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April 12, 2021

VIA ELECTRONIC FILING

Project No. 2628-065
R.L. Harris Hydroelectric Project
Transmittal of the Draft Operating Curve Change Feasibility Analysis Phase 2 Report

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

Dear Secretary Bose,

Alabama Power Company (Alabama Power) is the Federal Energy Regulatory Commission (FERC or Commission) licensee for the R.L. Harris Hydroelectric Project (Harris Project) (FERC No. 2628-065). On April 12, 2019, FERC issued its Study Plan Determination[1] (SPD) for the Harris Project, approving Alabama Power's ten relicensing studies with FERC modifications. On May 13, 2019, Alabama Power filed Final Study Plans to incorporate FERC's modifications and posted the Final Study Plans on the Harris relicensing website at www.harrisrelicensing.com. In the Final Study Plans, Alabama Power proposed a schedule for each study that included filing a voluntary Progress Update in October 2019[2] and October 2020[3].

Consistent with FERC's April 12, 2019 SPD, Alabama Power is filing the Draft Operating Curve Change Feasibility Analysis Phase 2 Report (Draft Report) (Attachment 1). This filing also includes the stakeholder consultation for this study beginning April 2019 through March 2021 (Attachment 2). Stakeholders have until May 11, 2021 to submit their comments to Alabama Power on the Draft Report. Comments should be sent directly to harrisrelicensing@southernco.com.

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[1] Accession Number 20190412-3000.
[2] Accession Number 20191030-5053.
[3] Accession Number 20201030-5215.

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

Sincerely,

Angela Anderegg

Angie Anderegg
Harris Relicensing Project Manager

Attachment 1 – Draft Operating Curve Change Feasibility Analysis Phase 2 Report
Attachment 2 – Operating Curve Change Feasibility Analysis Consultation Record (April 2019 – March 2021)

cc: Harris Action Team 1 Stakeholder List

Attachment 1

Draft Operating Curve Change Feasibility Analysis Phase 2 Report

Operating Curve Change Feasibility Analysis

Draft Phase 2 Report

R.L. Harris Hydroelectric Project

FERC No. 2628

Prepared by:

Alabama Power Company

and

Kleinschmidt Associates

April 2021

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1.0 INTRODUCTION

Alabama Power Company (Alabama Power) owns and operates the R.L. Harris Hydroelectric Project (Harris Project), licensed by the Federal Energy Regulatory Commission (FERC or Commission) (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.

Harris Reservoir is maintained at or below the elevations specified by the Harris operating curve, except when storing floodwater. From May 1 through October 1, Harris Reservoir is maintained at or below elevation 793 feet mean sea level (msl), depending on inflow conditions. Between October 1 and December 1, the operating curve elevation drops to elevation 785 feet msl. The pool level remains at or below elevation 785 feet msl until April 1. From April 1 to May 1, the operating curve elevation rises to full pool at elevation 793 feet msl. During high flow conditions, U.S. Army Corps of Engineers (USACE)-approved flood control procedures in the Harris Water Control Manual (WCM) are implemented. During low flow conditions, the drought contingency curve (the red line in Figure 1-1) is intended to be used as one of several factors in evaluating reservoir operations consistent with approved drought plans.

Alabama Power is using the Integrated Licensing Process (ILP) to obtain a new license for the Harris Project from FERC. During stakeholder one-on-one meetings and at an 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. Based on this request, Alabama Power filed the Operating Curve Change Feasibility Analysis Study Plan (Study Plan) to evaluate, in increments of one foot from 786 feet msl to 789 feet msl (i.e., 786, 787, 788, and 789 feet msl; collectively “winter pool alternatives” or “alternatives”), Alabama Power’s ability to increase the winter pool elevation and continue to meet Project purposes (Figure 1-1).

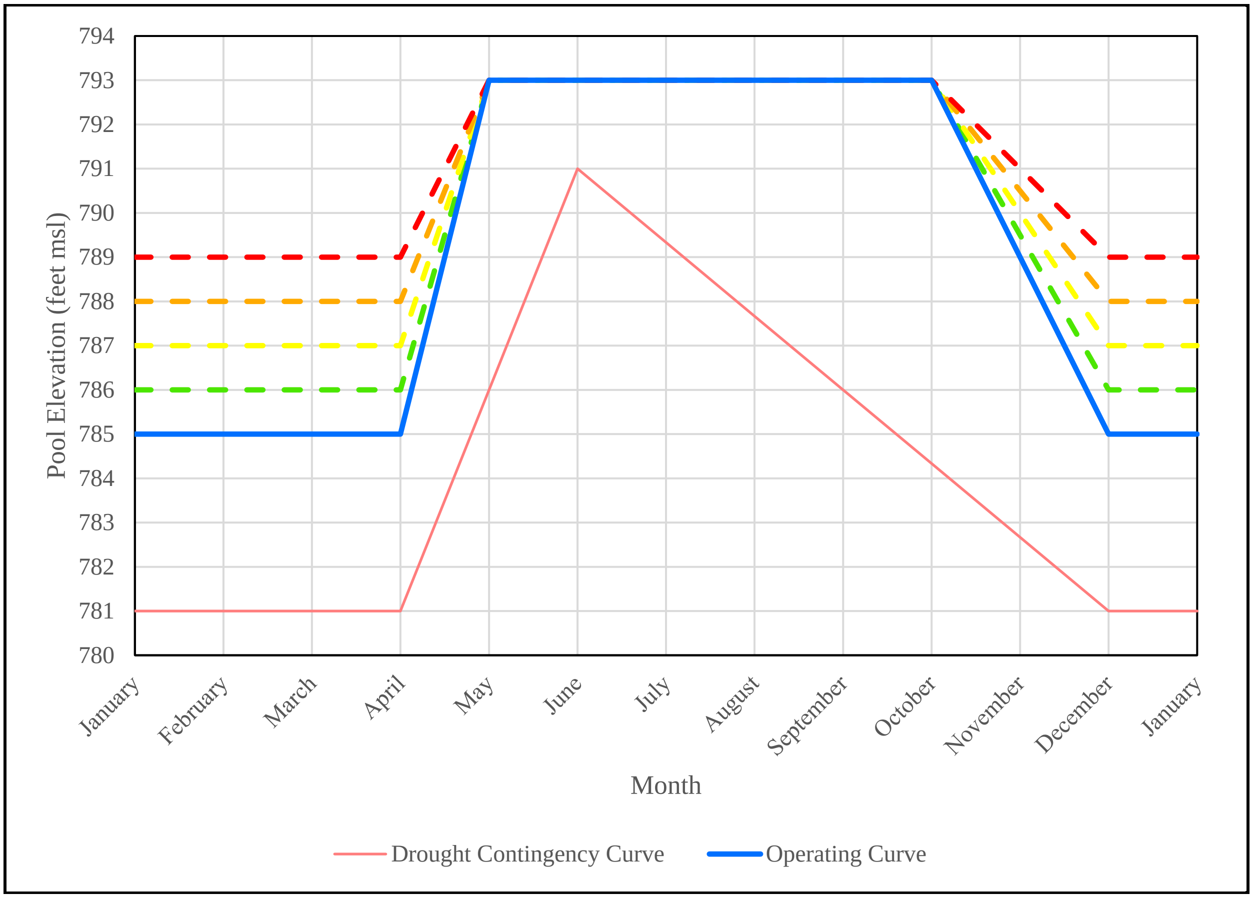

FIGURE 1–1 HARRIS OPERATING CURVE WITH PROPOSED 1-FOOT INCREMENTAL CHANGES

In the Study Plan, the evaluation of the alternatives was divided into two "phases". Consistent with the Study Plan, Alabama Power issued the Operating Curve Change Feasibility Analysis Phase 1 Report (Phase 1 Report) in August 2020 (Alabama Power and Kleinschmidt 2020). The Phase 1 Report described the hydrologic models (HEC-ResSim and HEC-RAS) developed for evaluating the alternatives and presented the Phase 1 results of the potential impacts of a winter operating curve change on hydropower generation, flood control, navigation, drought operations, Green Plan flows, and downstream release alternatives.[1]

[1] Due to timing of the development of the Phase 1 Report, the only downstream release alternatives evaluated in that report were pre-Green Plan, Green Plan, and a 150 cubic feet per second (cfs) continuous minimum flow. Shortly after Alabama Power finalized the Phase 1 Report, FERC required Alabama Power to evaluate additional downstream release alternatives. Because of the timing, these additional alternatives are analyzed in this report.

The purpose of this report is to present the Phase 2 analyses, consistent with the Study Plan. The Phase 2 analyses 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. These resources, and a summary of the methods used to analyze impacts are presented in Table 1-1.

Section 2.0 of this report provides a brief overview of the models developed and described in the Phase 1 Report. Section 3.0 presents the methods and results of analysis for each resource area. Section 4.0 provides a summary of all results, including those from the Phase 1 Report.

TABLE 1–1 SUMMARY OF THE RESOURCES AND STUDY METHODS USED IN PHASE 2 ANALYSES OF PROPOSED OPERATING CURVE CHANGES AT HARRIS DAM

Resource	Method: Lake Harris	Method: Tallapoosa River Downstream of Harris Dam through Horseshoe Bend
Downstream Release Alternatives	• HEC-ResSim	• N/A
Structures Downstream of Harris Dam	• N/A	• Phase 1 results • LIDAR data • County tax parcel data
Water Quality	• Phase 1 results • Baseline Water Quality Report (Kleinschmidt 2018c) • FERC-approved Water Quality Study • EFDC and HEC-ResSim	• Baseline Water Quality Report (Alabama Power and Kleinschmidt 2018) • FERC-approved Water Quality Study • 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

2.0 HYDROLOGIC MODEL SUMMARY

The following data and models were used to conduct the operating curve change feasibility analysis. More details are contained in the Phase 1 Report. In addition, the models, assumptions, and their ability to address the study questions were presented to HAT 1 on September 20, 2018 and September 11, 2019.

Data

1. Alabama-Coosa-Tallapoosa (ACT) unimpaired flow database – this database was developed by the 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. These data include average daily flows from 1939 – 2011[2] with regulation influences removed. This dataset was utilized in Hydrologic Engineering Center's Reservoir System Simulation (HEC-ResSim). An unsmoothed version of this dataset for 1939-2005 was utilized in the HEC-Flood Frequency Analysis (HEC-FFA).
2. Other data – Other data sources include USGS, USACE, and Alabama Power records.

Models

3. HEC-Flood Frequency Analysis (HEC-FFA) – This USACE model conforms with Technical Bulletin #17B in determining flood flow frequency. This model was used to determine the statistical frequency of flooding for one, three, and five-day flow volumes.

   Note that the Study Plan stated that HEC-Statistical Software Package (HEC-SSP) is the USACE's newest version of the Flood Frequency Analysis. HEC-SSP combines the capabilities of HEC-FFA with other HEC software, allowing for further statistical analysis of the data. The procedures used for analyzing the flow frequency (Bulletin #17B) did not change with the development of HEC-SSP. There has been no update to the inputs used in the HEC-FFA study of the Tallapoosa River; therefore, it was not necessary to use HEC-SSP for the purposes of this study.

[2] Although when developing the study plan Alabama Power anticipated the dataset to include the years 1939-2016, the unimpaired dataset provided by the USACE includes 1939-2011.

4. HEC-River Analysis System (HEC-RAS) – This model was used in the flood study portion of evaluating the operating curve. It routes flows in the unsteady state[3] along the river.
5. HEC-ResSim – This model looked at operational changes at the Harris Project in conjunction with operating curve changes on a daily timestep. It was used to focus on the hourly flood study operations. This model, in conjunction with the HEC-RAS model, shows impacts, if applicable, to the Martin Dam Project operations.
6. HEC-Data Storage System and Viewer (HEC-DSSVue) – This is the USACE's Data Storage System, which 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 was used to display some of the output of the other HEC models.
7. Alabama Power Hydro Energy (HydroBudget) Model – This model is a proprietary model that was used to evaluate the net economic gains or losses that could result from proposed operating curve changes at the Harris Project.
8. Environmental Fluid Dynamics Code (EFDC) – 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.

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

3.0 EFFECTS OF OPERATING CURVE CHANGES ON RESOURCES

3.1 Downstream Release Alternatives

As indicated in the Phase 1 Report, model results indicated that raising the winter operating curve would not affect Alabama Power's ability to return to Pre-Green Plan operations or to pass a continuous minimum flow of 150 cfs from Harris Dam due to an increase in the winter operating curve. Because Alabama Power is evaluating additional downstream release alternatives in the relicensing process, these additional alternatives were modeled to determine if raising the winter operating curve would affect the ability to pass these downstream release alternatives through Harris Dam.

3.1.1 Methods

The HEC-ResSim model developed for the Phase 1 Report was used to determine if raising the winter operating curve would affect Alabama Power's ability to pass a Modified Green Plan (changing the time of day in which the Green Plan pulses are released), 300 cfs continuous minimum flow (CMF), 600 cfs CMF, 800 cfs CMF, and four "hybrid" Green Plan alternatives that incorporate both a base minimum flow of 150 cfs, 300 cfs, 600 cfs, or 800 cfs, and the pulsing laid out in the existing Green Plan release criteria.

It should be noted that FERC also required an evaluation of a variation of the existing Green Plan where the daily volume of Harris Dam releases are 100% of the prior day's flow at the USGS Heflin stream gauge. As explained in a Harris Action Team (HAT) 3 meeting on November 5, 2020, Alabama Power already releases approximately 100% of the prior day's flow at the USGS Heflin stream gauge under the Green Plan. The Green Plan criteria states that Harris Dam release at least 75% of the prior day's flow at Heflin; translating that minimum requirement into the 10, 15, and 30 minute pulsing operations results in releases well above 75% of the prior day's Heflin flow (Figure 3-1). Therefore, there was no need to further evaluate this alternative because there is no discernible difference between these two alternatives.

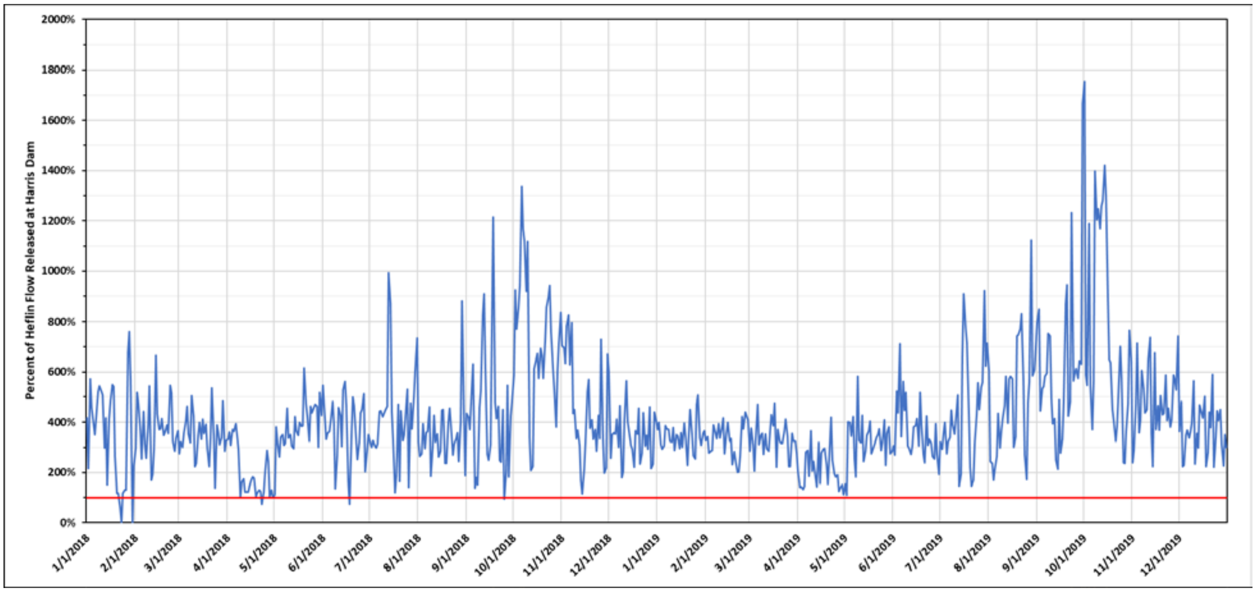

FIGURE 3–1 RELEASES FROM HARRIS DAM IN 2018 AND 2019 COMPARED TO 100% FLOW AT THE USGS HEFLIN GAGE

Note: Alabama Power suspended releases on two days in January 2018 to facilitate collecting LIDAR data around the Tallapoosa River below Harris Dam.

3.1.2 Results

Model results indicated that raising the winter operating curve would not affect Alabama Power's ability to pass any of the additional downstream release alternatives. The effect of downstream release alternatives on the reservoir level is analyzed in the Downstream Release Alternatives Phase 2 Report.

3.2 Effects on Structures Downstream of Harris Dam

As indicated in the Phase 1 Report, additional acres of land are inundated downstream of Harris Dam during the modeled 100-Year Design Flood[4] resulting from a change in winter operating curve (Appendix B, Table B-1). In addition, the depth and duration of flood above baseline elevation from the modeled 100-Year Design Flood also increases (Appendix B, Tables B-2 and B-3). Because of these effects, additional analysis was conducted to determine the potential impacts to structures affected by the modeled 100-Year Design Flood.

[4] For additional details on the 100-Year Design Flood, see the Phase 1 Report.

3.2.1 Methods

The methods for evaluating the effect of the winter pool alternatives on structures downstream of Harris Dam included:

1. Object Based Image Analysis (OBIA) with heads-up digitizing to identify structures downstream of Harris Dam,
2. An overlay analysis to find those structures affected by the operating curve alternatives,
3. A spatial join to associate affected structures with tax parcel data,
4. Summarizing the structures by tax-parcel use category (e.g., Agricultural, Forestry, Single Family, etc.), and
5. Counting the number of HEC-RAS model timesteps (hours) that each structure is inundated and summarizing by alternative.

The OBIA analysis incorporated Light Detection and Ranging (LIDAR) derived elevation products and the National Agriculture Imagery Program (NAIP) 1 m, 4 band (R,G,B,NIR) orthoimagery (USDA 2015) (Figure 3-2). When combined, the data sources provided valuable training data for an image classification algorithm that attempted to distinguish built-structures from their surroundings. The data were preprocessed by adding a height band to the NAIP image. Height was calculated as the first return (digital surface model) minus the ground (digital elevation model). A combination of automated LIDAR building classification tools and an OBIA workflow in ArcGIS Pro was used to identify structures and/or compounds of structures, and the exercise was completed with manual heads-up digitizing.[5]

[5] This method involves scanning a map or image into a computer. The digitizer then traces the points, lines and polygons using digitizing software. This method of digitizing has been named "heads-up" digitizing because the focus of the user is up on the screen, rather than down on a digitizing tablet.

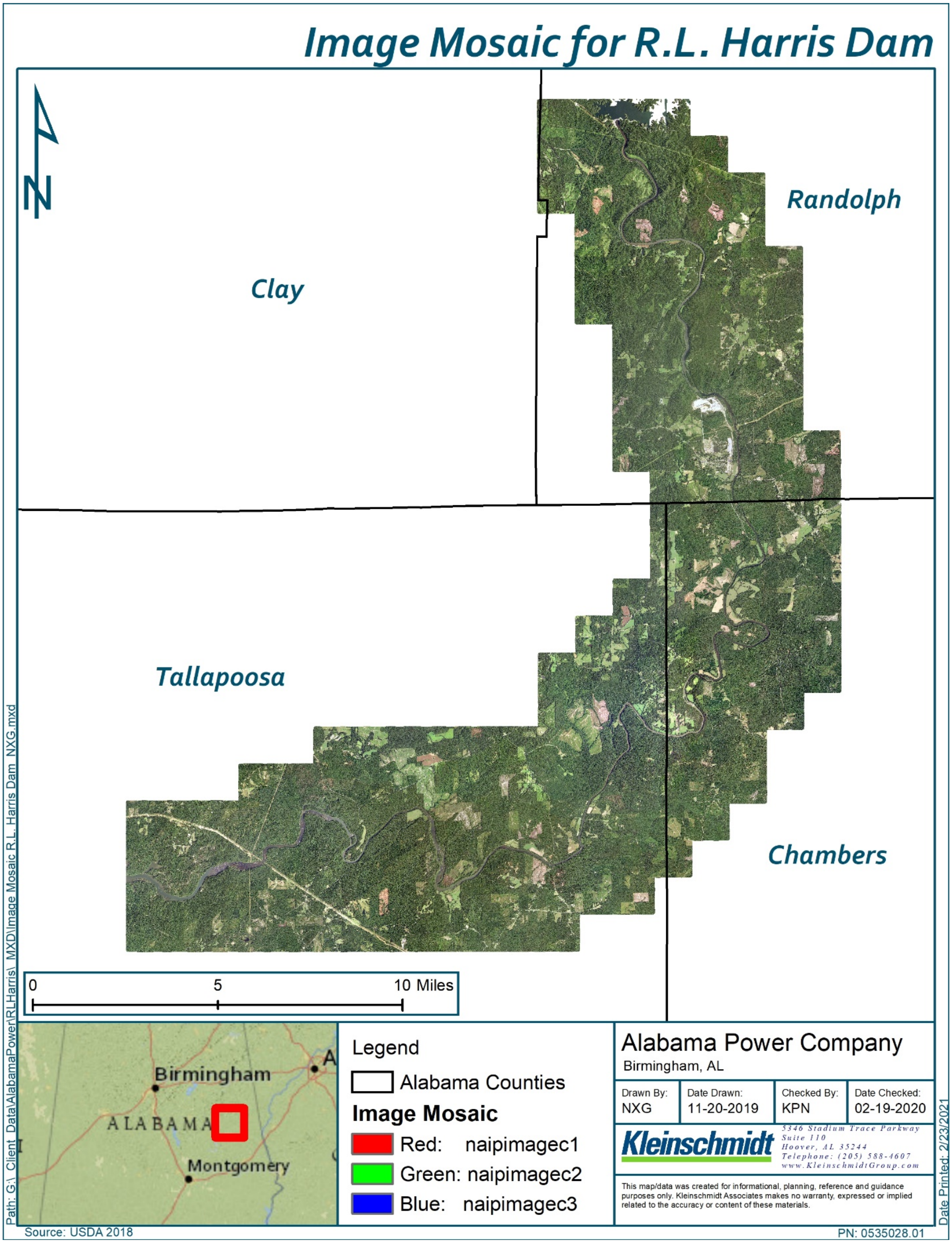

FIGURE 3–2 IMAGE MOSAIC FOR THE TALLAPOOSA RIVER BELOW HARRIS DAM

3.2.2 Results

The original intent of collecting LIDAR data was to provide data with appropriate resolution for elevation modeling. While the point cloud had at least 4 returns per square meter, the density of points was too low to accurately extract buildings returns, which prompted the use of the OBIA method.

The overall accuracy (Overall: 63%, Kappa: 56%)[6] of the OBIA classification method suffered from false positive building classifications. An examination of the confusion matrix (Table 3-1) found the user accuracy for structures at 100%, but the producer accuracy was very low at only 8%. In other words, the algorithm was able to correctly classify 100% of the training data classified as structures, but it falsely attributed other image pixels to buildings as well. The algorithm was primarily getting confused with water, shadows, and fields/bare ground and classifying them as buildings. Most likely, these classes shared similar spectral qualities to buildings. The low producer accuracy for our land cover classification of interest prompted the need for an in-depth heads-up digitizing exercise, where building classifications were manually scrutinized and adjusted as needed.

Following the heads-up digitizing exercise, 1,991 structures (Figure 3-3) were found within the study area. Table 3-2 includes the number of structures inundated (flood elevation above ground elevation) by the modeled 100-year Design Flood for the baseline and winter pool alternatives. Increasing the winter operating curve to 789 feet msl would potentially impact nine more structures during the modeled 100-Year Design Flood than the current winter operating curve.

[6] Kappa measures the degree of agreement between the training data and classifications made by the algorithm. It is an accuracy measure; generally the higher the Kappa, the better the model.

TABLE 3–1 CONFUSION MATRIX FOR OBJECT BASED IMAGE ANALYSIS (OBIA) ALGORITHM

	Structure	Vegetation	Water	Shadow	Field/Bare	Roads	User Accuracy
Structure	388	0	0	0	0	0	1
Vegetation	0	4992	12	256	167	15	0.91
Water	385	0	4684	653	51	0	0.81
Shadow	247	2	298	4010	1	0	0.88
Field/Bare	3980	5	6	81	4735	4908	0.34
Roads	0	1	0	0	46	77	0.63
Producer Accuracy	0.08	0.99	0.93	0.80	0.95	0.02	

Note the perfect user accuracy for structures, but poor producer accuracy, which created the need for heads up digitizing.

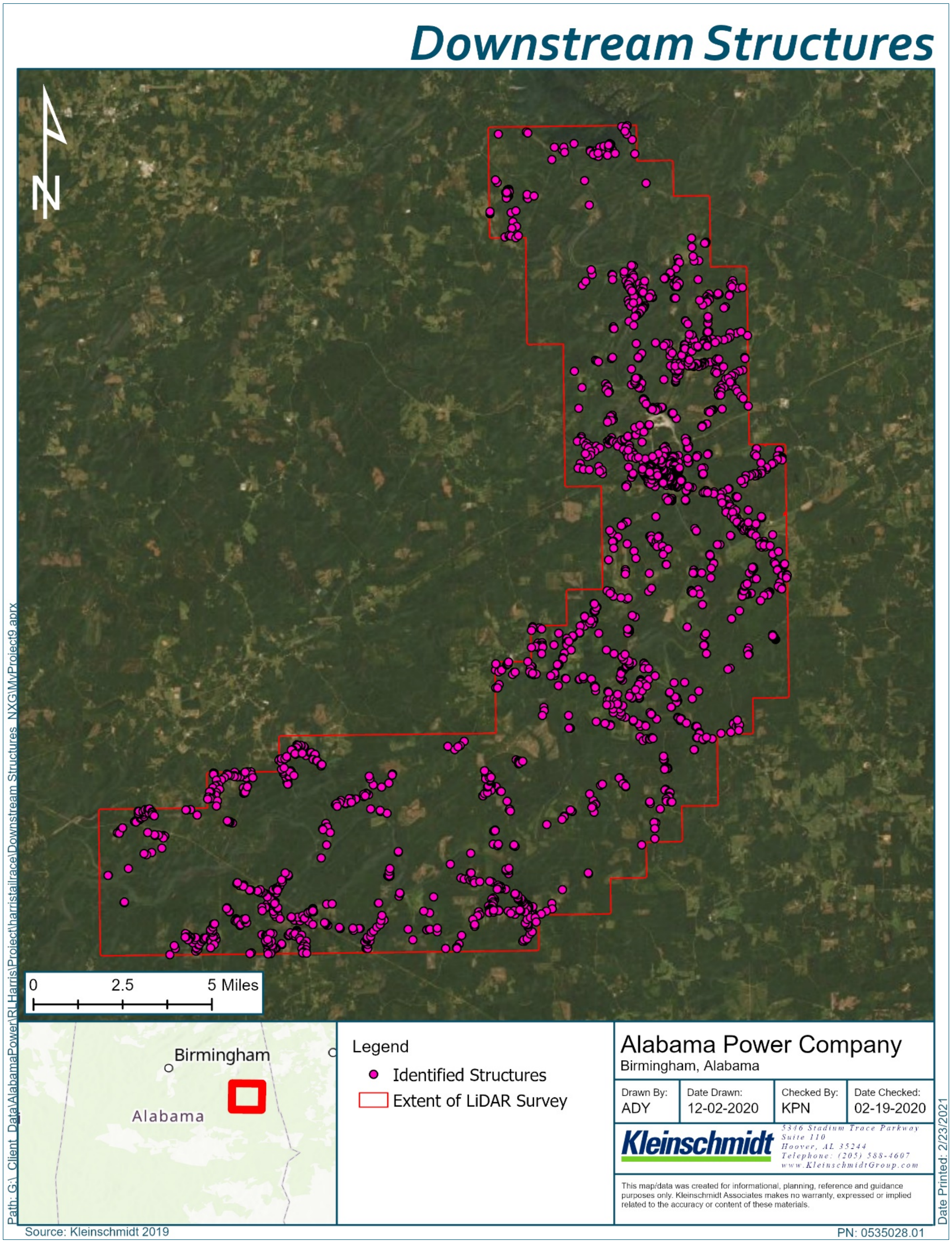

FIGURE 3–3 STRUCTURES IDENTIFIED BELOW HARRIS DAM WITHIN THE LIDAR DATA EXTENT

TABLE 3–2 NUMBER OF DOWNSTREAM STRUCTURES INUNDATED DURING THE MODELED 100-YEAR DESIGN FLOOD BY EACH WINTER POOL ALTERNATIVE

Alternative	No. of Structures Inundated
Baseline (785 feet msl)	79
+1 foot	79
+2 feet	83
+3 feet	83
+4 feet	88

After identifying the structures potentially impacted by the modeled 100-Year Design Flood, a spatial join associated the structures to each county's tax parcel database. Table 3-3 provides the number of structures by tax parcel type effected by each winter pool alternative. As the table shows, the number of single family structures and mobile homes impacted by the modeled 100-Year Design Flood increases as the winter pool alternatives increase.

TABLE 3–3 NUMBER OF DOWNSTREAM STRUCTURES BY TAX PARCEL USE TYPE IMPACTED BY THE 100-YEAR DESIGN FLOOD FOR EACH WINTER POOL ALTERNATIVE

Tax Parcel Use	Winter Pool Alternative				
	785 feet msl (Baseline)	786 feet msl	787 feet msl	788 feet msl	789 feet msl
Residential	1	1	1	1	1
Vacant Agricultural	2	2	2	2	2
Cabin	2	2	2	2	2
Unknown	2	2	2	2	3
Agricultural	4	4	4	4	4
Forestry	6	6	6	6	6
Commercial	6	6	6	6	6
Mobile Home	8	8	9	9	10
Vacant	24	24	25	25	25
Single Family	24	24	26	26	29
Total	79	79	83	83	88

With structures impacted by an increase in the winter operating curve identified, it was possible to count the number of HEC-RAS model timesteps that each structure was inundated. Each time step is an hour in duration; therefore, the count of all timesteps a structure is inundated is a measure of the number of hours it is inundated. Using GIS, the elevation and river mile for each structure was determined, which was then associated to the closest HEC-RAS cross section. Once every model time step was completed, it was determined if the modeled water surface elevation is greater than the ground elevation of the structure. Therefore, for each time step, the structure was considered inundated for one hour. Table 3-4 provides a descriptive summary of the number of hours (timesteps) structures were inundated and Table 3-5 has the number of hours inundated broken down by tax parcel type.

TABLE 3–4 NUMBER OF HOURS (TIMESTEPS) DOWNSTREAM STRUCTURES ARE INUNDATED BY THE MODELED 100-YEAR DESIGN FLOOD FOR EACH WINTER POOL ALTERNATIVE

Alternative	Minimum	25%	Median	75%	Maximum
Baseline (785 feet msl)	3.0	113.0	119.5	130.5	191.0
+1 foot	15.0	107.0	114.0	124.5	191.0
+2 feet	37.0	100.0	108.0	122.25	191.0
+3 feet	59.0	92.0	103.0	122.25	191.0
+4 feet	64.0	85.75	102.0	122.25	191.0

TABLE 3–5 NUMBER OF HOURS (TIMESTEPS) DOWNSTREAM STRUCTURES ARE INUNDATED BY THE MODELED 100-YEAR DESIGN FLOOD FOR EACH WINTER POOL ALTERNATIVE BY TAX PARCEL TYPE

Alternative	Tax Parcel Use	Number	Hours Inundated				
			Minimum	25%	Median	75%	Maximum
Baseline (785 feet msl)	Agricultural	4	132	134.25	138.5	144	150
	Vacant Agricultural	2	126	142.25	158.5	174.75	191
	Cabin	2	93	99	105	111	117
	Forestry	6	113	113.75	117	118	175
	Commercial	6	119	123.25	135	140	143
	Mobile Home	8	37	115.25	125.5	138.25	172
	Residential	1	121	121	121	121	121
	Single Family	24	3	110	119	125	177
	Vacant	24	36	114	119	124	191
	Unknown	2	74	86.5	99	124.5	150
	TOTAL	79					
+1 Foot	Agricultural	4	126	128.25	132.5	138	144
	Vacant Agricultural	2	120	137.75	155.5	173.25	191
	Cabin	2	103	105	107	109	111
	Forestry	6	107	107.5	110	111.75	173
	Commercial	6	113	116.5	129	134	136
	Mobile Home	8	58	109.25	119.5	132.25	171
	Residential	1	115	115	115	115	115
	Single Family	24	15	104	113	119	177
	Vacant	24	51	108	114	118	191
	Unknown	2	95	99	103	122	141
	TOTAL	79					

Alternative	Tax Parcel Use	Number	Hours Inundated				
			Minimum	25%	Median	75%	Maximum
+2 Feet	Agricultural	4	123	125.25	129.5	135.25	142
	Vacant Agricultural	2	116	134.75	153.5	172.25	191
	Cabin	2	95	97.5	100	102.5	105
	Forestry	6	100	100.5	103.5	105.75	173
	Commercial	6	106	113	127.5	133	136
	Mobile Home	9	63	103.25	115.5	131.75	171
	Residential	1	109	109	109	109	109
	Single Family	26	37	98	106	116	177
	Vacant	25	59	101	108	116	191
	Unknown	2	94	95	96	117	138
	TOTAL	83					
+3 Feet	Agricultural	4	123	124.5	129	135.25	142
	Vacant Agricultural	2	115	134	153	172	191
	Cabin	2	88	90.25	92.5	94.75	97
	Forestry	6	92	92.25	94.5	99	173
	Commercial	6	104	113	127.5	133	136
	Mobile Home	9	77	94.25	115.5	131.75	171
	Residential	1	101	101	101	101	101
	Single Family	26	59	90	101	116	177
	Vacant	25	64	92	98	116	191
	Unknown	2	87	87.5	88	112.5	137
	TOTAL	83					
+4 Feet	Agricultural	4	123	124.5	129	135.25	142
	Vacant Agricultural	2	113	132.5	152	171.5	191
	Cabin	2	82	84.25	86.5	88.75	91
	Forestry	6	85	85.75	90	96.5	173
	Commercial	6	104	113.75	127.5	133	136
	Mobile Home	10	76	89.25	114	131.75	171
	Residential	1	96	96	96	96	96
	Single Family	29	64	83	95	116	177
	Vacant	25	73	87	94	116	191
	Unknown	3	79	80.5	82	109.5	137
	TOTAL	88					

Table 3-4 and Table 3-5 show that although the four foot winter pool increase has the largest impact in terms of number of structures inundated, the median duration of inundation was the lowest. This phenomenon occurs because changes to the winter operating curve increase the starting pool elevation and Harris has less storage available in the reservoir to store floodwaters before Alabama Power must begin releasing water. Therefore, the downstream flood is more intense in terms of magnitude (greater rise) since water is released more quickly due to the higher reservoir elevation and less storage (Appendix B, Figure B-1). Additionally, after the flood, the reservoir returns to a water level that is 4 feet higher than the baseline elevation, which means Alabama Power can stop releasing water sooner than under the baseline. In other words, under existing conditions (baseline), Harris Reservoir is able to absorb more flood water because there is more storage available to use for flood control. Therefore, currently the magnitude of the inundation for each structure is lower because the peak of the flood hydrograph is attenuated by having smaller magnitude floodwaters released over a longer time.

The analysis of the duration of inundation of downstream structures is different than increases in flood duration presented in the Phase 1 Report. The Phase 1 Report provided the results of how the flood duration for each operating curve alternative exceeded the maximum existing conditions (baseline) flood elevation. The Phase 1 Report showed that the greater the proposed change in the winter operating curve, the longer the duration that downstream flooding exceeds the maximum flood elevation under existing conditions.

To further illustrate this, Figures 3-4 and 3-5 show the river stage hydrographs for the different winter pool alternatives at the Malone and Wadley cross sections, respectively. Both figures show two horizontal dotted lines; the upper line represents the maximum flood elevation under existing conditions (baseline), and the lower line represents the elevation of a hypothetical downstream structure. Both figures indicate that any of the winter pool alternatives would result in peak flood elevations greater than baseline, but the river stage drops below the ground elevation of the structure sooner for the winter pool alternatives compared to baseline.

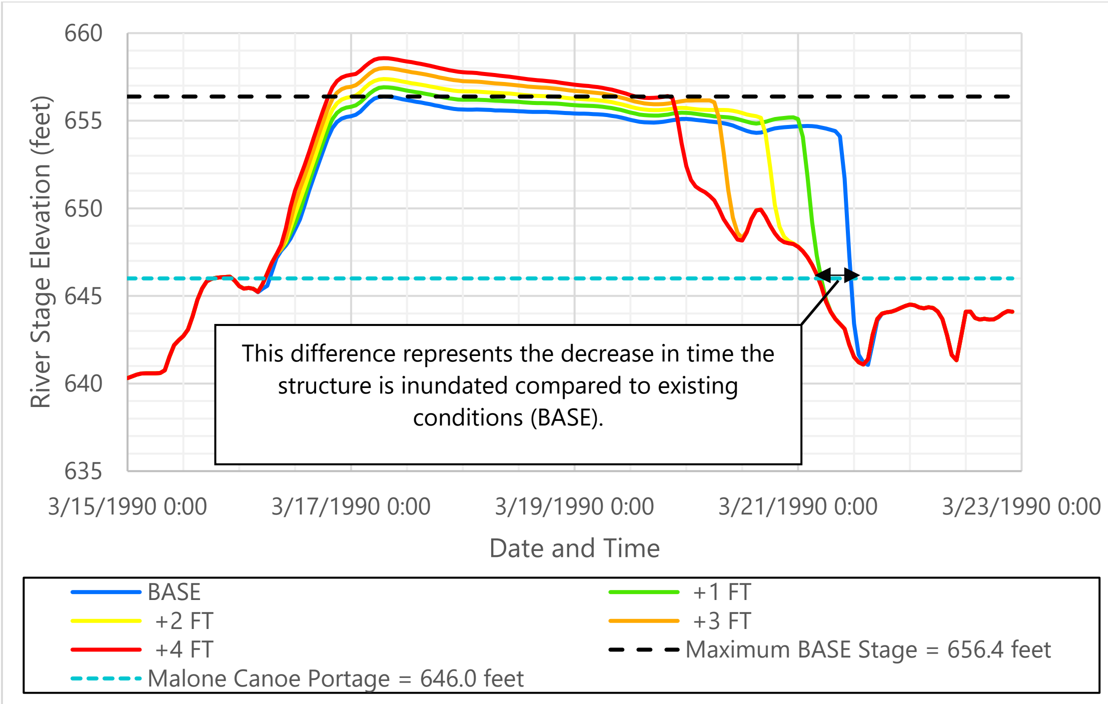

FIGURE 3–4 TALLAPOOSA RIVER STAGE HYDROGRAPHS AT RM 129.7 (MALONE) FROM RESULTS OF 100-YEAR DESIGN FLOOD IN HARRIS-MARTIN HEC-RAS MODEL

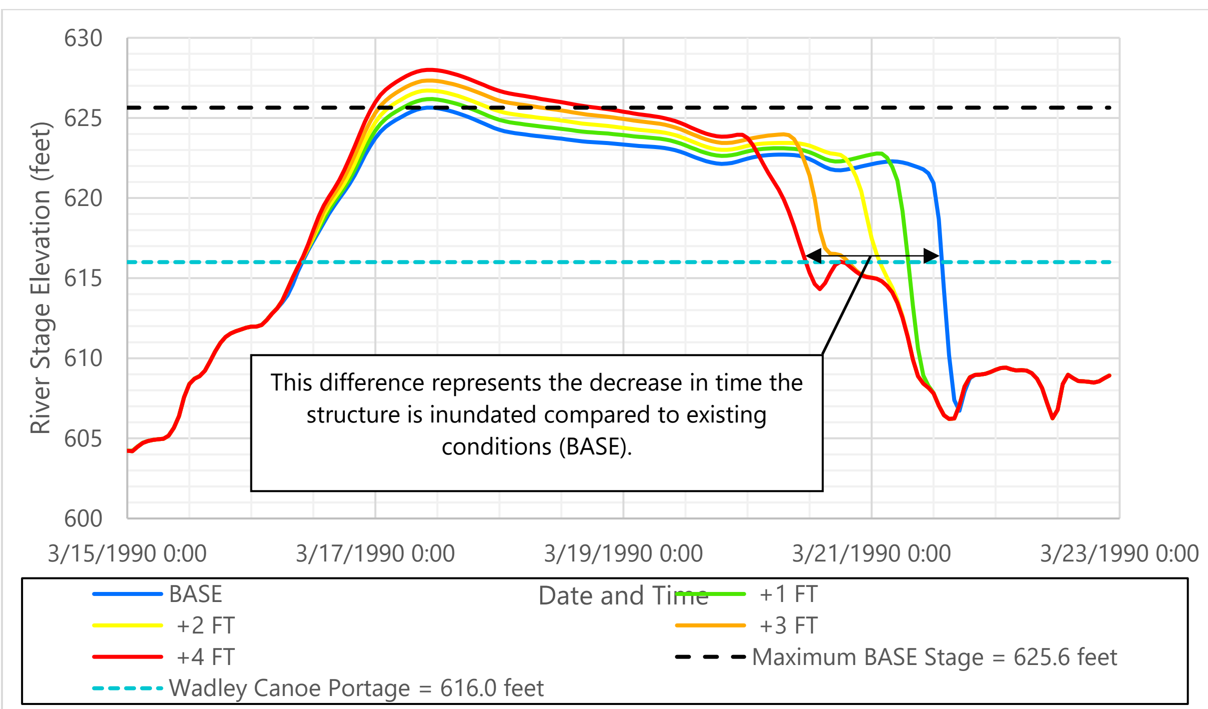

FIGURE 3–5 TALLAPOOSA RIVER STAGE HYDROGRAPHS AT RM 122.7 (WADLEY) FROM RESULTS OF 100-YEAR DESIGN FLOOD IN HARRIS-MARTIN HEC-RAS MODEL

3.3 Water Quality

As indicated in the Study Plan, water quality was assessed using existing information, Phase 1 Results, and an additional water quality model developed for the Phase 2 analysis.

3.3.1 Methods

Alabama Power commissioned the development of a three-dimensional Environmental Fluid Dynamics Code (EFDC) hydrodynamic and water quality model for Lake Harris (Dynamic Solutions 2020). A report detailing the development, calibration, and validation of the model is provided as Appendix C. It should be noted that the EFDC model was used to evaluate the potential effects of an operating curve change on water quality and it does not reflect Alabama Power's ability to meet state water quality standards. The calibrated and validated EFDC model of Harris Reservoir was used to evaluate the effects of each winter pool alternative on water temperature and dissolved oxygen in the forebay area of Harris Reservoir. Further, the effects of each winter pool alternative on Harris Dam discharge were evaluated based on temperature and dissolved oxygen changes at the intake elevation of the penstock. For all winter pool alternatives, the EFDC model of Lake Harris was run for the 6-year period from January 1, 2014 to December 31, 2019.

3.3.2 Results

Harris Reservoir

Since retention time is a function of reservoir volume and release rate, increasing the winter pool elevation would result in increased winter reservoir volume thereby increasing retention time. Since the EFDC model simulation showed little difference in water temperature and dissolved oxygen in the forebay between the baseline and the four winter pool alternatives, it is likely that other areas of the reservoir would also exhibit minimal differences among the winter pool alternatives.

Tallapoosa River Downstream of Harris Dam

The EFDC model indicated only small differences in simulated water temperature and dissolved oxygen in the withdrawal zone of the forebay between the baseline and the four winter pool alternatives. The model simulation results indicated that raising the winter operating curve up to four feet would result in only minor differences in water temperature and dissolved oxygen in the dam discharge (Dynamic Solutions 2020).

3.4 Water Use

As indicated in the Study Plan, water use was assessed using existing information and Phase 1 Results.

3.4.1 Methods

The effects of the winter pool alternatives on existing and potential water withdrawals in Harris Reservoir and the Tallapoosa River downstream of Harris Dam were qualitatively assessed. The Water Quantity, Water Use, and Discharge Report for the R.L. Harris Project (Kleinschmidt 2018b) provided locations of water users and average maximum daily volumes of water discharged or withdrawn by water users. HEC-ResSim was used to determine the effect of an increase in winter operating curve on available water in Harris Reservoir. HEC-RAS modeling was used to assess how changes in outflow from Harris Dam could affect water users in tributaries and the mainstem of the Tallapoosa River downstream of Harris Dam.

3.4.2 Results

<u>Harris Reservoir</u>

The Lakeside Campground and Marina withdraws groundwater near Cohobadiah Creek, a tributary to Harris Reservoir (Kleinschmidt 2018b); however, the well is located at an elevation greater than 793 feet msl, which is outside of Harris Reservoir and the Harris Project Boundary (Project Boundary). The Wedowee Water, Sewer, and Gas Board (WSGB) withdraws from and discharges to the upper Little Tallapoosa River (Kleinschmidt 2018b) and is the only water user that withdraws within the Project Boundary.

The Wedowee WSGB withdraws from the upper Little Tallapoosa River a daily average of 0.411 million gallons per day (mgd) (0.636 cfs) and a permitted daily maximum of 0.50 mgd (0.774 cfs) and discharges a daily average of 0.045 mgd (0.070 cfs) and a daily maximum of 0.150 mgd (0.232 cfs) (Kleinschmidt 2018b).

A potential increase in the winter operating curve is expected to have no negative impact on current or potential future water users. Each one foot winter operating curve increase provides additional water available for use during the winter. While Alabama Power does not guarantee any amount of water to be available for withdrawal at any time, increased winter operating curve elevations could increase peak elevation in drought years and store more water into the dry season. An increase in the winter operating curve would also increase the assimilative capacity of the Little Tallapoosa River arm of Harris Reservoir, which the Wedowee Water, Sewer, and Gas Board discharges into; however, this increase may be negligible and there are no reported issues with the existing assimilative capacity.

Tallapoosa River Downstream of Harris Dam

The Roanoke Utilities Board has two surface water intakes and one discharge point in Highpine Creek (Kleinschmidt 2018b), a tributary leading to the Tallapoosa River downstream of the Harris Project. Water use by the Roanoke Utilities Board would not be impacted by changes to the winter operating curve, because the intakes are located over 14 miles upstream of the confluence of Highpine Creek and the Tallapoosa River. The Town of Wadley Water System has one discharge in Hutton Creek (Kleinschmidt 2018b), a tributary leading to the Tallapoosa River downstream of the Harris Project. Because the amount of water available for assimilative capacity will not decrease due to a change in the winter operating curve, there would be no impact to the Town of Wadley Water System's discharge.

3.5 Erosion and Sedimentation

As indicated in the Study Plan, erosion and sedimentation were assessed using existing information and Phase 1 Results.

3.5.1 Methods

Harris Reservoir

Data (e.g., soil types, slope) were reviewed from the Erosion and Sedimentation Study (Kleinschmidt 2021a) to evaluate the potential effects of each winter pool alternative on erosion and sedimentation areas. Information from the Recreation Evaluation Report (Kleinschmidt 2020) was also used to determine the potential increase in recreation from higher winter operating curve elevations and its effect on erosion and sedimentation areas. Finally, the results of the Erosion and Sedimentation Study were used to determine the risk for occurrence of nuisance aquatic vegetation 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 were qualitatively assessed, and LIDAR data and a Geographic Information System (GIS) were used for Harris Reservoir to estimate the area that could be impacted at each site by each winter pool alternative. While use of historic photos was mentioned in the Study Plan, photos could not be used to assess the effects of the winter pool alternatives due to the limited resolution of publicly available historical photos needed to assess individual erosion areas.

Tallapoosa River Downstream of Harris Dam

The information gathered in the Tallapoosa River from Harris Dam through Horseshoe Bend in the Erosion and Sedimentation Study along with existing LIDAR data and results from the Phase 1 Report were used to determine the potential effects on erosion and sedimentation associated with a change in magnitude and frequency of flood events predicted with each winter pool alternative. While use of historic photos was mentioned in the Study Plan, photos could not be used to assess the downstream effects of the winter pool alternatives due to the limited resolution of publicly available historical photos needed to assess individual erosion areas.

3.5.2 Results

Harris Reservoir

Erosion

The Erosion and Sedimentation Study identified 22 sites on Harris Reservoir that were either experiencing or susceptible to erosion (Appendix D). Because soil types and their associated characteristics can lend to their erodibility, soil types at each of these sites is summarized below (Table 3-6).

TABLE 3–6 HARRIS RESERVOIR EROSION SITES AND ASSOCIATED SOIL TYPES AND CHARACTERISTICS

Erosion Site[1]	Latitude	Longitude	Potential Cause(s) of Erosion/Sedimentation	Description of Exposed Soils	Approximate Slopes (%)	Soil Group Associated Landform Location
E1	33.39649	-85.44412	Natural Factor Independent of Operations, Land Use	Oc, Ochlockonee fine sandy loam	0-2	Floodplains
E2	33.39618	-85.44512	Natural Factor Independent of Operations, Land Use	Oc, Ochlockonee fine sandy loam	0-2	Floodplains
E3	33.39448	-85.44763	Land Use	Oc, Ochlockonee fine sandy loam	0-2	Floodplains
E4	33.39253	-85.44797	Land Use	Oc, Ochlockonee fine sandy loam	0-2	Floodplains
E5	33.38870	-85.44677	Anthropogenic	Oc, Ochlockonee fine sandy loam	0-2	Floodplains
E6	33.38817	-85.45264	No active erosion	Oc, Ochlockonee fine sandy loam	0-2	Floodplains
E7	33.38399	-85.45285	Natural Factor Independent of Operations, Land Use	Bu, Buncombe loamy sand	0-5	Levees
E8	33.37972	-85.45260	Natural Factor Independent of Operations, Land Use	Bu, Buncombe loamy sand	0-5	Levees
E9	33.37732	-85.45879	Natural Factor Independent of Operations, Land Use	LtE, Louisa stony sandy loam	15-40	Overlay weathered bedrock on hillslopes
E10	33.37785	-85.45851	Natural Factor Independent of Operations, Land Use	Oc, Ochlockonee fine sandy loam	0-2	Floodplains
E11	33.38727	-85.47761	No active erosion	Mantachie fine sandy loam	0-2	Floodplains

Erosion Site[1]	Latitude	Longitude	Potential Cause(s) of Erosion/Sedimentation	Description of Exposed Soils	Approximate Slopes (%)	Soil Group Associated Landform Location
E12	33.36759	-85.47331	No active erosion	Oc, Ochlockonee fine sandy loam	0-2	Floodplains
E13	33.36509	-85.47680	No active erosion	MaD3, Madison gravelly clay loam	10-15	Hillslopes
E14	33.36407	-85.47728	Natural Factor Independent of Operations, Land Use	Oc, Ochlockonee fine sandy loam	0-2	Floodplains
E15	33.37197	-85.49914	No active erosion	LgE, Louisa gravelly sandy loam	15-40	Hillslopes
E16	33.37216	-85.50173	No active erosion	LtE, Louisa stony sandy loam	15-40	Overlay weathered bedrock on hillslopes
E17	33.37371	-85.50122	No active erosion	Mt, Mantachie fine sandy loam	0-2	Floodplains
E18	33.35833	-85.49693	Land Use, Anthropogenic	LtE, Louisa stony sandy loam	15-40	Overlay weathered bedrock on hillslopes
E19	33.35334	-85.50611	Land Use, Anthropogenic	LtE, Louisa stony sandy loam	15-40	Overlay weathered bedrock on hillslopes

Erosion Site[1]	Latitude	Longitude	Potential Cause(s) of Erosion/Sedimentation	Description of Exposed Soils	Approximate Slopes (%)	Soil Group Associated Landform Location
E20	33.35544	-85.51280	No active erosion	LtE, Louisa stony sandy loam	15-40	Overlay weathered bedrock on hillslopes
E21	33.33941	-85.55814	Anthropogenic	MdC2, Madison gravelly fine sandy loam	6-10	Hillslopes
E24	33.34779	-85.51483	Anthropogenic	DaD3, Davidson gravelly clay loam	10-15	Hillslopes

[1] Note that sites E22 and E23 are located downstream of Harris Dam.

Review of LIDAR information at these sites shows that none of the winter pool alternatives would likely affect existing erosion, as water levels will remain below where the erosion is taking place at these sites. Most of the existing erosion sites exhibited hard clay, bedrock, or increased amounts of larger rock (i.e., cobble/boulders) substrates below the current summer pool elevation of 793 feet msl. Because the substrates below summer pool at the erosion sites are stable, there should be no increase in erosion as a result of a winter operating curve change. One primary cause of erosion on Harris Reservoir noted in the Erosion and Sedimentation Study was the impact created by anthropogenic disturbance (Kleinschmidt 2021a). Examples of this type of disturbance include bank clearing/clear-cutting and boat-induced wave action. With an increase in the operating curve during the winter, the lake could experience an increase in recreation/boating activity. This is a result of fewer boating hazards introduced during low water periods and more dock and boat ramp access. Section 3.9 of this report assesses the expected increase in lake recreation structure access as a result of each winter pool alternative.

With each incremental increase in the winter operating curve, increased numbers of recreation structures around the lake become available for use. These structures include: boardwalks, boathouses, floats, piers, and wet slips. This likely will correlate with incremental increases to boater recreation during the winter months. With the expected increase in boater recreation during "off-season" periods (i.e., winter months), boat wave action may increase, and reservoir banks could endure an increase in exposure to erosive forces. However, none of the identified erosion sites will be affected as the erosion at these sites occurs well above the winter pool alternative elevations.

Sedimentation and Invasive Aquatic Vegetation

Nine sedimentation areas were identified in the Erosion and Sedimentation Study. Approximate surface area was calculated for the identified sedimentation areas using the 2015 LIDAR data (Table 3-7). The acreage for each winter pool alternative was also calculated using the 2015 LIDAR.

TABLE 3–7 INCREASE IN SURFACE AREA OF SEDIMENTATION SITES ON HARRIS RESERVOIR FOR EACH WINTER POOL ALTERNATIVE

Site	Latitude	Longitude	Baseline Acreage	+1 foot	+2 feet	+3 feet	+4 feet
S1	33.3763	-85.472	23.83	3.95	5.66	4.25	5.95
S2	33.3672	-85.478	4.96	1.93	0.93	0.27	0.15
S3	33.3659	-85.482	10.51	4.42	1.01	1.62	2.94
S4	33.3662	-85.485	5.49	1.51	1.27	2.34	0.13
S5	33.3605	-85.486	6.68	2.57	2.70	0.73	0.23
S6	33.3743	-85.514	13.55	7.11	2.14	1.18	0.83
S7	33.3264	-85.489	26.14	7.07	5.46	5.15	3.13
S8	33.4538	-85.61	10.59	0.93	1.32	1.46	1.78
S9	33.3065	-85.629	18.25	6.54	2.57	1.90	1.81

The sedimentation areas were also surveyed for the growth of invasive aquatic vegetation. Field surveillance conducted during 2020 did not detect any submerged aquatic vegetation (SAV) populations on the reservoir. The survey did identify some emergent vegetation growing in some of the areas. Results of the 2020 survey are found in Table 3-8.

Sedimentation rates on the reservoir will be relatively unchanged by a higher winter operative curve, while changes to depositional patterns could result; however, methods to predict these changes do not exist. Sedimentation areas will continue to be most prevalent in upstream areas of the major tributaries. Because sedimentation rates are entirely dependent on upstream, non-project related forces, changes to the operating curve will not affect reservoir sedimentation rates. Higher winter operating curve elevations could contribute to increased sedimentation area size over time. Drawdown periods that expose areas of accumulated sediment allow for winter and early spring rains to flush sediment to deeper depths, reducing overall size.

Risk of establishment of SAV populations is increased as a result of increased “habitat” in the sedimentation areas. Higher winter pool elevations will result in less acreage of exposed sediments during winter. This exposure helps manage any SAV introduced by killing seeds due to freezing, drying, or soil compaction. Furthermore, higher winter operating curve elevations will not allow for winter and early spring rains to flush accumulated sediments to deeper depths, resulting in more shallow water habitat for SAV.

TABLE 3–8 PRESENCE AND SIZE (IN ACRES) OF EMERGENT AQUATIC VEGETATION ON HARRIS RESERVOIR

Site	Location Description	Sedimentation Acreage	American Water-willow	Pickerel Weed	Alligator Weed	Juncus Grass
S1	Little Tallapoosa River	23.83	<0.25	<0.10		
S2	Little Tallapoosa River	4.96	<0.10			
S3	Little Tallapoosa River	6.61	<0.10			
S4	Little Tallapoosa River	5.49				
S5	Little Tallapoosa River	6.68				
S6	Pineywood Creek	13.55	< .25			
S7	Wedowee Creek	26.14	<.25			
S8	Tallapoosa River	10.58	1.00		<0.50	
S9	Fox Creek	18.25	<0.25			<0.25

<u>Tallapoosa River Downstream of Harris Dam</u>

Erosion

The Erosion and Sedimentation Study identified twenty-four sites that were either experiencing or susceptible to erosion (Appendix D). Two of these sites, E22 and E23, were located along the Tallapoosa River downstream of the dam. In addition, the downstream streambank assessment (Trutta 2019) identified (by river mile downstream of Harris Dam) additional streambank segments scoring as "slightly impaired" or worse (Table 3-9). A slightly impaired segment is defined as banks showing moderate erosion impact or some impact from human development. Impaired banks are defined as areas with a surrounding area consisting of more than 50% exposed soil with low riparian diversity or surface protection. Obvious impacts are from cattle, agriculture, industry, and poorly protected streambanks (Trutta 2019).

TABLE 3–9 MOST IMPAIRED STREAMBANK SEGMENTS ON THE TALLAPOOSA RIVER DOWNSTREAM OF HARRIS DAM

Bank[1]	River Mile Downstream of Harris Dam	Condition Score[2]	Latitude	Longitude
Right Bank	16.7	4.45	33.0833	-85.5526
Right Bank	16.6	3.96	33.0836	-85.5509
Right Bank	7.7	3.57	33.1919	-85.5791
Right Bank	16.5	3.55	33.084	-85.5494
Right Bank	16.3	3.35	33.0859	-85.5483
Left Bank	10	3.22	33.1625	-85.5843
Right Bank	16.9	3.2	33.0826	-85.5561
Right Bank	16.4	3.18	33.0848	-85.5486
Right Bank	43.8	3.17	32.9845	-85.7515
Left Bank	19.2	3.11	33.0612	-85.5551
Left Bank	17.9	3.09	33.0707	-85.5648
Right Bank	34.4	3.07	32.9716	-85.6631
Left Bank	20.6	3.05	33.0503	-85.5547
Left Bank	36.5	3.05	32.9568	-85.6914
Left Bank	36.6	3.04	32.956	-85.6928

[1] Left bank or right bank is a reference to the side of the river when traveling downstream.
[2] Bank Condition Scores: 1-Fully Functional, 2-Functional, 3-Slightly Impaired, 4-Impaired, 5-Non-Functional.
Source: Trutta 2019

Consistent with much of the streambank along the Tallapoosa River between Lake Harris and Lake Martin, many of these banks are steep sided and, as identified in the Phase 1 Report, are more apt to contain higher flood flows. Soils in these areas are more susceptible to erosion when streambank vegetation is disturbed or clear-cut, as identified in the Erosion and Sedimentation Study. Soils at sites E22 and E23, along with large portions of the streambanks between Harris Dam and Lake Martin are constituted of sand and loam, which are more susceptible to erosion. Because steeper banks contain the higher flood flows and do not overtop as easily, streambanks could experience increased scour. Increased scour would occur as velocities increase with the higher channelized flows resulting from the decreased storage in Harris Reservoir associated with higher winter operating curve elevations (for example, see the percent increase in spillway operations and at turbine capacity resulting from the winter operating curve alternatives in Appendix B, Table B-4).

Sedimentation

The Erosion and Sedimentation Study did not identify any sedimentation areas downstream of the Harris Dam. Subsequent agency and stakeholder consultation identified sedimentation at the Cornhouse Creek and No Business Creek confluences. Sandbar or delta sediment accumulation is a common natural process found at stream confluences. Because the creeks are free flowing, these creeks likely carry a considerably higher sediment load than the impounded Tallapoosa River. Sediment accumulation will ebb and flow as seasonal higher flows in the Tallapoosa River remobilize the deposited sediments downstream.

3.6 Aquatic Resources

As indicated in the Study Plan, the effects of increasing the winter operating curve on aquatic resources (fish spawning and fish entrainment) were assessed using existing information and Phase 1 Results.

3.6.1 Methods

<u>Fish Spawning</u>

The effects of increasing the winter operating curve on fish spawning in Harris Reservoir and the Tallapoosa River downstream of Harris Dam were qualitatively and quantitively assessed. The HEC-ResSim model and LIDAR were used to determine the effects of increasing the winter operating curve on wetted perimeter and littoral area of Harris Reservoir. The HEC-RAS model was used to determine the effects of winter pool alternatives on time spent in spillway operations and at turbine capacity.

<u>Fish Entrainment</u>

The Desktop Fish Entrainment and Turbine Mortality Report (Kleinschmidt 2018a) estimated the rate of fish entrainment at Harris Dam under current operations using a database of fish entrainment information by the Electric Power Research Institute (EPRI 1992). Information used for the study were derived from specific studies on projects that are similar to Harris with regard to geographic location, station hydraulic capacity, station operation, and fish information (species, assemblage, water quality) and that had available entrainment data (Kleinschmidt 2018a). Estimated turbine-induced mortality rates were then applied to fish entrainment estimates to determine potential fish mortality.

Turbine-induced mortality rates can vary based on the volume or velocity of water passing through turbines. The effects of an operating curve change on fish entrainment at Harris Dam were assessed based on changes in volume and velocity of water passing the turbines.

3.6.2 Results

<u>Fish Spawning</u>

Harris Reservoir

Harris Reservoir contains many primarily warm water species and many popular sport fishes, such as Largemouth Bass (*Micropterus salmoides*), Alabama Bass (*Micropterus henshalli*), Black Crappie (*Pomoxis nigromaculatus*), Redear Sunfish (*Lepomis microlophus*), Bluegill Sunfish (*Lepomis macrochirus*), White Bass (*Morone chrysops*), Flathead Catfish (*Pylodictis olivaris*), Blue Catfish (*Ictalurus furcatus*), and Channel Catfish (*Ictalurus punctatus*). During the spring, Alabama Power coordinates with the Alabama Department of Conservation and Natural Resources (ADCNR) to manage Harris Reservoir levels for the benefit of fish species (e.g., Largemouth Bass and crappie) that spawn in littoral (near-shore) areas. Based on input from ADCNR and when conditions permit, Alabama Power voluntarily maintains the lake at a stable or a slightly rising elevation for a period of 14 days to increase the spawning success of these species. An increase in the winter operating curve would increase the littoral area used by spawning fish in the early spring. At the existing winter operating curve of 785 feet msl, approximately 1,622 acres of shoreline are exposed. Winter operating curves of 786, 787, 788, and 789 feet msl would create an additional 276, 506, 804, and 944 acres of wetted area, respectively (Table 3-10). Additional wetted perimeter could provide additional spawning area during drought years.

TABLE 3–10 INCREASE IN RESERVOIR SURFACE AREA FOR EACH WINTER POOL ALTERNATIVE

Alternative	Reservoir Area (Acres)	Area Increase Compared to Baseline (Acres)
Baseline (785 feet msl)	8,341.78	0
+1 foot	8,618.13	276.35
+2 feet	8,848.22	506.44
+3 feet	9,145.52	803.74
+4 feet	9,285.35	943.57

Additional wetted area in Harris Reservoir would reduce desiccation of aquatic plants in littoral areas during winter drawdown and would be subject to increased aquatic plant growth, which could have a positive effect on the fishery (Durocher 1984; Bettoli et al. 1993) by increasing spawning areas and structure for young-of-year fish and benthic invertebrates. However, the increased aquatic plant growth associated with additional wetted area could have adverse effects, such as the establishment of invasive species (Spencer 2003) and necessitate the increased use of herbicidal controls.

Tallapoosa River Downstream of the Harris Project

Modeling results show that increasing the winter operating curve results in greater outflow from Harris Dam and subsequent flooding associated with outflow (Appendix B, Table B-4). Spill occurs at Harris 0.2 percent of the time under baseline operations. Winter operating curves of 786, 787, and 788 feet msl increased the frequency of spill to 0.3 percent of the time. A winter pool of 789 feet msl increased the frequency of spill to 0.4 percent. Percent of time spent at turbine capacity is 0.7 percent under baseline operations, increases to 0.8 percent at winter operating curves of 787 and 788 feet msl, and increases to 1.0 percent at a winter operating curve of 789 feet msl. Operating at turbine capacity can impact spawning sites and spawning behavior (Irwin et al. 2001; Martin 2008), but the increases in time spent in spillway operations and at turbine capacity are small and would likely occur most often in the winter, outside of spawning season.

Fish Entrainment

The volume and velocity of water passing through the turbines would not change under a different winter operating curve; therefore, fish entrainment is not expected to change under any of the winter pool alternatives.

3.7 Wildlife, Threatened and Endangered Species

As indicated in the Study Plan, the effects of increasing the winter operating curve on wildlife resources and threatened and endangered species were assessed using existing information and Phase 1 Results.

3.7.1 Methods

Wildlife and Terrestrial

Data were reviewed from the Pre-Application Document (PAD) (Alabama Power and Kleinschmidt 2018) to evaluate the potential effects of each winter pool alternative on Wildlife and Terrestrial Resources.

Threatened and Endangered Species

Data (e.g., species habitat range, species surveys, etc.) were reviewed from the Threatened and Endangered Species Study (Kleinschmidt 2021b) to evaluate the potential effects of each incremental winter operating curve elevation on threatened and endangered species (T&E).

3.7.2 Results

Wildlife and Terrestrial

Harris Reservoir

The proposed one to four foot increase in the winter operating curve would increase availability of shallow littoral habitats in coves and sloughs, which may increase availability of cover and feeding sites for overwintering resident and migratory waterfowl (Appendix E). The proposed higher winter operating curve elevations may similarly increase winter foraging habitat for wading birds (Appendix E). The increased wetted area in coves and sloughs during the winter months may result in marginal increases in availability of shallow breeding sites for early spring breeding amphibians, such as southern leopard frog (*Rana pipiens sphenocephala*), bullfrog (*Rana catesbeiana*), and spotted salamander (*Ambystoma maculatum*) (Mirarchi et al. 2004, as cited in Alabama Power and Kleinschmidt 2018) (Appendix F).

Tallapoosa River Downstream of Harris Dam

Temporary, short-term effects on wetted areas downstream of Harris Dam are expected to occur as a result of a one to four foot increase in the winter operating curve. Although a greater number of flood days are expected due to the one to four foot increase, no long-term effects to wildlife downstream are expected.

Threatened and Endangered Species

Harris Reservoir

An increase in the winter operating curve elevation in Lake Harris of one to four feet would increase the reservoir size by approximately 276 to 944 acres (one foot to four feet, respectively) (Table 3-10). Occupied and critical habitats of T&E species were examined to determine if they may potentially be affected by the one to four foot elevation increase. Habitat ranges of 20 federally-listed T&E species were identified within the Lake Harris Project Vicinity (Table 3-11). Of these species, only the Finelined Pocketbook (*Hamiota altilis*) was determined to have a critical habitat bordering the northernmost portion of the Lake Harris Project Boundary. The U.S. Fish and Wildlife Service (USFWS) recommended field surveys for Finelined Pocketbook, which were subsequently conducted in areas of critical habitat, in the Little Tallapoosa River, and in nearby tributaries in 2019 and 2020. The change in the winter operating curve elevation is not expected to affect the Finelined Pocketbook because no water elevation change is expected to occur within its critical habitat range (Figure 3-6). At the maximum proposed winter operating curve (789 feet msl), water elevation is expected to increase 1.47 RMs upstream when compared to the baseline winter operating curve (785 feet msl) (Figure 3-5). Survey results indicated that much of the critical habitat near the Lake Harris Project Boundary was degraded by siltation, and no Finelined Pocketbook were collected during the November 2019 and 2020 surveys (Kleinschmidt 2021b). No occupied or critical habitat was identified for any other T&E species within the Lake Harris Project Boundary

(Kleinschmidt 2021b). A one to four foot operating curve elevation increase is not expected to have an effect on T&E species within the Lake Harris Project Boundary.

Table 3–11 Federally Threatened and Endangered Species Potentially Occurring in Harris Project Vicinity

Scientific Name	Common Name	Federal Status[1]	State Protected	County of Occurrence	Occurrence	Documented Historic Range in Al
Picoides borealis	Red-cockaded Woodpecker	E	Yes	Clay & Randolph	No	Statewide in appropriate habitat
Notropis albizonatus	Palezone Shiner	E	Yes	Jackson	No	Tennessee River system
Erimonax monachus	Spotfin Chub	T	Yes	Jackson	No	Tennessee River system
Hamiota altilis	Finelined Pocketbook	T	Yes	Cleburne	No	Coosa, Tallapoosa, Cahaba River systems
Lampsilis virescens	Alabama Lampmussel	E	Yes	Jackson	No	Tennessee River system
Venustaconcha trabalis	Cumberland Bean	E	Yes	Jackson	No	Tennessee River system
Fusconaia cuneolus	Fine-rayed Pigtoe	E	Yes	Jackson	No	Tennessee River system
Toxolasma cylindrellus	Pale Lilliput	E	Yes	Jackson	No	Tennessee River system
Theliderma cylindrica	Rabbitsfoot	T	Yes	Jackson	No	Tennessee River system
Fusconaia cor	Shiny Pigtoe	E	Yes	Jackson	No	Tennessee River system
Epioblasma triquetra	Snuffbox	E	Yes	Jackson	No	Tennessee River system
Pleurobema georgianum	Southern Pigtoe	E	Yes	Clay & Cleburne	No	Coosa River system
Pleuronaia dolabelloides	Slabside Pearlymussel	E	Yes	Jackson	No	Tennessee River system
Myotis sodalis	Indiana Bat	E	Yes	Clay, Cleburne, Randolph, Chambers, Tallapoosa, & Jackson	Yes	Statewide in appropriate habitat
Myotis septentrionalis	Northern Long-eared Bat	T	Yes	Clay, Cleburne, Randolph, Chambers, Tallapoosa, & Jackson	Yes	Piedmont and Cumberland regions
Myotis grisescens	Gray Bat	E	Yes	Jackson	Yes	Statewide in appropriate habitat
Gratiola ampthiantha	Little Amphianthus	T	No	Randolph, Chambers, & Tallapoosa	Yes	Piedmont region (Bridges 1988)
Platanthera integrilabia	White Fringeless Orchid	T	No	Clay, Cleburne, Jackson, Chambers, & Tallapoosa	No	Talladega National Forest
Apios priceana	Price's Potato-bean	T	No	Jackson	Yes	Statewide in appropriate habitat
Clematis morefieldii	Morefield's Leather Flower	E	No	Jackson	No	Northern regions of state (USFWS 2007)

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

Source: Mirarchi et.al. 2004, USFWS 2016a, USFWS 2016b, Williams et.al. 2008, FERC 2018; as cited in Kleinschmidt 2021b

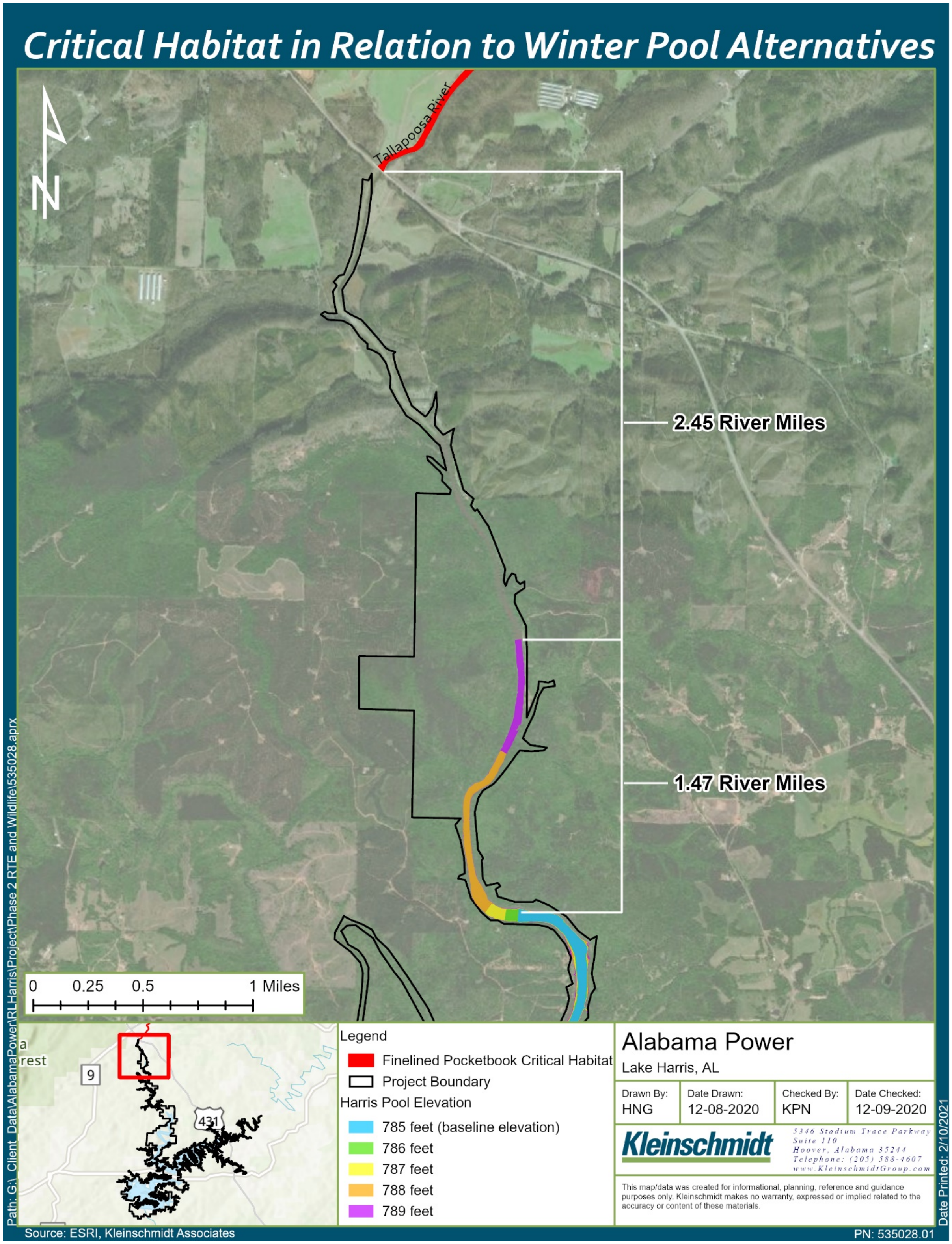

FIGURE 3–6 FINELINED POCKETBOOK CRITICAL HABITAT IN RELATION TO WINTER POOL ALTERNATIVES

Tallapoosa River Downstream of Harris Dam

No T&E species or critical habitats are present in the Tallapoosa River from Harris Dam through the Horseshoe Bend. Therefore, there would be no effects on T&E species from any of the winter pool alternatives.

3.8 Terrestrial Wetlands

As indicated in the Study Plan, the effects of increasing the winter operating curve on terrestrial resources (wetlands) were assessed using existing wetland data and Phase 1 Results.

3.8.1 Methods

Existing wetlands data in and around Harris Reservoir and downstream of Harris Dam in the Tallapoosa River through Horseshoe Bend were obtained. These data were incorporated into GIS, and the evaluation of changes to the winter operating curve indicated if the reservoir wetland areas were inundated or dry based on the winter operating curve alternative. For the Tallapoosa River downstream of Harris Dam, identified wetlands were analyzed based on changes in magnitude and frequency of flood events for each of the winter pool alternatives.

3.8.2 Results

Harris Reservoir

Existing National Wetland Inventory (NWI) data within the Lake Harris Project Boundary depict wetlands present prior to Project construction (Alabama Power and Kleinschmidt 2018). To document post-inundation wetlands, Cahaba Consulting, LLC (2016) conducted a wetland assessment in the winter of 2012 and the spring of 2013 at a pool elevation of 786 feet msl and 793 feet msl, respectively. Detailed methodology for the wetland assessment is presented in Appendix O of the PAD (Alabama Power and Kleinschmidt 2018). A total of 189 wetlands were identified throughout the impoundment's 271 miles of shoreline and islands, totaling 11.35 miles (14.98 acres) of wetland habitat (Alabama Power and Kleinschmidt 2018). Linear feet, quality and type of wetland recorded is provided in Table 3-12.

TABLE 3–12 HARRIS RESERVOIR WETLANDS

Quality	Lacustrine/Littoral on Shoreline		Shoreline and Alluvial Wetlands
	Linear Feet	Miles	Wetland Acres
Poor	5,268	1.00	2.16
Moderate	24,258	4.59	3.45
Good	30,430	5.76	9.28
Total	59,956	11.35	14.98

Source: Cahaba Consulting 2016, as cited in Alabama Power and Kleinschmidt 2018

A one to four foot increase in the winter operating curve elevation could potentially alter the dominant vegetation composition of wetlands bordering Harris Reservoir. Generally, as wetlands become more wetted, trends have involved a shift in dominant vegetation from woody vegetation to more herbaceous vegetation. For example, a freshwater forested/shrub wetland dominated by trees may shift toward a more shrub-dominated wetland. Wetlands bordering between a forested/shrub wetland and an emergent wetland may become more emergent, and emergent wetlands may shift toward ponds. Although these wetlands have a potential to change composition, they are not expected to reduce in size or diminish current habitat because wetland inundation is not expected to occur as a result of a higher winter pool elevation or a more wetted littoral environment. Because a one to four foot increase in elevation of the winter operating curve would increase the acreage of Harris Reservoir (Table 3-10), existing wetlands may also increase in size.

Tallapoosa River Downstream of Harris Dam

Although the modeled 100-Year Design Flood increased inundated acres downstream of Harris Dam for each of the winter pool alternatives, no long-term effects to wetlands downstream are expected from these short term events.

3.9 Recreation

The potential effects of a change in the winter operating curve on recreational use in Lake Harris were examined by using 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). The number of access points (both private docks and public boat ramps) available at each one foot increment change in winter operating curve elevation were then compared. Further, downstream access sites on the Tallapoosa River were evaluated for any effects from the winter pool alternatives.

3.9.1 Methods

Harris Reservoir

The two key components of determining the usability of a structure are: 1) water depth and 2) the location on the structure at which water depth is measured. Elevation data was gathered during winter pool using LIDAR, a remote sensing method that uses pulsed lasers to measure distances. The elevation data was overlain with aerial imagery of the area so that each pixel of the imagery had an elevation value. Using the elevation data, imagery of the winter operating curve contours was developed (Figure 3-7). These data were used to determine at what elevation water reaches a structure.

FIGURE 3–7 EXAMPLE ELEVATION CONTOURS FOR EACH WINTER POOL ALTERNATIVE

Alabama Power keeps and maintains an inventory of recreation structures on Lake Harris by gathering GPS data near or at each recreation structure and classifying those structures by type (e.g., boathouses, floats, piers, wet slips, and boardwalks). GPS data were converted to a shapefile, which is a file type used to mark geographic locations and provide information on geographic features. Each GPS point, represented by a yellow circle (marker), was then moved to a location on the structure where depth was measured to determine usability.

Depth was calculated using elevation data for each marker that was placed on or upland of the 785 feet msl contour (Figure 3-8). For example, a marker placed at 785.5 feet msl is at a depth of 0.5 feet at a lake surface elevation of 786 feet msl. Because LIDAR cannot penetrate the water's surface, the elevation of markers placed below the 785 feet msl contour (Figure 3-8) was estimated using the slope of the nearby bank to interpolate the slope under the lake's surface.

FIGURE 3–8 EXAMPLE OF POINTS USED TO DETERMINE DEPTH OF WATER
The image to the left shows a point on the upland side of a structure; depth was determined from the elevation contour. The image to the right shows a point where the slope of the bank was used to determine depth. The blue elevation contour is the 785 ft msl contour.

Structure Type

Different types of structures may become usable during different conditions; therefore, a single method of analysis could not be applied to all structure types. The amount of depth and location on the structure at which depth was measured was determined separately for each type of private structure (i.e., boathouses, floats, piers, wet slips, and boardwalks) and for public boat ramps.

<u>Boathouses</u>

Boathouses require a certain amount of water to moor a boat and may be oriented allowing boats to enter the structure either parallel or perpendicular to the bank. Regardless of which direction these structures are oriented, a marker was placed at the edge of the structure nearest to the bank (back edge) (Figure 3-9). A depth of two feet at this marker was required to classify these structures as usable.

<u>Floats</u>

Floats are often used to moor boats and are not fixed to the lake bottom, but float on the water's surface. A depth of two feet at the back edge of the structure was required to classify these structures as usable (Figure 3-9); a two foot depth is sufficient to moor a boat on most of the floats. Floats located in shallow areas that have a very gradual sloping lake bottom may not be usable using these standards, but a minimum of two feet at the back edge would keep the structure from resting on dry ground during the winter, preventing possible damage.

Piers

Piers are built in a variety of shapes and lengths and were therefore classified into three sub-categories and analyzed separately. “Platform” piers (Figure 3-9) look similar to floats and are characterized by a long walkway often ending in a square-shaped platform used to moor boats. A depth of two feet at the back edge of this platform was required to classify “platform” piers as usable.

Piers that have no definable platform on the end and therefore no obvious place to measure depth were classified as mooring and fishing piers. Mooring piers were defined as greater than 30 feet in length. The marker was moved 30 feet from the front edge of the pier to provide a sufficient amount of scope to moor a boat (Figure 3-9).

Fishing piers were defined as 30 feet or less in length. The marker was moved midway from the front edge of the pier (away from the bank) to ensure that anglers could fish off the front or could cast underneath the pier (Figure 3-9). A depth of two feet was required to classify the mooring and fishing piers as usable.

Wet Slips

Wet slips are similar to boathouses in purpose and appearance but are not enclosed with walls and a roof. Therefore, wet slips were analyzed similarly to boathouses, with a requirement of two feet of depth at the back edge of the structure regardless of the direction the structure is oriented (Figure 3-9). Wet slips with multiple slips were classified as usable when all slips are usable (Figure 3-9).

Boardwalks

Although boardwalks are not used for access to the reservoir, they are used by visitors to enjoy the scenery or access other structures. The objective analysis on boardwalks is to improve aesthetics during the winter months. A depth of one foot at the front edge of boardwalks was required to classify these structures as usable and to reduce the amount of dry ground around boardwalks (Figure 3-9).

Public Boat Ramps

The ADCNR builds the majority of public boat ramps on Harris Reservoir to be usable at low winter pool. Specifically, most boat ramps are constructed with a 15 percent grade as the bottom edge enters the water at the current winter operating curve of 785 feet msl. This means the bottom edge of the concrete boat ramp is at a depth of 4.5 feet. This standard allows boats up to 26 feet in length to be launched with minimal effort at low winter pool.

The ADCNR was consulted and aerial imagery of Harris Reservoir at winter pool was used to determine which ramps are usable at the current low winter pool. The remaining ramps were analyzed by placing the point at the bottom edge of the concrete ramp and were determined to be usable at a depth of 4.5 feet (Figure 3-9). The lowest elevation at which public ramps are usable was assessed to the nearest 0.5 foot. It is worth noting that a criteria of 4.5 feet of depth at the end of the ramp was applied to all ramps, regardless of the percent grade.

	
Boathouse	Float
	
Platform Pier	Mooring Pier
	
Fishing Pier	Boardwalk

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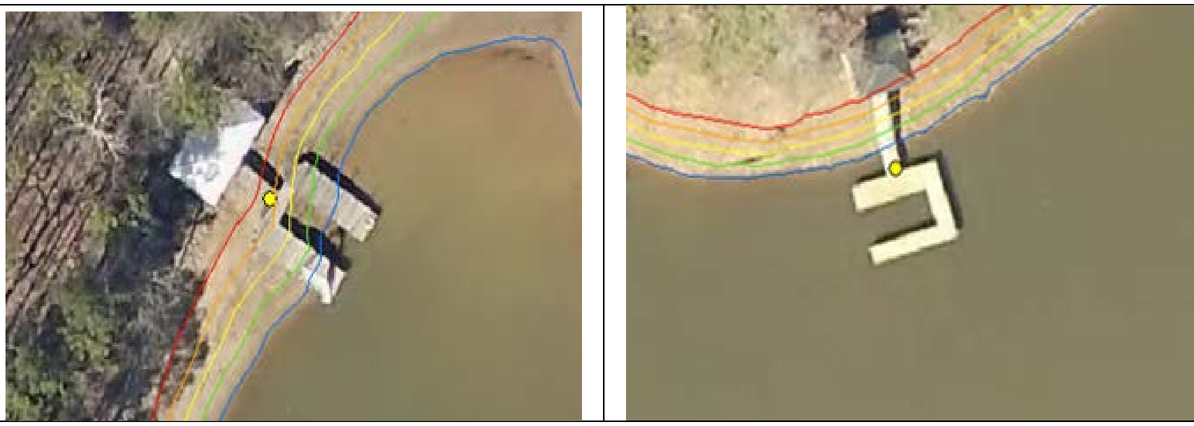

Wet Slips

Wet Slip with Multiple Slips

Public Boat Ramp

FIGURE 3–9 STRUCTURE TYPES AND THE POINTS AT WHICH USABILITY WAS DETERMINED

Field Assessment

Field confirmation was required for certain structures because: 1) some structures were constructed after the aerial imagery used for analysis was acquired (Figure 3-10) and 2) other structures were not clearly visible on the aerial imagery (i.e., structure is obscured by foliage or shadow on the imagery) (Figure 3-10). During July 2020, the location for depth analysis for these structures was confirmed in the field by acquiring a GPS reading at the physical location on the structure where depth at winter pool alternatives would be calculated. Field confirmation was also used to determine whether some structures were still operational or in use.

FIGURE 3–10 STRUCTURES BUILT AFTER IMAGERY WAS OBTAINED (LEFT) AND STRUCTURES COVERED BY FOLIAGE OR SHADOW (RIGHT)

<u>Tallapoosa River Downstream of Harris Dam</u>

Alabama Power evaluated the change in flood depth and duration at seven recreation sites downstream from Harris Dam. Using LIDAR data, the ground elevations at the access points were identified and, using the HEC-RAS model results from the Phase 1 Report, the peak flood elevation at each location for each winter pool alternative was compared to the ground elevation to determine depth of flooding above that point and the duration that the flood depth was higher than the ground elevation.

3.9.2 Results

<u>Harris Reservoir</u>

Private Structures

There were 2,282 private structures identified on Lake Harris; however, structures that appeared to be severely damaged, abandoned, unmaintained, or that were under construction were omitted from analysis. Omitting these structures resulted in 2,123 private recreation structures. Of these 2,123 structures, the elevation of the marker was estimated for 742 structures, and depths were obtained during the field assessment for 211 structures.

There are 449 usable structures at the current winter operating curve of 785 feet msl (21.1 percent of analyzed structures). This number increases to 642 at 786 feet msl (30.2 percent of total structures), to 826 at 787 feet msl (38.9 percent of total structures), to 1,112 at

788 feet msl (52.4 percent of analyzed structures), and to 1,327 at 789 feet msl (62.5 percent of analyzed structures). Total structure usability is summarized in Table 3-13.

TABLE 3-13 USABILITY OF ALL STRUCTURE TYPES ON HARRIS RESERVOIR AT EACH WINTER POOL ALTERNATIVE

Alternative	Number of Usable Structures[1]	Percentage of Usable Structures	Incremental Percentage Increase
Baseline (785 feet msl)	449	21.1	-
+1 foot	642	30.2	9.1
+2 feet	826	38.9	8.7
+3 feet	1112	52.4	13.5
+4 feet	1327	62.5	10.1

[1] There are 796 structures that would not be usable at any of the proposed alternatives.

A total of 25 boardwalks were analyzed. No boardwalks are usable at the current winter pool, and usability does not increase until lake level reaches 789 feet msl, at which level one boardwalk becomes usable. A total of 929 boathouses were analyzed, 303 of which are usable at the current winter operating curve (2.6 percent of analyzed boathouses). Percentage of usable boathouses increases an average of 12.4 percent (standard error = 1.4) with each one foot increase in winter operating curve. A total of 393 floats were analyzed, 101 of which are usable at the current winter operating curve (25.7 percent of analyzed floats). Percentage of usable floats increases an average of 14.7 percent (standard error = 1.8) with each one foot increase in winter operating curve. A total of 689 piers were analyzed, 37 of which are usable at the current winter operating curve (5.4 percent of analyzed piers). Percentage of usable piers increases an average of 5.1 percent (standard error = 1.7) with each one foot increase in winter operating curve. A total of 87 wet slips were analyzed, eight of which are usable at the current winter operating curve (9.2 percent of analyzed wet slips). Percentage of usable wet slips increases an average of 12.9 percent (standard error = 1.7) with each one foot increase in winter operating curve. Usability by structure type is summarized in Table 3-14.

TABLE 3–14 USABILITY OF ALL STRUCTURES ON HARRIS RESERVOIR BY STRUCTURE TYPE FOR EACH WINTER POOL ALTERNATIVE

Structure Type	Alternative	Number of Usable Structures	Percentage of Usable Structures	Incremental Percentage Increase
Boardwalks (n=25)	Baseline (785 feet msl)	0	0.0	-
	+1 foot	0	0.0	0.0
	+2 feet	0	0.0	0.0
	+3 feet	0	0.0	0.0
	+4 feet	1	4.0	4.0
Boathouses (n=929)	Baseline (785 feet msl)	303	32.6	-
	+1 foot	417	44.9	12.3
	+2 feet	526	56.6	11.7
	+3 feet	675	72.7	16.1
	+4 feet	762	82.0	9.3
Floats (n=393)	Baseline (785 feet msl)	101	25.7	-
	+1 foot	157	39.9	14.2
	+2 feet	204	51.9	12.0
	+3 feet	282	71.8	19.9
	+4 feet	332	84.5	12.7
Piers (n=689)	Baseline (785 feet msl)	37	5.4	-
	+1 foot	52	7.5	2.1
	+2 feet	71	10.3	2.8
	+3 feet	114	16.5	6.2
	+4 feet	178	25.8	9.3
Wet Slips (n=87)	Baseline (785 feet msl)	8	9.2	-
	+1 foot	16	18.4	9.2
	+2 feet	26	29.9	11.5
	+3 feet	41	47.1	17.2
	+4 feet	53	60.9	13.8

Public Boat Ramps

Boat ramps determined to be usable at the current winter operating curve were the Highway 48 Bridge, Big Fox Creek, Crescent Crest, and Foster's Boat Ramps. In addition, Lonnie White Boat Ramp is currently used by recreators during winter pool (Figure 3-11). Although Lonnie White is currently in use at winter pool, the ramp does not extend far into the reservoir and it may not be possible to launch larger boats without backing the trailer off the edge of the concrete slab. The ramp currently extends about 15 feet into the reservoir and the edge of the concrete slab is approximately 2.5 feet deep at current winter pool. The ADCNR is currently extending the Lonnie White Boat Ramp an additional 15 feet so that it can be fully usable at winter pool by the winter of 2021. The lowest elevation Lonnie White Boat Ramp is usable is about 787.5 feet msl currently.

Aerial imagery shows Swagg Boat Ramp in use by multiple recreators during winter pool, but it appears only a small portion of the ramp is submerged and launching under winter conditions does not appear ideal (Figure 3-12). Swagg Boat Ramp does not become usable under the criteria of this study until lake elevation reaches 790 feet msl. Lee's Bridge and Little Fox Creek Boat Ramps become usable at 790 and 791.5 feet msl, respectively. The elevations at which public ramps become usable is summarized in Table 3-15.

FIGURE 3–11 AERIAL IMAGE OF LONNIE WHITE BOAT RAMP AT A RESERVOIR LEVEL OF APPROXIMATELY 785 FEET MSL

Note: Lonnie White is frequently used during winter pool, but improvements will lengthen the ramp and increase usability by the drawdown of 2021.

FIGURE 3–12 EXAMPLE OF LIMITED WINTER USE AT SWAGG BOAT RAMP AT A RESERVOIR LEVEL OF APPROXIMATELY 785 FEET MSL

TABLE 3–15 PUBLIC BOAT RAMP USABILITY AT THE LOWEST POSSIBLE RESERVOIR ELEVATION

Boat Ramp	Lowest Reservoir Elevation Usable (feet msl)
Big Fox Creek	785.0
Crescent Crest	785.0
Foster's Bridge	785.0
Hwy 48 Bridge	785.0
Lee's Bridge	791.5
Little Fox Creek	790.0
Lonnie White*	787.5
Swagg**	790.0

*Lonnie White Boat Ramp is frequently used at current winter pool, but larger boats cannot launch and many boat trailers need to back off the edge of the ramp. ADCNR is currently extending the ramp so that it is fully usable by the drawdown of 2021.
**Swagg Boat Ramp ends right at the water's edge during current winter pool but is still in use by some recreators.

