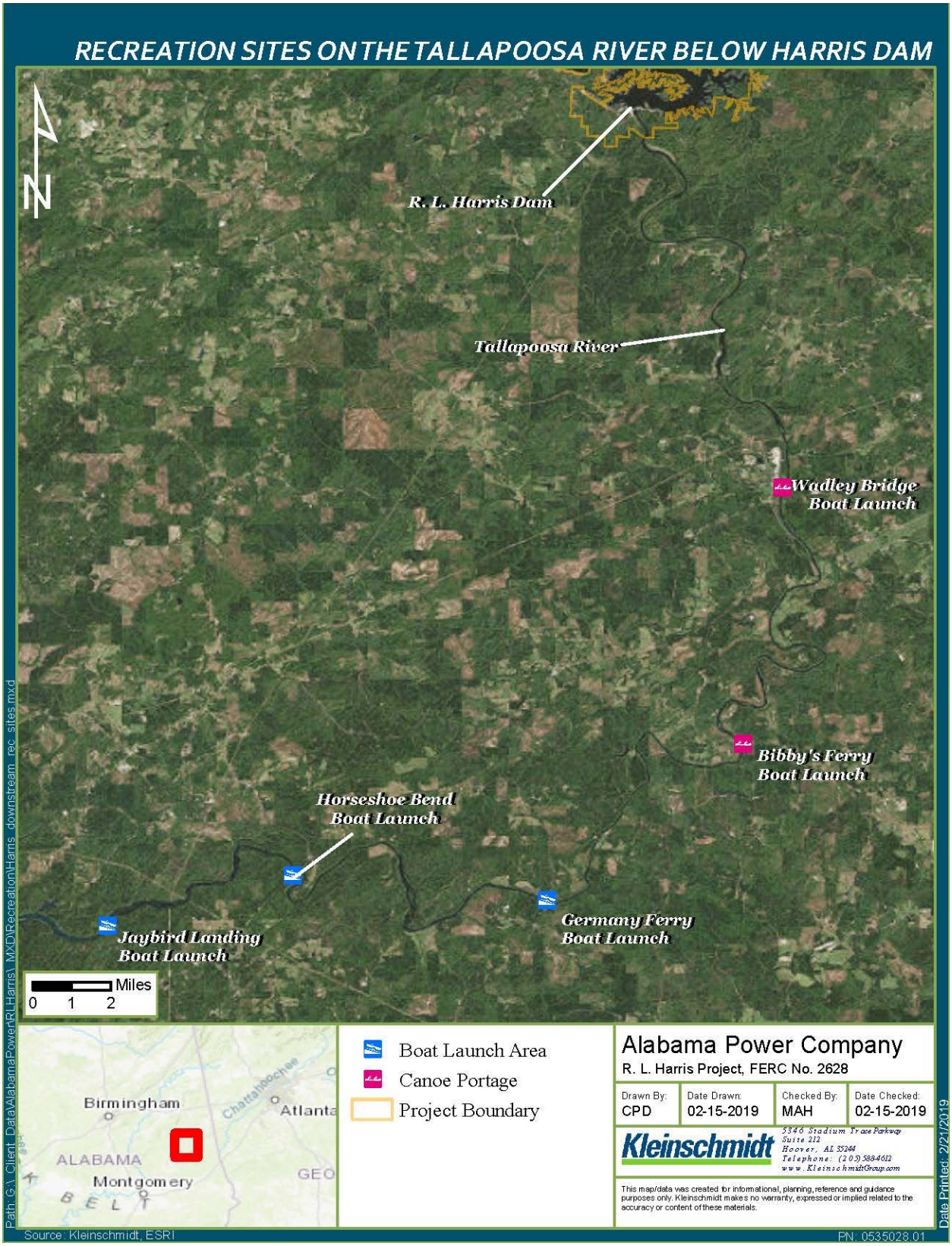


FIGURE 1-2 RECREATION SITES ON THE TALLAPOOSA RIVER BELOW HARRIS DAM

2.0 GOALS AND OBJECTIVES

One of the goals of this study is to gather baseline information on existing Project recreation facilities, existing Project recreational use and capacity, and estimated future demand and needs at the Harris Project.

The objectives of this component of the study are as follows:

- Review existing information and inventory and map (using Geographic Information Systems - GIS) existing Project recreation sites and access areas within the Project Boundary, including site locations and facilities/amenities;
- Summarize who owns, operates, and maintains each Project recreation site;
- Evaluate the condition of the Harris Project recreation sites and facilities within the Project Boundary, including existing information on the suitability of facilities to provide opportunities for persons with disabilities to participate in recreation opportunities (i.e., compliance with current Americans with Disabilities Act [ADA] design standards), where feasible, and public safety features; and
- Estimate current recreation use and the current and projected use capacity at Harris Project recreation sites.

The second goal of this study is to determine how flows in the Tallapoosa River downstream of Harris Dam affect recreational users and their activity. User groups include bank and boat (primarily canoe/kayak) anglers, recreational boaters, float tube users, and those who may be using access points for swimming.

To achieve this goal, the four objectives are to:

- Calculate total visitation (effort) and daily effort levels by user groups in the Study Area during the study period (May 1, 2019 to October 31, 2019);
- Measure user attitudes/perceptions about instream flow and trip satisfaction in the Study Area on the day they are intercepted during this period;
- Obtain catch information from anglers intercepted during this period; and
- Determine how instream flow affected a) overall effort, b) daily effort by each user group, c) perception of instream flow and trip satisfaction by user group, and d) species of fish targeted, caught, and retained.

Finally, the last goal of this study is to evaluate the adequacy of Harris Project recreation facilities (both on Lake Harris and downstream of Harris Dam) and identify if any changes or upgrades to the existing sites are needed to meet current or future recreation needs and demand.

3.0 PROJECT NEXUS AND GEOGRAPHIC SCOPE

The FERC policy requires Alabama Power to provide reasonable public recreation opportunities consistent with the safe and effective operation of the Harris Project. Alabama Power provides recreational opportunities according to the existing Harris Project license conditions and has undertaken measures, including ongoing maintenance of recreation facilities, throughout the license term. The proposed Recreation Evaluation Study will provide information about available recreational facilities, current use, and assess future recreational needs at the Harris Project.

The geographic scope includes public recreation sites located within the Harris Project. The geographic scope also includes the Tallapoosa River downstream from Harris Dam through Horseshoe Bend.

4.0 METHODS

The following describes the proposed methodology for the Harris Project Recreation Evaluation.

4.1 Project Recreation Site Inventory and Condition Assessment

Alabama Power will compile a site inventory and condition assessment information for each of the Harris Project recreation sites. The recreation site inventory and condition assessment will:

1. Describe the type and map the location of the recreation site in relation to the Project Boundary;
2. Describe the type, number, and condition of amenities provided at each site (including reservoir elevation at which boat launches become inoperable);
3. Estimate recreation facility capacity;
4. Evaluate the condition of the recreation sites and facilities, including suitability of facilities to provide opportunities for persons with disabilities to participate in recreation opportunities (i.e., compliance with current ADA design standards) and public safety features;
5. List entities responsible for the operation and maintenance of each facility; and
6. Document recreation facilities using photographs.

In addition to the information gathered on Project recreation sites, Alabama Power will utilize aerial imagery and Light Detection and Ranging (LiDAR) contours to examine private boat docks and boat ramps to determine the reservoir elevation at which these private facilities are usable and at which elevation they become unusable. Alabama Power will also conduct spot checks of a random sample of private boat docks and boat ramps to validate this information.

4.2 Project Area Recreation Use and Future Recreation Demand

Previously, the FERC required licensees to file Form 80 recreation reports for each project development every six years, unless the licensee obtains an exemption from FERC.[3] The Form 80 report included 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 included an assessment of the capacity utilization of the identified recreation amenities.

For recreation use at Project recreation sites, Alabama Power will compile the 2014 FERC Form 80 data and collect data during 2019 following the methodology applied for the 2014 Form 80 data collection period (Alabama Power 2015) (see Appendix B). This will allow for analysis and comparison of recreation facility use and capacity between the 2014 and 2019 data collection periods. Counts will be conducted as summarized in Appendix B. For each month, sites are counted

[3]. On December 28, 2018, FERC published a rule entitled *Elimination of Form 80 and Revision of Regulations on Recreational Opportunities and Development of Licensed Hydropower Projects*. The rule eliminated the Form 80 requirement; however, Alabama Power will use the Form 80 methodology to keep data collection consistent.

a minimum of six weekdays (8 am to 5 pm) and three weeknights (after 5 pm) at varying times of day and days of the week. Two weekend days and one weekend night are observed each month, and one count will be conducted during each holiday weekend (Memorial Day, July 4th, and Labor Day). Although not a Project recreation site, recreation use at Skyline will be characterized based on existing available recreation use data obtained from Alabama Department of Conservation and Natural Resources (ADCNR).

Alabama Power will assess future regional recreation demand and participation based on information provided in the Alabama State Comprehensive Outdoor Recreation Plan (SCORP), as well as assessment of population projections within the Harris Project region (e.g., Clay, Cleburne, Randolph, and Jackson counties, Alabama) (ADECA 2013).

4.3 Downstream Recreation Use

Tallapoosa River users will be contacted while exiting the river if using a boat or if they are stationary users at one of five access points (Wadley, Bibby's Ferry, Germany Ferry, Horseshoe Bend, and Jaybird Landing) (**Figure 1-2**). Two survey technicians will be stationed at one of these access points for 6 hours on 36 days during the study period. Date, day type (weekday vs. weekend), access point, and time of day (morning v. afternoon) will be randomly selected. At first contact, anglers will be interviewed to obtain information about catch and effort during their outing, their perceptions of instream flow that day (e.g., too low, about right, perfect, too high, dangerous), and their satisfaction with their trip that day (not at all to extremely satisfied); other users will be asked about their effort, perceptions of instream flow, and their trip satisfaction that day. Stationary users will be asked the same questions on instream flow and trip satisfaction, and when they started and plan to end their activity that day (if not observable). Each member of the party will be asked to answer questions about instream flow and trip satisfaction.

Effort for each user group will be estimated as the product of mean trip length, mean party size, and number of trips. Trip length and party size are recorded during the access point survey. Number of trips will be estimated through counts of vehicles, boat trailers, and bank parties at access sites on the same 36 days selected for access point surveys. A third survey technician will make a bus-route type roving survey along the entire stretch of river from Malone to Jaybird Landing to conduct instantaneous counts at the six access points (Malone, Wadley, Bibby's Ferry, Germany Ferry, Horseshoe Bend, and Jaybird Landing). The route will start and end at the access point where the two survey technicians are stationed that day. Whether they travel north or south on the bus route will be randomly selected each day. Total daily effort for each section of river will be estimated as the product of recorded trips and trip length (hours).

Pertinent modifications will likely be made to the general research plan during a pretest of the creel and user survey during March-April, 2019. Currently, with only anecdotal information on use, we must enter the pretesting period under the assumption there is equal distribution of effort in each section of the river and that effort is evenly distributed between weekday and weekend days. Pretesting should enable us to have a clearer understanding of longitudinal use and stratify the 36 sampling days by weekday/weekend and river section according to expected use. Additionally, where the technician conducting the instantaneous counts primary purpose is to collect counts, it may be necessary for them to interview users they encounter to supplement access point surveys if number of interviews is low during the study period. If so, these interviews will be kept separate from access point interviews for analysis purposes.

Content of the survey instrument will be developed in cooperation with Harris Action Team (HAT) 5 and will be modified based on pretesting. Research permits will be obtained from the National Park Service to conduct interviews within the Horseshoe Bend National Military Park per federal regulation.

4.4 Identify Potential Recreation Facility Needs and Upgrades

Alabama Power will consult with the HAT 5 members to review the recreation facility and use data and assess potential development of additional recreation sites and upgrades to existing sites at the Harris Project, including the Tallapoosa River downstream of Harris Dam. Alabama Power intends to hold HAT 5 meetings as necessary to accomplish this task.

5.0 REPORTS

As the various components of this study are completed, Alabama Power will share the results with HAT 5 through stakeholder meetings and written documentation. As part of the 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).

6.0 SCHEDULE

This schedule corresponds to the FERC-approved Harris Project Plan and Schedule. Consultation meeting dates will be finalized with HAT 5 members upon FERC approval of the study plan.

FERC Study Plan Determination	April 2019
Consultation with HAT 5	April 2019 – November 2021
Data Collection	May – December 2019
Initial Study Report	April 2020
Initial Study Report Meeting	April 2020
Updated Study Report	April 2021
Updated Study Report Meeting	April 2021
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 to conduct the recreation evaluation and develop a draft and final report, is $500K.

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.

Alabama Department of Economic and Community Affairs (ADECA). 2013. Statewide Comprehensive Outdoor Recreation Plan, 2013-2018, Prepared by South Central Alabama Development Commission 5900 Carmichael Place, Montgomery, Alabama. Available at: http://www.adeca.alabama.gov/Divisions/ced/Recreation/Trail%20Plan/SCORP%202013-2018.pdf. Accessed December 2017.

Alabama Power Company. 2018. Pre-Application Document for the Harris Hydroelectric Project (FERC No. 2628). Alabama Power Company, Birmingham, AL.

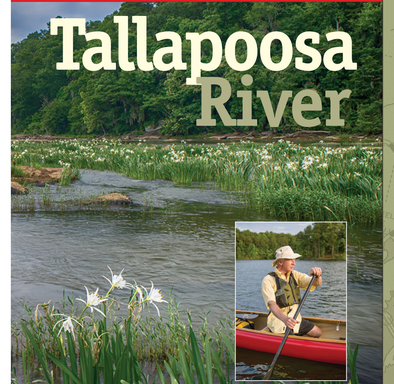
Alabama Power Company (Alabama Power). 2015. FERC Form 80 Report for the 2014 calendar year period. Filed with the Federal Energy Regulatory Commission on March 30, 2015. Alabama Power Company, Birmingham, AL.

APPENDIX A

HAROLD BANKS CANOE TRAIL TALLAPOOSA RIVER BROCHURE

Harold Banks Canoe Trail

Tallapoosa River



Alabama Cooperative Extension System • Alabama Scenic River Trail
Coosa Valley RC&D Council • Middle Tallapoosa Clean Water Partnership

Located at the southern end of the Appalachian Mountains, the Tallapoosa River winds 258 miles from western Georgia into eastern Alabama. The river gets its name from the people who lived along the lower stretch of it in the eighteenth century. The Tallapoosa flows through stretches of lush countryside that help preserve its natural beauty and solitude. The Tallapoosa is so unique that the Alabama section has been designated a part of the Alabama Scenic River Trail.