Tallapoosa River Downstream of Harris Dam

The depth increases and duration of flooding at the seven recreation sites located downstream of Harris Dam are presented in Table 3-16. Table 3-16 shows that the maximum depth of inundation at each recreation site increases as the winter pool alternatives increase. However, the duration of time above the ground elevation that each recreation site is inundated tends to decrease as the winter pool alternatives increase. As explained in Section 3.2.2, this is due to the decreasing amount of storage available in Harris Reservoir for each winter pool alternative compared to existing conditions (baseline).

Table 3–16 Recreation Access Sites Below Harris Dam and the Effect of Flooding Depth and Duration from Each Winter Pool Alternative

Location	Type of Access	Approximate Ground Elevation at Access (feet msl)	Baseline Flood Elevation (feet msl)	Depth Increase Above Base (feet)				Flood Duration (hours)				
				+1 foot	+2 feet	+3 feet	+4 feet	Baseline (785 feet msl)	+1 foot	+2 feet	+3 feet	+4 feet
R.L. Harris Dam	Tailwater Fishing	670.0	678.3	0.6	1.1	1.8	2.4	117	110	104	104	104
Malone	Canoe Portage	646.0	655.5	0.5	1.0	1.6	2.1	123	116.5	113.5	113.5	113.5
Wadley Bridge	Canoe Portage	616.0	625.9	0.5	1.1	1.7	2.4	123.5	117.5	112.5	106.5	98
Bibby's Ferry	Canoe Portage	582.0	597.0	0.6	1.1	1.8	2.5	130	124.5	121	120	119.5
Germany's Ferry	Boat Launch Area	569.0	579.9	0.4	0.8	1.2	1.6	148	140	137	136	136
Horseshoe Bend National Military Park	Boat Launch Area	537.0	543.5	0.3	0.5	0.8	1.1	144	137	133.5	132.5	132.5
Jaybird Landing	Boat Launch Area	494.0	503.9	0.4	0.7	1.2	1.6	150	140.5	138	137	137

Note: Flood duration is the time that the water surface elevation exceeds the ground elevation of each access point. An elevation for each access point was obtained using the digital elevation.

3.10 Cultural Resources

As indicated in the Study Plan, the effects of increasing the winter operating curve on cultural resources were assessed using existing information and Phase 1 Results.

3.10.1 Methods

Existing information (LIDAR, aerial imagery) was used, along with expert opinion, to evaluate cultural resources that may be impacted by reservoir fluctuation. Ninety-six cultural resources on Harris Reservoir were reviewed for possible effects from the winter pool alternatives.[7] A primary point of interest is the Miller Covered Bridge pier located at Horseshoe Bend National Military Park.[8] Qualitative information is used in the analysis below (rather than quantitative information noted in the Study Plan) as the cultural resources on Harris Reservoir are still being reviewed.

3.10.2 Results

<u>Harris Reservoir</u>

The most common adverse effects to historic properties, disregarding shoreline modifications, is reservoir fluctuation (raising and lowering) and watercraft activities (Faye 1987; Gage and Herrmann 2009; Keown et al. 1977; Thorne et al. 1987). Minimizing these fluctuations also minimizes periods when archaeological deposits are exposed or lie within the wave-action zone of the reservoir's shoreline. While keeping the water level higher during the winter may provide some benefits through increased inundation and minimizing periods of fluctuation, cultural resources along the shoreline of the Harris Reservoir may also be susceptible to damage as a result of changes in water levels. Effects can result from forces such as wind erosion, recreational activities, and vandalism. The

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[7] The Harris PAD identified 327 cultural resources in and around Lake Harris. Harris Action Team (HAT) 6 worked together to identify 96 cultural resources that may be eligible for listing in the National Register for Historic Places (NRHP) and may be affected by Harris Project operations. These 96 cultural resources are still under review and this number may be revised in the final Historic Properties Management Plan.

[8] Miller Covered Bridge was built in 1908 and was once the longest covered bridge in the United States at 600 feet in length. It has become recognized as a significant cultural resource associated with Horseshoe Bend Military Park and, as such, the National Park Service requested specific consideration be taken to the effects of changes to downstream flow. The remnants of the bridge include abutments on the left and right banks of the Tallapoosa River, as well as four stone and masonry piers within the river that are constantly affected by the flow of the river as the piers stand on the riverbed (OAR Personal Communication December 2020).

type and level of effects on cultural resources can vary widely, depending on the setting, size, and visibility of the resource, as well as whether there is public knowledge about the location of the resource (OAR Personal Communication December 2020).

At 785 feet msl, there would be no changes to the impacts to cultural resources on Harris Reservoir. A change to the operating curve above 785 feet msl would leave otherwise exposed cultural resources inundated and less susceptible to water fluctuation, wind erosion, recreational activities, and looting (vandalism), but more susceptible to erosion from variations in currents, general flow pattern fluctuations, and aquatic species nesting activities. With each one foot increase of a higher winter operating curve, potential negative effects on cultural resources would slightly decrease (OAR Personal Communications December 2020).

Tallapoosa River Downstream of Harris Dam

Changing the winter operating curve may result in a change to releases to the Tallapoosa River downstream of Harris Dam. A higher operating curve in the winter may result in more frequent high flow events downstream of Harris Dam. These releases have the potential to impact cultural resources downstream, including the Miller Covered Bridge, exposing them to additional fluctuations and erosion. These releases would be sporadic and would result in irregular inundation periods for the cultural resources downstream of Harris Dam.

4.0 SUMMARY

The purpose of this report is to present the Phase 2 analyses of the winter pool alternatives. In the preceding section, effects on resources were analyzed using the Phase 1 modeling results along with other FERC-approved relicensing study results; both quantitative and qualitative results were presented. The Phase 1 Report included effects on generation, navigation, flood control, drought management, and reservoir level. The primary adverse effect of raising the winter pool is on downstream resources in the form of an increase in flooding as shown by the modeled 100-Year Design Flood (an increase in acres inundated and an increase in flood depth). The primary beneficial effect of raising the winter pool is in the number of reservoir recreational structures (boat slips, docks, etc.) that are available for private recreational use/access during the winter months.

The effects of the winter pool alternatives on all resources are summarized in Table 4-1.

Table 4–1 Summary of Effects of Winter Pool Alternatives

Resource	+1 Foot	+2 Feet	+3 Feet	+ 4 Feet	Notes
Hydro Generation	$(19,400)	$(40,600)	$(52,100)	$(124,900)	Average annual revenue loss across Alabama Power's hydro fleet.
Harris Reservoir Elevations	Over the period of record, increasing the winter pool elevation did not affect the amount of time the reservoir was at or above the full summer pool elevation of 793 feet msl.				Increasing the winter pool elevation can result in higher elevations during low flow years compared to the existing operating curve (i.e., baseline).
Downstream Effects of 100-Year Design Flood (Increase in inundated acres and percent increase over baseline)	298 acres (4.9%)	485 acres (7.9%)	686 acres (11.2%)	889 acres (14.6%)	Each incremental increase in winter pool results in an increase in flood depth.
Spillway Operation (Number of additional days of spill and percent increase over baseline)	12 (0.1%)	13 (0.1%)	20 (0.1%)	37 (0.2%)	Over the period of record.
Turbine Capacity Operation (Number of additional days of capacity operations and percent increase over baseline)	15 (0.0%)	29 (0.1%)	54 (0.1%)	103 (0.3%)	Over the period of record.
Navigation	No Effect				
Drought Operations	No Effect				

Resource	+1 Foot	+2 Feet	+3 Feet	+ 4 Feet	Notes
Green Plan Flows (Ability to release GP flows)	No Effect				
Downstream Release Alternatives[9] (Alabama Power's ability to release downstream flow alternatives)	No Effect				
Structures Downstream of Harris Dam (Number of additional structures affected over baseline)	0	4	4	9	
Water Quality – Harris Reservoir	No Effect				
Water Quality – Harris Dam Discharge	No Effect				Minor differences in water temperature and dissolved oxygen
Water Use – Harris Reservoir	Minor Beneficial Effect				Increase in winter pool would mean more water is available during the winter and could help reach full pool in the summer
Water Use – Tallapoosa River	No Effect				

[9] Note that only the Pre-Green Plan, Green Plan, and 150 cfs continuous minimum flow were evaluated in the Phase 1 Report. The modified Green Plan and the other downstream release alternatives were analyzed in this report.

Resource	+1 Foot	+2 Feet	+3 Feet	+ 4 Feet	Notes
Erosion – Harris Reservoir	No Effect				Potential increase in boating during winter may result in additional erosion
Sedimentation – Harris Reservoir	Adverse Effect				Could increase size of sedimentation areas over time due to decreased "flushing" effect; this increase would also provide "habitat" for aquatic vegetation
Erosion – Tallapoosa River	Minor Adverse Effect				Increased potential for scour associated with higher flows and higher spill days due to a decrease in reservoir storage
Sedimentation – Tallapoosa River	No Effect				
Aquatic Resources – Harris Reservoir	Beneficial Effect				Increase in wetted area of reservoir would lead to increased productivity
Aquatic Resources – Tallapoosa River	No Effect				
Wildlife – Harris Reservoir	Beneficial Effect				Increase in shallow littoral habitats
Wildlife – Tallapoosa River	No Effect				
T&E Species – Harris Reservoir	No Effect				No species present

Resource	+1 Foot	+2 Feet	+3 Feet	+ 4 Feet	Notes
T&E Species – Tallapoosa River	No Effect				No species present
Terrestrial Wetlands – Harris Reservoir	Beneficial Effect				Could alter composition of existing wetlands and increase their size
Terrestrial Wetlands – Tallapoosa River	No Effect				
Recreation – Harris Reservoir (Percent increase in usable structures over baseline)	9.1%	17.8%	31.3%	41.4%	
Recreation – Tallapoosa River	Minor Adverse Effect				Maximum depth of inundation at formal recreation sites would increase; duration of time above ground elevation would decrease
Cultural Resources – Harris Reservoir	Minor Beneficial Effect				Higher winter pool would leave more cultural resources inundated year round
Cultural Resources – Tallapoosa River	Potential to Adverse Effect				Increased fluctuation of river could adversely affect known cultural resources

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APPENDIX A

ACRONYMS AND ABBREVIATIONS

Acronyms and Abbreviations

A

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

B

BA	Biological Assessment
B.A.S.S.	Bass Anglers Sportsmen Society
BCC	Birds of Conservation Concern
BLM	U.S. Bureau of Land Management
BOD	Biological Oxygen Demand

C

°C	Degrees Celsius or Centrigrade
CEII	Critical Energy Infrastructure Information
CFR	Code of Federal Regulation
cfs	Cubic Feet per Second
cfu	Colony Forming Unit
CLEAR	Community Livability for the East Alabama Region
CPUE	Catch-per-unit-effort
CWA	Clean Water Act

D

DEM	Digital Elevation Model
DIL	Drought Intensity Level
DO	Dissolved Oxygen
dsf	day-second-feet

E

EAP	Emergency Action Plan
ECOS	Environmental Conservation Online System
EFDC	Environmental Fluid Dynamics Code
EFH	Essential Fish Habitat
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act

F

°F	Degrees Fahrenheit
ft	Feet
F&W	Fish and Wildlife
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FNU	Formazin Nephelometric Unit
FOIA	Freedom of Information Act
FPA	Federal Power Act

G

GCN	Greatest Conservation Need
GIS	Geographic Information System
GNSS	Global Navigation Satellite System
GPS	Global Positioning Systems
GSA	Geological Survey of Alabama

H

Harris Project	R.L. Harris Hydroelectric Project
HAT	Harris Action Team
HEC	Hydrologic Engineering Center
HEC-DSSVue	HEC-Data Storage System and Viewer
HEC-FFA	HEC-Flood Frequency Analysis
HEC-RAS	HEC-River Analysis System
HEC-ResSim	HEC-Reservoir System Simulation Model
HEC-SSP	HEC-Statistical Software Package

HDSS	High Definition Stream Survey
hp	Horsepower
HPMP	Historic Properties Management Plan
HPUE	Harvest-per-unit-effort
HSB	Horseshoe Bend National Military Park

I

IBI	Index of Biological Integrity
IDP	Inadvertent Discovery Plan
IIC	Intercompany Interchange Contract
IVM	Integrated Vegetation Management
ILP	Integrated Licensing Process
IPaC	Information Planning and Conservation
ISR	Initial Study Report

J

JTU	Jackson Turbidity Units

K

kV	Kilovolt
kva	Kilovolt-amp
kHz	Kilohertz

L

LIDAR	Light Detection and Ranging
LWF	Limited Warm-water Fishery
LWPOA	Lake Wedowee Property Owners' Association

M

m	Meter
m^3	Cubic Meter
M&I	Municipal and Industrial
mg/L	Milligrams per liter
ml	Milliliter
mgd	Million Gallons per Day
µg/L	Microgram per liter
µs/cm	Microsiemens per centimeter
mi^2	Square Miles
MOU	Memorandum of Understanding

MPN	Most Probable Number
MRLC	Multi-Resolution Land Characteristics
msl	Mean Sea Level
MW	Megawatt
MWh	Megawatt Hour

N

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

O

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

P

PA	Programmatic Agreement
PAD	Pre-Application Document
PDF	Portable Document Format
pH	Potential of Hydrogen
PID	Preliminary Information Document
PLP	Preliminary Licensing Proposal
Project	R.L. Harris Hydroelectric Project
PUB	Palustrine Unconsolidated Bottom
PURPA	Public Utility Regulatory Policies Act
PWC	Personal Watercraft
PWS	Public Water Supply

Q

QA/QC	Quality Assurance/Quality Control

R

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

S

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

T

T&E	Threatened and Endangered
TCP	Traditional Cultural Properties
TMDL	Total Maximum Daily Load
TNC	The Nature Conservancy
TRB	Tallapoosa River Basin
TSI	Trophic State Index
TSS	Total Suspended Soils
TVA	Tennessee Valley Authority

U

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

W

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

APPENDIX B

RELEVANT TABLES AND FIGURES FROM THE PHASE 1 REPORT

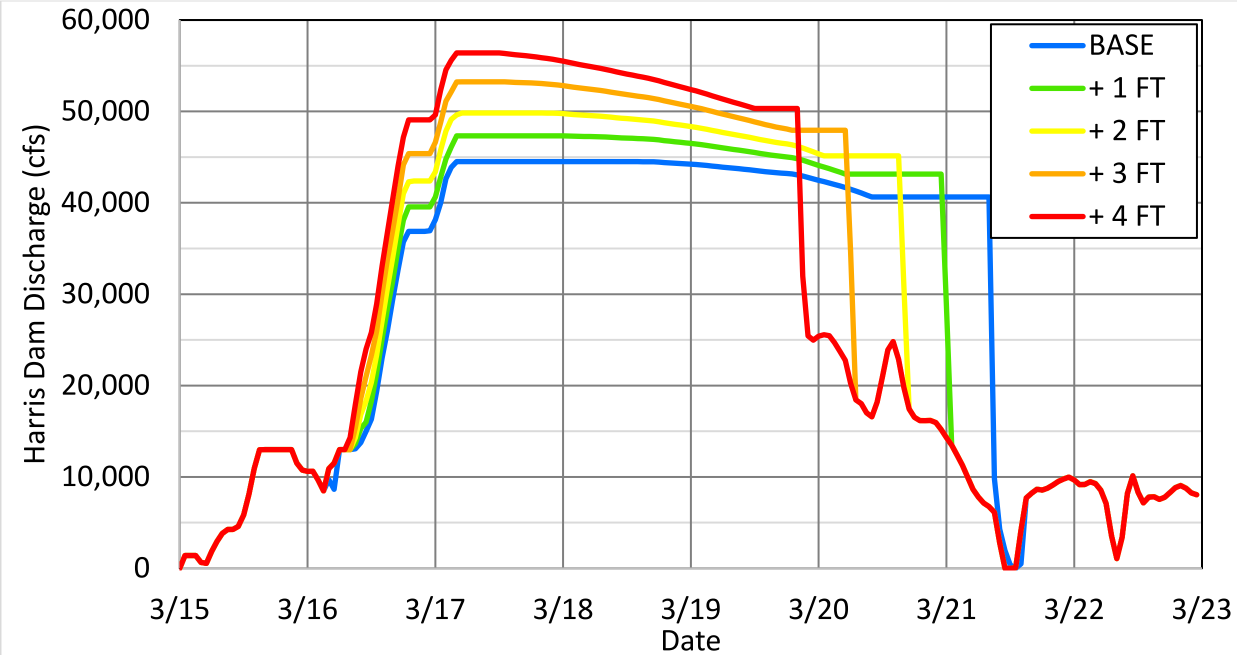

FIGURE B–1 OUTFLOW HYDROGRAPHS FROM THE 100-YEAR DESIGN FLOOD ROUTED THROUGH THE HARRIS RESERVOIR RESSIM MODEL

TABLE B–1 TOTAL ACRES INUNDATED DOWNSTREAM OF HARRIS DAM BASED ON RESULTS OF 100-YEAR DESIGN FLOOD IN HARRIS-MARTIN HEC-RAS MODEL

Elevation	Total Inundation Area (acres)	Increase over Baseline (acres)	Percent Increase over Baseline
Baseline (785 feet msl)	6,105	-	-
+ 1 foot	6,403	298	4.9%
+ 2 feet	6,590	485	7.9%
+ 3 feet	6,791	686	11.2%
+ 4 feet	6,995	889	14.6%

TABLE B–2 CHANGES IN MAXIMUM DOWNSTREAM WATER SURFACE ELEVATIONS RESULTING FROM CHANGE IN WINTER OPERATING CURVE

Location	Distance from Dam (miles)	Max Water Surface Rise (feet)			
		+ 1 foot	+ 2 feet	+ 3 feet	+ 4 feet
RM 129.7 (Malone, AL)	7	0.5	1.0	1.6	2.2
RM 122.7 (Wadley, AL)	14	0.5	1.1	1.7	2.4
RM 115.7	21	0.6	1.1	1.8	2.5
RM 108.7	28	0.5	1.0	1.6	2.2
RM 101.7	35	0.4	0.7	1.1	1.4
RM 93.7 (Horseshoe Bend)	43	0.3	0.7	1.0	1.4

TABLE B–3 CHANGES IN FLOOD DURATION RESULTING FROM CHANGE IN WINTER OPERATING CURVE

Location	Distance from Dam (miles)	Duration above Baseline Condition Max Elevation (hours)			
		+ 1 foot	+ 2 feet	+ 3 feet	+ 4 feet
RM 129.7 (Malone, AL)	7	15	43	61	67
RM 122.7 (Wadley, AL)	14	12	19	32	43
RM 115.7	21	13	21	35	46
RM 108.7	28	14	26	38	48
RM 101.7	35	17	27	40	48
RM 93.7 (Horseshoe Bend)	43	18	29	39	47

TABLE B–4 PERCENT OF TIME OVER THE PERIOD OF RECORD (1939 TO 2011) SPENT IN TURBINE CAPACITY AND SPILLWAY OPERATIONS FOR EACH WINTER POOL ALTERNATIVE

Elevation	Spillway Operations	Turbine Capacity
Baseline (785 feet msl)	0.2%	0.7%
+ 1 foot	0.3%	0.7%
+ 2 feet	0.3%	0.8%
+ 3 feet	0.3%	0.8%
+ 4 feet	0.4%	1.0%

APPENDIX C

3-DIMENSIONAL HYDRODYNAMIC AND WATER QUALITY MODEL OF LAKE HARRIS, ALABAMA

3-Dimensional Hydrodynamic and Water Quality Model of Lake Harris, Alabama

Prepared for:

Alabama Power Company
600 18th St N, Birmingham, AL 35203

November 25, 2020

DYNAMIC SOLUTIONS, LLC
6421 DEANE HILL DRIVE
KNOXVILLE, TENNESSEE 37919

Executive Summary

The purpose of this modeling effort was to calibrate and validate an EFDC model of hydrodynamics, sediment transport and water quality for Lake Harris to provide a technically credible modeling framework to support an evaluation of the simulated effects of raising the winter pool elevation on water temperature and dissolved oxygen in the forebay area of Lake Harris.

The Lake Harris EFDC model simulation period covered the 6-year period from 1 January 2014 through 31 December 2019. Results generated for the first year (2014) were used to spin-up the model to eliminate the effects of the initial conditions assigned for model setup. The model was calibrated using data collected during the 2-year period from 1 January 2018 to 31 December 2019 and the model was validated to data collected during the 3-year period from 1 January 2015 to 31 December 2017.

The calibrated and validated state variables of the EFDC model included stage, water temperature, total suspended solids, dissolved oxygen, algae biomass (as chlorophyll a), total organic carbon, nitrogen species (ammonia, nitrite/nitrate, total organic nitrogen, and total nitrogen), and phosphorus species (total phosphate, total organic phosphorus, and total phosphorus). The model was also calibrated and validated to Secchi depth as a derived output variable for water clarity.

Modeled water surface elevation showed excellent agreement with the observed stage data for both calibration and validation periods. Model performance for water temperature was very good with simulated water temperature following the seasonal trend of observed water temperature data very well as surface and bottom layer time series and vertical profiles. The water quality results for dissolved oxygen, total suspended solids, secchi depth, algae biomass (as chlorophyll a) and the inorganic and organic forms of nitrogen and phosphorus also demonstrated good agreement with the observed data sets over the entire domain.

The calibrated and validated EFDC model of Lake Harris was applied to evaluate the effects of raising the existing winter pool level on water temperature and dissolved oxygen in the forebay area of the lake. Comparison of the baseline conditions with the results of the scenario analysis clearly indicated that raising the winter pool elevation by up to 4 ft showed only minor impacts on water temperature and dissolved oxygen concentrations in the dam discharge flow.

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1. Introduction and Background

Lake Harris, located on the Tallapoosa River near Lineville, Alabama, has a length of 29 miles, a maximum depth of 121 feet at the dam and covers an area of approximately 9,870 acres with 367 miles of shoreline. The Tallapoosa River and the Little Tallapoosa River are the two main tributaries to the lake as shown in Figure 1-1. Lake Harris, also known as Lake Wedowee, was impounded on April 20, 1983 and the R.L. Harris Dam is one of the 14 hydroelectric power plants operated by Alabama Power Company (APC). The Federal Energy Regulatory Commission (FERC) issued an operating license to Alabama Power on December 27, 1973 and the 50-year license will expire on November 30, 2023. In order for Alabama Power to continue operating the Harris hydroelectric Project, the company must obtain a new operating license from FERC.

As part of the FERC relicensing process, stakeholders have requested that APC evaluate the feasibility of modifying the operating curve for seasonal elevation of Lake Harris. Specifically, stakeholders requested that APC evaluate raising the winter pool level from the current pool level by up to four feet. Currently, the operating curve consists of a target summer pool elevation of 793 ft (NGVD29) from May 1 to October 1, a drawdown to 785 ft (NGVD29) from October 1 to December 1, a target winter pool elevation of 785 ft (NGVD29) from December 1 to April 1, and a refilling to summer pool elevation of 793 ft (NGVD29) from April 1 to May 1, as shown in Figure 1-2.

In order to assess the potential effects of a higher winter pool elevation on water temperature and water quality, APC solicited technical assistance from Dynamic Solutions, LLC (DSLLC) to develop, calibrate, and validate a 3-dimensional Environmental Fluid Dynamic Code (EFDC) hydrodynamic and water quality model. The calibrated and validated EFDC model was then applied to evaluate the effects of increasing the winter pool elevation on water temperature and water quality, especially with regards to dissolved oxygen (DO) in the reservoir forebay and how increasing the winter pool elevation may impact water temperature and DO immediately downstream.

This report presents a summary of data sources used to setup the EFDC lake model, model calibration and validation results, and model performance results. Based on a range of winter elevation scenarios generated with the calibrated and validated lake model, the report presents assessments of the effects of increasing the winter pool elevation on water temperature and dissolved oxygen in the forebay area of Lake Harris.

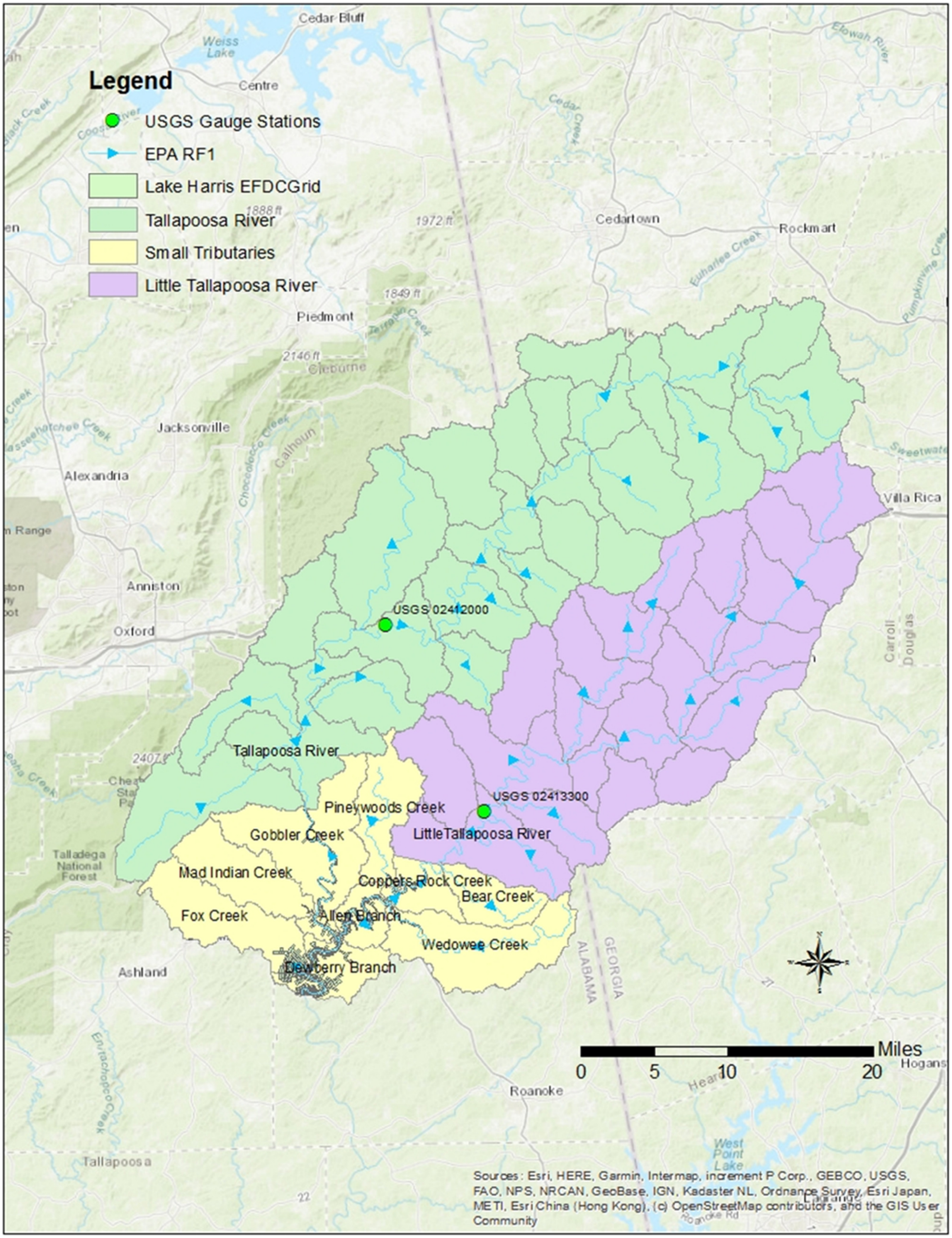

Figure 1-1 Location of Lake Harris

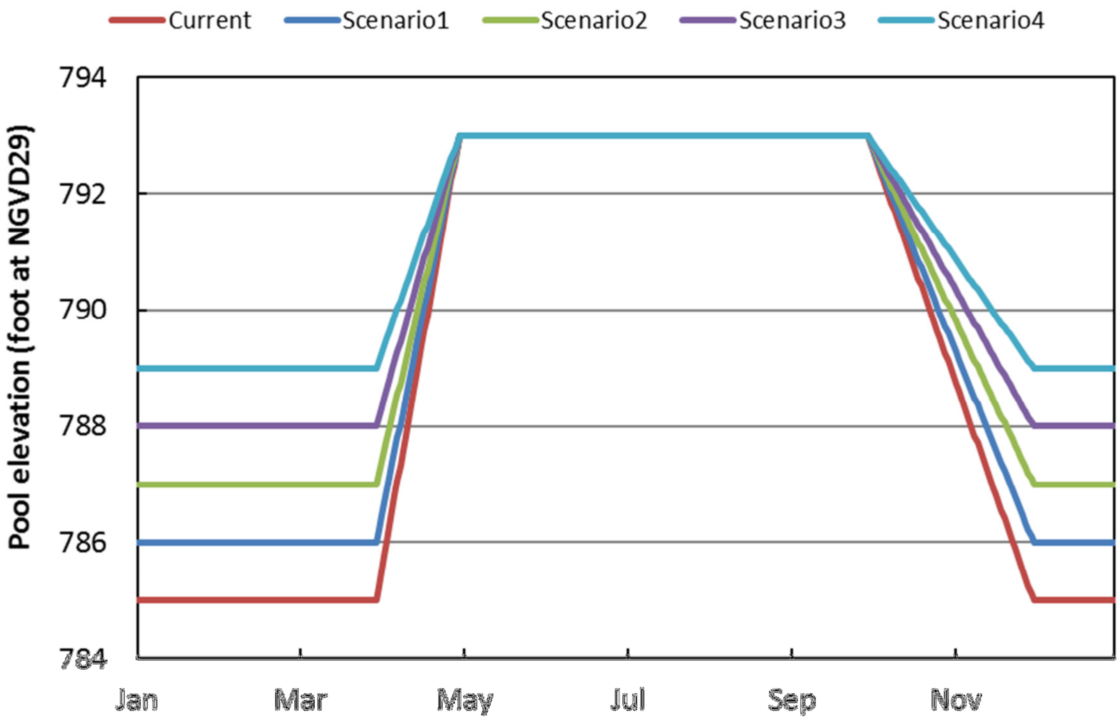

Figure 1-2 Operating Curves of Lake Harris Dam

2. Development of EFDC model

2.1 Overview of the EFDC Model

The Environmental Fluid Dynamics Code (EFDC) is a general-purpose surface water modeling package for simulating three-dimensional (3-D) circulation, mass transport, sediments and biogeochemical processes in surface waters including rivers, lakes, estuaries, reservoirs, nearshore and continental shelf-scale coastal systems. The EFDC model was originally developed at the Virginia Institute of Marine Science for estuarine and coastal applications (Hamrick, 1992; 1996). Over the past decade, the US Environmental Protection Agency (EPA) has continued to support its development and EFDC is now part of a family of public domain surface water models recommended by EPA to support water quality investigations including TMDL studies. In addition to state of the art hydrodynamics with salinity, water temperature and dye tracer simulation capabilities, EFDC can also simulate cohesive and non-cohesive sediment transport, the transport and fate of toxic contaminants in the water and sediment bed, and water quality interactions that include dissolved oxygen, nutrients, organic carbon, algae and bacteria. A state of the art sediment diagenesis model (Di Toro, 2001) is internally coupled with the water quality model (Park et al., 2000; Hamrick, 2007). Special enhancements to the hydrodynamic code, such as vegetation resistance, drying and wetting, hydraulic structure representation, wave current boundary layer interaction, and wave-induced currents, allow refined modeling of tidal systems, wetland and marsh systems, controlled-flow systems, and near-shore wave-induced currents and sediment transport. The EFDC code has been extensively tested, documented and used in more than 100 surface water modeling studies (Ji, 2017). The EFDC model is currently used by university, government, engineering and environmental consulting organizations worldwide.

2.2 Model Simulation Period

The Lake Harris EFDC model simulation period covered the 6-year period from 1 January 2014 through 31 December 2019. The model was calibrated for the period from 1 January 2018 through 31 December 2019 and the model was validated for the period from 1 January 2015 through 31 December 2017. The initial 1-year period for 2014 was used as the spin-up period to diminish the impact of the initial conditions on model results. The lake model was run continuously for the entire period from 1 January 2014 to 31 December 2019 and results were split out to present results for model calibration and model validation.

Hydrologic conditions were based on long-term annual rainfall data collected from the National Oceanic and Atmospheric Agency (NOAA) stations in the vicinity of Lake Harris, as shown in Figure 2-1. Historical annual rainfall data, compiled for the long-term period record from 1937 to 2019, was used to calculate summary statistics given in Table 2-1. Based on the long-term percentiles statistics and annual rainfall data compiled for 2015-2019 shown in Table 2-2, the calibration and validation periods covered the range of all three hydrological conditions representing a mix of dry, average, and wet years.

Table 2-1 Percentile Statistics of Annual Rainfall around Lake Harris: 1937-2019

Statistics	Annual rainfall (inch)
Minimum	29.61
10 Percentile	45.62
25 Percentile	50.24
50 Percentile	55.89
Average	56.19
75 Percentile	61.86
90 Percentile	71.13
Maximum	76.06

Table 2-2 Hydrological Conditions of the Calibration and Validation Periods

Year	Annual rainfall (inch)	Hydrological condition
2015	58.28	Average
2016	37.21	Dry
2017	68.34	Wet
2018	63.70	Wet
2019	60.13	Average to wet

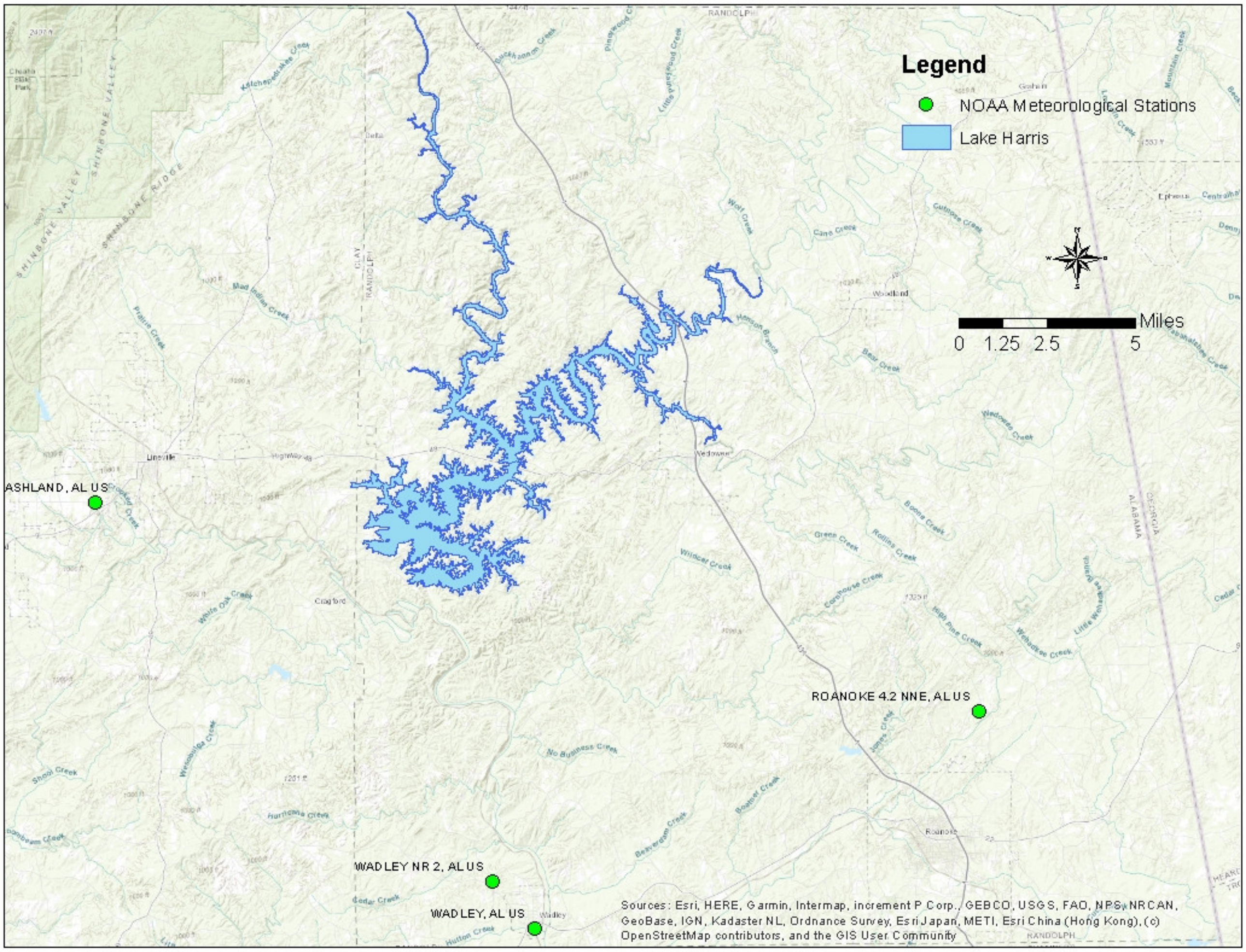

Figure 2-1 Location of the NOAA Meteorological Stations

The modeled state variable constituents for the Lake Harris EFDC hydrodynamic and water quality model are given below.

- **<u>Hydrodynamics</u>**
- Flow
- Water surface elevation
- Water temperature
- **<u>Sediment Transport and Water Quality</u>**
- Total suspended solids (TSS)
- Nitrogen (TN, NO_2+NO_3, Organic N, NH_3/NH_4)
- Phosphorus (TP, Organic P, Ortho-Phosphate)
- Total organic carbon (TOC)
- Phytoplankton (as Chl-a)
- Dissolved oxygen (DO)

2.3 Grid Development

Shoreline and bathymetry data available from aerial imagery and GIS data were used to generate the curvilinear orthogonal grid for the Lake Harris EFDC model. Data was transformed, as needed, to a horizontal coordinate system based on NAD1983 UTM Zone_16N (as meters). The computational grid is defined by a total of 912 horizontal grid cells covering a surface area of 8,948.6 acres as shown in Figure 2-2. Vertical layers for each grid cell were generated using the Sigma-Zed (SGZ) layering method. In the SGZ option for the EFDC model, the vertical layering scheme allows the number of layers to vary spatially over the model domain to differentiate shallow and deep areas of the lake. All bathymetry and water surface elevation data has been converted to NAVD88 with the units of meters to develop a consistent vertical datum, as shown in Figure 2-3. Due to the SGZ layering method, the bottom active cell can be associated with any layer in the model depending on the bathymetry. As water depth becomes shallower, the bottom active cell layer increases until only the top most layer in the model domain contains active cells in the shallower areas of the lake.

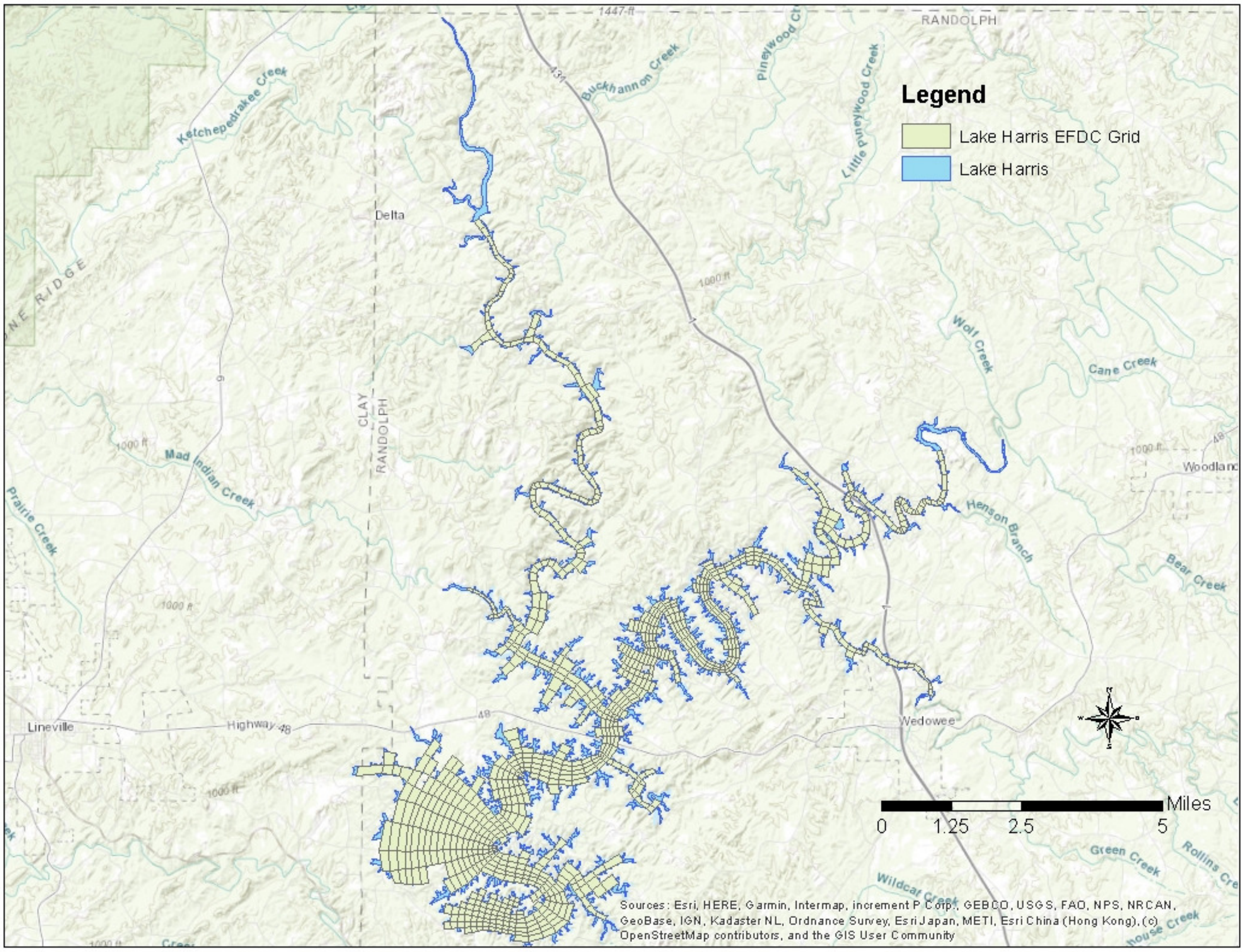

Figure 2-2 EFDC Model Grid for Lake Harris

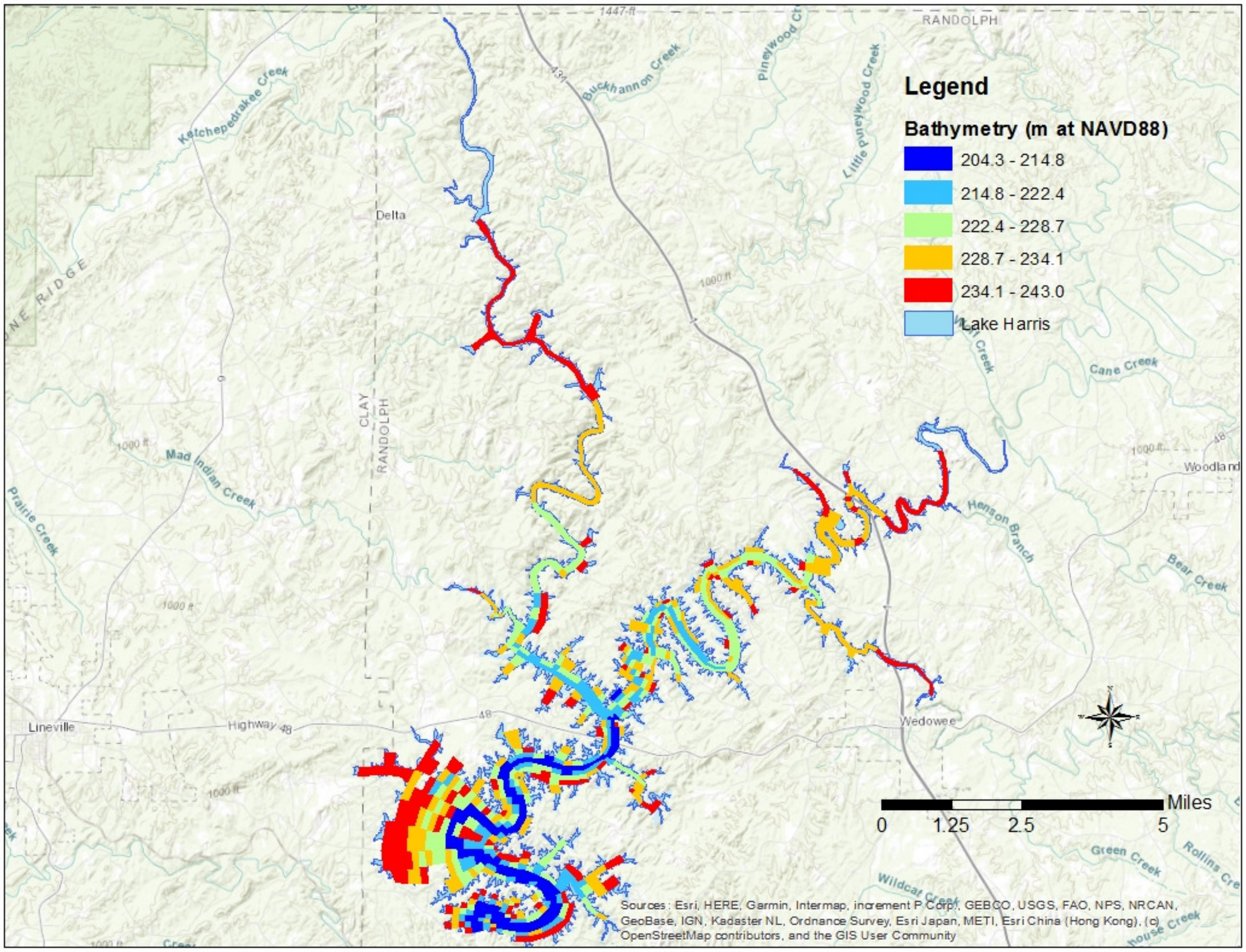

Figure 2-3 Bathymetry Data in the Lake Harris EFDC Model Domain

2.4 Meteorological Data

Meteorological data used in the EFDC hydrodynamic model included rainfall, wind speed and direction, relative humidity, atmospheric pressure, cloud cover, solar radiation, and air temperature. These data sets were used to calculate the impact of atmospheric forcing on water temperature and physical transport processes in the lake.

Hourly meteorological data was available at four NOAA meteorological stations, as shown in Figure 2-4. Anniston Metropolitan Airport is located in the west of Talladega National Forest while Lake Harris is located east of the Talladega National Forest in the valley. Thomas C Russell Field Airport has a more complete data set than does the stations located at the West Georgia Regional Airport and Lagrange Callaway Airport. The primary station used in the EFDC model to describe atmospheric forcing was, therefore, the Thomas C Russell Field Airport and the data sets from the other three stations were used to fill in missing data gaps from the records obtained for the Thomas C Russell Field Airport station. Short wave solar radiation data was estimated using a cloud-cover adjustment of latitude-dependent theoretical clear sky radiation. Evapotranspiration data used for input to the Lake Harris model was calculated internally by the EFDC model.

Table 2-3 Meteorological Stations Used in the EFDC Model

Station Name	Station ID	Agency	Latitude (N)	Longitude (W)
ANNISTON METROPOLITAN ARPT	WBAN 13871	NOAA	33.587	-85.856
WEST GEORGIA REGIONAL AIRPORT	WBAN 00249	NOAA	33.633	-85.150
THOMAS C RUSSELL FLD ARPT	WBAN 63833	NOAA	32.915	-85.963
LAGRANGE-CALLAWAY AIRPORT	WBAN 03821	NOAA	33.017	-85.067

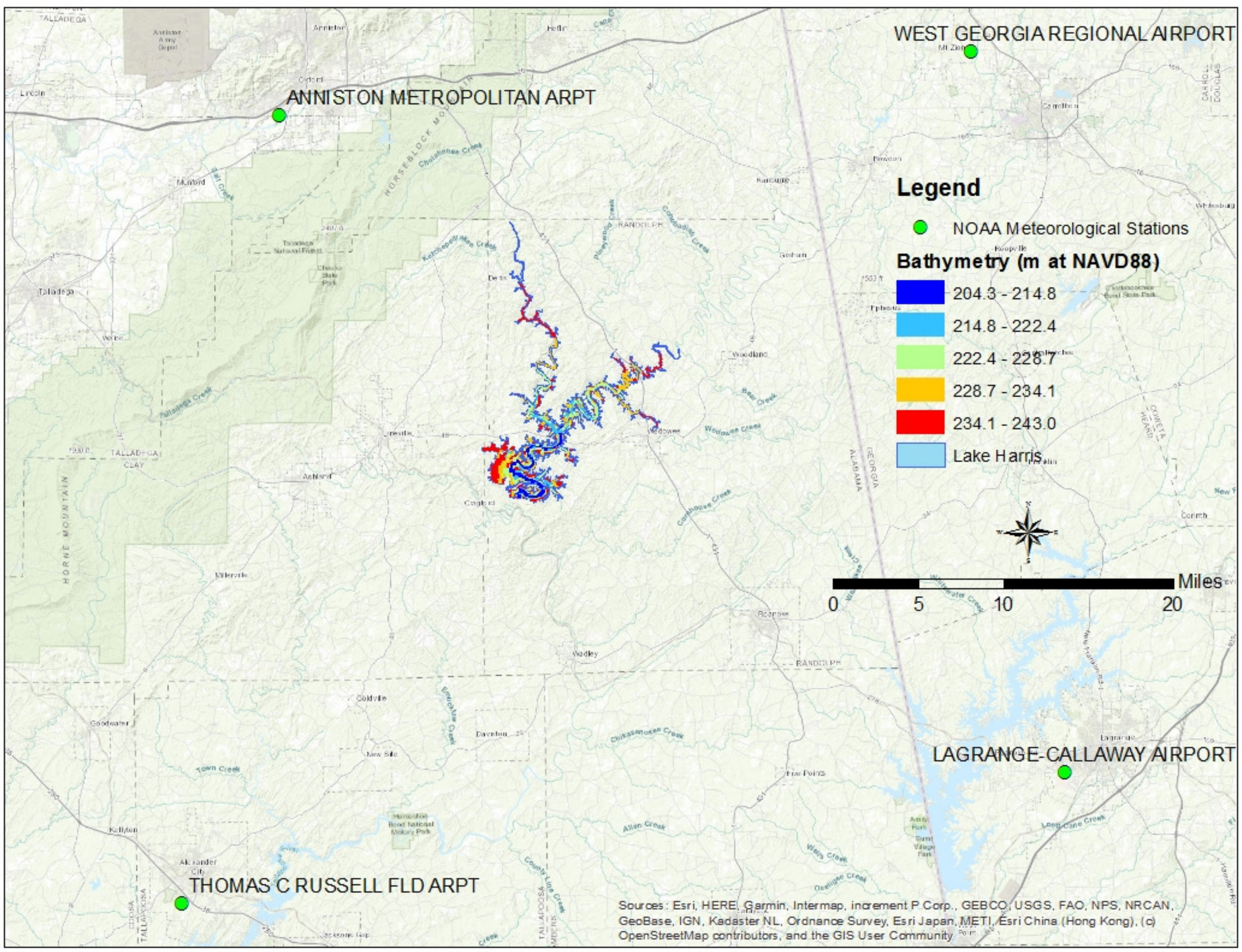

Figure 2-4 Location of the NOAA Meteorological Stations

2.5 Boundary Conditions

Boundary conditions for the EFDC model must be specified for flow boundary conditions to define external inflows of water and mass loading into the EFDC model domain. Flow boundary datasets required for input to EFDC include time series of flow, water temperature, suspended solids and water quality constituents to define mass loading inputs to the lake.

The Lake Harris EFDC model was developed with eleven (11) flow boundaries to define water coming into the lake from the tributaries, one (1) flow boundary to define release of water at the dam, and one (1) flow boundary to define a flow balance developed to account for water removed from the lake by water supply withdrawals and other unknown flows such as groundwater seepage and leakage from the dam. Table 2-4 listed the thirteen (13) model flow boundary indexes with the number of EFDC cells assigned to each boundary location. External flow boundary conditions were assigned to grid cells based on physical location and the specific boundary condition represented in the lake model (Figure 2-5).

Continuous observed flow data is available at two USGS gauge stations: (1) Tallapoosa River near Heflin (ID: USGS 02412000) and (2) Little Tallapoosa River near Newell (ID: USGS 02313300), as shown in Figure 2-5. The contributing areas of USGS 02412000 and USGS 02413300 stations are 448 and 406 square miles, respectively. The flow at each tributary, as shown in Figure 2-5, was estimated using a drainage area-weighted approach as follows. The ratio of the contributing area of each tributary to the target USGS gauge was first calculated (Table 2-5 and Table 2-6) and then the flow for each tributary was estimated as the product of the USGS flow and the drainage area ratio.

As a hydroelectric generating station, flow release records at the dam are maintained and were available from the APC. A flow balance was estimated using all inflows from rainfall and tributary flows and all outflows from evaporation and flow releases at the dam. As data for water supply withdrawals, groundwater seepage and leakage at the dam are either not readily available or are unknown, a flow balance is needed to account for these undocumented flows to ensure that the EFDC model simulated lake stage time series results match the observed lake stage.

Table 2-4 Lake Harris EFDC Model Flow Boundaries

BC	Boundary Group Name	Cells
1	Tallapoosa River	1
2	Little Tallapoosa River	1
3	Dam Discharge	1
4	Bear Creek	1
5	Copper Rock Creek	1
6	Wedowee Creek	1
7	Pineywoods Creek	1
8	Allen Branch	1
9	Dewberry Branch	2
10	Fox Creek	1
11	Mad Indian Creek	1
12	Gobbler Creek	2
13	Balance Flow	10

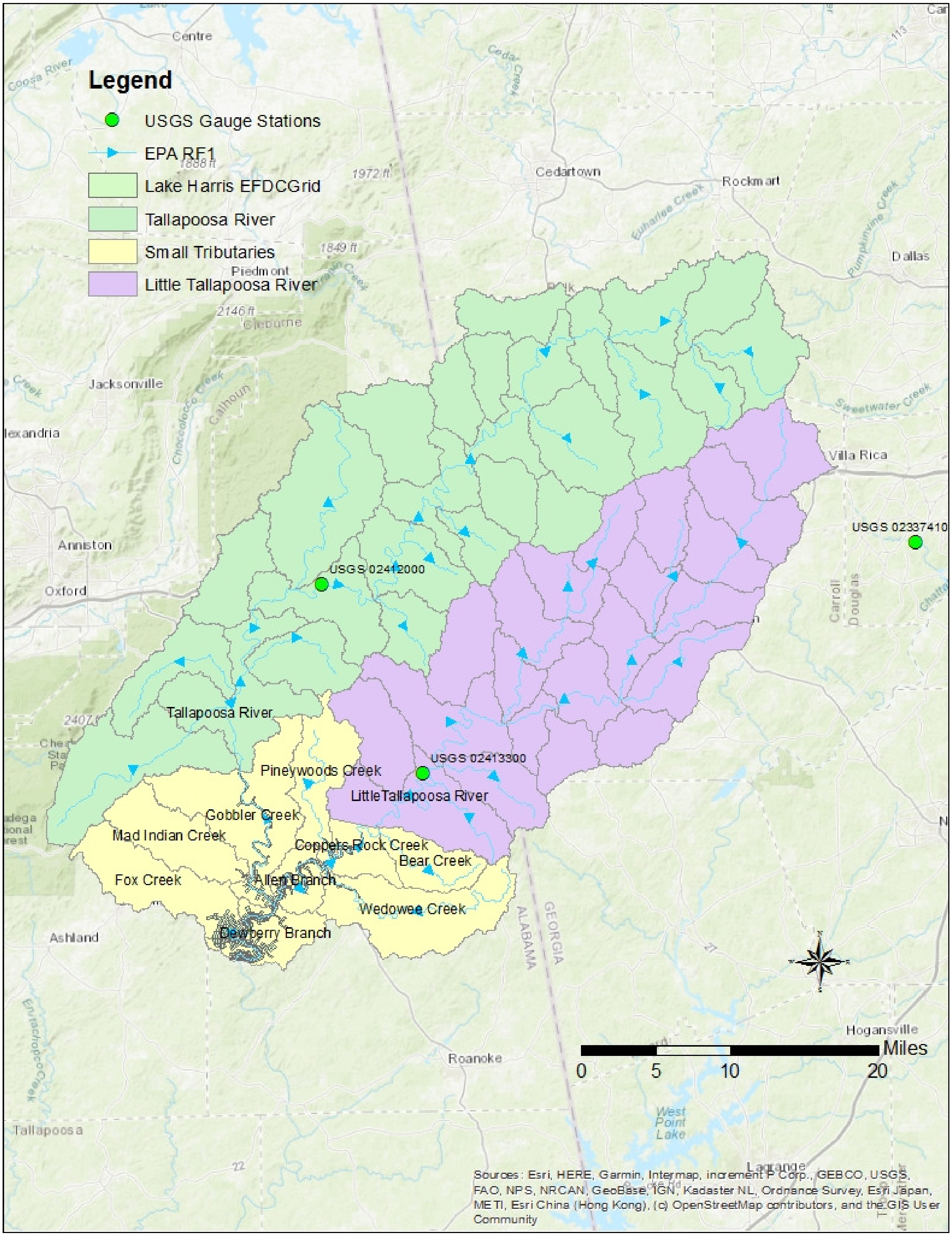

Figure 2-5 Location of the Tributary Boundary inflows to Lake Harris and USGS Stations

Table 2-5 Drainage Area Ratios of Tributary to Tallapoosa River USGS 02412000

Tributary Name	Contributing Area ($mile^2$)	Ratio
Tallapoosa River	705.528	1.574839
Gobbler Creek	54.654	0.121996
Fox Creek	36.043	0.080453
Mad Indian Creek	30.840	0.068839
Total	827.065	

Table 2-6 Drainage Area Ratios of Tributary to Little Tallapoosa River USGS 02413300

Tributary Name	Contributing Area ($mile^2$)	Ratio
Little Tallapoosa River	473.003	1.165032
Pineywoods Creek	27.636	0.068069
Bear Creek	19.344	0.047645
Wedowee Creek	50.628	0.124700
Allen Branch	10.316	0.025409
Dewberry Branch	15.280	0.037635
Coppers Rock Creek	14.646	0.036075
Total	610.853	

Observed water temperature data is available at two USGS gauge stations: (1) Tallapoosa River near Heflin (ID: USGS 02412000) and (2) Little Tallapoosa River near Newell (ID: USGS 02413300), as shown in Figure 2-5. The time interval of the observed temperature data set is 15-minute. The observed water temperature data, however, is only available from 5 December 2017 to the present at both USGS stations. The water temperature data prior to 5 December 2017 at both USGS stations, therefore, needs to be estimated to fill in this data gap.

The water temperature data at USGS 02412000 and USGS 02413300 prior to 5 December 2017 was estimated using a linear regression approach. Based on an assessment of the USGS stations close to Lake Harris, it was found that the water temperature data available from USGS gauge 02337410 (DOG RIVER AT GA 5, NEAR FAIRPLAY, GA) had the best linear relationship with the water temperature data recorded at USGS 02412000 and USGS 02413300, as shown in Figure 2-6 and Figure 2-7. The calculated regression coefficients (r^2) were higher than 0.97 demonstrating a strong relationship for both of these regressions. After filling in the data gaps in the long-term record, the complete water temperature time series data set from 2014 to 2019 was developed for both USGS 02412000 and USGS 02413300 stations. Water temperature boundary data associated with each tributary was then assigned to the USGS gauge data set as shown on Table 2-7.

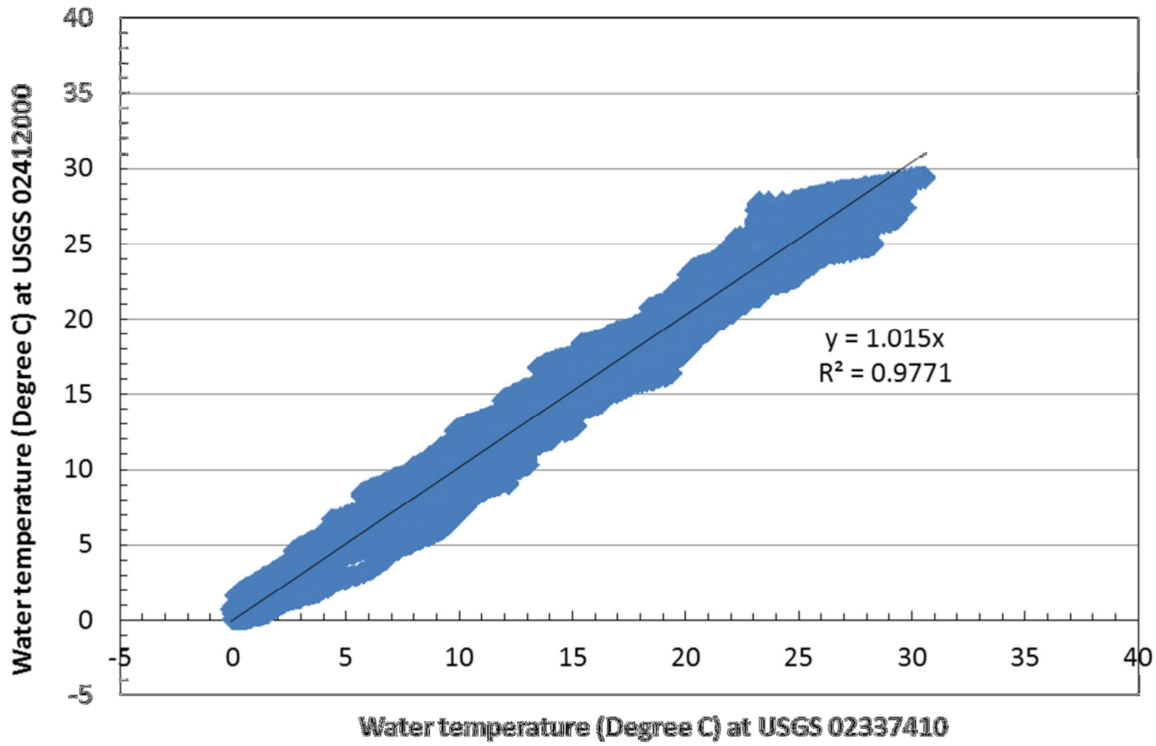

Figure 2-6 Linear Regression of Water Temperature Data between USGS 02412000 and USGS 02337410

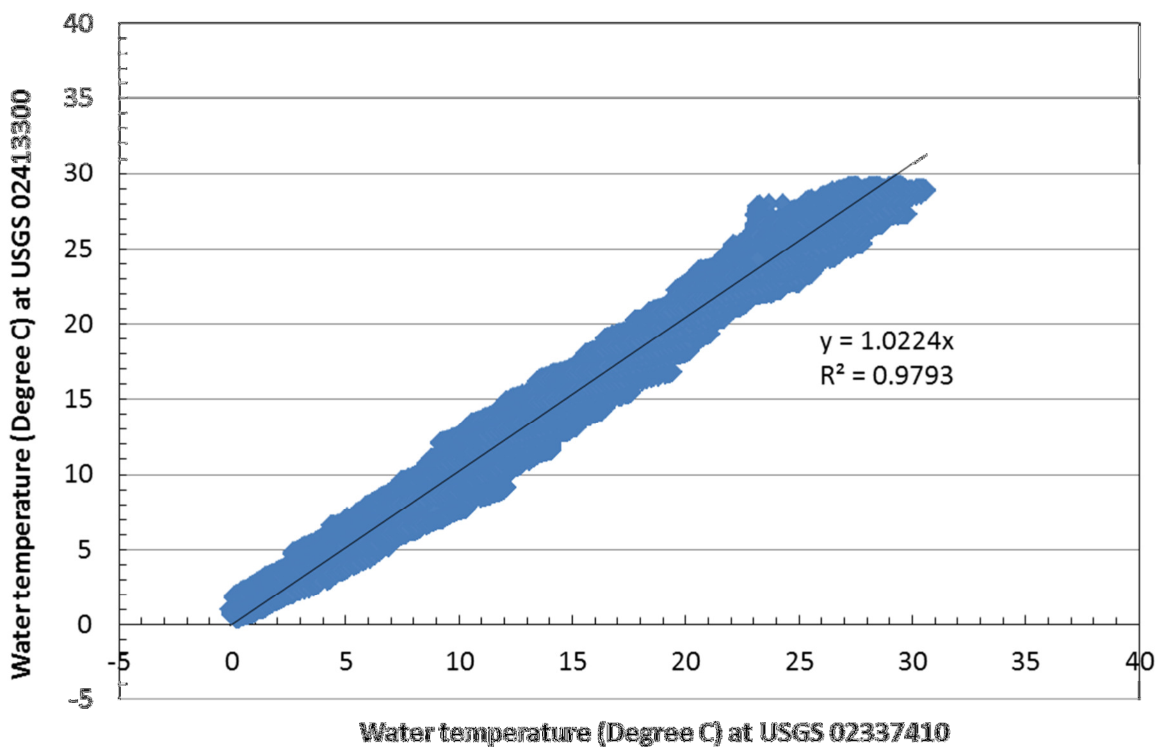

Figure 2-7 Linear Regression of Water Temperature Data between USGS 02413300 and USGS 02337410

Table 2-7 Assignment of Water Temperature Boundary

Tributary Name	Assigned Water Temperature Time Series
Tallapoosa River	USGS 02412000
Gobbler Creek	USGS 02412000
Fox Creek	USGS 02412000
Mad Indian Creek	USGS 02412000
Little Tallapoosa River	USGS 02413300
Pineywoods Creek	USGS 02413300
Bear Creek	USGS 02413300
Wedowee Creek	USGS 02413300
Allen Branch	USGS 02413300
Dewberry Branch	USGS 02413300
Coppers Rock Creek	USGS 02413300

Water quality constituent concentrations including total suspended solids, organic carbon, nutrients (nitrogen and phosphorus), and algae biomass at each of the flow boundary locations were estimated using the USGS LOAD ESTIMATOR (LOADEST) program, linear regression, and other approaches. More detailed information about how water quality boundary data sets were developed can be found in the next Section 2.6 (Estimation of Water Quality Boundaries) of this report.

2.6 Estimation of Water Quality Boundaries

Concentrations of all the water quality constituents at the flow boundaries, as shown in Figure 2-5, were first estimated using the USGS LOADEST program. LOADEST is a FORTRAN program for estimating water quality constituent loads in streams and rivers (Runkel et al., 2004). The LOADEST program assists the user in developing a regression model for the estimation of water quality constituent loads based on stream flow and water quality constituent concentration data. The LOADEST program provides eleven regression equations to estimate water quality constituent loadings. More detailed information about LOADEST, including regression model setup, calibration, and estimation, can be found in the USGS report by Runkel et al. (2004). The approach used for this study is described below as follows.

Paired flow and water quality data available for both the Tallapoosa River and the Little Tallapoosa River were collected and processed with observed water quality data downloaded from the Water Quality Portal website. Water quality stations in the Tallapoosa River and Little Tallapoosa River are given in Table 2-8, Table 2-9 and Figure 2-8. The processed flow-water quality data sets were used to prepare the LOADEST input file (calib.inp).

Paired flow and water quality data from both the Tallapoosa River and the Little Tallapoosa River stations were used to develop the regression model for each water quality constituent using USGS LOADEST with the option chosen for automated model selection. Regression equations developed with the LOADEST option were compared against the criteria to decide whether the developed regression models were acceptable or not based on criteria described below.

As recommended by Runkel et al. (2004), the criteria for acceptance of the regression model were: (1) Probability plot correlation coefficient (PPCC) should be close to a value of 1.0; (2) Absolute value of bias diagnostics (BP) should be close to or less than 25%; and (3) Nash-Sutcliffe efficiency index (E) value should be positive. The LOADEST method assumes a normal distribution of model residuals and a PPCC value close to 1.0 indicates that the model residuals follow a normal distribution. BP is the load bias as a percentage and positive values indicate over-estimation and negative values indicate under-estimation of the regression relationship. A Nash-Sutcliffe index value of E is equal to 1.0 represents a perfect match between observed and simulated data and a negative value of E (<0) indicates that the observed mean provides a better estimation than the LOADEST regression model. The LOADEST regression models for the Tallapoosa River and the Little Tallapoosa River that passed the above criteria for the water quality constituents are listed in Table 2-10 and Table 2-11.

As the final step in the estimation of the water quality boundary data sets, the accepted LOADEST regression models, as shown in Table 2-10 and Table 2-11 were used to estimate daily water quality loadings for the outlets of the Tallapoosa River and Little Tallapoosa River based on daily flow data records from 2014 to 2019. Time series of daily concentrations of the water quality constituent were then calculated from the daily load estimates and observed daily flow data.

Other approaches were used to estimate boundary conditions as time series for the water quality constituents which did not pass the LOADEST regression model criteria. The methods used to estimate water quality constituent daily concentrations for the Tallapoosa River and the Little Tallapoosa River are summarized in Table 2-12 and Table 2-13.

As phosphorus can adsorb to suspended sediment, Total Phosphorus can be significantly influenced by sorption/desorption and settling of suspended sediment. Total Suspended Solids (TSS) concentrations for the Little Tallapoosa River were estimated, therefore, based on a linear regression with Total Phosphorus (TP) data, as shown in Figure 2-9. Daily DO concentrations for both the Tallapoosa River and the Little Tallapoosa River were estimated as the 100% saturation concentration as a function of daily temperature data.

Once the complete water quality boundary conditions were developed at the outlets of the Tallapoosa River and Little Tallapoosa River, the assignment of water quality boundary for the small tributaries was based on Table 2-14.

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Table 2-8 Water Quality Stations in Tallapoosa River

Agency	Data Source	Station_ID	Latitude N	Longitude W
USGS	NWIS	USGS-02412000	33.623	-85.513
EPA	STORET	21AWIC-3132	33.623	-85.513
EPA	STORET	21AWIC-872	33.733	-85.372
EPA	STORET	21AWIC-873	33.606	-85.589
EPA	STORET	21AWIC-874	33.582	-85.592
EPA	STORET	21AWIC-875	33.556	-85.604
EPA	STORET	21AWIC-878	33.509	-85.625

Table 2-9 Water Quality Stations in Little Tallapoosa River

Agency	Data Source	Station_ID	Latitude N	Longitude W
USGS	NWIS	USGS-02413300	33.437	-85.399
EPA	STORET	21AWIC-1089	33.495	-85.338
EPA	STORET	21AWIC-2664	33.437	-85.399
EPA	STORET	21AWIC-4715	33.399	-85.439

Table 2-10 Regression Models Developed for Tallapoosa River

Constituents	LOADEST Model selected	R^2	PPCC	BP	E
BOD	#9	0.8658	0.9918	-1.80%	0.689
TKN	#3	0.6969	0.9892	-9.40%	0.509
NOX	#6	0.8126	0.9563	6.70%	0.467
TP	#6	0.795	0.9675	1.70%	0.964
TSS	#8	0.8772	0.9926	25.30%	0.787

Note: BP value for TSS is very close to 25% and is deemed to pass the criterion.

Table 2-11 Regression Models Developed for Little Tallapoosa River

Constituents	LOADEST Model selected	R^2	PPCC	Bp	E
BOD	#5	0.796	0.9892	-14.90%	0.454
NH4	#1	0.46	0.9826	5.40%	0.323
NO3	#9	0.9656	0.9678	1.10%	0.644
TKN	#6	0.8985	0.9984	6.40%	0.884
TP	#8	0.948	0.9547	-1.00%	0.648
TPO4	#2	0.8286	0.9742	0.60%	0.606

Table 2-12 Estimation of Concentrations of Water Quality Constituents in Tallapoosa River

Water Quality Parameter	Estimation Approach
TSS	LOADEST
TKN	LOADEST
NO3	LOADEST
TP	LOADEST
BOD	LOADEST
Chlorophyll a	a constant of 1.5 µg/L based on the observed data at station 21AWIC-878
NH4	Ratio of NH4:TKN = 0.16 based on the observed data at station 21AWIC-878
TON	TKN-NH4
TPO4	Ratio of TPO4:TP = 0.21 based on the observed data at station 21AWIC-878
TOP	TP – TPO4
TOC	Based on the LOADEST BOD5
DO	Based on water temperature and 100%saturation concentration

Table 2-13 Estimation of Concentrations of Water Quality Constituents in Little Tallapoosa River

Water Quality Parameter	Estimation Approach
TKN	LOADEST
NO3	LOADEST
NH4	LOADEST
TP	LOADEST
TPO4	LOADEST
BOD	LOADEST
Chlorophyll a	a constant of 3.0 µg/L based on the observed data at station 21AWIC-2664
TON	TKN – NH4
TOP	TP – TPO4
TOC	Based on the LOADEST BOD5
TSS	Based on the linear regression with TP
DO	Based on water temperature and 100%saturation concentration

Table 2-14 Assignment of Water Quality Boundary to Small Tributaries

Tributary Name	Assigned Water Temperature Time Series
Tallapoosa River	Tallapoosa River
Gobbler Creek	Tallapoosa River
Fox Creek	Tallapoosa River
Mad Indian Creek	Tallapoosa River
Little Tallapoosa River	Little Tallapoosa River
Pineywoods Creek	Little Tallapoosa River
Bear Creek	Little Tallapoosa River
Wedowee Creek	Little Tallapoosa River
Allen Branch	Little Tallapoosa River
Dewberry Branch	Little Tallapoosa River
Coppers Rock Creek	Little Tallapoosa River

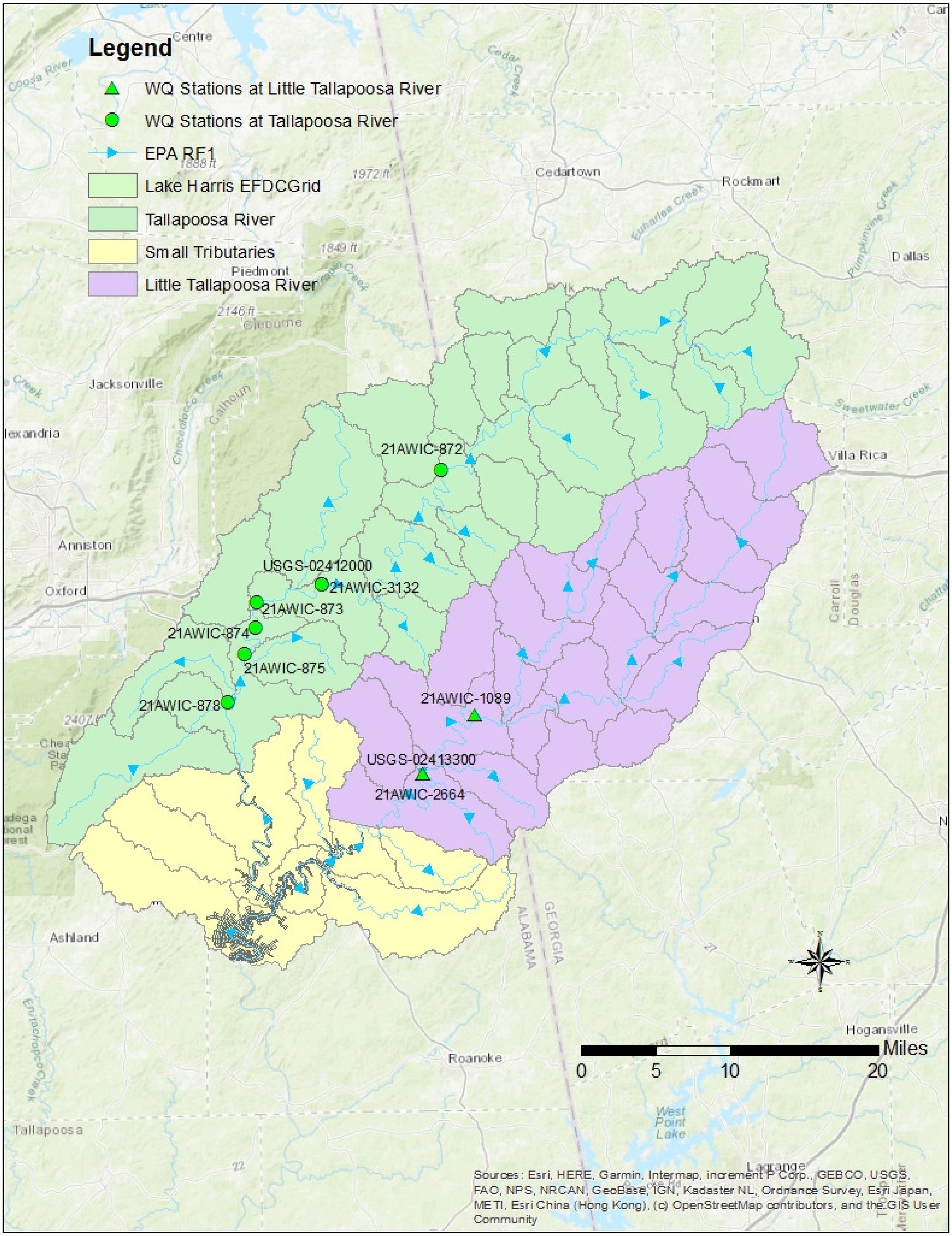

Figure 2-8 Location of Water Quality Stations

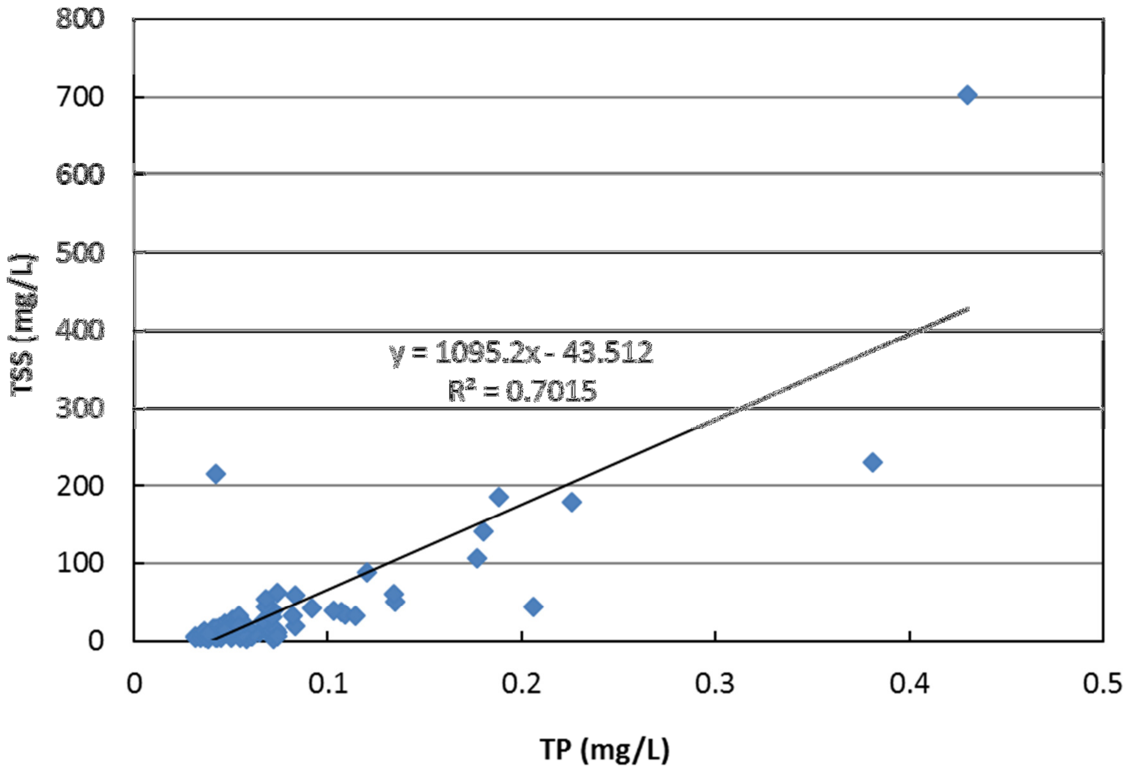

Figure 2-9 Linear Regression between TSS and TP at Little Tallapoosa River

3. Water Quality and Sediment Flux Model

3.1 Water Quality Model

For the Lake Harris EFDC model, the water quality model was internally coupled with the hydrodynamic model and a sediment transport model. The hydrodynamic model described circulation and physical transport processes including turbulent mixing, water column stratification during the summer months, and erosion of stratification during the winter months. The sediment transport model described the water column distribution of inorganic cohesive particles resulting from transport, settling, deposition, and resuspension processes.

State variables of the EFDC hydrodynamic model (water temperature) and sediment transport model (inorganic suspended solids) are internally coupled with the EFDC water quality model. State variables of the EFDC water quality model include one functional group of algae; organic carbon, inorganic phosphorus (orthophosphate), organic phosphorus; inorganic nitrogen (ammonium and nitrite + nitrate), organic nitrogen; chemical oxygen demand (COD) and dissolved oxygen. The state variables represented in the Lake Harris EFDC hydrodynamic and water quality model are listed in Table 3-1.

The formulations of the EFDC water quality model are based on the kinetic processes and interactions developed for the Chesapeake Bay model (Cerco and Cole, 1995; Cerco et al., 2002). An overview of the source and sink terms for each state variable is presented in this section and details of the state variable equations and kinetic terms for each state variable are presented in Park et al. (1995), Hamrick (2007) and Ji (2017).

Table 3-1 EFDC State Variables

	EFDC State Variable		**EFDC UNITS**	**Used in Model**
	Flow	FLOW	cms	Yes
	Water_Temperature	TEM	Deg-C	Yes
	Salinity	SAL	ppt	No
	Cohesive Suspended Solids	COH	mg/L	Yes
	Non-cohesive Suspended Solids	NONCOH	mg/L	No
1	BlueGreen_Algae	CHC	mgC/L	No
2	Diatoms_Algae	CHD	mgC/L	No
3	Green_Algae	CHG	mgC/L	Yes
4	Refractory_Particulate_Org_C	RPOC	mgC/L	Yes
5	Labile_Particulate_Org_C	LPOC	mgC/L	Yes
6	Dissolved_Org_C	DOC	mgC/L	Yes
7	Refractory_Particulate_Org_P	RPOP	mgP/L	Yes
8	Labile_Particulate_Org_P	LPOP	mgP/L	Yes
9	Dissolved_Org_P	DOP	mgP/L	Yes
10	Total_Phosphate (PO4_P)	TPO4	mgP/L	Yes
11	Refractory_Particulate_Org_N	RPON	mgN/L	Yes
12	Labile_Particulate_Org_N	LPON	mgN/L	Yes
13	Dissolved_Org_N	DON	mgN/L	Yes
14	Ammonia_N ($NH4^{+}$)	NH4	mgN/L	Yes
15	Nitrate_N (NO2 + NO3)	NO3	mgN/L	Yes
16	Particulate-Biogenic_Silica	PBSI	mgSi/L	No
17	Available_Silica	SI	mgSi/L	No
18	Chemical_Oxygen_Demand	COD	mg/L	Yes
19	Dissolved_Oxygen	OXY	mgO2/L	Yes
20	Total_Active_Metal	TAM	mg/L	No
21	Fecal_Coliform_Bacteria	FCB	# /100mL	No

Suspended Solids

Suspended solids in the EFDC model can be differentiated by multiple size classes of cohesive and non-cohesive solids. Suspended solids are represented as a single size class of cohesive particles in the Lake Harris model. Cohesive suspended solids are included in the model to account for the inorganic solids component of light attenuation in the water column. Since cohesive particles derived from silts and clays are characterized by a small particle diameter (< 62 microns) and a low settling velocity, cohesive particles can remain suspended in the water column for long periods of time and contribute to light attenuation that can influence algal production. Non-cohesive particles, consisting of fine to coarse size sands, by contrast, are characterized by much larger particles (> 62 microns) with rapid settling velocities that quickly remove any resuspended non-cohesive particles from the water column to the sediment bed.

The key processes that control the distribution of cohesive particles are transport in the water column, flocculation and settling, deposition to the sediment bed, consolidation within the bed, and resuspension or erosion of the sediment bed. In the EFDC model for Lake Harris, cohesive settling is defined by a constant settling velocity that is determined by model calibration. Deposition and erosion are controlled by the assignment of critical stresses for deposition and erosion and the bottom layer velocity and shear stress computed by the hydrodynamic model. Initial critical stresses for deposition and erosion of cohesive particles are taken from parameter values defined by Ji (2017) for a sediment transport model of Lake Okeechobee and then adjusted as needed during model calibration. Parameter values for deposition and erosion assigned for the calibration of cohesive solids are summarized in Table 3-2.

Table 3-2 EFDC Model Parameter Values for Cohesive Solids

Variable	Value	Description	Units
SDEN	3.7736E-07	Sediment Specific Volume	m^3/g
SSG	2.65	Sediment Specific Gravity	--
WSEDO	7.0E-06	Constant Sediment Settling Velocity	m/s
TAUD	3.00E-03	Critical Stress for Deposition	$(m/s)^2$
WRSPO	5.00E-06	Reference Surface Erosion Rate	$g/m^2/s$
TAUR	4.00E-03	Critical Stress for Erosion	$(m/s)^2$

Algae

Phytoplankton in the EFDC model can be represented by three different functional groups of algae as (1) blue-green cyanobacteria; (2) diatoms; and (3) green algae. The Lake Harris EFDC model was developed to simulate only green algae as a "generic" group since there was no observed data available to characterize seasonal phytoplankton composition. Kinetic processes represented for algal groups include photosynthetic production, basal metabolism (respiration and excretion), settling and predation. Photosynthetic production is described by a growth rate that is functionally dependent on a maximum growth rate, water temperature, the availability of sunlight at the surface, light extinction in the water column, the optimum light level for growth, and half-saturation dependent nutrient limitation by either nitrogen or phosphorus. Growth and basal metabolism are temperature dependent processes while settling and predation losses are assigned as constant parameter values.

Organic Carbon

Total organic carbon is represented in the model with three state variables as dissolved organic carbon (DOC) and refractory and labile forms of particulate organic carbon (RPOC and LPOC). The time scale for decomposition of particulate organic matter (POM) is used to differentiate refractory and labile POM with labile matter decomposing rapidly (weeks to months) while decay of refractory POM takes much longer (years). Although DOC is not termed "labile", DOC is considered to react with a rapid time scale for decomposition (weeks to months).

Kinetic processes represented in the model for particulate organic carbon (POC) include algal predation, dissolution of RPOC and LPOC to DOC, and settling. Kinetic processes for DOC include sources from algal excretion, predation and dissolution of POC and losses from decomposition and denitrification. With the exception of settling of POC, all the kinetic reaction processes are temperature dependent.

Phosphorus

The organic and inorganic forms of phosphorus are represented in the model. Total organic phosphorus is represented in the model with three state variables as dissolved organic phosphorus (DOP) and refractory and labile forms of particulate organic phosphorus (RPOP and LPOP). As with organic carbon, the time scale for decomposition of particulate organic matter (POM) is used to differentiate refractory and labile POP. Kinetic processes represented in the model for POP include algal metabolism, predation, dissolution of RPOP and LPOP to DOP, and settling. Kinetic processes for DOP include sources from algal metabolism, predation and dissolution of POP to DOP with losses of DOP from mineralization to phosphate. With the exception of settling of POP, the kinetic reaction processes are all temperature dependent.

Inorganic phosphorus is represented as a single state variable for total phosphate which accounts for both the dissolved and particulate sorbed forms of phosphate. Adsorption and desorption of phosphate is defined on the basis of equilibrium partitioning using an assigned phosphate partition coefficient for suspended solids. Kinetic terms for total phosphate include sources from algal metabolism, predation and mineralization from DOP while losses for phosphate include settling of the sorbed fraction of total phosphate and uptake by phytoplankton growth. Depending on the concentration gradient between the bottom layer of the water column and sediment bed porewater phosphate, the sediment-water interface can serve as either a source or a loss term for phosphate in the water column. With the exception of the partition coefficient and the settling of sorbed phosphate, the kinetic reaction processes for phosphate are all temperature dependent.

Nitrogen

The organic and inorganic forms of nitrogen are represented in the model. Total organic nitrogen is represented in the model with three state variables as dissolved organic nitrogen (DON) and refractory and labile forms of particulate organic nitrogen (RPON and LPON). As with organic carbon, the time scale for decomposition of particulate organic matter (POM) is used to differentiate refractory and labile PON. Kinetic processes represented in the model for PON include algal metabolism, predation, dissolution of RPON and LPON to DON, and settling. Kinetic processes for DON include sources from algal metabolism and predation, dissolution of PON to DON and losses of DON from mineralization of PON to ammonium. With the exception of settling of PON, the kinetic reaction processes are all temperature dependent.

Inorganic nitrogen is represented by two state variables as (1) ammonia and (2) nitrite+nitrate. In natural waters total ammonia exists in two forms as the ammonium ion ($NH4^+$) and as un-ionized (NH3) ammonia. The ammonium ion ($NH4^+$) is the form of ammonia that is oxidized by nitrifying bacteria to nitrite and nitrate and used by phytoplankton for photosynthetic growth. Un-ionized ammonia (NH3) is the form of ammonia that is toxic to fish and other aquatic species. The toxic level of ammonia (NH3) is water temperature and pH dependent and toxicity increases as water temperature and/or pH increase. In most natural waters, where pH is relatively stable (~6 to 8), the ionized form of ammonia ($NH4^+$) typically has a much larger concentration than the un-ionized form of ammonia (NH3) (Ji, 2017). In most water quality models, the ammonium ion ($NH4^+$) is the form of ammonia that is commonly simulated as shown in Table 3-1 (Cerco and Cole, 1994; Tetra Tech, 2007; Ji, 2017).

Kinetic terms for ammonia include sources from algal metabolism and predation and mineralization from DON. Losses for ammonia include bacterially mediated transformation to nitrite and nitrate by nitrification and uptake by phytoplankton growth. Depending on the concentration gradient between the bottom layer of the water column and sediment bed porewater ammonia, the sediment-water interface can serve as either a source or a loss term for ammonia in the water column. The kinetic reaction processes for ammonia are all temperature dependent.

Since the time scale for conversion of nitrite to nitrate is very rapid, the concentration of nitrite in natural waters is much smaller than nitrate concentrations. In almost all water quality models, nitrite and nitrate are combined as a single state variable representing the sum of these two forms of inorganic nitrogen (nitrite+nitrate). Kinetic terms for nitrite/nitrate include sources from nitrification from ammonia to nitrite and nitrate. Losses include photosynthetic uptake by phytoplankton and denitrification to nitrogen gas. Depending on the concentration gradient between the bottom layer of the water column and sediment bed porewater nitrite/nitrate, the sediment-water interface can serve as either a source or a loss term for nitrite/nitrate in the water column. The kinetic reaction processes for nitrite/nitrate are all water temperature dependent.

Chemical Oxygen Demand (COD)

In the EFDC water quality model, chemical oxygen demand (COD) represents the concentration of reduced substances that can be oxidized through inorganic processes. The principal source of COD in freshwater is methane released from oxidation of organic carbon in the sediment bed across the sediment-water interface. Since sediment bed decomposition is accounted for in the water quality model, the only source of COD to the water column is the flux of methane across the sediment-water interface. Sources from the open water boundaries and upstream flow boundaries are set to zero for COD. The loss term in the water column is defined by a temperature dependent first order oxidation rate.

Dissolved Oxygen

Dissolved oxygen is a key state variable in the water quality model since several kinetic processes interact with, and can be controlled by, dissolved oxygen. Kinetic processes represented in the dissolved oxygen model include sources from atmospheric reaeration in the surface layer and algal photosynthetic production. Kinetic loss terms include algal respiration, nitrification, decomposition of DOC, oxidation of COD, and in the bottom layer of the water column, consumption of dissolved oxygen from sediment oxygen demand. Sediment oxygen demand is internally simulated with the sediment flux model by coupling particulate organic carbon deposition from the water column and decomposition of organic matter in the sediment bed. The kinetic reaction processes for dissolved oxygen are all temperature dependent.

Kinetic Coefficients

Most of the water quality parameters and coefficients needed by the EFDC water quality model were initialized with default values as indicated in the user's manual (Hamrick, 2007). These default values are, in general, the same as the parameter values determined for the

Chesapeake Bay model (Cerco and Cole, 1995). Models developed for Lake Washington (Arhonditsis and Brett, 2005) and Chesapeake Bay tributaries (Cerco et al., 2002) also provided kinetic coefficients needed for the EFDC water quality model. Kinetic coefficients and model parameters were adjusted, as needed, within ranges reported in the literature, during model calibration to obtain the most reasonable agreement between observed and simulated water quality concentrations such as total suspended solids, algal biomass, organic carbon, dissolved oxygen and nutrients. A large body of literature is available from numerous advanced modeling studies developed over the past decade to provide information on reported ranges of parameter values that can be assigned for site-specific modeling projects (see Ji, 2017; Park et al, 1995; Hamrick, 2007; Dynamic Solutions, 2012; Dynamic Solutions, 2016).

Kinetic coefficients and model parameters assigned for the water quality model are assigned as either global or spatially dependent zone parameters for the Lake Harris EFDC model. Nine zones were used to represent the spatial variation in algae kinetics in the Lake Harris model (Figure 3-1).