Naturalists, historians, and adventurers are quick to point out that the crown jewel of the Tallapoosa River lies in east central Alabama within the borders of Tallapoosa and Chambers Counties. Along a 25-mile stretch of water, visitors discover the tranquility in a mighty waterway that winds and spills along the Piedmont. Pause along your journey to witness the unique perspective of a fierce battle fought long ago and wonder in the beauty of the shoal lily while catching a glimpse of a soaring bald eagle.

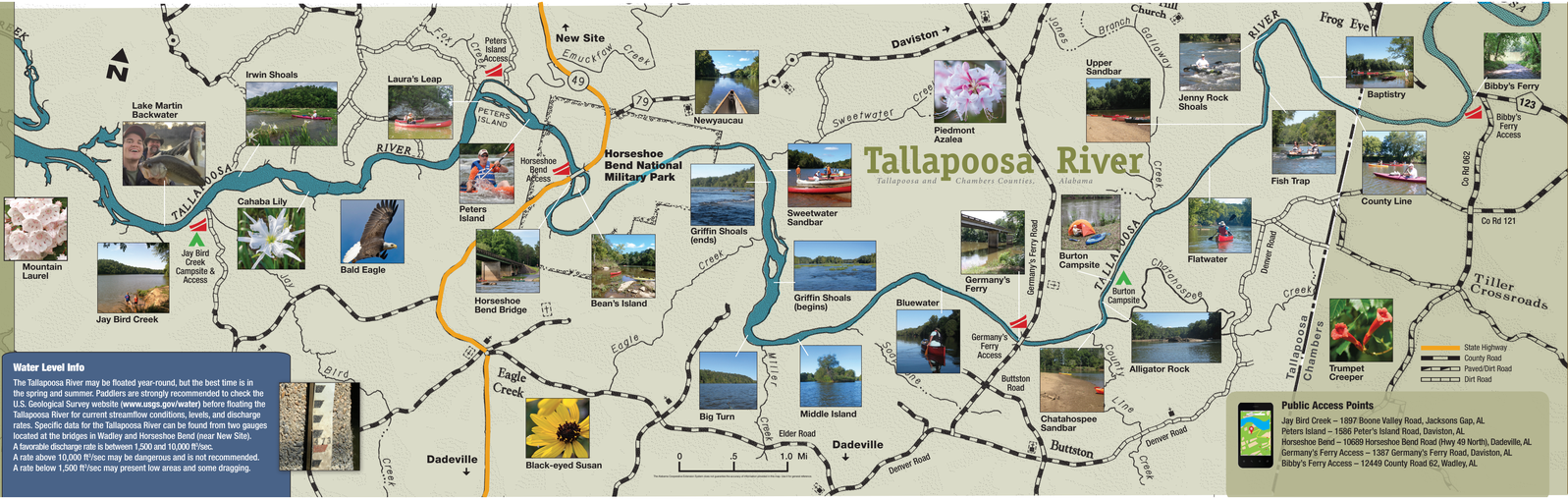
About Harold Banks

Harold Banks is a man of many talents—historian, forester, storyteller, explorer, and outdoorsman. But in Tallapoosa County, he is best known for his red canoe and his expertise on the river. In 2009, he became the first person to solo paddle the entire 258 miles of the Tallapoosa River from its origins in Paulding County, Georgia, to its end at Fort Toulouse near Wetumpka, Alabama. In 2015, the 25-mile stretch of the river located in Tallapoosa and Chambers Counties and cherished by Harold was named in his honor. He resides in Dadeville, Alabama.

Water Level Info

The Tallapoosa River may be floated year-round, but the best time is in the spring and summer. Paddlers are strongly recommended to check the U.S. Geological Survey website (**www.usgs.gov/water**) before floating the Tallapoosa River for current streamflow conditions, levels, and discharge rates. Specific data for the Tallapoosa River can be found from two gauges located at the bridges in Wadley and Horseshoe Bend (near New Site).

A favorable discharge rate is between 1,500 and 10,000 ft³/sec.
A rate above 10,000 ft³/sec may be dangerous and is not recommended.
A rate below 1,500 ft³/sec may present low areas and some dragging.



Public Access Points

Jay Bird Creek – 1897 Boone Valley Road, Jacksons Gap, AL
Peters Island – 1586 Peter's Island Road, Daviston, AL
Horseshoe Bend – 10689 Horseshoe Bend Road (Hwy 49 North), Dadeville, AL
Germany's Ferry Access – 1387 Germany's Ferry Road, Daviston, AL
Bibby's Ferry Access – 12449 County Road 62, Wadley, AL

Welcome to the Harold Banks Canoe Trail!

A peaceful, family friendly adventure, the trail is a combination of flat water and shoals rarely above class 1 (easy) in the International Scale of River Difficulty. But the level, flow, and volume of the Tallapoosa River are seasonal and dictated by Alabama Power and its hydroelectric Harris Dam located upstream near Wedowee, Alabama. Paddlers are strongly encouraged to monitor the online water level gauges kept by the U.S. Geological Service at the Wadley Bridge and Horseshoe Bend Bridge.

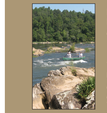
The Tallapoosa County Canoe Trail is divided into three sections and manageable float trips:

Section 1 (8.25 miles, 5-hour float) begins with public access at Bibby's Ferry, just across the Tallapoosa County line in Chambers County, and ends with public access at Germany's Ferry Bridge. This section features unique spots such as the Baptistry and the Fish Trap, brisk shoals, great fishing, a campsite, and stretches of flat water paddling.

Section 2 (9.75 miles, 6-hour float) begins with public access at Germany's Ferry Bridge and ends with public access at Horseshoe Bend Bridge. This middle section begins with blue water paddling and includes fishing spots, mile-long Griffin Shoals, with a brisk side channel, and ends with reminiscent paddling through historic Horseshoe Bend National Military Park.

Section 3 (6 miles, 4-hour float) is the most popular and considered by many to be the most scenic. It begins with public access at Horseshoe Bend Bridge and ends at Jay Bird Creek public access. This lower section has several patches of Shoal or Cahaba lilies, is known to have bald eagles in the area, and features Peters Island, Laura's Leap, side chutes, Irwin Shoals, and a campsite at Jay Bird Creek. Bear left or right to take the swift side chutes for more excitement!

For more information, contact your county Extension office. Visit www.aces.edu/directory.



Important Contact Numbers

Tallapoosa County Extension Office	(256) 825-1050
Tallapoosa County Sheriff's Office	(256) 825-4264
Russell Medical Center	(256) 329-7100
Horseshoe Bend National Military Park	(256) 234-7111
Alabama Forestry Commission (to report wildfires)	(800) 492-3711

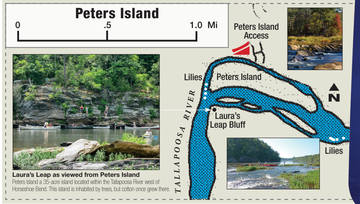
Helpful Websites

Tallapoosa County Extension	www.aces.edu/Tallapoosa
U.S.G.S (Alabama Stream Flows)	www.usgs.gov/water
Alabama Scenic River Trail	www.alabamascenicrivertrail.com
Alexander City Chamber of Commerce	www.alexandercity.org
Tallapoosa County, Alabama	www.tallasco.com
Outdoor Alabama	www.outdooralabama.com
Horseshoe Bend National Military Park	www.nps.gov/hobe
Google Earth	www.google.com/earth

ANR-2229

Alabama Cooperative Extension System, Alabama Scenic River Trail, Alabama Power, Tallapoosa Publishers, Inc., Middle Tallapoosa Clean Water Partnership, Alexander City Chamber of Commerce, Tallapoosa County Commission, Tallapoosa County Sheriff's Department, Horseshoe Bend National Military Park, Coosa Valley RC&D Council, Chambers County Commission

Shane Harris, County Extension Coordinator, Tallapoosa County; **Bruce Dupree,** Creative Services Manager, Auburn University. Contributors: Herald Banks, Kenneth S. Boone, Sabrina Wood, Jim Fridley, and Chuck Browne. Photo credits: Kenneth S. Boone, Shane Harris, Herald Banks, and Patrick E. O'Neil. The Alabama Cooperative Extension System (Alabama A&M University and Auburn University) is an equal opportunity educator and employer. © 2015 by the Alabama Cooperative Extension System. All rights reserved.



Laura's Leap as viewed from Peters Island
Peters Island a 35-acre island located within the Tallapoosa River west of Horseshoe Bend. This island is inhabited by trees, but cotton once grew there.

Camping Notes

- Several landowners have given permission for public camping along the creek. Respect this privilege and camp only at designated campsites.
- All private land adjoining the creek is posted by Alabama law.
- Camping is by permission only and only in designated areas.
- Landowners who give permission for trespass have liability protection under the Code of Alabama 1975 Article 1 Section 35-15-1.

Please leave it BETTER than you found it

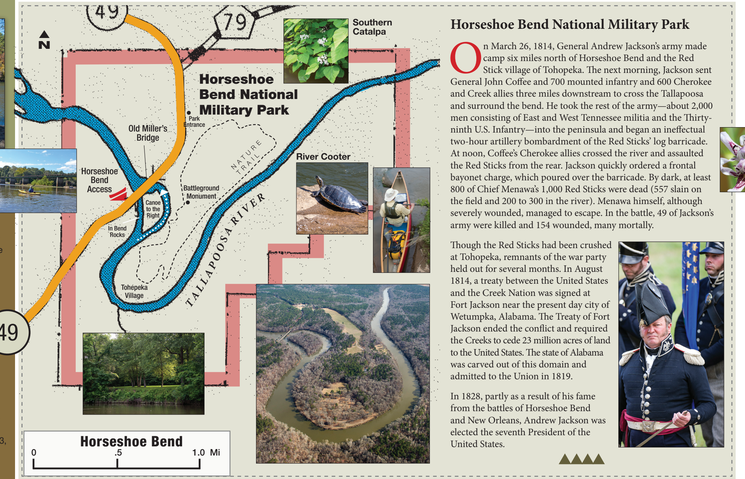
Camping permitted

Please use your good judgement in your decision to dry. Gather the Alabama Scenic River Trail not the landowner is responsible for your safety.

Campsite Etiquette

The two public campsites on the Tallapoosa River are all on private property. These sites are available by permission of the landowners, so respect this privilege by following these guidelines.

- Leave it cleaner than you found it.
- Collect firewood from dead material on the ground.
- Keep fire inside a stone ring and extinguish with water before leaving.
- Use the restroom away from the campsite area.
- Do not damage trees in any way, including using nails.
- Send a thank-you note to the landowner via the Tallapoosa County Extension Office, 125 North Broadnax Street, Rm 23, Dadeville, AL 36853. Reference the campsite name.



Horseshoe Bend National Military Park

On March 26, 1814, General Andrew Jackson's army made camp six miles north of Horseshoe Bend and the Red Stick village of Tohopeka. The next morning, Jackson sent General John Coffee and 700 mounted infantry and 600 Cherokee and Creek allies three miles downstream to cross the Tallapoosa and surround the bend. He took the rest of the army—about 2,000 men consisting of East and West Tennessee militia and the Thirty-ninth U.S. Infantry—into the peninsula and began an ineffectual two-hour artillery bombardment of the Red Sticks' log barricade. At noon, Coffee's Cherokee allies crossed the river and assaulted the Red Sticks from the rear. Jackson quickly ordered a frontal bayonet charge, which poured over the barricade. By dark, at least 800 of Chief Menawa's 1,000 Red Sticks were dead (557 slain on the field and 200 to 300 in the river). Menawa himself, although severely wounded, managed to escape. In the battle, 49 of Jackson's army were killed and 154 wounded, many mortally.

Though the Red Sticks had been crushed at Tohopeka, remnants of the war party held out for several months. In August 1814, a treaty between the United States and the Creek Nation was signed at Fort Jackson near the present day city of Wetumpka, Alabama. The Treaty of Fort Jackson ended the conflict and required the Creeks to cede 23 million acres of land to the United States. The state of Alabama was carved out of this domain and admitted to the Union in 1819.

In 1828, partly as a result of his fame from the battles of Horseshoe Bend and New Orleans, Andrew Jackson was elected the seventh President of the United States.

Fish Trap

Fish weirs are structures built within a stream or river designed to route fish to a particular area, such as shallows or into a trap where they can be captured. Native Americans and early settlers stacked stones to build V-shaped dams in the river to create a rock weir to trap fish. The "V" pointed downstream with a narrow opening at the apex. Often in normal or high water, the rocks were not evident; one might only notice watery ripples showing the weir's pattern. In the summer when the water ran low, the Native Americans caught fish by herding them into the weir, where a trap made of baskets or cane was positioned at the apex. Indian oral tradition notes that women and children would enter the weir and splash with their hands, canes, or sticks to scare fish toward the trap. There the fish could be speared, netted, or caught.

Water Quality

Tallapoosa River is classified as Outstanding Alabama Water (OAW); high-quality waters that constitute an outstanding Alabama resource, such as waters of state parks and wildlife refuges and waters of exceptional recreational or ecological significance.

The Tallapoosa River Basin, a part of the greater Mobile River Basin, has long been treasured for the quality water it provides. The Tallapoosa River's headwaters originate in Georgia's counties Paulding and Carroll. It then flows into Alabama in Cleburne County and meanders southwesterly through Randolph, Chambers, Tallapoosa, and Elmore Counties until it joins the Coosa River to create the Alabama River. The Tallapoosa River forms two large reservoirs, Lake Wedowee and Lake Martin.

Total drainage area of the Tallapoosa Basin equals 4,053 square miles in Alabama.

Float Trip Checklist

- map
- paddles
- life preservers
- dry bag and clothes
- flashlight
- drinks and food
- sunglasses
- wide-brimmed hat
- sunscreen
- car keys
- GPS (optional)
- lighter or fire-starter stick
- toilet tissue in zippered plastic bag
- cell phone, camera in zippered plastic bag
- hammock or camping gear (optional)

APPENDIX B

ALABAMA POWER FERC FORM 80 METHODS

600 N. 18th Street
Post Office Box 2641
Birmingham, AL 35203

Tel 205.257.1000

March 30, 2015

VIA ELECTRONIC FILING

FERC Project No's. 349 (Martin Dam)
2146 (Coosa River)
2165 (Warrior River)
2203 (Holt)
2407 (Yates and Thurlow)
2628 (R L Harris)

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

RE: FERC Form No. 80's

Dear Ms. Bose:

Alabama Power Company (APC) is the licensee for the Martin Dam (FERC No. 349), Coosa River (FERC No. 2146), Warrior River (FERC No. 2165), Holt (FERC No. 2203), Yates and Thurlow (FERC No. 2407), and R L Harris (FERC No. 2628) Hydroelectric Projects which includes the following 14 developments:

Project Number	Development
349	Martin Dam
2146	Weiss
2146	Neely Henry
2146	Logan Martin
2146	Lay
2146	Mitchell
2146	Jordan
2146	Bouldin
2165	Lewis Smith
2165	John Hollis Bankhead Dam
2203	Holt
2407	Thurlow
2407	Yates
2628	R L Harris

In accordance with 18 CFR § 8.11, APC is required to gather recreation use data for a 12-month period beginning no later than March 15, 2014, to be filed on the Licensed Hydropower Development Recreation Report, FERC Form No. 80 (Form 80) by April 1, 2015, for each of its hydropower project developments.