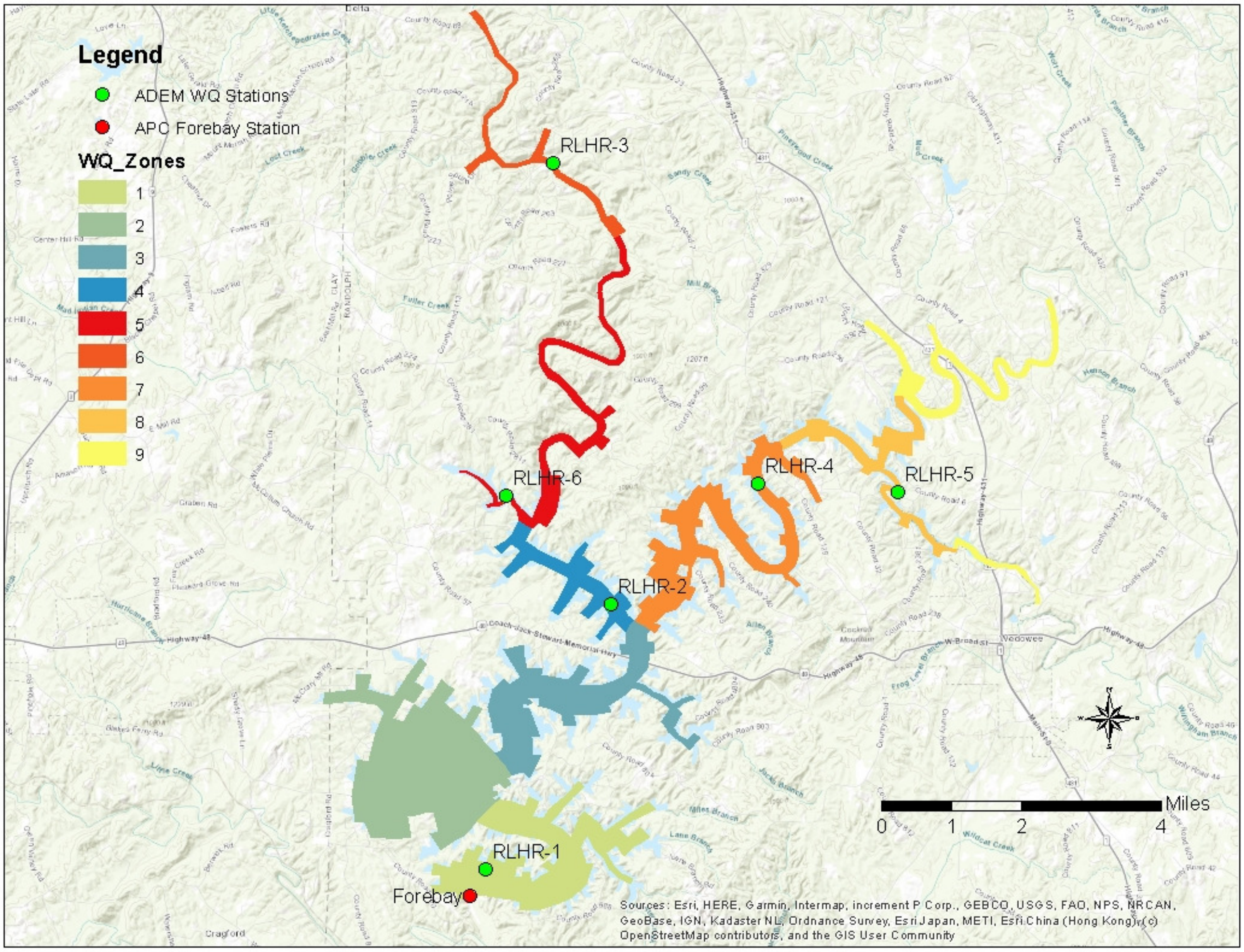

Figure 3-1 Spatial water quality kinetic zones defined for Lake Harris

Atmospheric Deposition

Atmospheric deposition is represented in the EFDC model with separate source terms for dry deposition and wet deposition. Dry deposition is defined by a constant mass flux rate (as g/m^2-day) for a constituent that settles out as dust or is deposited on a dry surface during a period of no precipitation. Wet deposition is defined by a constant concentration (as mg/L) of water quality constituents in rainfall and the time series of precipitation assigned for input to the hydrodynamic model. For the Lake Harris model, wet and dry deposition data (Table 3-3) was assigned as the average of annual data from 2015-2019 for ammonia and nitrate from the National Atmospheric Deposition Program (NADP) for Station GA41 (Georgia Station, Lat 33.18 N; Lon -84.41 W) and the Clean Air Status and Trends Network (CASTNET) Station GAS153 (Georgia Station, Lat 33.18 N; Lon -84.41 W) (Figure 3-2). As data was not available from the CASTNET and NADP sites for phosphate, dry deposition for phosphate was estimated using annual average N/P ratios for atmospheric deposition of N and P reported for 6 monitoring sites in Iowa (Anderson and Downing, 2006) and the ammonia and nitrate data obtained from the NADP and CASTNET data sources.

Table 3-3 Dry and Wet Atmospheric Deposition for Nutrients

	Dry	Wet	Data Source
	g/m^2-day	mg/L	
TPO4	6.00E-06	0.000566	Anderson & Downing (2006), Table VII
NH4	3.80E-05	0.175933	Dry (CASTNET, GAS 153); Wet (NADP, GA 41); average 2015-2019
NO3	7.80E-05	0.08531	Dry (CASTNET, GAS 153); Wet (NADP, GA 41); average 2015-2019

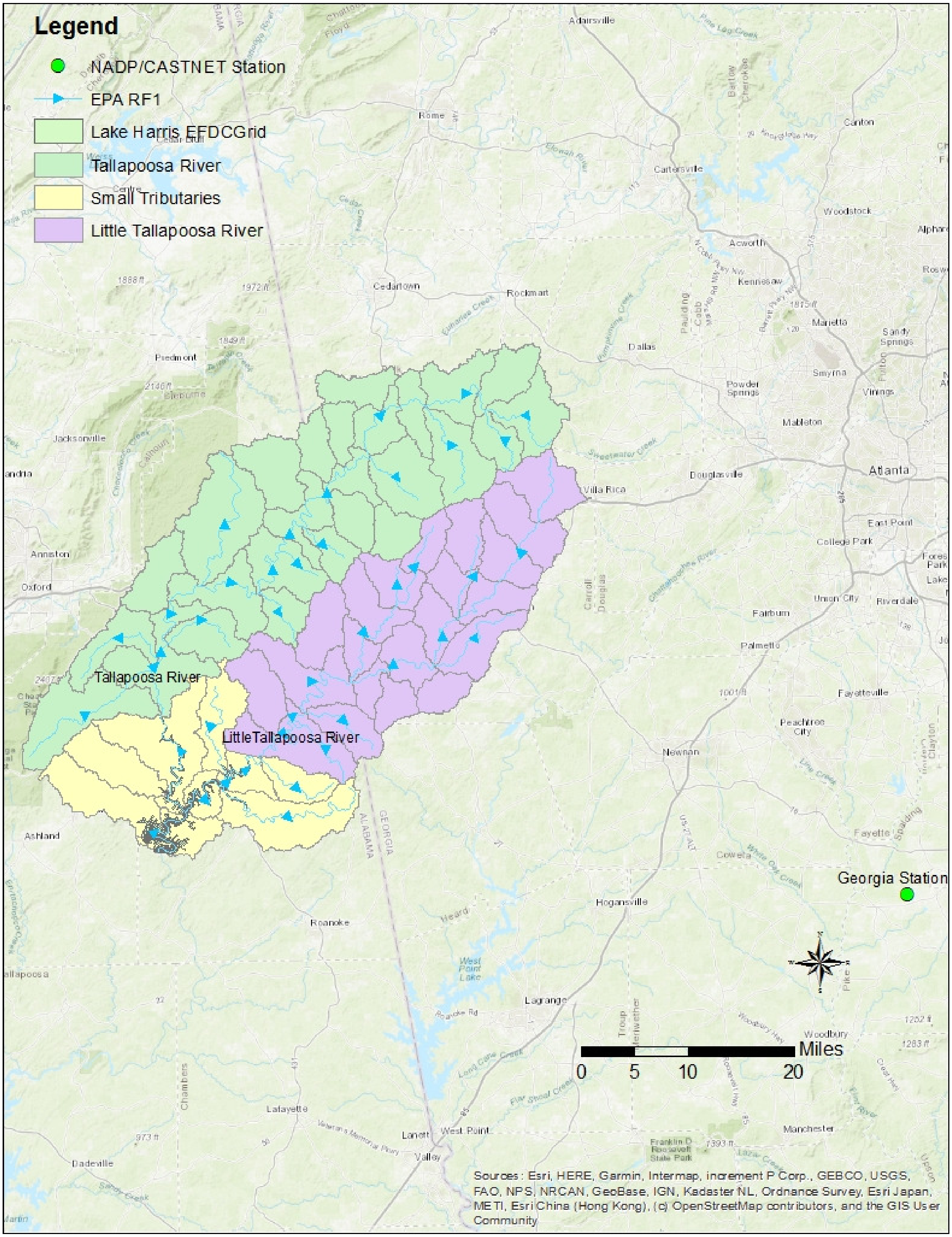

Figure 3-2 Locations of the EPA CASTNET Station and NADP/NTP Station

3.2 Sediment Flux Model

The EFDC water quality model provides three options for defining the sediment-water interface fluxes for nutrients and dissolved oxygen. The options are: (1) externally forced spatially and temporally constant fluxes; (2) externally forced spatially and temporally variable fluxes; and (3) internally coupled fluxes simulated with the sediment diagenesis model. The water quality state variables that are controlled by diffusive exchange across the sediment-water interface include phosphate, ammonia, nitrate, silica, chemical oxygen demand and dissolved oxygen. The first two options require that the sediment fluxes be assigned as spatial/temporal forcing functions based on either observed site-specific data from field surveys or best estimates based on the literature and sediment bed characteristics. The third option is the activation of the full sediment diagenesis model developed by Di Toro (2001).

For the Lake Harris EFDC model, the second option was selected because observed sediment bed chemistry data was not available. The initial sediment oxygen demand (SOD) values and nutrient fluxes (NH4 and PO4) for each spatial zone were based on measured SOD values in Weiss Lake in 2001 by the Environmental Protection Agency (EPA) (Tetra Tech, 2007). Location of the nine water quality zones is shown in Figure 3-1. During the calibration process, the SOD values and nutrient fluxes were adjusted as needed to best match the dissolved oxygen and nutrient observations. The seasonal pattern of SOD was initially based on the observed data reported by Cowan et al. (1996). The final calibrated data set for monthly SOD rates are given in Table 3-4. The highest monthly SOD value of 1.12 g/m^2-day determined by calibration was very close to the observed SOD values in Browns Lake in Mississippi collected by the USACE (Price et al., 1994).

Table 3-4 Monthly SOD Values Calibrated for Lake Harris EFDC Model (g/m^2-day)

Month	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9
January	-0.65	-0.65	-0.65	-0.65	-0.65	-0.28	-0.65	-0.65	-0.28
February	-0.85	-0.85	-0.65	-0.65	-0.65	-0.28	-0.65	-0.65	-0.28
March	-0.85	-0.85	-0.65	-0.65	-0.65	-0.28	-0.65	-0.65	-0.28
April	-0.85	-0.85	-0.85	-0.85	-0.85	-0.28	-0.85	-0.85	-0.28
May	-1.00	-1.00	-1.00	-1.00	-1.00	-0.28	-1.00	-1.00	-0.28
June	-1.12	-1.12	-1.12	-1.12	-1.12	-0.28	-1.12	-1.12	-0.28
July	-1.12	-1.12	-1.12	-1.12	-1.12	-0.28	-1.12	-1.12	-0.28
August	-1.00	-1.00	-1.00	-1.00	-1.00	-0.28	-0.85	-0.85	-0.28
September	-0.85	-0.85	-0.85	-0.85	-0.85	-0.28	-0.85	-0.65	-0.28
October	-0.65	-0.65	-0.65	-0.65	-0.65	-0.28	-0.65	-0.65	-0.28
November	-0.65	-0.65	-0.65	-0.65	-0.65	-0.28	-0.65	-0.65	-0.28
December	-0.65	-0.65	-0.65	-0.65	-0.65	-0.28	-0.65	-0.65	-0.28

4. Calibration and Validation Stations

4.1 Stage Calibration and Validation Stations

The observed stage data in Lake Harris is available from APC at the forebay station shown in Figure 2-5.

4.2 Water Quality Calibration and Validation Stations

The Lake Harris EFDC model was calibrated and validated at one (1) APC station at the forebay and six (6) Alabama Department of Environmental Management (ADEM) stations: RLHR-1, RLHR-2, RLHR-3, RLHR-4, RLHR-5, and RLHR-6. Station identification information for these stations is listed in Table 4-1 and station locations are shown in Figure 4-1.

Table 4-1 Water Quality Calibration and Validation Stations for Lake Harris

Station Code	Location Description	Latitude (N)	Longitude (W)
Forebay	Dam site, most downstream site of the lake	33.25856	-85.6166
RLHR-1	Lower reservoir. Deepest point, main river channel, dam forebay	33.26406	-85.6127
RLHR-2	Mid reservoir. Deepest point, main river channel, immediate upstream of Tallapoosa River/Little Tallapoosa River confluence.	33.31843	-85.5811
RLHR-3	Upper reservoir. Deepest point, main river channel, immediate downstream of Randolph Co. Hwy 82 bridge.	33.41002	-85.5939
RLHR-4	Deepest point, Little Tallapoosa River channel, immediate downstream of Randolph Co. Hwy 29.	33.34314	-85.5444
RLHR-5	Deepest point, main creek channel, Wedowee Creek embayment, approx. 0.5 miles upstream of lake confluence.	33.34083	-85.5097
RLHR-6	Deepest point, main creek channel, Mad Indian Creek embayment, approx. 0.5 miles upstream of lake confluence.	33.34139	-85.6064

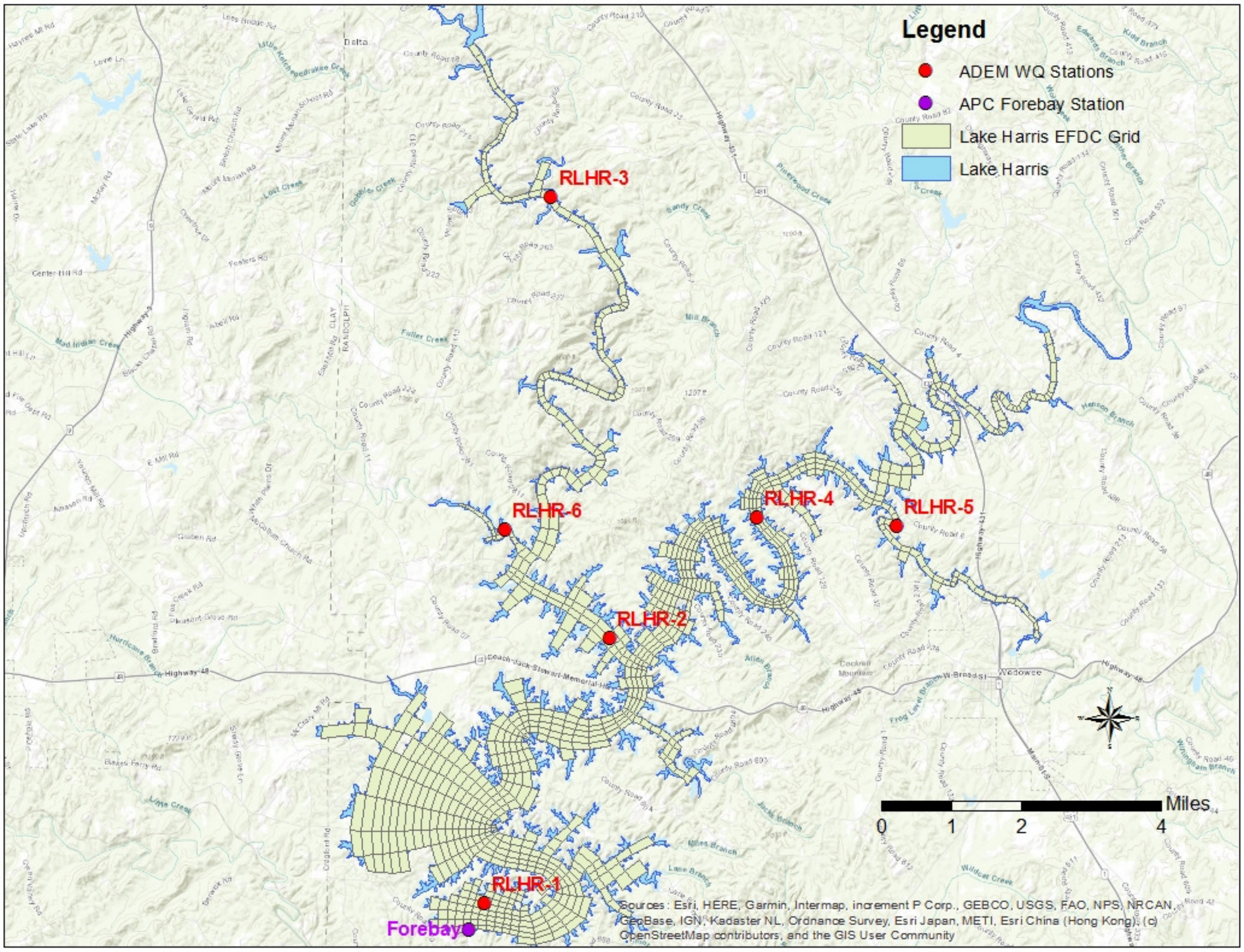

Figure 4-1 Locations of the APC and ADEM Water Quality Stations in Lake Harris

5. Model Performance Statistics

Observed station data was processed to define time series for each station location for the surface layer and bottom layer of the water column. Observed data was assigned to a vertical layer based on surface water elevation, station bottom elevation and the total depth of the water column estimated for the sampling date and time. Station locations were overlaid on the model grid to define a set of discrete grid cells that correspond to each monitoring site for extraction of model results.

The model-data model performance statistic selected for calibration of the hydrodynamic and water quality model was the Root Mean Square Error (RMSE). The units of the RMSE are defined by the units of each state variable of the model.

The equation for the RMSE is,

$$\mathrm{RMSE} = \sqrt{\frac{1}{N}\Sigma(O-P)^2} \qquad \text{Equation (1)}$$

Where

N is the number of paired records of observed measurements and EFDC model results,

O is the observed water quality measurement,

P is the predicted EFDC model result.

6. Hydrodynamic Model Calibration and Validation

6.1 Lake Stage Calibration

The hydrodynamic model was calibrated for the 2-year time period from 1 January 2018 to 31 December 2019. Figure 6-1 shows the comparison of observed lake water surface elevation at the APC forebay station and simulated water surface elevation extracted from a grid cell at that location. Water level data for the lake were based on the NAVD88 vertical datum with units of meters.

Simulated lake elevation was in excellent agreement with the measured lake elevation for the calibration period from January 2018 through December 2019. The summary of model performance statistics between observed and simulated water surface elevation for the calibration period is given in Table 6-1. The simulated average stage was 240.613 m, which was very close to the averaged observed stage of 240.612 m. The calculated RMS error was 0.016 m (Table 6-1).

Table 6-1 Model Performance Statistics for Hydrodynamic Model for Lake Stage (NAVD88, m)

Station ID	Parameter	Simulation Periods	Starting	Ending	# Pairs	RMS (m)	Data Average (m)	Model Average (m)
Forebay	Stage (m)	Calibration	1/1/2018 0:00	12/31/2019 0:00	17,473	0.016	240.612	240.613
Forebay	Stage (m)	Validation	1/1/2015 0:00	12/31/2017 0:00	26,297	0.019	240.603	240.606

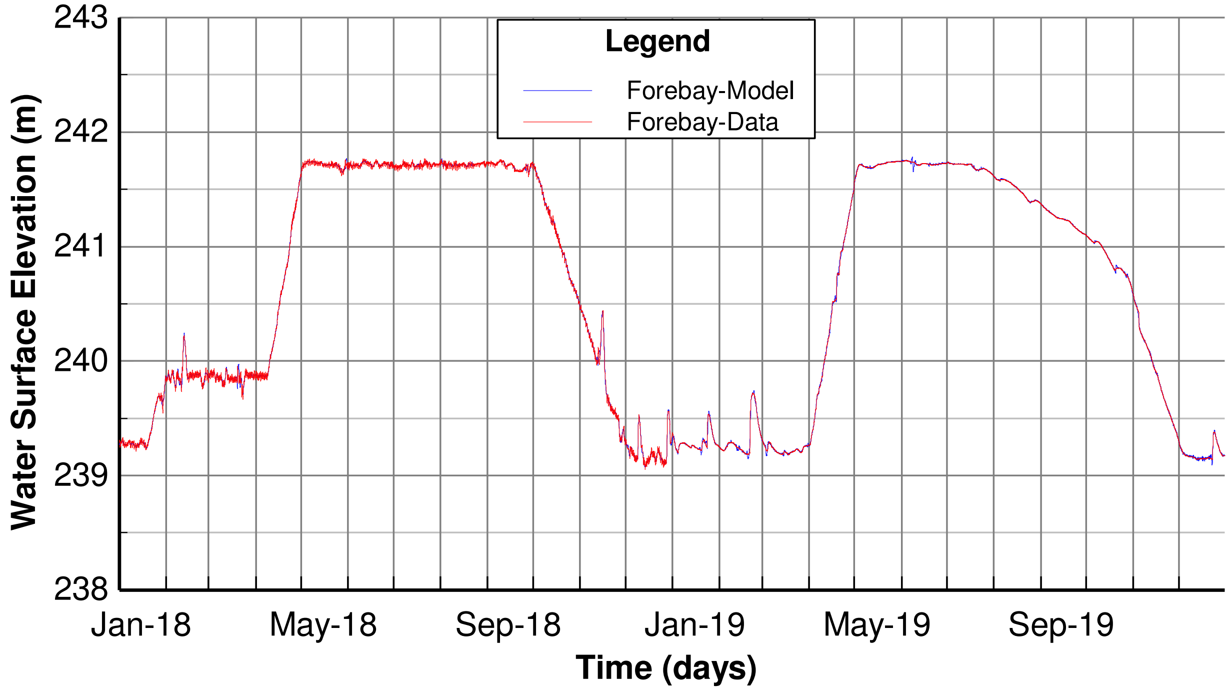

Figure 6-1 Calibration Plot of Water Surface Elevation at APC Forebay Station

6.2 Lake Stage Validation

The Lake Harris EFDC model was validated for the 3-year time period from 1 January 2015 to 31 December 2017. The validation plot for surface water elevation at the APC forebay station (NAVD88) is shown in Figure 6-2. The summary of model performance statistics between observed and simulated water surface elevation for the validation period is given in Table 6-1. Simulated lake elevation was again in excellent agreement with the measured lake elevation for the entire validation period. The simulated average stage was 240.606 m, which, again, was very close to the averaged observed stage of 240.603 m. The calculated RMS error was 0.019 m (Table 6-1).

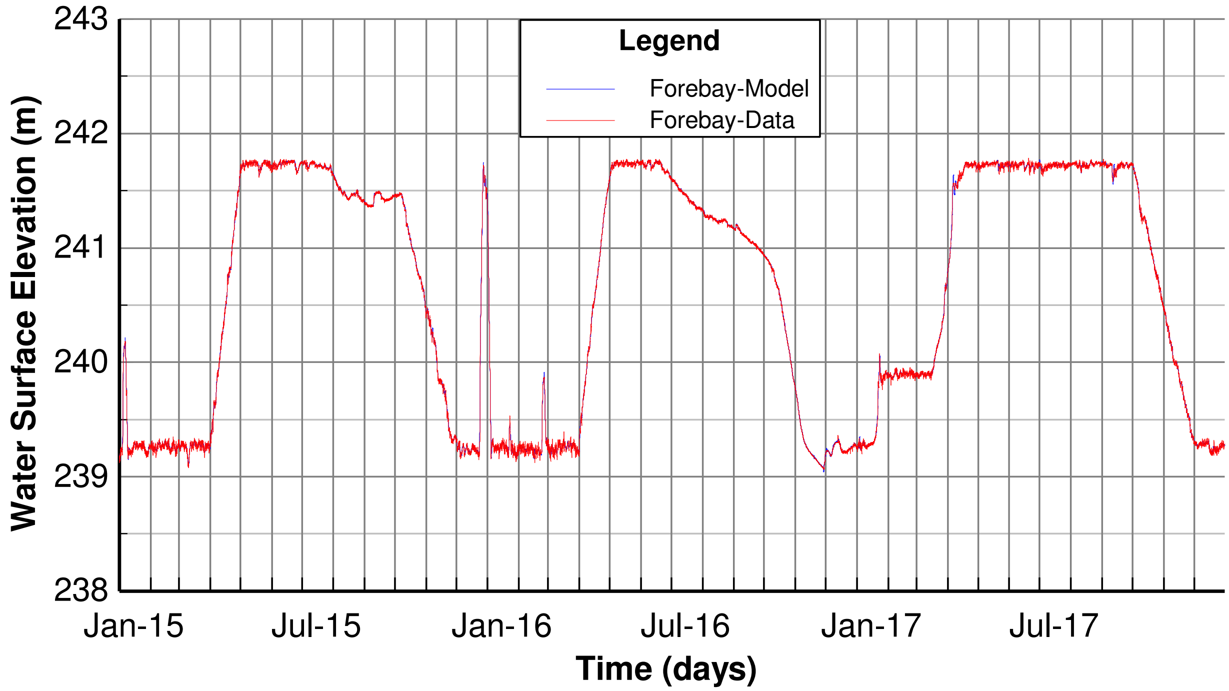

Figure 6-2 Validation Plot of Water Surface Elevation at APC Forebay Station

7. Water Quality Model Calibration and Validation

Prior to model calibration and validation, a one-year model spin-up run was conducted to eliminate the impact of initial water quality conditions on model results. Calibration of the lake model is demonstrated with model-data comparisons for water temperature, total suspended solids, secchi depth, dissolved oxygen, nutrients, and algae biomass as station time series. Vertical profiles are presented for water temperature and dissolved oxygen.

Observed data collected near the surface was compared to lake model results for the EFDC surface layer and data collected near the bottom was compared to model results for the EFDC bottom layer. Observed data at the bottom layer was available only for water temperature and dissolved oxygen (DO). Station results are presented in this section to show model calibration and validation for the selected water quality stations in Lake Harris as shown in Figure 4-1.

During the calibration and validation periods, the availability of observed data sets were very limited. In many cases the sample size of the observed data set for either the calibration period or validation period was less than 10 records. Hence, summary statistics for model performance were computed for the entire calibraton and validation periods. Model-data comparison plots are, however, shown separately for the calibration and validation periods.

7.1 Water Temperature Calibration and Validation

Procedures used to calibrate water temperature included: (1) check the boundary conditions assigned for water temperature; (2) check the meteorological data to make sure that the solar radiation data are in a reasonable range; and (3) adjust the key parameters within reasonable ranges to best match the observed water temperature data.

Modeled water temperature results are presented for comparison to the observed data for the surface layer and bottom layer. Water temperature calibration plots at the APC forebay station are shown in Figure 7-1 and Figure 7-2 and water temperature validation plots at the APC forebay station are shown in Figure 7-3 and Figure 7-4. The water temperature surface and bottom layer calibration and validation plots at the ADEM stations RLHR-2, RLHR-3, RLHR-4, RLHR-5, and RLHR-6 are presented in Appendix A. Summary statistics for model performance for water temperature are given in Table 7-1.

As can be seen in the model-data plots, the model results for the surface and bottom layer are in very good agreement with measured water temperature for both the calibration and validation periods. Modeled water temperature closely followed the seasonal trends of the observed data in both the surface and bottom layers. The calculated RMS errors ranged from 0.71 ºC in the bottom layer for station RLHR-4 to 1.98 ºC in the bottom layer for station RLHR-3, as shown in Table 7-1.

Table 7-1 Hydrodynamic Model Performance Statistics for Time Series of Water Temperature (℃)

Station ID	Layer	Starting	Ending	# Pairs	RMS	Data Average	Model Average
Forebay	Surface	5/25/2016 13:59	10/2/2019 13:15	37	1.35	25.00	24.53
Forebay	Bottom	5/25/2016 13:59	10/2/2019 13:15	37	0.96	10.18	9.44
RLHR-2	Surface	4/29/2015 7:47	10/24/2018 9:51	14	1.02	26.20	26.25
RLHR-2	Bottom	4/29/2015 7:47	10/24/2018 9:51	11	0.84	9.26	9.05
RLHR-3	Surface	4/29/2015 8:25	10/24/2018 10:42	16	1.23	24.72	25.22
RLHR-3	Bottom	4/29/2015 8:25	10/24/2018 10:42	11	1.98	23.59	22.05
RLHR-4	Surface	4/29/2015 9:35	10/24/2018 11:26	14	1.03	26.40	26.67
RLHR-4	Bottom	4/29/2015 9:35	10/24/2018 11:26	13	0.71	12.68	13.00
RLHR-5	Surface	4/29/2015 9:56	10/24/2018 11:46	14	1.05	26.52	27.02
RLHR-5	Bottom	4/29/2015 9:56	10/24/2018 11:46	9	1.74	17.23	18.64
RLHR-6	Surface	4/29/2015 9:05	10/24/2018 10:15	14	1.03	26.16	26.26
RLHR-6	Bottom	4/29/2015 9:05	10/24/2018 10:15	12	1.61	17.45	16.75

Vertical profiles comparisons of water temperature at the APC forebay station are shown in Figure 7-5 through Figure 7-9 while comparisons of the water temperature vertical profiles at the ADEM stations RLHR-2, RLHR-3, RLHR-4, RLHR-5, and RLHR-6 are given in Appendix B. Vertical profiles show the model results extracted as "snapshots" for a time interval of the simulation that matches the observed date and time records for the hydrographic survey profile. As can be seen in the model-data vertical profile plots, the simulated water temperature profiles are in excellent agreement with the observed temperature measurements in most cases. Summary statistics for model performance of the set of water temperature vertical profiles are given in Table 7-2. Calculated RMS errors ranged from 0.95 ºC at station RLHR-4 to 1.17 ºC at APC forebay station, as shown in Table 7-2.

Table 7-2 Hydrodynamic Model Performance Statistics for Vertical Profiles of Water Temperature (℃)

Station ID	Starting	Ending	# Pairs	RMS	Data Average	Model Average
Forebay	5/25/2016	10/2/2019	518	1.17	17.74	17.73
RLHR-2	4/29/2015	10/24/2018	413	1.03	17.54	17.49
RLHR-3	4/29/2015	10/24/2018	161	1.08	24.06	23.73
RLHR-4	4/29/2015	10/24/2018	298	0.95	20.68	20.82
RLHR-5	4/29/2015	10/24/2018	207	1.10	23.16	23.64
RLHR-6	4/29/2015	10/24/2018	220	0.96	22.79	22.62

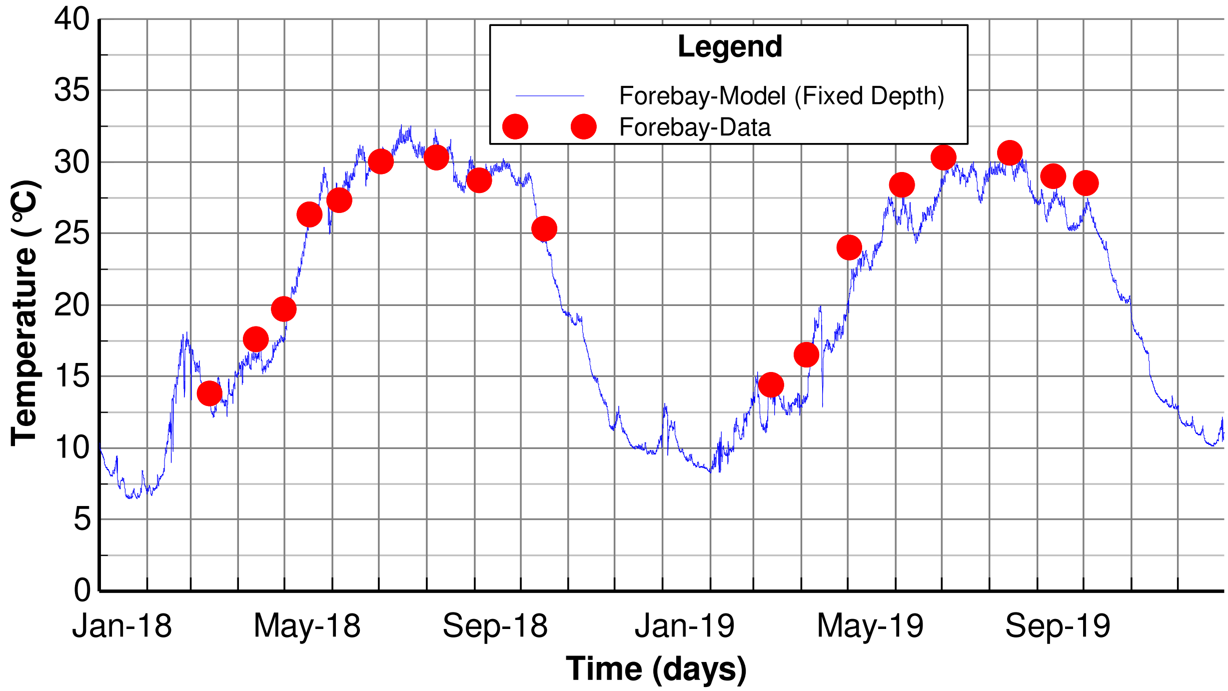

Figure 7-1 Calibration Plot of Surface Layer Water Temperature at APC Forebay Station

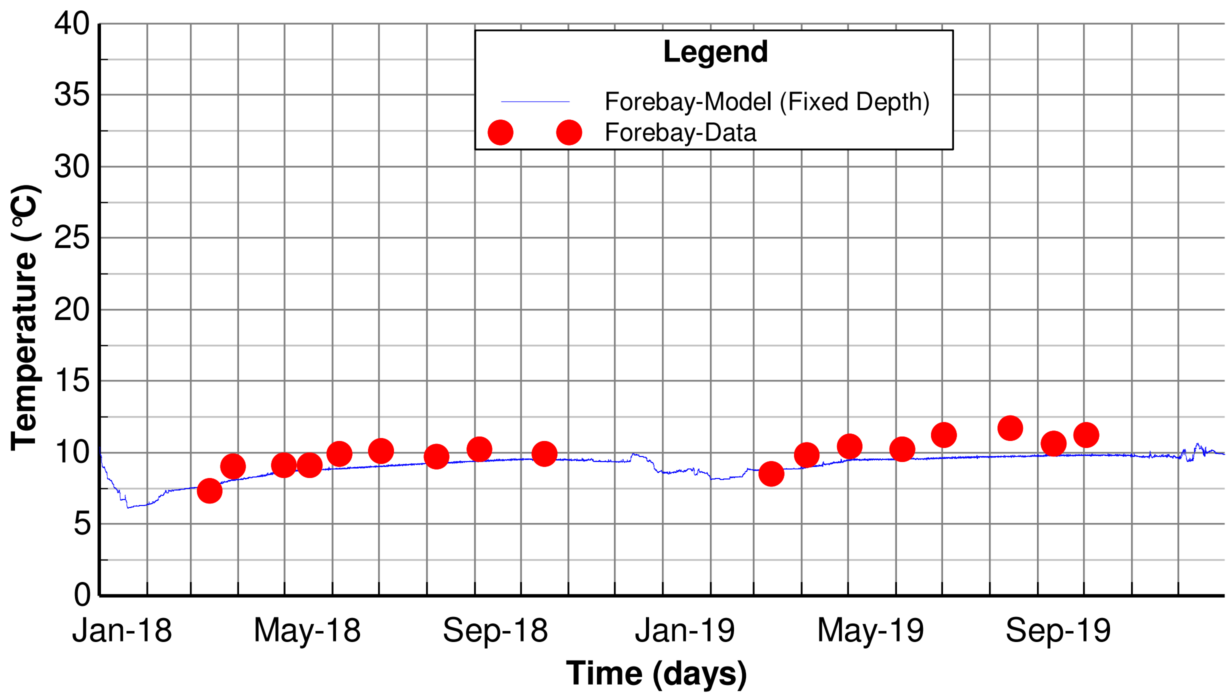

Figure 7-2 Calibration Plot of Bottom Layer Water Temperature at APC Forebay Station

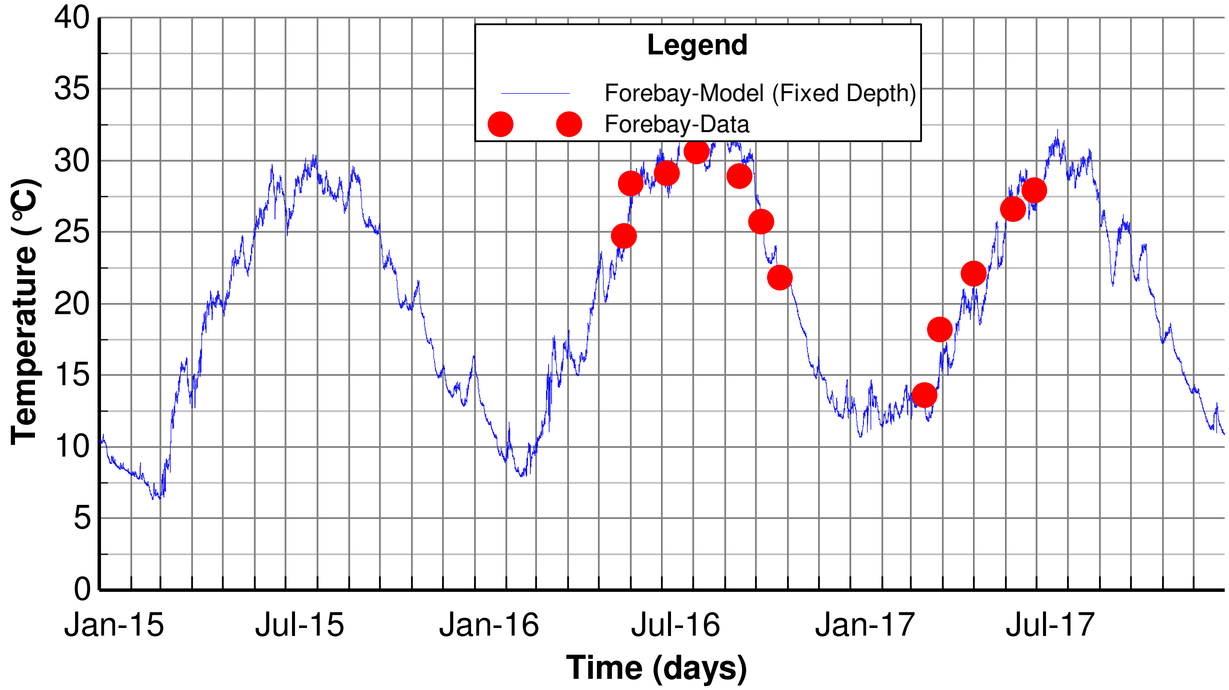

Figure 7-3 Validation Plot of Surface Layer Water Temperature at APC Forebay Station

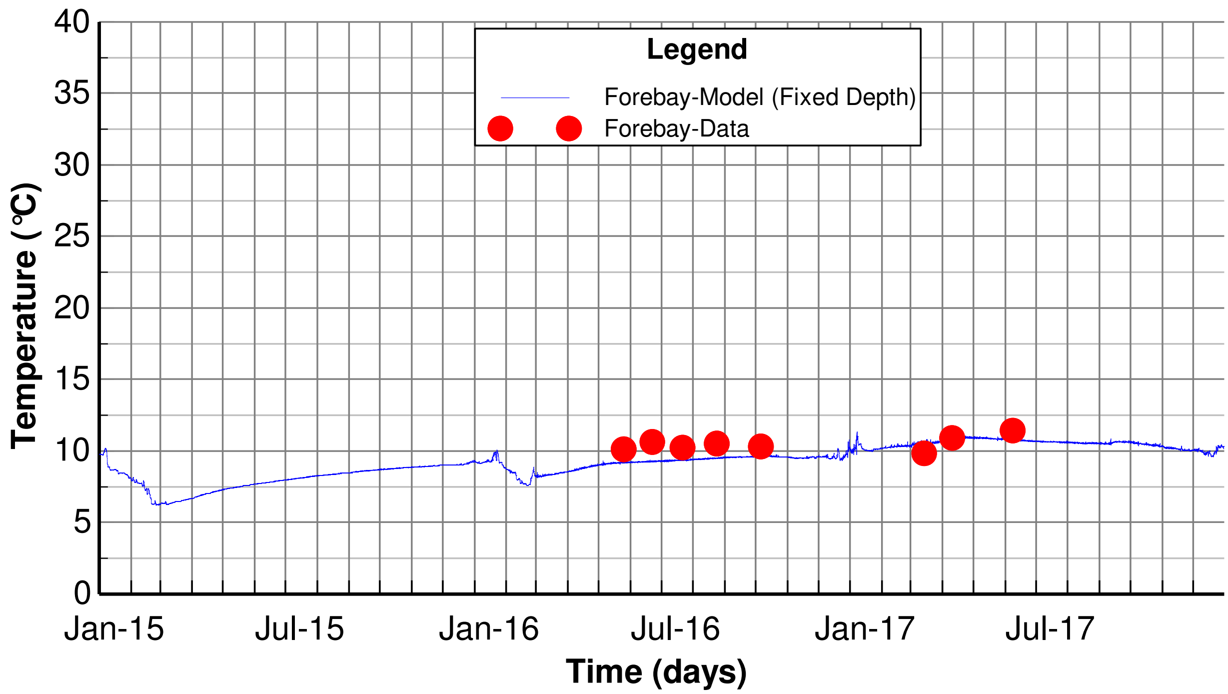

Figure 7-4 Validation Plot of Bottom Layer Water Temperature at APC Forebay Station

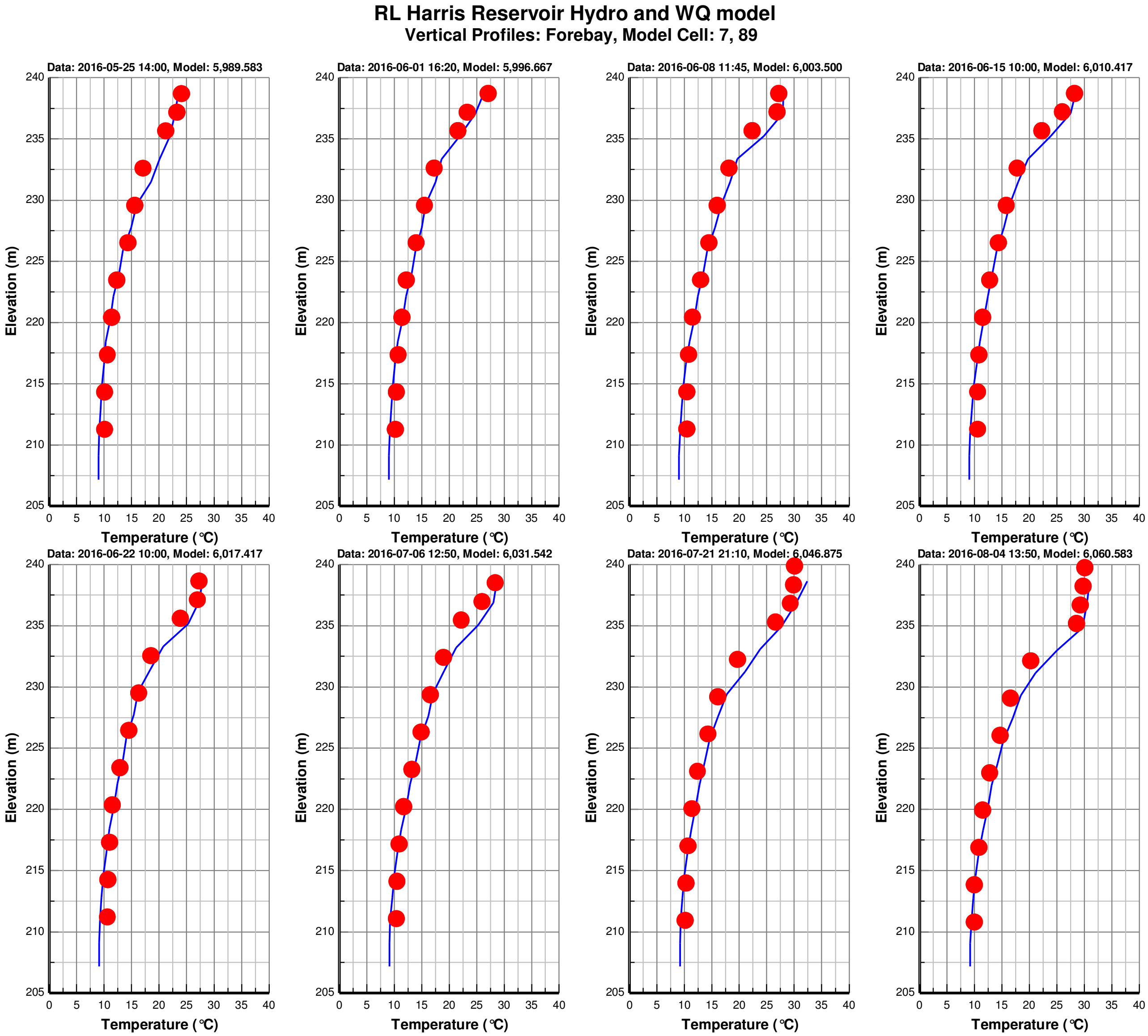

Figure 7-5 Water Temperature Vertical Profile Comparison Plot at APC Forebay Station (25 May 2016 – 4 August 2016)

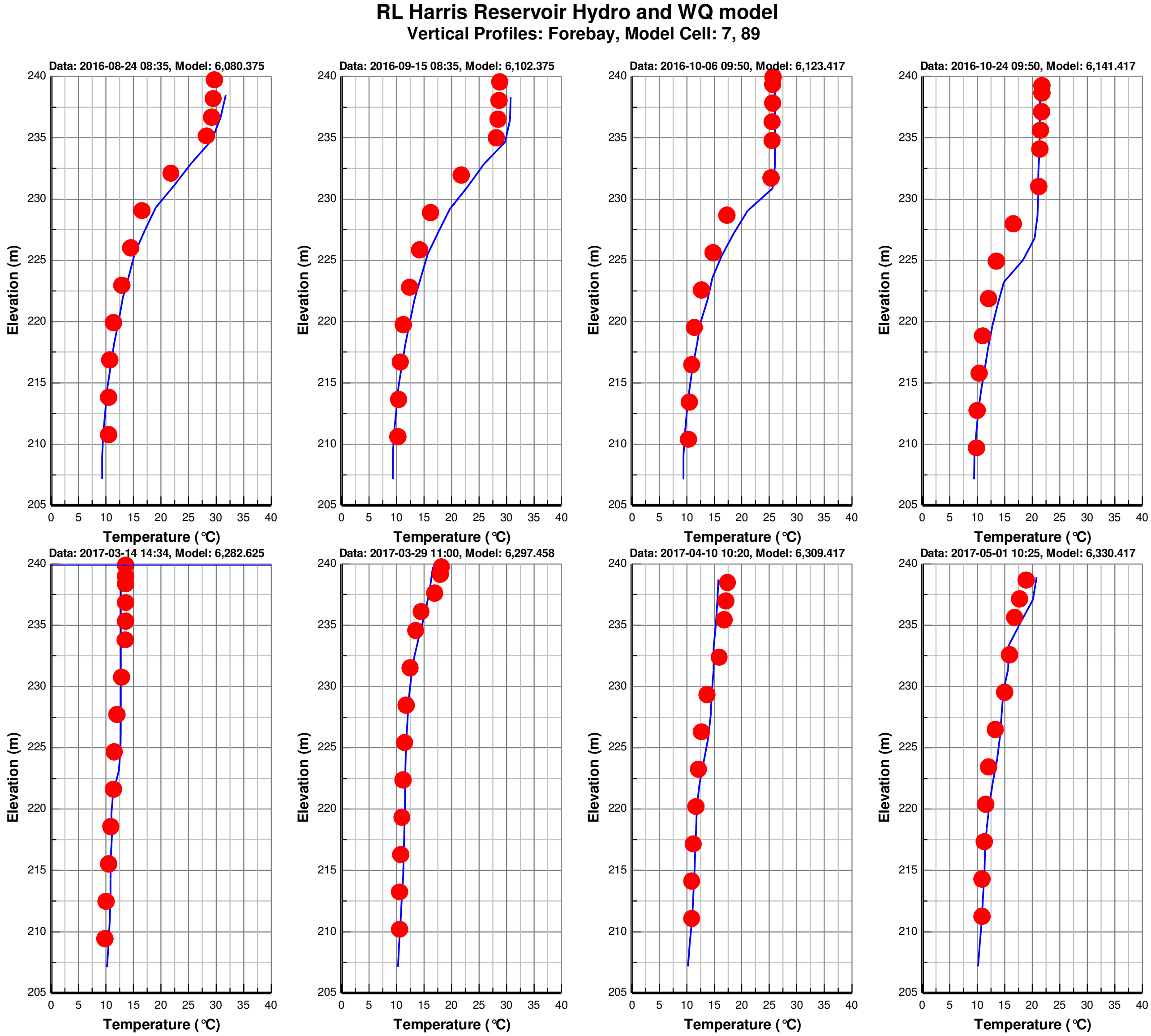

Figure 7-6 Water Temperature Vertical Profile Comparison Plot at APC Forebay Station (24 August 2016 – 1 May 2017)

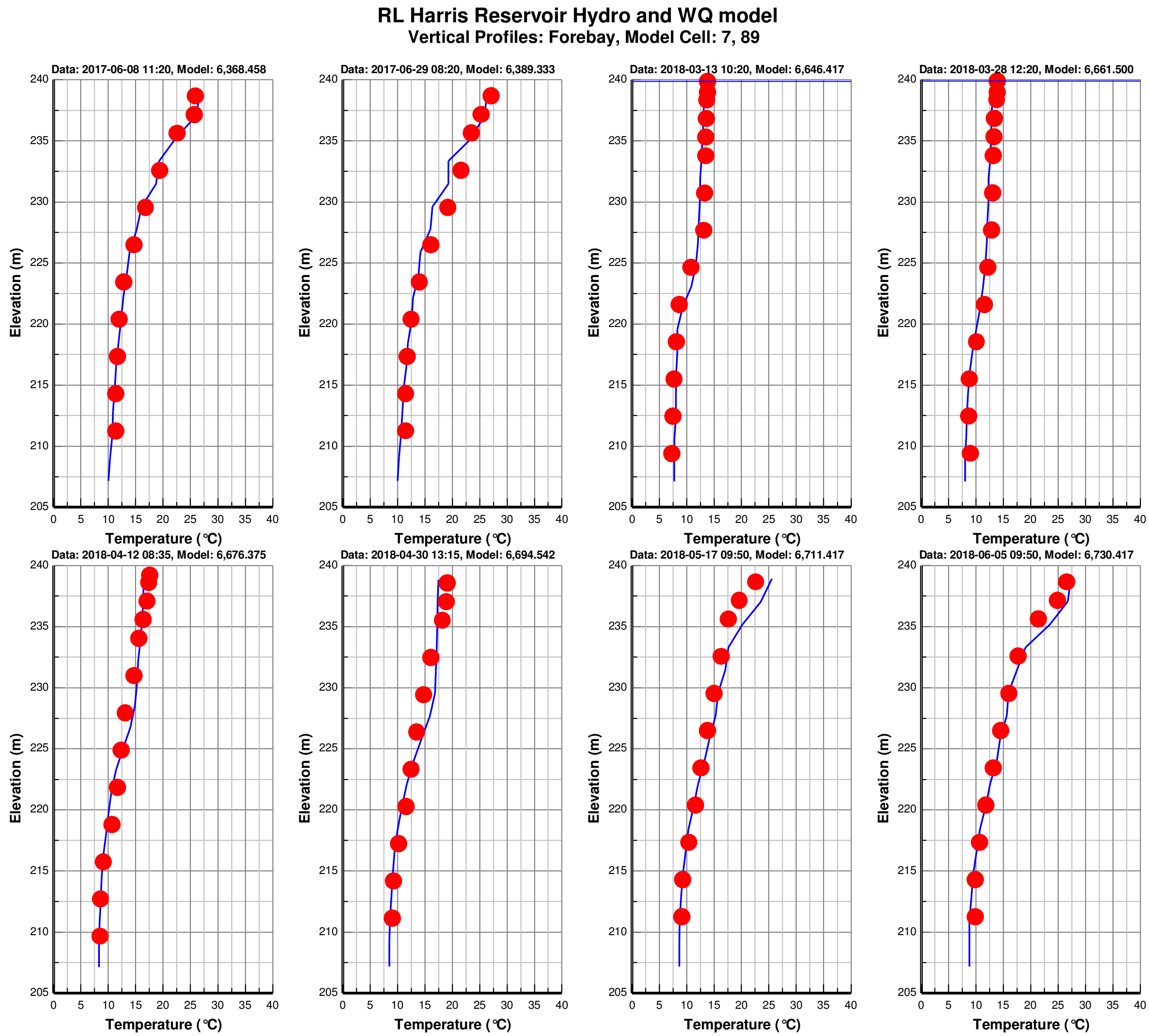

Figure 7-7 Water Temperature Vertical Profile Comparison Plot at APC Forebay Station (8 June 2017 – 5 June 2018)

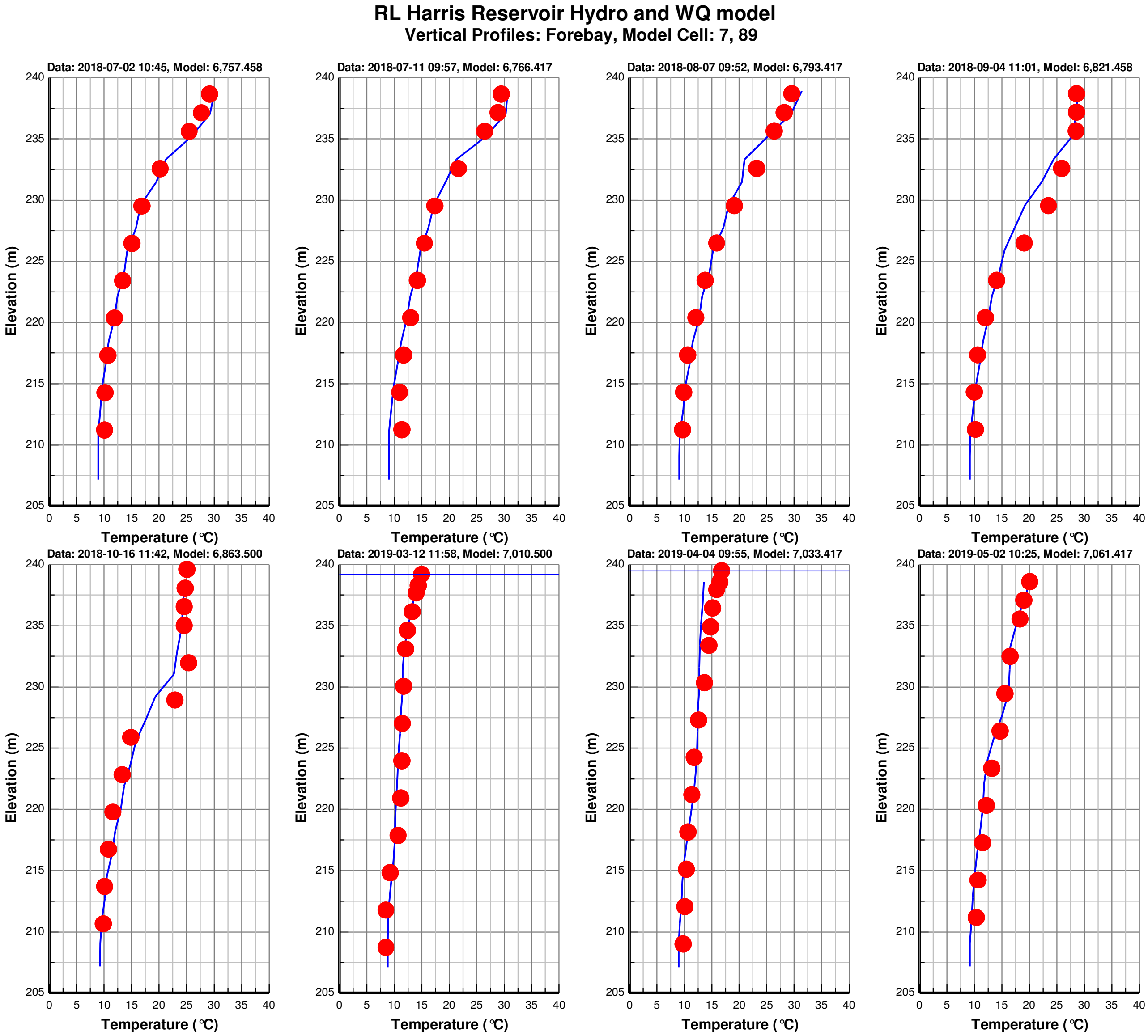

Figure 7-8 Water Temperature Vertical Profile Comparison Plot at APC Forebay Station (2 July 2018 – 2 May 2019)

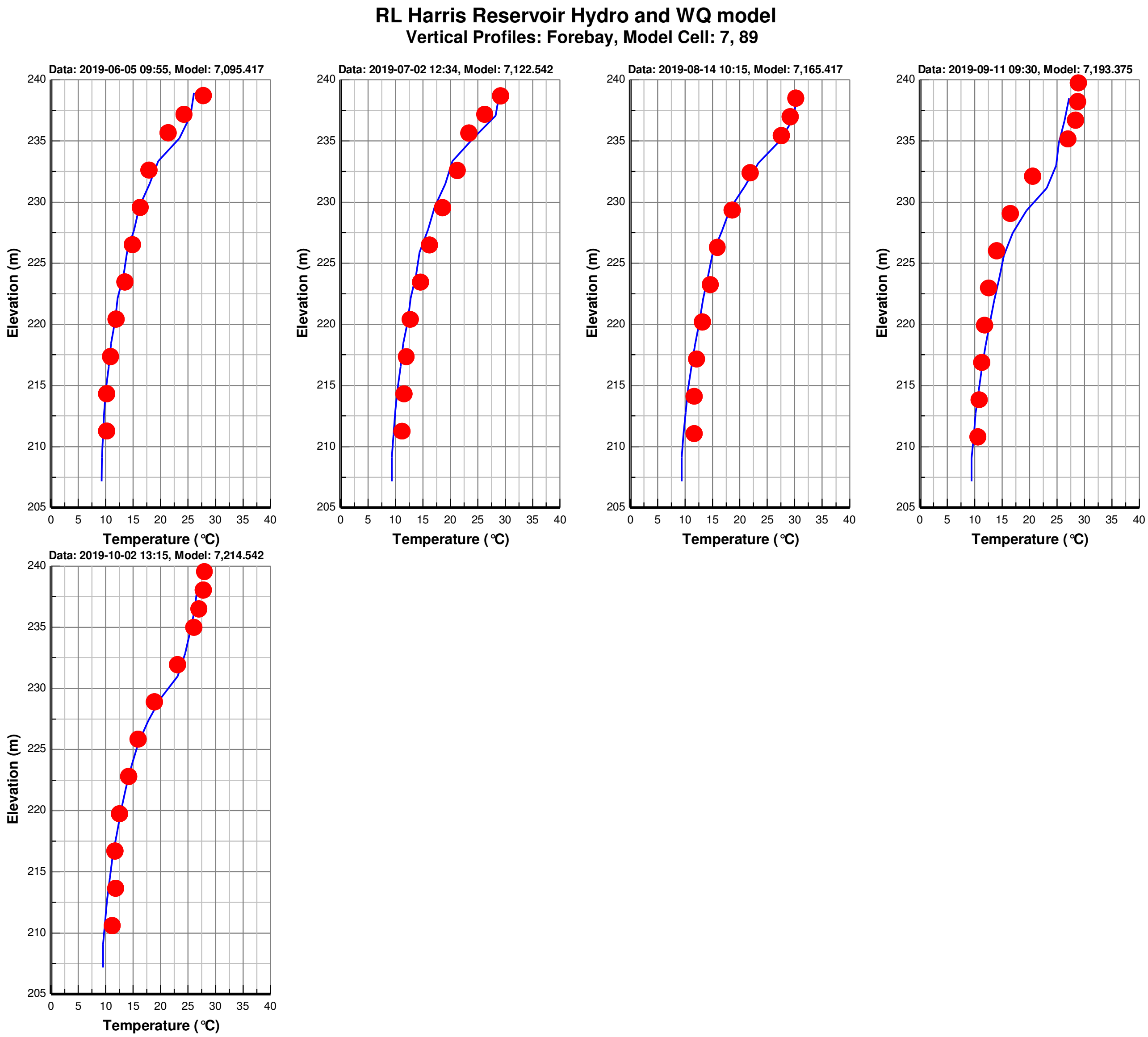

Figure 7-9 Water Temperature Vertical Profile Comparison Plot at APC Forebay Station (5 June 2019 – 2 October 2019)

7.2 Total Suspended Solids Calibration and Validation

Procedures used to calibrate total suspended solids included: (1) check the TSS boundary conditions; and (2) adjust the key parameters within reasonable ranges to best match the observed data.

As observed TSS data was available only for the surface layer, modeled TSS results were presented for comparison to the observed data only for the surface layer. Total suspended solids calibration and validation plots at ADEM Station RLHR-1 are given in Figure 7-10 and Figure 7-11, respectively. Total suspended solids calibration and validation plots at ADEM stations RLHR-2, RLHR-3, RLHR-4, RLHR-5, and RLHR-6 are given in Appendix A. Summary statistics for model performance of total suspended solids are given in Table 7-3.

As can be seen in these model-data plots, the model results for the surface layer are in reasonable agreement with observed TSS. The calculated RMS errors for model performance ranged from 1.91 mg/L at station RLHR-1 to 7.01 mg/L at station RLHR-6. In most of the cases, the Lake Harris EFDC model results overestimated the observed data with the exception of station RLHR-1 (Table 7-3).

The purpose of the total suspended solids calibration was to simulate a reasonable amount of suspended solids in the water column to ensure that light extinction due to inorganic suspended solids provides a good representation of the effects of light attenuation on both water temperature and water clarity. As suspended solids were reasonably well simulated and the model performance of water temperature was very good, the sediment transport model results based on TSS calibration were deemed to be acceptable.

Table 7-3 Model Performance Statistics for Total Suspended Solids (mg/L)

Station ID	Layer	Starting	Ending	# Pairs	RMS	Data Average	Model Average
RLHR-1	Surface	4/29/2015 7:05	10/24/2018 9:11	14	1.91	1.86	0.65
RLHR-2	Surface	4/29/2015 7:47	10/24/2018 9:51	14	6.27	1.96	3.59
RLHR-3	Surface	4/29/2015 8:25	10/24/2018 10:42	15	9.87	4.93	10.17
RLHR-4	Surface	4/29/2015 9:35	10/24/2018 11:26	14	6.04	2.61	4.17
RLHR-5	Surface	4/29/2015 9:56	10/24/2018 11:46	14	6.89	2.75	4.13
RLHR-6	Surface	4/29/2015 9:05	10/24/2018 10:15	14	7.01	2.50	4.89

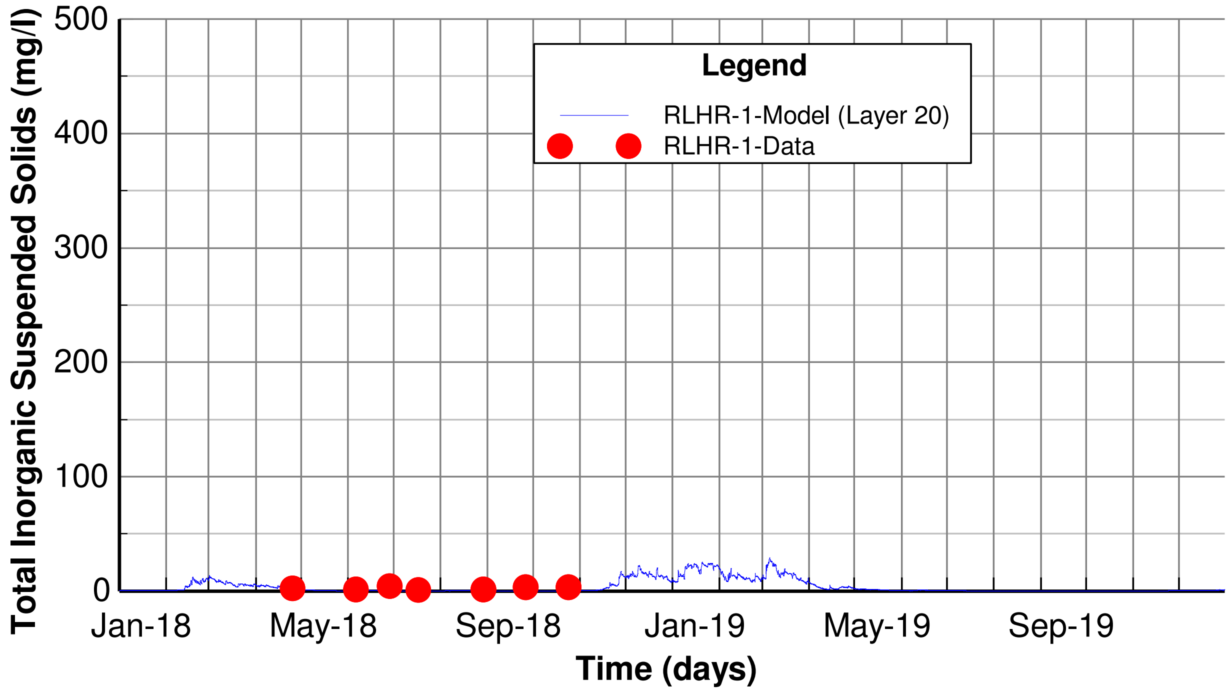

Figure 7-10 Calibration Plot of Surface Layer Total Suspended Solids at Station RLHR-1

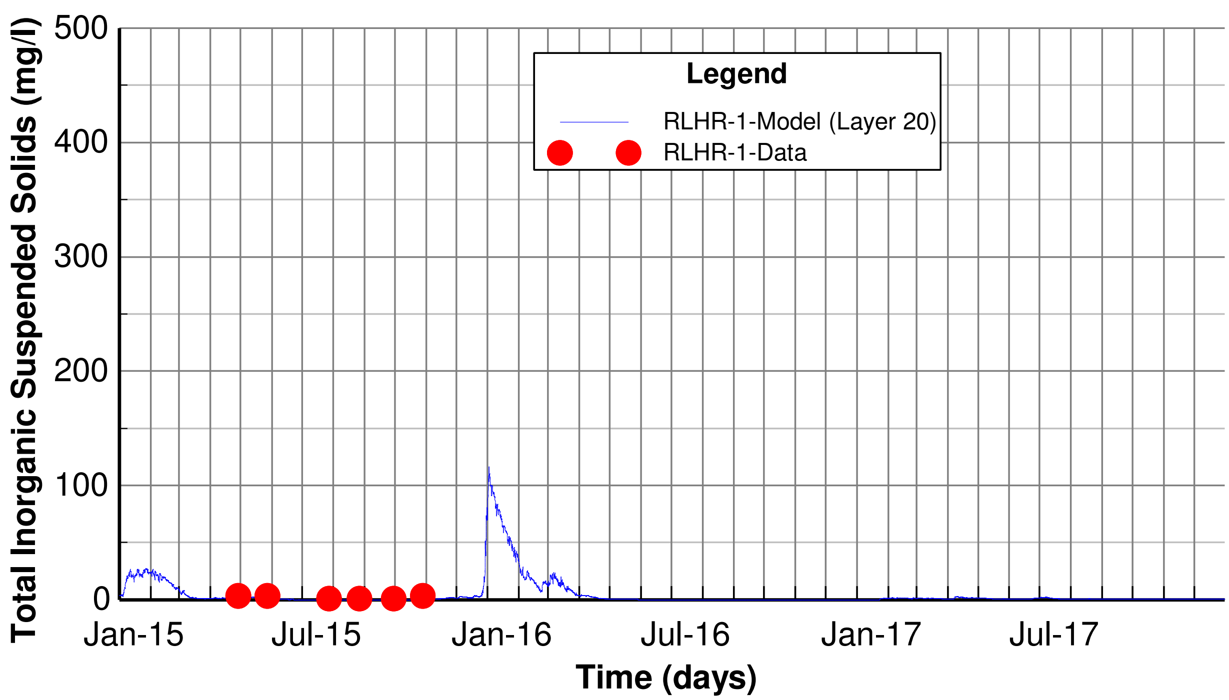

Figure 7-11 Validation Plot of Surface Layer Total Suspended Solids at Station RLHR-1

7.3 Secchi Depth Calibration and Validation

Secchi depth provides simple yet very meaningful measurements to characterize water clarity in a waterbody such as Lake Harris. In the EFDC model, Secchi depth is a derived output variable that represents the overall effect of light extinction by algal biomass (as chlorophyll a) and the concentrations of inorganic suspended solids, POC, DOC, and background effects of light attenuation not related to these state variables. In the EFDC hydrodynamic and water quality model, water quality-dependent light extinction in the water column also strongly impacts the simulation of water temperature in the hydrodynamic model.

Modeled Secchi depth results compared to the observed data sets collected during the calibration and validation periods at ADEM station RLHR-1 are shown in Figure 7-12 and Figure 7-13. Secchi depth calibration and validation plots at ADEM stations RLHR-2, RLHR-3, RLHR-4, RLHR-5, and RLHR-6 are given in Appendix A. Summary statistics for model performance of Secchi depth are given in Table 7-4.

As can be seen in the model-observed data plots, the modeled Secchi depth results fell within the range of the measured Secchi depth records. The calculated RMS errors ranged from 0.30 m at ADEM station RLHR-3 to 0.67 m at ADEM station RLHR-1. In addition, as suspended solids and Secchi depth were both reasonably well simulated and the model performance of water temperature was very good, it was deemed that the Secchi depth simulation provided an acceptable representation of light attenuation in Lake Harris.

Table 7-4 Model Performance Statistics for Secchi Depth (meter)

Station ID	Layer	Starting	Ending	# Pairs	RMS	Data Average	Model Average
RLHR-1	Surface	4/29/2015 7:05	10/24/2018 9:11	14	0.67	2.69	2.53
RLHR-2	Surface	4/29/2015 7:47	10/24/2018 9:51	14	0.55	2.19	1.81
RLHR-3	Surface	4/29/2015 8:25	10/24/2018 10:42	15	0.30	1.34	1.16
RLHR-4	Surface	4/29/2015 9:35	10/24/2018 11:26	14	0.50	1.99	1.72
RLHR-5	Surface	4/29/2015 9:56	10/24/2018 11:46	14	0.47	1.82	1.50
RLHR-6	Surface	4/29/2015 9:05	10/24/2018 10:15	14	0.39	1.96	1.70

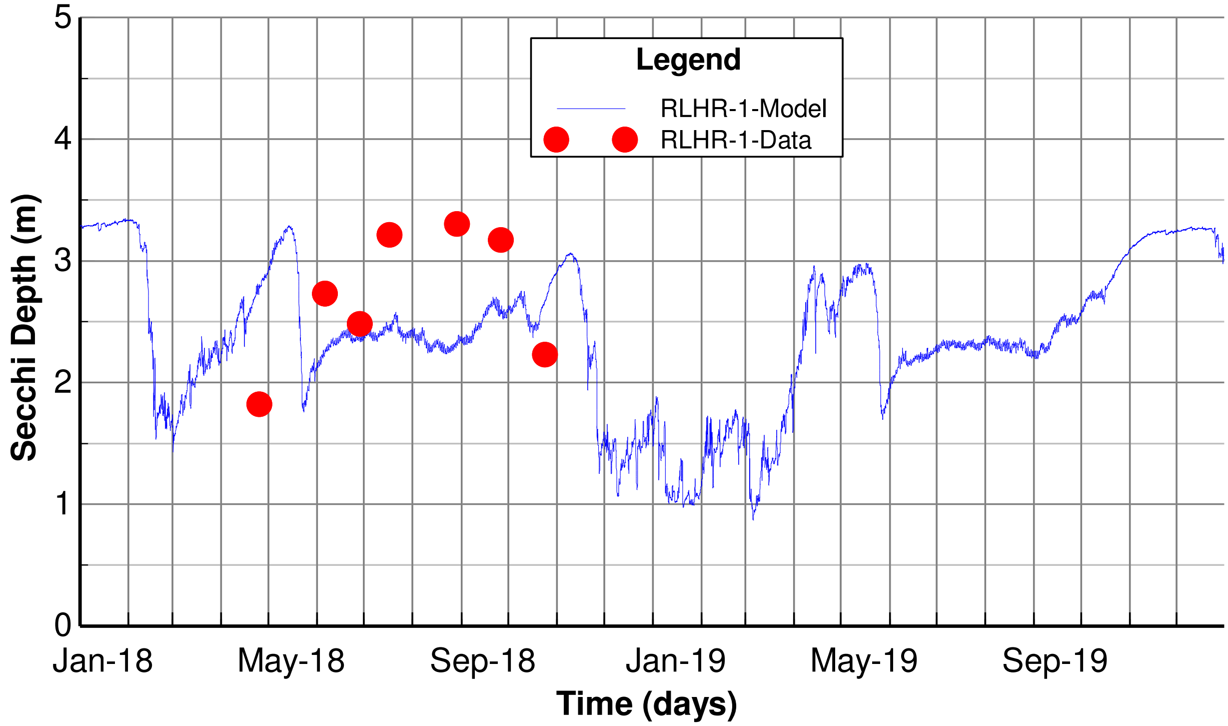

Figure 7-12 Calibration Plot of Modeled and Observed Secchi Depth at Station RLHR-1

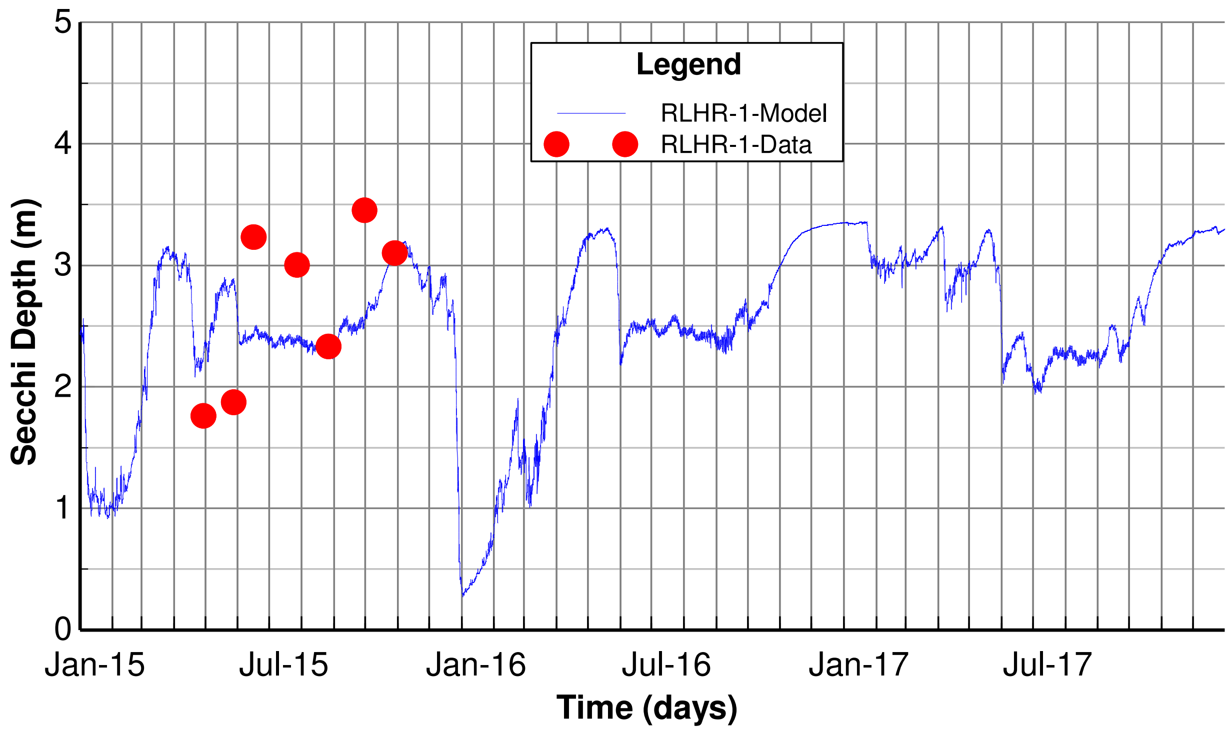

Figure 7-13 Validation Plot of Modeled and Observed Secchi Depth at Station RLHR-1

7.4 Dissolved Oxygen Calibration and Validation

Procedures used to calibrate dissolved oxygen included: (1) check the dissolved oxygen boundary conditions asigned for the EFDC model; and (2) adjust the key parameters within reasonable ranges to obtain the best match with the observed data.

Modeled oxygen results are presented for comparison to the observed data for the surface layer and bottom layer. Dissolved oxygen time series calibration plots at the APC forebay station are shown in Figure 7-14 and Figure 7-15, respectively. Dissolved oxygen time series validation plots at the APC forebay station are shown in Figure 7-16 and Figure 7-17, respectively. The dissolved oxygen surface and bottom layer calibration and validation plots at ADEM stations RLHR-2, RLHR-3, RLHR-4, RLHR-5, and RLHR-6 are given in Appendix A. In general, the model results for both the surface and bottom layers followed the seasonal patterns of the measured dissolved oxygen data reasonably well as can be seen in the model-data plots.

The model results for calibration and validation of the bottom layer, for the most part, demonstrate good agreement with the observed seasonal depletion of dissolved oxygen to summer hypoxic and anoxic levels in response to water column stratification. The exception to the good agreeement, however, are the model validation results for spring-summer months of 2017 where the model results, although decreasing because of stratification,.are about 2-3 mg/L higher than the observed oxygen measurements (see Figure 7-17). The over-estimation of bottom DO concentrations in 2017 might be caused by the APC operating procedures that were implemented to deal with the the drought conditions of 2016 (annual rainfall of 37.21 inch).

Following the drought of 2016, Lake Harris was filled 2 ft higher than the normal operation schedule starting in mid-January 2017 which led to reduced dam release discharges in March. Full summer pool elevation (793 ft NGVD29) was then reached almost a month early in 2017. This could have ended up storing more oxygen-consuming organic matter that would have been discharged downstream out of the lake during a normal spring. In addition, the Lake EFDC sediment flux model used the same assigned monthly SOD values for each year of the calibration and validation periods, as discussed in Section 3.2. This approach was considered to be reasonable because observed sediment bed chemistry data was not available for application of the fully coupled water column-bed sediment diagenesis module. Confirmation of the this empirical approach was demonstrated with the EFDC model results for bottom DO concentrations that compared very well with observations for the 2018-2019 calibration period and the 2015-2016 validation period, as shown in Figure 7-15 and Figure 7-17.

Summary statistics for model performance for dissolved oxygen are given in Table 7-5. The calculated RMS errors ranged from 0.39 mg/L at the bottom layer of ADEM station RLHR-4 to 2.65 mg/L at the bottom layer of ADEM station RLHR-5, as shown in Table 7-5. If the 2017 observed data was excluded from the model performance analysis, the calculated RMS error for bottom DO at APC forebay station would have decreased considerably from 1.66 to 1.04 mg/L.

Table 7-5 Model Performance Statistics for Time Series of Dissolved Oxygen (mg/L)

Station ID	Layer	Starting	Ending	# Pairs	RMS	Data Average	Model Average
Forebay	Surface	5/25/2016 13:59	10/2/2019 13:15	37	0.82	8.83	8.46
Forebay	Bottom	5/25/2016 13:59	10/2/2019 13:15	37	1.66	2.00	2.63
RLHR-2	Surface	4/29/2015 7:47	10/24/2018 9:51	14	1.04	8.12	7.94
RLHR-2	Bottom	4/29/2015 7:47	10/24/2018 9:51	11	0.42	0.63	0.48
RLHR-3	Surface	4/29/2015 8:25	10/24/2018 10:42	16	1.00	8.19	8.67
RLHR-3	Bottom	4/29/2015 8:25	10/24/2018 10:42	11	1.64	4.48	4.65
RLHR-4	Surface	4/29/2015 9:35	10/24/2018 11:26	14	1.16	8.55	8.08
RLHR-4	Bottom	4/29/2015 9:35	10/24/2018 11:26	13	0.39	0.28	0.00
RLHR-5	Surface	4/29/2015 9:56	10/24/2018 11:46	14	1.24	8.71	8.08
RLHR-5	Bottom	4/29/2015 9:56	10/24/2018 11:46	9	2.65	1.27	1.94
RLHR-6	Surface	4/29/2015 9:05	10/24/2018 10:15	14	0.82	8.45	8.09
RLHR-6	Bottom	4/29/2015 9:05	10/24/2018 10:15	12	1.79	1.57	1.88

The model-data comparisons for dissolved oxygen vertical profiles at the APC forebay station are given in Figure 7-18 through Figure 7-22. The comparisons for vertical profiles of dissolved oxygen at ADEM stations RLHR-2, RLHR-3, RLHR-4, RLHR-5, and RLHR-6 are given in Appendix B. Vertical profiles show the model results extracted as “snapshots” for a time interval of the simulation that matches the observed date and time records for the hydrographic survey profile. As can be seen in these model-data plots of vertical profiles, the model results were reasonably consistent with the observed dissolved oxygen in most cases, especially for the well-mixed winter conditions. Similar to the time series plot comparison of bottom DO, the vertical profile comparisdn of DO in 2017 was not as good as the other years. Summary statistics for model performance of the vertical profiles for dissolved oxygen are given in Table 7-6. The calculated RMS errors ranged from 1.45 mg/L at ADEM station RLHR-2 to 2.14 mg/L at ADEM station RLHR-5, as shown in Table 7-6.

Table 7-6 Model Performance Statistics for Vertical Profiles of Dissolved Oxygen (mg/L)

Station ID	Starting	Ending	# Pairs	RMS	Data Average	Model Average
Forebay	5/25/2016	10/2/2019	518	2.06	5.23	6.28
RLHR-2	4/29/2015	10/24/2018	413	1.45	3.28	3.91
RLHR-3	4/29/2015	10/24/2018	161	1.80	6.63	7.96
RLHR-4	4/29/2015	10/24/2018	298	1.73	3.57	4.43
RLHR-5	4/29/2015	10/24/2018	207	2.14	4.77	5.89
RLHR-6	4/29/2015	10/24/2018	220	1.27	5.64	5.89

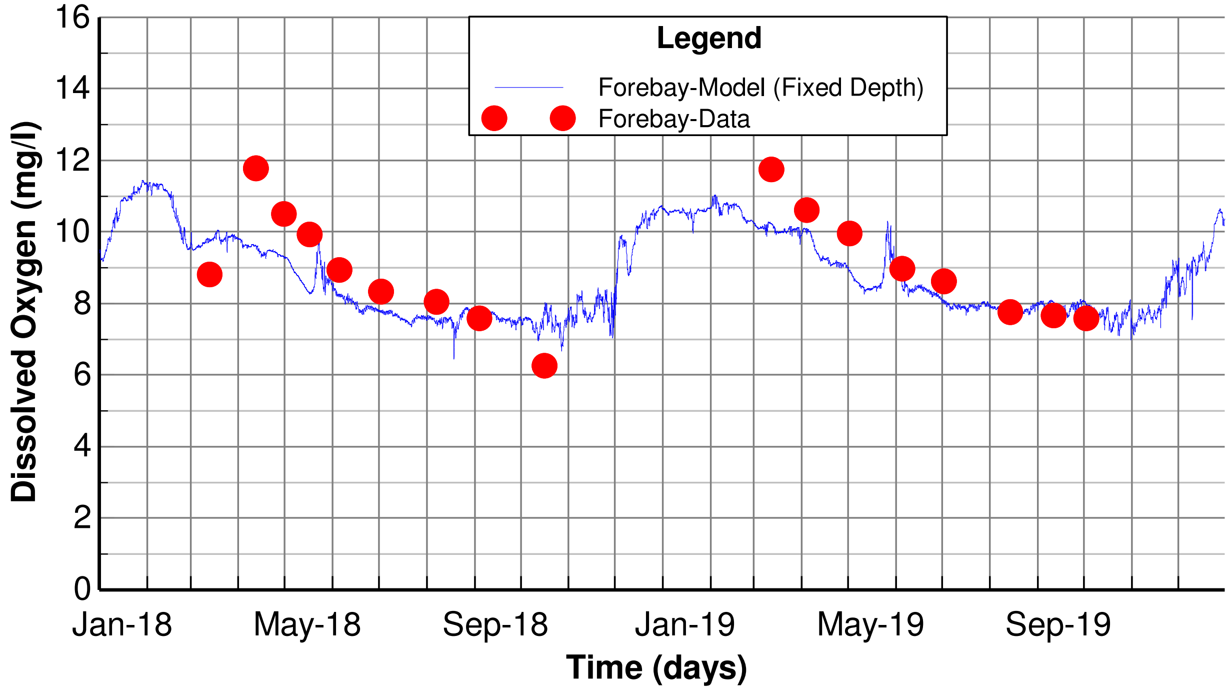

Figure 7-14 Calibration Plot of Surface Layer Dissolved Oxygen at APC Forebay Station

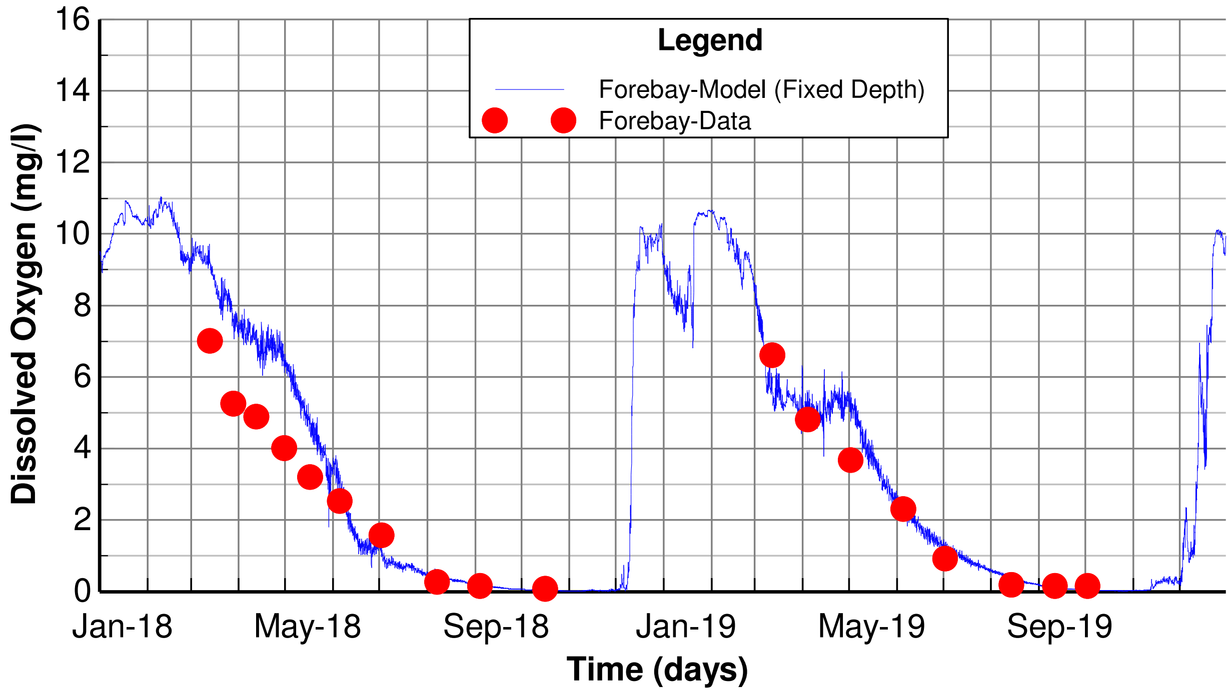

Figure 7-15 Calibration Plot of Bottom Layer Dissolved Oxygen at APC Forebay Station.