In conjunction with these filings, APC is also filing herein its detailed methods of data collection and estimations of recreational use on its reservoirs that was used to complete each Form 80.

Please contact me at 205-257-1207 or twstjohn@southernco.com if you need additional information.

Sincerely,

Thomas W. St. John

Alabama Power Company

ALABAMA POWER COMPANY

2014 FERC FORM 80 METHODS

SUMMARY REPORT

600 18TH STREET NORTH
BIRMINGHAM, AL 35203

DATA COLLECTION METHODS

DESCRIPTIONS BY TYPE

TRAFFIC/TRAIL COUNTS (20%)

- Definition: count of the total number of vehicles or trailers parked for the use of a specific amenity at a given moment.
- This method is used for amenities in which users are not centrally congregated for an accurate count, such as boat launch and trail users.
- Vehicle and trailer counts are later converted into an estimation of people using the formulas described later in this document.
- Counts are conducted various months throughout the calendar year. For each month, sites are counted a minimum of six weekdays (8am to 5pm) and three weeknights (after 5 pm) at varying times of day and days of the week. Two weekend days and one weekend night is observed each month, not including required holiday weekend counts.

ATTENDANCE RECORDS (10%)

- Definition: count of total users for a site for the entire calendar year, not broken out by amenity or time of day or week.
- This method is used for larger parks with gate attendants, particularly Flat Rock Park and DARE Park, in which counts are taken of each user that passes its gates year round.
- Generalizations of this type of data must be made by comparing overall numbers to similar situations in order to assess utilization of individual amenities. Total Recreation Days, however, will be 100% accurate in this scenario.

STAFF OBSERVATIONS (60%)

- Definition: counts of the total number of people utilizing a specific amenity at a given moment.
- This method is used for the majority of amenities in which users are centrally congregated for an accurate count, such as a picnic area, swim area, or fishing area.
- Counts are conducted various months throughout the calendar year. For each month, sites are counted a minimum of six weekdays (8am to 5pm) and three weeknights (after 5 pm) at varying times of day and days of the week. Two weekend days and one weekend night is observed each month, not including required holiday weekend counts.

VISITOR COUNTS OR SURVEYS (10%)

- Definition: count or estimation of total users for a site for the entire calendar year, broken out by amenity and time of day and week, if possible.

- This method is implemented at third party facilities such as private marinas or state parks that collect their own counts, observations, and visitor records throughout the year for their own use and often in great detail.

- Information requested from these entities mirrored that of what was being collected by APC personnel on other sites. Each entity has its own data collection method. Therefore, a variety of answers are received which must then be normalized to a common figure for use in this report. Despite its increased complexity, this data is often very accurate at the amenity level, and much like the aforementioned attendance records, provides a very clear picture of Total Recreation Days at the site.

SCHEDULE 1

DEFINITIONS AND CALCULATIONS FOR RELEVANT LINE ITEMS

DOLLAR VALUES

- Construction, Operation and Maintenance Costs = 2014 costs for both capital and O&M projects on all APC operated and/or maintained recreation sites

- Recreation Revenues for Calendar Year = 2014 revenue accrued by APC from recreation site users on APC reservoirs

TOTAL RECREATION DAYS

FERC Definition: Each visit by a person to a development for recreational purposes during any portion of a 24-hour period.

Total Recreation Days = Annual Total Daytime + Annual Total Nighttime

NOTE: These values are further defined below.

ANNUAL TOTAL: DAYTIME

Annual Daytime Total = [Average Non-Peak Weekday Daytime Use x Number of Non-Peak Weekdays Open in 2014] + [Average Non-Peak Weekend Daytime Use x Number of Non-Peak Weekends Open in 2014] + [Average Holiday Weekend Day Daytime Use x Number of Holiday Weekend Days Open in 2014]

WHEREAS:

- Average Daytime Use = Average use from 12:01am until 5pm, calculated based on the formulas provided in the following section for each amenity.

  NOTE: Totals account for all amenities at all sites for each development. In some cases, counts for amenities were redundant in terms of site users as at many sites the use of one amenity implies the use of another. These redundancies were eliminated within our calculations.

ANNUAL TOTAL: NIGHTTIME

Annual Nighttime Total = [Average Non-Peak Weekday Nighttime Use x Number of Non-Peak Weekdays Open in 2014] + [Average Non-Peak Weekend Nighttime Use x Number of Non-Peak Weekends Open in 2014] + [Average Holiday Weekend Day Nighttime Use x Number of Holiday Weekend Days Open in 2014]

WHEREAS:

- Average Nighttime Use = Average use from 5pm to midnight, calculated based on the formulas provided in the following section for each amenity.

  NOTE: Totals account for all amenities at all sites for each development. In some cases, counts for amenities were redundant in terms of site users as at many sites the use of one amenity implies the use of another. These redundancies were eliminated within our calculations.

PEAK WEEKEND AVERAGE: DAYTIME

Peak Weekend Daytime Average = Average Daytime Use on a Holiday Weekend Day x 3

WHEREAS:

- Average Peak Weekend Daytime Use = Average use of recreation facilities on a Holiday weekend (Labor Day, July 4th, Memorial Day) from 12:01am until 5pm, calculated based on the formulas provided in the following section for each amenity. In 2014, these weekends fell on Saturday, Sunday, and Monday for Labor Day and Memorial Day and on Friday, Saturday, and Sunday for July 4th.

  NOTE: Totals account for all amenities at all sites for each development. In some cases, counts for amenities were redundant in terms of site users as at many sites the use of one amenity implies the use of another. These redundancies were eliminated within our calculations.

PEAK WEEKEND AVERAGE: NIGHTTIME

Peak Weekend Nighttime Average = Average Nighttime Use on a Holiday Weekend Day x 3

WHEREAS:

- Average Peak Weekend Nighttime Use = Average use of recreation facilities on a Holiday weekend (Labor Day, July 4th, Memorial Day) from 5pm to midnight, calculated based on the formulas provided in the following section for each amenity. In 2014, these weekends fell on Saturday, Sunday, and Monday for Labor Day and Memorial Day and on Friday, Saturday, and Sunday for July 4th.

  NOTE: Totals account for all amenities at all sites for each development. In some cases, counts for amenities were redundant in terms of site users as at many sites the use of one amenity implies the use of another. These redundancies were eliminated within our calculations.

SCHEDULE 2

DEFINITIONS AND CALCULATIONS BY RECREATION AMENITY TYPE

BOAT LAUNCH AREAS

FERC Definition: Improved areas having one or more boat launch lanes that are usually marked with signs, have hardened surfaces, and typically have adjacent parking.

TOTAL UNITS

- Lanes: total number of lanes from which a boat may be launched simultaneously on a given development

CAPACITY UTILIZATION

Capacity Utilization = Daily Capacity / Estimated Daily Use

WHEREAS:

- Daily Capacity = Total # of Trailer Rig Parking Spaces **x** 2 (average users per boat) **x** 3 (average turnover throughout the day)

- Estimated Daily Use = [Total # of Trailer Rigs Counted on Non-Peak Weekend Days **x** 2 (average users per boat) **x** 3 (average turnover throughout the day)] / Total # of Non-Peak Weekend Days Counted

MARINAS

FERC Definition: Facilities with more than 10 slips on project waters, which include one or more of the following: docking, fueling, repair and storage of boats; boat/equipment rental; or sell bait/food.