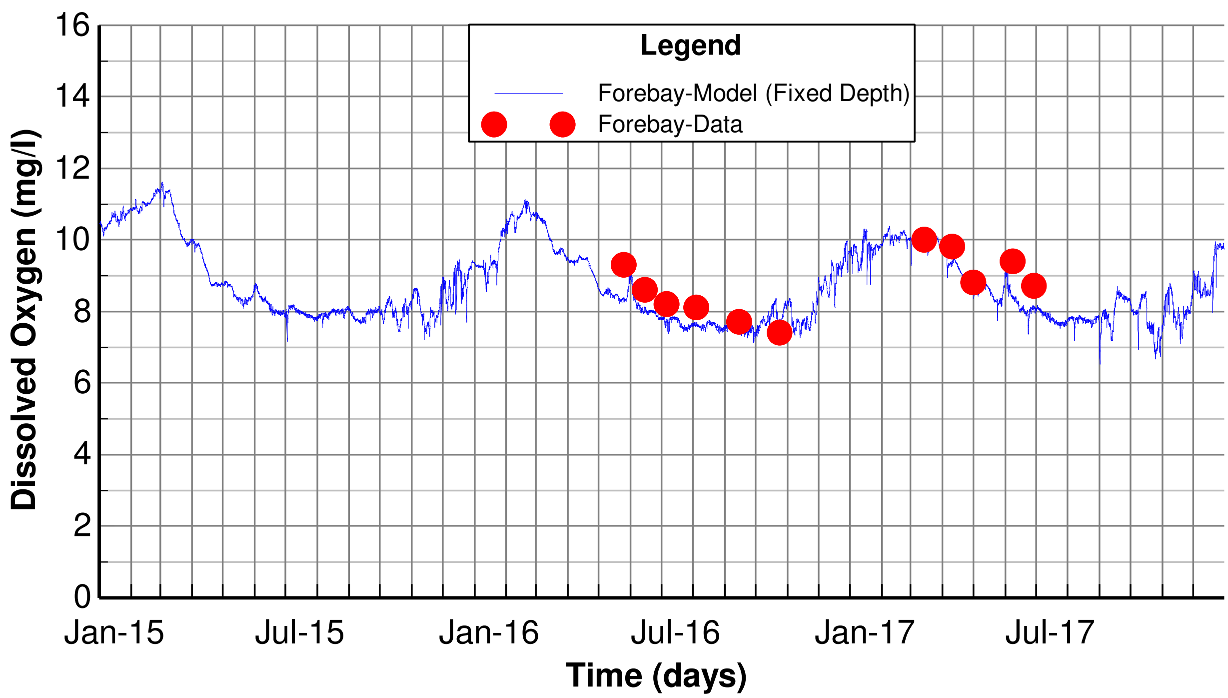

Figure 7-16 Validation Plot of Surface Layer Dissolved Oxygen at APC Forebay Station

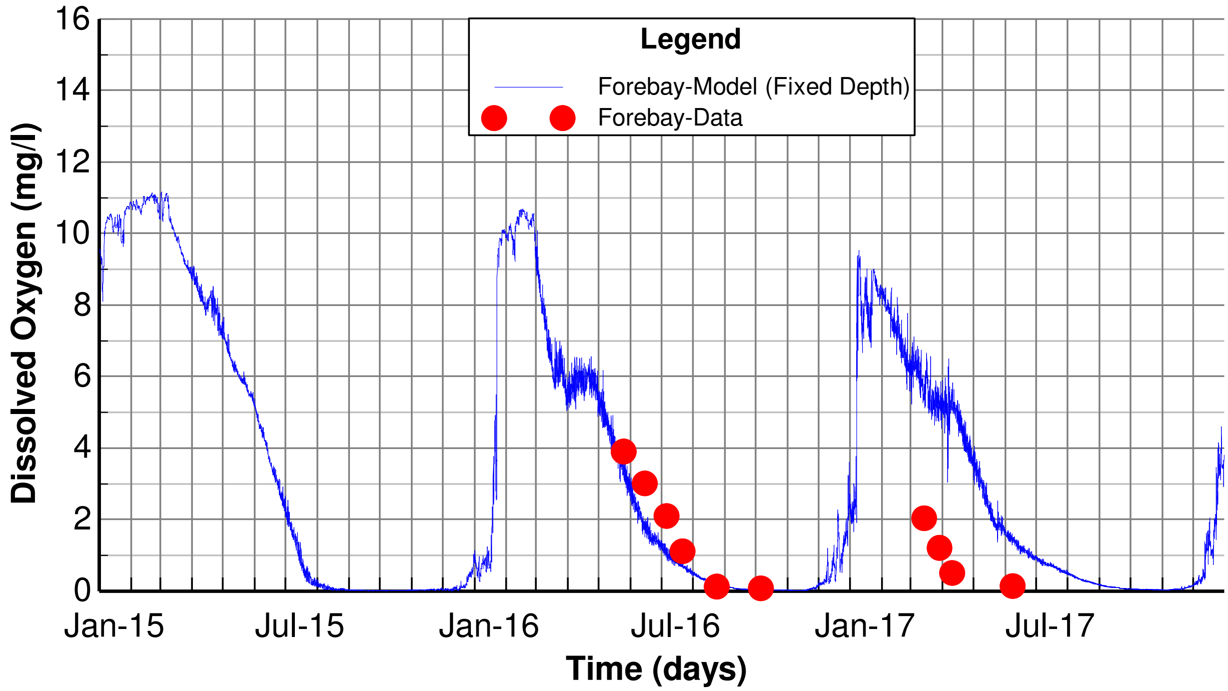

Figure 7-17 Validation Plot of Bottom Layer Dissolved Oxygen at APC Forebay Station

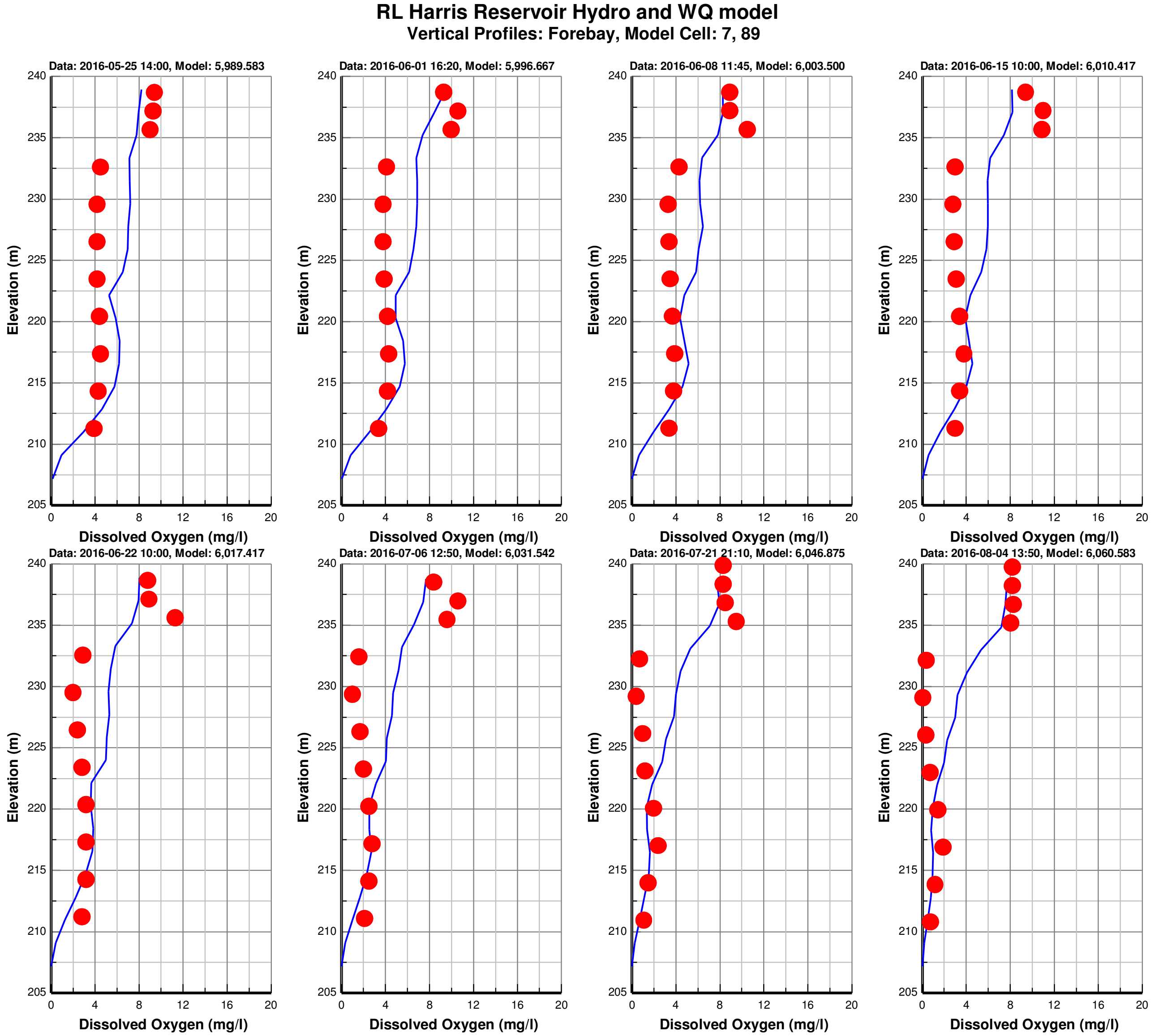

Figure 7-18 Dissolved Oxygen Vertical Profile Comparison Plot at APC Forebay Station (25 May 2016 – 4 August 2016)

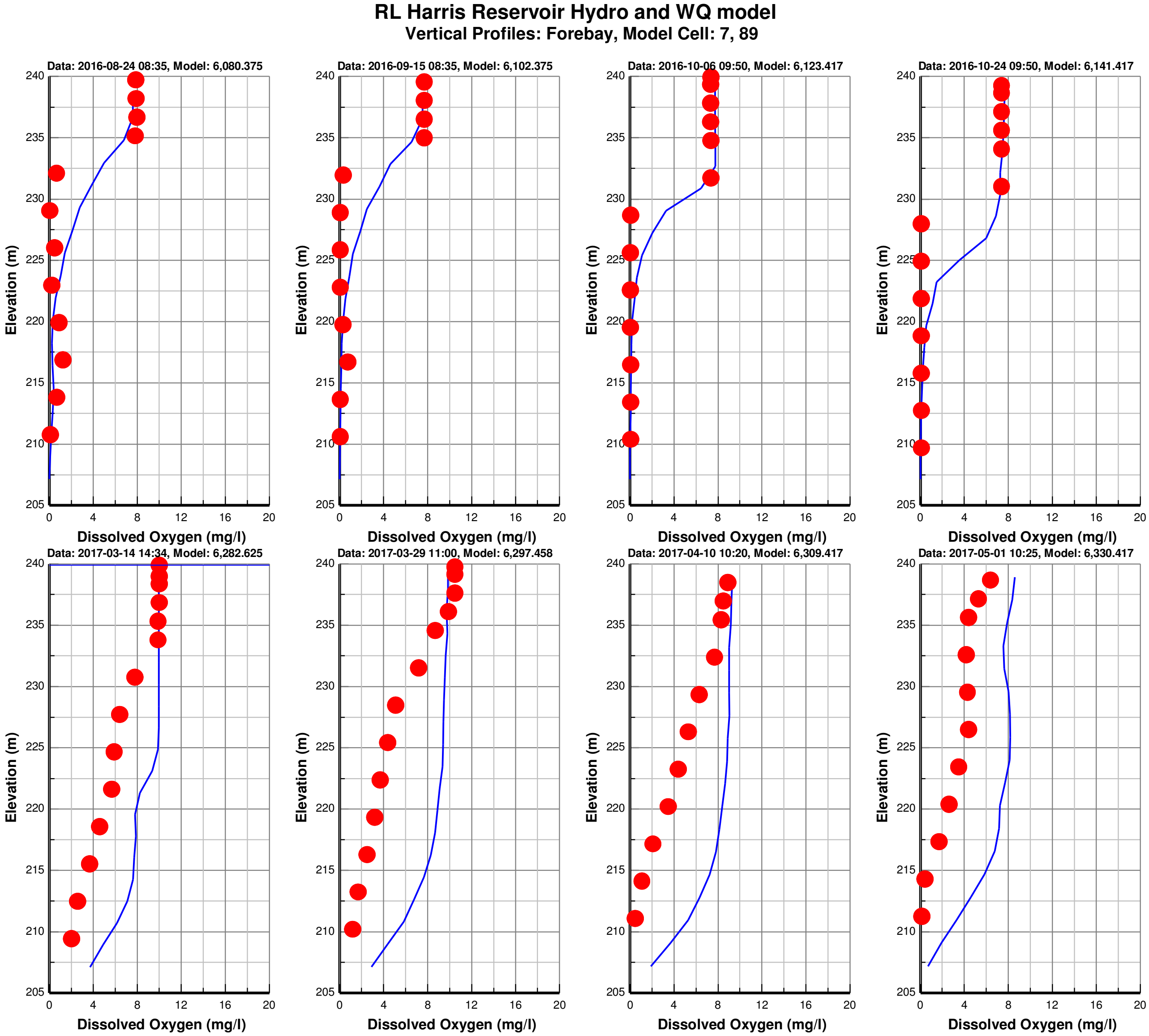

Figure 7-19 Dissolved Oxygen Vertical Profile Comparison Plot at APC Forebay Station (24 August 2016 – 1 May 2017)

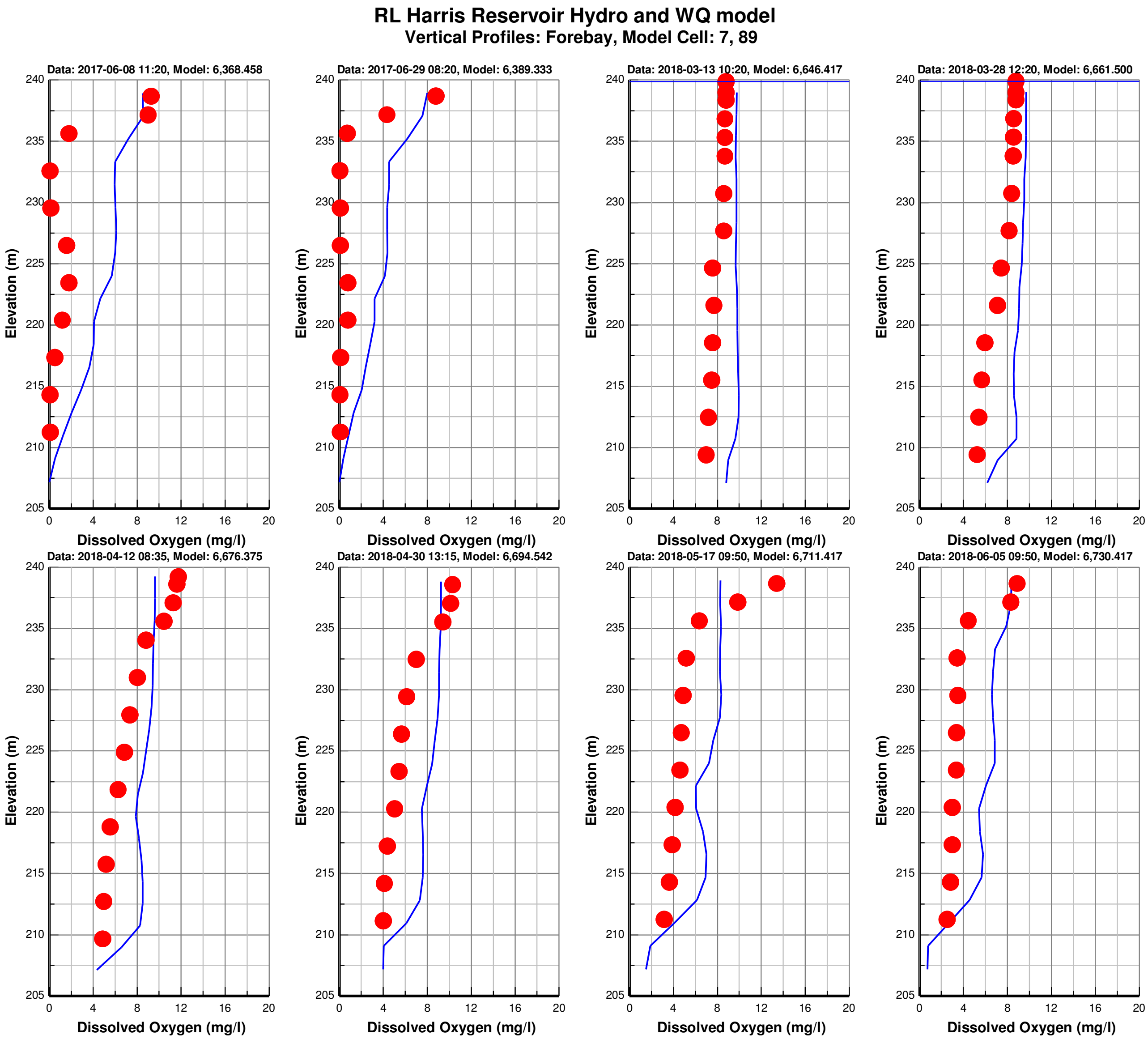

Figure 7-20 Dissolved Oxygen Vertical Profile Comparison Plot at APC Forebay Station (8 June 2017 – 5 June 2018)

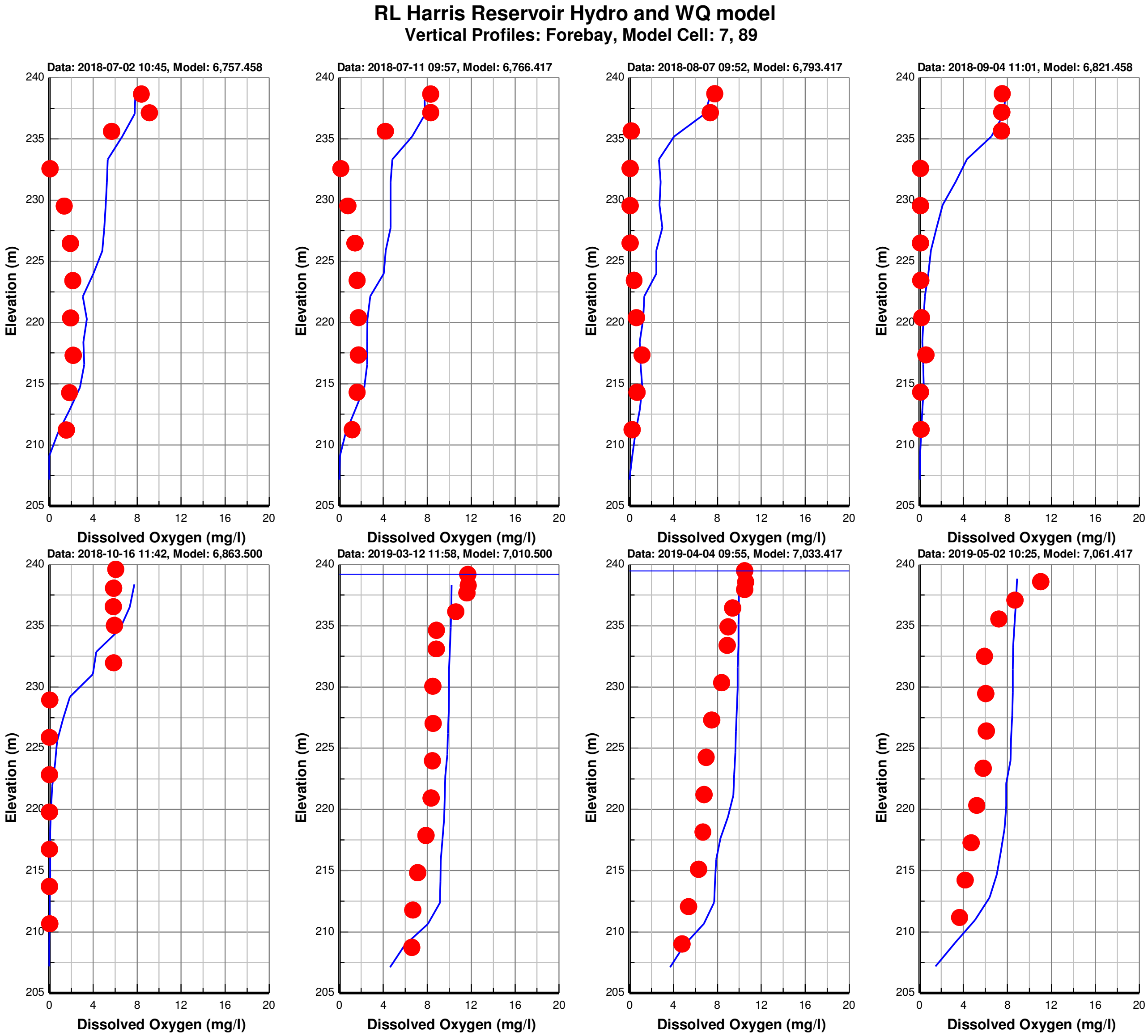

Figure 7-21 Dissolved Oxygen Vertical Profile Comparison Plot at APC Forebay Station (2 July 2018 – 2 May 2019)

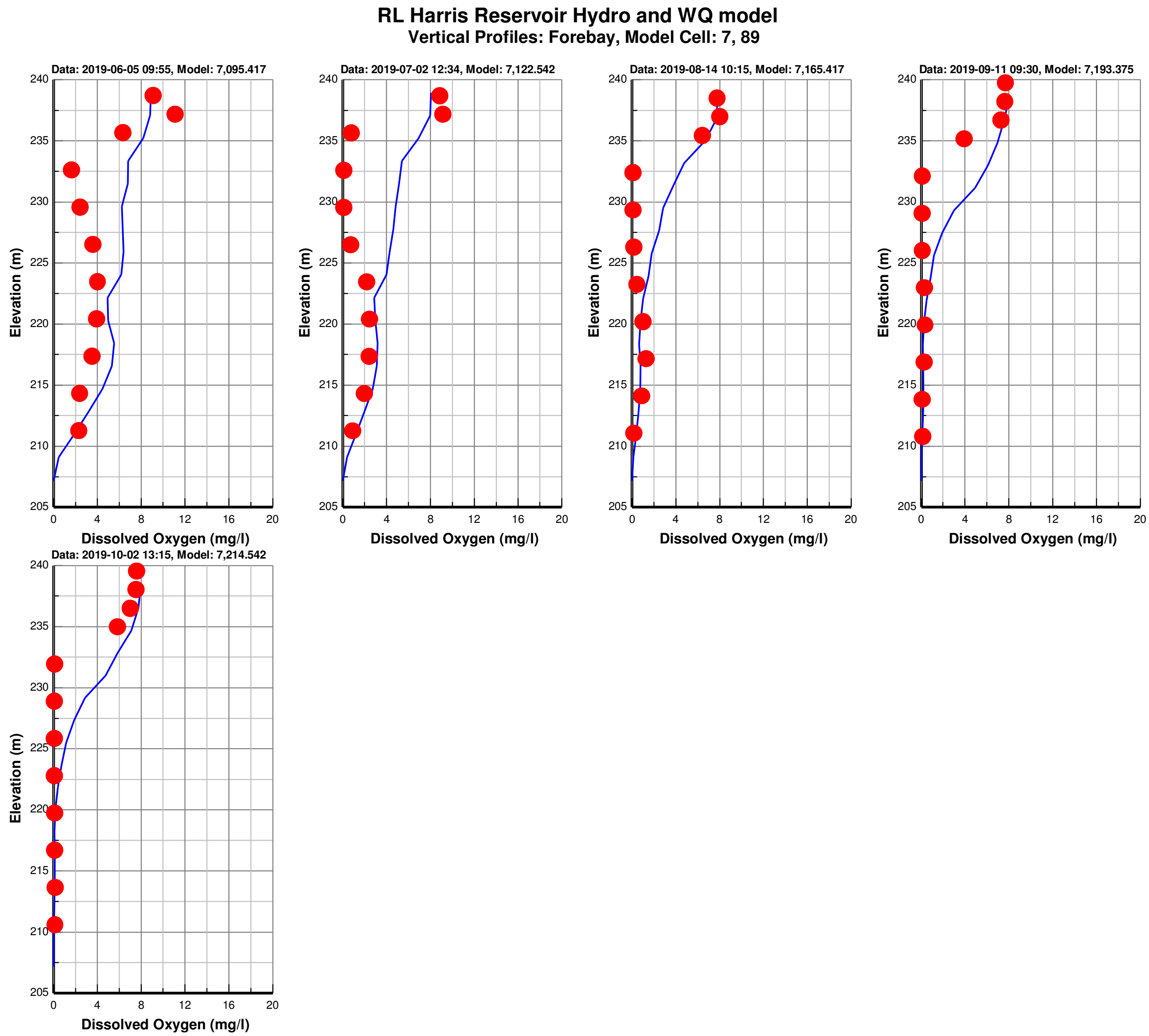

Figure 7-22 Dissolved Oxygen Vertical Profile Comparison Plot at APC Forebay Station (5 June 2019 – 2 October 2019)

7.5 Algae Calibration and Validation

Procedures used to calibrate algae (as chlorophyll a) included: (1) check the algae boundary conditions of the EFDC model; and (2) adjust the key parameters within reasonable ranges to match the observed data.

Modeled algae biomass results (as chlorophyll a) were presented for comparison to the observed data for the surface layer. In the Lake Harris model, green algae was simulated as a the functional group to derive total algae biomass for comparison to chlorophyll a observations. Chlorophyll a calibration and validation plots at ADEM station RLHR-1 are given in Figure 7-23 and Figure 7-24, respectively. The chlorophyll a surface layer calibration and validation plots at ADEM stations RLHR-2, RLHR-3, RLHR-4, RLHR-5, and RLHR-6 are given in Appendix A. As can be seen in these model-data plots, the model results are in fairly good agreement with measured algal biomass. In particular, the EFDC-simulated chlorophyll a concentrations followed the seasonal trend of observed chlorophyll a at these ADEM monitoring stations.

Summary statistics for model performance for chlorophyll a are given in Table 7-7. The calculated RMS errors ranged from 2.30 µg/L at the surface layer of ADEM station RLHR-3 to 8.16 µg/L at the surface layer of ADEM station RLHR-6, as shown in Table 7-7.

Table 7-7 Model Performance Statistics for Chlorophyll a (µg/L)

Station ID	Layer	Starting	Ending	# Pairs	RMS	Data Average	Model Average
RLHR-1	Surface	4/29/2015 7:05	10/24/2018 9:11	14	5.94	5.24	4.60
RLHR-2	Surface	4/29/2015 7:47	10/24/2018 9:51	14	4.52	4.06	5.61
RLHR-3	Surface	4/29/2015 8:25	10/24/2018 10:42	15	2.30	11.02	7.28
RLHR-4	Surface	4/29/2015 9:35	10/24/2018 11:26	14	5.81	7.51	8.23
RLHR-5	Surface	4/29/2015 9:56	10/24/2018 11:46	14	7.08	6.81	8.33
RLHR-6	Surface	4/29/2015 9:05	10/24/2018 10:15	14	8.16	5.46	6.26

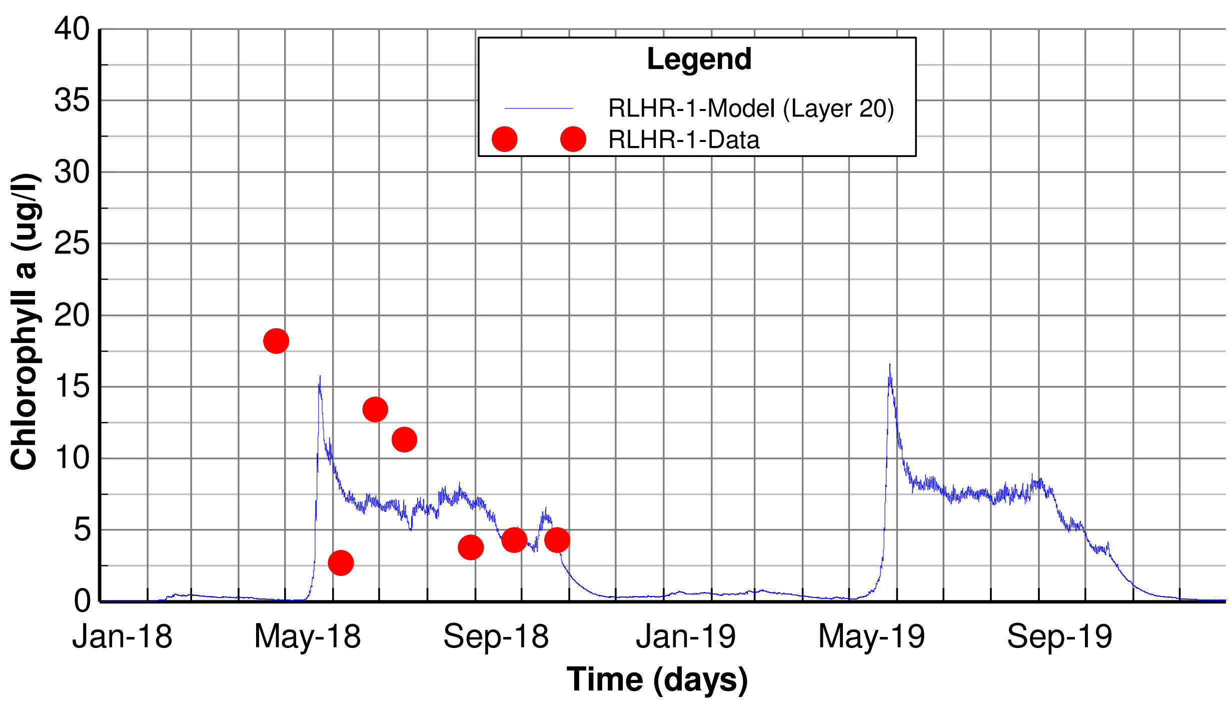

Figure 7-23 Calibration Plot of Surface Layer Chlorophyll a at Station RLHR-1

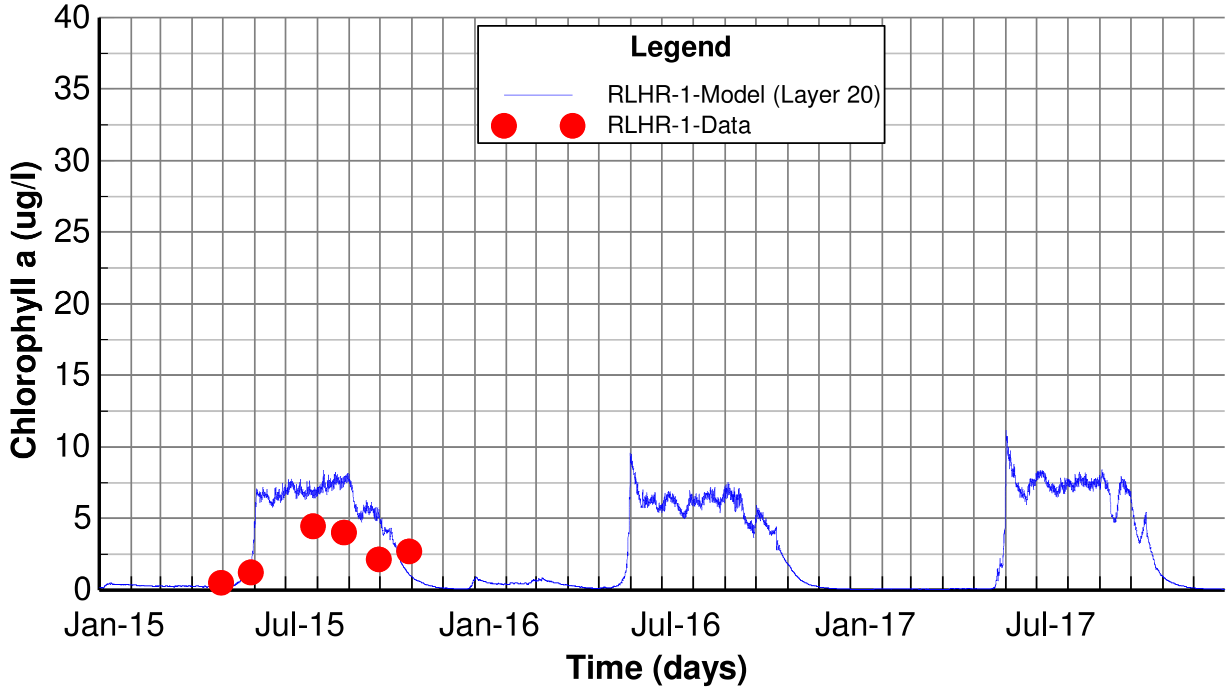

Figure 7-24 Validation Plot of Surface Layer Chlorophyll a at Station RLHR-1

7.6 Nitrogen Calibration and Validation

Procedures used to calibrate nitrogen state variables included: (1) check the boundary conditions of the EFDC model; and (2) adjust the key parameters within reasonable ranges to match the observed data.

Ammonia-N ($NH4^+$), nitrate-N (NO2+NO3), total organic nitrogen (TON) and total nitrogen (TN) model results at ADEM station RLHR-1 are presented for comparison to the observed data for the surface layer. The ammonia calibration and validation plots are given in Figure 7-25 and Figure 7-26, respectively. The nitrite/nitrate calibration and validation plots are given in Figure 7-27 and Figure 7-28, respectively. The TON calibration and validation plots are given in Figure 7-29 and Figure 7-30, respectively and the TN calibration and validation plots are given in Figure 7-31 and Figure 7-32, respectively. The ammonia, nitrite/nitrate, TON and TN surface layer calibration and validation plots at ADEM stations RLHR-2, RLHR-3, RLHR-4, RLHR-5, and RLHR-6 are given in Appendix A.

The summary statistics for model performance of ammonia are given in Table 7-8.The calculated RMS errors ranged from 0.043 mg/L at the surface layer of ADEM station RLHR-4 to 0.075 mg/L at the surface layer of ADEM station RLHR-2, as shown in Table 7-8.

Table 7-8 Model Performance Statistics for Ammonia (mg N/L)

Station ID	Layer	Starting	Ending	# Pairs	RMS	Data Average	Model Average
RLHR-1	Surface	4/29/2015 7:05	10/24/2018 9:11	14	0.072	0.04	0.031
RLHR-2	Surface	4/29/2015 7:47	10/24/2018 9:51	14	0.075	0.043	0.022
RLHR-3	Surface	4/29/2015 8:25	10/24/2018 10:42	15	0.064	0.044	0.027
RLHR-4	Surface	4/29/2015 9:35	10/24/2018 11:26	14	0.043	0.022	0.023
RLHR-5	Surface	4/29/2015 9:56	10/24/2018 11:46	14	0.047	0.022	0.023
RLHR-6	Surface	4/29/2015 9:05	10/24/2018 10:15	14	0.072	0.035	0.019

The summary statistics for model performance of nitrate are given in Table 7-9. The calculated RMS errors ranged from 0.039 mg/L at the surface layer of ADEM station RLHR-6 to 0.054 mg/L at the surface layer of ADEM station RLHR-3 as shown in Table 7-9.

Table 7-9 Model Performance Statistics for Nitrate (mg N/L)

Station ID	Layer	Starting	Ending	# Pairs	RMS	Data Average	Model Average
RLHR-1	Surface	4/29/2015 7:05	10/24/2018 9:11	14	0.029	0.022	0.02
RLHR-2	Surface	4/29/2015 7:47	10/24/2018 9:51	14	0.046	0.023	0.021
RLHR-3	Surface	4/29/2015 8:25	10/24/2018 10:42	15	0.054	0.045	0.078
RLHR-4	Surface	4/29/2015 9:35	10/24/2018 11:26	14	0.05	0.066	0.046
RLHR-5	Surface	4/29/2015 9:56	10/24/2018 11:46	14	0.042	0.062	0.048
RLHR-6	Surface	4/29/2015 9:05	10/24/2018 10:15	14	0.039	0.021	0.022

The summary statistics for model performance of Total Organic Nitrogen are given in Table 7-10. The calculated RMS errors ranged from 0.027 mg/L at the surface layer of ADEM station RLHR-3 to 0.336 mg/L at the bottom layer of ADEM station RLHR-4 as shown in Table 7-10.

Table 7-10 Model Performance Statistics for Total Organic Nitrogen (mg N/L)

Station ID	Layer	Starting	Ending	# Pairs	RMS	Data Average	Model Average
RLHR-1	Surface	4/29/2015 7:05	10/24/2018 9:11	14	0.229	0.244	0.433
RLHR-2	Surface	4/29/2015 7:47	10/24/2018 9:51	14	0.28	0.278	0.454
RLHR-3	Surface	4/29/2015 8:25	10/24/2018 10:42	15	0.207	0.325	0.379
RLHR-4	Surface	4/29/2015 9:35	10/24/2018 11:26	14	0.336	0.344	0.614
RLHR-5	Surface	4/29/2015 9:56	10/24/2018 11:46	14	0.318	0.409	0.631
RLHR-6	Surface	4/29/2015 9:05	10/24/2018 10:15	14	0.222	0.319	0.42

The summary statistics for model performance of total nitrogen are given in Table 7-11. The calculated RMS errors ranged from 0.213 mg/L at the surface layer of ADEM station RLHR-3 to 0.32 mg/L at the surface layer of ADEM station RLHRL-4, as shown in Table 7-11.

Table 7-11 Model Performance Statistics for Total Nitrogen (mg N/L)

Station ID	Layer	Starting	Ending	# Pairs	RMS	Data Average	Model Average
RLHR-1	Surface	4/29/2015 7:05	10/24/2018 9:11	14	0.228	0.306	0.483
RLHR-2	Surface	4/29/2015 7:47	10/24/2018 9:51	14	0.246	0.343	0.497
RLHR-3	Surface	4/29/2015 8:25	10/24/2018 10:42	15	0.213	0.412	0.483
RLHR-4	Surface	4/29/2015 9:35	10/24/2018 11:26	14	0.32	0.433	0.683
RLHR-5	Surface	4/29/2015 9:56	10/24/2018 11:46	14	0.315	0.494	0.702
RLHR-6	Surface	4/29/2015 9:05	10/24/2018 10:15	14	0.179	0.375	0.461

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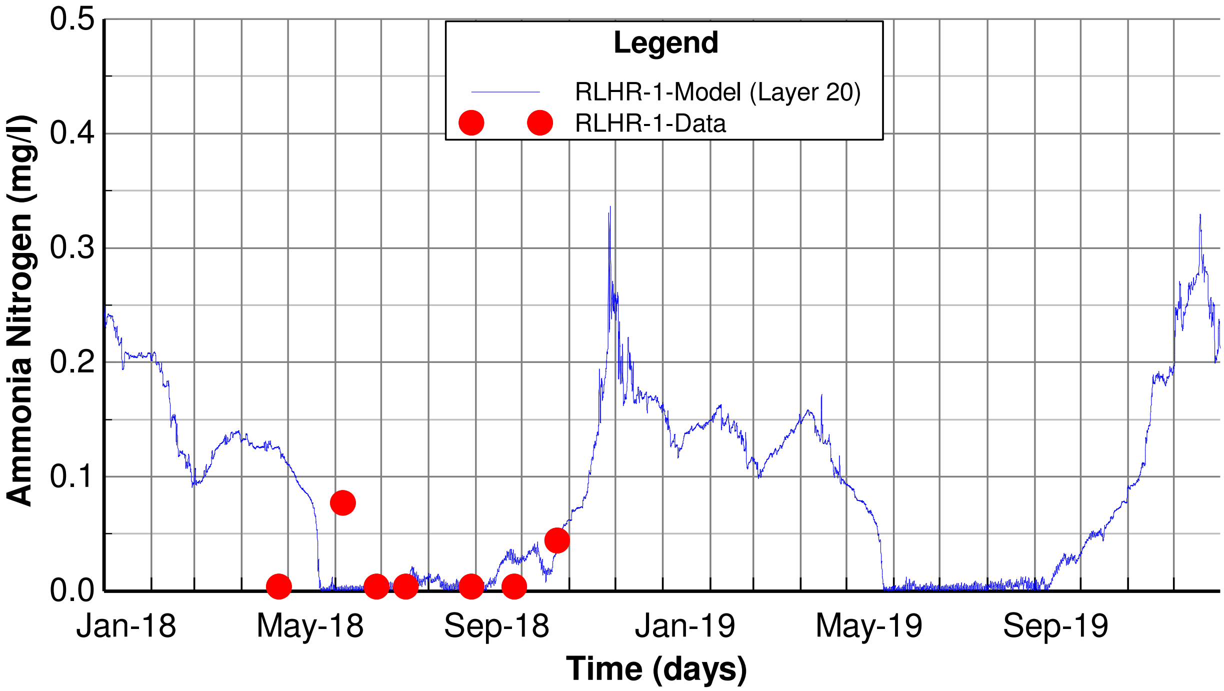

Figure 7-25 Calibration Plot of Surface Layer Ammonia at Station RLHR-1

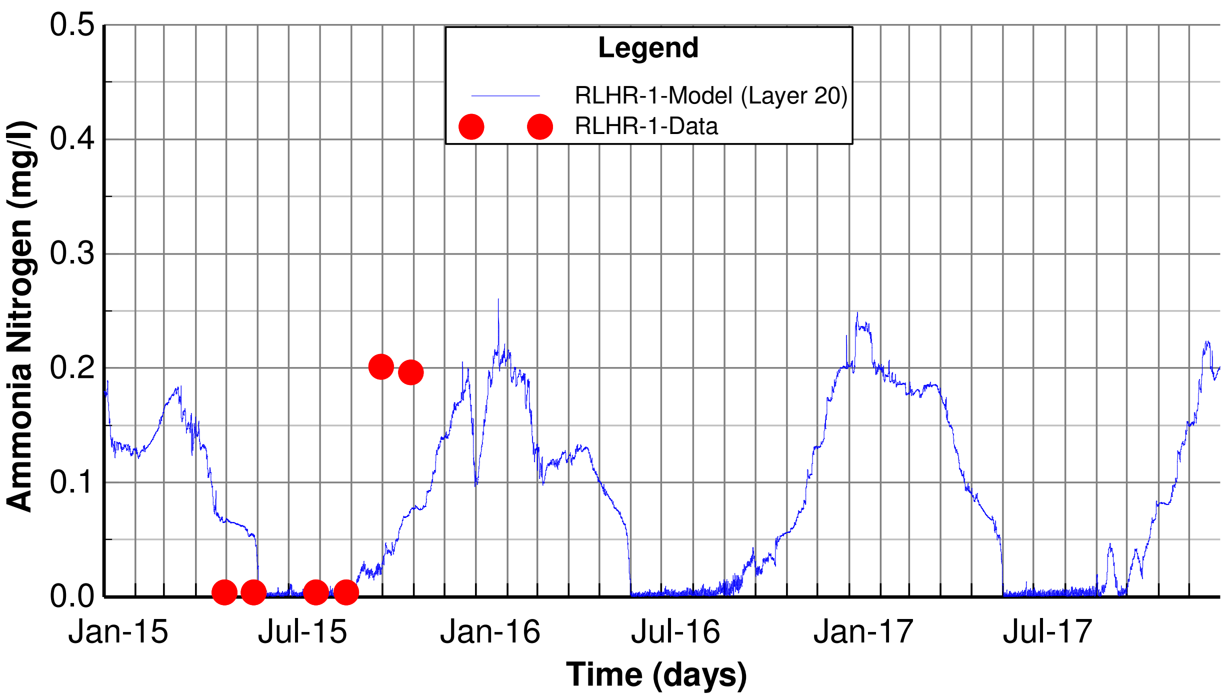

Figure 7-26 Validation Plot of Surface Layer Ammonia at Station RLHR-1

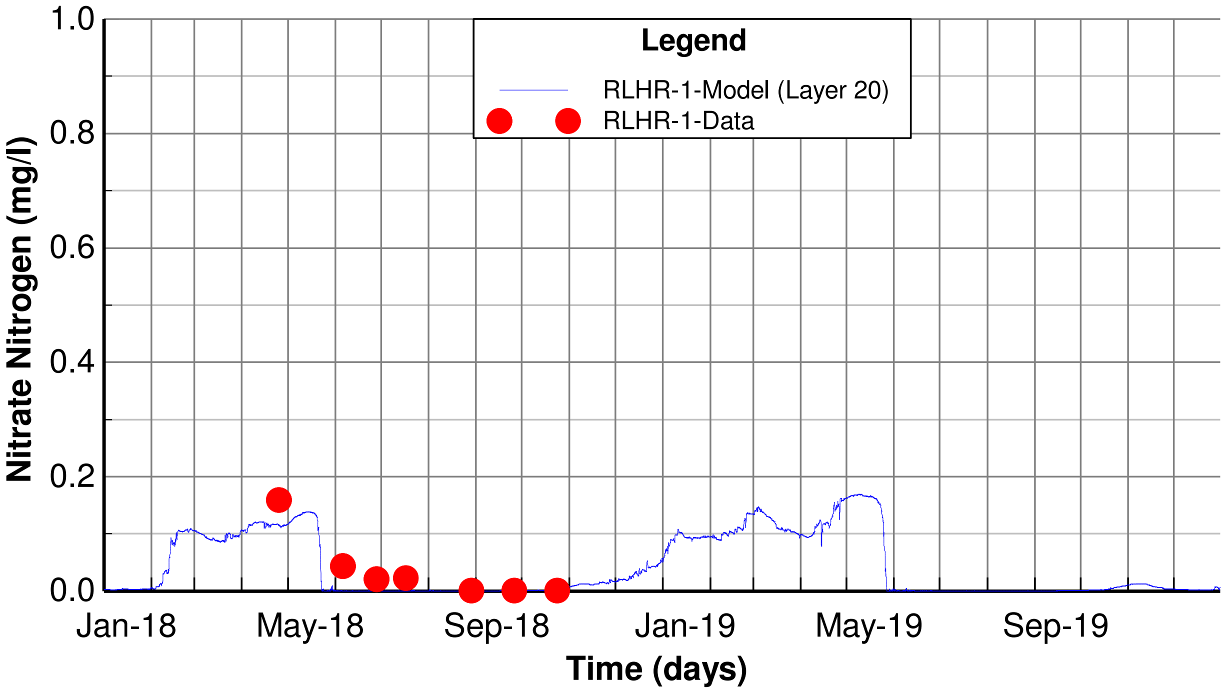

Figure 7-27 Calibration Plot of Surface Layer Nitrate at Station RLHR-1

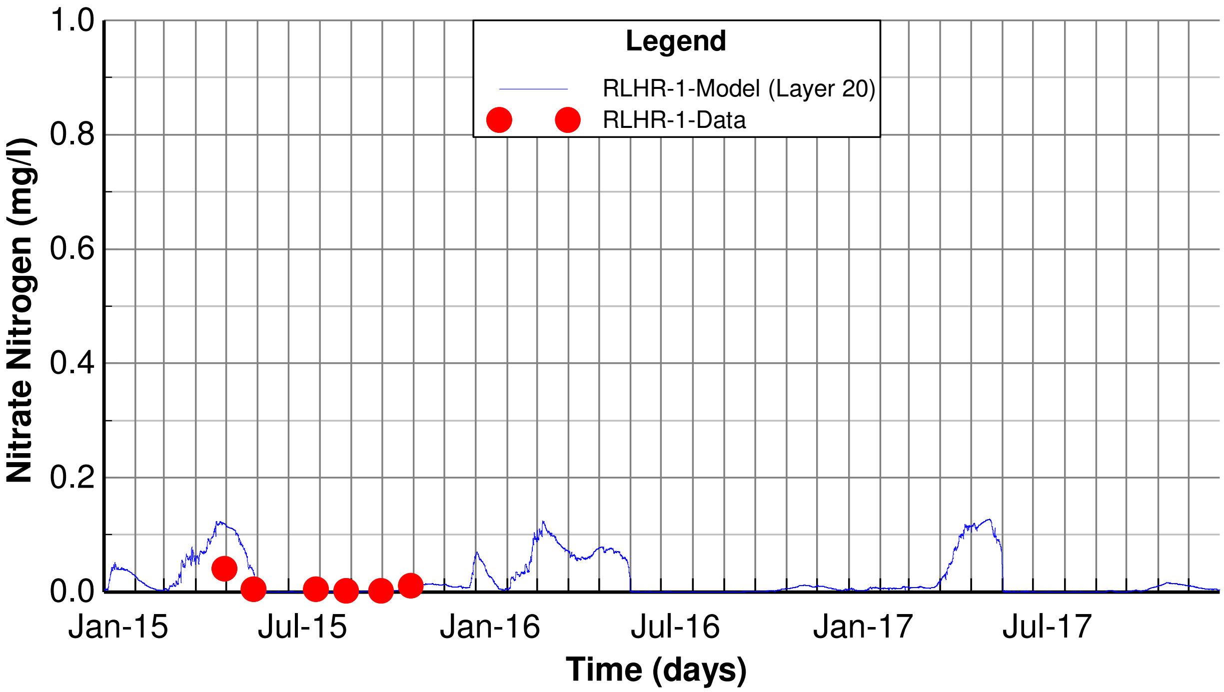

Figure 7-28 Validation Plot of Surface Layer Nitrate at Station RLHR-1

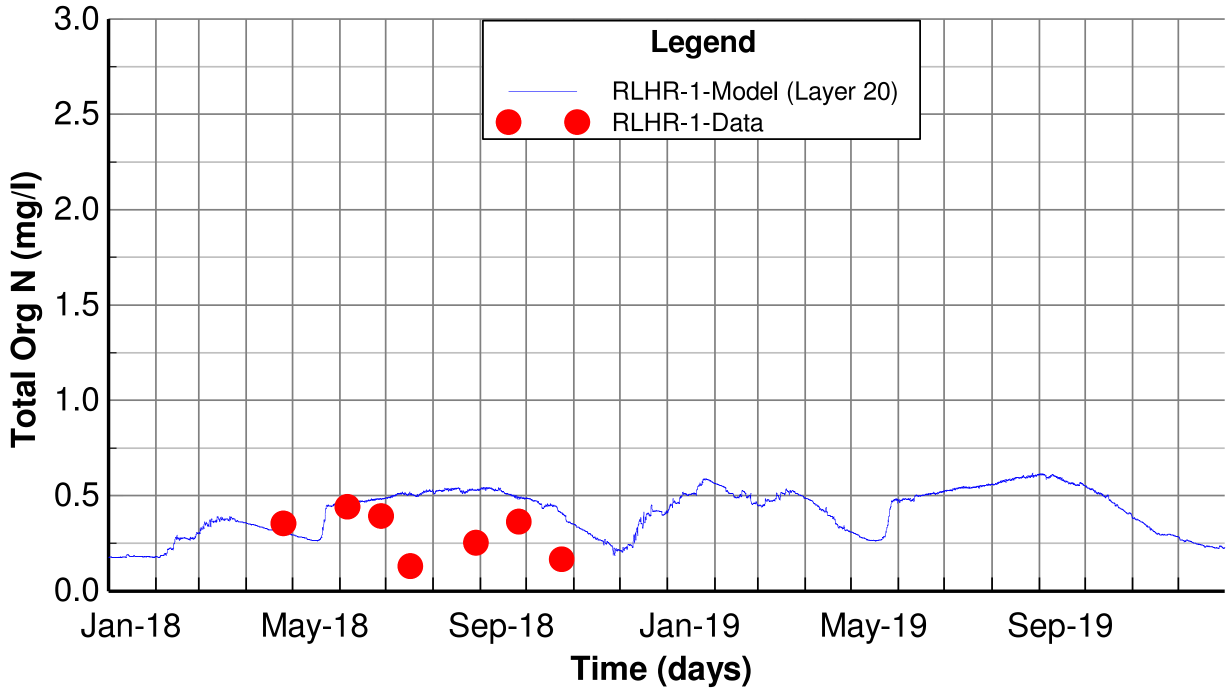

Figure 7-29 Calibration Plot of Surface Layer Total Organic Nitrogen at Station RLHR-1

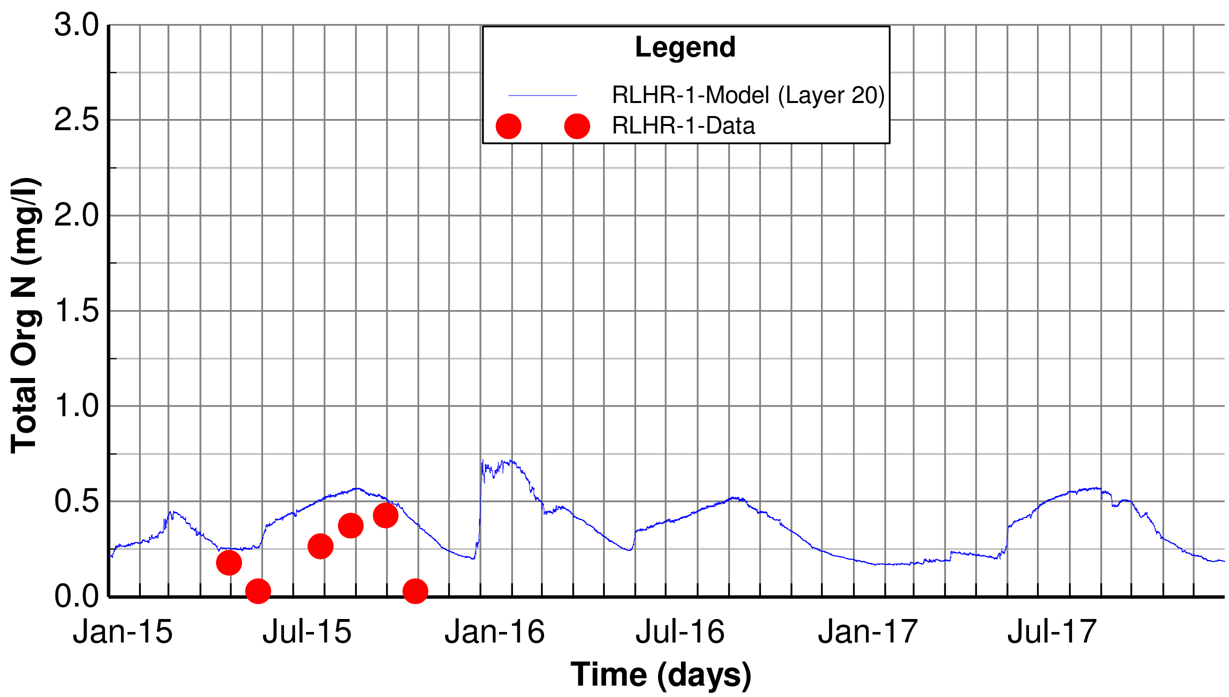

Figure 7-30 Validation Plot of Surface Layer Total Organic Nitrogen at Station RLHR-1

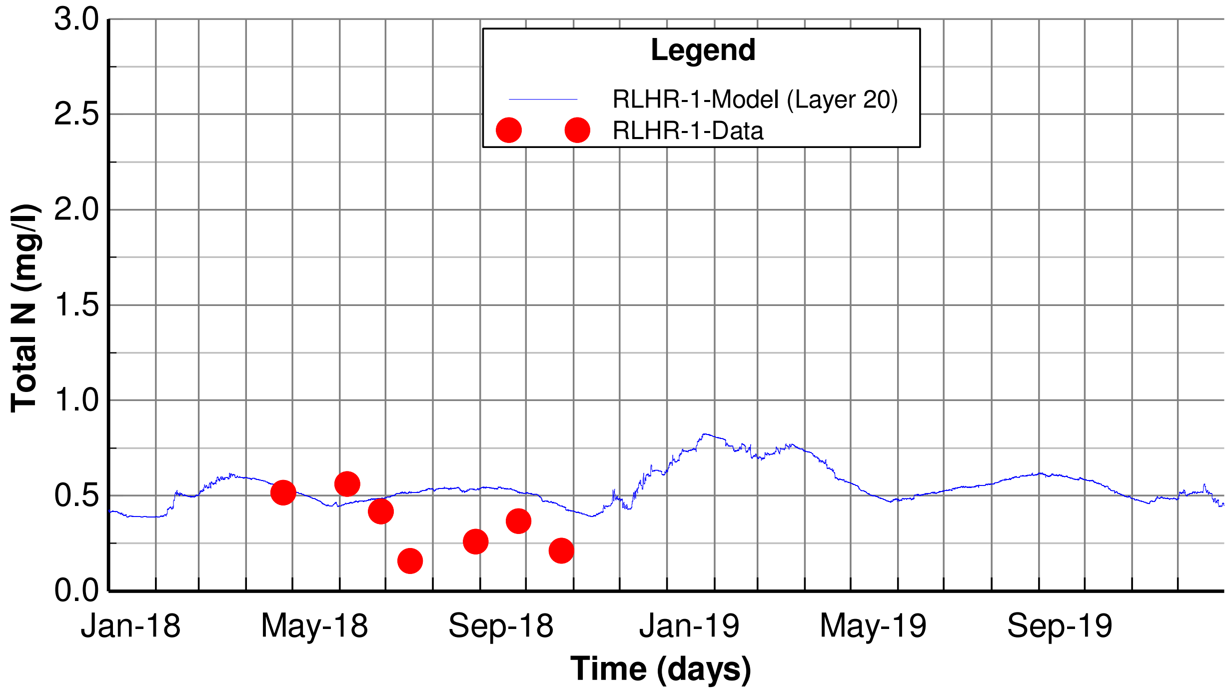

Figure 7-31 Calibration Plot of Surface Layer Total Nitrogen at Station RLHR-1

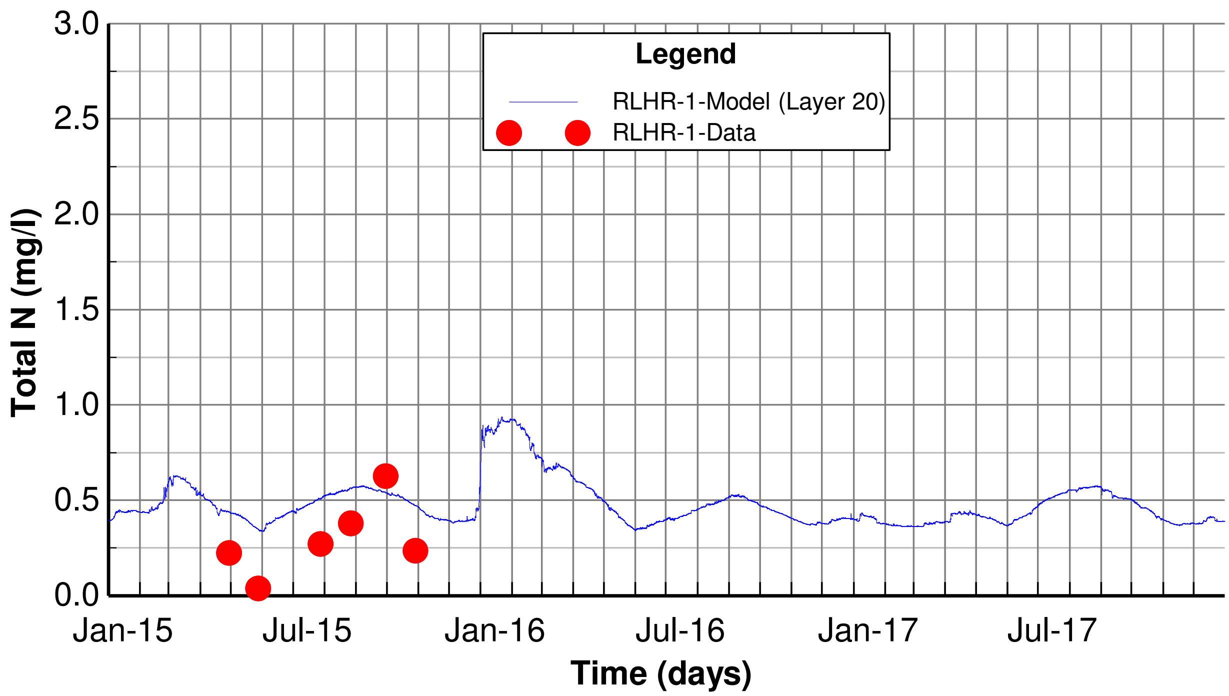

Figure 7-32 Validation Plot of Surface Layer Total Nitrogen at Station RLHR-1

7.7 Phosphorus Calibration and Validation

Procedures used to calibrate phosphorus state variables include: (1) check the phosphorus boundary conditions of the EFDC model; and (2) adjust the key parameters within reasonable ranges to match the observed data.

Total phosphate (TPO4), total organic phosphorus (TOP), and total phosphorus (TP) model results at ADEM station RLHR-1 are presented for comparison to the observed data for the surface layer. The TPO4 calibration and validation plots are given in Figure 7-33 and Figure 7-34, repectviely. The TOP calibration and validation plots are given in Figure 7-35 and Figure 7-36, respectively. The TP calibration and validation plots are given in Figure 7-37 and Figure 7-38, respectively. The total phosphate, total organic phosphorus, and total phosphorus surface layer calibration and validation plots at ADEM stations RLHR-2, RLHR-3, RLHR-4, RLHR-5, and RLHR-6 are given in Appendix A.

The summary statistics for model performance of total phosphate are given in Table 7-12. The calculated RMS errors ranged from 0.008 mg/L at the surface layer of ADEM station RLHR-3 to 0.01 mg/L at the surface layer of ADEM stations RLHR-4 and RLHR-5, as shown in Table 7-12.

Table 7-12 Model Performance Statistics for Total Phosphate (mg P/L)

Station ID	Layer	Starting	Ending	# Pairs	RMS	Data Average	Model Average
RLHR-1	Surface	4/29/2015 7:05	10/24/2018 9:11	14	0.009	0.002	0.006
RLHR-2	Surface	4/29/2015 7:47	10/24/2018 9:51	14	0.009	0.002	0.007
RLHR-3	Surface	4/29/2015 8:25	10/24/2018 10:42	15	0.008	0.003	0.007
RLHR-4	Surface	4/29/2015 9:35	10/24/2018 11:26	14	0.01	0.002	0.007
RLHR-5	Surface	4/29/2015 9:56	10/24/2018 11:46	14	0.01	0.002	0.006
RLHR-6	Surface	4/29/2015 9:05	10/24/2018 10:15	14	0.009	0.002	0.007

The summary statistics for model performance of total organic phosphorus are given in Table 7-13. The calculated RMS errors ranged from 0.008 mg/L at the surface layer of ADEM station RLHR-4 to 0.028 mg/L at the surface layer of ADEM station RLHR-3, as shown in Table 7-13.

Table 7-13 Model Performance Statistics for Total Organic Phosphorus (mg P/L)

Station ID	Layer	Starting	Ending	# Pairs	RMS	Data Average	Model Average
RLHR-1	Surface	4/29/2015 7:05	10/24/2018 9:11	14	0.005	0.009	0.01
RLHR-2	Surface	4/29/2015 7:47	10/24/2018 9:51	14	0.01	0.011	0.015
RLHR-3	Surface	4/29/2015 8:25	10/24/2018 10:42	15	0.021	0.02	0.03
RLHR-4	Surface	4/29/2015 9:35	10/24/2018 11:26	14	0.008	0.014	0.018
RLHR-5	Surface	4/29/2015 9:56	10/24/2018 11:46	14	0.01	0.018	0.018
RLHR-6	Surface	4/29/2015 9:05	10/24/2018 10:15	14	0.012	0.011	0.019

The summary statistics for model performance of total phosphorus are given in Table 7-14. The calculated RMS errors ranged from 0.008 mg/L at the surface layer of ADEM station RLHR-1 to 0.028 mg/L at the bottom layer of ADEM station RLHR-3, as shown in Table 7-14.

Table 7-14 Model Performance Statistics for Total Phosphorus (mg P/L)

Station ID	Layer	Starting	Ending	# Pairs	RMS	Data Average	Model Average
RLHR-1	Surface	4/29/2015 7:05	10/24/2018 9:11	14	0.008	0.01	0.016
RLHR-2	Surface	4/29/2015 7:47	10/24/2018 9:51	14	0.018	0.013	0.022
RLHR-3	Surface	4/29/2015 8:25	10/24/2018 10:42	15	0.028	0.023	0.037
RLHR-4	Surface	4/29/2015 9:35	10/24/2018 11:26	14	0.015	0.016	0.024
RLHR-5	Surface	4/29/2015 9:56	10/24/2018 11:46	14	0.017	0.02	0.024
RLHR-6	Surface	4/29/2015 9:05	10/24/2018 10:15	14	0.019	0.014	0.025

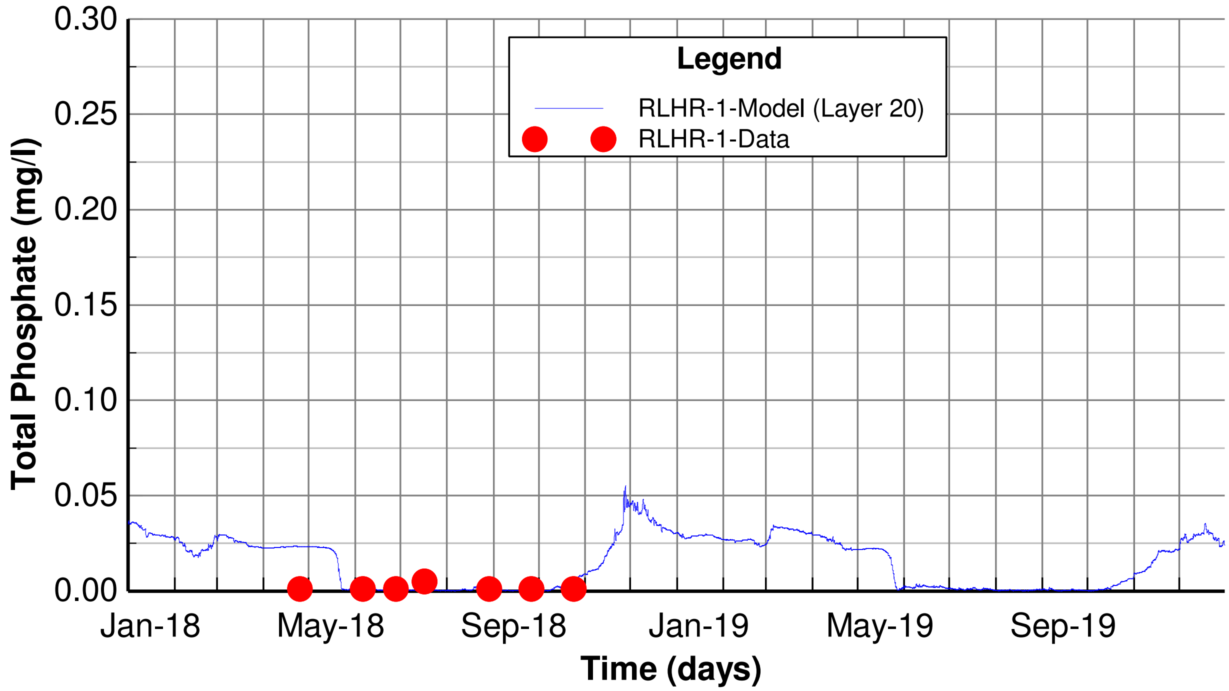

Figure 7-33 Calibration Plot of Surface Layer Total Phosphate at Station RLHR-1

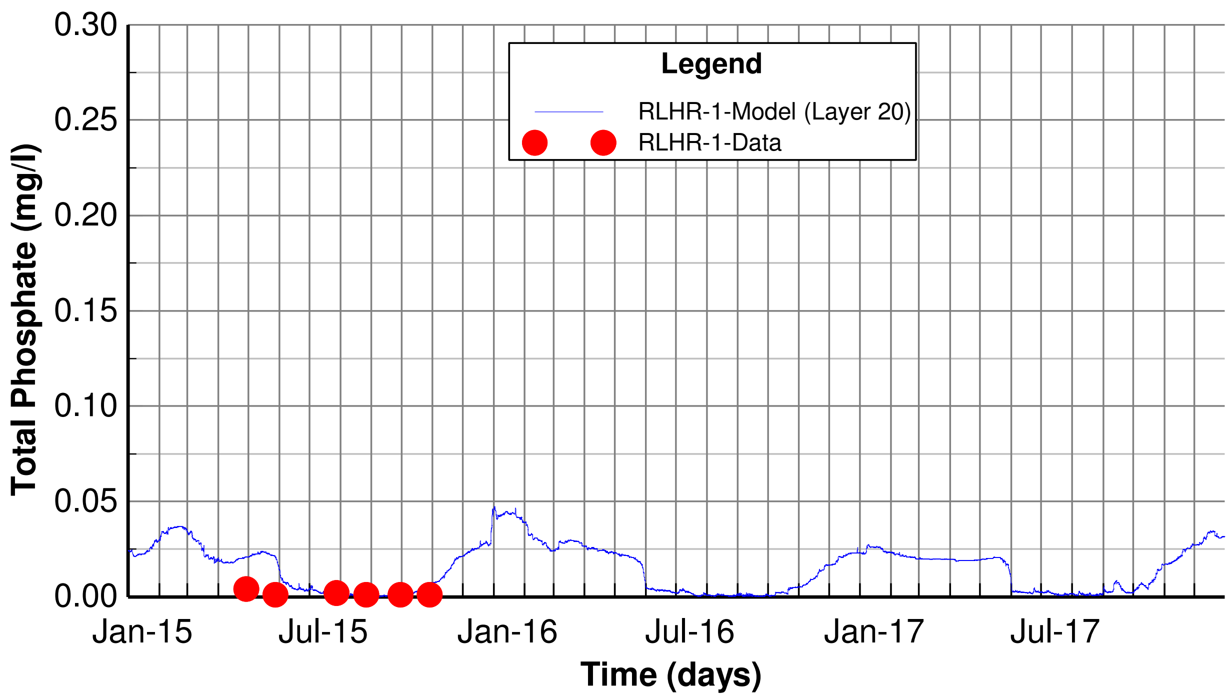

Figure 7-34 Validation Plot of Surface Layer Total Phosphate at Station RLHR-1

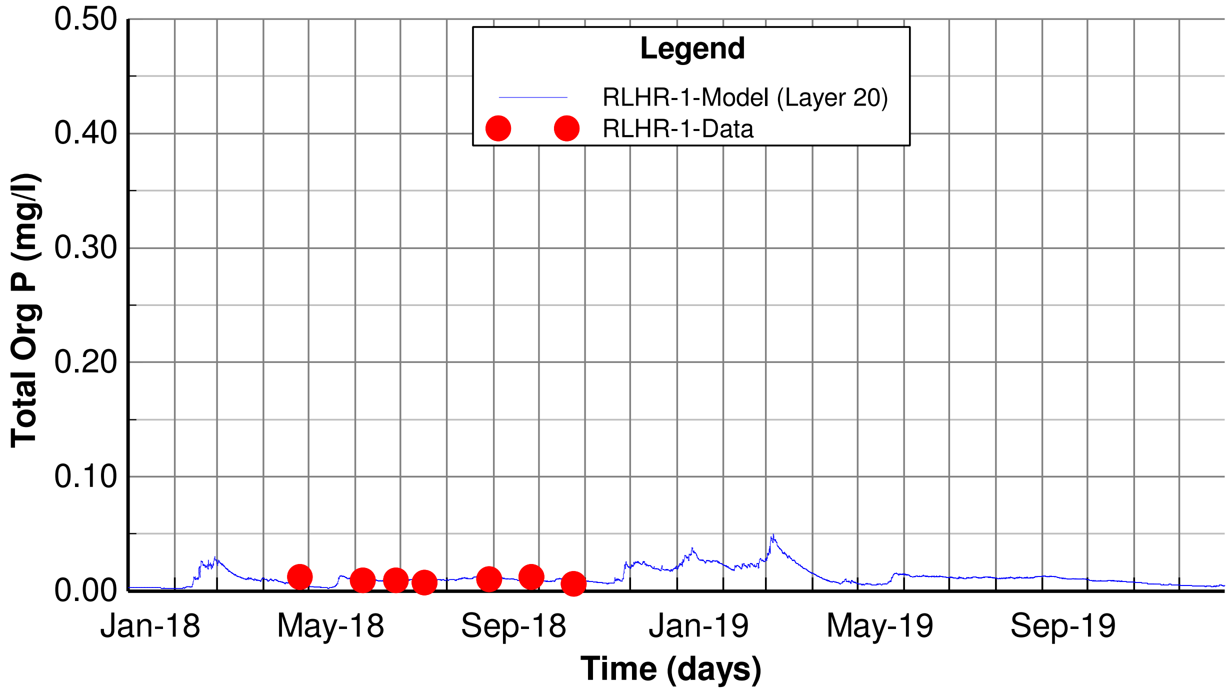

Figure 7-35 Calibration Plot of Surface Layer Total Organic Phosphorus at Station RLHR-1

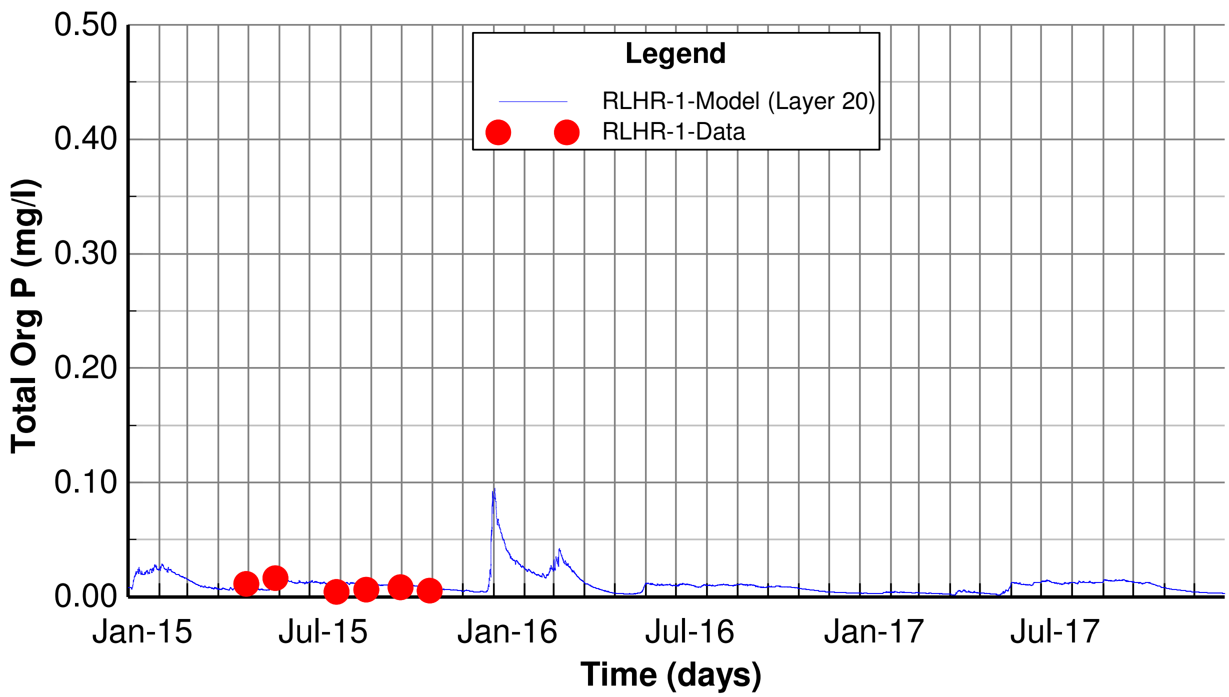

Figure 7-36 Validation Plot of Surface Layer Total Organic Phosphorus at Station RLHR-1

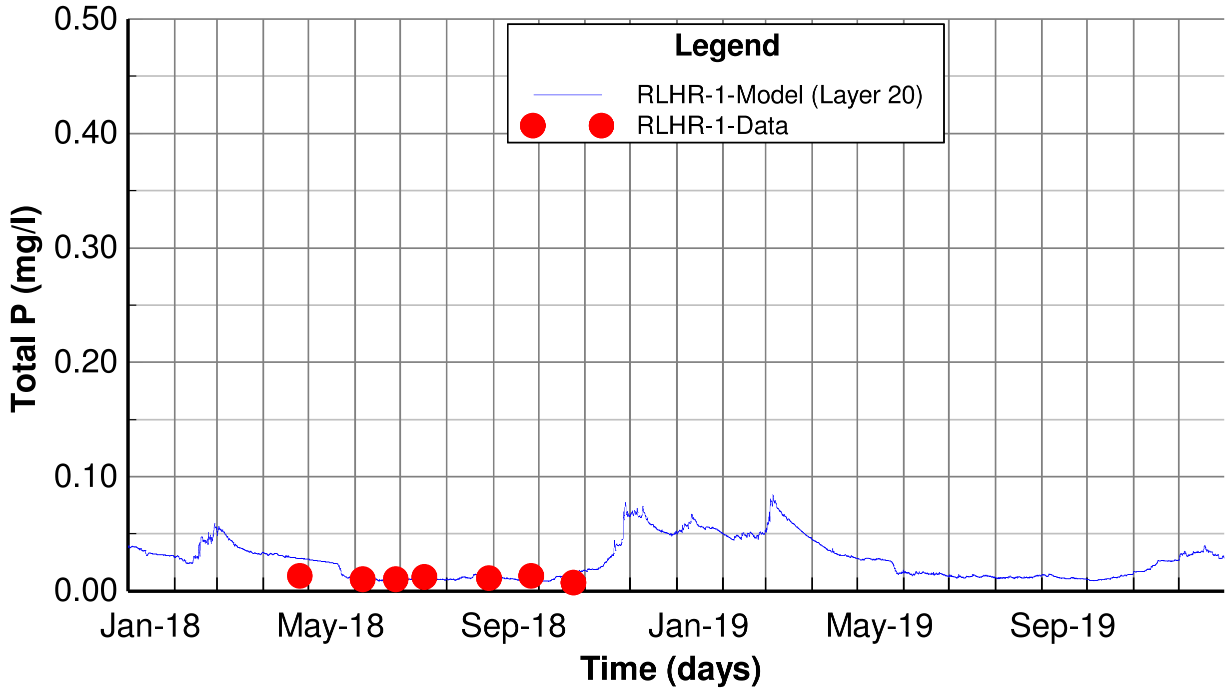

Figure 7-37 Calibration Plot of Surface Layer Total Phosphorus at Station RLHR-1

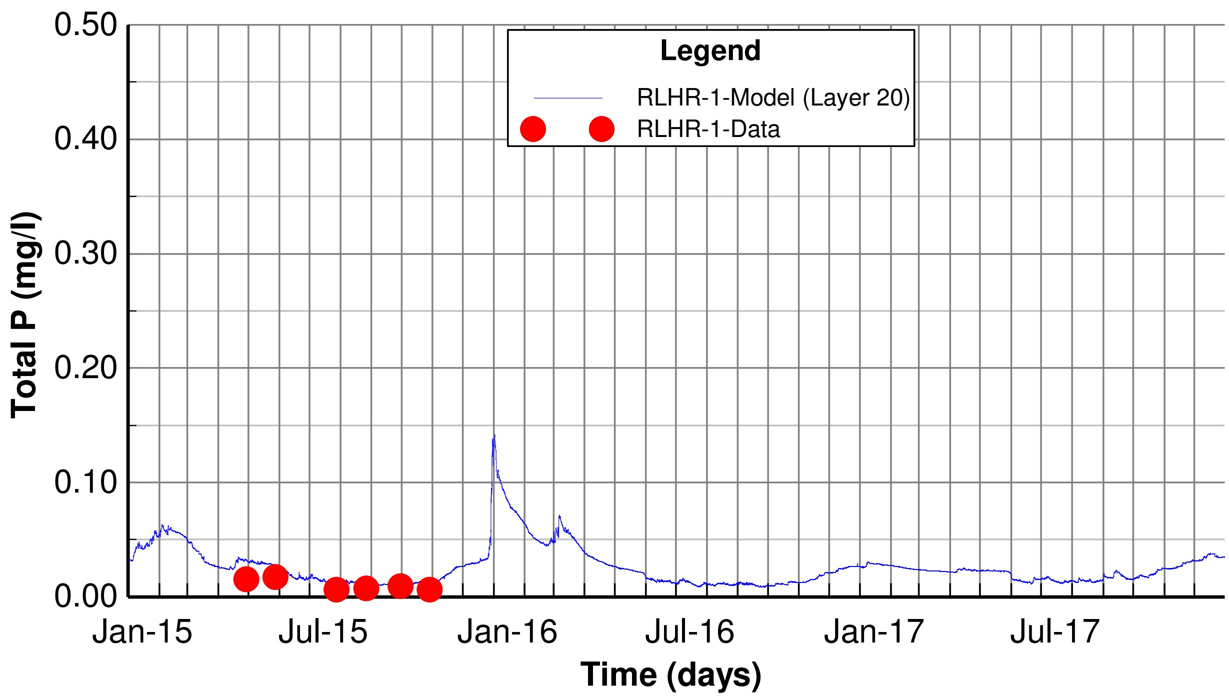

Figure 7-38 Validation Plot of Surface Layer Total Phosphorus at Station RLHR-1

8. Scenario Analysis

The calibrated and validated EFDC model of Lake Harris was used to evaluate the effects of a range of scenarios designed to raise the winter pool elevation by up to four feet on water temperature and dissolved oxygen in the forebay area of Lake Harris. The operating curves of the lake stages are shown in Table 8-1 and Figure 1-2.

Table 8-1 Operating Curves of Lake Harris Dam

Scenarios	Winter Pool Elevation (ft NGVD29)
Baseline	785
Scenario 1	786
Scenario 2	787
Scenario 3	788
Scenario 4	789

For each scenario run, the initial water surface elevation was adjusted and a scenario flow balance was re-calculated to make sure the simulated water surface elevation at the forebay followed the scheduled operation curves. For all four scenarios, the EFDC model of Lake Harris was run for the 6-year period from 1 January 2014 to 31 December 2019.

Since the dam discharge was released from the top four layers of the model, water temperature and dissolved oxygen data simulated in the top four layers were extracted for the period from 2015 to 2019 for all four scenarios and the baseline simulation. The baseline EFDC model refers to the calibrated and validated EFDC model results that represent the existing operating schedule. Data from the top four layers were pooled to compute average values for water temperature and dissolved oxygen for each of the four scenarios and the baseline run. Average water temperature and dissolved oxygen scenario results were then compared with the baseline results.

The simulated water surface elevation at the forebay area for the four scenarios and baseline run are shown in Figure 8-1. The simulated water surface elevation results for all four scenarios followed the scheduled operation curves, as specified in Table 8-1 and shown in Figure 1-2. The comparison of the time series plots of simulated water temperature and dissolved oxygen concentration of the dam discharge between the baseline and scenarios are shown in Figure 8-2 and Figure 8-3, respectively. Hourly water temperature and dissolved oxygen results for baseline and scenarios were also extracted from the EFDC models to calculated the statistics including minimum, 10 percentile, 25 percentile, 50 percentile, 75 percentile, 90 percentile, maximum, and mean values. The summary statistics of water temperature and dissolved oxygen for the baseline and scenarios are given in Table 8-2 and Table 8-3, respectively. As can be seen, there are only small differences in simulated water temperature and dissolved oxygen between the baseline run and the four scenarios. The model simulation results clearly indicate that raising the winter pool water level by up to 4 ft would lead to only minor differences in water temperature and dissolved oxygen in the dam discharge flow.

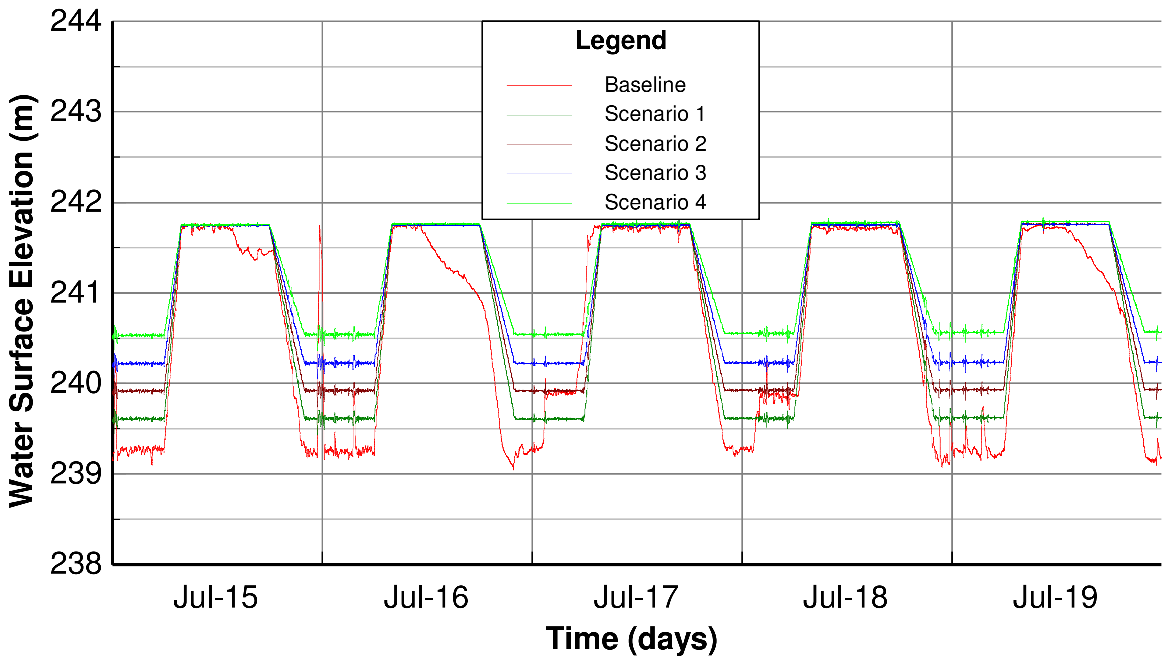

Figure 8-1 Comparison of Simulated Water Surface Elevation at the APC Forebay Station between Baseline and Scenarios

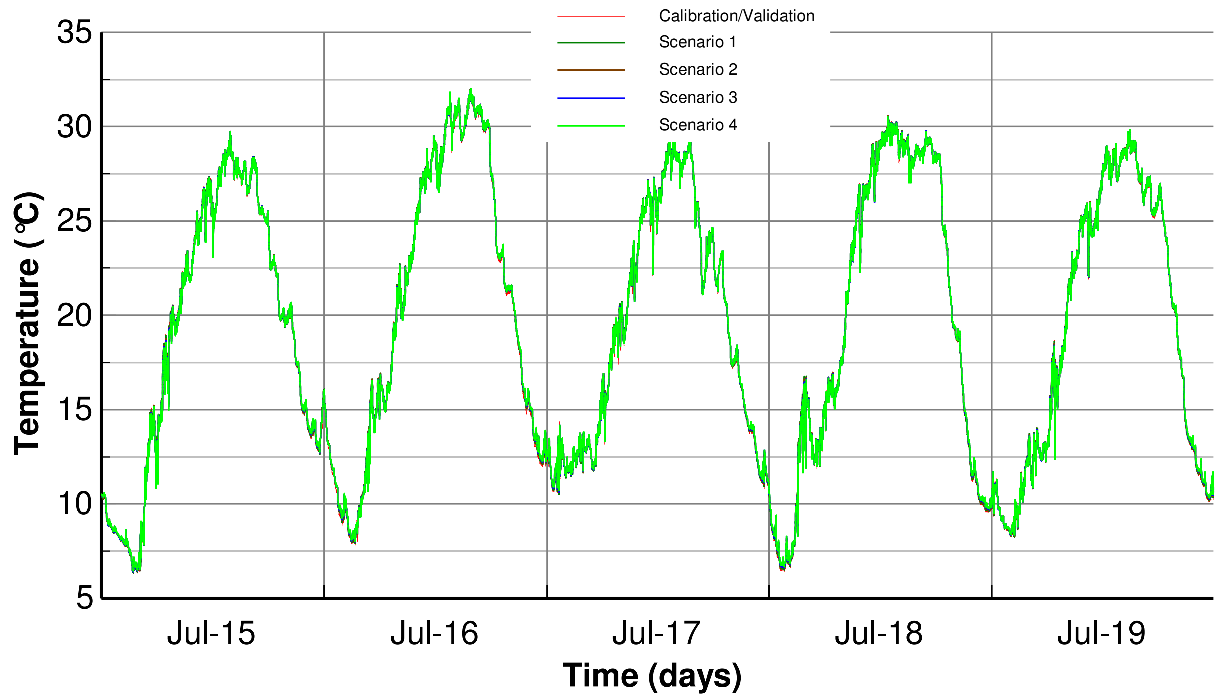

Figure 8-2 Comparison of Water Temperature of Dam Discharge between Baseline and Scenarios

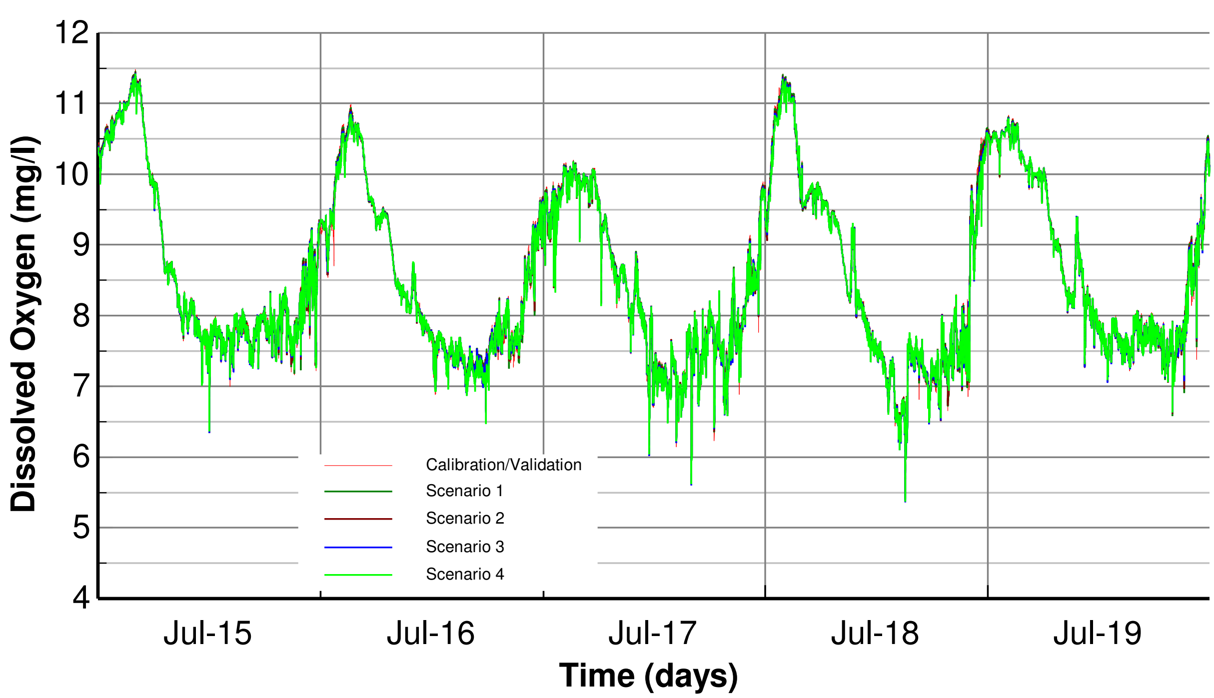

Figure 8-3 Comparison of Dissolved Oxygen of Dam Discharge between Baseline and Scenarios

Table 8-2 Summary Statistics of Water Temperature for Baseline and Scenarios

Statistics	Calibration/Validation	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Minimum	6.322	6.360	6.395	6.395	6.439
10 percentile	9.749	9.802	9.823	9.840	9.882
25 percentile	12.978	13.013	13.027	13.035	13.053
50 percentile	19.688	19.709	19.691	19.684	19.677
75 percentile	26.566	26.586	26.568	26.557	26.545
90 percentile	28.680	28.704	28.693	28.686	28.680
Maximum	31.998	32.028	32.031	32.018	32.038
Mean	19.493	19.534	19.535	19.535	19.541

Table 8-3 Summary Statistics of Dissolved Oxygen for Baseline and Scenarios

Statistics	Calibration/Validation	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Minimum	5.385	5.385	5.408	5.358	5.369
10 percentile	7.288	7.296	7.291	7.287	7.272
25 percentile	7.623	7.625	7.621	7.625	7.626
50 percentile	8.197	8.191	8.184	8.187	8.188
75 percentile	9.602	9.600	9.596	9.592	9.585
90 percentile	10.495	10.478	10.464	10.454	10.443
Maximum	11.480	11.462	11.445	11.433	11.423
Mean	8.587	8.584	8.577	8.573	8.569

9. References

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APPENDIX D

EROSION AND SEDIMENTATION SITES IDENTIFIED IN EROSION AND SEDIMENTATION STUDY

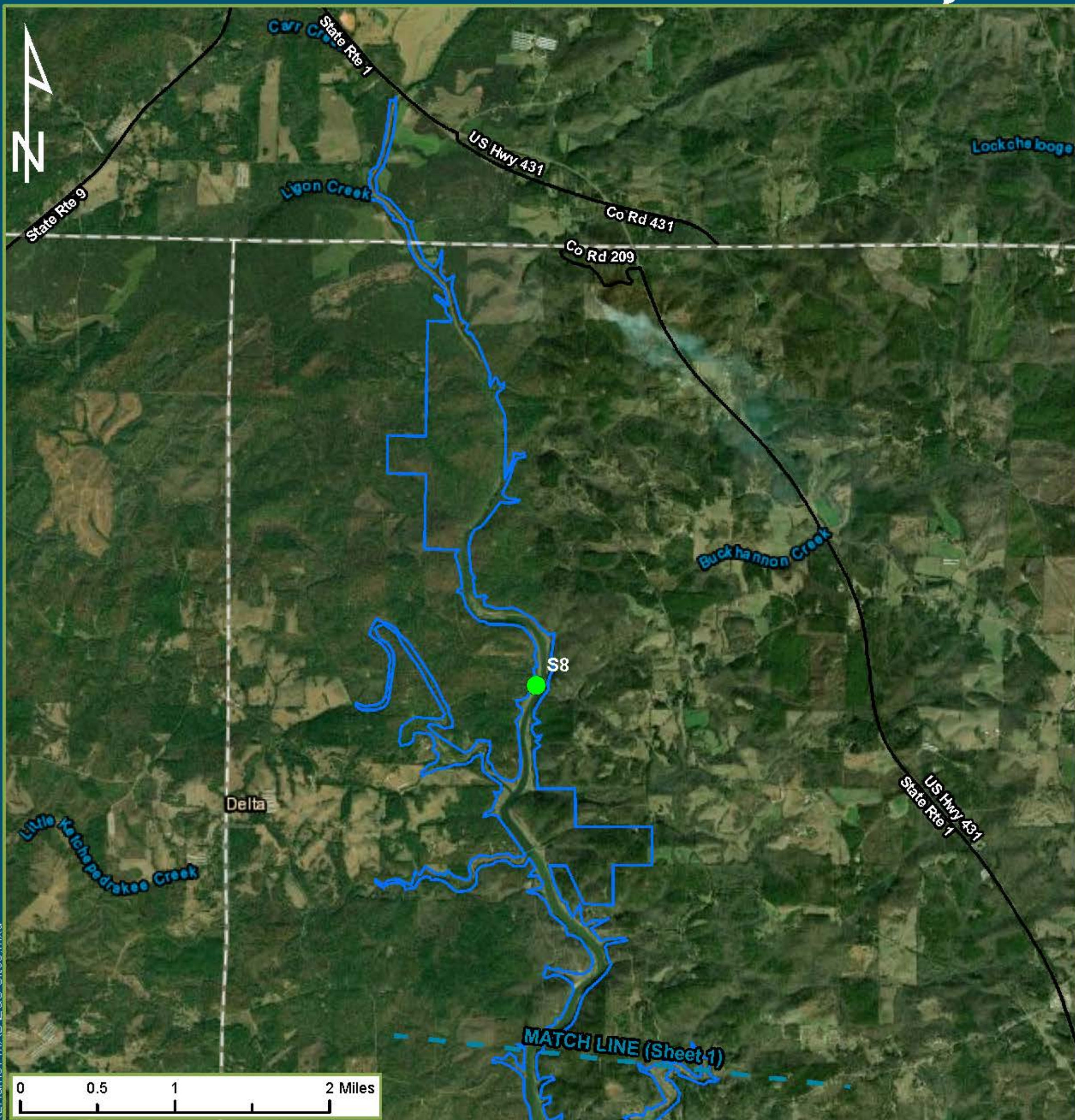
Erosion Site	Latitude	Longitude	Potential Cause of Erosion/ Sedimentation	Length (feet)	Width (feet)	Description of Exposed Soils	Adjacent Land Use
E1	33.39649	-85.44412	Natural Factor Independent of Operations, Land Use	100	20	Oc, Ochlockonee fine sandy loam	Agricultural, Exposed Roots or Root Undercutting, Leaning or Fallen Trees
E2	33.39618	-85.44512	Natural Factor Independent of Operations, Land Use	150	20	Oc, Ochlockonee fine sandy loam	Agricultural
E3	33.39448	-85.44763	Land Use	50	30	Oc, Ochlockonee fine sandy loam	Agricultural
E4	33.39253	-85.44797	Land Use	varying	N/A	Oc, Ochlockonee fine sandy loam	Early Successional Vegetation, Developed, Residential
E5	33.38870	-85.44677	Anthropogenic	100	10	Oc, Ochlockonee fine sandy loam	Unvegetated, Exposed Roots or Root Undercutting, Leaning or Fallen Trees, Residential
E6	33.38817	-85.45264	No active erosion	N/A	N/A	Oc, Ochlockonee fine sandy loam	N/A
E7	33.38399	-85.45285	Natural Factor Independent of Operations, Land Use	75	5	Bu, Buncombe loamy sand	Undeveloped Wooded, Exposed Roots or Root Undercutting, Leaning or Fallen Trees
E8	33.37972	-85.45260	Natural Factor Independent of Operations, Land Use	100	10	Bu, Buncombe loamy sand	Undeveloped Grassy
E9	33.37732	-85.45879	Natural Factor Independent of Operations, Land Use	450	5	LtE, Louisa stony sandy loam	Early Successional Vegetation, Exposed Roots or Root Undercutting, Leaning or Fallen Trees, Residential