TOTAL UNITS

- Not Applicable

CAPACITY UTILIZATION

Capacity Utilization = Daily Capacity / Estimated Daily Use

WHEREAS:

- Daily Capacity = Total # of Boat Slips and Dry Storage Available Within the Project Boundary (both annual and courtesy)
- Estimated Daily Use = Average Number of Slips and Dry Storage Within the Project Boundary in Use Daily (both annual and courtesy)

NOTE:

- All marina estimates were obtained from marina personnel and were not broken down by time of day or week as there was no uniform response from which to normalize the data. Therefore, these estimates do not account solely for non-peak weekend usage but for the entire year.

WHITEWATER BOATING

FERC Definition: Put-ins/Take-outs specifically designated for whitewater access.

TOTAL UNITS

- Not Applicable

CAPACITY UTILIZATION

Capacity Utilization = Daily Capacity / Estimated Daily Use

WHEREAS:

- Daily Capacity = Maximum Number of Paddlers Ferried in a Day by Both Paddling Companies

- Estimated Daily Use = Total # of Paddlers Ferried on Non-Peak Weekend Days / Total # of Non-Peak Weekend Days Open

TAILWATER FISHING

FERC Definition: Platforms, walkways, or similar structures to facilitate below dam fishing.

TOTAL UNITS

- Not Applicable

CAPACITY UTILIZATION

Capacity Utilization = Daily Capacity / Estimated Daily Use

WHEREAS:

- Daily Capacity = [Length of Pier or Bank Available for Fishing / 8 (average horizontal space needed per fisherman)] **x** 3 (average turnover throughout the day)
- Estimated Daily Use = [Total # of Fishermen Counted on Non-Peak Weekend Days **x** 3 (average turnover throughout the day)] / Total # of Non-Peak Weekend Days Counted

NOTE:

- For T-shaped piers, only the end portion of the pier was considered available for fishing.

RESERVOIR FISHING

FERC Definition: Platforms, walkways, or similar structures to facilitate fishing in the reservoir pool or feeder streams.

TOTAL UNITS

- Not Applicable

CAPACITY UTILIZATION

Capacity Utilization = Daily Capacity / Estimated Daily Use

WHEREAS:

- Daily Capacity = [Length of Pier or Bank Available for Fishing / 8 (average horizontal space needed per fisherman)] **x** 3 (average turnover throughout the day)
- Estimated Daily Use = [Total # of Fishermen Counted on Non-Peak Weekend Days **x** 3 (average turnover throughout the day)] / Total # of Non-Peak Weekend Days Counted

NOTE:

- For T-shaped piers, only the end portion of the pier was considered available for fishing.

SWIM AREAS

FERC Definition: Sites providing swimming facilities (bath houses, designated swim areas, parking and sanitation facilities).

TOTAL UNITS

- Acres: total acreage of beach and buoyed swim area

CAPACITY UTILIZATION

Capacity Utilization = Daily Capacity / Estimated Daily Use

WHEREAS:

- Daily Capacity = Acreage of Swim Area **x** 0.01 (suitable acreage per swim user) **x** 2 (average turnover throughout the day)
- Estimated Daily Use = [Total # of Swimmers Counted on Non-Peak Weekend Days **x** 2 (average turnover throughout the day)] / Total # of Non-Peak Weekend Days Counted

TRAILS

FERC Definition: Narrow tracks used for non-automobile recreation travel which are mapped and designated for specific use(s) such as hiking, biking, horseback riding, snowmobiling, or XC skiing (excludes portages, paths or accessible routes).

TOTAL UNITS

- Miles: total length of trail system

CAPACITY UTILIZATION

Capacity Utilization = Daily Capacity / Estimated Daily Use

WHEREAS:

- Daily Capacity = Total # of Single Car Parking Spaces **x** 2 (average users per vehicle) **x** 2 (average turnover throughout the day)
- Estimated Daily Use = [Total # of Single Cars Counted on Non-Peak Weekend Days **x** 2 (average users per vehicle) **x** 2 (average turnover throughout the day)] / Total # of Non-Peak Weekend Days Counted

ACTIVE RECREATION AREAS

FERC Definition: Playground equipment, game courts/fields, golf/disc golf courses, jogging tracks, etc.

TOTAL UNITS

- Acres: total acreage of active recreation area

CAPACITY UTILIZATION

Capacity Utilization = Daily Capacity / Estimated Daily Use

WHEREAS:

- Daily Capacity = Total # of Single Car Parking Spaces **x** 2 (average users per vehicle) **x** 2 (average turnover throughout the day)
- Estimated Daily Use = [Total # of Single Cars Counted on Non-Peak Weekend Days **x** 2 (average users per vehicle) **x** 2 (average turnover throughout the day)] / Total # of Non-Peak Weekend Days Counted

PICNIC AREAS

FERC Definition: Locations containing one or more picnic sites (each of which may include tables, grills, trash cans, and parking).

TOTAL UNITS

- Sites: total number of picnic tables in area

CAPACITY UTILIZATION

Capacity Utilization = Daily Capacity / Estimated Daily Use

WHEREAS:

- Daily Capacity = Total # of Picnic Tables **x** 6 (maximum users per table) **x** 2 (average turnover throughout the day)

- Estimated Daily Use = [Total # of Users Counted on Non-Peak Weekend Days **x** 2 (average turnover throughout the day)] / Total # of Non-Peak Weekend Days Counted

OVERLOOKS/VISTAS

FERC Definition: Sites established to view scenery, wildlife, cultural resources, project features, or landscapes.

TOTAL UNITS

- Acres: total acreage available from which to view the area

CAPACITY UTILIZATION

Capacity Utilization = Daily Capacity / Estimated Daily Use

WHEREAS:

- Daily Capacity = Total # of Single Car Parking Spaces **x** 2 (average users per vehicle) **x** 3 (average turnover throughout the day)
- Estimated Daily Use = [Total # of Single Cars Counted on Non-Peak Weekend Days **x** 3 (average users per vehicle) **x** 2 (average turnover throughout the day)] / Total # of Non-Peak Weekend Days Counted

VISITOR CENTERS

FERC Definition: Buildings where the public can gather information about the development/project, its operation, nearby historic, natural, cultural, recreational resources, and other items of interest.

TOTAL UNITS

- Not Applicable

CAPACITY UTILIZATION

Capacity Utilization = Daily Capacity / Estimated Daily Use

WHEREAS:

- Daily Capacity = Maximum # of Visitors Per Tour **x** Maximum # of Tours Available Per Day

- Estimated Daily Use = Total # of Visitors Counted in 2014 / Total # of Days Open in 2014

INTERPRETIVE DISPLAYS

FERC Definition: Signage/Kiosks/Billboards which provide information about the development/project, its operation, nearby historic, natural, cultural, recreational resources, and other items of interest.

TOTAL UNITS

- Not Applicable

CAPACITY UTILIZATION

- Not Applicable

HUNTING AREAS

FERC Definition: Lands open to the general public for hunting.

TOTAL UNITS

- Acres: total acreage within the project boundary available for hunting

CAPACITY UTILIZATION

Capacity Utilization = Daily Capacity / Estimated Daily Use

WHEREAS:

- Daily Capacity = Maximum # of Hunters Allowed Daily (1 per site)
- Estimated Daily Use = Total # of Hunters Counted in 2014 / [Total # of Days Open in 2014 **x** Total # of Slots Available at Each Site in 2014]

CAMPGROUNDS

FERC Definition: Hardened areas developed to cluster campers (may include sites for tents, trailers, recreational vehicles [RV], yurts, cabins, or a combination, but excludes group camps).

TOTAL UNITS

- Acres: acreage available within the project boundary for campsites

CAPACITY UTILIZATION

- Not Applicable

CAMPSITES

FERC Definition: Sites for tents, trailers, recreational vehicles [RV], yurts, cabins, or a combination of temporary uses.

TOTAL UNITS

- Not Applicable

CAPACITY UTILIZATION

Capacity Utilization = Daily Capacity / Estimated Daily Use

WHEREAS:

- Daily Capacity = Total # of Campsites Available **x** 4 (average campers per site)
- Estimated Daily Use = [Total # of Campsites Used in 2014 Provided By Operator **x** 4 (average campers per site)] / Total # of Days Open in 2014

COTTAGE SITES

FERC Definition: Permanent, all-weather, buildings rented for short-term use, by the public, for recreational purposes.

TOTAL UNITS

- Not Applicable

CAPACITY UTILIZATION

Capacity Utilization = Daily Capacity / Estimated Daily Use

WHEREAS:

- Daily Capacity = Total # of Cottage Sites Available **x** 4 (average users per site)
- Estimated Daily Use = [Total # of Cottage Sites Used in 2014 Provided By Operator **x** 4 (average users per site)] / Total # of Days Open in 2014

DISPERSED CAMPING AREAS

FERC Definition: Places visitors are allowed to camp outside of a developed campground.

TOTAL UNITS

- Sites: total number of sites available within the project boundary for primitive camping in an area

CAPACITY UTILIZATION

Capacity Utilization = Daily Capacity / Estimated Daily Use

WHEREAS:

- Daily Capacity = Total # of Campsites Available **x** 4 (average campers per site)
- Estimated Daily Use = [Average # of Campsites Used in 2014 on Non-Peak Weekend Days **x** 4 (average campers per site)] / Total # of Non-Peak Weekend Days Open in 2014

INFORMAL USE AREAS

FERC Definition: Well used locations which typically do not include amenities, but require operation and maintenance and/or public safety responsibilities.

TOTAL UNITS

- Not Applicable

CAPACITY UTILIZATION

Capacity Utilization = Daily Capacity / Estimated Daily Use

WHEREAS:

- Daily Capacity = See Formula for Informal Amenity Type (amenity to which site most resembles)
- Estimated Daily Use = See Formula for Informal Amenity Type (amenity to which site most resembles)

NOTE:

- Informal Use Areas have no infrastructure but are commonly used as a recreation opportunity. They are not actively managed or maintained. These sites are treated as the amenity for which they most closely resemble and could possibly be developed formally in the future. Their calculations, therefore, mirror that specific amenity.

ACCESS POINTS

FERC Definition: Well-used sites for visitors entering project lands or waters, without trespassing, for recreational purposes (may have limited development such as parking, restrooms, signage).

TOTAL UNITS

- Not Applicable

CAPACITY UTILIZATION

Capacity Utilization = Daily Capacity / Estimated Daily Use

WHEREAS:

- Daily Capacity = See Formula for Informal Amenity Type (amenity to which site most resembles)
- Estimated Daily Use = See Formula for Informal Amenity Type (amenity to which site most resembles)

NOTE:

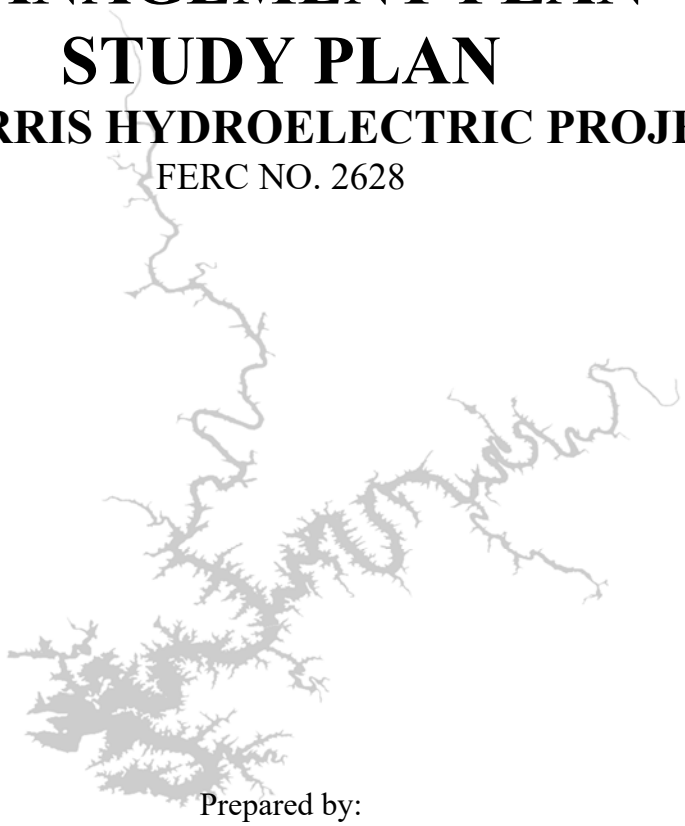
- Access Points contain some sort of infrastructure that lends itself to recreation opportunity but is not actively managed or maintained. These areas are treated as the amenity for which they most closely resemble and could possibly be developed formally in the future. Their calculations, therefore, mirror that specific amenity.

HARRIS DAM
RELICENSING

CULTURAL RESOURCES PROGRAMMATIC AGREEMENT
and
HISTORIC PROPERTIES MANAGEMENT PLAN
STUDY PLAN

R. L. HARRIS HYDROELECTRIC PROJECT

FERC NO. 2628



Prepared by:

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March 2019

ALABAMA POWER COMPANY
BIRMINGHAM, ALABAMA

R. L. HARRIS HYDROELECTRIC PROJECT
FERC NO. 2628

CULTURAL RESOURCES PROGRAMMATIC AGREEMENT AND HISTORIC PROPERTIES MANAGEMENT PLAN STUDY PLAN

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CULTURAL RESOURCES PROGRAMMATIC AGREEMENT AND HISTORIC PROPERTIES MANAGEMENT PLAN 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

Before and after Harris Project construction, several cultural resources studies were conducted at the Harris Project. In total, eighteen surveys were conducted in the Harris Project Area. In 1974, the University of Alabama Department of Anthropology[2] performed an archaeological survey of the dam construction area, proposed Lake Harris area, and a proposed thermal plant site to be situated adjacent to the Harris Reservoir[3]. Following this initial survey, the Department of Anthropology performed two additional studies: one in 1974 and another in 1975. The University of Alabama Museum's Office of Archaeological Research (OAR) conducted additional studies in the proposed Harris Project Area in 1976 and 1977. The purpose of the 1977 survey was to synthesize the results of previous investigations. In 1985, after Harris Reservoir was inundated, OAR performed surveys primarily focused on shoreline areas within the scenic easement (OAR 2016a). These additional surveys were conducted to assess lands to be used for various project construction permitting, including building and maintaining transmission lines, creating food plots for hunting lands around Lake Harris, and building bridges (OAR 2016a).