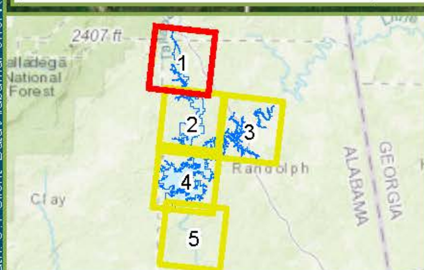
Erosion Site	Latitude	Longitude	Potential Cause of Erosion/ Sedimentation	Length (feet)	Width (feet)	Description of Exposed Soils	Adjacent Land Use
E10	33.37785	-85.45851	Natural Factor Independent of Operations, Land Use	150	5	Oc, Ochlockonee fine sandy loam	Early Successional Vegetation, Exposed Roots or Root Undercutting, Leaning or Fallen Trees, Residential
E11	33.38727	-85.47761	No active erosion	N/A	N/A	Mt, Mantachie fine sandy loam	N/A
E12	33.36759	-85.47331	No active erosion	N/A	N/A	Oc, Ochlockonee fine sandy loam	Developed
E13	33.36509	-85.47680	No active erosion	N/A	N/A	MaD3, Madison gravelly clay loam	Undeveloped Grassy, Roadway Embankment
E14	33.36407	-85.47728	Natural Factor Independent of Operations, Anthropogenic	N/A	N/A	Oc, Ochlockonee fine sandy loam	Undeveloped Wooded, Roadway Embankment
E15	33.37197	-85.49914	No active erosion	N/A	N/A	LgE, Louisa gravelly sandy loam	Developed, Wooded and Grassy, Residential
E16	33.37216	-85.50173	No active erosion	N/A	N/A	LtE, Louisa stony sandy loam	Undeveloped Grassy
E17	33.37371	-85.50122	No active erosion	N/A	N/A	Mt, Mantachie fine sandy loam	Undeveloped Grassy, Exposed Roots or Root Undercutting, Power Line Crossing
E18	33.35833	-85.49693	Land Use, Anthropogenic	300	5	LtE, Louisa stony sandy loam	Developed, Grassy
E19	33.35334	-85.50611	Land Use, Anthropogenic	150	3	LtE, Louisa stony sandy loam	Early Successional Vegetation, Exposed Roots or Root Undercutting, Developed Grassy
E20	33.35544	-85.51280	No active erosion			LtE, Louisa stony sandy loam	Undeveloped Grassy
E21	33.33941	-85.55814	Anthropogenic	100	2	MdC2, Madison gravelly fine sandy loam	Exposed Roots or Root Undercutting, Residential Grass Cutting

Erosion Site	Latitude	Longitude	Potential Cause of Erosion/ Sedimentation	Length (feet)	Width (feet)	Description of Exposed Soils	Adjacent Land Use
E22*	33.19603	-85.57649	Natural Factor Independent of Operations, Land Use	30	4	Oc, Ochlockonee fine sandy loam	Developed, Grassy, Early Successional Vegetation, Exposed Roots or Root Undercutting, Leaning or Fallen Trees
E23*	33.18490	-85.58503	Land Use	400	10	Oc, Ochlockonee fine sandy loam	Agricultural, Grassy, Early Successional Vegetation, Exposed Roots or Root Undercutting, Leaning or Fallen Trees
E24	33.34779	-85.51483	Anthropogenic	30	5	DaD3, Davidson gravelly clay loam	Undeveloped Wooded, Exposed Roots or Root Undercutting, Leaning or Fallen Trees

* Located downstream of Harris Dam

Erosion/Sedimentation Study Sites





Legend

- Sedimentation
- Erosion
- Match Line
- Major Road
- Project Boundary

Alabama Power Company

Birmingham, AL

R.L. Harris Project

FERC Project No. 2628

Drawn By:	Date Drawn:	Checked By:	Date Checked:
JJJ	1/20/2020	MAH	1/20/2020

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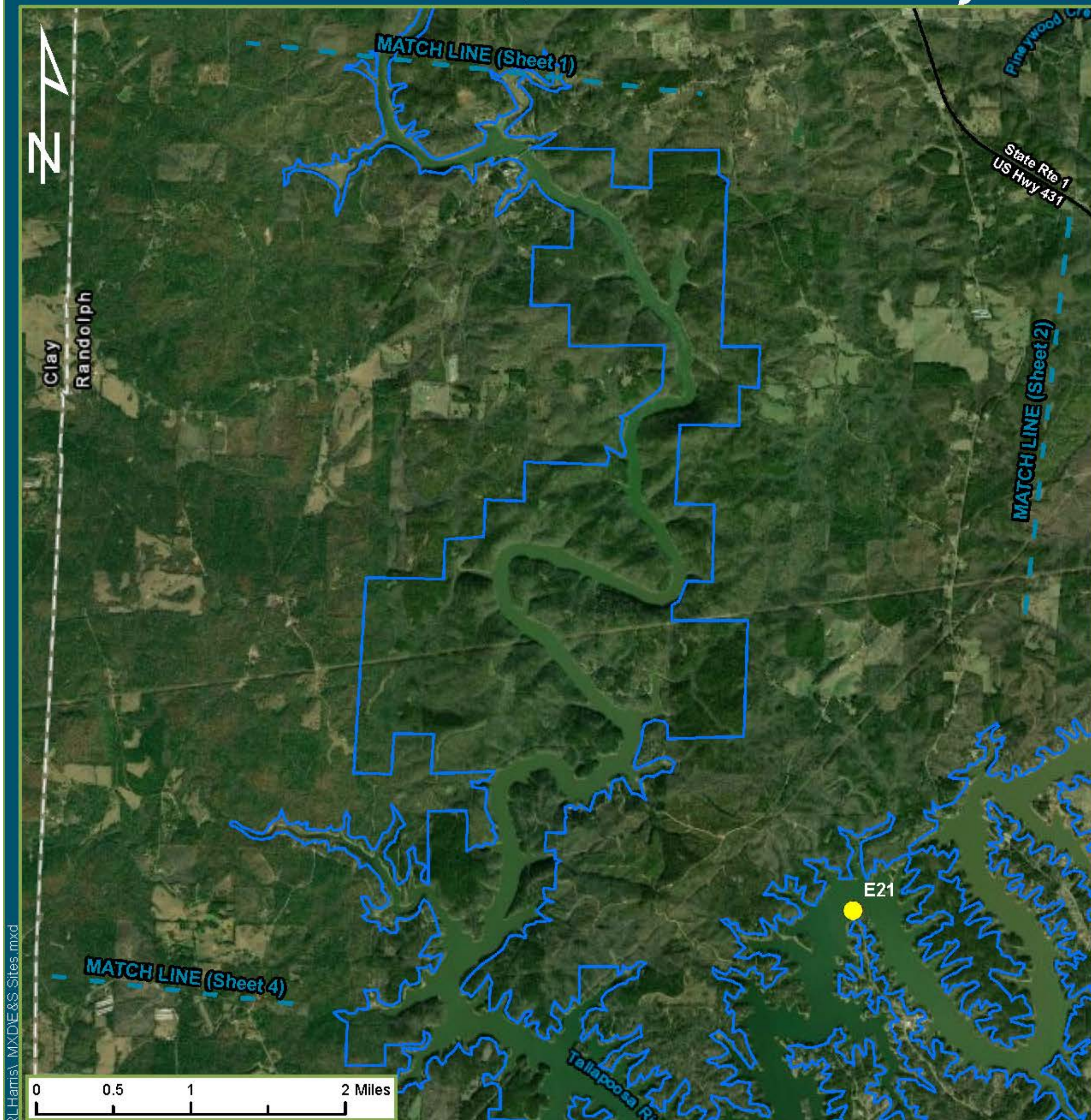
Path: G:\ Client Data\AlabamaPower\RL Harris\ MXD\E&S Sites.mxd

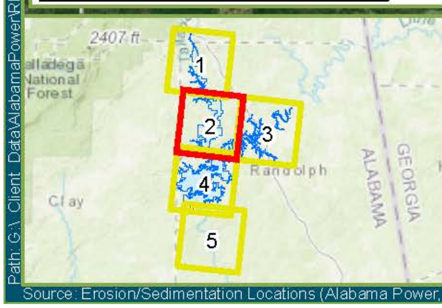
Date Printed: 2/7/2020

Source: Erosion/Sedimentation Locations (Alabama Power, 2019), Project Boundary (Alabama Power, 2019), Aerial Imagery (ESRI, 2020)

PN: 0535028.01

Erosion/Sedimentation Study Sites





Legend

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- Erosion
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- Major Road
- Project Boundary

Alabama Power Company
Birmingham, AL

R.L. Harris Project
FERC Project No. 2628

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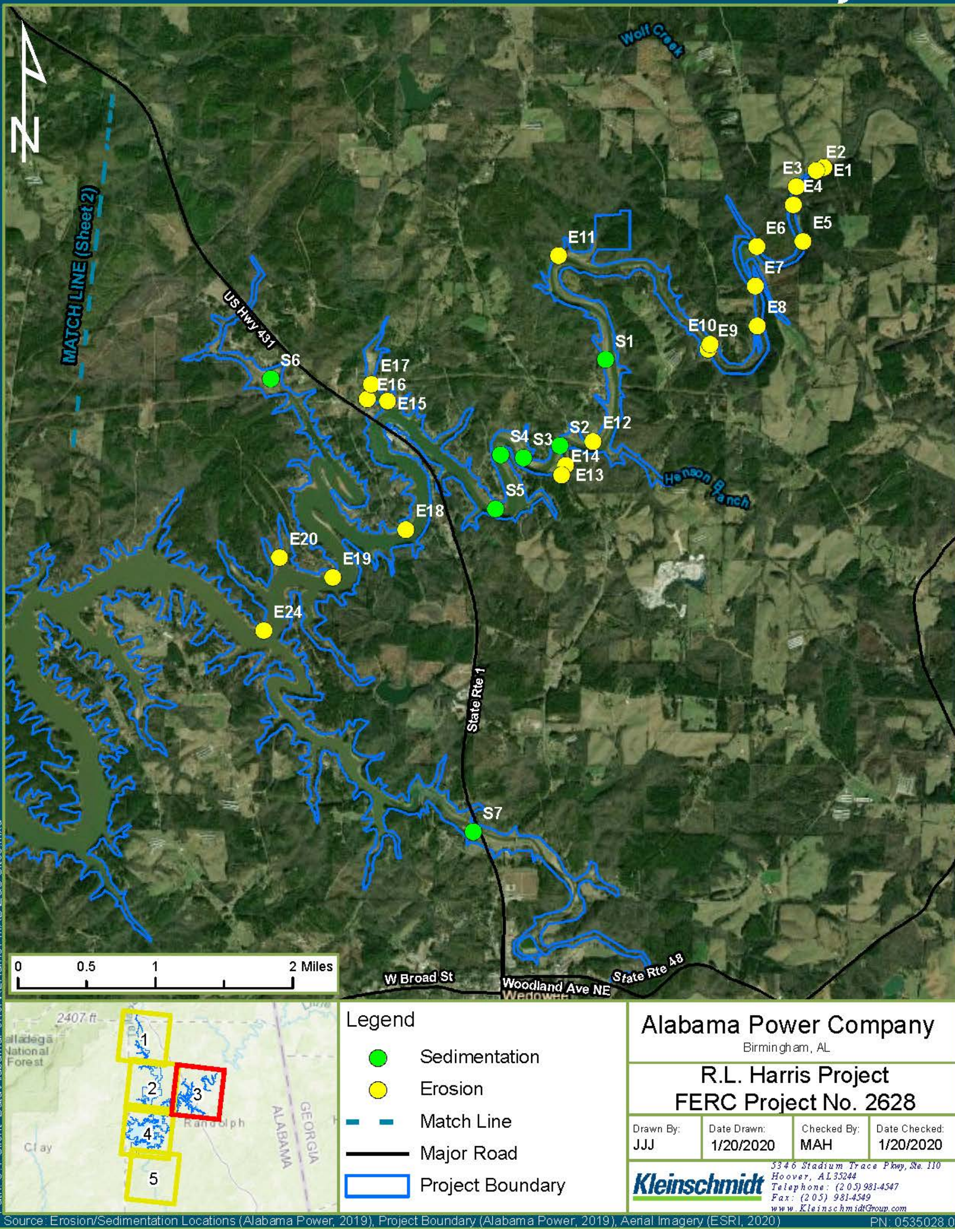

Legend

- Sedimentation
- Erosion
- Match Line
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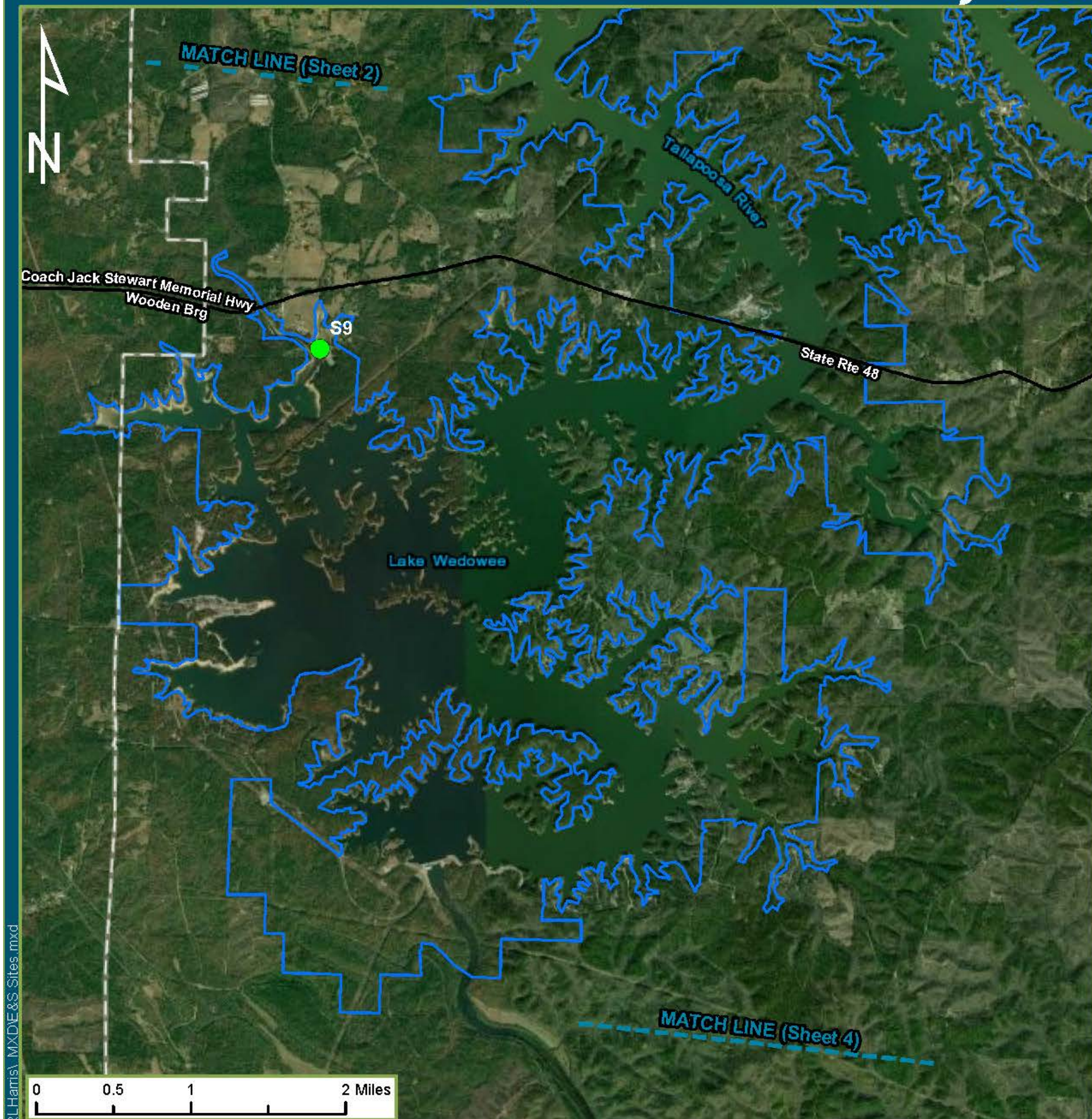

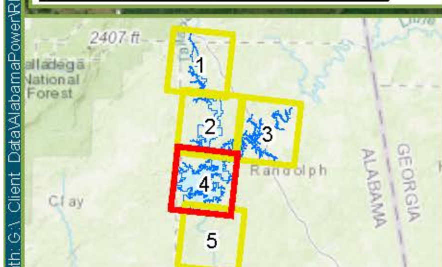

Legend

- Sedimentation
- Erosion
- Match Line
- Major Road
- Project Boundary

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FERC Project No. 2628

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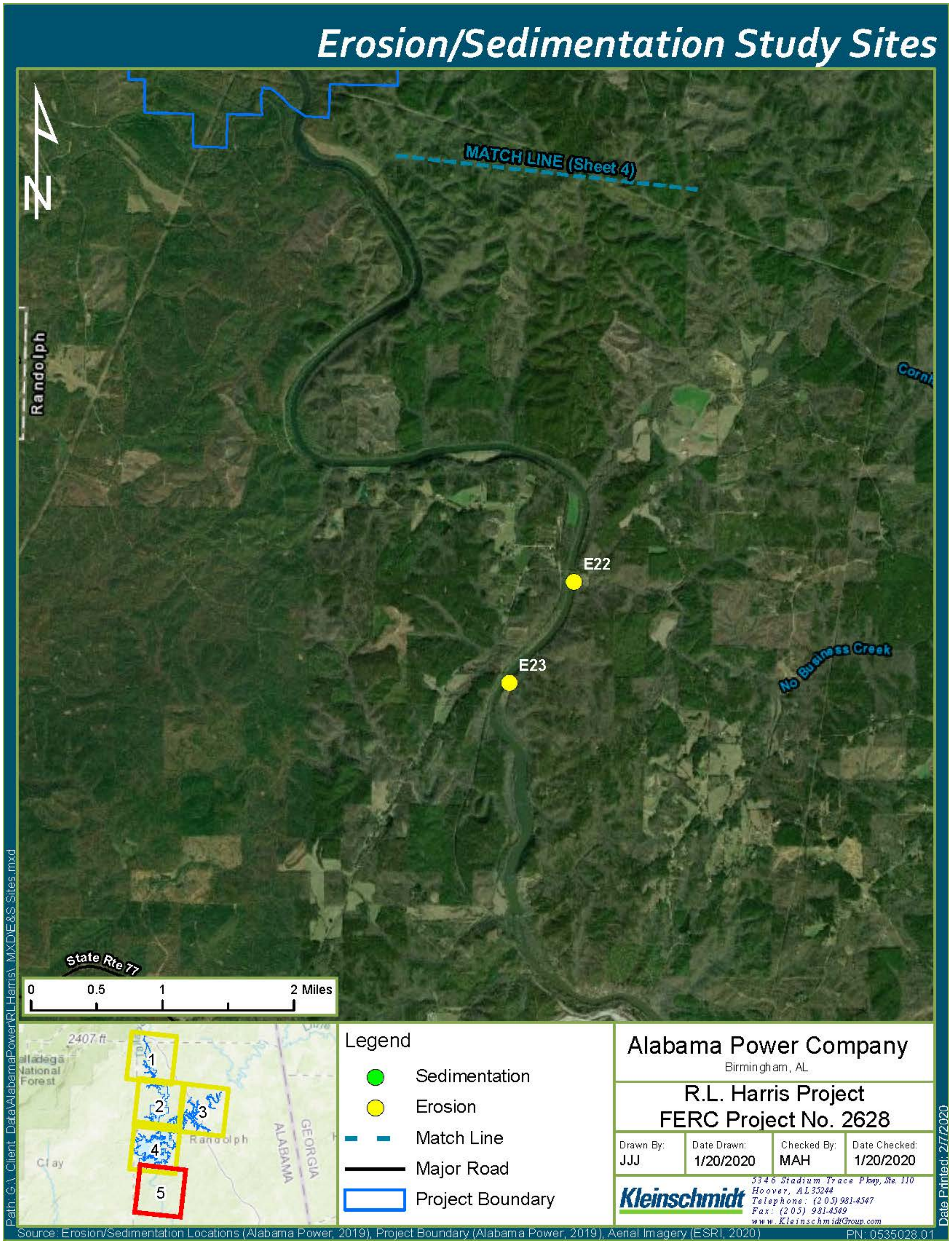
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Clay
ALABAMA
GEORGIA
Legend
Sedimentation
Erosion
Match Line
Major Road
Project Boundary
Alabama Power Company
Birmingham, AL
R.L. Harris Project
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APPENDIX E

WADING AND/OR OVERWINTERING BIRD SPECIES POTENTIALLY OCCURRING IN THE HARRIS PROJECT VICINITY

Family	Common Name	Scientific Name	Breeds in Project Area	Abundance/ Seasonality	Habitat
Anatidae	Canada Goose	*Branta Canadensis*	X	Fairly common in all seasons	Freshwater marshes, agricultural fields, and on lakes
Anatidae	Wood Duck	*Aix sponsa*	X	Common in all seasons	Wooded swamps, beaver ponds, bottomlands, creeks, and lakes
Anatidae	Gadwall	*Anas strepera*		Fairly common in winter and uncommon in fall and spring	Shallow freshwater ponds and lakes with abundant aquatic vegetation
Anatidae	American Wigeon	*Anas Americana*		Fairly common in winter, spring, and fall	Shallow freshwater ponds and lakes with abundant aquatic vegetation
Anatidae	Mallard	*Anas platyrhynchos*	X	Common in winter, fairly common in spring and fall, and uncommon in summer	Shallow water of ponds, lakes, and flooded fields
Anatidae	Blue-winged Teal	*Anas discors*		Common to fairly common in spring and fall	Shallow freshwater ponds, sloughs, creeks, and on lake mudflats
Anatidae	Northern Shoveler	*Anas clypeata*		Common in winter, spring, and fall	Freshwater ponds, swamps, and on lakes
Anatidae	Northern Pintail	*Anas acuta*		Fairly common in winter, spring, and fall	Freshwater marshes, agricultural fields, and shallow portions of lakes, ponds, and rivers
Anatidae	Green-winged Teal	*Anas cerci*		Common in winter, spring, and fall	Shallow freshwater marshes, and on creeks, lakes, and mudflats
Anatidae	Ring-necked Duck	*Aythya collaris*		Common in winter, early spring, and late fall	Shallow, wooded, freshwater ponds, swamps, and lakes
Anatidae	Lesser Scaup	*Aythya affinisthrus*		Fairly common in winter, spring, and fall	Larger lakes and rivers
Anatidae	Bufflehead	*Bucephala albeola*		Common in winter, early spring, and late fall	Larger lakes and slow-moving rivers
Anatidae	Hooded Merganser	*Lophodytes cucullatus*	X	Fairly common in winter, spring, and fall, and rare in summer	Wooded freshwater ponds, lakes, and slow water river systems
Anatidae	Ruddy Duck	*Oxyura jamaicensis*		Fairly common in winter	Freshwater ponds, lakes, and slow-moving rivers

Family	Common Name	Scientific Name	Breeds in Project Area	Abundance/ Seasonality	Habitat
Phasianidae	Wild Turkey	*Meleagris gallopavo*	X	Fairly common in all seasons	Forested and partially forested habitats
Odontophoridae	Northern Bobwhite	*Colinus virginianus*	X	Fairly common in all seasons in early successional habitats	Farms, along woodland edges, recently cut-over forest land, and in open country habitats dominated by old fields
Podicipedidae	Pied-billed Grebe	*Podilymbus podiceps*	X	Fairly common in spring, winter, and fall	Lakes and marshy ponds
Phalacrocoracidae	Double-crested Cormorant	*Phalacrocorax auritus*		Fairly common in fall, winter, and spring and uncommon in summer	Larger lakes, ponds, and rivers
Ardeidae	Great Blue Heron	*Ardea herodias*	X	Common in all seasons	Shallow water of ponds, lakes, and rivers
Ardeidae	Great Egret	*Ardea alba*	X	Common to fairly common in spring, summer, but uncommon to rare in winter	Shallow water of ponds, lakes, and rivers
Ardeidae	Little Blue Heron	*Egretta caerulea*	X	Rare to uncommon in spring to mid-summer, but fairly common in late summer and early fall	Shallow water of ponds, lakes, and rivers
Ardeidae	Green Heron	*Butorides virescens*	X	Common in spring, summer, and fall, but rare in winter	Edge of ponds, lakes, and rivers
Cathartidae	Black Vulture	*Coragyps atratus*	X	Common throughout year	Agricultural and livestock areas
Cathartidae	Turkey Vulture	*Cathartes aura*	X	Common in all seasons and regions	Wooded as well as open areas
Accipitridae	Northern Harrier	*Circus cyaneus*		Fairly common in winter, spring, and fall	In and over old fields, marshes, meadows, and grasslands
Accipitradae	Red-shouldered Hawk	*Buteo lineatus*	X	Fairly common in all seasons	Moist woodlands and swamps
Accipitradae	Red-tailed Hawk	*Buteo jamaicensis*	X	Common winter and fairly common in spring, summer, and fall	Open country and woodland edges
Falconidae	American Kestrel	*Falco sparverius*	X	Common in winter, fairly common in spring and fall, but rare in summer	Open fields and woodland edges

Family	Common Name	Scientific Name	Breeds in Project Area	Abundance/ Seasonality	Habitat
Rallidae	American Coot	*Fulica Americana*		Common in winter, common to uncommon in spring and fall, and rare in summer	Rivers, ponds, lakes, and swamps
Charadriidae	American Golden-Plover	*Pluvialis dominica*		Fairly common in spring and uncommon to rare in fall	Short grasslands, flooded fields and on mudflats of lakes, ponds, and rivers
Charadriidae	Semipalmated Plover	*Charadrius semipalmatus*		Fairly common in spring and fall, and occasional in early winter	Mudflats of lakes, ponds, and rivers
Charadriidae	Killdeer	*Charadrius vociferous*	X	Common in all seasons	Short-grass fields, and mudflats and shorelines of lakes, ponds, and rivers
Scolopacidae	Greater Yellowlegs	*Tringa melanoleuca*		Fairly common in spring and fall, but uncommon in winter and late summer	Along shorelines of shallow ponds and lakes, marsh edges, in flooded fields, and on mudflats
Scolopacidae	Lesser Yellowlegs	*Tringa flavipes*		Common in spring and fall, rare in winter, uncommon to rare in summer	Along shorelines of shallow ponds and lakes, marsh edges, in flooded fields and on mudflats
Scolopacidae	Spotted Sandpiper	*Actitis macularius*	X	Common in spring, late summer, and fall, but rare in winter	Along pond and lake margins, stream banks, and on mudflats
Scolopacidae	Solitary Sandpiper	*Tringa solitaria*		Common in spring, late summer, and fall	Along lake borders, stream banks, ponds, and marsh edges
Scolopacidae	Semipalmated Sandpiper	*Calidris pusilla*		Fairly common in spring and fall, and uncommon in late summer	On mudflats, and along pond edges and lakeshores
Scolopacidae	Least Sandpiper	*Calidris minutilla*		Common in spring, fairly common in fall, uncommon in winter and late summer, and occasional in early summer	On mudflats, and along pond edges and lakeshores
Scolopacidae	Pectoral Sandpiper	*Calidris melanotos*		Common in spring and fall, and uncommon in late summer	Wet meadows, flooded fields, on mudflats, and along shores of ponds, pools, and lakes
Scolopacidae	Common Snipe	*Gallinago*		Common in winter, spring, and fall	Marshes and wet grassy areas
Scolopacidae	American Woodcock	*Scolopax minor*	X	Fairly common in fall and winter, and occasional in spring	Moist shrubby woods, floodplains, thickets, and at edges of swamps

Family	Common Name	Scientific Name	Breeds in Project Area	Abundance/ Seasonality	Habitat
Laridae	Ring-billed Gull	*Larus delawarensis*		Fairly common in winter, spring, and fall, and occasional in summer	Summer rivers, lakes, irrigated and plowed fields, and garbage dumps
Columbidae	Rock Pigeon	*Columba livia Exotic*	X	Common in all seasons	In cities, and on farms, bridges, cliffs
Columbidae	Mourning Dove	*Zenaida macroura*	X	Common in all seasons	Farms, and in towns, woodlots, agricultural fields, and grasslands
Strigidae	Eastern Screech-Owl	*Megascops asio*	X	Common in all seasons	Woodlands, especially near open areas
Strigidae	Great Horned Owl	*Bubo virginianus*	X	Fairly common in all seasons	Woodlands, parklands, and occasionally in wooded suburbs
Strigidae	Barred Owl	*Strix varia*	X	Common in all seasons	Moist woodlands and wooded swamps
Alcedinidae	Belted Kingfisher	*Ceryle alcyon*	X	Common in all seasons	Along wooded rivers, streams, lakes, ponds, and in marshes
Picidae	Red-bellied Woodpecker	*Melanerpes carolinus*	X	Common in all seasons	Woodlands
Picidae	Yellow-bellied Sapsucker	*Sphyrapicus varius*		Fairly common in winter, spring, and fall	Mixed hardwood and conifer forests
Picidae	Downy Woodpecker	*Picoides pubescens*	X	Common in all seasons	Woodlands, orchards, suburban areas, parks, and farm woodlots
Picidae	Red-cockaded Woodpecker	*Picoides borealis*	X	Rare and isolated in all seasons	Old growth pine with open mid-story
Picidae	Northern Flicker	*Colaptes auratus*	X	Fairly common in all seasons and regions	Open woodlands and fields, and on lawns and open meadows with large trees
Picidae	Pileated Woodpecker	*Dryocopus pileatus*	X	Fairly common in all seasons	Mature woodlands with coniferous and hardwood trees
Tyrannidae	Eastern Wood-Pewee	*Contopus virens*	X	Common to fairly common in spring, summer, and fall	Open woodlands, parks, and along forest edges
Tyrannidae	Eastern Phoebe	*Sayornis phoebe*	X	Common in winter, spring, and fall	Open deciduous woodlands near bridges, cliffs, and eaves

Family	Common Name	Scientific Name	Breeds in Project Area	Abundance/ Seasonality	Habitat
Laniidae	Loggerhead Shrike	*Lanius ludovicianus*	X	Fairly common in winter, spring, and fall, and uncommon in summer	Open country with scattered trees and shrubs, and in hedgerows along agricultural fields
Corvidae	Blue Jay	*Cyanocitta cristata*	X	Common in all seasons	Forests, open woodlands, wooded residential areas, and parks
Corvidae	American Crow	*Corvus brachyrhynchos*	X	Common	All woodlands, farmlands, and suburban areas
Corvidae	Fish Crow	*Corvus ossifragus*	X	Fairly common to locally common in all seasons	Around swamplands, riverine areas, large lakes, urban and suburban areas, and farmlands
Hirundinidae	Tree Swallow	*Tachycineta bicolor*	X	Common in fall, fairly common in spring, and rare in winter and summer	Open areas, and over ponds and lakes; nests in cavities in dead, standing timber and boxes
Paridae	Carolina Chickadee	*Poecile carolinensis*	X	Common in all seasons	Woodlands and wooded suburbs
Paridae	Tufted Titmouse	*Baeolophus bicolor*	X	Common in all seasons	Woodlands and wooded suburbs
Sittidae	Brown-headed Nuthatch	*Sitta pusilla*	X	Locally common in all seasons	Open pine forests
Troglodytidae	Carolina Wren	*Thryothorus ludovicianus*	X	Common in all seasons	Thickets in woodlands, farmlands, and suburbs
Troglodytidae	House Wren	*Troglodytes aedon*	X	Fairly common in fall, uncommon in spring, and rare in winter and summer	Farmlands, thickets, and suburban yards with dense hedgerows
Regulidae	Golden-crowned Kinglet	*Regulus satrapa*		Common in winter, spring, and fall	Woodlands, especially with conifers
Regulidae	Ruby-crowned Kinglet	*Regulus calendula*		Common in winter, spring, and fall	Woodlands
Sylviidae	Blue-gray Gnatcatcher	*Polioptila caerulea*	X	Common in spring, summer, and fall, and rare in winter	Open woodlands, forest edges, and tree-lined fence rows

Family	Common Name	Scientific Name	Breeds in Project Area	Abundance/ Seasonality	Habitat
Turdidae	Eastern Bluebird	*Sialia sialis*	X	Common in all seasons	Open rural areas, farmlands, fence rows, open suburban areas, and parks with scattered trees
Turdidae	Hermit Thrush	*Catharus guttatus*		Common in winter, spring, and fall	Woodlands with dense undergrowth
Turdidae	American Robin	*Turdus migratorius*	X	Common in all seasons	Short grass areas with scattered trees
Mimidae	Northern Mockingbird	*Mimus polyglottos*	X	Common in all seasons	Openings with short grass, scattered shrubs, and trees
Mimidae	Brown Thrasher	*Toxostoma rufum*	X	Common in all seasons	Short ground cover vegetation near dense thickets, hedgerows, and shrubs
Motacillidae	American Pipit	*Anthus rubescens*		Fairly common in winter, spring, and fall	Open country, especially on plowed fields and mudflats
Bombycillidae	Cedar Waxwing	*Bombycilla cedrorum*	X	Common in winter, spring, and fall, and occasional in summer	Areas with trees and shrubs that produce fruits, such as hackberry, mulberry, cedar, cherry, and holly
Parulidae	Yellow-throated Warbler	*Dendroica dominica*	X	Fairly common in spring, summer, and fall, and occasional in winter	Older pine forests, and woodlands with sycamores, especially near water; in migration, found in woodlands
Parulidae	Pine Warbler	*Dendroica pinus*	X	Common in all seasons	Mature pine woodlands
Parulidae	Prairie Warbler	*Setophaga discolor*	X	Common in spring, summer, and fall, and occasional in winter	Brushy early successional growth, particularly regenerating clear cuts
Parulidae	Palm Warbler	*Dendroica palmarum*		Common in spring, fairly common in fall, and rare in winter	Open areas with scattered shrubs and trees
Parulidae	Common Yellowthroat	*Geothlypis trichas*	X	Common in spring, summer, and fall, and rare in winter	Along woodland edges, and in hedgerows, thickets, marshes, and wet meadows
Parulidae	Yellow-breasted Chat	*Icteria virens*	X	Common in spring, summer, and fall, and occasional in winter	Early successional growth areas
Thraupidae	Summer Tanager	*Piranga rubra*	X	Common in spring, summer, and fall, and occasional in winter	In breeding season, found in open, mixed hardwood-coniferous forests and along forest edges

Family	Common Name	Scientific Name	Breeds in Project Area	Abundance/ Seasonality	Habitat
Emberizidae	Eastern Towhee	*Pipilo erythrophthalmus*	X	Common in all seasons	Brushy woodlands and early successional growth
Emberizidae	Chipping Sparrow	*Spizella passerine*	X	Common in all seasons	Open areas with short grass and scattered trees, especially conifers
Emberizidae	Field Sparrow	*Spizella pusilla*	X	Common to fairly common in all seasons	Early successional growth areas, especially with dense ground cover
Emberizidae	Savannah Sparrow	*Passerculus sandwichensis*		Common in winter, spring, and fall	Open grassy fields
Emberizidae	Song Sparrow	*Melospiza melodia*	X	Common in winter, spring, and fall, and uncommon to rare in summer	Open brushy and weedy areas
Emberizidae	Swamp Sparrow	*Melospiza Georgiana*		Common to fairly common in winter, spring, and fall	Freshwater marshes, and shrubby and weedy areas, especially near water
Emberizidae	White-throated Sparrow	*Zonotrichia albicollis*		Common in winter, spring, and fall, and rare in summer	Thickets and shrubby areas
Emberizidae	Dark-eyed Junco	*Junco hyemalis*		Common in winter, spring, and fall, and occasional in summer	Open woodlands, and brushy and grassy areas
Cardinalidae	Northern Cardinal	*Cardinalis*	X	Common in all seasons	Shrubby areas, hedgerows, thickets, and suburban gardens
Cardinalidae	Indigo Bunting	*Passerina cyanea*	X	Common in spring, summer, and fall, and occasional in winter	Brushy and weedy area, in early successional stages and woodland openings, and along woodland and field borders
Icteridae	Red-winged Blackbird	*Agelaius phoeniceus*	X	Common in all seasons	Marshes, and brushy, weedy, and grassy areas, especially when wet
Icteridae	Eastern Meadowlark	*Sturnella magna*	X	Common in all seasons	Grassy, weedy fields, especially high grass
Icteridae	Common Grackle	*Quiscalus quiscula*	X	Common in all seasons	Open woodlands, especially those with pines and grassy areas; also fields with short grasses or in cultivated fields
Icteridae	Brown-headed Cowbird	*Molothrus ater*	X	Common in all seasons	Open areas, especially with livestock

Family	Common Name	Scientific Name	Breeds in Project Area	Abundance/ Seasonality	Habitat
Icteridae	Baltimore Oriole	*Icterus galbula*	X	Fairly common in spring and fall, but rare in summer and winter	In breeding season, found in open areas, with scattered trees, especially near water. In migration, found in woodlands
Fringillidae	House Finch	*Carpodacus mexicanus*	X	Common in all seasons	Open woodlands
Fringillidae	American Goldfinch	*Carduelis tristis*	X	Common in winter, spring, and fall	Open woodlands, brushy areas, and willow thickets
Passeridae	House Sparrow	*Passer domesticus Exotic*	X	Common in all seasons	Urban and suburban areas, and open farmland

Source: Alabama Power and Kleinschmidt 2018

APPENDIX F

AMPHIBIAN SPECIES POTENTIALLY OCCURRING IN THE HARRIS PROJECT VICINITY

Family	Common Name	Scientific Name	Abundance in Project Area	Habitat
Amphibians				
Bufonidae	American Toad	*Bufo americanus*	Common	Upland forests, suburban areas
Bufonidae	Fowler's Toad	*Bufo woodhousii*	Common	Sandy areas around shores of lakes, or in river valleys
Hylidae	Northern Cricket Frog	*Acris crepitans*	Common	Creekbanks, lakeshores, and mudflats
Hylidae	Cope's Gray Treefrog	*Hyla chrysoscelis*	Common	Small trees or shrubs, typically over standing water; on ground or at water's edge during breeding season
Hylidae	Green Treefrog	*Hyla cinerea*	Moderately common	Permanent aquatic habitats
Hylidae	Mountain Chorus Frog	*Pseudacris brachyphona*	Moderately common	Forested areas in most of northern Alabama
Hylidae	Northern Spring Peeper	*Pseudacris crucifer*	Common	Ponds, pools, and swamps
Hylidae	Upland Chorus Frog	*Pseudacris triseriata feriarum*	Moderately common	Grassy swales, moist woodlands, river-bottom swamps, and environs of ponds, bogs, and marshes
Microhylidae	Eastern Narrow-mouthed Toad	*Gastrophyrne carolinensis*	Common	Variety of habitats providing suitable cover and moisture, including under logs and or leaf litter
Pelobatidae	Eastern Spadefoot Toad	*Scaphiopus holbrooki*	Moderately	Forested areas of sandy or loose soil
Ranidae	Bullfrog	*Rana catesbeiana*	Common	Permanent aquatic habitats
Ranidae	Bronze Frog	*Rana clamitans spp.*	Moderately common	Rocks, stumps, limestone crevices of stream environs, bayheads and swamps
Ranidae	Wood Frog	*Rana sylvatica*	Uncommon	Moist wooded areas
Ranidae	Southern Leopard Frog	*Rana pipiens sphenocephala*	Moderately common, believed to be declining	All types of aquatic to slightly brackish habitats
Ambystomatidae	Spotted Salamander	*Ambystoma maculatum*	Moderately common, believed to be declining	Bottomland hardwoods, woodland pools
Ambystomatidae	Marbled Salamander	*Ambystoma opacum*	Common	Bottomland hardwoods, woodland pools

Family	Common Name	Scientific Name	Abundance in Project Area	Habitat
Plethodontidae	Spotted Dusky Salamander	*Desmongnathus conanti*	Common	Damp habitats, seepage areas
Plethodontidae	Southern Two-lined Salamander	*Eurycea cirrigera*	Common	Shaded aquatic habitats
Plethodontidae	Three-lined Salamander	*Eurycea guttolineata*	Common	Shaded aquatic habitats, forested floodplains
Plethodontidae	Webster's Salamander	*Plethodon websteri*	Moderately common	Damp deciduous forest
Plethodontidae	Northern Slimy Salamander	*Plethodon glutinosus*	Common	Wide variety of habitats
Plethodontidae	Northern Red Salamander	*Pseudotriton ruber*	Common	Aquatic margins in forested areas
Salamandridae	Eastern Newt	*Notophthalmus viridescens louisianensis*	Moderately common	Terrestrial or aquatic habitats, depending on life stage
Salamandridae	Central Newt	*Notophthalmus viridescens*	Moderately common	Terrestrial or aquatic habitats, depending on life stage

Source: Alabama Power and Kleinschmidt 2018

Attachment 2
Operating Curve Change Feasibility Analysis Consultation Record (April 2019 – March 2021)

Benjamin M Bennett, Wadley, AL.
I have spent most of my life on the river. But it is sad to see the banks and the old trees falling in the river. 25 foot of the banks gone in some places . Places where the water was 10 to 20 foot deep now 5 foot . And I know there are a lot of Native American burial grounds up and down the river either gone or will be within 2 years because of erosion. Something has to be done soon. Why cant we let what water comes in the lake come out ?

HAT 1 meeting - September 11, 2019

Anderegg, Angela Segars

Tue 8/13/2019 6:18 PM

To: 'harrisrelicensing@southernco.com' <harrisrelicensing@southernco.com>
Bcc damon.abernethy@dcnr.alabama.gov <damon.abernethy@dcnr.alabama.gov>; steve.bryant@dcnr.alabama.gov <steve.bryant@dcnr.alabama.gov>; stan.cook@dcnr.alabama.gov <stan.cook@dcnr.alabama.gov>; taconya.goar@dcnr.alabama.gov <taconya.goar@dcnr.alabama.gov>; chris.greene@dcnr.alabama.gov <chris.greene@dcnr.alabama.gov>; keith.henderson@dcnr.alabama.gov <keith.henderson@dcnr.alabama.gov>; mike.holley@dcnr.alabama.gov <mike.holley@dcnr.alabama.gov>; evan.lawrence@dcnr.alabama.gov <evan.lawrence@dcnr.alabama.gov>; nick.nichols@dcnr.alabama.gov <nick.nichols@dcnr.alabama.gov>; brian.atkins@adeca.alabama.gov <brian.atkins@adeca.alabama.gov>; tom.littlepage@adeca.alabama.gov <tom.littlepage@adeca.alabama.gov>; jhaslbauer@adem.alabama.gov <jhaslbauer@adem.alabama.gov>; cljohnson@adem.alabama.gov <cljohnson@adem.alabama.gov>; mlen@adem.alabama.gov <mlen@adem.alabama.gov>; fal@adem.alabama.gov <fal@adem.alabama.gov>; djmoore@adem.alabama.gov <djmoore@adem.alabama.gov>; arsegars@southernco.com <arsegars@southernco.com>; dkanders@southernco.com <dkanders@southernco.com>; jefbaker@southernco.com <jefbaker@southernco.com>; jcarlee@southernco.com <jcarlee@southernco.com>; kechandl@southernco.com <kechandl@southernco.com>; mcoker@southernco.com <mcoker@southernco.com>; cggoodma@southernco.com <cggoodma@southernco.com>; sgraham@southernco.com <sgraham@southernco.com>; ammcvica@southernco.com <ammcvica@southernco.com>; tlmills@southernco.com <tlmills@southernco.com>; cmnix@southernco.com <cmnix@southernco.com>; kodom@southernco.com <kodom@southernco.com>; alpeeple@southernco.com <alpeeple@southernco.com>; dpreston@southernco.com <dpreston@southernco.com>; scsmith@southernco.com <scsmith@southernco.com>; twstjohn@southernco.com <twstjohn@southernco.com>; dawhatle@southernco.com <dawhatle@southernco.com>; cchaffin@alabamarivers.org <cchaffin@alabamarivers.org>; clowry@alabamarivers.org <clowry@alabamarivers.org>; gjobsis@americanrivers.org <gjobsis@americanrivers.org>; kmo0025@auburn.edu <kmo0025@auburn.edu>; devridr@auburn.edu <devridr@auburn.edu>; irwiner@auburn.edu <irwiner@auburn.edu>; wrighr2@aces.edu <wrighr2@aces.edu>; lgallen@balch.com <lgallen@balch.com>; jhancock@balch.com <jhancock@balch.com>; allan.creamer@ferc.gov <allan.creamer@ferc.gov>; rachel.mcnamara@ferc.gov <rachel.mcnamara@ferc.gov>; sarah.salazar@ferc.gov <sarah.salazar@ferc.gov>; monte.terhaar@ferc.gov <monte.terhaar@ferc.gov>; gene@wedoweelakehomes.com <gene@wedoweelakehomes.com>; kate.cosnahan@kleinschmidtgroup.com <kate.cosnahan@kleinschmidtgroup.com>; colin.dinken@kleinschmidtgroup.com <colin.dinken@kleinschmidtgroup.com>; amanda.fleming@kleinschmidtgroup.com <amanda.fleming@kleinschmidtgroup.com>; chris.goodell@kleinschmidtgroup.com <chris.goodell@kleinschmidtgroup.com>; henry.mealing@kleinschmidtgroup.com <henry.mealing@kleinschmidtgroup.com>; jason.moak@kleinschmidtgroup.com <jason.moak@kleinschmidtgroup.com>; kelly.schaeffer@kleinschmidtgroup.com <kelly.schaeffer@kleinschmidtgroup.com>; jessecunningham@msn.com <jessecunningham@msn.com>; mdollar48@gmail.com <mdollar48@gmail.com>; drheinzen@charter.net <drheinzen@charter.net>; sforehand@russelllands.com <sforehand@russelllands.com>; 1942jthompson420@gmail.com <1942jthompson420@gmail.com>; nancyburnes@centurylink.net <nancyburnes@centurylink.net>; sandnfrench@gmail.com <sandnfrench@gmail.com>; lgarland68@aol.com <lgarland68@aol.com>; rbmorris222@gmail.com <rbmorris222@gmail.com>; Ira Parsons (irapar@centurytel.net) <irapar@centurytel.net>; mitchell.reid@tnc.org <mitchell.reid@tnc.org>; richardburnes3@gmail.com <richardburnes3@gmail.com>; eilandfarm@aol.com <eilandfarm@aol.com>; athall@fujifilm.com <athall@fujifilm.com>; ebt.drt@numail.org <ebt.drt@numail.org>; georgettraylor@centurylink.net <georgettraylor@centurylink.net>; beckyrainwater1@yahoo.com <beckyrainwater1@yahoo.com>; dbronson@charter.net <dbronson@charter.net>; wmcampbell218@gmail.com <wmcampbell218@gmail.com>; jec22641@aol.com <jec22641@aol.com>; sonjaholloman@gmail.com <sonjaholloman@gmail.com>; butchjackson60@gmail.com <butchjackson60@gmail.com>; donnamat@aol.com <donnamat@aol.com>; goxford@centurylink.net <goxford@centurylink.net>; mhpwedowee@gmail.com <mhpwedowee@gmail.com>; jerrelshell@gmail.com <jerrelshell@gmail.com>; bsmith0253@gmail.com <bsmith0253@gmail.com>; inspector_003@yahoo.com

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HAT 1,

Alabama Power Company will be hosting a series of HAT meetings on **Wednesday, September 11, 2019 at the Oxford Civic Center,** 401 Mccullars Ln, Oxford, AL 36203. The HAT 1 meeting will be from **9:00 to 11:00**. The purpose of the HAT 1 meeting is to review the models, model assumptions, inputs and scenarios, and to review the schedule for deliverables and respond to stakeholder questions on the models. This is for both the Operating Curve Change Feasibility Analysis and the Downstream Release Alternatives studies. Note that Alabama Power will not be presenting results of any of the modeling efforts at this meeting; however we will be explaining how the analyses will provide results.

Please RSVP by Friday, September 6, 2019. Lunch will be provided (~11:45) so please indicate any food allergies or vegetarian preferences on or before September 6, 2019. I encourage everyone to attend in person. If this is not feasible, we are also offering a Skype option (info below). It would be ideal to join on your computer as we will be viewing presentations and maps.

If you have any questions about the agenda or meeting, please email or call me at ARSEGARS@southernco.com or (205) 257-2251.

Join Skype Meeting [meet.lync.com]

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Find a local number [dialin.lync.com]

Conference ID: 892052380

Angie Anderegg
Hydro Services
(205)257-2251
arsegars@southernco.com

HAT 1 (Project Operations) Stakeholder Meeting Summary
September 11, 2019
9 am to 11 am
Oxford Civic Center, Oxford, AL

Participants:
See Attachment A

Participants by Phone:
Chuck Denman – Downstream Property Owner
Sarah Salazar – FERC
Monte TerHaar – FERC
Kyrstin Wallach – FERC

Action Items:

- Alabama Power will post the HAT 1 meeting summary and all meeting materials to the Harris Relicensing website (www.harrisrelicensing.com)

Summary
The following summarizes the September 11, 2019 Harris Action Team (HAT) 1 (Project Operations) meeting. The meeting presentation is included in Attachment B; therefore, this meeting summary focuses on the overall meeting purpose, highlights of the presentation, and stakeholders' questions/comments and Alabama Power's responses.

Introduction – Angie Anderegg (Alabama Power)
Angie introduced the HAT 1 meeting purpose, reviewed the safety procedures, and introduced participants in the meeting room and by phone. The purpose of the HAT 1 meeting was to discuss all the models, the methods, and the model inputs and outputs (how the model will be used) for the Operating Curve Change Feasibility Analysis and the Downstream Release Alternatives Studies.

Operating Curve Change Feasibility Analysis – Kenneth Odom (Alabama Power)
Kenneth presented a detailed overview of the three models: Hydrologic Engineering Center (HEC) – Statistical Software Package (SSP) (HEC-SSP) and the Flood Frequency Analysis (HEC-FFA); the HEC-Reservoir Simulation (HEC-RES-Sim); and HEC-River Analysis System (HEC-RAS). Kenneth explained how each of the tools were used in the process and how Alabama Power will use these tools in evaluating the baseline condition (existing winter pool elevation) and the four alternative winter pool elevations (raising the winter curve by 1, 2, 3, and 4 feet). Kenneth also explained that the 100-year flood is a high streamflow event that has a 1 percent chance of being equaled or exceeded in any year. Barry Morris (Lake Wedowee Property Owners Association-LWPOA) asked Kenneth to explain the difference between peak and inflow volume. Kenneth responded that the peak inflow is the maximum inflow – like the instantaneous peak. Inflow volume is the volume (acre-feet) that occurs over the full duration of the storm, which provides a better picture of the area occupied in the reservoir. This volume is cumulative over a flow event.

Barry asked about other data inputs in addition to the U.S. Geological Survey (USGS) that Alabama Power would consider during a flood event. Kenneth noted that Alabama Power uses a network of rainfall gages in addition to the stream flow gages. Additionally, Alabama Power knows the amount of water going through the forebay and spillway, which allows inflow as well as outflow to be calculated.

Barry Morris asked about the forebay water quality modeling. Jason Moak (Kleinschmidt) noted that the forebay water quality modeling would be used to address effects of the alternative winter pool elevations on water quality and temperature in the reservoir. Barry asked if the forebay modeling focused on temperature and dissolved oxygen; Kenneth stated that while the focus of the study is evaluating impacts to DO and temperature, the Environmental Fluid Dynamics Code (EFDC) model does incorporate other water quality/chemistry data.

Downstream Release Alternatives Study – Kenneth Odom

Kenneth also reviewed the tools for the Downstream Alternatives Study. Taconya Goar (Alabama Department of Conservation and Natural Resources – ADCNR) asked if this study would also include flood flows downstream. Angie Anderegg clarified that Alabama Power would review high, normal, and low flow operations in the Downstream Release Alternatives Study.

FERC staff asked if Alabama Power had determined what the modified Green Plan would entail. Jason Moak responded that Alabama Power is working to complete the habitat study and, based on the results of that study, Alabama Power will better define modifications to the existing Green Plan. A stakeholder asked about the difference between the continuous minimum flow alternative and the Green Plan and whether the Green Plan would have a minimum flow. Angie Anderegg responded that the Green Plan does not have a continuous minimum flow; however, the minimum flow alternative is the same daily volume (150 cfs) as the Green Plan pulses and the modified Green Plan would likely include changes to the timing of those pulses. Angie provided an example of how Alabama Power could modify the Green Plan to include shifting the pulses to occur in the early morning hours (e.g., 3 am) to support kayaking/boating activity later in the day.

Alabama Power discussed the cross-section data used to develop the HEC-RAS model. Jason Moak noted that this data will be available as x, y, and z points, and currently there are over 200 between the dam and Jaybird Landing. Donna Matthews asked if any of the 200 transects were monitoring real time data. Jason Moak responded that the transects are not monitors but are necessary to build the downstream HEC-RAS model. Alabama Power has deployed 20 level logger monitors in the Tallapoosa River below Harris Dam that are collecting data (elevation and temperature). Jason also noted that the USGS has recently installed a gage at Malone. Albert Eiland (downstream property owner) shared his experience with the high flow events in the Tallapoosa River and its effect on his property. He is concerned that raising the winter curve at Lake Harris will reduce any flood protection he may have on his property downstream of the Harris Dam. Barry Morris asked at what point in a rain event does the U.S. Army Corps of Engineers (USACE) intervene. Alan Peeples (Alabama Power) noted that Alabama Power and the USACE are in constant communication during high flow events and that Alabama Power's flood control operations are dictated by the USACE Harris Reservoir Regulation Manual. Barry asked if Alabama Power can override the Harris Reservoir Regulation Manual. Alan noted that it is possible to ask the USACE for a variance; however, Alabama Power would be required to do additional modeling prior to that variance request. Mr. Eiland asked about operations in 2003, including why Alabama Power did not release water when they knew a rain event was coming to the Harris area. Alabama Power does not pre-evacuate the reservoir because weather forecasts are often inaccurate, and Alabama Power must abide by the USACE flood control procedures specified in the Harris Reservoir Regulation Manual.

Angie Anderegg reviewed the next steps for the Operating Curve Change Feasibility Analysis and the Downstream Release Alternatives studies. Alabama Power will file a Progress Update on all the studies before the end of October 2019. Between October and the first quarter (Q1) of 2020, Alabama Power will be modeling the alternatives in each study plan and will prepare an Initial Study Report that must be filed with FERC in April 2020. The Phase 1 Modeling report will be part of the Initial Study Report and will include effects on downstream flooding, generation, navigation, and drought management. Phase 2 of these studies will address effects on other resources. Additional HAT 1 meetings will be held in Q1 2020.

ATTACHMENT A
HARRIS ACTION TEAM 1 MEETING ATTENDEES

HARRIS DAM RELICENSING

HARRIS PROJECT RELICENSING

HAT 1 SIGN-IN SHEET

September 11, 2019 9:00 AM

	Name/ Affiliation or Organization	Email
1	*John Smith/ Stakeholder*	*jsmith@email.com*
2	Kelly Yates, Env. Affairs	kayates@southernco.com
3	Stacy Thompson APC Env. Affairs	sthompso@southernco.com
4	DAVID Smith	inspector_003@yahoo.com
5	Glenell Smith	gardenergirl07@yahoo.com
6	Trey Stevens	trsteven@southernco.com
7	Joel Stevens	tjsteven@southernco.com
8	Jason Moak	jason.moak@kleinschmidtgroup.com
9	Kelly Schaeffer	Kelly.Schaeffer@Kleinschmidtgroup.com
10	Barry Morris	rbmorris333@gmail.com
11	Mike Holley	mike.holley@dcnr.alabama.gov
12	Tina Freeman	tpfreema@southernco.com

HARRIS DAM RELICENSING

HARRIS PROJECT RELICENSING

HAT 1 SIGN-IN SHEET

September 11, 2019 9:00 AM

Name/ Affiliation or Organization	Email
13 Sheila Smith APC	scsmith@southernco.com
14 ALBERT EILAND	EILANDFARM@AOL.COM
15 Nathan Aycock	Nathan.Aycock@dcnr.alabama.gov
16 Butch Jackson	~~Katter~~ lakebutch@KW.com
17 Taconya Goar	taconya.goar@dcnr.alabama.gov
18 Sylvia French	sandnfrench@gmail.com
19 TOM GARLAND	jfcrew@southernco.com
20 Jim Crew	
21 Alan Peeples	alpeeple@southernco.com
22 Kenneth Odom	kodom@southernco.com
23 Mitch Reid	mitchell.reid@tnc.org
24 TINA L MILLS	tlmills@southernco.com

HARRIS DAM
RELICENSING

HARRIS PROJECT RELICENSING

HAT 1 SIGN-IN SHEET

September 11, 2019 9:00 AM

	Name/ Affiliation or Organization	Email
25	Fred Leslie/ADEM Field Ops	fal@adem.alabama.gov
26	Chris Goodman	cggoodma@southernco.com
27	Keith Chandler	
28	Carl Chaffin	cchaffin@alabama.org
29	Jason Carlee	jcarlee@southernco.com
30	Ashley McVicar	ammcvica@southernco.com
31	Donna Matthews	donnamat@aol.com
32	Kristie Coffman / ALCFWRU	kmo0025@auburn.edu
33	Jennifer Rasberry / APC	
34	HARRY E. MERRILL	HARRY.Merrill47@gmail.com
35	FERC Staff on phone	Sarah Salazar
36		

ATTACHMENT B

SEPTEMBER 11, 2019 HAT 1 PRESENTATION

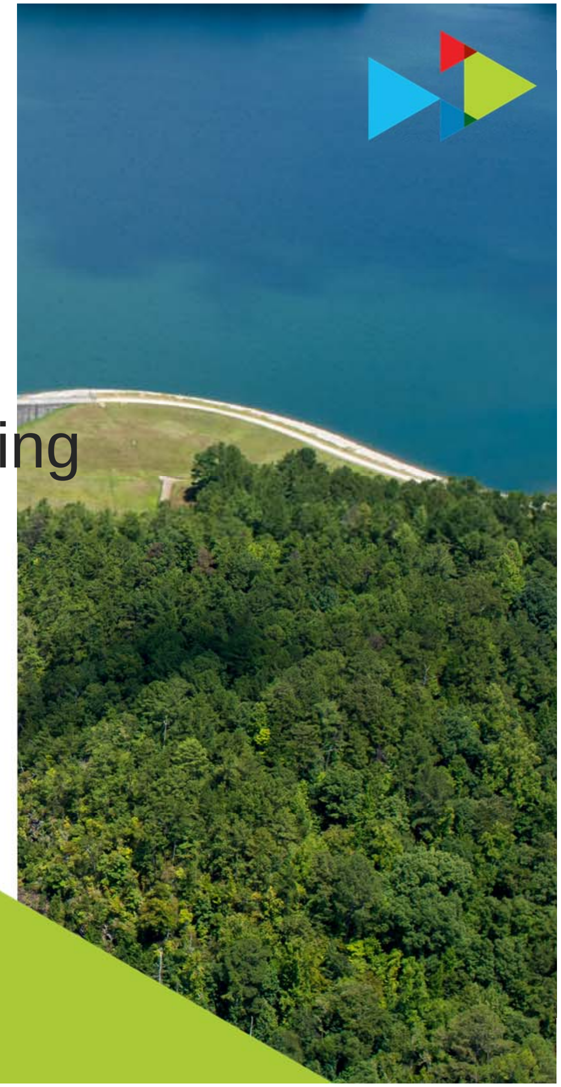
Alabama Power

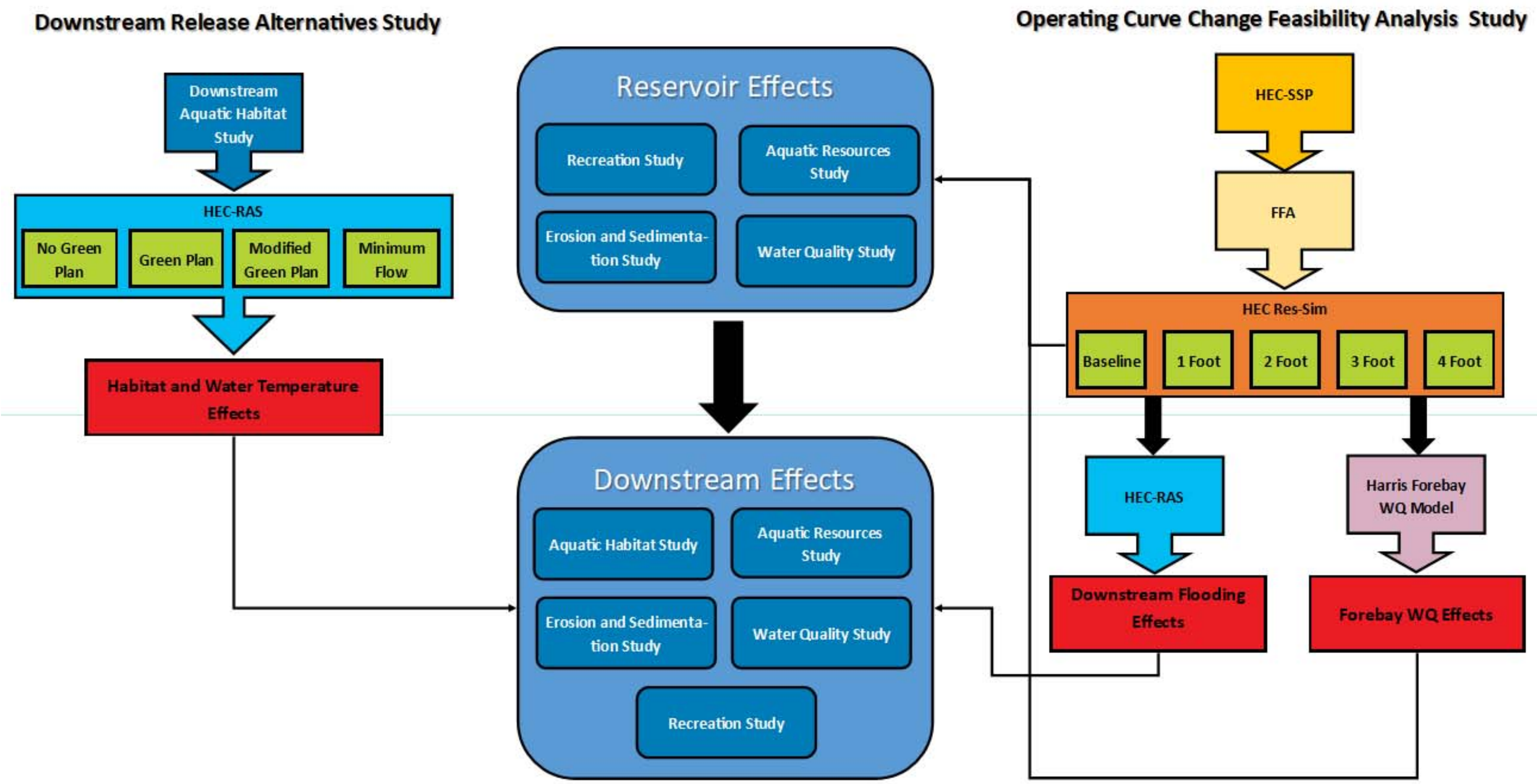
R.L. Harris Project Relicensing

Project Operations – HAT 1

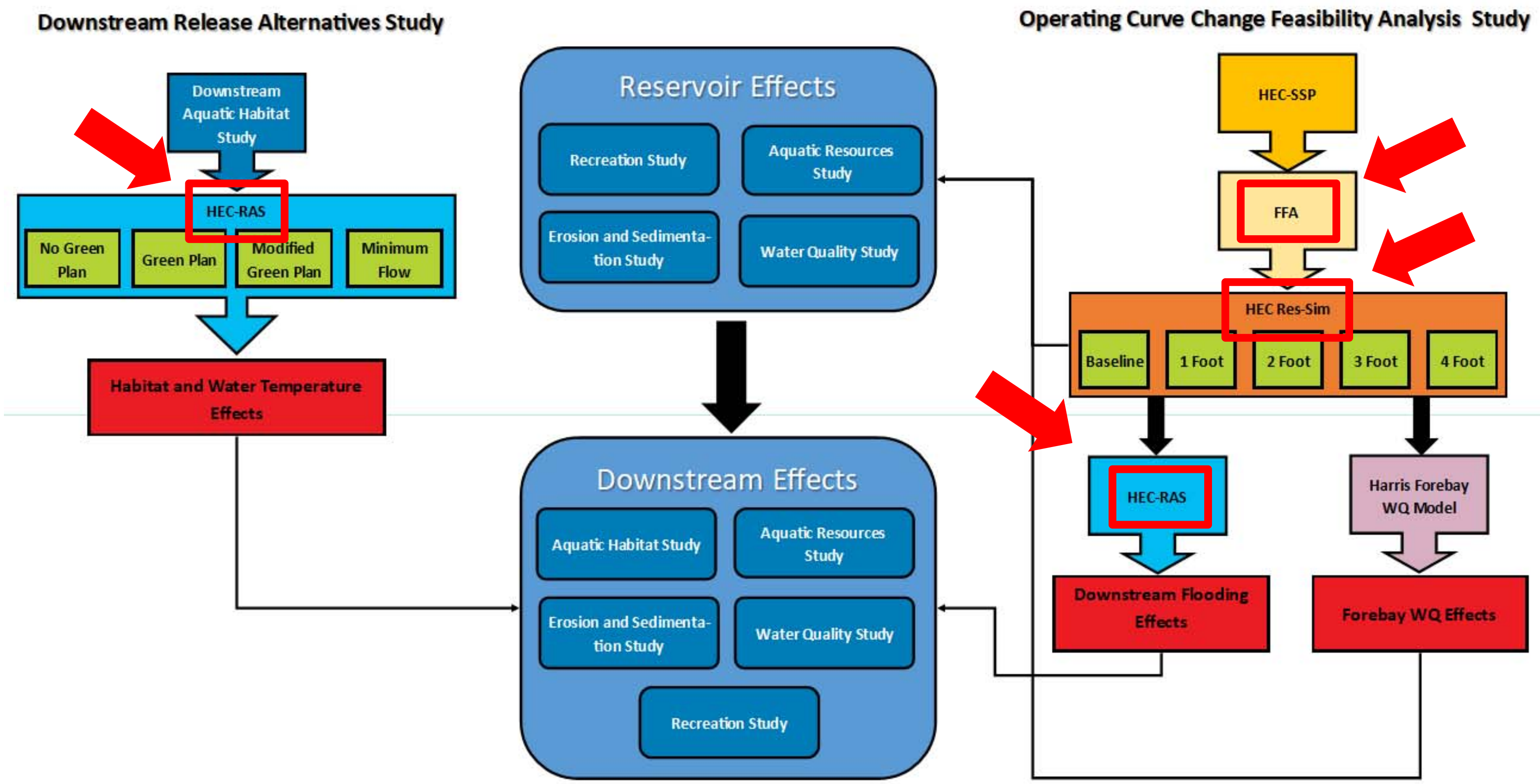
Model Inputs and Methodologies for Operating Curve Change Analysis and Downstream Release Alternatives

September 11, 2019





Downstream Release Alternatives Study
Downstream Aquatic Habitat Study
HEC-RAS
No Green Plan
Green Plan
Modified Green Plan
Minimum Flow
Habitat and Water Temperature Effects
Reservoir Effects
Recreation Study
Aquatic Resources Study
Erosion and Sedimentation Study
Water Quality Study
Downstream Effects
Aquatic Habitat Study
Aquatic Resources Study
Erosion and Sedimentation Study
Water Quality Study
Recreation Study
Operating Curve Change Feasibility Analysis Study
HEC-SSP
FFA
HEC Res-Sim
Baseline
1 Foot
2 Foot
3 Foot
4 Foot
HEC-RAS
Harris Forebay WQ Model
Downstream Flooding Effects
Forebay WQ Effects


Downstream Release Alternatives Study
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HEC Res-Sim
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2 Foot
3 Foot
4 Foot
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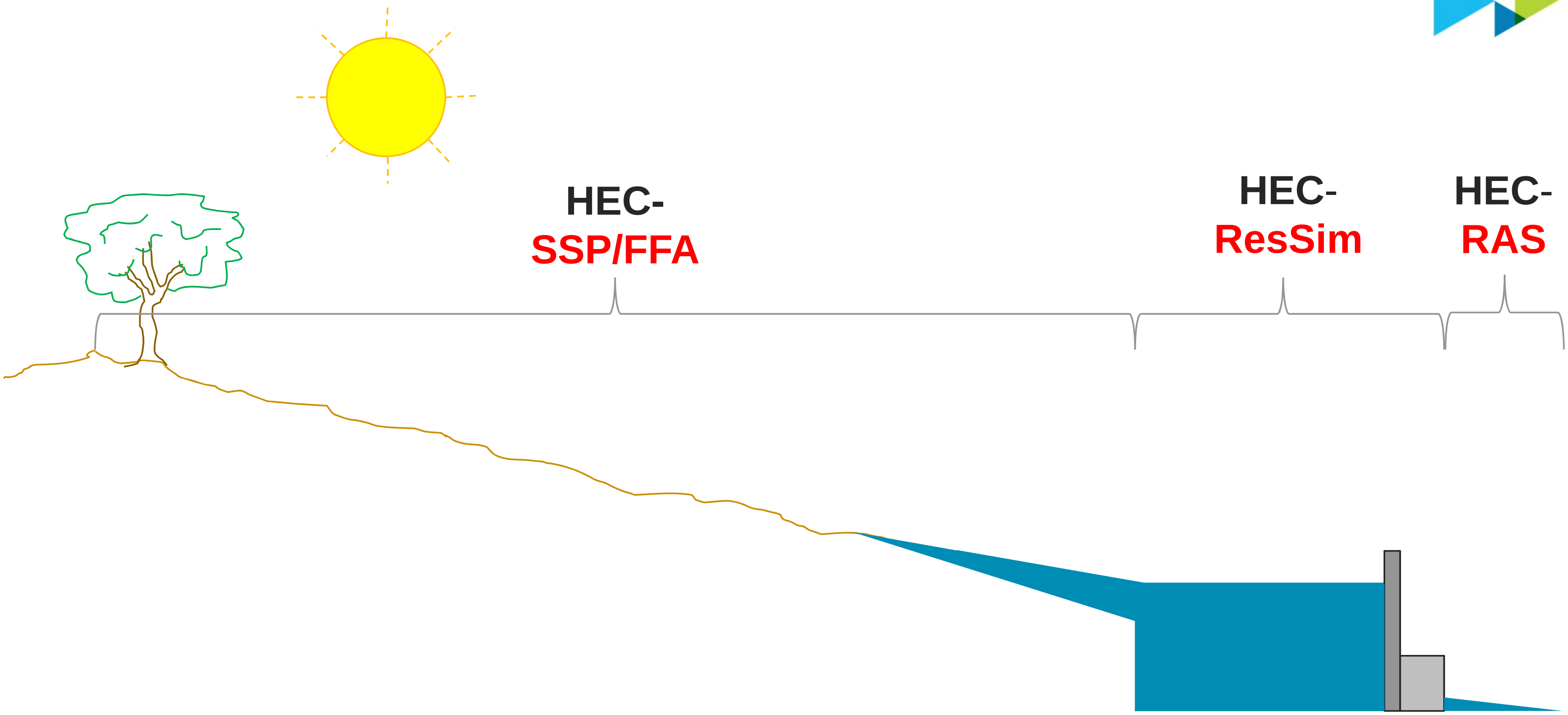
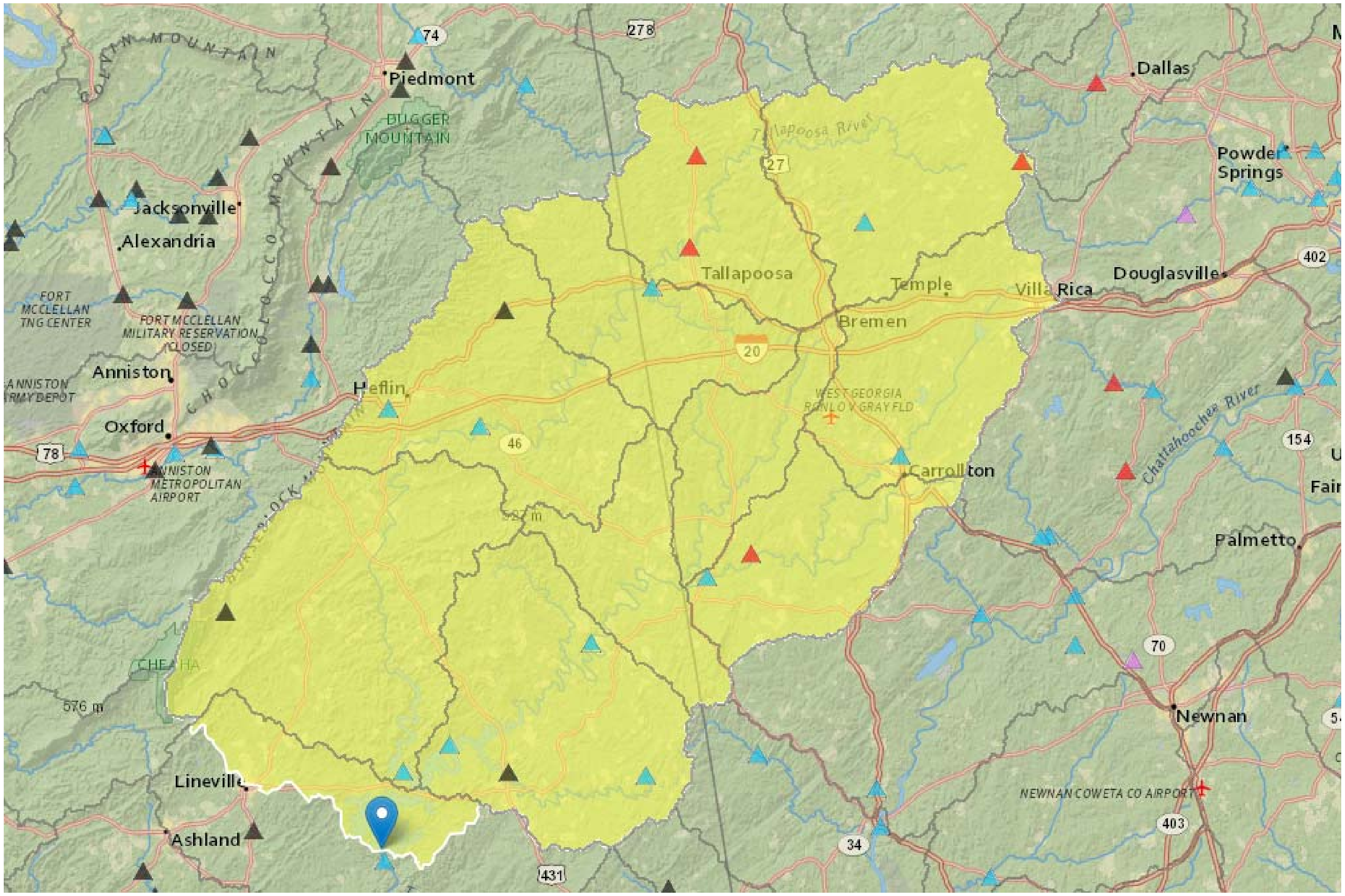
Where the models are used…



Harris Watershed Boundary



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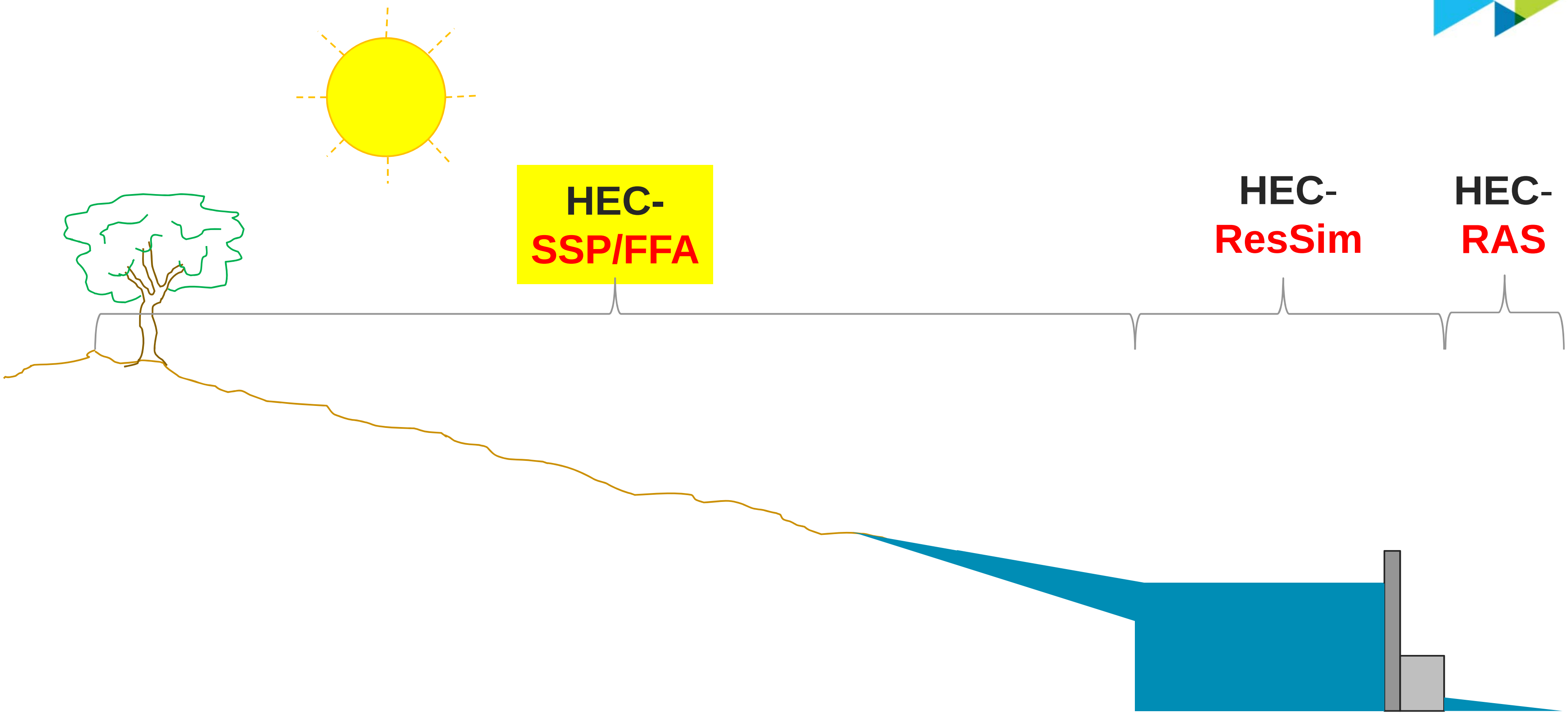
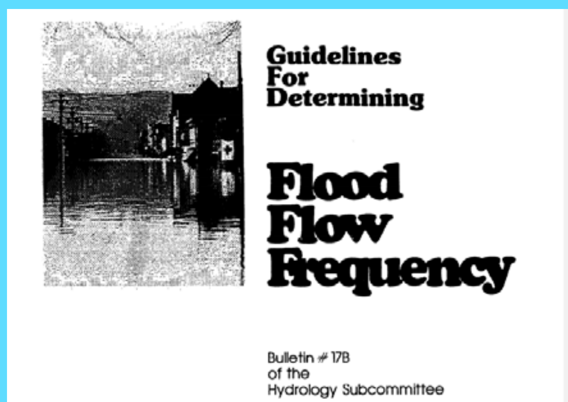


HEC-**SSP** (**S**tatistical **S**oftware **P**ackage)



FFA

Flood Frequency Analysis for the Coosa and Tallapoosa Rivers

100-year flood

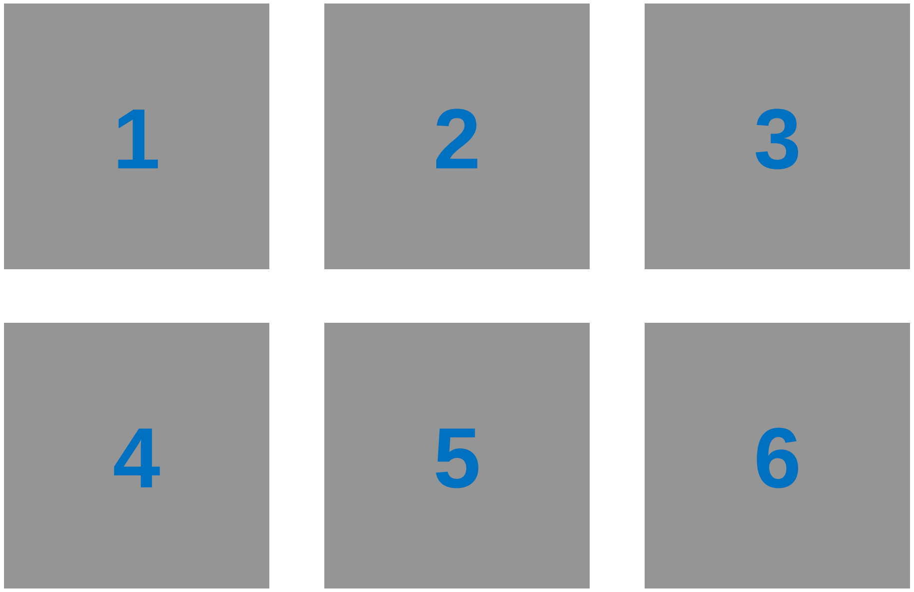
Why the 100-year flood?

- U.S. Government in the 1960's decided the 100-year flood would be the basis for the National Flood Insurance Program, and it has been the standard since
- This makes the 100-year flood event the base of what MUST be studied

Exactly what do you mean by the "100-year" flood event?

- **It is a high streamflow event that has a 1-percent chance of being equaled or exceeded in any year.**
- The keyword here is "chance"
- Consider the following: if we had 1000 years of annual streamflow data, we would expect to see ten 100-year floods (1-percent chance floods) over the 1000-year record. These ten events could occur at any time during the 1000-year period.

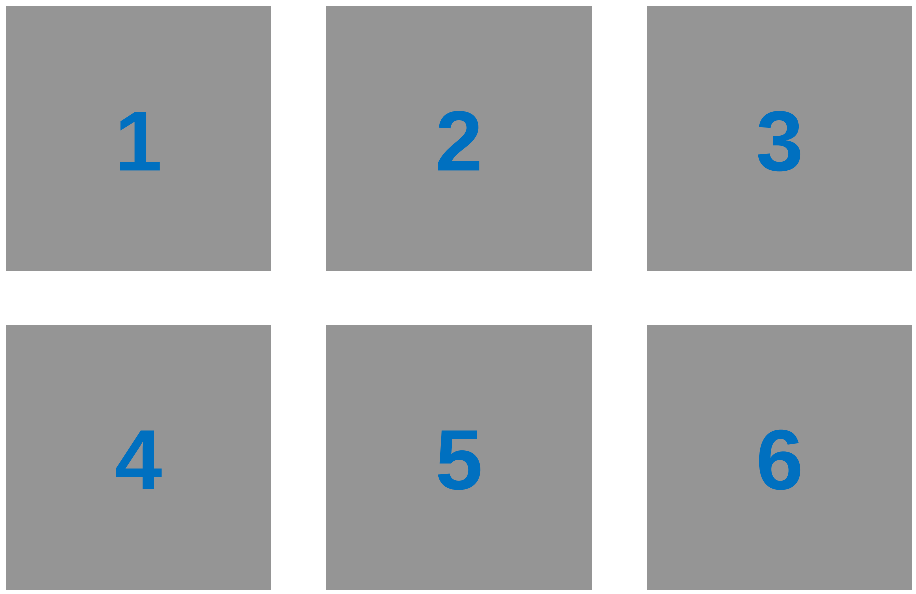
Let's play a game of "chance." Pick a number. One card has a dollar sign under it. What are your chances of picking the right one?



Let’s play a game of “chance.” Pick a number. One card has a dollar sign under it. What are your chances of picking the right one?

What if we turned the cards back over and shuffled the dollar sign to randomly land on any card and then I, once again, ask you to pick a number?

How many would pick the 4-Card again? Why or Why not?



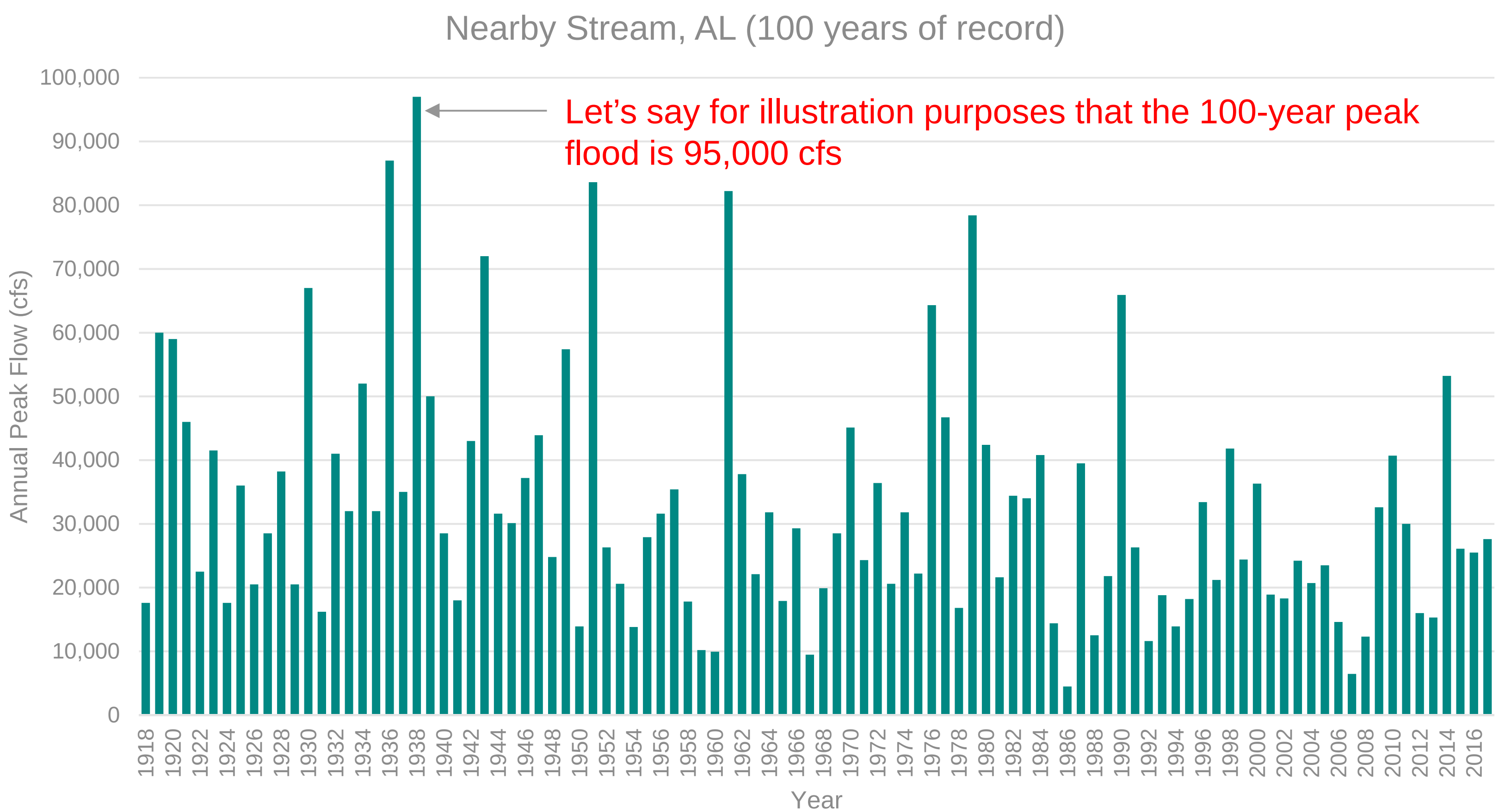
How many would pick a different card because you think that 1, 2, 3, 5, and 6 will have the $ before it can come back around to the 4-Card?

Very Common Misconception

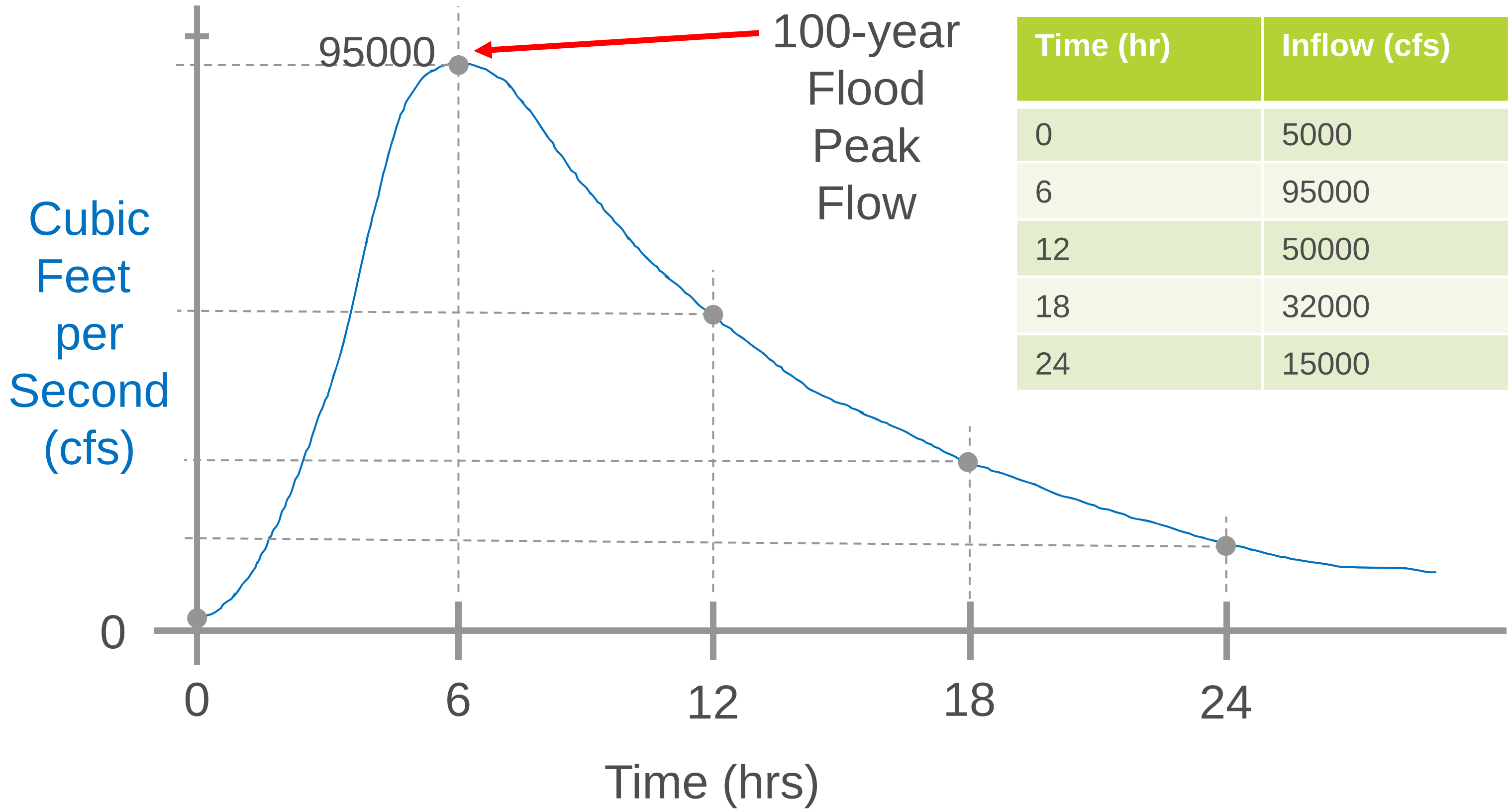
"If the 100-year flood just occurred, then we don't have to worry about another flood like that for the next 99 years."

WRONG!!!

(For Illustration Purposes Only)

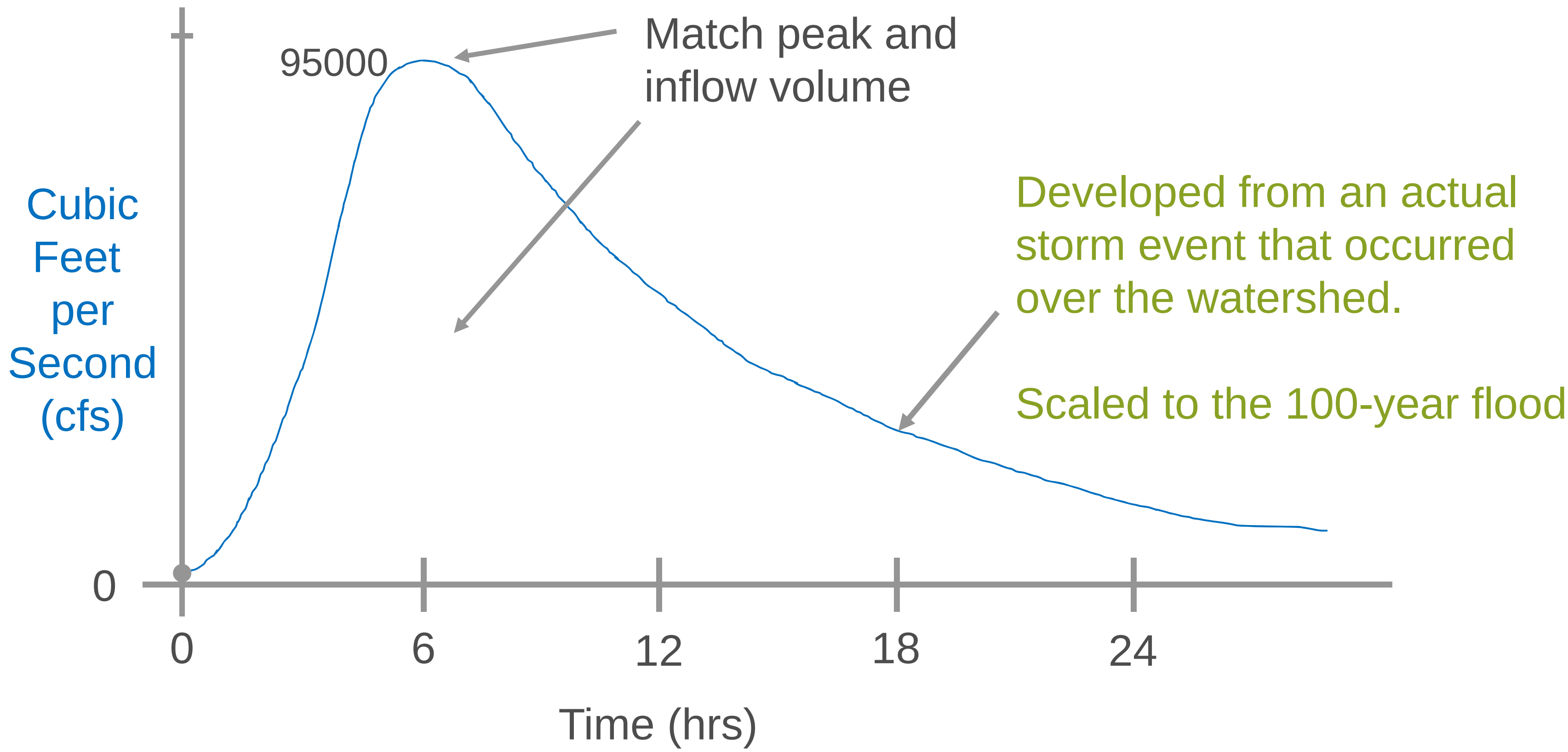


Inflow Hydrograph for Nearby Stream, AL
(**For Illustration Purposes Only)**



Time (hr)	Inflow (cfs)
0	5000
6	95000
12	50000
18	32000
24	15000

Inflow Hydrograph for Nearby Stream, AL **(For Illustration Purposes Only)**



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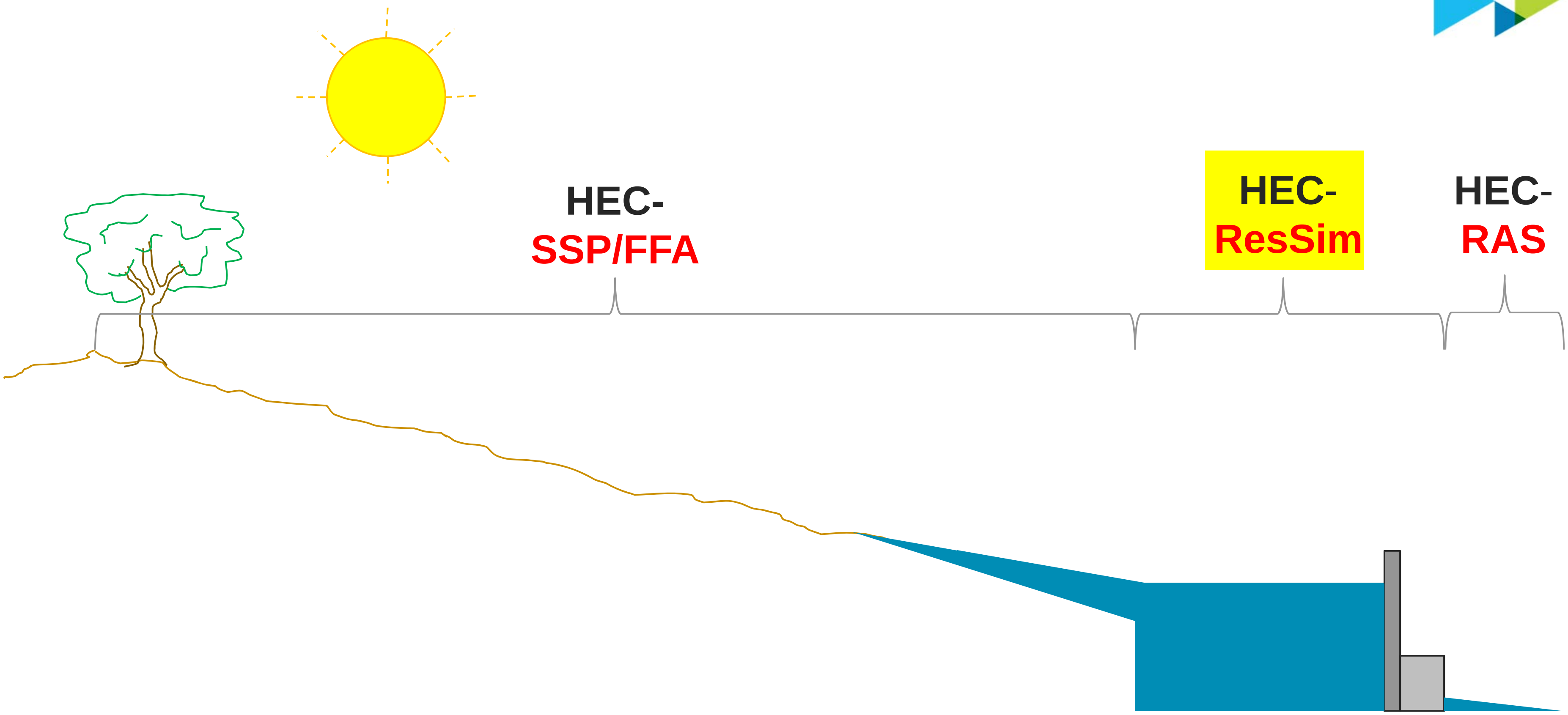
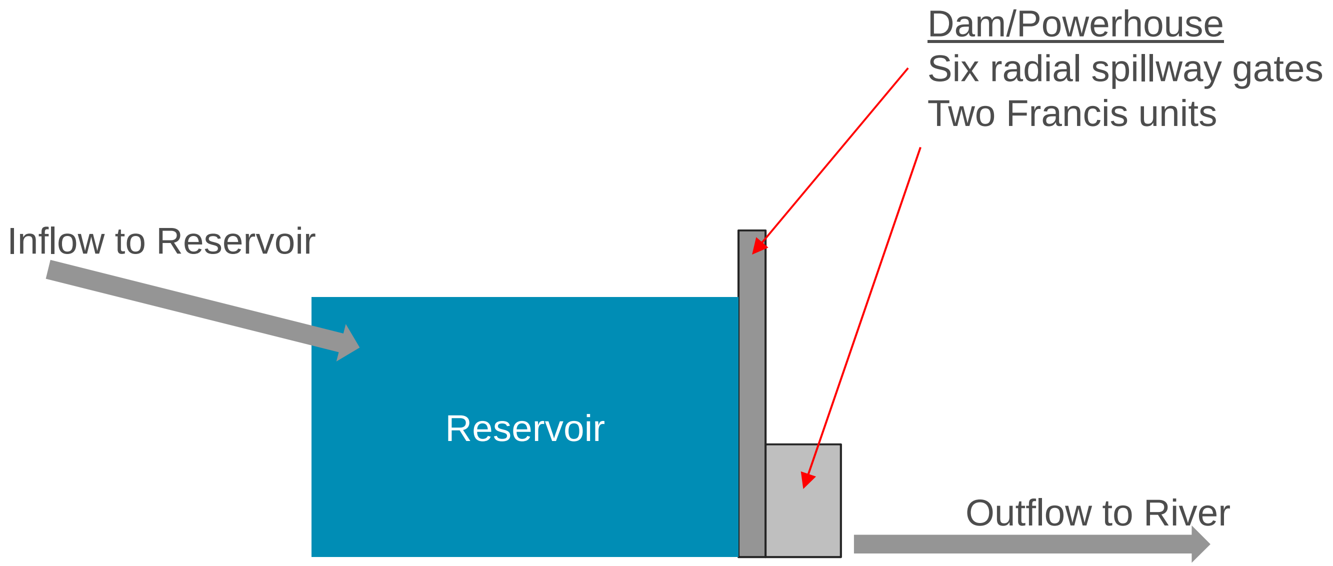
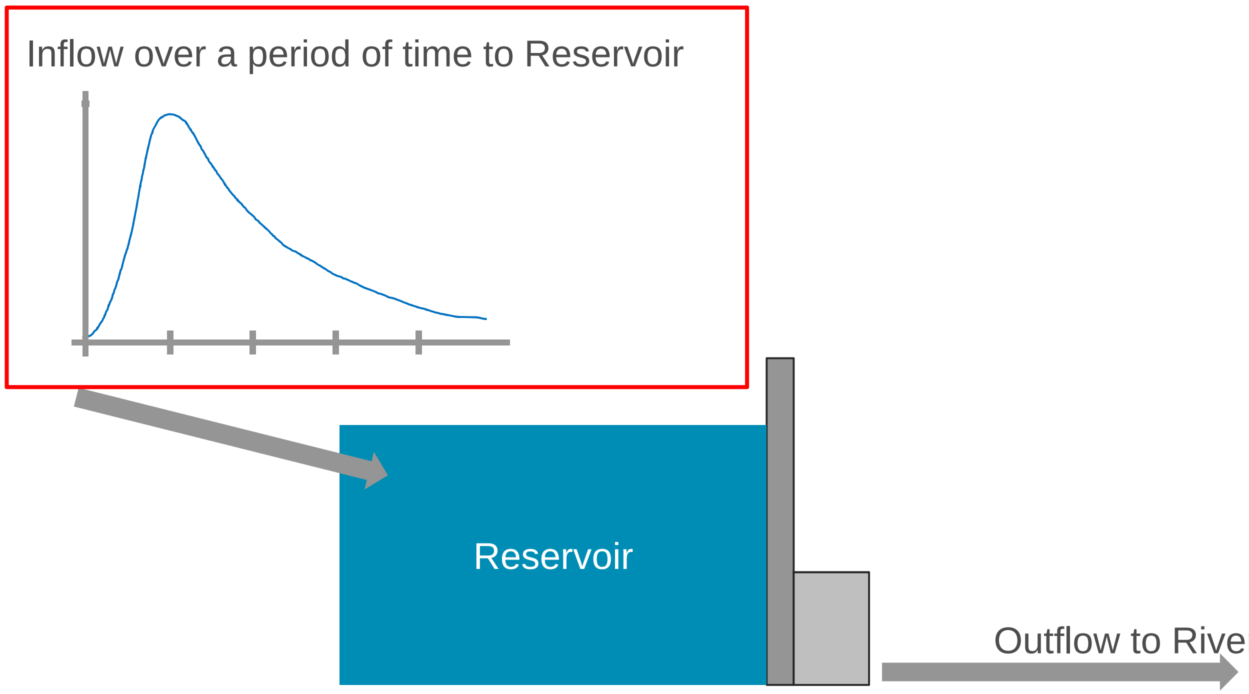


Schematic used to discuss HEC-ResSim



How **HEC-ResSim** sees the Reservoir

1. FFA and ”scaled” actual event

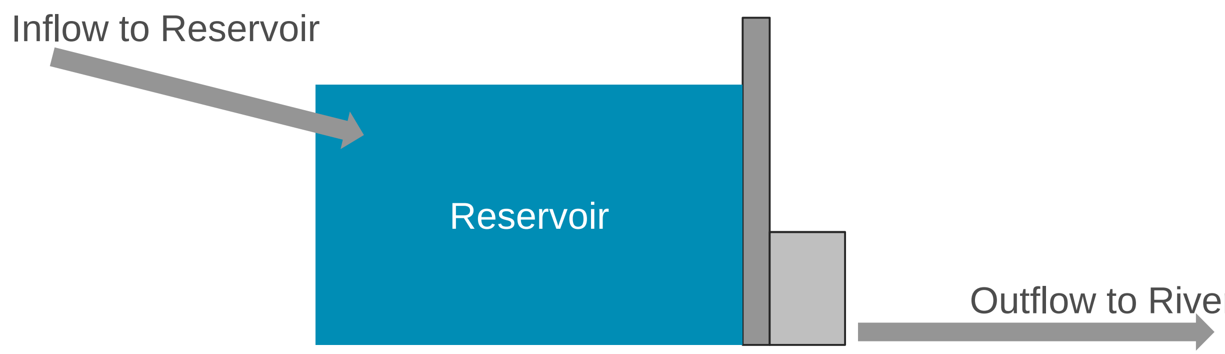


HEC-ResSim

2.

Elevation-Volume Table

Res. Elevation	Volume (ac-ft)
790	394724
791	404840
792	415170
793	425721
794	436495



HEC-ResSim

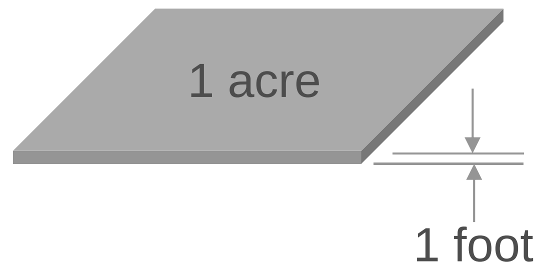
2.

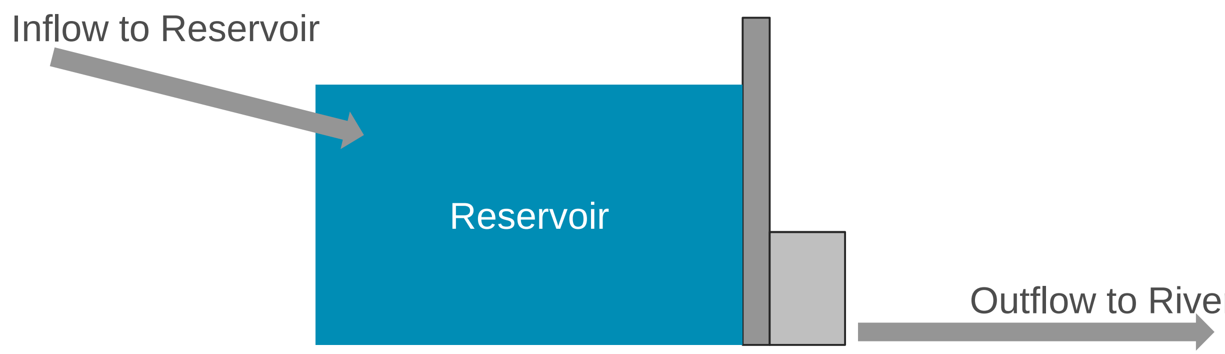
Elevation-Volume Table

Res. Elevation	Volume (ac-ft)
790	394724
791	404840
792	415170
793	425721
794	436495

What is an ac-ft (or acre-foot)?

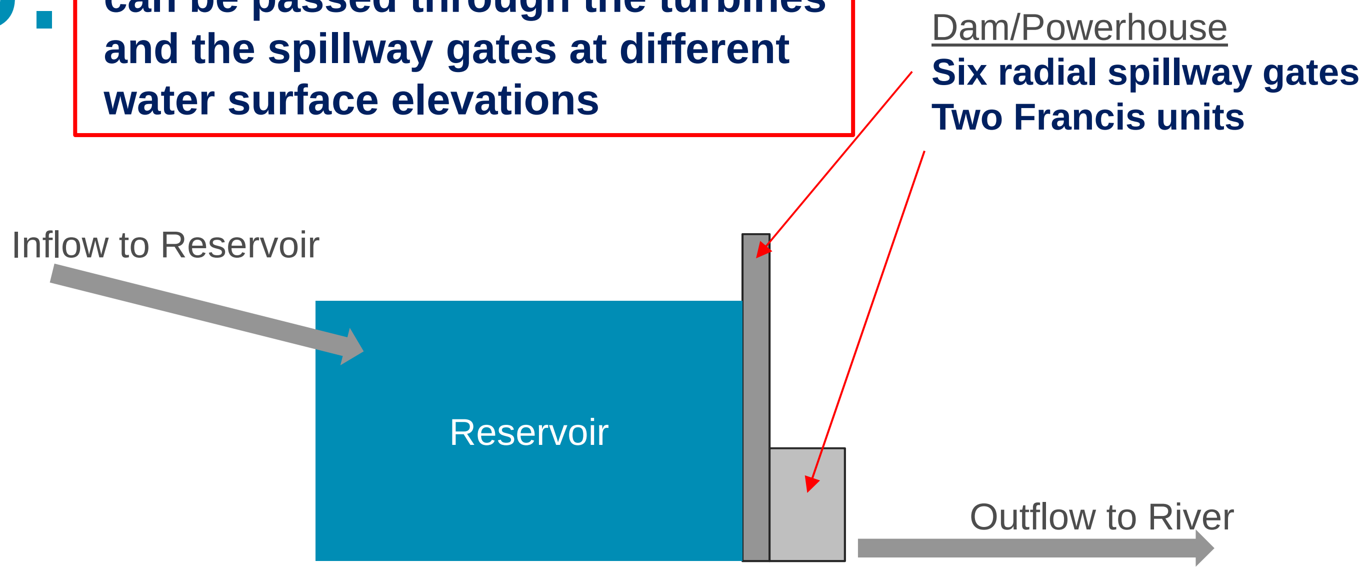
It is a measure of volume where one acre-foot is an area of one acre covered with one foot of water





HEC-ResSim

3. **Information about how much water can be passed through the turbines and the spillway gates at different water surface elevations**



HEC-ResSim

4.

Reservoir Regulation Manual

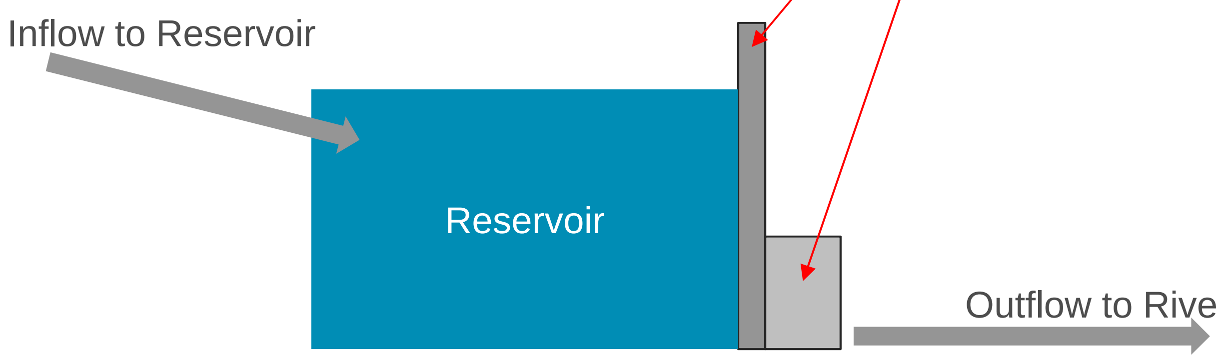
This tells us how the reservoir must be operated.

For high flows, the manual mandates how we must operate the **turbines and spillway gates** in accordance with approved **U.S. Army Corps of Engineers rules** called **Flood Control Regulation Schedule**

Dam/Powerhouse

Six radial spillway gates

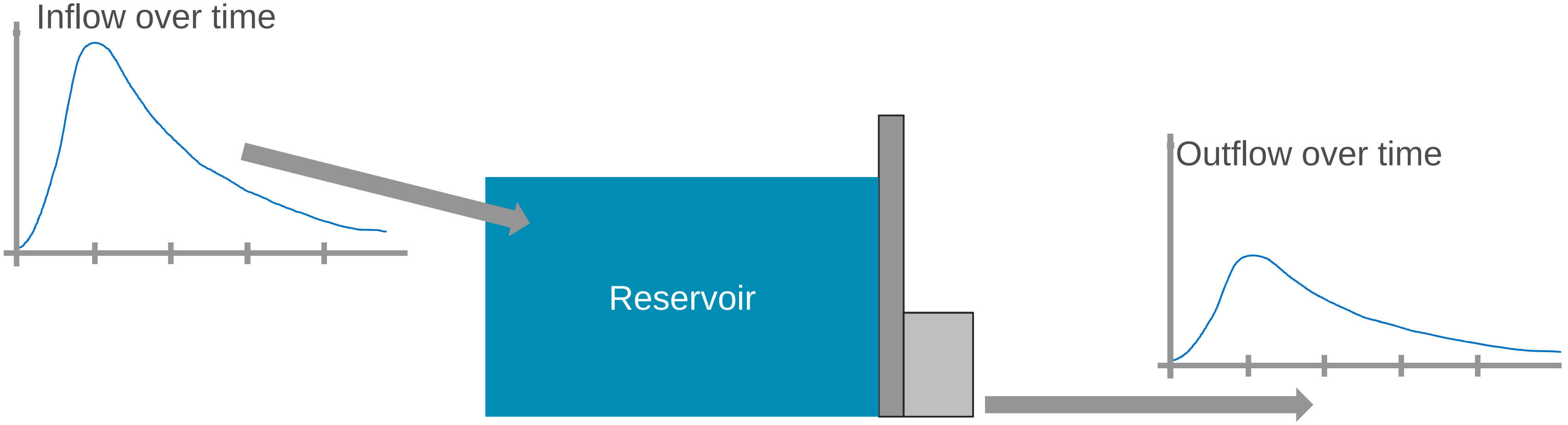
Two Francis units

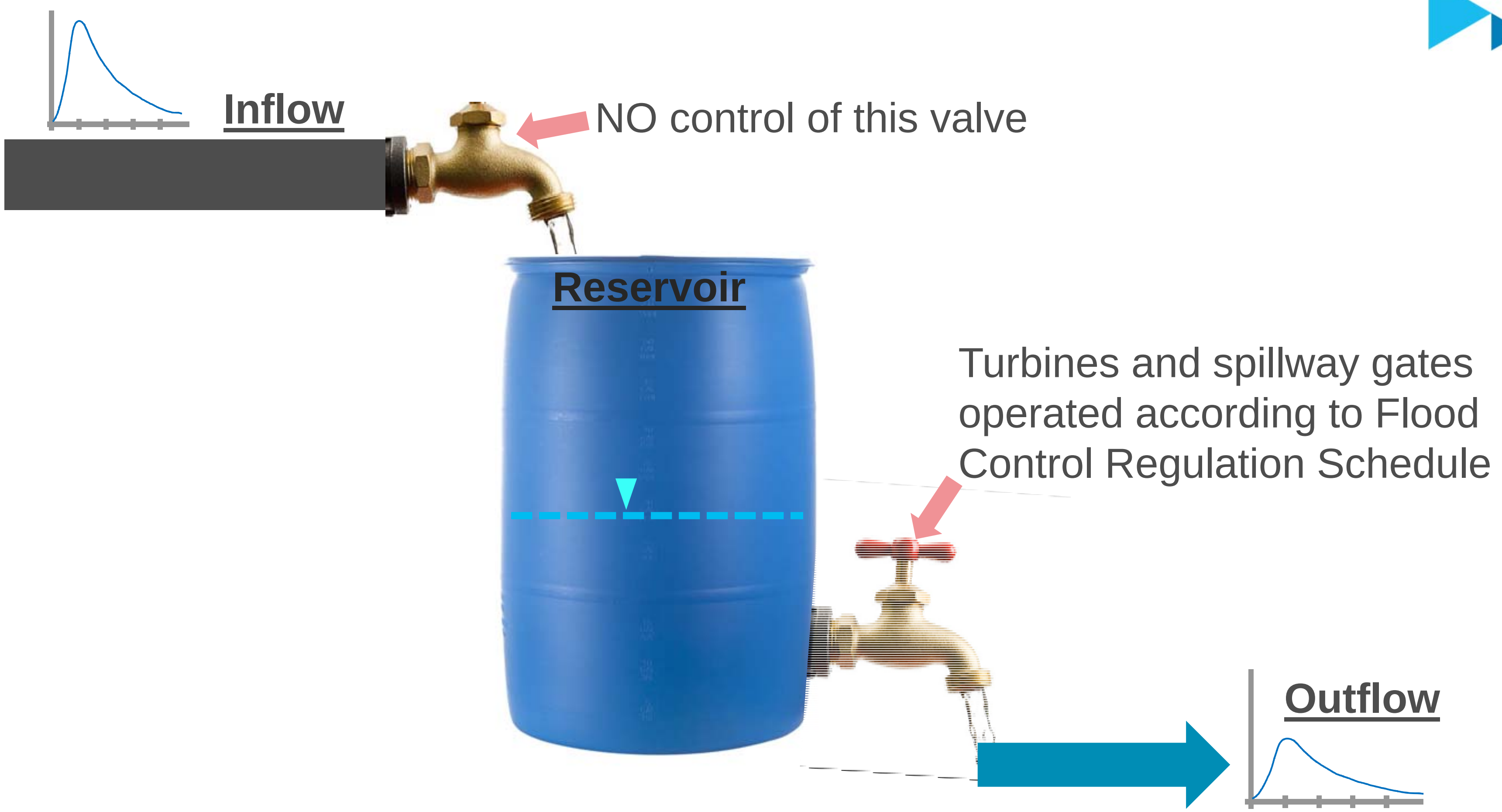


If **INFLOW** is higher than **OUTFLOW**: ELEVATION

If **INFLOW** is less than **OUTFLOW**: ELEVATION

If **INFLOW** is equal to **OUTFLOW**: No Change in ELEVATION



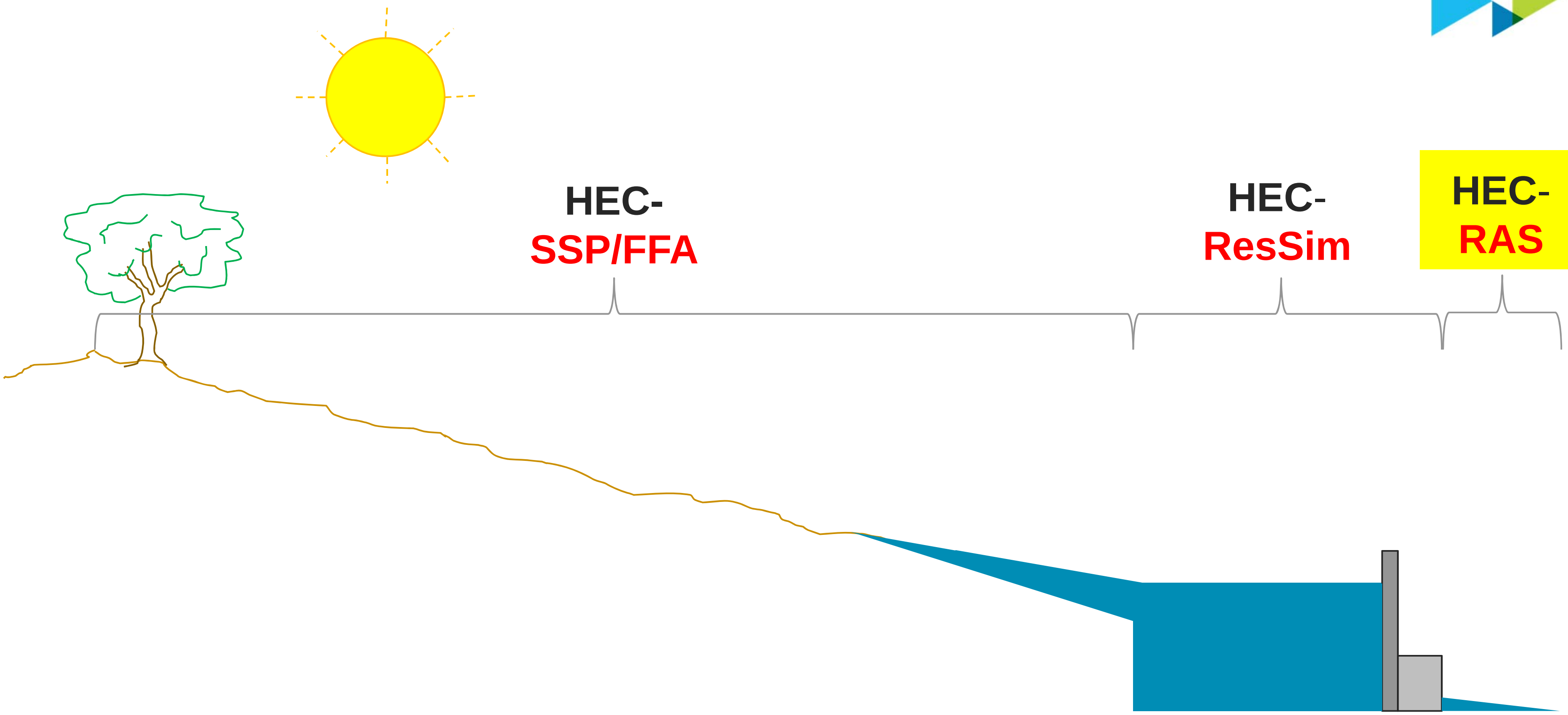

Inflow
NO control of this valve
Reservoir
Turbines and spillway gates operated according to Flood Control Regulation Schedule
Outflow

Outputs from HEC-ResSim

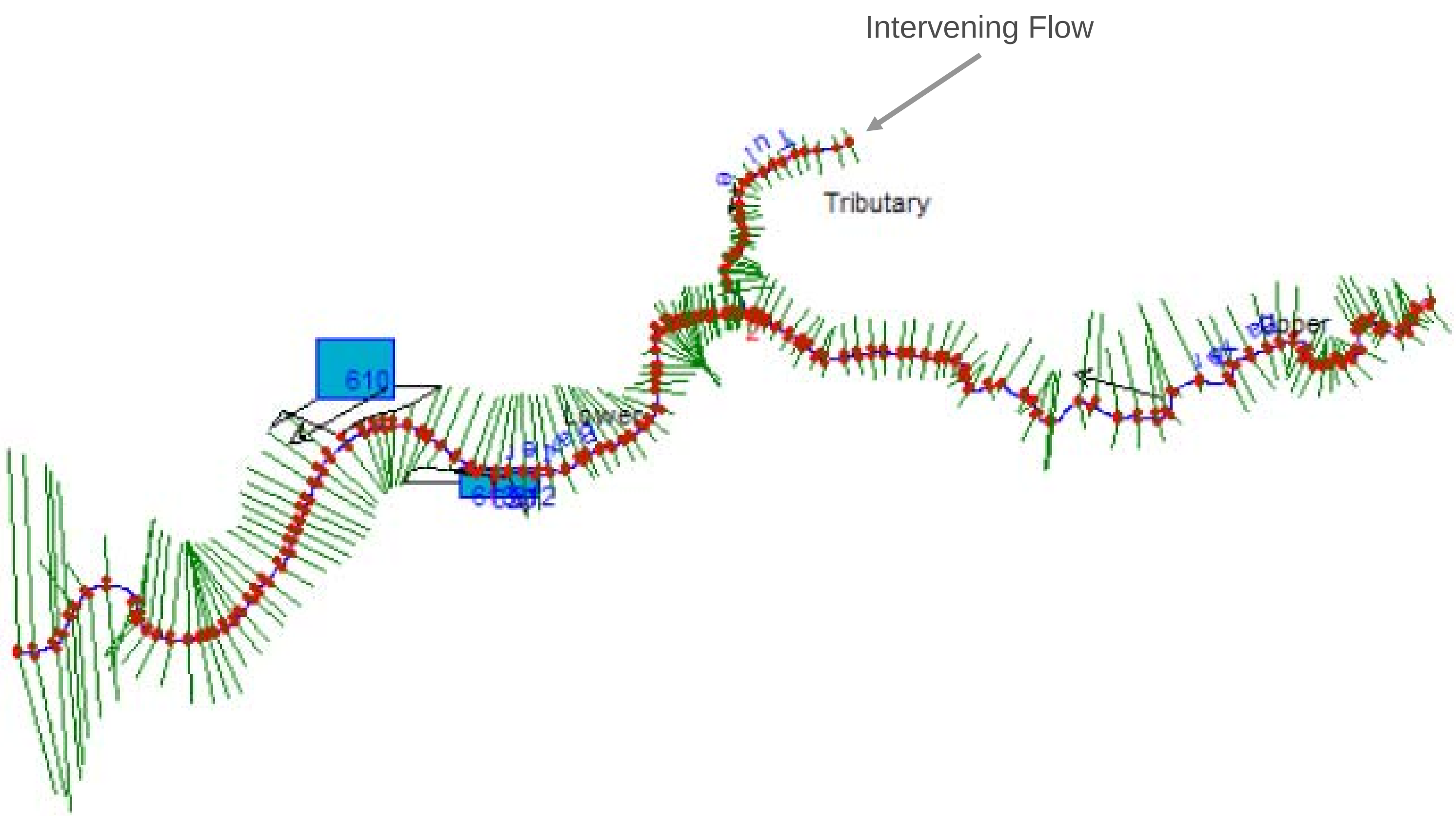
- How the reservoir elevation changes over time during a flood event
- The outflow hydrograph (turbines + spillway) to be used in **HEC-RAS**

***Both controlled by the Flood Control Regulation Schedule**

Where the models are used…



HEC-RAS cross-sections on a river
(For Illustration Purposes Only)



Schematic used to discuss HEC-RAS

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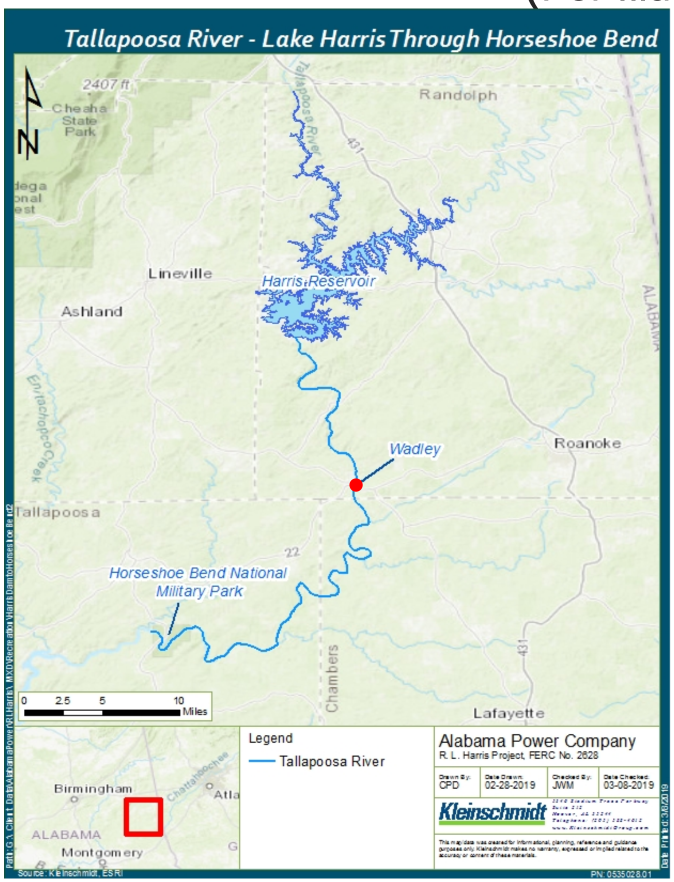
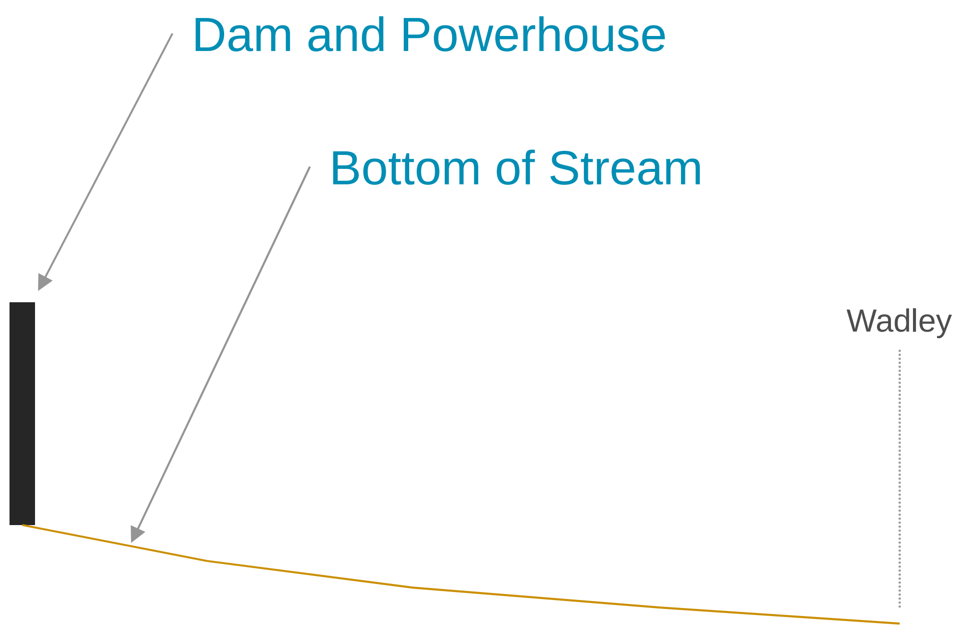
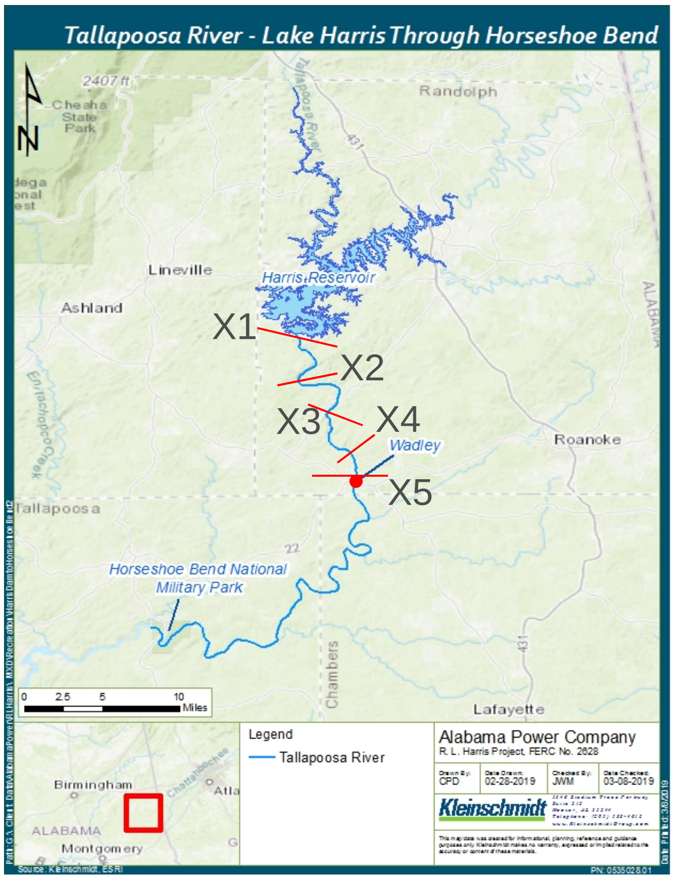


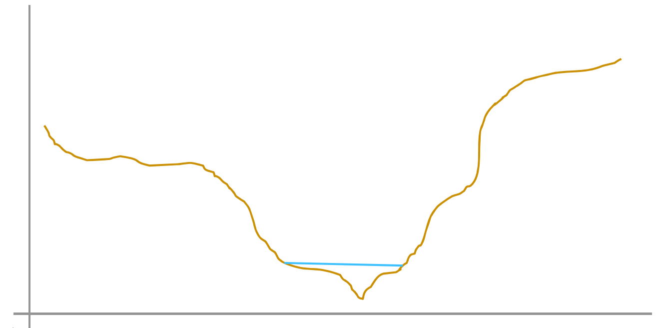


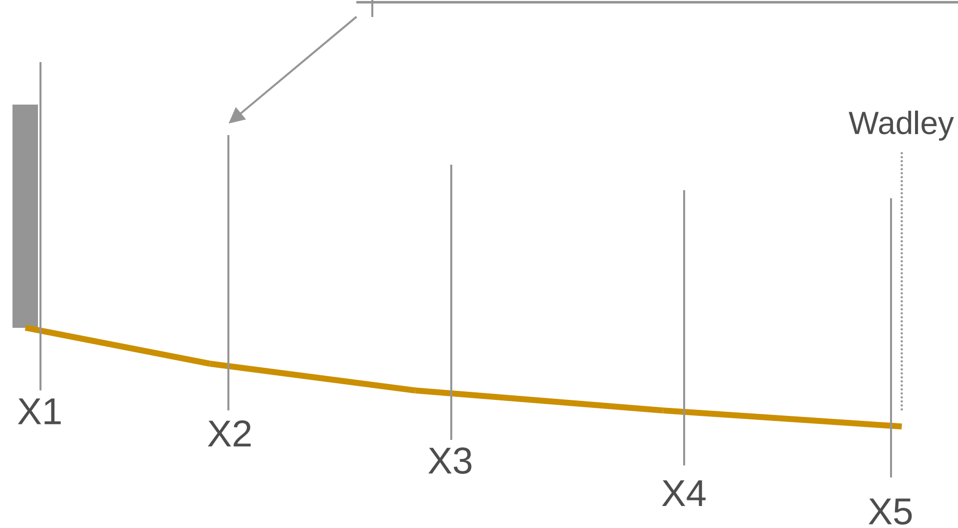
HEC-RAS Stream Cross Sections

(For Illustration Purposes Only)



What is a cross section?





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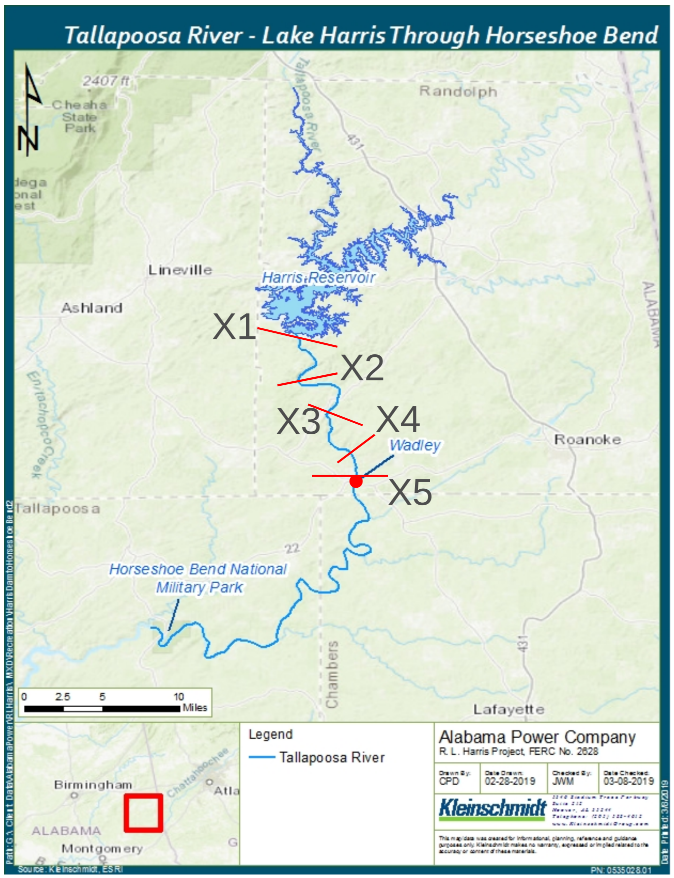

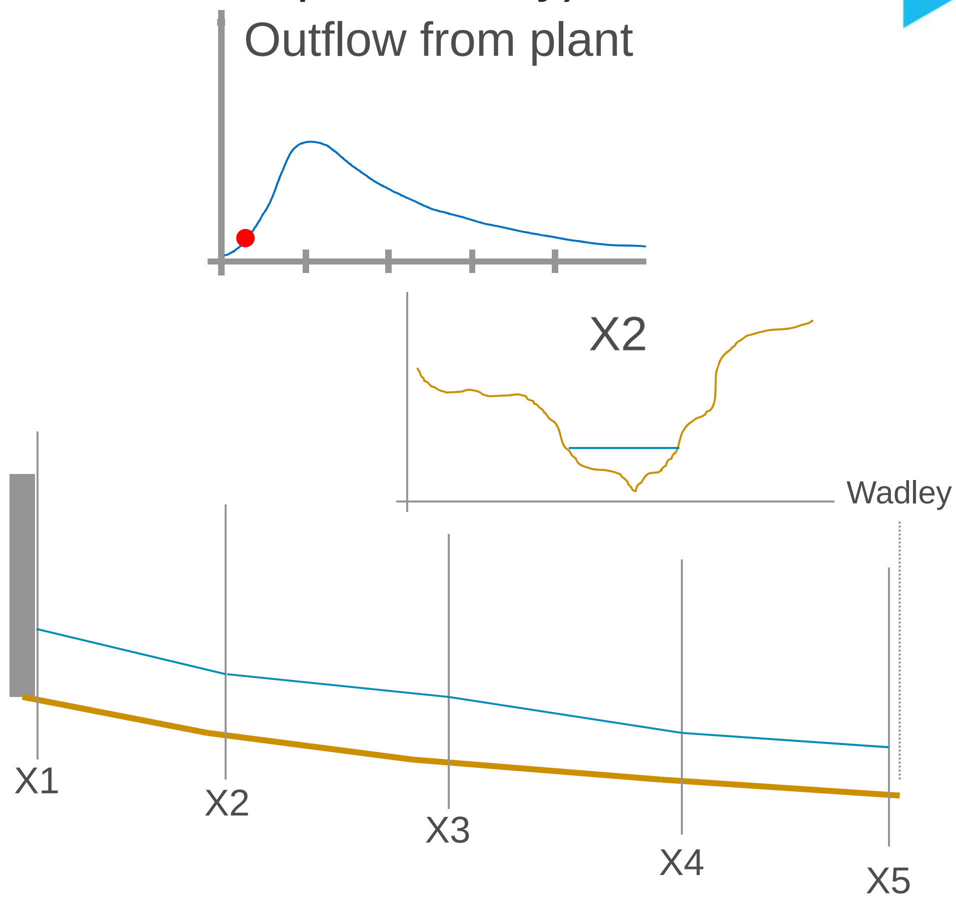

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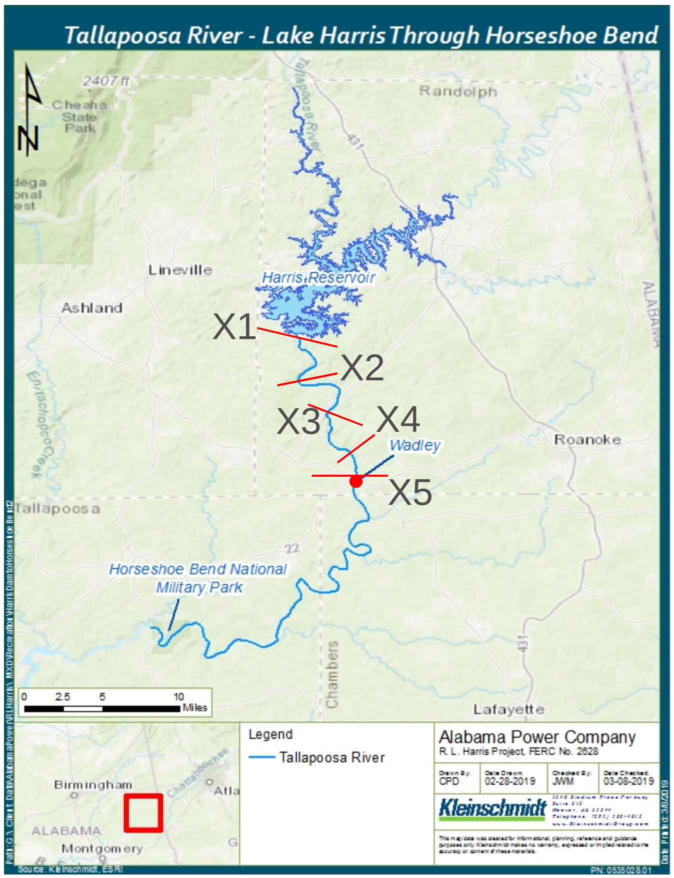

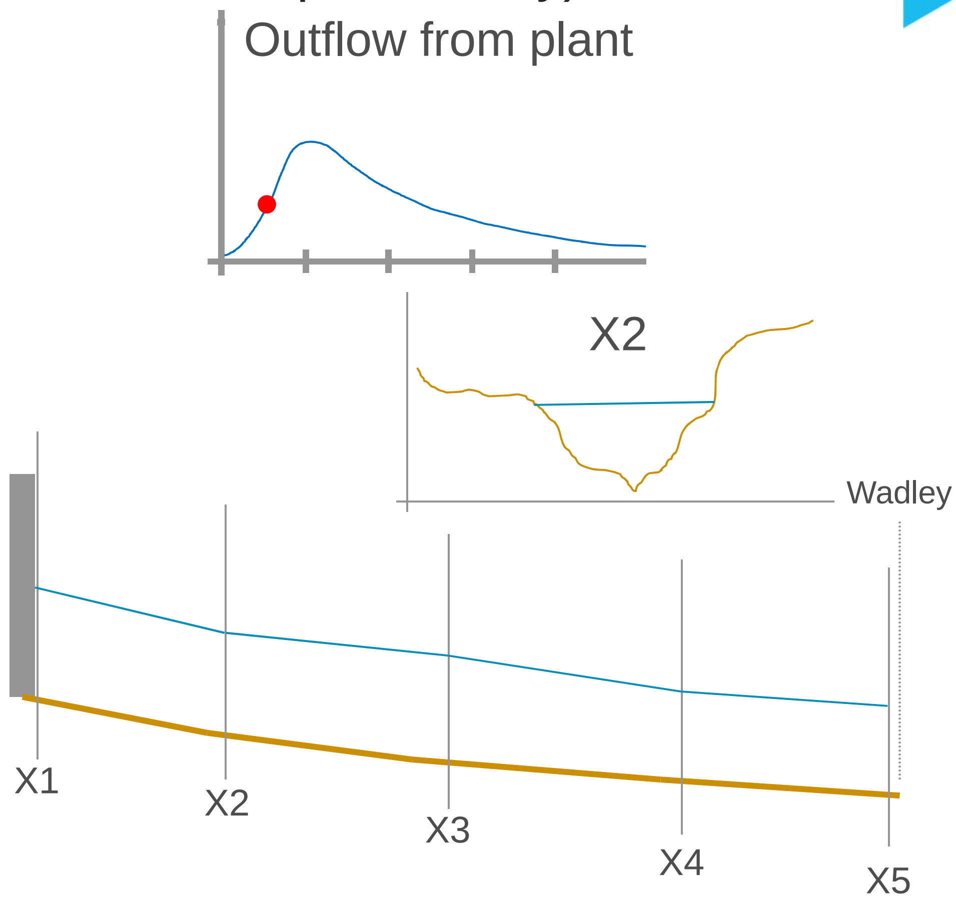

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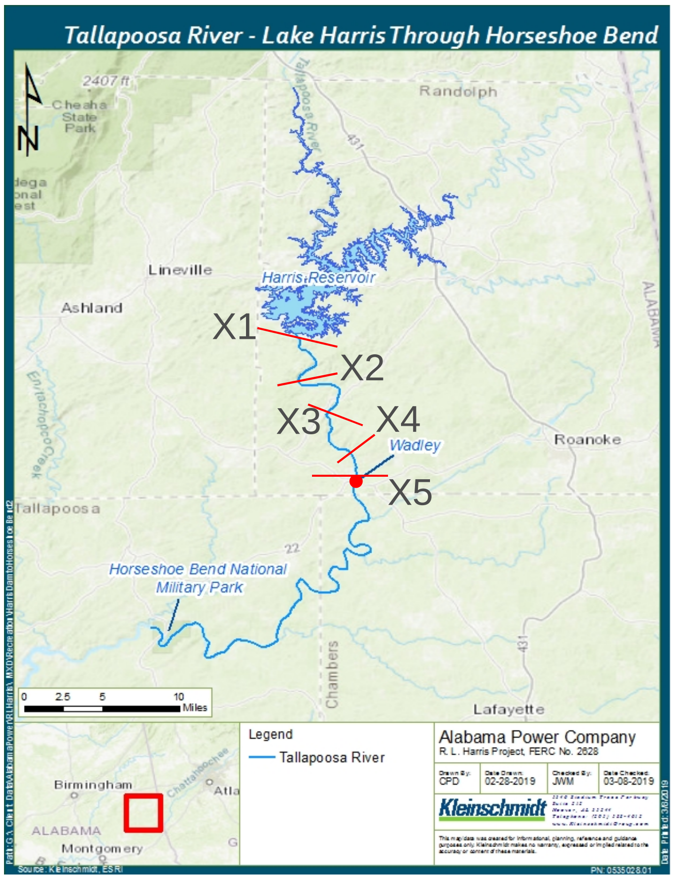

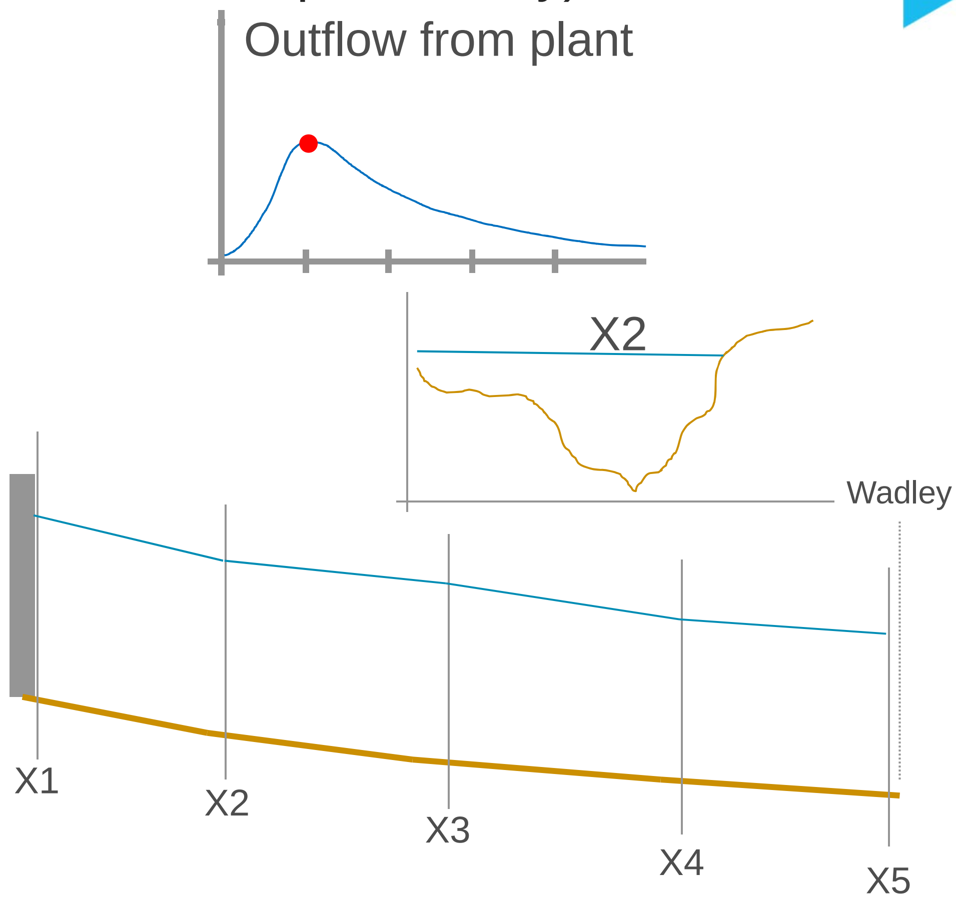

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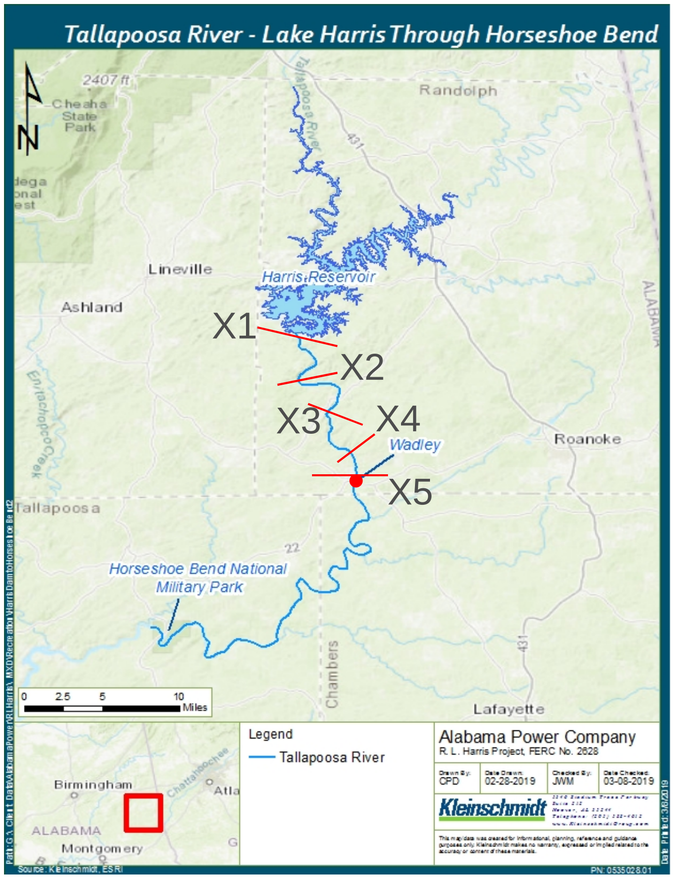

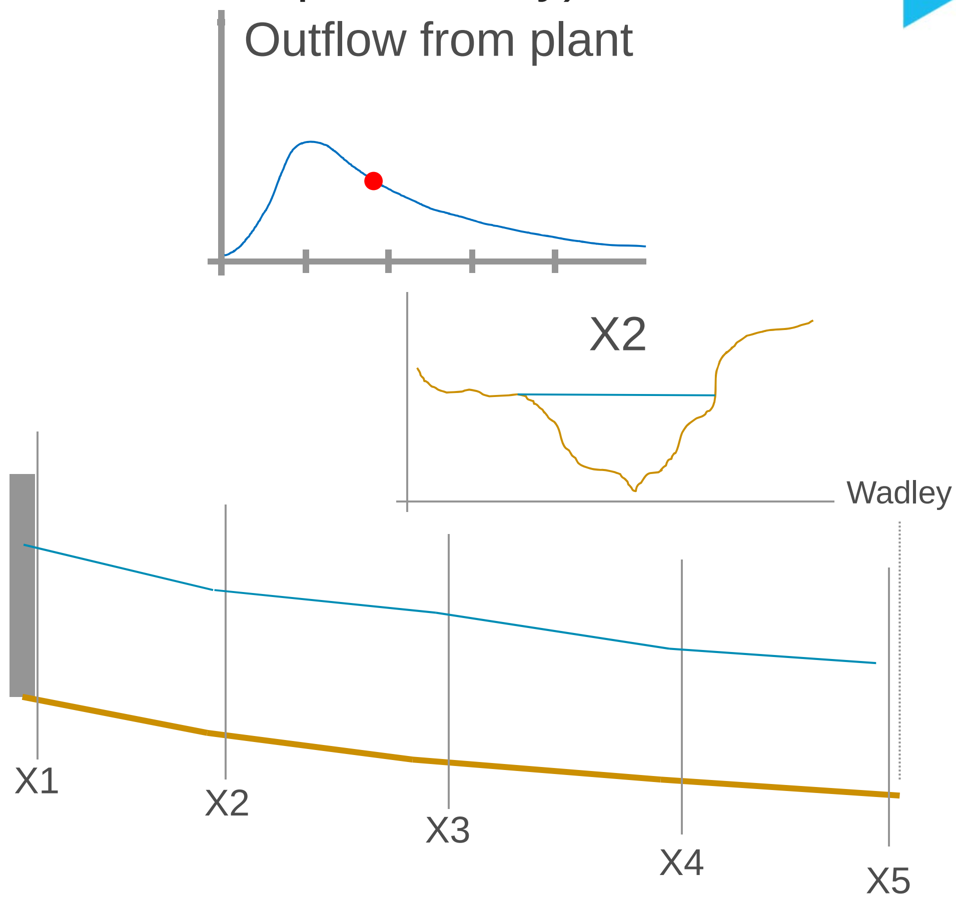

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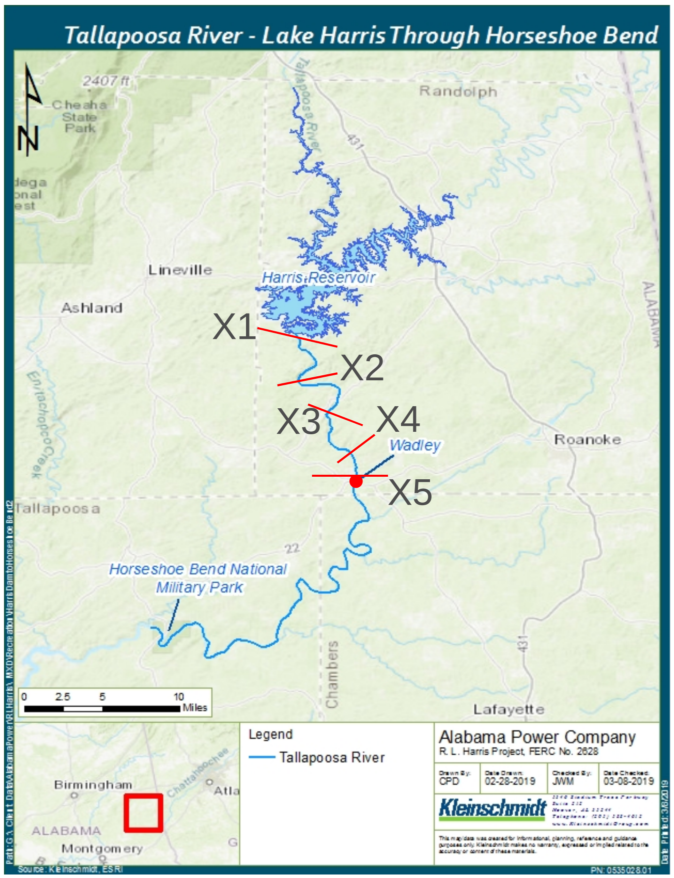

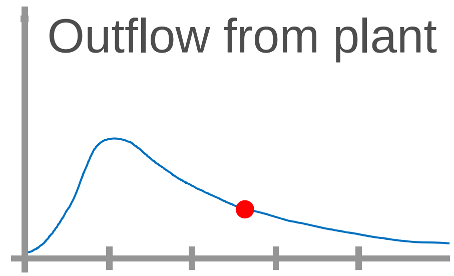

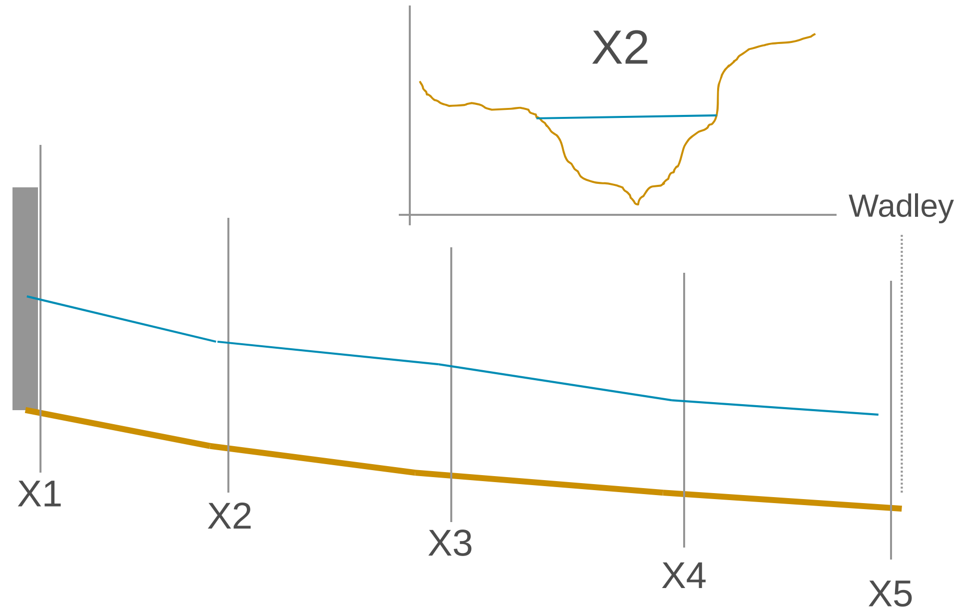

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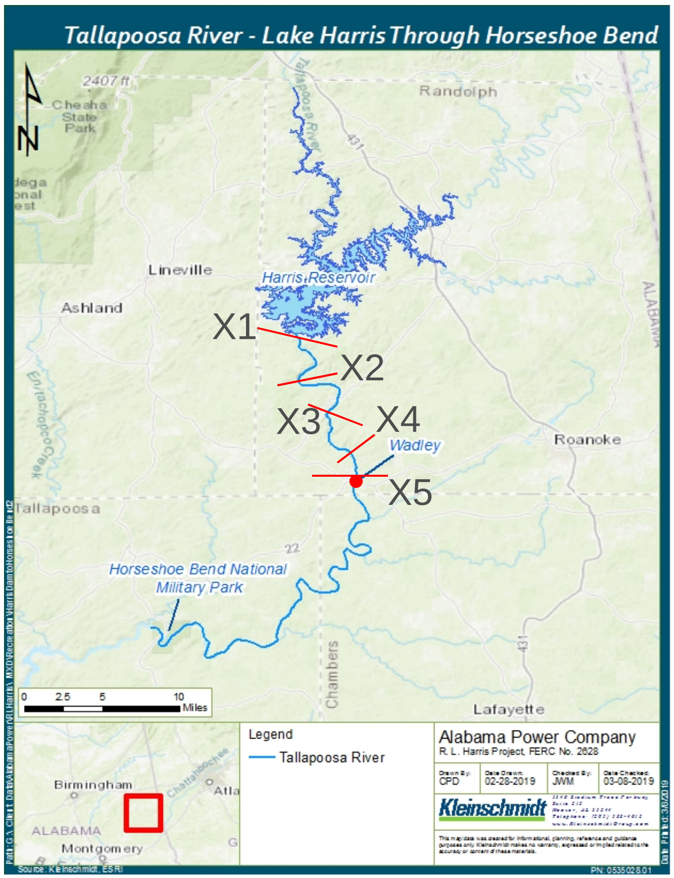
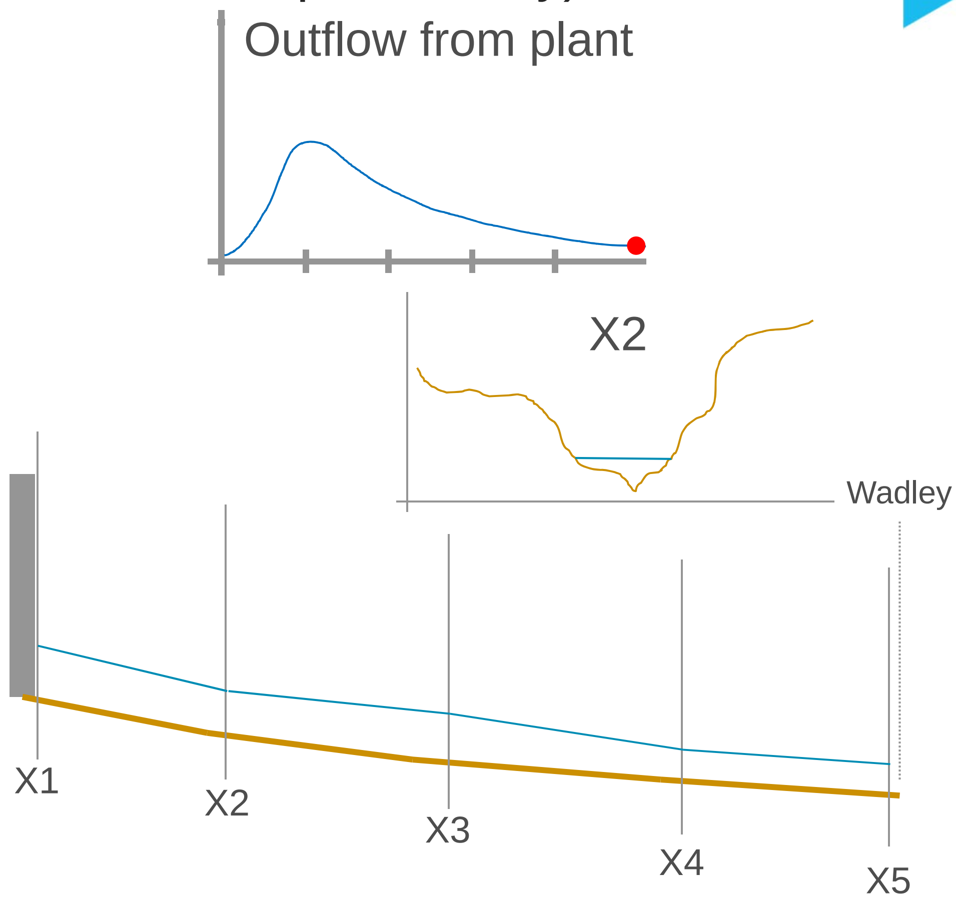
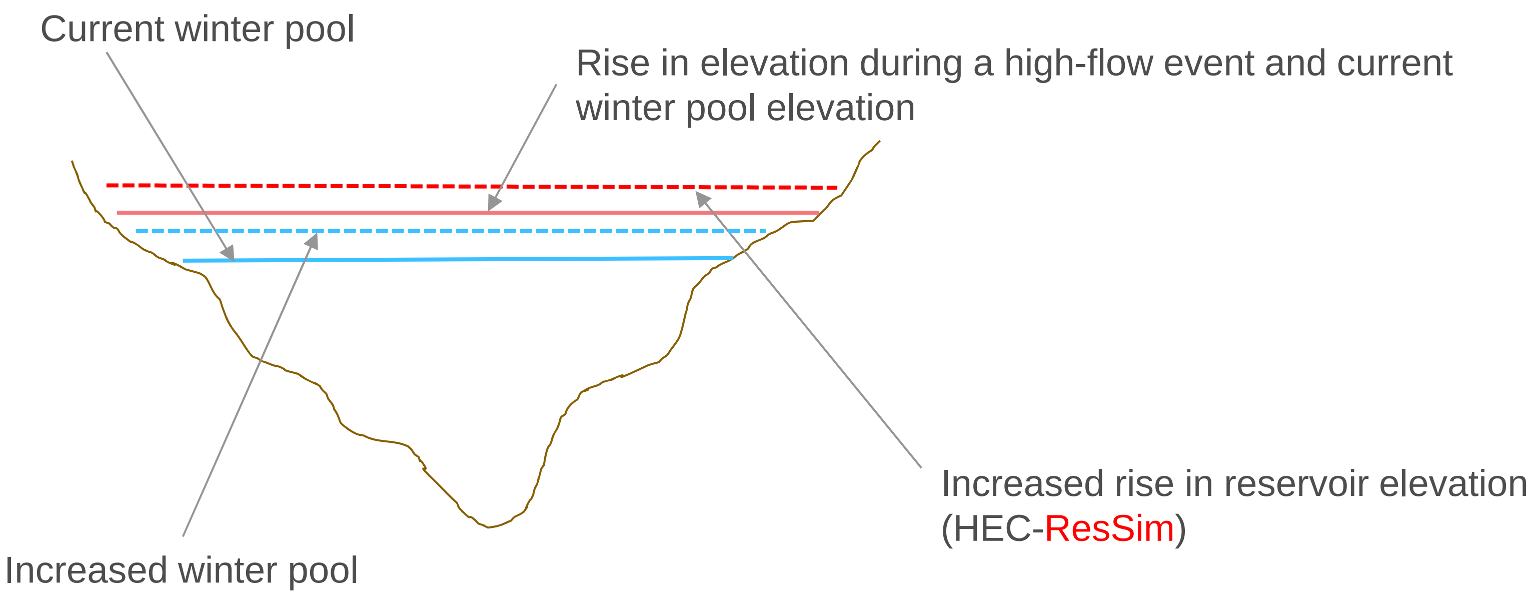


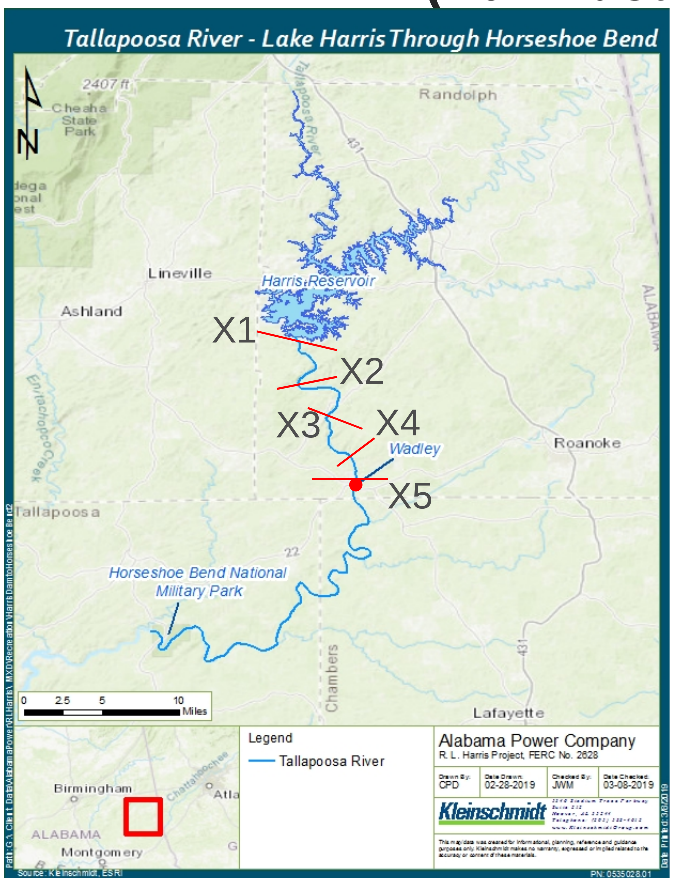


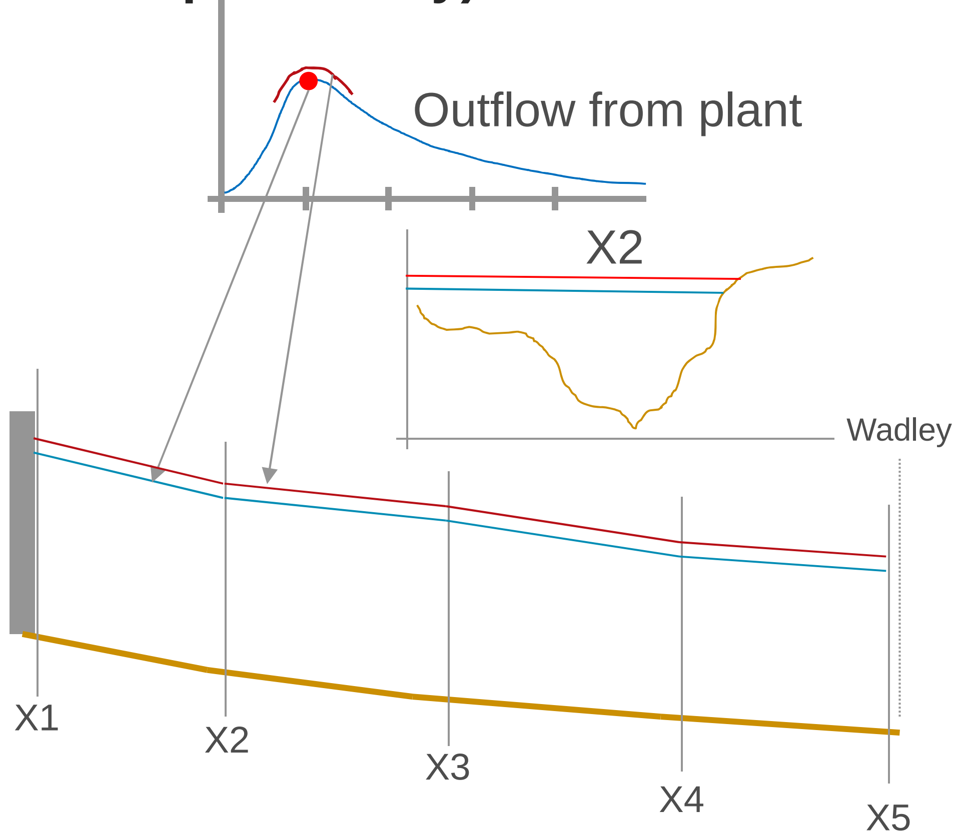
If the winter pool is increased, what happens during a high-flow event?



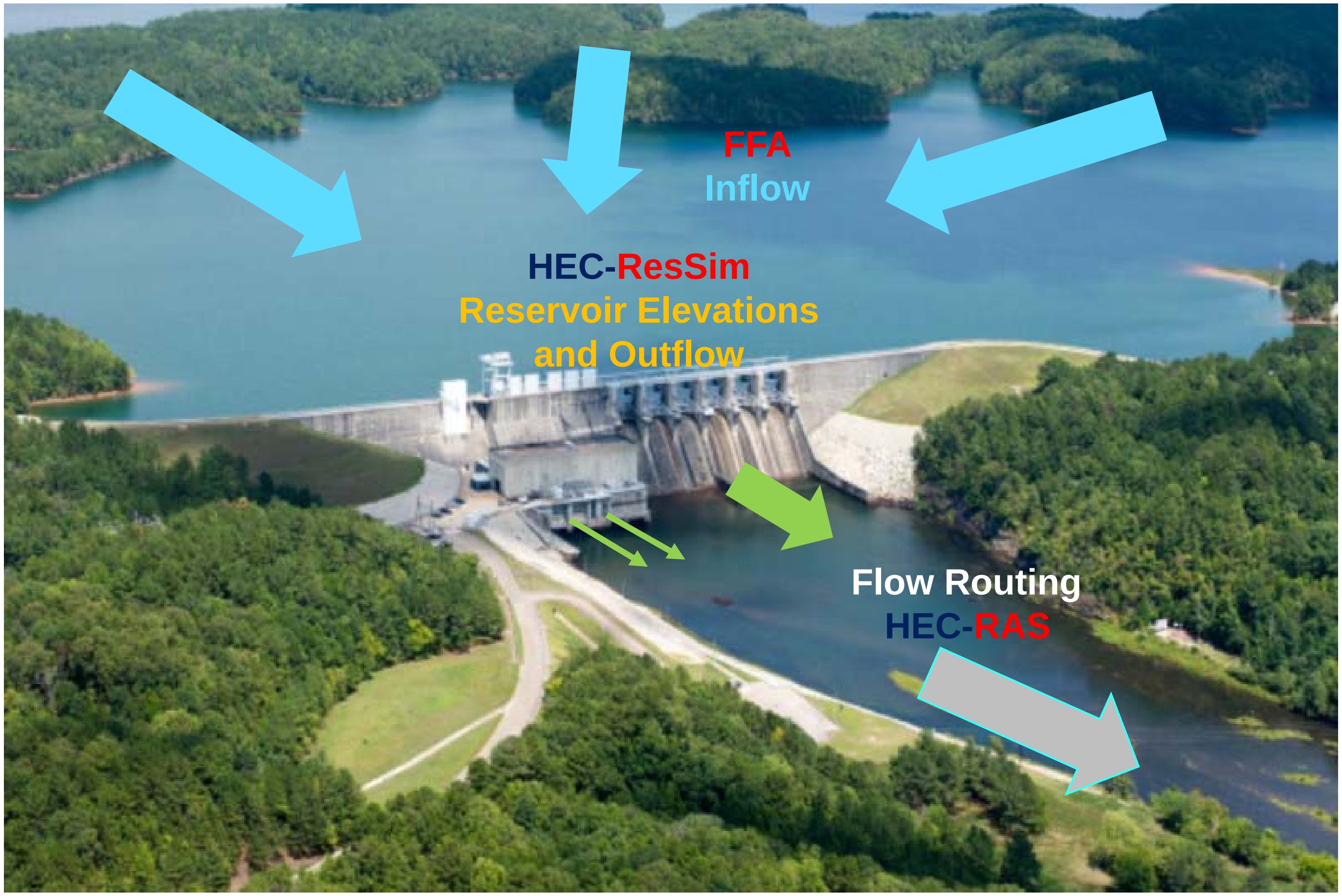
AND…

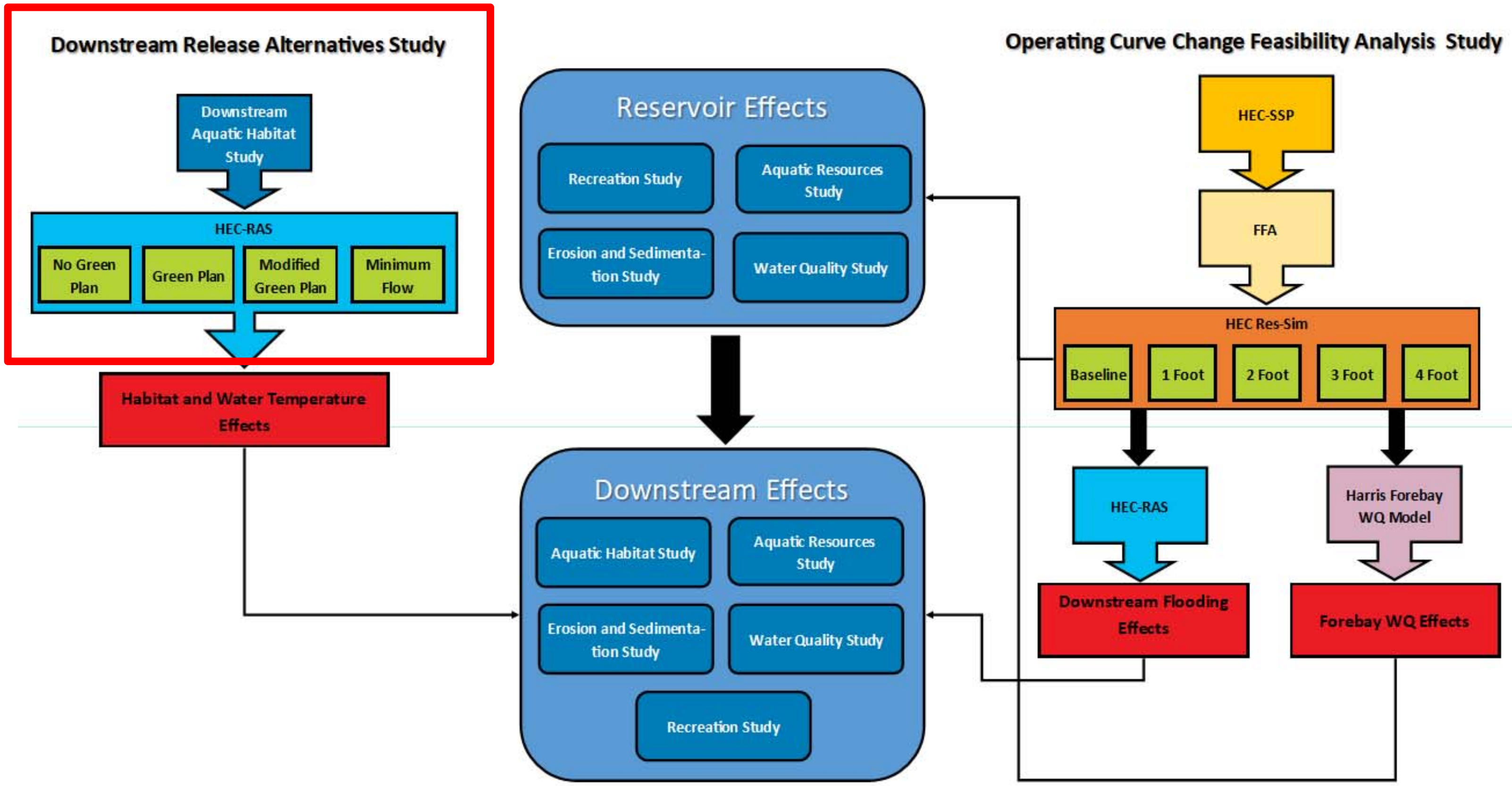
What happens when more water is released?
(For Illustration Purposes only)





To summarize with a picture…





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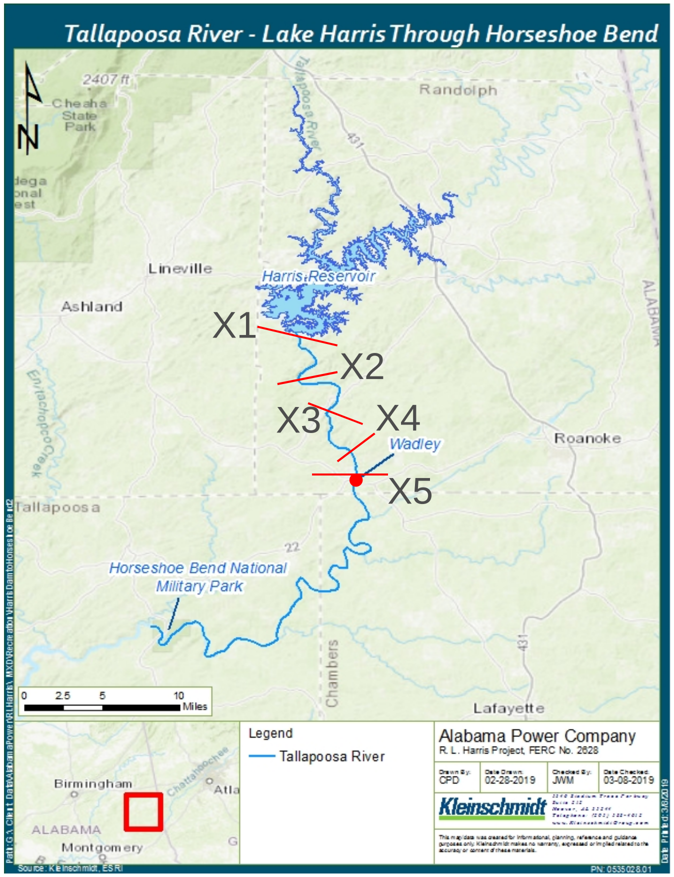
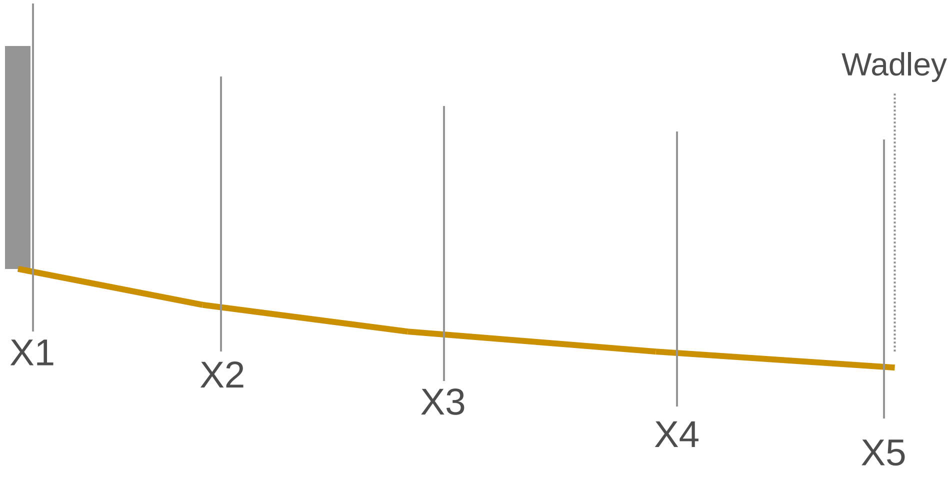
HEC-RAS model



Alternatives Studied

- Green Plan
- No Green Plan
- Modified Green Plan
- 150 cfs continuous minimum flow



Downstream Release Alternatives Study

HEC-ResSim model

Alternatives Studied

- Green Plan
- No Green Plan
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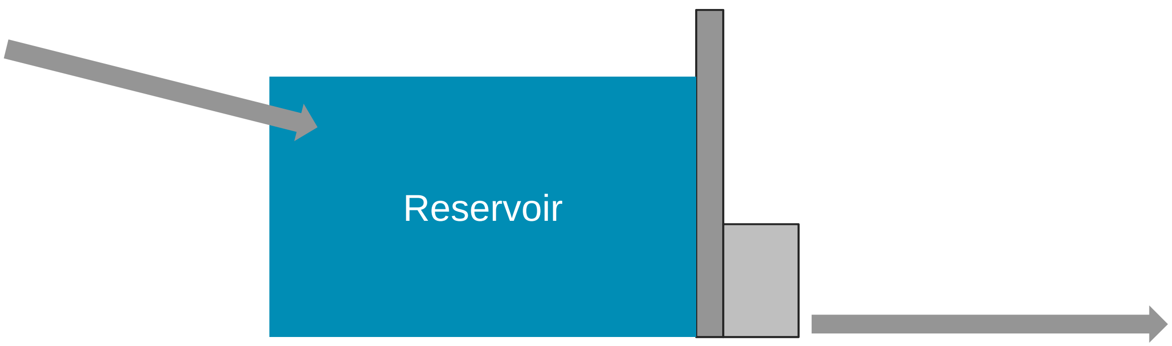
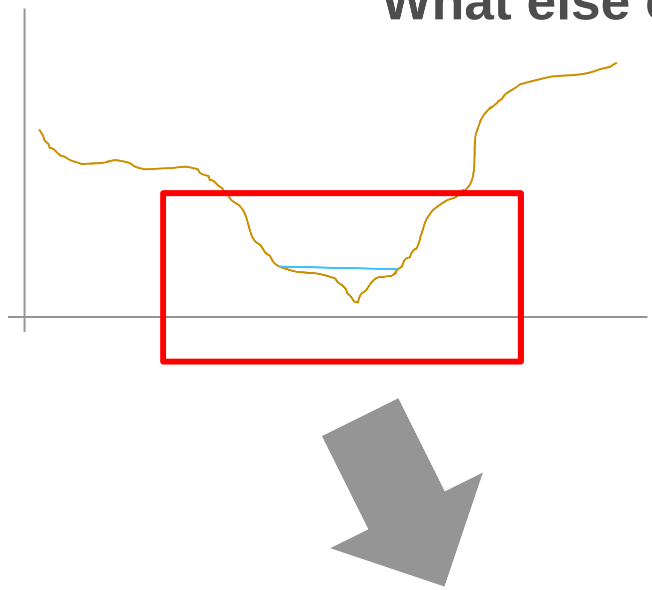
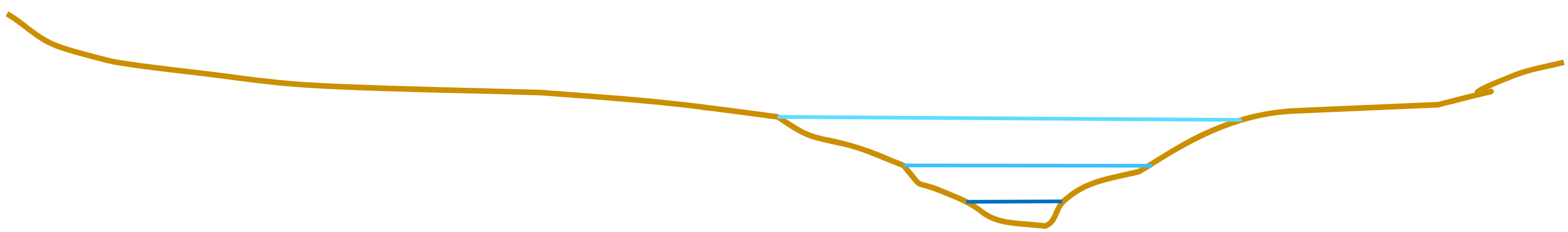
- 150 cfs continuous minimum flow



What else can HEC-RAS be used for?