The National Park Service (NPS) has expressed concern that flows from Harris Dam are damaging the Miller Covered Bridge piers and other cultural resources located at the Horseshoe Bend National Military Park. The Miller Covered Bridge was built in 1908 and, at 600 feet, was once the longest covered bridge in the United States. In the late 1950s, a new concrete bridge was constructed parallel to the Miller Covered Bridge.

The University of Alabama, in conjunction with Alabama Power, conducted two surveys at Skyline. From November 1990 to March 1991, the University of Alabama performed a survey of approximately 3,000 acres within the Skyline Project Boundary. In October 2006, OAR performed a cultural resources survey on two areas within the Skyline WMA in Jackson County near Stevenson, Alabama (OAR 2016b).

Additional background information on the basin setting, general prehistory of Alabama, prehistory within the Tallapoosa and Tennessee River basins, and historic overview are contained in the Pre-Application Document (PAD) for the Harris Project.

1.1 Resource Management Goals

The FERC has responsibility to consult with the Advisory Council on Historic Preservation (Advisory Council) and the Alabama Historical Commission (AHC or State Historic Preservation Office [SHPO]) pursuant to the Advisory Council's regulations (36 CFR part 800) implementing the National Historic Preservation Act (54 U.S.C. 306108; hereinafter, "Section 106"). FERC could require Alabama Power to implement the provisions of a Programmatic Agreement (PA) as a condition of issuing a new license for the Harris Project, if there will be adverse effects to historic properties, to satisfy FERC's Section 106 responsibilities during the term of the new license.

[2] The Department of Anthropology at the University of Alabama conducted surveys and archaeological investigations prior to the creation of the Office of Archaeological Research.
[3] The proposed thermal plant was never built.

1.2 Current Operations and Operational Alternatives

The cultural resources study will involve collecting and summarizing existing cultural resources baseline information. Any effects on cultural resources from potential changes in operations will be analyzed in the R.L. Harris Project Operating Curve Change Feasibility Study and the Downstream Release Alternatives Study. Information from the baseline and effects analyses will be included the Harris Project Historic Properties Management Plan (HPMP) that will be developed as part of this study.

2.0 GOALS AND OBJECTIVES

The goal of the study is to develop a plan to assess cultural resources identified in the Harris Project Area of Potential Effects (APE).

The first objective of the study is to develop a HPMP for the Harris Project. The HPMP will describe the Harris Project, APE, anticipated effects, and Alabama Power's proposed measures to protect Historic Properties.

The second objective of the study is to determine the need for, and if required, develop a draft PA (among FERC, the SHPO, Alabama Power, and applicable federally recognized tribes[4]) for managing Historic Properties that may be affected by a new license issued to Alabama Power for the continued operation of the Harris Project. FERC will issue the draft PA with any draft National Environmental Policy Act (NEPA) documents (Environmental Assessment or Environmental Impact Statement) and then issue the final PA with the final NEPA analysis.

3.0 PROJECT NEXUS AND GEOGRAPHIC SCOPE

The cultural resources study will determine if cultural resources are present or are likely to be present within the APE and whether the authorized Harris Project uses may cause changes in the character or use of Historic Properties, if Historic Properties exist.

The geographic scope of the study will be the APE (as defined by Harris Action Team (HAT) 6) and will include Lake Harris, Skyline, and the area below the Harris Dam through Horseshoe Bend.

4.0 METHODS

The overall purpose of this study is to gather additional information for preparing the draft HPMP. The procedures to attain additional information may include, but are not limited to:

[4] As of March 2019, the applicable tribes consist of the following: Cherokee Nation, Eastern Band of Cherokee Indians, United Keetoowah Band of Cherokee Indians in Oklahoma, Alabama-Quassarte Tribal Town, Alabama-Coushatta Tribe of Texas, Coushatta Tribe of Louisiana, Muscogee (Creek) Nation, Poarch Band of Creek Indians, and Thlopthlocco Tribal Town.

1. Determine the APE for the Harris Project;
2. Determine the presence and location of known Historic Properties in the APE (including a pier evaluation for the Miller Covered Bridge at Horseshoe Bend National Military Park Boat Ramp);
3. Obtain detailed topographical information for the Harris Project Area;
4. Obtain data (high resolution aerial imagery, current soils maps, past surveys, etc.) to determine appropriate areas of high probability for containing Historic Properties, as needed;
5. Consult with SHPO and applicable federally recognized tribes that have an active interest in the Harris Project; and
6. Evaluate methods for determining the Harris Dam and associated facilities' eligibility for the National Register of Historic Places (NRHP).

To accomplish this, the study may involve the following components:

1. Consult with SHPO and applicable federally recognized tribes that have an interest in the Harris Project to develop the APE for the Harris Project.
2. Complete an analysis of the Miller Covered Bridge piers at Horseshoe Bend National Military Park Boat Ramp to determine eligibility for the NRHP.
3. Update the literature search of the Alabama State Site File (ASSF) and the National Archaeological Database Bibliography (NADB) to identify any additional known historic sites and consult with applicable federally recognized tribes and the Alabama SHPO to identify any known additional cultural resources which are not recorded in the ASSF or NADB.
4. Collect Light Detection and Ranging (LIDAR) data and process into contour maps of the Harris Project lands.
5. Collect high resolution, ground controlled aerial imagery of Harris Project lands. This data will be processed to determine Harris Project lands that have not been developed and to provide a visual assessment of existing Harris Project lands which may contain cultural resources.
6. Review data from Items 4 and 5 and determine any additional areas for survey. Review existing surveys and current methods and determine if any updated surveys are needed[5].
7. Develop a HPMP for the Harris Project, which will include provisions to conduct an analysis in 2033 of the Harris Dam and Powerhouse to determine eligibility for the NRHP.

5.0 REPORTS

As the various components of this study are completed, Alabama Power will share the results with HAT 6 through stakeholder meetings and written documentation. Due to the sensitive and protected nature of archaeological information, the distribution of this information will be limited to SHPO, FERC, and applicable federally recognized Native American tribes with an interest in the Harris Project.

[5] Any archaeological surveys and reports must meet the guidelines in the Policy for Archaeological Survey and Testing in Alabama (Alabama Historical Commission Administrative Code Chapter 460-X-9 Archaeological Investigations).

As part of the 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).

6.0 SCHEDULE

This schedule corresponds to the FERC-approved Harris Project Process Plan and Schedule. Consultation meeting dates will be finalized with HAT 6 members upon FERC approval of the study plan.

FERC Study Plan Determination	April 2019
Consultation with HAT 6	April 2019 – November 2021
Develop HPMP	May 2019 – December 2020
Initial Study Report	April 2020
Initial Study Report Meeting	April 2020
Updated Study Report	April 2021
Updated Study Report Meeting	April 2021
File Preliminary Licensing Proposal	By July 3, 2021
File Final License Application and Final HPMP with FERC	November 2021

7.0 COST AND EFFORT

Alabama Power estimates the cost to consult on and implement this study plan, including costs to review cultural data and develop a HPMP, is $245K.

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.

Alabama Power Company. 2018. Pre-Application Document for the Harris Hydroelectric Project (FERC No. 2628). Alabama Power Company, Birmingham, AL.

Office of Archaeological Research. 2016a. Summary of Previous Surveys of R.L. Harris Reservoir: 1974:2010. Tuscaloosa, AL.

Office of Archaeological Research. 2016b. Summary of Two Previous Surveys within the Skyline Wildlife Management Area: 1992 and 2006. Tuscaloosa, AL.