- Downstream release alternatives
- Water quality
- Water Use
- Erosion
- Aquatic Resources
- Wildlife and Terrestrial Resources
- Recreation Resources
- Cultural Resources



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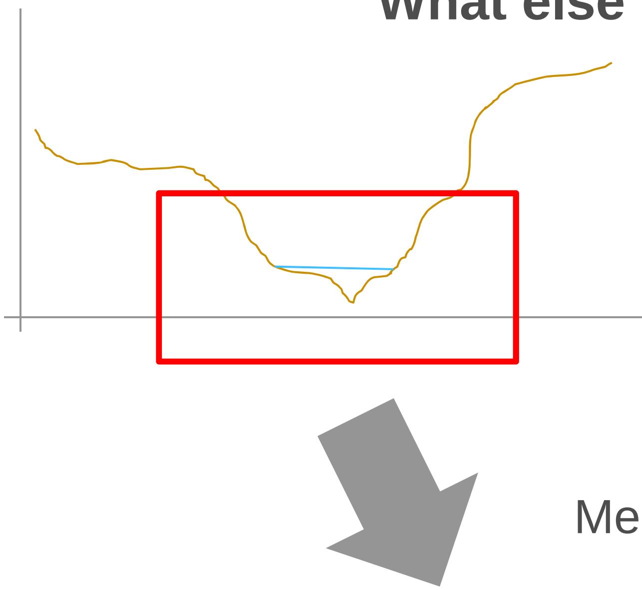
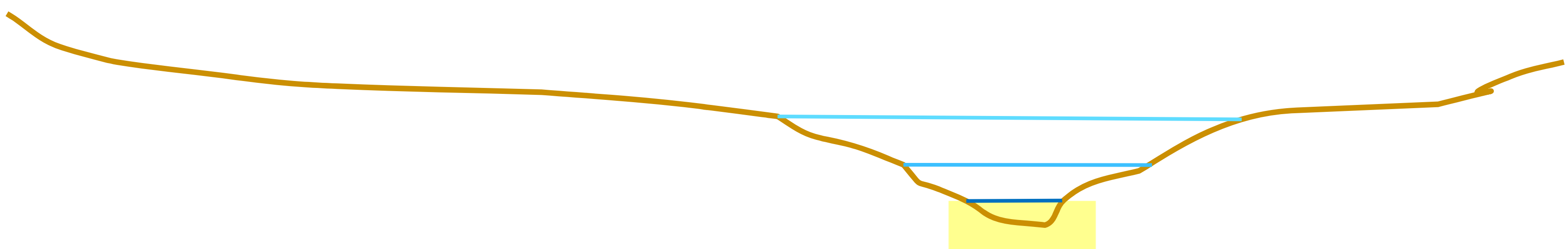


Measure wetted perimeter during low flow scenarios



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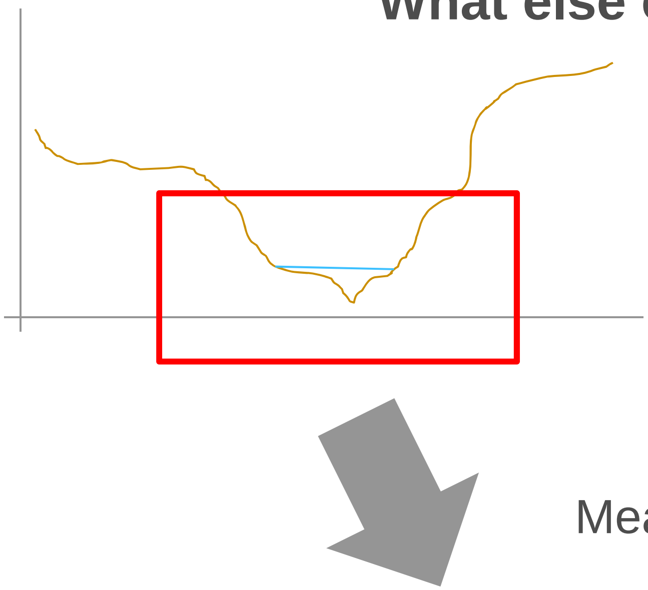

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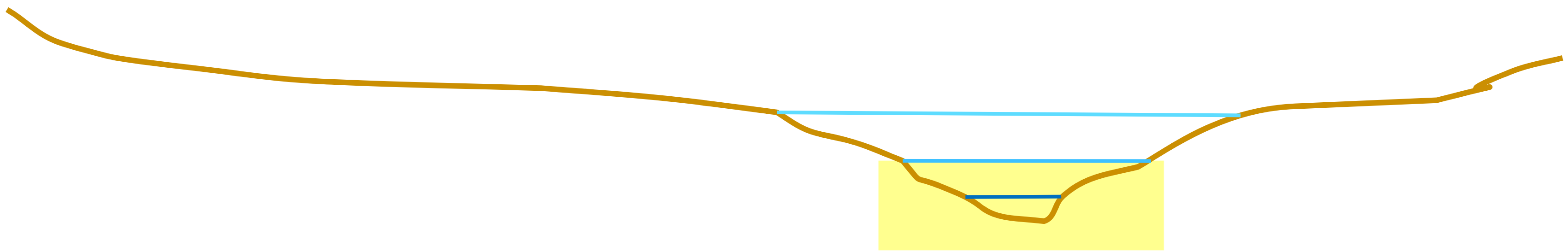

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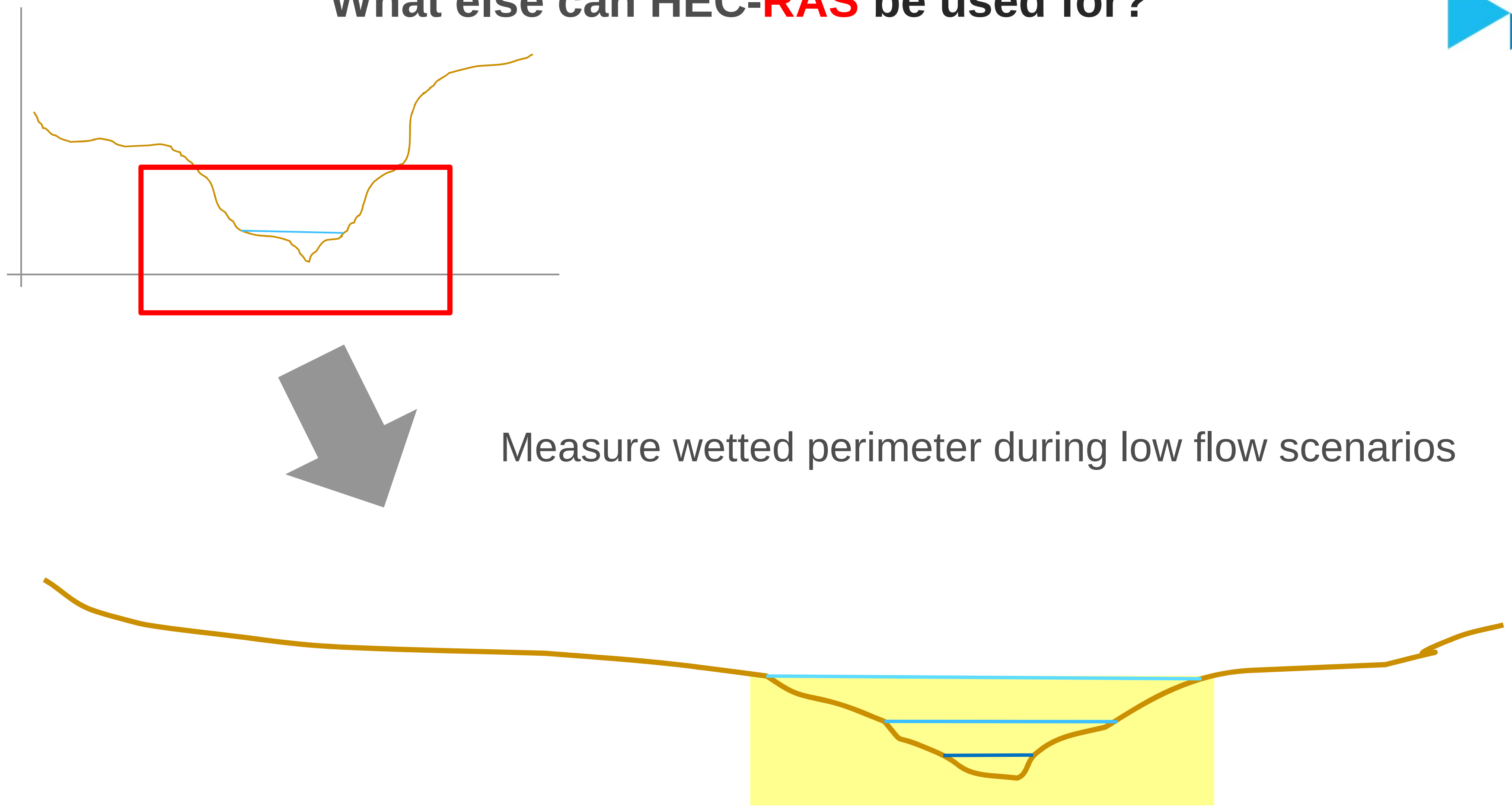
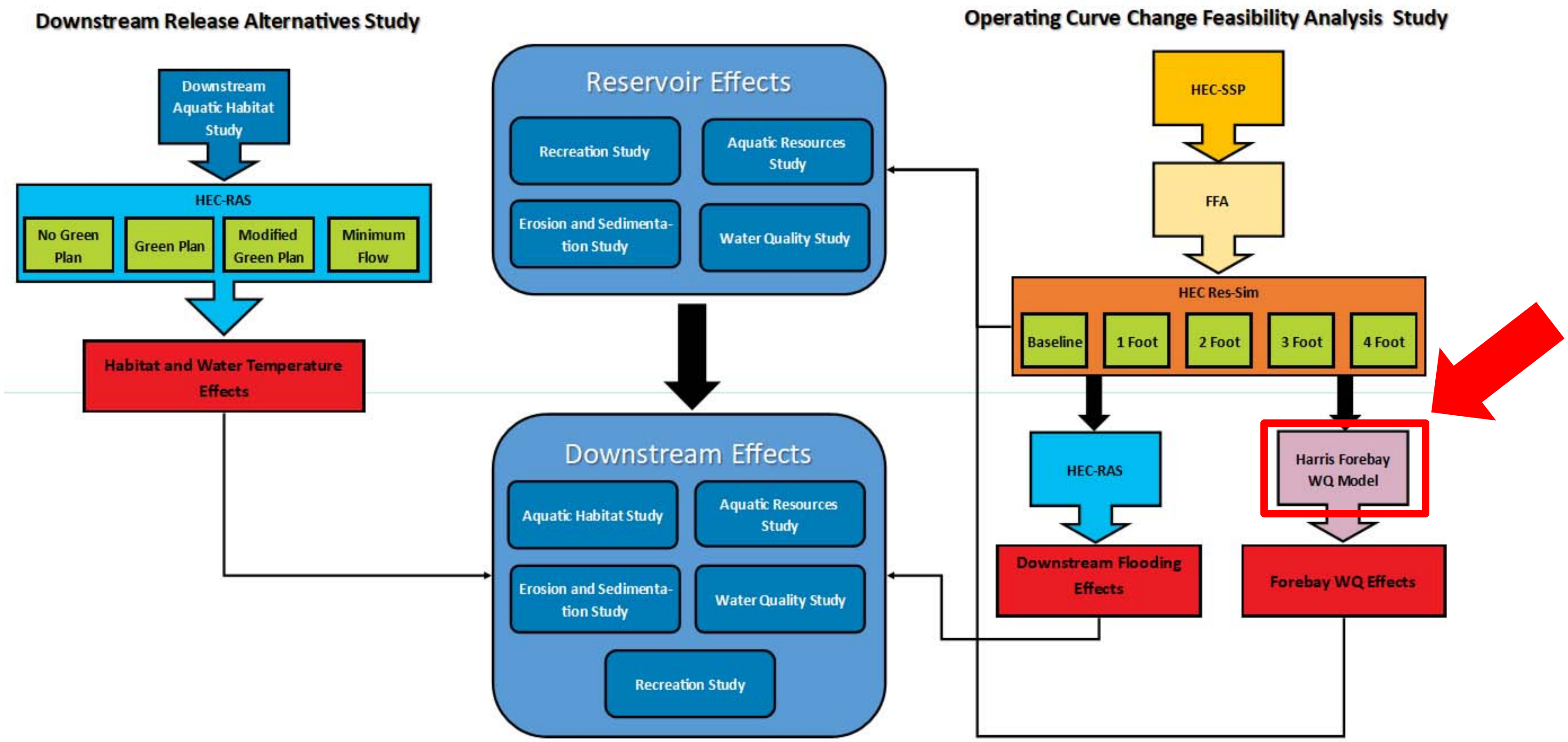


Measure wetted perimeter during low flow scenarios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Environmental Fluid Dynamics Code (EFDC)

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- Abstract
- Applications and Possible Uses
- Model History
- Technical Support and Training
- Quality Assurance and Quality Control
- Related Sites
- References
- EFDC Model Download

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Subject:	HAT 1 - September 11 meeting notes
Date:	Tuesday, October 1, 2019 1:04:00 PM

HAT 1,

The meeting notes and materials from the HAT 1 meeting held September 11, 2019 can be found on the Harris relicensing website (www.harrisrelicensing.com) under HAT 1 – Project Operations.

Thanks,

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Level logger information

APC Harris Relicensing

Mon 10/14/2019 6:34 PM

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Good afternoon,

There have several questions at recent HAT meetings about the location of the level loggers that are collecting elevation and temperature data that will be used in several of the relicensing studies. For your information, here is a link to a map that shows the locations of the 20 level logger monitors: Level Logger Locations. This link will also be placed under HATs 1 and 3 on the Harris relicensing website, www.harrisrelicensing.com.

Thanks,

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Harris Relicensing Progress Update

APC Harris Relicensing

Wed 10/30/2019 5:39 PM

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Harris Relicensing stakeholders,

In the Harris Project Final Study Plans, filed with FERC on May 13, 2019, Alabama Power agreed to file voluntary Progress Updates with FERC in October 2019 and October 2020. The purpose of the Progress Update is to ensure that stakeholders and FERC can review the study progress to date and plan for future reports, meetings, and overall relicensing activities. This is a voluntary action that is not required under the ILP. Alabama Power has filed the October 2019 Progress Update with FERC and posted it to the Harris Project relicensing website: www.harrisrelicensing.com [harrisrelicensing.com] (in the Relicensing Documents folder).

Thanks,

Angie Anderegg

Hydro Services
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October 30, 2019

VIA ELECTRONIC FILING

Project No. 2628-065
R.L. Harris Hydroelectric Project
Progress Update

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 March 13, 2019, Alabama Power filed 10 study plans for FERC approval as part of the Integrated Licensing Process for the Harris Project. On April 12, 2019, FERC approved Alabama Power's study plans with FERC modifications. Alabama Power filed the Final Study Plans with FERC on May 13, 2019 and posted the Final Study Plans to the Harris Project relicensing website at www.harrisrelicensing.com.

As part of the May 13, 2019 filing, Alabama Power recognized the complexity of tracking the 10 relicensing studies and committed to filing a voluntary Progress Update with FERC in October 2019 and October 2020. The purpose of this Progress Update (Attachment A) is to ensure that stakeholders and FERC can review the study progress to date and plan for future reports, meetings, and overall relicensing activities. This is a voluntary action that is not required under the ILP. Alabama Power will post this Progress Update to the Harris Project relicensing website. The Harris Action Team distribution lists are included as Attachment B.

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

Sincerely,

Angela Anderegg

Angie Anderegg
Harris Relicensing Project Manager

Attachments (2)

cc: Harris Stakeholder List

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Attachment A
October 2019 Harris Project Progress Update

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HARRIS DAM RELICENSING

PROGRESS UPDATE

R. L. HARRIS HYDROELECTRIC PROJECT

FERC NO. 2628

Prepared by:

ALABAMA POWER COMPANY
BIRMINGHAM, ALABAMA

Alabama Power

October 2019

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ALABAMA POWER COMPANY
BIRMINGHAM, ALABAMA

R. L. HARRIS HYDROELECTRIC PROJECT
FERC NO. 2628

PROGRESS UPDATE

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ALABAMA POWER COMPANY
BIRMINGHAM, ALABAMA

R. L. HARRIS HYDROELECTRIC PROJECT
FERC NO. 2628

PROGRESS UPDATE

1.0 INTRODUCTION

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 June 1, 2018, Alabama Power filed a Pre-Application Document and began the Integrated Licensing Process (ILP) for the Harris Project[1].

On November 13, 2018, Alabama Power filed ten proposed study plans for the Harris Project. FERC issued a Study Plan Determination on April 12, 2019, which included FERC staff recommendations. Alabama Power incorporated FERC's recommendations and filed the Final Study Plans with FERC on May 13, 2019[2]. Based upon FERC's prior comments and as part of the Final Study Plans, Alabama Power incorporated within each study plan's schedule a milestone to file a voluntary Progress Update in October 2019 and October 2020. This Progress Update is designed to inform stakeholders and FERC of the study progress, future reports, Harris Action Team (HAT) meetings, and overall relicensing activities. A summary of the Harris Project relicensing activities follows in Section 2 to Section 7 of this report.

[1] Accession No. 20180601-5125

[2] Accession No. 20190513-5093

2.0 HAT 1 – PROJECT OPERATIONS

2.1 DOWNSTREAM RELEASE ALTERNATIVES STUDY PLAN

- Alabama Power deployed 20 level loggers and has collected bathymetry data in the Tallapoosa River needed for the HEC-RAS modeling.
- Alabama Power held a HAT 1 meeting on September 11, 2019, to discuss the models used in the Downstream Release Alternatives Study Plan and status of the modeling analysis.
- Alabama Power posted the September 11, 2019 HAT 1 meeting summary on the Harris Relicensing website at www.harrisrelicensing.com.
- Beginning in November 2019, Alabama Power will download the level logger data and complete the HEC-RAS model.
- In accordance with the FERC approved study plan, Alabama Power will host a HAT 1 meeting to present initial model results in February/March 2020.

2.2 OPERATING CURVE CHANGE FEASIBILITY ANALYSIS STUDY PLAN

- Alabama Power hosted a HAT 1 meeting on September 11, 2019, to discuss the models, methods, and model inputs and outputs (how the model will be used) for the Operating Curve Change Feasibility Analysis.
- Alabama Power posted the September 11, 2019 HAT 1 meeting summary on the Harris Relicensing website at www.harrisrelicensing.com.
- Alabama Power is in the process of modeling the four alternative winter operating curve elevations and will evaluate the effects on flood control, navigation, generation, drought operations, and Green Plan operations.
- In accordance with the FERC approved study plan, Alabama Power will host a HAT 1 meeting to present initial model results in February/March 2020.

3.0 HAT 2 – WATER QUALITY AND USE

3.1 EROSION AND SEDIMENTATION STUDY PLAN

- Alabama Power distributed an email on May 1, 2019 to HAT 2 members requesting any locations of additional areas of erosion and sedimentation concerns on Lake Harris and in the Tallapoosa River downstream of Harris Dam. Alabama Power did not receive any comments from stakeholders regarding additional areas of erosion and sedimentation concern.
- Alabama Power held a HAT 2 meeting on September 11, 2019, where it presented GIS overlays and maps of the erosion and sedimentation sites that will be assessed when the reservoir level is at winter pool elevation.
- Alabama Power posted the September 11th HAT 2 meeting summary and meeting materials, as well as a link to an online map with the locations of the identified erosion and sedimentation study sites, on the Harris Relicensing website at www.harrisrelicensing.com.
- Following the September 11 HAT 2 meeting, a stakeholder requested, and Alabama Power agreed, to include one additional erosion site in the field assessment.
- Trutta Environmental Solutions conducted a bank erosion susceptibility survey on the Tallapoosa River from the Harris Dam through Horseshoe Bend. Trutta Environmental Solutions is in the process of analyzing the data and preparing a report.
- In November/December, Alabama Power will conduct the field assessment of the erosion and sedimentation areas.
- In accordance with the FERC-approved study plan, Alabama Power will prepare and distribute a Draft Erosion and Sedimentation Study Report to HAT 2 in March 2020.

3.2 WATER QUALITY STUDY PLAN

- Alabama Power distributed an email on May 1, 2019, to HAT 2 members requesting locations of any additional areas of water quality concerns on Lake Harris. Alabama Power did not receive any comments from stakeholders regarding additional areas of water quality concern.
- Alabama Power held a HAT 2 meeting on September 11, 2019, to provide an update on the Water Quality Study Plan.
- Alabama Power posted the September 1, 2019 HAT 2 meeting summary on the Harris Relicensing website at www.harrisrelicensing.com.
- Alabama Power is continuing to monitor temperature and dissolved oxygen in the tailrace and at a monitoring location approximately ½ mile downstream of Harris Dam through October 31, 2019. Additionally, Alabama Power will continue to collect monthly vertical water quality profiles in the forebay through October 31, 2019.
- In accordance with the FERC-approved study plan, Alabama Power will distribute a Draft Water Quality Study Report to HAT 2 in March 2020.

4.0 HAT 3 – FISH AND WILDLIFE

4.1 AQUATIC RESOURCES STUDY PLAN

- Alabama Power is developing the desktop assessment of aquatic resources, per Task 4.1 of the approved study plan.
- Auburn University has identified several sources of existing information, per Task 4.2.1 of the approved study plan. Where information is not available for a particular species, data for similar (surrogate species) may be used.
- Auburn University has analyzed Pre and post Green Plan temperature data from the regulated reaches, per Task 4.2.2 of the approved study plan. Preliminary results of this analysis were presented to HAT 3 members on March 20, 2019.
- Auburn University is collecting additional temperature data and analyzing all available temperature data on a sub-daily basis.
- Alabama Power posted the March 20, 2019 HAT 3 meeting summary on the Harris Relicensing website at www.harrisrelicensing.com.
- Auburn University has collected electrofishing samples in April, July, and September 2019, per Task 4.2.3 of the approved study plan. Additional methods to increase catch rates for some target species are being explored.
- Auburn University is performing analyses of age/growth and diet of target species collected during electrofishing, per Task 4.2.4 of the approved study plan. Individuals from target species collected during electrofishing are undergoing swim performance tests to determine active metabolic rates and static respirometry tests to assess to determine resting metabolic rates.
- In accordance with the FERC approved study plan, Alabama Power will host a HAT 3 meeting on progress to date in March 2020.

4.2 DOWNSTREAM AQUATIC HABITAT STUDY PLAN

- Alabama Power held a HAT 3 meeting on March 20, 2019, regarding the Downstream Aquatic Habitat Study Plan.
- Alabama Power posted the March 20, 2019 HAT 3 meeting summary on the Harris Relicensing website at www.harrisrelicensing.com.
- Alabama Power has deployed 20 level loggers and has collected approximately 90 percent of the bathymetry data needed for modeling.
- Alabama Power has completed the mesohabitat analysis for the study area.
- In the next few months, Alabama Power will collect the remaining bathymetry data and download data (i.e., elevation and temperature) collected by level loggers.
- Alabama Power will complete the HEC-RAS modeling for habitat in Q4 2019 and Q1 2020.

- In accordance with the FERC approved study plan, Alabama Power will host HAT 3 progress meetings in November/December 2019 and February/March 2020.

4.3 THREATENED AND ENDANGERED (T&E) SPECIES STUDY PLAN

- Alabama Power held a HAT 3 meeting on August 27, 2019 regarding the T&E Species Study Plan.
- Alabama Power posted the August 27, 2019 HAT 3 meeting summary on the Harris Relicensing website at www.harrisrelicensing.com.
- Alabama Power developed GIS overlays of habitat information and developed maps to determine possible areas in the FERC-approved geographic scope where T&E species may occur.
- Alabama Power is working with USFWS to determine where field verification surveys may be needed. These surveys are tentatively scheduled to be conducted in Fall 2019.
- In accordance with the FERC-approved study plan, Alabama Power will distribute a Draft T&E Study Report to HAT 3 in February 2020.

5.0 HAT 4 – PROJECT LANDS

5.1 PROJECT LANDS EVALUATION STUDY PLAN

- Alabama Power held a HAT 4 meeting on September 11, 2019, to review proposed land use changes, including lands to be added to the Project Boundary, lands to be removed from the Project Boundary, and proposed changes in land use classifications of existing Project lands. Alabama Power presented the proposed changes in GIS overlays.
- Alabama Power posted the September 11, 2019 HAT 4 meeting summary on the Harris Relicensing website at www.harrisrelicensing.com.
- Following the September 11, 2019 HAT 4 meeting, Alabama Power solicited feedback from HAT 4 on the Project Lands proposal. All stakeholder feedback will be considered in developing the final proposal.
- During the spring and fall 2019, Samford University conducted a botanical inventory at Flat Rock Park.
- In the next few months, Alabama Power will evaluate the Skyline property for Bobwhite quail habitat.

6.0 HAT 5 – RECREATION

6.1 RECREATION EVALUATION STUDY PLAN

- Alabama Power began collecting recreation use data on Lake Harris in March 2019 and downstream in the Tallapoosa River in May 2019. Alabama Power will continue collecting recreation use information through October 31 (downstream) and December 2019 (Lake Harris). Data analysis will occur in Q1 2020.
- Alabama Power is estimating the percent of usable shoreline structures at current operations and at each winter pool alternative using light detection and ranging (LiDAR) data of the shoreline and GPS coordinates of each shoreline structure. This information will be presented to HAT 5 in the Draft Recreation Report in June 2020.
- Alabama Power conducted a Project recreation site inventory and condition assessment in October 2019.
- Alabama Power will be conducting a downstream landowner survey in January 2020.
- Alabama Power will host a HAT 5 meeting in March 2020 to provide an update on recreation data collection.

20191030-5053 FERC PDF (Unofficial) 10/30/2019 10:16:30 AM

7.0 HAT 6 – CULTURAL RESOURCES

7.1 CULTURAL RESOURCES PROGRAMMATIC AGREEMENT AND HISTORIC PROPERTIES MANAGEMENT PLAN STUDY PLAN

- Alabama Power conducted HAT 6 meetings May 22 and July 9, 2019.
- Alabama Power posted meeting summaries on the Harris relicensing website at www.harrisrelicensing.com
- Alabama Power distributed Archeological Survey Reports and Alabama Historical Commission concurrence letters for surveys in the Harris Project Boundary, Harris Project Boundary shapefiles, and other relevant cultural resources information to participating tribes and the State Historic Preservation Office (SHPO) (May 2019).
- In August 2019, Alabama Power distributed reports and images related to fish weirs in the Harris Project Boundary. Much of this information is sensitive in nature; therefore, Alabama Power limited the distribution to federal agencies and tribes.
- Alabama Power posted July 9, 2019 meeting notes to the Harris Relicensing website at www.harrisrelicensing.com.
- Alabama Power proposed a draft Historic Properties Management Plan outline (HPMP) to HAT 6 members on May 22, 2019.
- Alabama Power is working to define the Area of Potential Effects (APE) and proposes that the APE include lands in the R.L. Harris FERC Project Boundary (Lake Harris and Skyline). In addition, Alabama Power is evaluating the area below Harris Dam through Horseshoe Bend to determine any effects of **Project Operations** on Cultural Resources[3].
- The next HAT 6 meeting will be held on November 6, 2019. The information to be discussed in this meeting is sensitive in nature; therefore, Alabama Power is limiting the participation to applicable state and federal agencies, and applicable tribes. At this meeting, Alabama Power plans to confirm the final determination of Lake Harris sites for further evaluation and review and confirm survey methods for additional cultural resources evaluations on Lake Harris and Skyline. In addition, Alabama Power will continue discussions on the HPMP and propose an Inadvertent Discovery Plan and Traditional Cultural Properties (TCP) Identification Plan outline.

[3] While not included in the Harris Project APE, the geographic scope of the Cultural Resources Programmatic Agreement and Historic Properties Management Plan Study Plan extends to Horseshoe Bend.

Attachment B
Harris Action Team Distribution Lists

HAT 1 - Project Operations

Name	Company
Damon Abernethy	Alabama Department of Conservation and Natural Resources
Bob Allen	U.S. Army Corps of Engineers
Brian Atkins	Alabama Department of Economic and Community Affairs
Richard Bronson	Stakeholder
Steve Bryant	Alabama Department of Conservation and Natural Resources
Nancy Burnes	Lake Wedowee Property Owners Association
Richard Burnes	Property Owner
Matt and Ann Campbell	Stakeholder
Curt Chaffin	Alabama Rivers Alliance
Kristie Coffman	Auburn University
Stan Cook	Alabama Department of Conservation and Natural Resources
Allan Creamer	Federal Energy Regulatory Commission
Doug & Jan Crisp	Stakeholder
Gene Crouch	Keller Williams Realty Group; Lake Wedowee
Jesse Cunningham	Lake Martin HOBO
Dennis Devries	Auburn University
Mike Dollar	Lake Martin HOBO
Jeff Duncan	U.S. National Park Service
Albert Eiland	Property Owner
Steve Forehand	Lake Martin Resource Association
Sylvia French	Lake Wedowee Property Owners Association
Tom Garland	Lake Wedowee Property Owners Association
Taconya Goar	Alabama Department of Conservation and Natural Resources
Lisa Gordon	U.S. Environmental Protection Agency
Chris Greene	Alabama Department of Conservation and Natural Resources
Jennifer Grunewald	U.S. Fish and Wildlife
Andrew Hall	Property Owner
Randall Harvey	U.S. Army Corps of Engineers
Jennifer Haslbauer	Alabama Department of Environmental Management
James Hathorn	U.S. Army Corps of Engineers
Dave Heinzen	Lake Martin HOBO
Keith Henderson	Alabama Department of Conservation and Natural Resources
Mike Holley	Alabama Department of Conservation and Natural Resources
Dan Holliman	U.S. Environmental Protection Agency
Sonja Holloman	Stakeholder
Elise Irwin	Auburn University
Butch Jackson	Stakeholder
Gerrit Jobsis	American Rivers
Chris Johnson	Alabama Department of Environmental Management
Evan Lawrence	Alabama Department of Conservation and Natural Resources
Michael Len	Alabama Department of Environmental Management
Fred Leslie	Alabama Department of Environmental Management
Tom Littlepage	Alabama Department of Economic and Community Affairs
Cindy Lowry	Alabama Rivers Alliance
Donna Matthews	Stakeholder
Rachel McNamara	Federal Energy Regulatory Commission

HAT 1 - Project Operations

Name	Company
David Moore	Alabama Department of Environmental Management
Barry Morris	Lake Wedowee Property Owners Association
Ginny Oxford	Stakeholder
Mellie Parrish	Stakeholder
Ira Parsons	Lake Wedowee Property Owners Association
Jeff Powell	U.S. Fish and Wildlife
Becky Rainwater	ReMax Lakefront
Mitch Reid	Nature Conservancy
Sarah Salazar	Federal Energy Regulatory Commission
Jerrel Shell	Stakeholder
Barry Smith	Stakeholder
Paul Smith	Stakeholder
David Smith	Stakeholder
Linda Stone	Stakeholder
Chuck Sumner	U.S. Army Corps of Engineers
Monte Terhaar	Federal Energy Regulatory Commission
David Thomas	Stakeholder
John Thompson	Lake Martin Resource Association
David Thompson	Property Owner
George Traylor	Property Owner
Steve Traylor	Stakeholder
Jimmy Traylor	Stakeholder
Jonas White	U.S. Army Corps of Engineers
Russell Wright	Auburn University

HAT 2 - Water Quality and Use

Name	Company
Damon Abernethy	Alabama Department of Conservation and Natural Resources
Steve Bryant	Alabama Department of Conservation and Natural Resources
Nancy Burnes	Lake Wedowee Property Owners Association
Richard Burnes	Property Owner
Matt and Ann Campbell	Stakeholder
Curt Chaffin	Alabama Rivers Alliance
Maria Clark	U.S. Environmental Proection Agency
Kristie Coffman	Auburn University
Stan Cook	Alabama Department of Conservation and Natural Resources
Allan Creamer	Federal Energy Regulatory Commission
Jan and Crisp	Stakeholder
Jesse Cunningham	Lake Martin HOBO
Chris Decker	U.S. Environmental Proection Agency
Chuck Denman	Stakeholder
Jeff Duncan	U.S. National Park Service
Albert Eiland	Property Owner
Steve Forehand	Lake Martin Resource Association
Tom Garland	Lake Wedowee Property Owners Association
Taconya Goar	Alabama Department of Conservation and Natural Resources
Lisa Gordon	U.S. Environmental Proection Agency
Chris Greene	Alabama Department of Conservation and Natural Resources
Evelyn Hammrick	Property Owner
Jennifer Haslbauer	Alabama Department of Environmental Management
Keith Henderson	Alabama Department of Conservation and Natural Resources
Mike Holley	Alabama Department of Conservation and Natural Resources
Dan Holliman	U.S. Environmental Proection Agency
Elise Irwin	Auburn University
Gerrit Jobsis	American Rivers
Chris Johnson	Alabama Department of Environmental Management
Carol Knight	Stakeholder
Michael Len	Alabama Department of Environmental Management
Fred Leslie	Alabama Department of Environmental Management
Cindy Lowry	Alabama Rivers Alliance
Donna Matthews	Stakeholder
Rachel McNamara	Federal Energy Regulatory Commission
Harry Merrill	Stakeholder
David Moore	Alabama Department of Environmental Management
Barry Morris	Lake Wedowee Property Owners Association
Mellie Parrish	Stakeholder
Jerry & Mary Poss	Stakeholder
Mitch Reid	Nature Conservancy
Eric Reutebuch	Auburn University
Sarah Salazar	Federal Energy Regulatory Commission
Amy Silvano	Alabama Department of Conservation and Natural Resources
David Smith	Stakeholder
Monte Terhaar	Federal Energy Regulatory Commission

HAT 2 - Water Quality and Use

Name	Company
John Thompson	Lake Martin Resource Association

HAT 3 - Fish and Wildlife

Name	Company
Damon Abernethy	Alabama Department of Conservation and Natural Resources
Steve Bryant	Alabama Department of Conservation and Natural Resources
Matt and Ann Campbell	Stakeholder
Curt Chaffin	Alabama Rivers Alliance
Kristie Coffman	Auburn University
Evan Collins	U.S. Fish and Wildlife
Stan Cook	Alabama Department of Conservation and Natural Resources
Allan Creamer	Federal Energy Regulatory Commission
Chris Decker	U.S. Environmental Protection Agency
Dennis Devries	Auburn University
Jeff Duncan	U.S. National Park Service
Steve Forehand	Lake Martin Resource Association
Tom Garland	Lake Wedowee Property Owners Association
Taconya Goar	Alabama Department of Conservation and Natural Resources
Chris Greene	Alabama Department of Conservation and Natural Resources
Jennifer Grunewald	U.S. Fish and Wildlife
Keith Henderson	Alabama Department of Conservation and Natural Resources
Mike Holley	Alabama Department of Conservation and Natural Resources
Dan Holliman	U.S. Environmental Protection Agency
Elise Irwin	Auburn University
Gerrit Jobsis	American Rivers
Evan Lawrence	Alabama Department of Conservation and Natural Resources
Cindy Lowry	Alabama Rivers Alliance
Donna Matthews	Stakeholder
Rachel McNamara	Federal Energy Regulatory Commission
Chris Oberholster	Birmingham Audubon
Mellie Parrish	Stakeholder
Bill Pearsons	U.S. Fish and Wildlife
Jeff Powell	U.S. Fish and Wildlife
Mitch Reid	Nature Conservancy
Sarah Salazar	Federal Energy Regulatory Commission
Amy Silvano	Alabama Department of Conservation and Natural Resources
Tricia Stearns	Stakeholder
Monte Terhaar	Federal Energy Regulatory Commission
Steve Traylor	Stakeholder
Jimmy Traylor	Stakeholder
Pace Wilber	National Oceanic and Atmospheric Administration
Ken Wills	Alabama Glade Conservation Coalition
Russell Wright	Auburn University

HAT 4 - Project Lands

Name	Company
Damon Abernethy	Alabama Department of Conservation and Natural Resources
Matt Brooks	Alabama Law Enforcement Agency
Coty Brown	Alabama Law Enforcement Agency
Steve Bryant	Alabama Department of Conservation and Natural Resources
Matt and Ann Campbell	Stakeholder
Curt Chaffin	Alabama Rivers Alliance
Kristie Coffman	Auburn University
Evan Collins	U.S. Fish and Wildlife
Allan Creamer	Federal Energy Regulatory Commission
Gene Crouch	Keller Williams Realty Group; Lake Wedowee
Steve Forehand	Lake Martin Resource Association
Tom Garland	Lake Wedowee Property Owners Association
Keith Gauldin	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
Jennifer Grunewald	U.S. Fish and Wildlife
Keith Henderson	Alabama Department of Conservation and Natural Resources
Mike Holley	Alabama Department of Conservation and Natural Resources
Elise Irwin	Auburn University
Gerrit Jobsis	American Rivers
Evan Lawrence	Alabama Department of Conservation and Natural Resources
Cindy Lowry	Alabama Rivers Alliance
Diane Lunsford	Lake Wedowee Property Owners Association
Donna Matthews	Stakeholder
Allison McCartney	U.S. Bureau of Land Management
Rachel McNamara	Federal Energy Regulatory Commission
Harry Merrill	Stakeholder
Brad Mitchell	Lake Wedowee Property Owners Association
Stan Nelson	Nelson and Company
Chris Oberholster	Birmingham Audubon
Mellie Parrish	Stakeholder
Jerry & Mary Poss	Stakeholder
Jeff Powell	U.S. Fish and Wildlife
Mark Prestridge	Randolph County Water Authority
Mitch Reid	Nature Conservancy
Sarah Salazar	Federal Energy Regulatory Commission
Amy Silvano	Alabama Department of Conservation and Natural Resources
Chris Smith	Alabama Department of Conservation and Natural Resources
Glenell Smith	Stakeholder
David Smith	Stakeholder
Paul Smith	Stakeholder
John Sullivan	U.S. Bureau of Land Management
Monte Terhaar	Federal Energy Regulatory Commission
John Thompson	Stakeholder
Ken Wills	Alabama Glade Conservation Coalition

HAT 5 - Recreation

Name	Company
Damon Abernethy	Alabama Department of Conservation and Natural Resources
Matt Brooks	Alabama Law Enforcement Agency
Coty Brown	Alabama Law Enforcement Agency
Matt and Ann Campbell	Stakeholder
Curt Chaffin	Alabama Rivers Alliance
Kristie Coffman	Auburn University
Allan Creamer	Federal Energy Regulatory Commission
Jesse Cunningham	Lake Martin HOBO
Mike Dollar	Lake Martin HOBO
Jeff Duncan	U.S. National Park service
Steve Forehand	Lake Martin Resource Association
Sylvia French	Stakeholder
Tom Garland	Stakeholder
Keith Gauldin	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
Dave Heinzen	Lake Martin HOBO
Keith Henderson	Alabama Department of Conservation and Natural Resources
Mike Holley	Alabama Department of Conservation and Natural Resources
Sonja Hollomon	Stakeholder
Elise Irwin	Auburn University
Butch Jackson	Property Owner
Gerrit Jobsis	American Rivers
Gerry Knight	Stakeholder
Evan Lawrence	Alabama Department of Conservation and Natural Resources
Cindy Lowry	Alabama Rivers Alliance
Donna Matthews	Stakeholder
Rachel McNamara	Federal Energy Regulatory Commission
Harry Merrill	Stakeholder
Brad Mitchell	Lake Wedowee Property Owners Association
Chris Oberholster	Birmingham Audubon
Ginny Oxford	Stakeholder
Mellie Parrish	Stakeholder
Ira Parsons	Lake Wedowee Property Owners Association
Jerry and Mary Poss	Stakeholder
Mitch Reid	Nature Conservancy
Sarah Salazar	Federal Energy Regulatory Commission
Chris Smith	Alabama Department of Conservation and Natural Resources
Paul Smith	Stakeholder
Jim Sparrow	Alabama Bass Federation
Tricia Stearns	Stakeholder
Monte Terhaar	Federal Energy Regulatory Commission
Bryant Whaley	Randolph County Economic / Industrial Development

HAT 6 - Cultural Resources

Name	Company
Steve Bryant	Alabama Department of Conservation and Natural Resources
Nancy Burnes	Lake Wedowee Property Owners Association
RaeLynn Butler	Muscogee (Creek) Nation of Oklahoma
Bryant Celestine	Alabama-Coushatta Tribe of Texas
Kristie Coffman	Auburn University
Allan Creamer	Federal Energy Regulatory Commission
Jeff Duncan	U.S. National Park Service
Taconya Goar	Alabama Department of Conservation and Natural Resources
Larry Haikey	Poarch Band of Creek Indians
Evelyn Hamrick	Property Owner
Mike Holley	Alabama Department of Conservation and Natural Resources
Gerrit Jobsis	American Rivers Alliance
Linda Langley	Coushatta Tribe of Louisiana
Janice Lowe	Alabama Quassarte Tribe
Donna Matthews	Stakeholder
Janet Maylen	Thlopthlocco Tribal Town
Amanda McBride	Alabama Historical Commission
Allison McCartney	U.S. Bureau of Land Management
Rachel McNamara	Federal Energy Regulatory Commission
Karen Pritchett	United Keetoowah Band of Cherokee Indians
Mitch Reid	Nature Conservancy
Sarah Salazar	Federal Energy Regulatory Commission
Eric Sipes	Alabama Historical Commission
Barry Smith	Stakeholder
Robin Soweka	Muscogee (Creek) Nation of Oklahoma
John Sullivan	U.S. Bureau of Land Management
Monte Terhaar	Federal Energy Regulatory Commission
Elizabeth Toombs	Tribal Historic Preservation Office Cherokee Nation
Russ Townsend	Eastern Band of Cherokee Indians

From:	Cindy Lowry
To:	Anderegg, Angela Segars
Subject:	Re: Question about Harris dam operations
Date:	Wednesday, February 12, 2020 2:57:58 PM

EXTERNAL MAIL: Caution Opening Links or Files

Yes, I have told Martha that y'alls operations are pretty much prescribed in your license and operations manuals from the ACoE. I didn't know for sure if there was anything new in light of the significant rainfall we have seen lately. I will pass along this link as a reminder. If there are more specifics that this doesn't answer, I'll let you know. Thanks!
Cindy

On Wed, Feb 12, 2020 at 2:32 PM Anderegg, Angela Segars <ARSEGARS@southernco.com> wrote:

> Hi Cindy
>
> As always in high flow events, we are just following our prescribed flood control procedures from the USACE. What people are seeing now is no different than what they have seen historically. We've discussed flood control operations at a few of the relicensing meetings to-date, but one in particular that may be helpful is the Operations presentation from January 31, 2018. There is a ppt and a video on our website: http://www.harrisrelicensing.com/_layouts/15/start.aspx#/HAT%201%20%20Project%20Operations/Forms/AllItems.aspx [harrisrelicensing.com].
>
> Can you give me a list of what the specific concerns are, I can certainly ask our water management folks to respond.
>
> Thanks,
>
> **Angie Anderegg**
>
> Hydro Services
>
> (205)257-2251
>
> arsegars@southernco.com
>
> ---
>
> **From:** Cindy Lowry <clowry@alabamarivers.org>
> **Sent:** Wednesday, February 12, 2020 12:38 PM
> **To:** Anderegg, Angela Segars <ARSEGARS@southernco.com>
> **Cc:** Martha Hunter (mhunter@alabamarivers.org) <mhunter@alabamarivers.org>
> **Subject:** Question about Harris dam operations
>
> **EXTERNAL MAIL: Caution Opening Links or Files**
>
> ---
>
> Hi Angie,
>
> We are getting called about concerns from the downstream landowners regarding flooding issues coming from Harris dam. They are very concerned with all the recent rains that the lake levels/dam releases, etc...is not being done as well as it could be to help manage downstream flooding problems. Would you be willing to talk with us and perhaps some downstream landowners about this issue to explain the operations currently? Obviously, we will be talking about this as we go through the relicensing process, but if there is anything you can do to help us better understand and give the

> downstream landowners some relief, that would be appreciated.
>
> Thank you,
>
> Cindy
>
> --
>
> Cindy Lowry, MPA
>
> Executive Director
>
> Alabama Rivers Alliance
>
> 2014 6th Ave N, Suite 200
>
> Birmingham, AL 35203
>
> 205-322-6395 ext. 106
>
> www.alabamarivers.org [alabamarivers.org]
>
> ***Celebrating more than 20 years of protecting Alabama's 132,000 miles of rivers and streams!***

--
Cindy Lowry, MPA
Executive Director
Alabama Rivers Alliance
2014 6th Ave N, Suite 200
Birmingham, AL 35203
205-322-6395 ext. 106
www.alabamarivers.org [alabamarivers.org]

Celebrating more than 20 years of protecting Alabama's 132,000 miles of rivers and streams!

From:	Anderegg, Angela Segars
To:	james traylor
Subject:	RE: Tallapoosa River Flooding
Date:	Thursday, February 13, 2020 2:42:04 PM

Hey Jimmy, I've asked our water management folk to give you a call.

Angie Anderegg
Hydro Services
(205)257-2251
arsegars@southernco.com

-----Original Message-----
From: james traylor <trayjim@bellsouth.net>
Sent: Thursday, February 13, 2020 1:18 PM
To: Anderegg, Angela Segars <ARSEGARS@southernco.com>
Subject: Re: Tallapoosa River Flooding

EXTERNAL MAIL: Caution Opening Links or Files

____

I'll review the presentation and let you know. As of now APC has opened a flood gate and we are under water within 10 minutes of the water reaching us. The reason I asked the question was for a warning. Why can't APC give advanced warning?

Jimmy Traylor
Sent from iPhone

> On Feb 13, 2020, at 12:54 PM, Anderegg, Angela Segars <ARSEGARS@southernco.com> wrote:
>
> Hi Jimmy,
>
> We've discussed flood control operations at a few of the relicensing meetings to-date, but one in particular that may be most helpful in understanding the flood operations is the Operations presentation from January 31, 2018. There is a ppt and a video on our website: https://urldefense.proofpoint.com/v2/url?u=http-3A__www.harrisrelicensing.com_-5Flayouts_15_start.aspx-23_HAT-25201-2520-2520Project-2520Operations_Forms_AllItems.aspx&d=DwIFaQ&c=AgWC6Nl7Slwpc9jE7UoQH1_Cvyci3SsTNfdLP4V1RCg&r=3qWv32MayddUzrbqJnBFwNmttMUUbdCuXZrVDKTC5gg&m=h5_aBVHbDHM0rPAGqe5H9oF-QBys5ibVUggXnd59vAk&s=lgZvsDPWw6AK7r3H9VW2GDhehdcGJyDvNnh42SsihXY&e= .
>
> If you have some specific questions, I can ask our water management folks to get in touch with you.
>
> Angie Anderegg
> Hydro Services
> (205)257-2251
> arsegars@southernco.com
>
> -----Original Message-----
> From: James Traylor <trayjim@bellsouth.net>
> Sent: Thursday, February 13, 2020 9:47 AM
> To: Anderegg, Angela Segars <ARSEGARS@southernco.com>
> Subject: Tallapoosa River Flooding
>
> EXTERNAL MAIL: Caution Opening Links or Files
>
> ________________________________
>
> Angela,
>
> In reference to flooding on the Tallapoosa River below Harris Dam, Can you please tell us what the criteria is for flood gate operations? Before the dam, the river was predictable. We always knew after "x" amount of rain what to expect. Since the dam, when the flood gates open, there is no time to prepare. The river will rise 10-12 feet in a half of an hour. The flooding is very rapid and violent.
>
> Thanks,
>
> Jimmy Traylor
>
>
> Sent from my iPad

From:	APC Harris Relicensing
To:	"harrisrelicensing@southernco.com"
Bcc:	damon.abernethy@dcnr.alabama.gov; steve.bryant@dcnr.alabama.gov; todd.fobian@dcnr.alabama.gov; chris.greene@dcnr.alabama.gov; keith.henderson@dcnr.alabama.gov; mike.holley@dcnr.alabama.gov; evan.lawrence@dcnr.alabama.gov; matthew.marshall@dcnr.alabama.gov; brian.atkins@adeca.alabama.gov; tom.littlepage@adeca.alabama.gov; jhaslbauer@adem.alabama.gov; cljohnson@adem.alabama.gov; mlen@adem.alabama.gov; fal@adem.alabama.gov; djmoore@adem.alabama.gov; arsegars@southernco.com; dkanders@southernco.com; jefbaker@southernco.com; jcarlee@southernco.com; kechandl@southernco.com; mcoker@southernco.com; cggoodma@southernco.com; sgraham@southernco.com; ammcvica@southernco.com; tlmills@southernco.com; cmnix@southernco.com; kodom@southernco.com; alpeeple@southernco.com; scsmith@southernco.com; twstjohn@southernco.com; wtanders@southernco.com; Rasberry, Jennifer S.; mhunter@alabamarivers.org; clowry@alabamarivers.org; gjobsis@americanrivers.org; kmo0025@auburn.edu; devridr@auburn.edu; irwiner@auburn.edu; wrighr2@aces.edu; lgallen@balch.com; jhancock@balch.com; allan.creamer@ferc.gov; rachel.mcnamara@ferc.gov; sarah.salazar@ferc.gov; monte.terhaar@ferc.gov; gene@wedoweelakehomes.com; kate.cosnahan@kleinschmidtgroup.com; colin.dinken@kleinschmidtgroup.com; amanda.fleming@kleinschmidtgroup.com; chris.goodell@kleinschmidtgroup.com; henry.mealing@kleinschmidtgroup.com; jason.moak@kleinschmidtgroup.com; kelly.schaeffer@kleinschmidtgroup.com; jessecunningham@msn.com; mdollar48@gmail.com; drheinzen@charter.net; sforehand@russelllands.com; 1942jthompson420@gmail.com; nancyburnes@centurylink.net; sandnfrench@gmail.com; lgarland68@aol.com; rbmorris222@gmail.com; Ira Parsons (irapar@centurytel.net); mitchell.reid@tnc.org; richardburnes3@gmail.com; eilandfarm@aol.com; athall@fujifilm.com; ebt.drt@numail.org; georgettraylor@centurylink.net; beckyrainwater1@yahoo.com; dbronson@charter.net; wmcampbell218@gmail.com; jec22641@aol.com; sonjaholloman@gmail.com; butchjackson60@gmail.com; donnamat@aol.com; goxford@centurylink.net; mhpwedowee@gmail.com; jerrelshell@gmail.com; bsmith0253@gmail.com; inspector_003@yahoo.com; paul.trudine@gmail.com; lindastone2012@gmail.com; granddadth@windstream.net; trayjim@bellsouth.net; straylor426@bellsouth.net; robert.a.allen@usace.army.mil; randall.b.harvey@usace.army.mil; james.e.hathorn.jr@sam.usace.army.mil; lewis.c.sumner@usace.army.mil; jonas.white@usace.army.mil; gordon.lisa-perras@epa.gov; holliman.daniel@epa.gov; jennifer_grunewald@fws.gov; jeff_powell@fws.gov; jeff_duncan@nps.gov
Subject:	Harris relicensing - March 19th HAT 1 meeting
Date:	Friday, February 21, 2020 12:40:41 PM
Attachments:	2020-03-19 HAT Meeting Agenda.doc

HAT 1,

Alabama Power Company will be hosting a series of HAT meetings on **Thursday, March 19, 2020 at the Oxford Civic Center,** 401 McCullars Ln, Oxford, AL 36203. The HAT 1 meeting will be from **9:00 to 12:45 (see attached agenda)**. The purpose of the HAT 1 meeting is to review initial results and progress to date for the Operating Curve Change Feasibility Analysis and the Downstream Release Alternatives studies.

Please RSVP by Friday, March 13, 2020. Lunch will be provided (~11:15) so please indicate any food allergies or vegetarian preferences on or before March 13, 2020. I encourage everyone to attend in person. If this is not feasible, we are also offering a Skype option (info below). It would be ideal to join on your computer as we will be viewing presentations.

If you have any questions about the agenda or meeting, please email or call me at ARSEGARS@southernco.com or (205) 257-2251.

Join Skype Meeting

+1 (205) 257-2663

Conference ID: 3660816

Angie Anderegg
Hydro Services
(205)257-2251
arsegars@southernco.com

Meeting Agenda
March 19, 2020
9:00 AM – 3:30 PM
Oxford Civic Center: 401 McCullars Lane, Oxford, AL 36203

Meeting Purpose: Update stakeholders on Harris Action Teams' (HATs) progress on Project Operations (HAT 1), Recreation (HAT 5), and Fish and Wildlife (HAT 3).

9:00 AM	**Welcome, Safety Message, and Meeting Purpose**
9:15 AM	**HAT 1: Project Operations** Operating Curve Feasibility Analysis Downstream Release Alternatives
11:15 AM	Lunch
12:00 PM	**HAT 1 Phase 2: Qualitative and Quantitative Evaluations of the Effect(s) of an Operating Curve Change on Resources** Recreation Structure Usability at Winter Pool Alternatives
12:45 PM	**HAT 5: Recreation** Recreation Evaluation
1:30 PM	**HAT 3: Fish and Wildlife** Threatened and Endangered Species Downstream Aquatic Habitat Aquatic Resources
3:30 PM	**Wrap-up, Questions, and Adjourn**

From:	APC Harris Relicensing
To:	"harrisrelicensing@southernco.com"
Bcc:	damon.abernethy@dcnr.alabama.gov; nathan.aycock@dcnr.alabama.gov; steve.bryant@dcnr.alabama.gov; todd.fobian@dcnr.alabama.gov; chris.greene@dcnr.alabama.gov; keith.henderson@dcnr.alabama.gov; mike.holley@dcnr.alabama.gov; evan.lawrence@dcnr.alabama.gov; matthew.marshall@dcnr.alabama.gov; brian.atkins@adeca.alabama.gov; tom.littlepage@adeca.alabama.gov; jhaslbauer@adem.alabama.gov; cljohnson@adem.alabama.gov; mlen@adem.alabama.gov; fal@adem.alabama.gov; djmoore@adem.alabama.gov; arsegars@southernco.com; dkanders@southernco.com; wtanders@southernco.com; jefbaker@southernco.com; jcarlee@southernco.com; kechandl@southernco.com; mcoker@southernco.com; cggoodma@southernco.com; sgraham@southernco.com; ammcvica@southernco.com; tlmills@southernco.com; cmnix@southernco.com; kodom@southernco.com; alpeeple@southernco.com; scsmith@southernco.com; twstjohn@southernco.com; Rasberry, Jennifer S.; mhunter@alabamarivers.org; clowry@alabamarivers.org; jwest@alabamarivers.org; gjobsis@americanrivers.org; kmo0025@auburn.edu; devridr@auburn.edu; irwiner@auburn.edu; wrighr2@aces.edu; lgallen@balch.com; jhancock@balch.com; allan.creamer@ferc.gov; rachel.mcnamara@ferc.gov; sarah.salazar@ferc.gov; monte.terhaar@ferc.gov; gene@wedoweelakehomes.com; kate.cosnahan@kleinschmidtgroup.com; colin.dinken@kleinschmidtgroup.com; amanda.fleming@kleinschmidtgroup.com; chris.goodell@kleinschmidtgroup.com; henry.mealing@kleinschmidtgroup.com; jason.moak@kleinschmidtgroup.com; kelly.schaeffer@kleinschmidtgroup.com; jessecunningham@msn.com; mdollar48@gmail.com; drheinzen@charter.net; sforehand@russelllands.com; 1942jthompson420@gmail.com; nancyburnes@centurylink.net; sandnfrench@gmail.com; lgarland68@aol.com; rbmorris222@gmail.com; irapar@centurytel.net; mitchell.reid@tnc.org; richardburnes3@gmail.com; eilandfarm@aol.com; athall@fujifilm.com; ebt.drt@numail.org; georgettraylor@centurylink.net; beckyrainwater1@yahoo.com; dbronson@charter.net; wmcampbell218@gmail.com; jec22641@aol.com; sonjahollomon@gmail.com; butchjackson60@gmail.com; donnamat@aol.com; goxford@centurylink.net; mhpwedowee@gmail.com; jerrelshell@gmail.com; bsmith0253@gmail.com; inspector_003@yahoo.com; paul.trudine@gmail.com; lindastone2012@gmail.com; granddadth@windstream.net; trayjim@bellsouth.net; straylor426@bellsouth.net; robert.a.allen@usace.army.mil; randall.b.harvey@usace.army.mil; james.e.hathorn.jr@sam.usace.army.mil; lewis.c.sumner@usace.army.mil; jonas.white@usace.army.mil; gordon.lisa-perras@epa.gov; holliman.daniel@epa.gov; jennifer_grunewald@fws.gov; jeff_powell@fws.gov; jeff_duncan@nps.gov
Subject:	UPDATE - Harris relicensing - HAT 1 meeting
Date:	Friday, March 13, 2020 12:52:47 PM
Attachments:	2020-03-19 HAT Meeting Agenda.doc
Importance:	High

HAT 1,

Due to the ongoing situation with the spread of COVID-19 (the "coronavirus"), Southern Company has directed its employees to use virtual meetings, when possible. Therefore, the HAT 1 meeting scheduled for Thursday, March 19th will **only be held via the Skype link below and call-in number below**. If you are able to join via Skype, we will be sharing the presentation. If you are not, we will provide the presentation in a PDF document the morning of the meeting and the presenter will help you follow along with the slides.

The Skype link will be available beginning at 8:30 am. I suggest you join early to make sure that your computer is capable of joining (has all the necessary software). We will be muting and unmuting the phones from the control center, so please don't worry about announcing that you joined. **At 9 am, the meeting will begin**, and we will conduct a roll call to make sure we have a record of who attended the meeting. Also, if you use your computer's microphone and speaker to join the call, there is no need to use the phone number.

If you have any questions, please let me know.

From: APC Harris Relicensing
Sent: Friday, February 21, 2020 12:41 PM
To: 'harrisrelicensing@southernco.com' <harrisrelicensing@southernco.com>
Subject: Harris relicensing - March 19th HAT 1 meeting

HAT 1,

Alabama Power Company will be hosting a series of HAT meetings on **Thursday, March 19, 2020 at the Oxford Civic Center,** 401 McCullars Ln, Oxford, AL 36203. The HAT 1 meeting will be from **9:00 to 12:45 (see attached agenda)**. The purpose of the HAT 1 meeting is to review initial results and progress to date for the Operating Curve Change Feasibility Analysis and the Downstream Release Alternatives studies.

Please RSVP by Friday, March 13, 2020. Lunch will be provided (~11:15) so please indicate any food allergies or vegetarian preferences on or before March 13, 2020. I encourage everyone to attend in person. If this is not feasible, we are also offering a Skype option (info below). It would be ideal to join on your computer as we will be viewing presentations.

If you have any questions about the agenda or meeting, please email or call me at ARSEGARS@southernco.com or (205) 257-2251.

Join Skype Meeting

+1 (205) 257-2663

Conference ID: 3660816

Angie Anderegg
Hydro Services
(205)257-2251
arsegars@southernco.com

From:	APC Harris Relicensing
To:	APC Harris Relicensing
Bcc:	"damon.abernethy@dcnr.alabama.gov"; nathan.aycock@dcnr.alabama.gov; "steve.bryant@dcnr.alabama.gov"; todd.fobian@dcnr.alabama.gov; "chris.greene@dcnr.alabama.gov"; "keith.henderson@dcnr.alabama.gov"; "mike.holley@dcnr.alabama.gov"; "evan.lawrence@dcnr.alabama.gov"; "matthew.marshall@dcnr.alabama.gov"; "brian.atkins@adeca.alabama.gov"; "tom.littlepage@adeca.alabama.gov"; "jhaslbauer@adem.alabama.gov"; "cljohnson@adem.alabama.gov"; "mlen@adem.alabama.gov"; "fal@adem.alabama.gov"; "djmoore@adem.alabama.gov"; Anderegg, Angela Segars; Anderson, Dave; Anderson, Wesley Taylor; Baker, Jeffery L.; Carlee, Jason; Chandler, Keith Edward; Coker, Mary Paulette; Goodman, Chris G.; Graham, Stacey A.; McVicar, Ashley M; Mills, Tina L.; Nix, Christy M.; Odom, Kenneth; Peeples, Alan L.; Smith, Sheila C.; St. John, Thomas W.; Rasberry, Jennifer S.; "mhunter@alabamarivers.org"; "clowry@alabamarivers.org"; jwest@alabamarivers.org; "gjobsis@americanrivers.org"; "kmo0025@auburn.edu"; "devridr@auburn.edu"; "irwiner@auburn.edu"; "wrighr2@aces.edu"; Allen, Leslie G. (Balch); Hancock, Jim (Balch); allan.creamer@ferc.gov; rachel.mcnamara@ferc.gov; "sarah.salazar@ferc.gov"; monte.terhaar@ferc.gov; "gene@wedoweelakehomes.com"; "kate.cosnahan@kleinschmidtgroup.com"; "colin.dinken@kleinschmidtgroup.com"; "amanda.fleming@kleinschmidtgroup.com"; "chris.goodell@kleinschmidtgroup.com"; "henry.mealing@kleinschmidtgroup.com"; "jason.moak@kleinschmidtgroup.com"; "kelly.schaeffer@kleinschmidtgroup.com"; "jessecunningham@msn.com"; "mdollar48@gmail.com"; "drheinzen@charter.net"; "sforehand@russelllands.com"; "1942jthompson420@gmail.com"; "nancyburnes@centurylink.net"; "sandnfrench@gmail.com"; "lgarland68@aol.com"; "rbmorris222@gmail.com"; "irapar@centurytel.net"; "mitchell.reid@tnc.org"; "richardburnes3@gmail.com"; eilandfarm@aol.com; "athall@fujifilm.com"; "ebt.drt@numail.org"; "georgettraylor@centurylink.net"; "beckyrainwater1@yahoo.com"; "dbronson@charter.net"; wmcampbell218@gmail.com; "jec22641@aol.com"; sonjahollomon@gmail.com; "butchjackson60@gmail.com"; "donnamat@aol.com"; "goxford@centurylink.net"; "mhpwedowee@gmail.com"; "jerrelshell@gmail.com"; "bsmith0253@gmail.com"; "inspector_003@yahoo.com"; "paul.trudine@gmail.com"; "lindastone2012@gmail.com"; "granddadth@windstream.net"; "trayjim@bellsouth.net"; "straylor426@bellsouth.net"; "robert.a.allen@usace.army.mil"; "randall.b.harvey@usace.army.mil"; "james.e.hathorn.jr@sam.usace.army.mil"; "lewis.c.sumner@usace.army.mil"; "jonas.white@usace.army.mil"; "gordon.lisa-perras@epa.gov"; "holliman.daniel@epa.gov"; "jennifer_grunewald@fws.gov"; "jeff_powell@fws.gov"; "jeff_duncan@nps.gov"
Subject:	CANCELLED - Harris relicensing - HAT 1 meeting
Date:	Monday, March 16, 2020 12:51:10 PM

HAT 1,

First, I apologize for the multiple emails regarding this week's meeting and I appreciate you bearing with us. Because we are all in such a state of flux with schools closing and more and more of us being asked to telecommute, and the uncertainty of how well our technology is going to work when we're all trying to use it at once, we have decided to cancel this Thursday's stakeholder meeting. The information we were going to cover will be included in the Initial Study Report filing, along with several draft reports, in April.

Again, thank you for bearing with us. Stay well!

Angie Anderegg
Hydro Services
(205)257-2251
arsegars@southernco.com

From: APC Harris Relicensing
To: "harrisrelicensing@southernco.com"
Bcc: Robin Crockett; "Lydia Mayo"; 1942jthompson420@gmail.com; 9sling@charter.net; alcondir@aol.com; allan.creamer@ferc.gov; alpeeple@southernco.com; amanda.fleming@kleinschmidtgroup.com; amanda.mcbride@ahc.alabama.gov; amccartn@blm.gov; ammcvica@southernco.com; amy.silvano@dcnr.alabama.gov; andrew.nix@dcnr.alabama.gov; arsegars@southernco.com; athall@fujifilm.com; aubie84@yahoo.com; awhorton@corblu.com; bart_roby@msn.com; baxterchip@yahoo.com; bboozer6@gmail.com; bdavis081942@gmail.com; beckyrainwater1@yahoo.com; bill_pearson@fws.gov; blacklake20@gmail.com; blm_es_inquiries@blm.gov; bob.stone@smimail.net; bradandsue795@gmail.com; bradfordt71@gmail.com; brian.atkins@adeca.alabama.gov; bruce.bradford@forestry.alabama.gov; bsmith0253@gmail.com; butchjackson60@gmail.com; bwhaley@randolphcountyeda.com; carolbuggknight@hotmail.com; celestine.bryant@actribe.org; cengstrom@centurytel.net; ceo@jcchamber.com; cggoodma@southernco.com; cgnav@uscg.mil; chad@cleburnecountychamber.com; chandlermary937@gmail.com; chiefknight2002@yahoo.com; chimneycove@gmail.com; chris.goodell@kleinschmidtgroup.com; chris.greene@dcnr.alabama.gov; chris.smith@dcnr.alabama.gov; chris@alaudubon.org; chuckdenman@hotmail.com; clark.maria@epa.gov; claychamber@gmail.com; clint.lloyd@auburn.edu; cljohnson@adem.alabama.gov; clowry@alabamarivers.org; cmnix@southernco.com; coetim@aol.com; colin.dinken@kleinschmidtgroup.com; cooper.jamal@epa.gov; coty.brown@alea.gov; craig.litteken@usace.army.mil; crystal.davis@adeca.alabama.gov; crystal.lakewedoweedocks@gmail.com; crystal@hunterbend.com; dalerose120@yahoo.com; damon.abernethy@dcnr.alabama.gov; dbronson@charter.net; dcnr.wffdirector@dcnr.alabama.gov; decker.chris@epa.gov; devridr@auburn.edu; dfarr@randolphcountyalabama.gov; dhayba@usgs.gov; djmoore@adem.alabama.gov; dkanders@southernco.com; dolmoore@southernco.com; donnamat@aol.com; doug.deaton@dcnr.alabama.gov; dpreston@southernco.com; drheinzen@charter.net; ebt.drt@numail.org; eilandfarm@aol.com; el.brannon@yahoo.com; elizabeth-toombs@cherokee.org; emathews@aces.edu; eric.sipes@ahc.alabama.gov; evan.lawrence@dcnr.alabama.gov; evan_collins@fws.gov; eveham75@gmail.com; fal@adem.alabama.gov; fredcanoes@aol.com; gardenergirl04@yahoo.com; garyprice@centurytel.net; gene@wedoweelakehomes.com; georgettraylor@centurylink.net; gerryknight77@gmail.com; gfhorn@southernco.com; gjobsis@americanrivers.org; gld@adem.alabama.gov; glea@wgsarrell.com; gordon.lisa-perras@epa.gov; goxford@centurylink.net; granddadth@windstream.net; harry.merrill47@gmail.com; helen.greer@att.net; henry.mealing@kleinschmidtgroup.com; holliman.daniel@epa.gov; info@aeconline.com; info@tunica.org; inspector_003@yahoo.com; irapar@centurytel.net; irwiner@auburn.edu; j35sullivan@blm.gov; james.e.hathorn.jr@sam.usace.army.mil; jason.moak@kleinschmidtgroup.com; jcandler7@yahoo.com; jcarlee@southernco.com; jec22641@aol.com; jeddins@achp.gov; jefbaker@southernco.com; jeff_duncan@nps.gov; jeff_powell@fws.gov; jennifer.l.jacobson@usace.army.mil; jennifer_grunewald@fws.gov; jerrelshell@gmail.com; jessecunningham@msn.com; jfcrew@southernco.com; jhancock@balch.com; jharjo@alabama-quassarte.org; jhaslbauer@adem.alabama.gov; jhouser@osiny.org; jkwdurham@gmail.com; jlowe@alabama-quassarte.org; jnyerby@southernco.com; joan.e.zehrt@usace.army.mil; john.free@psc.alabama.gov; johndiane@sbcglobal.net; jonas.white@usace.army.mil; josh.benefield@forestry.alabama.gov; jpsparrow@att.net; jsrasber@southernco.com; jthacker@southernco.com; jthroneberry@tnc.org; judymcrealtor@gmail.com; jwest@alabamarivers.org; kajumba.ntale@epa.gov; karen.brunso@chickasaw.net; kate.cosnahan@kleinschmidtgroup.com; kcarleton@choctaw.org; kechandl@southernco.com; keith.gauldin@dcnr.alabama.gov; keith.henderson@dcnr.alabama.gov; kelly.schaeffer@kleinschmidtgroup.com; ken.wills@jcdh.org; kenbarnes01@yahoo.com; kenneth.boswell@adeca.alabama.gov; kmhunt@maxxsouth.net; kmo0025@auburn.edu; kodom@southernco.com; kpritchett@ukb-nsn.gov; kristina.mullins@usace.army.mil; lakewedoweedocks@gmail.com; leeanne.wofford@ahc.alabama.gov; leon.m.cromartie@usace.army.mil; leopoldo_miranda@fws.gov; lewis.c.sumner@usace.army.mil; lgallen@balch.com; lgarland68@aol.com; lindastone2012@gmail.com; llangley@coushattatribela.org; lovvornt@randolphcountyalabama.gov; lswinsto@southernco.com; lth0002@auburn.edu; mark@americanwhitewater.org; matt.brooks@alea.gov; matthew.marshall@dcnr.alabama.gov; mayo.lydia@epa.gov; mcoker@southernco.com; mcw0061@aces.edu; mdollar48@gmail.com; meredith.h.ladart@usace.army.mil; mhpwedowee@gmail.com; mhunter@alabamarivers.org; michael.w.creswell@usace.army.mil; midwaytreasures@bellsouth.net; mike.holley@dcnr.alabama.gov; mitchell.reid@tnc.org; mlen@adem.alabama.gov; mnedd@blm.gov; monte.terhaar@ferc.gov; mooretn@auburn.edu; mprandolph@gmail.com; nancyburnes@centurylink.net; nanferebee@juno.com; nathan.aycock@dcnr.alabama.gov; orr.chauncey@epa.gov; pace.wilber@noaa.gov; partnersinfo@wwfus.org; patti.powell@dcnr.alabama.gov; patty@ten-o.com; paul.trudine@gmail.com; ptrammell@reddyice.com; publicaffairs@doc.gov; rachel.mcnamara@ferc.gov; raebutler@mcn-nsn.gov; rancococ@teleclipse.net; randall.b.harvey@usace.army.mil; randy@randyrogerslaw.com; randy@wedoweemarine.com; rbmorris222@gmail.com; rcodydeal@hotmail.com; reuteem@auburn.edu; richardburnes3@gmail.com; rick.oates@forestry.alabama.gov; rickmcwhorter723@icloud.com; rifraft2@aol.com; rjdavis8346@gmail.com; robert.a.allen@usace.army.mil; roger.mcneil@noaa.gov; ron@lakewedowee.org; rosoweka@mcn-nsn.gov; russtown@nc-cherokee.com; ryan.prince@forestry.alabama.gov; sabrinawood@live.com; sandnfrench@gmail.com; sarah.salazar@ferc.gov; sbryan@pci-nsn.gov; scsmith@southernco.com; section106@mcn-nsn.gov; sforehand@russelllands.com; sgraham@southernco.com; sherry.bradley@adph.state.al.us; sidney.hare@gmail.com; simsthe@aces.edu; snelson@nelsonandco.com; sonjahollomon@gmail.com; steve.bryant@dcnr.alabama.gov; stewartjack12@bellsouth.net; straylor426@bellsouth.net; sueagnew52@yahoo.com; taconya.goar@dcnr.alabama.gov; tdadunaway@gmail.com; thpo@pci-nsn.gov; thpo@tttown.org; timguffey@jcch.net; tlamberth@russelllands.com; tlmills@southernco.com; todd.fobian@dcnr.alabama.gov; tom.diggs@ung.edu; tom.lettieri47@gmail.com; tom.littlepage@adeca.alabama.gov; tpfreema@southernco.com; trayjim@bellsouth.net; triciastearns@gmail.com; twstjohn@southernco.com; variscom506@gmail.com; walker.mary@epa.gov; william.puckett@swcc.alabama.gov; wmcampbell218@gmail.com; wrighr2@aces.edu; wsgardne@southernco.com; wtanders@southernco.com

Subject: UPDATE - Harris Relicensing - Initial Study Report meeting
Date: Friday, March 20, 2020 2:11:32 PM

Harris relicensing stakeholders,

Due to concerns with COVID-19, Alabama Power has asked employees to not have public meetings through the end of April. Therefore, our Initial Study Report meeting will need to be held via conference call. We will share presentations beforehand in order for everyone to be able to follow along during the call. Also, in order to give stakeholders more time to review the Initial Study Report, we are moving the meeting to **April 27th**. Please hold this date from 9:00 am to 4:00 pm central time. I will also send out call in information and an agenda ahead of time.

Thank you,

Angie Anderegg
Hydro Services
(205)257-2251
arsegars@southernco.com

From: APC Harris Relicensing <g2apchr@southernco.com>
Sent: Friday, February 21, 2020 1:00 PM
To: APC Harris Relicensing <g2apchr@southernco.com>
Subject: Harris Relicensing - Initial Study Report meeting

Harris relicensing stakeholders,

Please save-the-date for the Initial Study Report meeting on **April 21, 2020 from 9:00 am to 4:00 pm at the Oxford Civic Center**, 401 McCullars Lane, Oxford, AL 36203. I will send additional details, including call-in information for those who need it, closer to date (although I do encourage attendance in person). Because this is one of the Integrated Licensing Process milestones and we will be covering a lot that day, I wanted to go ahead and get it on your radar.

If you have any questions, please email or call me at ARSEGARS@southernco.com or (205) 257-2251.

Thanks,

Angie Anderegg
Hydro Services
(205)257-2251
arsegars@southernco.com

From: Anderegg, Angela Segars
To: APC Harris Relicensing
Bcc: Robin Crockett; "Lydia Mayo"; 1942jthompson420@gmail.com; 9sling@charter.net; alcondir@aol.com; allan.creamer@ferc.gov; alpeeple@southernco.com; amanda.fleming@kleinschmidtgroup.com; amanda.mcbride@ahc.alabama.gov; amccartn@blm.gov; ammcvica@southernco.com; amy.silvano@dcnr.alabama.gov; andrew.nix@dcnr.alabama.gov; arsegars@southernco.com; athall@fujifilm.com; aubie84@yahoo.com; awhorton@corblu.com; bart_roby@msn.com; baxterchip@yahoo.com; bboozer6@gmail.com; bdavis081942@gmail.com; beckyrainwater1@yahoo.com; bill_pearson@fws.gov; blacklake20@gmail.com; blm_es_inquiries@blm.gov; bob.stone@smimail.net; bradandsue795@gmail.com; bradfordt71@gmail.com; brian.atkins@adeca.alabama.gov; bruce.bradford@forestry.alabama.gov; bsmith0253@gmail.com; butchjackson60@gmail.com; bwhaley@randolphcountyeda.com; carolbuggknight@hotmail.com; celestine.bryant@actribe.org; cengstrom@centurytel.net; ceo@jcchamber.com; cggoodma@southernco.com; cgnav@uscg.mil; chad@cleburnecountychamber.com; chandlermary937@gmail.com; chiefknight2002@yahoo.com; chimneycove@gmail.com; chris.goodell@kleinschmidtgroup.com; chris.greene@dcnr.alabama.gov; chris.smith@dcnr.alabama.gov; chris@alaudubon.org; chuckdenman@hotmail.com; clark.maria@epa.gov; claychamber@gmail.com; clint.lloyd@auburn.edu; cljohnson@adem.alabama.gov; clowry@alabamarivers.org; cmnix@southernco.com; coetim@aol.com; colin.dinken@kleinschmidtgroup.com; cooper.jamal@epa.gov; coty.brown@alea.gov; craig.litteken@usace.army.mil; crystal.davis@adeca.alabama.gov; crystal.lakewedoweedocks@gmail.com; crystal@hunterbend.com; dalerose120@yahoo.com; damon.abernethy@dcnr.alabama.gov; dbronson@charter.net; dcnr.wffdirector@dcnr.alabama.gov; decker.chris@epa.gov; devridr@auburn.edu; dfarr@randolphcountyalabama.gov; dhayba@usgs.gov; djmoore@adem.alabama.gov; dkanders@southernco.com; dolmoore@southernco.com; donnamat@aol.com; doug.deaton@dcnr.alabama.gov; dpreston@southernco.com; drheinzen@charter.net; ebt.drt@numail.org; eilandfarm@aol.com; el.brannon@yahoo.com; elizabeth-toombs@cherokee.org; emathews@aces.edu; eric.sipes@ahc.alabama.gov; evan.lawrence@dcnr.alabama.gov; evan_collins@fws.gov; eveham75@gmail.com; fal@adem.alabama.gov; fredcanoes@aol.com; gardenergirl04@yahoo.com; garyprice@centurytel.net; gene@wedoweelakehomes.com; georgettraylor@centurylink.net; gerryknight77@gmail.com; gfhorn@southernco.com; gjobsis@americanrivers.org; gld@adem.alabama.gov; glea@wgsarrell.com; gordon.lisa-perras@epa.gov; goxford@centurylink.net; granddadth@windstream.net; harry.merrill47@gmail.com; helen.greer@att.net; henry.mealing@kleinschmidtgroup.com; holliman.daniel@epa.gov; info@aeconline.com; info@tunica.org; inspector_003@yahoo.com; irapar@centurytel.net; irwiner@auburn.edu; j35sullivan@blm.gov; james.e.hathorn.jr@sam.usace.army.mil; jason.moak@kleinschmidtgroup.com; jcandler7@yahoo.com; jcarlee@southernco.com; jec22641@aol.com; jeddins@achp.gov; jefbaker@southernco.com; jeff_duncan@nps.gov; jeff_powell@fws.gov; jennifer.l.jacobson@usace.army.mil; jennifer_grunewald@fws.gov; jerrelshell@gmail.com; jessecunningham@msn.com; jfcrew@southernco.com; jhancock@balch.com; jharjo@alabama-quassarte.org; jhaslbauer@adem.alabama.gov; jhouser@osiny.org; jkwdurham@gmail.com; jlowe@alabama-quassarte.org; jnyerby@southernco.com; joan.e.zehrt@usace.army.mil; john.free@psc.alabama.gov; johndiane@sbcglobal.net; jonas.white@usace.army.mil; josh.benefield@forestry.alabama.gov; jpsparrow@att.net; jsrasber@southernco.com; jthacker@southernco.com; jthroneberry@tnc.org; judymcrealtor@gmail.com; jwest@alabamarivers.org; kajumba.ntale@epa.gov; karen.brunso@chickasaw.net; kate.cosnahan@kleinschmidtgroup.com; kcarleton@choctaw.org; kechandl@southernco.com; keith.gauldin@dcnr.alabama.gov; keith.henderson@dcnr.alabama.gov; kelly.schaeffer@kleinschmidtgroup.com; ken.wills@jcdh.org; kenbarnes01@yahoo.com; kenneth.boswell@adeca.alabama.gov; kmhunt@maxxsouth.net; kmo0025@auburn.edu; kodom@southernco.com; kpritchett@ukb-nsn.gov; kristina.mullins@usace.army.mil; lakewedoweedocks@gmail.com; leeanne.wofford@ahc.alabama.gov; leon.m.cromartie@usace.army.mil; leopoldo_miranda@fws.gov; lewis.c.sumner@usace.army.mil; lgallen@balch.com; lgarland68@aol.com; lindastone2012@gmail.com; llangley@coushattatribela.org; lovvornt@randolphcountyalabama.gov; lswinsto@southernco.com; lth0002@auburn.edu; mark@americanwhitewater.org; matt.brooks@alea.gov; matthew.marshall@dcnr.alabama.gov; mayo.lydia@epa.gov; mcoker@southernco.com; mcw0061@aces.edu; mdollar48@gmail.com; meredith.h.ladart@usace.army.mil; mhpwedowee@gmail.com; mhunter@alabamarivers.org; michael.w.creswell@usace.army.mil; midwaytreasures@bellsouth.net; mike.holley@dcnr.alabama.gov; mitchell.reid@tnc.org; mlen@adem.alabama.gov; mnedd@blm.gov; monte.terhaar@ferc.gov; mooretn@auburn.edu; mprandolph@gmail.com; nancyburnes@centurylink.net; nanferebee@juno.com; nathan.aycock@dcnr.alabama.gov; orr.chauncey@epa.gov; pace.wilber@noaa.gov; partnersinfo@wwfus.org; patti.powell@dcnr.alabama.gov; patty@ten-o.com; paul.trudine@gmail.com; ptrammell@reddyice.com; publicaffairs@doc.gov; rachel.mcnamara@ferc.gov; raebutler@mcn-nsn.gov; rancococ@teleclipse.net; randall.b.harvey@usace.army.mil; randy@randyrogerslaw.com; randy@wedoweemarine.com; rbmorris222@gmail.com; rcodydeal@hotmail.com; reuteem@auburn.edu; richardburnes3@gmail.com; rick.oates@forestry.alabama.gov; rickmcwhorter723@icloud.com; rifraft2@aol.com; rjdavis8346@gmail.com; robert.a.allen@usace.army.mil; roger.mcneil@noaa.gov; ron@lakewedowee.org; rosoweka@mcn-nsn.gov; russtown@nc-cherokee.com; ryan.prince@forestry.alabama.gov; sabrinawood@live.com; sandnfrench@gmail.com; sarah.salazar@ferc.gov; sbryan@pci-nsn.gov; scsmith@southernco.com; section106@mcn-nsn.gov; sforehand@russelllands.com; sgraham@southernco.com; sherry.bradley@adph.state.al.us; sidney.hare@gmail.com; simsthe@aces.edu; snelson@nelsonandco.com; sonjahollomon@gmail.com; steve.bryant@dcnr.alabama.gov; stewartjack12@bellsouth.net; straylor426@bellsouth.net; sueagnew52@yahoo.com; tdadunaway@gmail.com; thpo@pci-nsn.gov; thpo@tttown.org; timguffey@jcch.net; tlamberth@russelllands.com; tlmills@southernco.com; todd.fobian@dcnr.alabama.gov; tom.diggs@ung.edu; tom.lettieri47@gmail.com; tom.littlepage@adeca.alabama.gov; tpfreema@southernco.com; trayjim@bellsouth.net; triciastearns@gmail.com; twstjohn@southernco.com; variscom506@gmail.com; walker.mary@epa.gov; william.puckett@swcc.alabama.gov; wmcampbell218@gmail.com; wrighr2@aces.edu; wsgardne@southernco.com; wtanders@southernco.com

Subject: NEW UPDATE - Harris Relicensing - Initial Study Report meeting
Date: Thursday, March 26, 2020 1:42:38 PM
Importance: High

Harris relicensing stakeholders,

It has been brought to our attention that April 27th is a state holiday and several of our state agency offices will be closed. Therefore, in order to ensure state agencies can participate in the Initial Study Report meeting and to provide adequate time for your review and preparation, the Initial Study Report meeting will be held on **April 28th**. Please hold this date from 9:00 am to 4:00 pm central time. I will send out call in information and an agenda ahead of time.

Thank you for your understanding,

Angie

Angie Anderegg
Hydro Services
(205)257-2251
arsegars@southernco.com

From: APC Harris Relicensing <g2apchr@southernco.com>
Sent: Friday, March 20, 2020 2:13 PM
To: APC Harris Relicensing <g2apchr@southernco.com>
Subject: UPDATE - Harris Relicensing - Initial Study Report meeting

Harris relicensing stakeholders,

Due to concerns with COVID-19, Alabama Power has asked employees to not have public meetings through the end of April. Therefore, our Initial Study Report meeting will need to be held via conference call. We will share presentations beforehand in order for everyone to be able to follow along during the call. Also, in order to give stakeholders more time to review the Initial Study Report, we are moving the meeting to **April 27th**. Please hold this date from 9:00 am to 4:00 pm central time. I will also send out call in information and an agenda ahead of time.

Thank you,

Angie Anderegg
Hydro Services
(205)257-2251
arsegars@southernco.com

From: APC Harris Relicensing <g2apchr@southernco.com>
Sent: Friday, February 21, 2020 1:00 PM
To: APC Harris Relicensing <g2apchr@southernco.com>
Subject: Harris Relicensing - Initial Study Report meeting

Harris relicensing stakeholders,

Please save-the-date for the Initial Study Report meeting on **April 21, 2020 from 9:00 am to 4:00 pm at the Oxford Civic Center**, 401 McCullars Lane, Oxford, AL 36203. I will send additional details, including call-in information for those who need it, closer to date (although I do encourage attendance in person). Because this is one of the Integrated Licensing Process milestones and we will be covering a lot that day, I wanted to go ahead and get it on your radar.

If you have any questions, please email or call me at ARSEGARS@southernco.com or (205) 257-2251.

Thanks,

Angie Anderegg
Hydro Services
(205)257-2251
arsegars@southernco.com

From: Colin Dinken <Colin.Dinken@Kleinschmidtgroup.com>
Sent: Wednesday, April 1, 2020 1:45 PM
To: Mize, Todd
Subject: RE: Lake Harris public ramps

No problem at all. I must be getting conversations mixed up. I'll get in touch with Keith. Thanks!

From: Mize, Todd <Todd.Mize@dcnr.alabama.gov>
Sent: Wednesday, April 1, 2020 1:43 PM
To: Colin Dinken <Colin.Dinken@Kleinschmidtgroup.com>
Subject: RE: Lake Harris public ramps

Colin,

I know you and I talked about the construction requirements and all, but you must have talked with someone else about which ramps are unusable at low pool. I don't have any knowledge of that. Keith Henderson, ADCNR boating access coordinator, might have that information. Sorry man.

Keith.henderson@dcnr.alabama.gov

Sincerely,

B. Todd Mize, PE
Department of Conservation and Natural Resources
Wildlife and Freshwater Fisheries - Engineering
64 North Union St., Room 551
Montgomery, AL 36130

Office (334) 353-8596
Cell Phone (334) 201-2994
Todd.Mize@dcnr.alabama.gov

From: Colin Dinken <Colin.Dinken@Kleinschmidtgroup.com>
Sent: Wednesday, April 1, 2020 10:52 AM
To: Mize, Todd <Todd.Mize@dcnr.alabama.gov>
Subject: Lake Harris public ramps

Hey Todd,

Hope you're staying sane and healthy during this global pandemic. I talked to you a few months ago about the standards y'all use for ramp construction on Lake Harris, and you mentioned that most ramps on Harris can be used to launch up to a 26 foot boat at low pool. I believe you said a couple were not usable at low pool and I think I wrote those ramps down, but have no idea where I left that scratch piece of paper. If you have that info on hand would you mind sending it to me in an email so I will not lose it this time? I have everything else about the 15% slope, 4.5 feet of depth at the end of the ramp, etc., just can't remember which ramps aren't usable at low pool. Think it's Lee's Bridge and one or two others.

Thanks for your help!

Colin Dinken
Associate Scientist
Kleinschmidt
Office: 205-588-4613
www.KleinschmidtGroup.com

Alabama Power

600 North 18th Street
Hydro Services 16N-8180
Birmingham, AL 35203
205 257 2251 tel
arsegars@southernco.com

April 10, 2020

VIA ELECTRONIC FILING

Project No. 2628-065
R.L. Harris Hydroelectric Project
Transmittal of the Initial Study Report

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 or Commission) licensee for the R.L. Harris Hydroelectric Project (Harris Project) (FERC No. 2628-065). On April 12, 2019, FERC issued its Study Plan Determination (SPD)[1] for the Harris Project, approving Alabama Power's ten relicensing studies with FERC modifications. On May 13, 2019, Alabama Power filed Final Study Plans to incorporate FERC's modifications and posted the Final Study Plans on the Harris relicensing website at www.harrisrelicensing.com. In the Final Study Plans, Alabama Power proposed a schedule for each study that included filing a voluntary Progress Update in October 2019 and October 2020. Alabama Power filed the first of two Progress Updates on October 31, 2019.[2]

Pursuant to the Commission's Integrated Licensing Process (ILP) and 18 CFR § 5.15(c), Alabama Power is filing herein the Harris Project Initial Study Report (ISR) (Attachment). The enclosed ISR describes Alabama Power's overall progress to-date in implementing the study plan and schedule, a summary of the data, and any variances from the study plan and schedule. The ISR also includes modifications, if applicable, to ongoing studies. Alabama Power is not proposing any new studies.

Concurrent with this ISR filing, Alabama Power is filing six study reports and two cultural resources documents, including the consultation record for each of these six reports, which includes correspondence from May 2019 through March 2020. Table 1 outlines each study, the respective Harris Action Team (HAT), and the status of the study report. For those studies where a Draft Study Report is not due at the time of filing this ISR, the draft study report due date is noted.

[1] Accession Number 20190412-3000

[2] Accession Number 20191030-5053

Table 1 – Summary of the Harris Studies and Study Reports Filed with FERC Concurrent with the ISR

Study Name	Harris Action Team (HAT)	Draft Study Report Filed Concurrent with ISR (YES/NO)
Operating Curve Change Feasibility Analysis	HAT 1	YES – Draft Report with consultation filed with FERC
Downstream Release Alternatives Study	HAT 1	YES – Draft Report with consultation filed with FERC
Erosion and Sedimentation Study	HAT 2	YES – Draft Report with consultation filed with FERC
Water Quality Study	HAT 2	YES – Draft Report with consultation filed with FERC
Aquatic Resources Study	HAT 3	NO – Draft Report due July 2020
Downstream Aquatic Habitat Study	HAT 3	NO – Draft Report due June 2020
Threatened and Endangered Species Study	HAT 3	YES – Draft Desktop Assessment with consultation filed with FERC
Project Lands Evaluation	HAT 4	YES – Draft Phase 1 Study Report with consultation filed with FERC
Recreation Evaluation Study	HAT 5	NO – Draft Report due June 2020 (requesting variance to August 2020)
Cultural Resources Programmatic Agreement and Historic Properties Management Plan Study	HAT 6	YES – Inadvertent Discovery Plan; Traditional Cultural Properties Identification Plan; consultation filed with FERC; No – Area of Potential Effect (due April 2020; requesting variance to June 2020)

The SPD schedule for the HAT 1, HAT 3, and HAT 5 studies included hosting HAT meetings in March 2020. Due to COVID-19 and related travel and public gathering restrictions, and statewide office closures, Alabama Power did not host these HAT meetings.

Alabama Power is requesting a schedule variance for the following studies:

1) Water Quality Study – Alabama Power stated that it would submit a Section 401 Water Quality Certification (WQC) to ADEM in 2020; however, following discussions with ADEM, Alabama Power intends to submit the 401 WQC application to ADEM in April 2021.

2) Draft Recreation Evaluation Study Report - Alabama Power added the Tallapoosa River Downstream Landowner Survey and the Tallapoosa River Recreation User Survey in 2020[3]. Due to the additional study elements and extended deadline for landowners and the public to participate in the surveys, Alabama Power will file the Draft Recreation Evaluation Study Report in August 2020 rather than June

[3] Accession Number 20191219-5186

2020. Alabama Power is not requesting a schedule variance for the Final Recreation Evaluation Study Report due November 2020.

3) The Area of Potential Effect (APE) – Alabama Power is continuing consultation with the Alabama Historical Commission to finalize the APE as part of the Cultural Resources Study; therefore, Alabama Power will file the APE and associated consultation in June 2020.

Pursuant to 18 CFR §5.15(c)(2), Alabama Power will host the Initial Study Report Meeting (Meeting) with stakeholders and FERC on April 28, 2020 by conference call ([205] 257-2663 **or** [404] 460-0605, conference ID 489472). Note that Alabama Power consulted with FERC staff on hosting this Meeting one day later than the date required by the ILP schedule due to a state holiday on April 27, 2020, and to provide stakeholders adequate time to review the ISR prior to the Meeting. The Meeting will begin at 9:00 AM and conclude by 4:00 PM. The purpose of the Meeting is to provide an opportunity to review the contents of the ISR and to discuss the study results and proposals to modify the study plan, if any, in light of the progress of the studies and data collected.

Alabama Power will file the Initial Study Report Meeting Summary by May 12, 2020. Stakeholders will have until June 11, 2020, to file comments on the ISR and Meeting Summary with FERC.

Stakeholders may access the ISR and the individual study reports on FERC's website (http://www.ferc.gov) by going to the "eLibrary" link and entering the docket number (P-2628). The ISR and study reports are also available on the Project relicensing website at https://harrisrelicensing.com.

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

Sincerely,

Angela Anderegg

Angie Anderegg
Harris Relicensing Project Manager

Attachment – Initial Study Report

cc: Harris Stakeholder List

Attachment
Initial Study Report

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INITIAL STUDY REPORT

R. L. HARRIS PROJECT
FERC NO. 2628

Prepared by:

ALABAMA POWER COMPANY
BIRMINGHAM, ALABAMA

APRIL 2020

INITIAL STUDY REPORT

R. L. HARRIS PROJECT
FERC NO. 2628

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INITIAL STUDY REPORT

R. L. HARRIS PROJECT
FERC NO. 2628

1.0 INTRODUCTION

Alabama Power Company (Alabama Power) owns and operates the R.L. Harris Project (FERC Project No. 2628) (Harris Project), licensed by the Federal Energy Regulatory Commission (FERC or Commission). Alabama Power is relicensing of the 135-megawatt Harris Project, and the existing license expires in 2023. 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

[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).

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by, the State of Alabama for wildlife management and public hunting and are part of the Skyline WMA.

For the purposes of this report, "Lake Harris" refers to the 9,870-acre reservoir, the 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.

Commonly used acronyms and abbreviations that may appear in this Initial Study Report (ISR) are included in Appendix A.

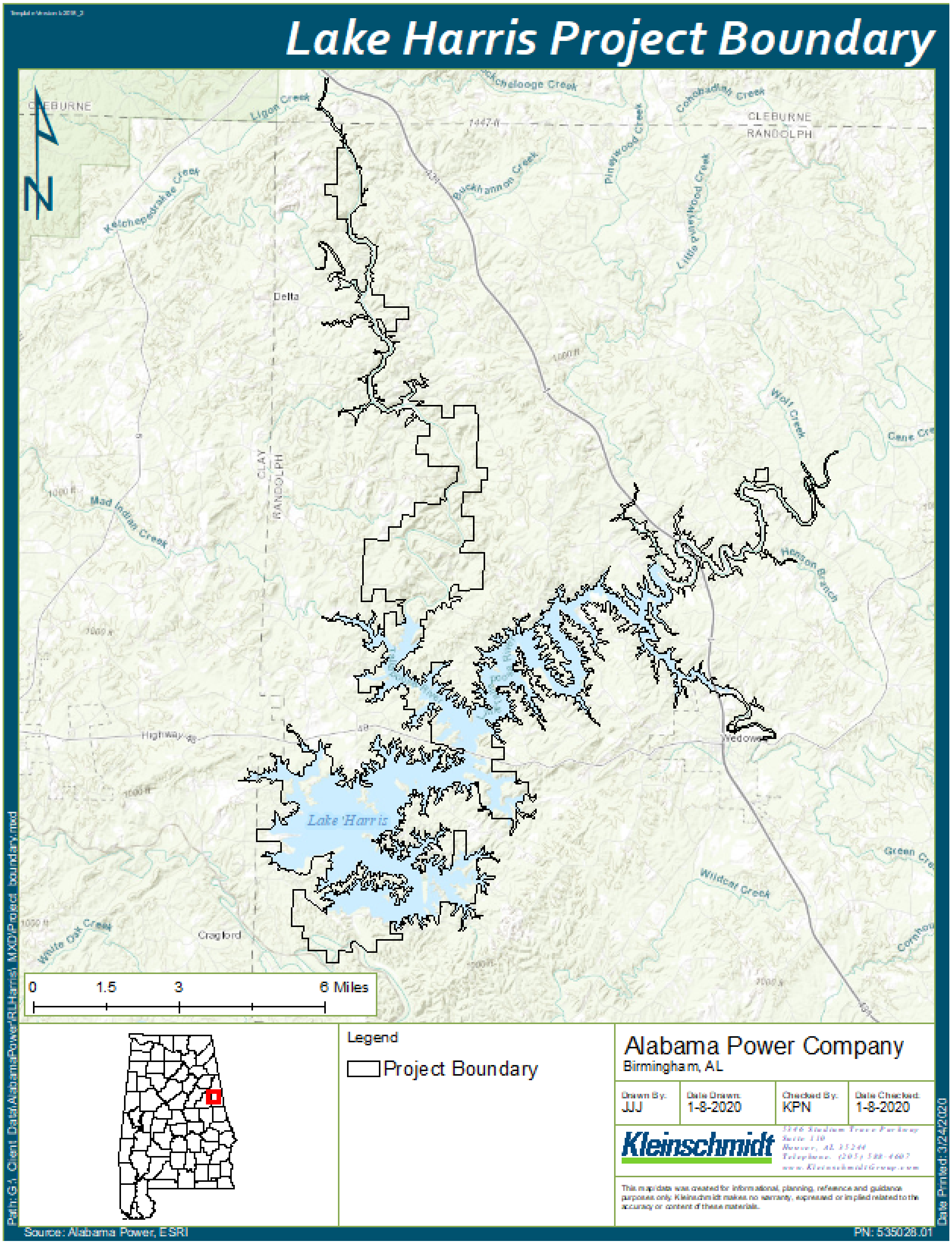

FIGURE 1 **LAKE HARRIS PROJECT BOUNDARY**

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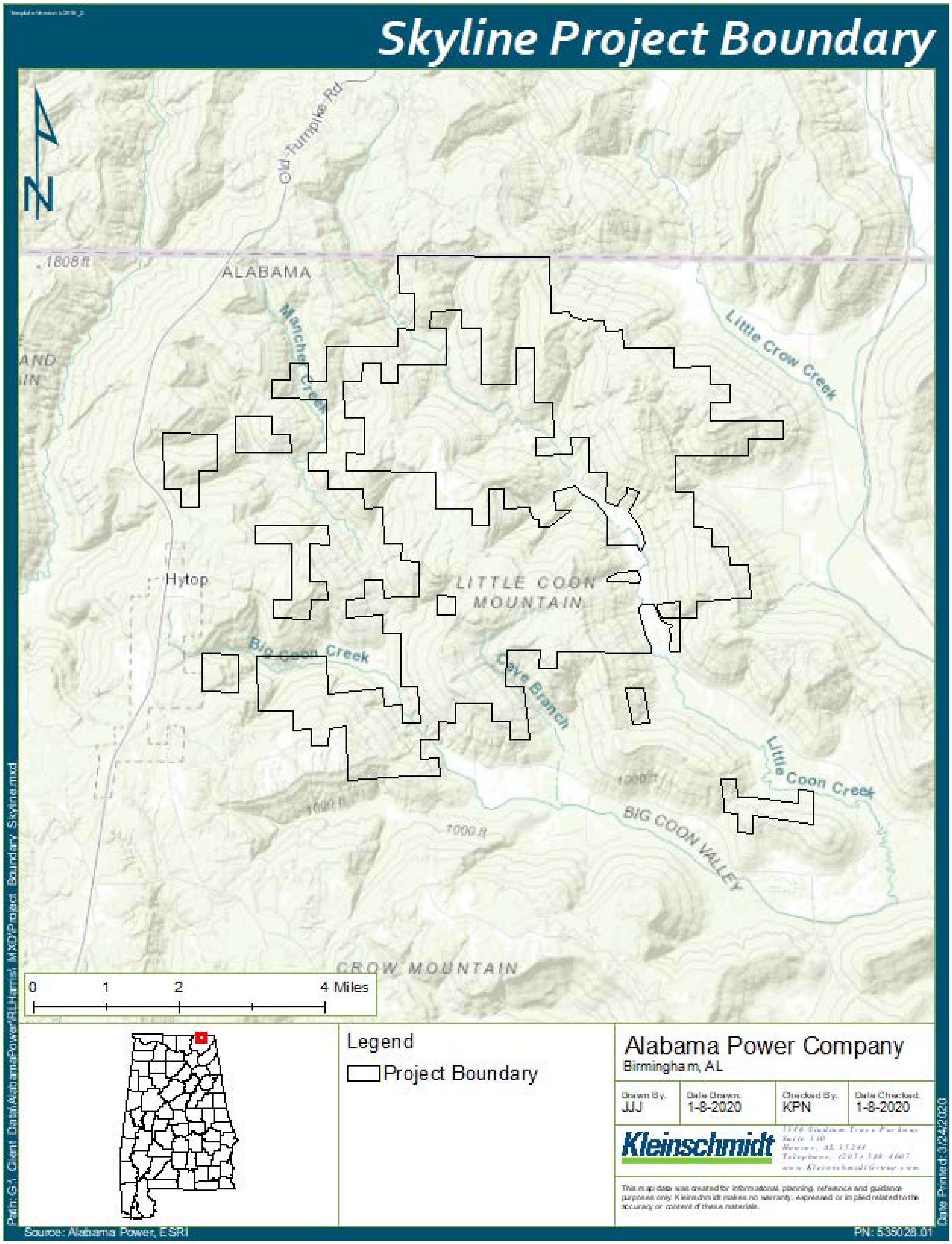

FIGURE 2 SKYLINE PROJECT BOUNDARY

2.0 HARRIS STUDY PLAN OVERVIEW

During the October 19, 2017 Issue Identification Workshop, stakeholders provided information on resources that may be affected by the Harris Project. On August 28 and 29, 2018, FERC held Harris Project Scoping Meetings[2] to provide additional opportunities for stakeholders and the public to present and discuss any issues related to the Harris Project relicensing. On November 13, 2018, Alabama Power filed the following 10 proposed study plans for the Harris Project.

- Operating Curve Change Feasibility Analysis Study
- Downstream Release Alternatives Study
- Erosion and Sedimentation Study
- Water Quality Study
- Aquatic Resources Study
- Downstream Aquatic Habitat Study
- Threatened and Endangered (T&E) Species Study
- Project Lands Evaluation Study
- Recreation Evaluation Study
- Cultural Resources Programmatic Agreement and Historic Properties Management Plan Study

Based on comments filed by stakeholders, Alabama Power filed revised study plans on March 13, 2019. FERC issued a Study Plan Determination (SPD)[3] on April 12, 2019, which approved Alabama Power's study plans and included FERC staff recommendations. Alabama Power incorporated FERC's recommendations and filed the Final Study Plans with FERC on May 13, 2019[4]. According to the FERC's process plan and schedule for the Harris Project, Alabama Power's ISR is due to FERC on or before April 12, 2020.

Alabama Power formed the Harris Action Teams (HATs) to provide stakeholders an opportunity to work on the issues of most importance to them and, in the case of federal and state agencies, those issues where it has regulatory or statutory responsibility. The HATs include:

- HAT 1 – Project Operations
- HAT 2 – Water Quality and Use

[2] Accession Nos. 20181010-4002 and 20181010-4003
[3] Accession No. 20190412-3000
[4] Accession No. 20190513-5093

- HAT 3 – Fish and Wildlife
- HAT 4 – Project Lands
- HAT 5 – Recreation
- HAT 6 – Cultural Resources

The HATs met throughout 2019 and into 2020 to discuss the various studies and to provide input regarding the study process.

Pursuant to FERC's SPD, Alabama Power is filing six draft study reports and two cultural resources documents concurrently with the ISR filing. These include:

- Draft Operating Curve Change Feasibility Analysis Phase 1 Report
- Draft Downstream Release Alternatives Phase 1 Report
- Draft Erosion and Sedimentation Study Report
- Draft Water Quality Report
- Draft Threatened and Endangered Species Desktop Assessment
- Draft Phase 1 Project Lands Evaluation Study Report
- Inadvertent Discovery Plan (IDP)
- Traditional Cultural Properties (TCP) Identification Plan

The filings containing the draft study reports and the cultural resources documents include HAT meeting summaries and presentations, and documentation of consultation between May 2019 through March 2020. Alabama Power will file with FERC the study reports for the Aquatic Resources and Downstream Aquatic Habitat studies according to the due date in the FERC SPD. Alabama Power will file the Draft Recreation Evaluation study report in August 2020[5]. The filing containing these draft study reports will include documentation of consultation from May 2019 to the date the respective study reports are filed with FERC.

Sections 3 through 12 of this ISR summarize the 10 FERC-approved studies in accordance with 18 Code of Federal Regulations (CFR), Section 5.15, including 1) the purpose of the study and summary of methods; 2) the study progress, including data collected; 3) any variance from the

[5] This is a variance in the schedule from the June 2020 date in the FERC SPD.

FERC SPD and schedule; and 4) remaining activities and any modifications to the existing study or new studies proposed by Alabama Power.

3.0 OPERATING CURVE CHANGE FEASIBILITY ANALYSIS STUDY

3.1 STUDY PURPOSE AND SUMMARY OF METHODS

The Operating Curve Change Feasibility Analysis Study evaluates, in increments of 1 foot from 786 feet msl to 789 feet msl (i.e., 786, 787, 788, and 789 feet msl; collectively "winter pool alternatives" or "alternatives"), Alabama Power's ability to increase the winter pool elevation and continue to meet Project purposes. Any changes to the Harris Project operating curve could have the potential to impact downstream communities and, therefore, downstream impacts must be identified in the analysis.

This study is divided into two phases: During Phase 1, Alabama Power performed extensive modeling and analysis of the hydrologic record and baseline information for the Project to identify potential impacts of a winter operating curve change on hydropower generation, flood control, navigation, drought operations, Green Plan flows,[6] and downstream release alternatives. In Phase 2, Alabama Power will conduct qualitative and quantitative evaluations of potential resource impacts (water quality; water use; erosion and sedimentation, including invasive species; aquatic resources; wildlife, threatened and endangered species; terrestrial wetlands; recreation; and cultural resources).

Phase 1 study methods included using existing data (hydrologic record and baseline information) to develop the appropriate simulation models to evaluate, in increments of 1 foot from 786 feet msl to 789 feet msl, Alabama Power's ability to increase the winter pool elevation and continue to meet Project purposes. The simulation models developed as part of this study provided the tools needed to identify impacts to operational parameters and resources.

The study methods also included calibrating the models and defining the model boundaries. These methods and models are described in detail in Sections 1 through 4 of the Draft Operating Curve Change Feasibility Phase 1 Report.

[6] See Section 4.2.1.1 of the Draft Operating Curve Change Feasibility Analysis Phase 1 Report for discussion of the Green Plan.

3.2 STUDY PROGRESS

Alabama Power formed HAT 1 to provide stakeholders an opportunity to participate in issues related to Project operations. Alabama Power presented the models and assumptions to HAT 1 on September 11, 2019. As noted in Section 2.0, the Draft Operating Curve Change Feasibility Analysis Phase 1 Report is being filed concurrently with the ISR and the filing contains the relevant HAT 1 meeting summaries, presentations, and documentation of consultation. The Phase 1 draft report presents results for seven operational parameters: hydropower generation, flood control, navigation, drought operations, Green Plan flows, Harris Reservoir levels, and downstream release alternatives.

The Phase 1 Hydrologic Engineering Center-River Analysis System (HEC-RAS) modeling using the Hydrologic Engineering Center-Reservoir System Simulation (HEC-ResSim) model output indicates that any increase in the winter pool elevation at the Harris Dam will result in increased area, depth, and duration of flooding at points downstream of Harris Dam. Due to the natural channel geometry, for long stretches of the Tallapoosa River there is not significantly more area affected by increases in the winter pool; however, there are increases in the areas affected by flooding where tributary streams with low lying floodplains enter the Tallapoosa River. The proposed operating curve changes not only increase inundation areas but also increase the depth of flooding.

The Green Plan minimum releases from Harris were met or exceeded for the period of record for all alternatives. No changes were found in the ability to pass Green Plan flows from Harris Dam due to an increase in the winter pool. With the discharge target based on flows upstream of the reservoir at Heflin, the required releases were the same for all alternatives.

Using the HydroBudget model, Alabama Power determined that each of the four operating curve alternatives resulted in a loss in hydropower generation. While the greatest annual economic loss occurs in the + 4-foot (789-feet msl) winter pool alternative, this loss represents a relatively small decrease in hydropower generation for the Alabama Power hydroelectric system as a whole.

The four alternatives had no effect, compared to baseline, on Alabama Power’s ability to maintain the Harris Reservoir levels, implement drought operations, or support navigation downstream. Finally, the four alternatives did not affect Alabama Power's ability to release the downstream release alternatives being evaluated in the Downstream Release Alternatives Study Plan.

3.3 Variance from the Study Plan and Schedule

Alabama Power conducted the Operating Curve Change Feasibility Analysis Phase 1 Study in full conformance with FERC's SPD; however, Alabama Power's schedule included hosting a HAT 1 meeting in March 2020. Due to COVID-19 and related travel and public gathering restrictions, and statewide office closures, Alabama Power did not host this meeting.

3.4 Remaining Activities/Modifications or Other Proposed Studies

Alabama Power does not propose any additional studies beyond those in the FERC SPD.

Remaining activities include:

- Review comments on the Draft Operating Curve Change Feasibility Analysis Phase 1 Report and modify the Final Report, as appropriate. For any comments not addressed in the Final Report, Alabama Power will provide an explanation of why these comments were not incorporated.
- Alabama Power will use the information in the Phase 1 Final Report along with FERC-approved relicensing study results and existing information to conduct the Phase 2 analysis to determine potential resource impacts on water quality, water use, erosion and sedimentation (including invasive species), aquatic resources, wildlife, T&E species, terrestrial wetlands, recreation resources, and cultural resources.
- In Phase 2, Alabama Power will analyze how the proposed operating curve alternatives could potentially affect existing structures (houses, barns, sheds, etc.) downstream of Harris Dam during flood events. Analysis will include identifying structures inundated under the various alternatives, including depth of inundation and duration.
- The modeling results combined with other environmental study analyses will result in a final recommendation from Alabama Power on any change in the operating curve at Harris.

4.0 DOWNSTREAM RELEASE ALTERNATIVES STUDY

4.1 STUDY PURPOSE AND SUMMARY OF METHODS

The Downstream Release Alternatives Study evaluates the effects of pre- and post-implementation of the 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[7] (i.e., changing the time of day in which Green Plan pulses are released) on Project resources.

This study is being conducted in two phases. In Phase 1, Alabama Power used models developed in other Harris Project FERC-approved studies and conducted modeling simulations using specific methods, tools, and processes (as described in the FERC-approved Study Plan) to evaluate impacts to existing operational parameters, including reservoir levels, hydropower generation, flood control, navigation, and drought operations. In Phase 2, Alabama Power will analyze the effects of the downstream release alternatives on other resources, including water quality, water use, erosion and sedimentation (including invasive species), downstream aquatic resources (temperature and habitat), wildlife and terrestrial resources, T&E species, recreation, and cultural resources.

Study methods included using existing data (hydrologic record and baseline information) to develop the appropriate simulation models to conduct the analysis of the downstream release alternatives. The primary tool for this study is HEC-RAS; however, Alabama Power used other HEC models to address the effects of downstream release alternatives. Tools included: 1) Alabama-Coosa-Tallapoosa (ACT) unimpaired flow database and other U.S. Geological Survey (USGS), U.S. Army Corps of Engineers (USACE), and Alabama Power records; 2) HEC-RAS; HEC-ResSim; Hydrologic Engineering Center- Data Storage System and Viewer (HEC-DSSVue); and Alabama Power's HydroBudget. These models are described in detail in Section 4 of the Draft Downstream Release Alternatives Phase 1 Report.

Impacts to the Harris Project were evaluated by modeling the current operations combined with each downstream release alternative through the daily HEC Res-Sim for the ACT Basin. During

[7] The alternative/modified Green Plan operation downstream release alternative will be evaluated as part of Phase 2. Results from the other three scenarios as well as from the Aquatic Resources Study are needed to design the alternative to be studied.

Phase 2 of this study, the outflow hydrographs from HEC-ResSim will be routed downstream using HEC-RAS to assess effects on alternative release scenarios on Project resources.

4.2 STUDY PROGRESS

Alabama Power formed HAT 1 to provide stakeholders an opportunity to participate in issues related to Project operations. Alabama Power presented the Phase 1 Downstream Release Alternatives models and assumptions to HAT 1 on September 11, 2019. As noted in Section 2.0, the Draft Downstream Release Alternatives Study Phase 1 Report is being filed concurrently with the ISR and the filing contains the relevant HAT 1 meeting summaries, presentations, and documentation of consultation.

The Phase 1 HEC-RAS modeling using the HEC-ResSim output indicates that Pre-Green Plan, Green Plan, and 150 cfs continuous minimum flow have no effect on Harris Reservoir levels, flood control, navigation, or drought operations. Comparing the Pre-Green Plan and Green Plan using HydroBudget shows that returning to Pre-Green Plan operations would result in an annual economic gain to Alabama Power customers from a hydropower generation perspective because all hydropower generation would occur during peak times rather than a portion of generation occurring during off-peak pulsing operations. In evaluating the 150 cfs minimum flow alternative, there are too many unknowns at this time to generate reliable/accurate HydroBudget results; however, if the 150 cfs minimum flow is provided through a non-generation mechanism, the impact to hydropower generation will be the same or slightly worse than the impact from Green Plan operations. The capital and operation and maintenance costs associated with a generating or non-generating mechanism for providing a 150 cfs minimum flow will be considered in other economic analyses required by the relicensing process if it is part of Alabama Power's proposal.

4.3 VARIANCE FROM THE STUDY PLAN AND SCHEDULE

Alabama Power conducted the Downstream Release Alternatives Study in full conformance with FERC's SPD; however, Alabama Power's schedule included hosting a HAT 1 meeting in March 2020. Due to COVID-19 and related travel and public gathering restrictions, and statewide office closures, Alabama Power did not host this meeting.

4.4 REMAINING ACTIVITIES/MODIFICATIONS OR OTHER PROPOSED STUDIES

Alabama Power does not propose any additional studies beyond those in the FERC SPD**.**

Remaining Activities include:

- Review comments on the Draft Downstream Release Alternatives Study Phase 1 Report and modify the Final Report, as applicable. For any comments not addressed in the Final Report, Alabama Power will provide an explanation why these comments were not incorporated.
- Alabama Power will use the information in the Phase 1 Final Report along with FERC-approved relicensing study results and existing information to conduct the Phase 2 analysis to determine potential resource impacts on water quality, water use, downstream erosion, aquatic resources, wildlife, terrestrial, and T&E resources, recreation, and cultural resources.
- The modeling results combined with other environmental study analyses will result in a final recommendation from Alabama Power on any downstream release at Harris.

5.0 WATER QUALITY STUDY

5.1 STUDY PURPOSE AND SUMMARY OF METHODS

The Draft Water Quality Study Report supplements information included in the 2016 Baseline Water Quality Report. Data sources include Alabama Power, Alabama Department of Environmental Management (ADEM), and Alabama Water Watch (AWW). AWW data was not available to Alabama Power to include in the 2016 Baseline Water Quality Report. Therefore, this study report summarizes data collected from 2017 through 2019 with the exception of AWW data which also includes years prior to 2017. No additional data than what was included in the 2016 Baseline Water Quality Report were available for streams at Skyline. Because the current 303(d) list includes a section of Little Coon Creek at Skyline as impaired due to siltation, it is addressed in the Draft Erosion and Sedimentation Report.

In an effort to support obtaining the required 401 Water Quality Certification (WQC), Alabama Power conducted dissolved oxygen and temperature monitoring in the tailrace at a location previously approved by ADEM, approximately 800-feet-downstream of the Harris Dam on the west bank of the river, from June 1 through October 31 (2017 through 2019). Measurements of dissolved oxygen and temperature were recorded continuously at 15-minute intervals during generation. Alabama Power also collected monthly vertical profiles of temperature and dissolved oxygen in the Harris Reservoir forebay between March and October of 2018 and 2019 for comparison to historic profiles.

In addition to the monitoring to support the 401 WQC, Alabama Power monitored dissolved oxygen and temperature approximately 0.5 mile downstream of Harris Dam. Data were recorded continuously at 15-minute intervals beginning March 1 through October 31, 2019. Alabama Power provided discharge data during the March 1 through October 31 monitoring period to allow for data comparison.

Additionally, Alabama Power worked with HAT 2 participants to identify areas of water quality concern (areas believed to have degraded water quality conditions) and determined if identified areas warrant further examination as well as compiled available water quality information for those areas.

5.2 STUDY PROGRESS

Alabama Power developed HAT 2 to provide stakeholders an opportunity to participate in issues related to water quality. Alabama Power held a HAT 2 meeting on September 11, 2019 and distributed the Draft Water Quality Study Report to HAT 2 participants on March 9, 2020. The Draft Water Quality Report presented results on water quality parameters in the Harris Reservoir as well as in the Tallapoosa River downstream of the Harris Dam. As noted in Section 2.0, the Draft Water Quality Study Report is being filed concurrently with the ISR and the filing contains the relevant HAT 2 meeting summaries, presentations, and documentation of consultation.

Alabama Power collected dissolved oxygen and temperature data as described in the study methods at two locations downstream of the dam, in addition to the monthly vertical profiles collected in the Harris Reservoir forebay.

HAT 2 stakeholders identified one location, the Foster's Bridge area at Lake Harris, as an area of water quality concern with regard to potential nutrient enrichment and associated impacts. Alabama Power used existing and historical data to assess the Foster's Bridge area.

Data collected during generation immediately downstream of Harris Dam in 2018 and 2019 indicated dissolved oxygen was greater than 5 milligrams per liter (mg/L) for 94 percent of all measurements (91 percent in 2018 and 99.6 percent in 2019). Data from the continuous monitoring station that recorded data during both generation and non-generation in 2019 indicated dissolved oxygen levels were greater than 5 mg/L for 99.9 percent of all measurements. Monitoring data collected by Alabama Power in 2017 showed numerous events where dissolved oxygen was less than 5 mg/L. The low dissolved oxygen events in 2017 may be attributed to conditions in the Harris Reservoir that were impacted by severe drought in the summer and fall of 2016, where inflows to the lake were at historic lows. A variance that allowed for the lake to be filled two feet above the normal rule curve earlier in the year was likely another contributing factor. Harris Reservoir became more strongly stratified earlier in the year compared to other years. Dissolved oxygen levels at depths below 20 feet in the lake were hypoxic/anoxic from June through October 2017.

Data collected by ADEM on the Tallapoosa River at Harris Dam, Wadley, and Horseshoe Bend showed dissolved oxygen levels were well above 5 mg/L during each of their sampling events.

Data from the recently installed continuous monitor at Malone indicated that dissolved oxygen levels were greater than 5 mg/L for 99 percent of the monitoring period.

5.3 VARIANCE FROM THE STUDY PLAN AND SCHEDULE

Alabama Power conducted the Water Quality Study in full conformance with FERC's SPD; however, following discussions with ADEM, Alabama Power intends to submit an application to ADEM for the 401 WQC in April 2021, not in April 2020 as noted in the FERC SPD.

5.4 REMAINING ACTIVITIES/MODIFICATIONS OR OTHER PROPOSED STUDIES

Alabama Power does not propose any additional studies beyond that in FERC's SPD.

Remaining Activities include:

- Review comments on the Draft Water Quality Study Report and modify the Final Report, as applicable. For any comments not addressed in the Final Report, Alabama Power will provide an explanation why these comments were not incorporated.
- Alabama Power will prepare the 401 WQC application and submit to ADEM in April 2021.

6.0 EROSION AND SEDIMENTATION STUDY

6.1 Study Purpose and Summary of Methods

The Erosion and Sedimentation Study identified problematic erosion sites and sedimentation areas at the Harris Project and downstream of Harris Dam to Horseshoe Bend and determined the likely causes. Erosion and sedimentation sites were solicited from HAT 2 participants.

Methods for evaluating erosion sites on Lake Harris and the Tallapoosa River downstream of Harris Dam included photographing, georeferencing, and examining each site identified by HAT 2 participants, either in the field or via aerial imagery analysis, to determine the cause of the erosion (i.e., Harris Project operations, land disturbance [development], or natural processes). Additionally, a High Definition Stream Survey (HDSS) was conducted to evaluate streambank conditions on the Tallapoosa River downstream of Harris Dam to Horseshoe Bend. Regarding sedimentation areas, light, detection and ranging (LIDAR) and available satellite imagery/aerial photography were used to examine identified areas. The analysis of both erosion and sedimentation areas was supported by field observations. The identified sedimentation areas will be surveyed for nuisance aquatic vegetation.

Little Coon Creek, which flows through portions of the Project Boundary at Skyline, is currently listed as impaired by ADEM due to siltation. The sources of this impairment include non-irrigated crop production and pasture grazing. Study methods included a GIS analysis of land use classifications within the Project Boundary at Skyline to assess the impact of agriculture on Little Coon Creek. Land use data was provided by the multi-resolution land characteristics (MRLC) consortium.

6.2 Study Progress

Alabama Power developed HAT 2 to provide stakeholders an opportunity to participate in issues related to erosion and sedimentation. During the October 19, 2017 issue identification workshop, several stakeholders noted the location of possible erosion and sedimentation areas. Alabama Power distributed an email on May 1, 2019 to HAT 2 participants providing maps of erosion and sedimentation areas previously identified for evaluation and requesting identification of additional areas of erosion and sedimentation concerns. Alabama Power held a HAT 2 meeting on September 11, 2019 where it presented geographic information system (GIS) overlays and maps of erosion and sedimentation sites that would be included in the field assessment. Following the September 11, 2019 HAT 2 meeting, a stakeholder requested, and Alabama Power agreed, to include an additional erosion site in the field assessment. On March 17, 2020, Alabama Power distributed the Draft Erosion and Sedimentation Study Report to HAT 2. As noted in Section 2.0, the Draft Erosion and Sedimentation Study Report is being filed concurrently with the ISR and the filing contains the relevant HAT 2 meeting summaries, presentations, and documentation of consultation.

6.2.1 LAKE HARRIS

Twenty-four erosion sites were identified for field assessment; field assessments were conducted in December 2019 during the winter drawdown when the sites were dewatered and could be fully assessed. Each site was photographed and examined to determine the cause of erosion. No significant signs of active erosion were present at 8 of the 24 sites.

Nine sedimentation areas were identified by stakeholders and by examining available satellite imagery/aerial photography and LIDAR data using GIS. The identified sedimentation areas were limited to areas exposed during the winter pool drawdown due to limitations of LIDAR in measuring below water surfaces. Therefore, approximate surface area for each identified sedimentation area was measured using contours established in a 2015 LIDAR survey of the lake during the drawdown. Limited aerial imagery of the lake during winter draw down and historic LIDAR data for the reservoir did not allow for a comparison to historic conditions. On December 4, 2019, Alabama Power visited all sedimentation areas that were accessible via boat to conduct field verification.

Sedimentation areas on Lake Harris are primarily concentrated in the Little Tallapoosa arm where riverine flows enter the impoundment zone created by Lake Harris. To assess potential causes for sediment introduction to the system, land use classifications were analyzed for the Little Tallapoosa River Basin in 2001 and compared to 2016. Twenty-five percent of the Little Tallapoosa River Basin has been converted to hay/pasture fields. Land clearing and conversion to agricultural fields is a significant contributing factor of sedimentation in the Little Tallapoosa arm of Lake Harris.

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6.2.2 TALLAPOOSA RIVER DOWNSTREAM OF HARRIS DAM

Streambank condition point data collected during the downstream HDSS was averaged into 0.1-mile segments to help facilitate finding any failing streambank areas. Using these data, a ranking system was developed to understand specific areas of failing streambanks on the Tallapoosa River and to identify any significantly impaired areas. Notably, only one area scored as impaired to non-functional (located on the right bank between river mile [RM] 16.3 to 16.9).

The downstream HDSS results were also used to assess the condition of identified erosion sites 22 and 23. These sites were assessed using the same criteria as the erosion sites located within Lake Harris. Both sites were confirmed to have areas of erosion primarily caused by adjacent land use/clearing and natural riverine processes.

6.2.3 SKYLINE

A GIS analysis of land use classifications within the Project Boundary at Skyline was used to assess the impact of agriculture on Little Coon Creek. A comparison of land use within the watershed boundary of Little Coon Creek was conducted using the earliest available MRLC landcover dataset (2001) and the most recent (2016). This analysis indicated that 8.8 percent of the land within the watershed is used for agriculture (i.e. cultivated crops and hay/pasture), increasing from 2001 to 2016. The proximity of these areas to Little Coon Creek more easily allows for soils loosened due to tilling or other agricultural practices to be washed into Little Coon Creek, resulting in sedimentation of the creek bottom.

6.3 VARIANCE FROM THE STUDY PLAN AND SCHEDULE

There are no variances from the study plan or schedule.

Alabama Power conducted the Erosion and Sedimentation Study in full conformance with FERC’s SPD.

6.4 REMAINING ACTIVITIES/MODIFICATIONS OR OTHER PROPOSED STUDIES

Alabama Power does not propose any additional studies beyond that in FERC’s SPD.

Remaining Activities include:

- Alabama Power will perform additional reconnaissance at identified sedimentation sites on Lake Harris during full (summer) pool conditions to determine if any nuisance aquatic vegetation is present and provide the results of that assessment to HAT 2 in the form of a technical memorandum.
- Review comments on the Draft Erosion and Sedimentation Study Report and modify the Final Report, as applicable. For any comments not addressed in the Final Report, Alabama Power will provide an explanation why these comments were not incorporated.

7.0 AQUATIC RESOURCES STUDY

7.1 STUDY PURPOSE AND SUMMARY OF METHODS

The Aquatic Resources Study evaluates the effects of the Harris Project on aquatic resources. Monitoring conducted since the initiation of the Green Plan[8] indicated a positive fish community response and increased shoal habitat availability; however, little information exists characterizing the extent that the Green Plan enhanced the aquatic habitat from Harris Dam downstream through Horseshoe Bend. Furthermore, the Alabama Department of Conservation and Natural Resources (ADCNR) noted the abundance of some species is below expected levels, which could be due to several factors including sampling methodologies, thermal regime, flow regime, and/or nutrient availability.

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. 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.

Questions have also been raised regarding potential effects the Harris Project may have on other aquatic fauna within the Project Area, including macroinvertebrates such as mollusks and crayfish. Alabama Power is investigating the effects of the Harris Project on these aquatic species and is performing an assessment of the Harris Project's potential effects on species mobility and population health.

These study tasks are being accomplished through desktop assessments, field studies, and laboratory studies. Alabama Power has been compiling and summarizing data from existing information sources to provide a comprehensive characterization of aquatic resources within the Project Area. Alabama Power is also working with Auburn University to conduct field and

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[8] Generally, the Green Plan specifies short (10 to 30 minute) pulses from Harris Dam, with the pulse duration determined by conditions at a gage on an unregulated section of the Tallapoosa River upstream of Harris Reservoir. The purpose of the Green Plan was to reduce the effects of peaking operations on the aquatic community downstream.

laboratory studies of the fish populations in the Tallapoosa River downstream of Harris Dam through Horseshoe Bend to determine how Harris Dam may be affecting the fish community in this reach.

7.2 STUDY PROGRESS

Alabama Power developed HAT 3 to provide stakeholders an opportunity to participate in issues related to fish and wildlife resources. Alabama Power is performing a desktop assessment summarizing relevant current and historic information characterizing aquatic resources at the Harris Project. Sources of information include 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.

Currently, Alabama Power is finalizing this desktop assessment and will include it in the Draft Aquatic Study Report to be filed with FERC in July 2020.

A literature review of temperature requirements of target species (Redbreast Sunfish, Channel Catfish, Tallapoosa Bass, and Alabama Bass) is being conducted by Auburn University. Because the Alabama Bass is recently described, there is little information on its temperature requirements; therefore, temperature data for the spotted bass, a closely related species, is being used. Alabama Power and USGS have provided Auburn University with historic temperature data to incorporate into its analysis.

Auburn University has been sampling the fish community at four sites: Horseshoe Bend, Wadley, Lee’s Bridge (control site), and the Harris Dam tailrace. Sampling was conducted in April, May, July, September, November 2019, and January 2020, with six, 10-minute sampling transects occurring each sampling day. Individual fish were weighed, measured, sexed, had gonads removed and weighed, had diets removed from stomachs and preserved, and had otoliths removed and stored to be evaluated. To date, all diets have been quantified, all prey items identified, and a subsample measured, and all diet data have been entered into a databank for evaluation.

Representative specimens of the target fish collected at the four sites are being used in intermittent flow static respirometry tests to assess their baseline, or resting, metabolic rates under multiple temperatures. The metabolic rates will be used in bioenergetics models for each target species at each of the four sites. Swimming respirometry is also being used to quantify both performance capabilities of fish and their active metabolic rates. Diet, size distributions, and growth rates are currently being estimated for bioenergetics model simulations.

As noted in Section 2.0, Alabama Power will file the Draft Aquatic Resources Study Report with consultation documentation in July 2020.

7.3 VARIANCE FROM THE STUDY PLAN AND SCHEDULE

To date, Alabama Power has conducted the Aquatic Resources Study in full conformance with FERC's SPD; however, Alabama Power's schedule included hosting a HAT 3 meeting in March 2020. Due to COVID-19 and related travel and public gathering restrictions, and statewide office closures, Alabama Power did not host this meeting.

Auburn University is exploring alternatives to electromyogram radio tags because of their limited ability to quantify fish swimming energetic costs and the relatively large size of these tags. Acoustic/radio (CART) tags are being considered, and the study plan will be revised if needed, to track the activity of individual fish from small watercraft and to detect their position.

7.4 REMAINING ACTIVITIES/MODIFICATIONS OR OTHER PROPOSED STUDIES

Alabama Power does not propose any additional studies beyond that in FERC's SPD.

Remaining tasks include**:**

- Incorporate the Aquatic Resources Desktop Assessment into the Draft Aquatic Resources Study Report.
- Obtain temperature data at the USGS and Alabama Power monitors and the 20 temperature and level loggers stationed downstream of Harris Dam (recording through July 2020 or later). Temperatures recorded from 2019 and 2020 will be consolidated with historical data.
- Gather and review literature and any available information on temperature tolerances, preferences, or optima for target species.
- Continue fish sampling at each site every other month, conditions permitting, through November 2020.
- Consider an alternative "control" site upstream of the reservoir because the flow regime at the current upstream site (Lee's Bridge) appears to be more closely affected by dam operations than expected.

- Tag and track fish with CART tags during summer of 2020.
- Continue static respirometry tests and complete at both 10 degrees Centigrade (10ºC) and 21°C in 2020.
- Continue to measure active metabolic rates using a combination of increasing water velocity and decreasing water temperature.
- Incorporate the necessary physiological parameters into the bioenergetics model to conduct simulations needed to test potential influence of water temperature and flow on growth rates of fishes below Harris Dam. Auburn University will estimate annual growth of the target fish species using temperature regimes and diets observed in upstream control sites compared to downstream treatment sites along more impacted sections of the Tallapoosa River.
- Alabama Power will distribute the Draft Aquatic Resources Study Report and file with FERC in July 2020. Alabama Power will review comments on the Draft Aquatic Resources Study Report and modify the Final Report, as applicable. For any comments not addressed in the Final Report, Alabama Power will provide an explanation why these comments were not incorporated.

8.0 DOWNSTREAM AQUATIC HABITAT STUDY

8.1 STUDY PURPOSE AND SUMMARY OF METHODS

The Downstream Aquatic Habitat Study describes the relationship between Project operations and aquatic habitat in the Tallapoosa River from Harris Dam through Horseshoe Bend. This study includes the following:

- **Mesohabitat Analysis** - A desktop analysis of the types of available habitat in the Tallapoosa River using GIS, aerial imagery, and visual observations.
- **Hydrologic Data Collection and Analysis –** Collection and analysis of water level, river channel, and water temperature data.
- **Modeling –** Development of a HEC-RAS model to evaluate the effect of current operations on the amount and persistence of wetted aquatic habitat, especially shoal/shallow-water habitat.

8.2 STUDY PROGRESS

Alabama Power developed HAT 3 to provide stakeholders an opportunity to participate in issues related to fish and wildlife resources. Alabama Power held a HAT 3 meeting on December 11, 2019, to review methods for calculating the habitat types using HEC-RAS. Due to low attendance in December 2019, Alabama Power held an additional HAT 3 meeting on February 20, 2020. Alabama Power will file the Draft Downstream Aquatic Habitat Study Report, along with the relevant documentation of consultation, with FERC in June 2020.

The desktop mesohabitat analysis concluded that the 47-mile reach of the Tallapoosa River below Harris Dam is comprised of approximately 46 percent pool habitat, 44 percent riffle habitat, and 10 percent run habitat with current operations. The analysis indicated these habitat types are relatively evenly distributed along the reach, except for a reach between 7 miles and 14 miles downstream of Harris Dam where the amount of riffle habitat per mile is nearly twice that of other reaches.

Water level loggers installed at twenty locations in the Tallapoosa River below Harris Dam began recording water level and water temperature at 15-minute intervals in April 2019 and will continue through June 2020. During deployment and subsequent visits to perform maintenance and download logger data, technicians performed bathymetric surveys at approximately 200 cross-sections to acquire accurate riverbed elevation data for use in the hydraulic model.

The existing HEC-RAS model[9] terrain was updated using newly collected riverbed elevation and LIDAR data. Based on the USACE's unimpaired flow data set for the Tallapoosa River, 2001 was selected as an "average" water year for modeling purposes. Alabama Power ran simulations using hydrographs created with Harris Dam operations data for 2001. Alabama Power is currently analyzing the results to determine the effects on downstream aquatic habitat.

8.3 VARIANCE FROM THE STUDY PLAN AND SCHEDULE

To date, Alabama Power has conducted the Downstream Aquatic Habitat Study in full conformance with FERC's SPD; however, Alabama Power's schedule included hosting a HAT 3 meeting in March 2020. Due to COVID-19 and related travel and public gathering restrictions, and statewide office closures, Alabama Power did not host this meeting.

8.4 REMAINING ACTIVITIES/MODIFICATIONS OR OTHER PROPOSED STUDIES

Alabama Power does not propose any additional studies beyond that in FERC's SPD.

Remaining activities include:

- Continue analyzing the results of Green Plan model simulations based on input and recommendations. Note that effects on downstream aquatic habitat from modifications to current operations are addressed in the Phase 2 of the Downstream Release Alternatives Study.
- Continue collecting level logger data through June 2020.
- Alabama Power will distribute a Draft Downstream Aquatic Habitat Report in June 2020. Alabama Power will review comments on the Draft Aquatic Resources Study Report and modify the Final Report, as applicable. For any comments not addressed in the Final Report, Alabama Power will provide an explanation why these comments were not incorporated.

[9] The HEC-RAS model developed for the Operating Curve Change Feasibility Analysis and the Downstream Release Alternatives Study was used for this downstream aquatic habitat study.

9.0 THREATENED AND ENDANGERED SPECIES STUDY

9.1 STUDY PURPOSE AND SUMMARY OF METHODS

The Threatened and Endangered Species Study assesses the probability of populations of currently listed federal and/or state protected species and/or their critical habitat occurring within the Harris Project Boundary or Project Area and determine if there are Project related impacts.

The study methods include conducting a desktop analysis of habitat information and maps, compiling a list of federally and state protected T&E species, and identifying critical habitats that occur within the Harris Project Vicinity and the downstream reach of the Tallapoosa River from the Harris Dam through Horseshoe Bend. This study includes reviewing habitat requirements and range of existing and extirpated species and identifying environmental factors potentially affecting each species.

9.2 STUDY PROGRESS

Alabama Power developed HAT 3 to provide stakeholders an opportunity to participate in issues related to fish and wildlife resources. Alabama Power held a HAT 3 meeting on August 27, 2019 to discuss the T&E Species Study Plan and methods. Alabama Power and the USFWS met on November 21, 2019 to survey for fine-lined pocketbook on an approximate 3.75-mile stretch of the Tallapoosa River starting from the County 36 bridge and extending to the shoal below the Highway 431 bridge. The USFWS and Alabama Power agreed to conduct additional surveys on the fine-lined pocketbook in Spring 2020.[10]

Alabama Power distributed the Draft Threatened and Endangered Species Desktop Assessment to stakeholders on February 21, 2020. As noted in Section 2.0, the Draft Threatened and Endangered Species Desktop Assessment is being filed concurrently with the ISR and the filing contains the relevant HAT 3 meeting summaries, presentations, and consultation records.

The draft desktop assessment determined the probability of populations of currently listed T&E species and/or their critical habitat occurring within the Harris Project Boundary or Project Area. A list of species potentially occurring in Alabama counties in the Project Vicinity was compiled

[10] The date of survey may be modified due to COVID-19 restrictions. Alabama Power will consult with the USFWS on survey dates.

from the T&E species list using ADCNR, USFWS, and Alabama Natural Heritage Program databases.

Results and maps were obtained and summarized from USFWS Recovery Plans and 5-Year Reviews, the Federal Register Listings and Critical Habitat Designations, and USFWS Environmental Conservation Online System (ECOS). Maps depicting current species ranges and critical habitats were developed using GIS data available on the USFWS' ECOS online system. This information was used to determine whether further assessments of identified species and habitat are necessary.

The Alabama counties in the vicinity of the Harris Project overlap with the habitat range, critical habitat, and extant populations of 20 federal and state protected T&E species. Nine of these species have habitat ranges intersecting with the Project Boundaries, five of which have a range occurring in the Project Boundary at Skyline, and six of which have a range occurring in the Project Boundary at Lake Harris. Additionally, the USFWS has designated critical habitat for 6 of the 20 total species identified (finelined pocketbook, Indiana bat, rabbitsfoot, slabside pearlymussel, southern pigtoe, and spotfin chub). In addition to critical habitat ranges, specific extant populations were identified for ten species. Seven of the ten listed mussels (Alabama lampmussel, fine-rayed pigtoe, pale lilliput, rabbitsfoot, snuffbox, shiny pigtoe, and slabside pearlymussel), and one of the two listed fish (palezone shiner) have extant populations in the Paint Rock River, which is located 3.9 linear miles from the closest Project Boundary at Skyline. The desktop review of federally listed species and their habitats identified potential habitat for three bat species, two mussels species, two plant species, and a bird that may have habitat within the Project Boundary at Lake Harris and Skyline.

9.3 VARIANCE FROM THE STUDY PLAN AND SCHEDULE

To date, Alabama Power has conducted the Threatened & Endangered Species Study in full conformance with FERC's SPD; however, Alabama Power's schedule included hosting a HAT 3 meeting in March 2020. Due to COVID-19 and related travel and public gathering restrictions, and statewide office closures, Alabama Power did not host this meeting.

9.4 Remaining Activities/Modifications or Other Proposed Studies

Alabama Power does not propose any additional studies beyond that in FERC's SPD.

Remaining Activities include:

- Review comments on the Draft Threatened and Endangered Species Desktop Assessment and modify the Final Assessment, as applicable. For any comments not included in the Final Assessment, Alabama Power will provide an explanation why these comments were not incorporated.
- Alabama Power will continue working with USFWS to complete field surveys at Harris and Skyline WMA to determine if T&E species are located within the Harris Project Boundary. Species to be surveyed in Spring/Summer 2020[11] include: the palezone shiner at Skyline WMA and the fine-lined pocketbook mussel upstream of Harris Dam.
- The Final T&E Species Study Report will include the Desktop Assessment, the results of all field investigations, and other tasks described in the FERC SPD T&E Species Study Plan.

[11] The date of survey may be modified due to COVID-19 restrictions. Alabama Power will consult with the USFWS on survey dates.

10.0 PROJECT LANDS EVALUATION STUDY

10.1 STUDY PURPOSE AND SUMMARY OF METHODS

The Harris Project Lands Evaluation identifies lands around Lake Harris and at Skyline that are needed for Harris Project purposes and classifies these lands based upon use. Alabama Power evaluated the land use classifications for the Harris Project and determined changes needed to conform to Alabama Power's current land classification system and other Alabama Power FERC-approved Shoreline Management Plans (SMP). This Phase 1 portion of the study identified lands to be added to, or removed from, the current Harris Project Boundary and/or be reclassified. Phase 2 will use the results of Phase 1 and other Harris relicensing studies to develop a Wildlife Management Program (WMP) and a SMP.

The process and methods for Phase 1 included: meeting with HAT 4 members to discuss potential changes to the Harris Project lands (add, delete, or reclassify); a desktop analysis utilizing GIS data such as T&E species, wetlands, and cultural resources (i.e., "Sensitive Areas"), timber management tracts and current practices, and ADEM's data on impaired waters; and developing a draft map using GIS to show all proposed changes to Harris Project lands.

Phase 2 includes development of 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 Project Lands Evaluation, Alabama Power will incorporate information collected during other relicensing studies (e.g., T&E, water quality, and recreation studies), as appropriate, to the SMP and WMP. Specific activities for developing the SMP and WMP are included in FERC's SPD.

10.2 STUDY PROGRESS

Alabama Power developed HAT 4 to provide stakeholders an opportunity to participate in issues related to Project lands, the WMP, and SMP. Alabama Power held a HAT 4 meeting on September 11, 2019, to review proposed land use changes, including lands to be added to the Project Boundary, lands to be removed from the Project Boundary, and proposed changes in land use classifications of existing Project lands. Alabama Power presented the proposed changes in GIS overlays. Following the September 11, 2019 HAT 4 meeting, Alabama Power solicited feedback from HAT 4 regarding the Project Lands proposal. As noted in Section 2.0, the Draft Phase 1 Project Lands Evaluation Study Report is being filed concurrently with the ISR and the filing contains the relevant HAT 4 meeting summaries, presentations, and documentation of consultation.

Alabama Power identified lands around Lake Harris and at Skyline that are needed for Harris Project purposes and classified these lands based upon use. In addition, Alabama Power evaluated acreage at Skyline to determine availability of suitable bobwhite quail habitat and prepared the Draft Phase 1 Project Lands Evaluation Study Report. Finally, Samford University conducted a botanical inventory of a 20-acre parcel at Flat Rock Park.

10.3 VARIANCE FROM THE STUDY PLAN AND SCHEDULE

There are no variances from the study plan or schedule.

Alabama Power conducted the Project Lands Evaluation in full conformance with FERC's SPD.

10.4 REMAINING ACTIVITIES/MODIFICATIONS OR OTHER PROPOSED STUDIES

Alabama Power does not propose any additional studies beyond that in FERC's SPD.

Remaining activities include:

- Alabama Power will review comments on the Draft Phase 1 Project Lands Evaluation Study Report and modify the Final Report, as applicable. For any comments not addressed in the Final Report, Alabama Power will provide an explanation of why these comments were not incorporated.
- Samford University will conduct a botanical survey on an additional 21 acres of land adjacent to the previously surveyed area.
- Complete the Project Lands Evaluation Study Plan methods for Phase 2 SMP and WMP.

11.0 RECREATION EVALUATION STUDY

11.1 STUDY PURPOSE AND SUMMARY OF METHODS

The Harris Recreation Evaluation Study Plan and subsequent relevant FERC filings contain several components to determine potential recreational impact of the Harris Project: 1) recreational use of the Harris Project (Lake Harris Public Access); 2) recreational use of the Tallapoosa River below Harris Dam (Tallapoosa River User); and, 3) as introduced in the December 19, 2019 FERC filing, the Tallapoosa River Landowner Survey Research Plan[12].

The Lake Harris Public Access component includes gathering baseline information on existing Project recreation facilities, existing Project recreational use and capacity, and estimated future demand and needs at the Harris Project. For this component, Alabama Power has completed the following:

- Reviewed existing information and inventoried and mapped (using GIS) existing Project recreation sites and access areas within the Project Boundary;
- Summarized who owns, operates, and maintains each Project recreation site;
- Evaluated the condition of the Harris Project recreation sites and facilities within the Project Boundary; and
- Estimated current recreation use and the current and projected use capacity at Harris Project recreation sites[13].

To determine how flows in the Tallapoosa River downstream of Harris Dam affect recreational users and their activity, Alabama Power has completed the following:

- Calculated total visitation (effort) and daily effort levels by user groups during the study period (May 1, 2019 to October 31, 2019);
- Measured user attitudes/perceptions about instream flow and trip satisfaction on the day they were intercepted during this period;
- Obtained catch information from anglers intercepted during this period; and

[12] Accession No. 20191219-5186.
[13] Alabama Power worked with Southwick Associates on this component of the study and as of April 2020, this information is still preliminary and will be presented to stakeholders in the Draft Recreation Evaluation Report.

- Determined 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[14].

Alabama Power is also surveying landowners downstream of Harris Dam[15] as well as recreational users of the Tallapoosa River regarding their recreation use of the Tallapoosa River. Alabama Power:

- Reviewed county tax records to identify residential, vacation, forestry, agricultural, or vacant land adjacent to the Tallapoosa River in Randolph, Chambers, or Tallapoosa Counties that could be used for river-related recreation and obtained their mailing address;
- Developed a survey instrument to collect information from downstream landowners on their recreational use of the Tallapoosa River, use by others they may provide access to on their property, landowner perception of instream flow, and their attitudes about recreation and other resource issues on the Tallapoosa River downstream of Harris Dam to Jaybird Landing Boat Ramp; and
- Sent landowners an introductory pre-survey letter via first-class mail informing them of the study, followed one week later with a first-class mailing with a request to participate in study. This mailing included a paper copy of the survey, including a self-addressed stamped envelope for return, and also provided directions to fill out the survey online.

11.2 STUDY PROGRESS

Alabama Power developed HAT 5 to provide stakeholders an opportunity to participate in issues related to recreation. Alabama Power held a HAT 5 meeting on December 11, 2019, to discuss the Tallapoosa River Landowner Survey Research Plan. Alabama Power will file the Draft Downstream Recreation Evaluation Study Report, along with the relevant documentation of consultation, with FERC in August 2020.

Alabama Power conducted Lake Harris Public Access questionnaires and counts from March to December 2019 (counts were conducted almost daily and employed nine recreation clerks who conducted 1,357 questionnaires) [16]. Alabama Power also conducted Tallapoosa River User Surveys and counts from May to October 2019 (40 count days with approximately 200 surveys).

[14] Alabama Power worked with Dr. Kevin Hunt on this component of the survey and as of April 2020, this information is still preliminary and will be presented to stakeholders in the Draft Recreation Evaluation Report.
[15] As described in the December 19, 2019 Tallapoosa River Landowner Survey Research Plan.
[16] The start date for the counts was March 11, 2019. The survey questionnaire started on May 10, 2019. The last date for both was December 15, 2019.

Additionally, ADCNR provided data on recreation use at the Skyline WMA (man-days hunted and harvest estimates were conveyed in August 2019). In October 2019, Alabama Power inventoried recreation facilities at the Lake Harris Public Access sites (12 Harris Project Recreation sites[17], Lakeside Marina, and Wedowee Marine).

At the conclusion of the Tallapoosa River User Survey, researchers noted a lack of information from downstream landowners. To supplement data collected at public recreation sites on the Tallapoosa River downstream of the Project, Alabama Power developed a survey for downstream landowners regarding river-related recreation. Alabama Power facilitated a HAT 5 meeting on December 11, 2019, to provide stakeholders the opportunity to comment on the proposed Tallapoosa River Downstream Landowner Survey. Alabama Power incorporated several comments from HAT 5 members into the Tallapoosa River Landowner Survey Research Plan (including distributing a paper copy of the survey and delaying the start of the survey). Per stakeholder suggestions at the December 2019 HAT meeting, Alabama Power added an anonymous internet survey (Tallapoosa River Recreation User Survey) for river users to express opinions regarding their recreation experience on the Tallapoosa River. Initially, Alabama Power was only assessing landowners who owned residential, vacation, agricultural land that may be used as a residence, or non-industrial vacant land that was tied to an individual landowner. Alabama Power expanded the landowner categories to include forest landowners (known businesses in this category were removed so that only private individuals remained) and extended the response deadline for the Tallapoosa River Downstream Landowner Survey to April 15, 2020 (original deadline was March 31, 2020).

11.3 VARIANCE FROM THE STUDY PLAN AND SCHEDULE

To date, Alabama Power conducted the Recreation Evaluation Study in full accordance with the methods and schedule described in the FERC SPD with the exception of the following variances:

- Alabama Power added the Tallapoosa River Downstream Landowner Survey and Tallapoosa River Recreation User Survey described above.
- Alabama Power will file the Draft Harris Project Recreation Evaluation report in August 2020 (rather than June 2020) due to the additional study elements and extended

[17] Lee's Bridge Boat Ramp; Foster's Bridge Boat Ramp; Swagg Boat Ramp; Lonnie White Boat Ramp; Crescent Crest Boat Ramp; Highway 48 Bridge Boat Ramp; Wedowee Marine South Marina; Little Fox Creek Boat Ramp Big Fox Creek Boat Ramp; Flat Rock Park Day Use Park; R. L. Harris Management Area; and Harris Tailrace Fishing Platform.

participation deadlines. Alabama Power will keep with the schedule and file the Final Harris Project Recreation Evaluation report in November 2020.

Alabama Power's schedule included hosting a HAT 5 meeting in March 2020. Due to COVID-19 and related travel and public gathering restrictions, and statewide office closures, Alabama Power did not host this meeting.

11.4 Remaining Activities/Modifications or Other Proposed Studies

Alabama Power does not propose any additional studies beyond that in FERC's SPD.

Due to the additional surveys and subsequent processing and analysis of the data, Alabama Power will file the Draft Recreation Evaluation Study Report in August 2020 rather than in June 2020. Alabama Power is not proposing to change the Final Report due date in November 2020.

Remaining activities include:

- Use information collected from the Tallapoosa River Downstream Landowner Survey and Tallapoosa River Recreation User Survey to characterize use of the Tallapoosa River downstream of Harris Dam to Jaybird Landing Boat Ramp.
- Use information on river flow to determine how instream flow affects landowner recreational use and satisfaction on the Tallapoosa River downstream of Harris Dam.
- Combine Tallapoosa River Downstream Landowner Survey and Tallapoosa River Recreation User Survey with data gathered at public recreation sites in 2019.
- In August 2020, Alabama Power will distribute a Draft Recreation Evaluation Study Report. Alabama Power will review comments on the Draft Recreation Evaluation Study Report and modify the Final Report, as applicable. For any comments not addressed in the Final Report, Alabama Power will provide an explanation why these comments were not incorporated.

12.0 CULTURAL RESOURCES STUDY

12.1 STUDY PURPOSE AND SUMMARY OF METHODS

The Harris Project Cultural Resources[18] Programmatic Agreement and Historic Properties Management Plan Study Plan involves collecting and summarizing existing cultural resources baseline information and developing a plan to assess cultural resources identified in the Harris Project Area of Potential Effect (APE).

Alabama Power will develop a Historic Properties Management Plan (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.

As part of this study, Alabama Power will determine the need for, and if required, develop a draft Programmatic Agreement (PA) (among FERC, the State Historic Preservation Office [SHPO], Alabama Power, and applicable federally recognized tribes[19]) 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.

12.2 STUDY PROGRESS

Alabama Power formed HAT 6 to provide stakeholders an opportunity to participate in issues related to cultural resources. Alabama Power has conducted several HAT 6 meetings in 2019 and 2020. These meetings covered numerous topics, summarized below:

- May 22, 2019 - Sites Selected for Further Evaluation, TCP Identification Plan, APE, HPMP outline
- July 9, 2019 - Sites Selected for Further Evaluation

[18] FERC has the 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 U.S. Code of Federal Regulation [C.F.R.] part 800) implementing the National Historic Preservation Act (NHPA) (54 U.S. States Code [U.S.C.] 306108; hereinafter, "Section 106".

[19] Applicable tribes as of March 2019- Cherokee Nation, Eastern Band of Cherokee Indians, United Keetoowah Band of Cherokee Indians in Oklahoma, Alabama-Coushatta Tribe of Texas, Alabama-Quassarte Tribal Town, Coushatta Tribe of Louisiana, Kialegee Tribal Town, Muscogee (Creek) Nation, Poarch Band of Creek Indians, and Thlopthlocco Tribal Town.

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- November 6, 2019 - Muscogee August 19, 2019 Letter, Fish Weir Information, Final Determination of Lake Harris Sites for Further Evaluation, Lake Harris Survey Schedule, Lake Harris Site Evaluation Methods, Skyline Site Selection and Evaluation Methods, HPMP, IDP, and TCP Identification Plan outline discussion
- March 2, 2020 - Draft IDP, Draft TCP Identification Plan, Proposed APE

Alabama Power and the Office of Archeological Research (OAR) reviewed existing information on the 330 previously recorded archeological sites and identified sites for further evaluation. Of the 96 sites identified for preliminary archeological assessments, 79 were identified through OAR research and 17 additional sites were requested by the Muscogee (Creek) Nation[20]. Per the OAR, the preliminary archaeological assessment was intended to determine the general disposition of previously recorded archaeological sites selected in concert with consulting parties that were considered potentially significant cultural resources. The preliminary archeological assessment was conducted to determine the location, setting, and general condition of the sites. It involved both a literature/records search and, if needed, an on-site field reconnaissance. In addition, Alabama Power and OAR performed cultural resources assessments[21] at several sites at Skyline (previous surveys identified 141 sites as Undetermined in regard to their National Register of Historic Places [National Register] status in the Alabama State Site File). Finally, Alabama Power and OAR evaluated a sample of the 236 known caves recorded in Skyline (13 caves were investigated by using digital photography, mapping rock art locations, and documenting other utilization)[22].

The FERC SPD specified that "Alabama Power should also include both a written description of the APE, a map clearly identifying the APE and its relationship to the Harris Project Boundary, and concurrence from, the Alabama SHPO on the APE prior to conducting fieldwork (5.9(b)(6)." Beginning in May 2019, Alabama Power consulted with stakeholders to establish the Harris Project APE and Alabama Power is continuing to work with Alabama SHPO to finalize the APE.

[20] Filed on August 16, 2019.
[21] Cultural Resource Assessments conducted at Skyline and those to be conducted around Lake Harris comply with the Alabama SHPO guidelines. Methods for both the preliminary archeological assessments and cultural resources assessments were shared with appropriate HAT 6 members following the November 6, 2019 meeting.
[22] These investigations were led by Scott Shaw. Scott did the initial assessment of the caves and bat populations prior to field crews entering to conduct documentation. Scott made efforts to avoid large hibernating populations and record any bat species encountered within each visited cave. This information was shared with Alabama Power for dissemination as appropriate to USFWS and ADCNR.

In addition, Alabama Power worked with HAT 6 to develop the IDP and the TCP Identification Plan.

Per section 304 of the National Historic Preservation Act (NHPA), as amended, and 36 CFR 800.11(c), Alabama Power will "withhold any information about the location, character, or ownership of a historic property from public disclosure when disclosure may cause a significant invasion of privacy, risk harm to the historic property, or impede the use of a traditional religious site by practitioners." Alabama Power will file all such information collected to date as "privileged."

As noted in Section 2.0, the cultural documents filed concurrently with this ISR contain HAT 6 meeting summaries, presentations, and documentation of consultation.

12.3 VARIANCE FROM THE STUDY PLAN AND SCHEDULE

Alabama Power conducted the Cultural Resources Programmatic Agreement and Historic Properties Management Plan Study in full conformance with FERC's SPD.

Alabama Power continues to work with the Alabama SHPO for concurrence regarding the Harris APE and plans to file the final APE (with maps) by June 30, 2020.

12.4 REMAINING ACTIVITIES/MODIFICATIONS OR OTHER PROPOSED STUDIES

Alabama Power does not propose any additional studies beyond that in FERC's SPD.

Remaining Activities include:

- Alabama Power will complete consultation and determine the final Harris APE.
- Alabama Power will complete survey work and TCP identification by February 2021 and complete eligibility assessments for known cultural resources by July 2021.
- Alabama Power will conduct a cultural resources assessment for the sites identified during the Lake Harris preliminary archeological assessment.
- Alabama Power will begin drafting an HPMP, which will include provisions for future National Register eligibility evaluation of the Harris Project facilities in 2033, when the Project would reach an age of 50 years.
- Alabama Power will continue to determine and document the presence of cultural resources within the Project's APE; evaluate any known cultural resources for National Register eligibility (including the piers at Miller Covered Bridge); and determine if

authorized use of the Harris Project, including any proposed changes in Project operation proposed under a new license, would cause changes in the character or use of historic properties, if such properties exist.

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APPENDIX A

ACRONYMS AND ABBREVIATIONS

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ACRONYMS AND ABBREVIATIONS

A

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

B

BA	Biological Assessment
B.A.S.S.	Bass Anglers Sportsmen Society
BCC	Birds of Conservation Concern
BLM	U.S. Bureau of Land Management
BOD	Biological Oxygen Demand

C

°C	Degrees Celsius or Centrigrade
CEII	Critical Energy Infrastructure Information
CFR	Code of Federal Regulation
cfs	Cubic Feet per Second
cfu	Colony Forming Unit
CLEAR	Community Livability for the East Alabama Region
CPUE	Catch-per-unit-effort
CWA	Clean Water Act

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D

DEM	Digital Elevation Model
DIL	Drought Intensity Level
DO	Dissolved Oxygen
dsf	day-second-feet

E

EAP	Emergency Action Plan
ECOS	Environmental Conservation Online System
EFDC	Environmental Fluid Dynamics Code
EFH	Essential Fish Habitat
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act

F

°F	Degrees Fahrenheit
ft	Feet
F&W	Fish and Wildlife
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FNU	Formazin Nephelometric Unit
FOIA	Freedom of Information Act
FPA	Federal Power Act

G

GCN	Greatest Conservation Need
GIS	Geographic Information System
GNSS	Global Navigation Satellite System
GPS	Global Positioning Systems
GSA	Geological Survey of Alabama

H

Harris Project	R.L. Harris Hydroelectric Project
HAT	Harris Action Team
HEC	Hydrologic Engineering Center
HEC-DSSVue	HEC-Data Storage System and Viewer
HEC-FFA	HEC-Flood Frequency Analysis
HEC-RAS	HEC-River Analysis System
HEC-ResSim	HEC-Reservoir System Simulation Model
HEC-SSP	HEC-Statistical Software Package

HDSS	High Definition Stream Survey
hp	Horsepower
HPMP	Historic Properties Management Plan
HPUE	Harvest-per-unit-effort
HSB	Horseshoe Bend National Military Park

I

IBI	Index of Biological Integrity
IDP	Inadvertent Discovery Plan
IIC	Intercompany Interchange Contract
IVM	Integrated Vegetation Management
ILP	Integrated Licensing Process
IPaC	Information Planning and Conservation
ISR	Initial Study Report

J

JTU	Jackson Turbidity Units

K

kV	Kilovolt
kva	Kilovolt-amp
kHz	Kilohertz

L

LIDAR	Light Detection and Ranging
LWF	Limited Warm-water Fishery
LWPOA	Lake Wedowee Property Owners’ Association

M

m	Meter
m^3	Cubic Meter
M&I	Municipal and Industrial
mg/L	Milligrams per liter
ml	Milliliter
mgd	Million Gallons per Day
µg/L	Microgram per liter
µs/cm	Microsiemens per centimeter
mi^2	Square Miles
MOU	Memorandum of Understanding

MPN	Most Probable Number
MRLC	Multi-Resolution Land Characteristics
msl	Mean Sea Level
MW	Megawatt
MWh	Megawatt Hour

N

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

O

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

P

PA	Programmatic Agreement
PAD	Pre-Application Document
PDF	Portable Document Format
pH	Potential of Hydrogen
PID	Preliminary Information Document
PLP	Preliminary Licensing Proposal
Project	R.L. Harris Hydroelectric Project
PUB	Palustrine Unconsolidated Bottom
PURPA	Public Utility Regulatory Policies Act
PWC	Personal Watercraft
PWS	Public Water Supply

Q

QA/QC	Quality Assurance/Quality Control

R

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

S

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

T

T&E	Threatened and Endangered
TCP	Traditional Cultural Properties
TMDL	Total Maximum Daily Load
TNC	The Nature Conservancy
TRB	Tallapoosa River Basin
TSI	Trophic State Index
TSS	Total Suspended Soils
TVA	Tennessee Valley Authority

U

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

W

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

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kenneth.boswell@adeca.alabama.gov; kmhunt@maxxsouth.net; kmo0025@auburn.edu;
kodom@southernco.com; kpritchett@ukb-nsn.gov; kristina.mullins@usace.army.mil;
lakewedoweedocks@gmail.com; leeanne.wofford@ahc.alabama.gov; leon.m.cromartie@usace.army.mil;
leopoldo_miranda@fws.gov; lewis.c.sumner@usace.army.mil; lgallen@balch.com; lgarland68@aol.com;
lindastone2012@gmail.com; llangley@coushattatribela.org; lovvornt@randolphcountyalabama.gov;
lswinsto@southernco.com; lth0002@auburn.edu; mark@americanwhitewater.org; matt.brooks@alea.gov;
matthew.marshall@dcnr.alabama.gov; mayo.lydia@epa.gov; mcoker@southernco.com; mcw0061@aces.edu;
mdollar48@gmail.com; meredith.h.ladart@usace.army.mil; mhpwedowee@gmail.com;
mhunter@alabamarivers.org; michael.w.creswell@usace.army.mil; midwaytreasures@bellsouth.net;
mike.holley@dcnr.alabama.gov; mitchell.reid@tnc.org; mlen@adem.alabama.gov; mnedd@blm.gov;
monte.terhaar@ferc.gov; mooretn@auburn.edu; mprandolphwater@gmail.com; nancyburnes@centurylink.net;
nanferebee@juno.com; nathan.aycock@dcnr.alabama.gov; orr.chauncey@epa.gov; pace.wilber@noaa.gov;
partnersinfo@wwfus.org; patti.powell@dcnr.alabama.gov; patty@ten-o.com; paul.trudine@gmail.com;
ptrammell@reddyice.com; publicaffairs@doc.gov; rachel.mcnamara@ferc.gov; raebutler@mcn-nsn.gov;
rancococ@teleclipse.net; randall.b.harvey@usace.army.mil; randy@randyrogerslaw.com;
randy@wedoweemarine.com; rbmorris222@gmail.com; rcodydeal@hotmail.com; reuteem@auburn.edu;
richardburnes3@gmail.com; rick.oates@forestry.alabama.gov; rickmcwhorter723@icloud.com; rifraft2@aol.com;
rjdavis8346@gmail.com; robert.a.allen@usace.army.mil; roger.mcneil@noaa.gov; ron@lakewedowee.org;
rosoweka@mcn-nsn.gov; russtown@nc-cherokee.com; ryan.prince@forestry.alabama.gov;
sabrinawood@live.com; sandnfrench@gmail.com; sarah.salazar@ferc.gov; sbryan@pci-nsn.gov;
scsmith@southernco.com; section106@mcn-nsn.gov; sforehand@russelllands.com; sgraham@southernco.com;
sherry.bradley@adph.state.al.us; sidney.hare@gmail.com; simsthe@aces.edu; snelson@nelsonandco.com;
sonjahollomon@gmail.com; steve.bryant@dcnr.alabama.gov; stewartjack12@bellsouth.net;
straylor426@bellsouth.net; sueagnew52@yahoo.com; tdadunaway@gmail.com; thpo@pci-nsn.gov;
thpo@tttown.org; timguffey@jcch.net; tlamberth@russelllands.com; tlmills@southernco.com;
todd.fobian@dcnr.alabama.gov; tom.diggs@ung.edu; tom.lettieri47@gmail.com;
tom.littlepage@adeca.alabama.gov; tpfreema@southernco.com; trayjim@bellsouth.net; triciastearns@gmail.com;
twstjohn@southernco.com; variscom506@gmail.com; walker.mary@epa.gov;
william.puckett@swcc.alabama.gov; wmcampbell218@gmail.com; wrighr2@aces.edu;
wsgardne@southernco.com; wtanders@southernco.com

Subject: Harris Relicensing - Initial Study Report
Date: Friday, April 10, 2020 2:59:07 PM

Harris relicensing stakeholders,

Pursuant to FERC's Integrated Licensing Process, Alabama Power filed its Harris Project Initial Study Report (ISR) today. Concurrent with the ISR filing, Alabama Power filed six draft study reports and two cultural resources documents, including consultation records for each. Stakeholders may access the ISR and the draft study reports on FERC's website (http://www.ferc.gov) by going to the "eLibrary" link and entering the docket number (P-2628). The ISR and study reports are also available on the Project relicensing website at https://harrisrelicensing.com.

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Thanks,

Angie Anderegg
Hydro Services
(205)257-2251
arsegars@southernco.com

From:	Anderegg, Angela Segars
To:	Hathorn, James E Jr SAM
Cc:	Peeples, Alan L.; Odom, Kenneth; Graham, Stacey A.
Subject:	FW: Corps presentation
Date:	Tuesday, April 14, 2020 10:54:12 AM
Attachments:	Harris Relicensing Corps Meeting Res-Sim results 2020-03-17 final.pptx

Hi James,

Attached is the presentation from our March 17th conference call. The Initial Study Report for Harris relicensing, along with the draft Operating Curve Change Feasibility Analysis Report was filed with FERC last Friday. The Initial Study Report meeting is coming up on April 28th. Hope you can join us.

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Hydro Services

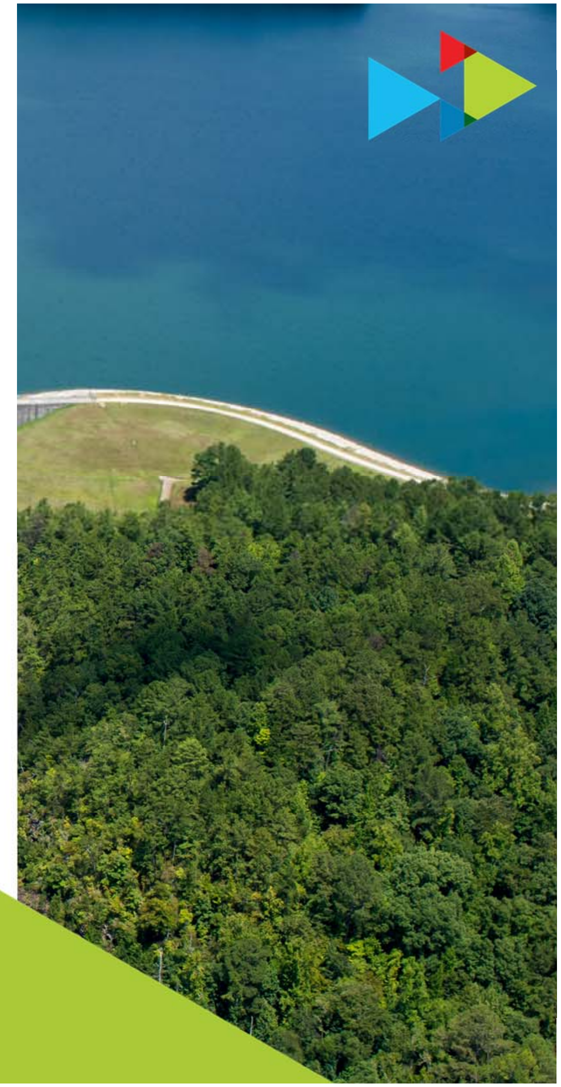
(205)257-2251
arsegars@southernco.com

Alabama Power

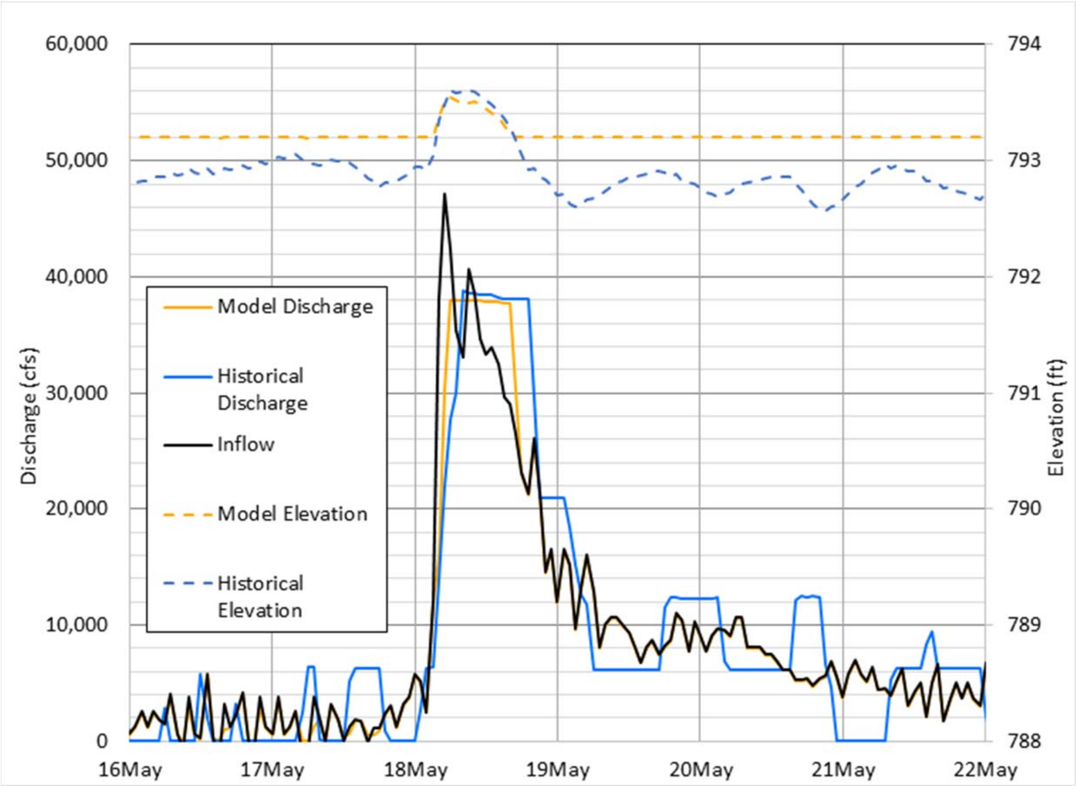
Harris Dam Relicensing

Project Operations – HAT 1

Res-Sim Results



Res-Sim Calibration



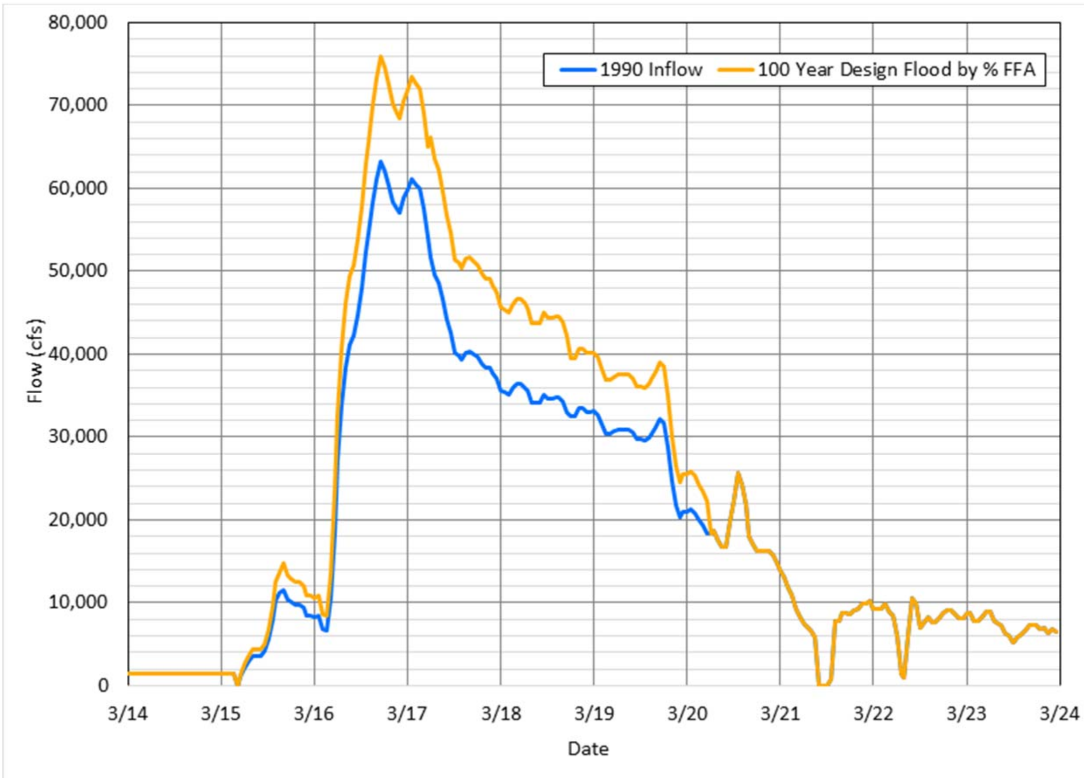
Hydrograph Results for 100-yr Design Flood for Harris Dam

AVERAGE FLOW (days)	SCALE FACTOR	1990 FLOOD (cfs)	1% FFA (cfs)	DESIGN FLOOD (cfs)
1-day	1.20	51,531	61,900	61,961
3-days	1.28	38,170	48,900	47,489
5-days	1.21	32,110	39,000	39,702

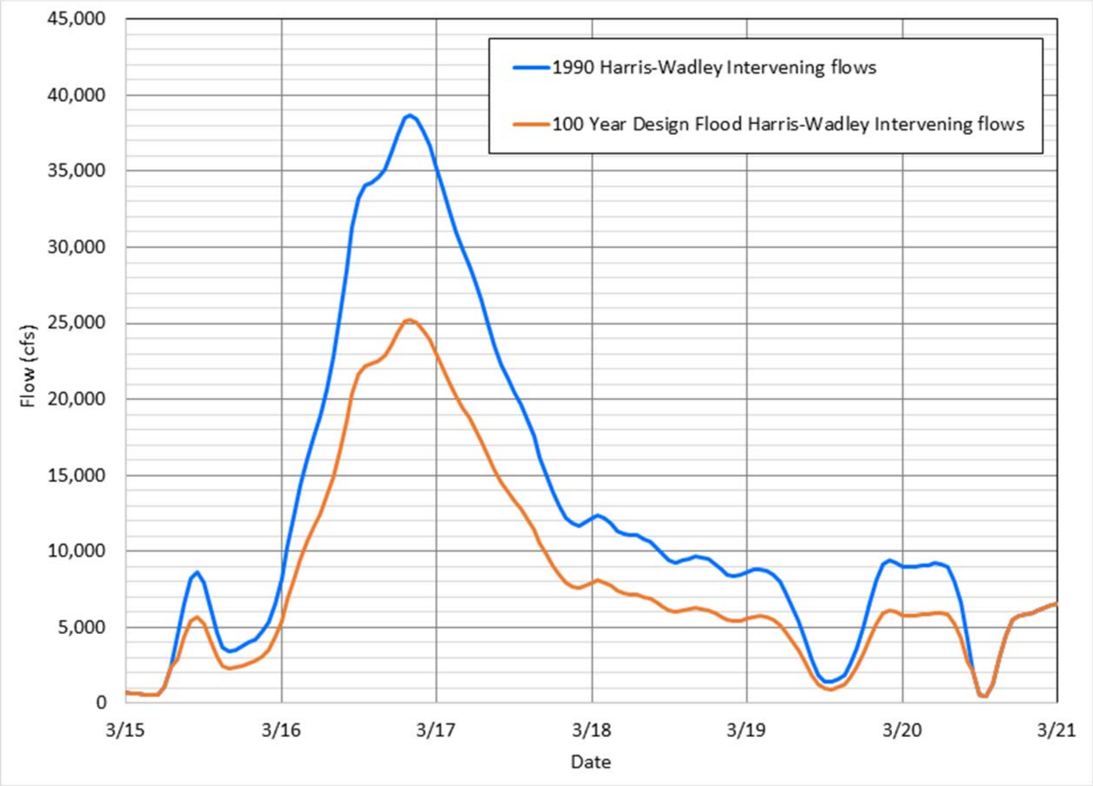
Hydrograph Results for 100-yr Design Flood Intervening Flows for Harris-Wadley Reach

AVERAGE FLOW (days)	SCALE FACTOR	1990 FLOOD (cfs)	1% FFA (cfs)	DESIGN FLOOD (cfs)
1-day	0.6513	32,858	21,400	21,400
3-days	0.6613	18,889	12,500	12,332
5-days	0.6477	14,358	9,300	9,358

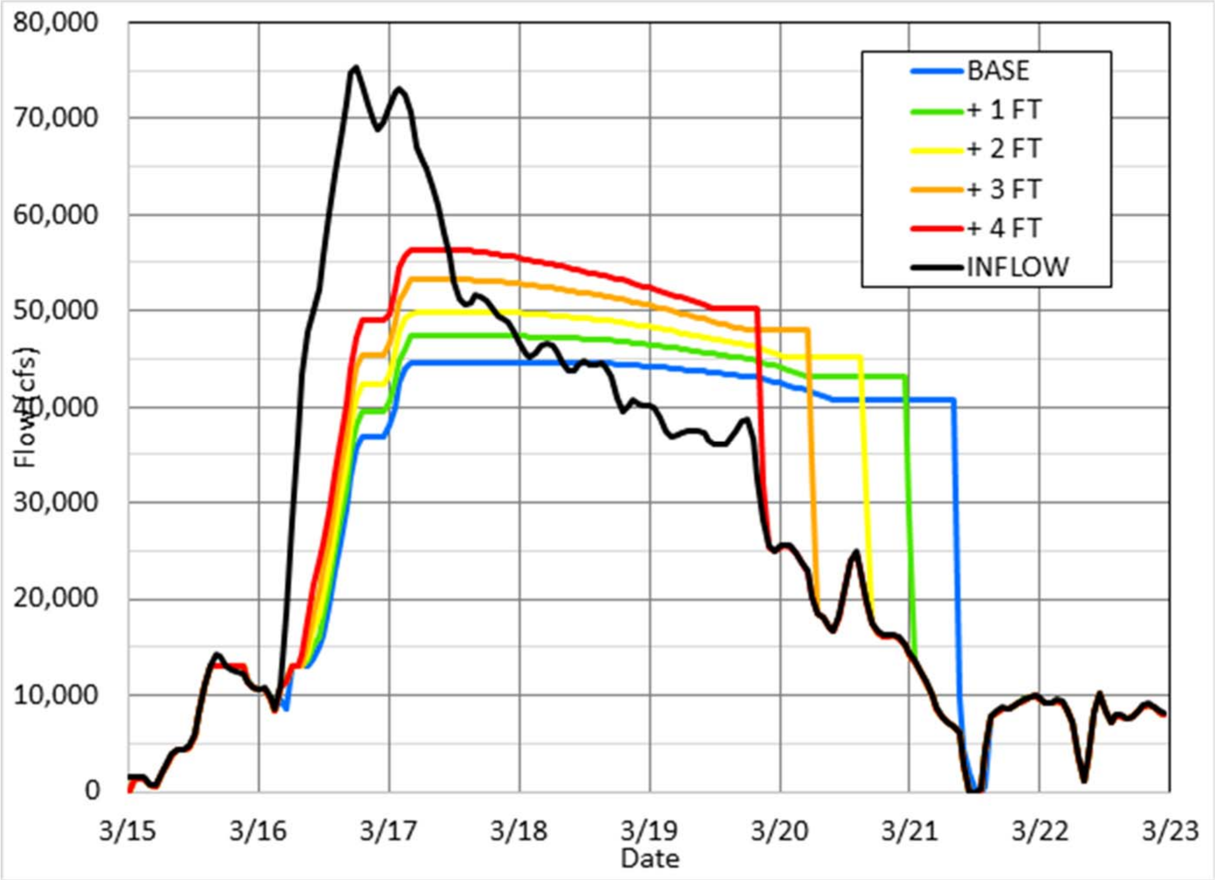
Inflows at Harris Reservoir for 100-yr Design Flood for Harris Dam



Intervening Flows at Wadley for 100-yr Design Flood for Harris Dam



100-year Design Flood Outflows



Downstream Results Locations

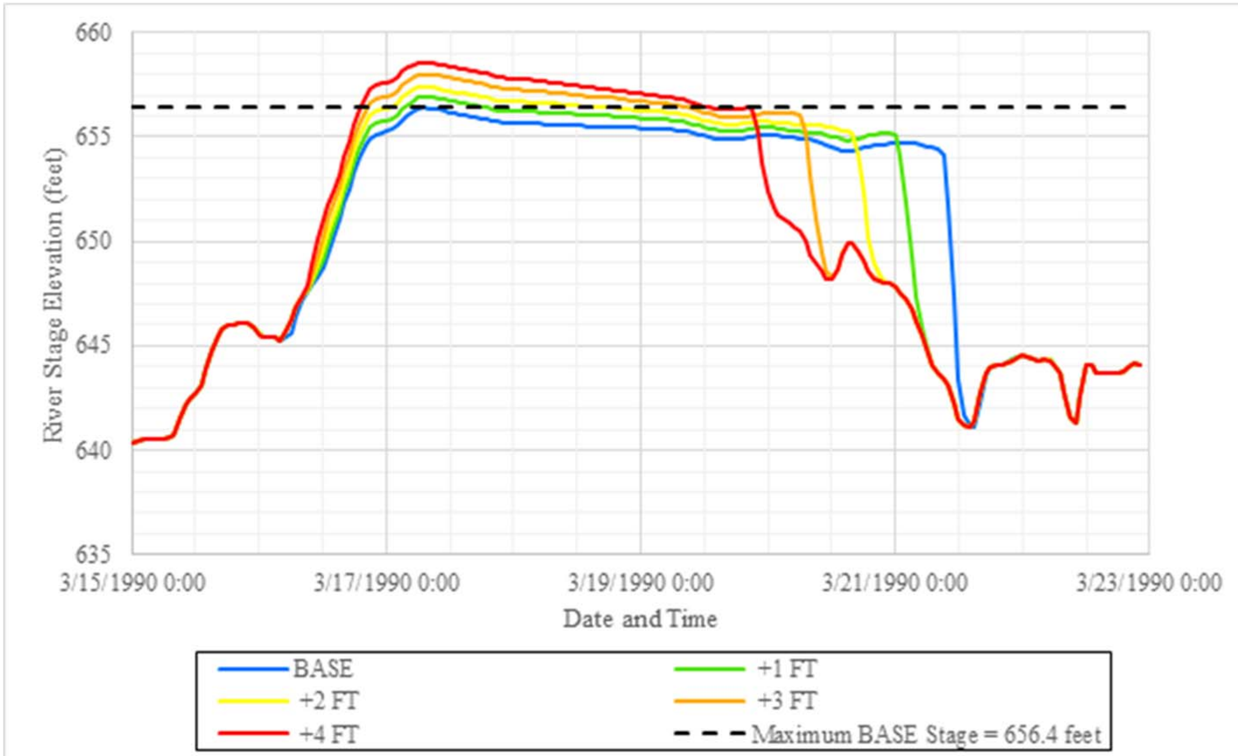
Changes in Water Surface Elevation

Location	Distance from Dam (miles)	Max Water Surface Rise (feet)			
		+ 1 foot	+ 2 feet	+ 3 feet	+ 4 feet
RM 129.7 (Malone, AL)	7	0.5	1.0	1.6	2.2
RM 122.7 (Wadley, AL)	14	0.5	1.1	1.7	2.4
RM 115.7	21	0.6	1.1	1.8	2.5
RM 108.7	28	0.5	1.0	1.6	2.2
RM 101.7	35	0.4	0.7	1.1	1.4
RM 93.7 (Horseshoe Bend)	43	0.3	0.7	1.0	1.4

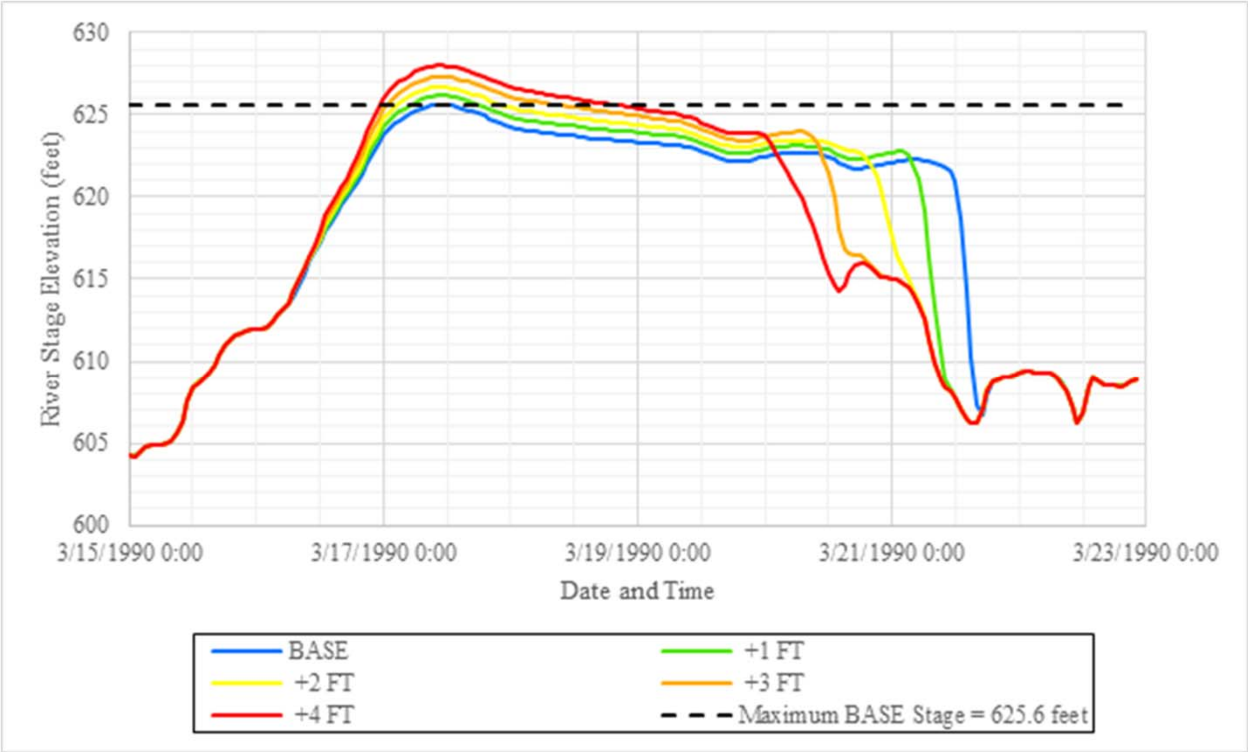
Changes in Flood Duration

Location	Distance from Dam (miles)	Duration above Baseline Condition Max Elevation (hours)			
		+ 1 foot	+ 2 feet	+ 3 feet	+ 4 feet
RM 129.7 (Malone, AL)	7	15	43	61	67
RM 122.7 (Wadley, AL)	14	12	19	32	43
RM 115.7	21	13	21	34	46
RM 108.7	28	14	26	38	48
RM 101.7	35	17	27	40	48
RM 93.7 (Horseshoe Bend)	43	18	29	39	47

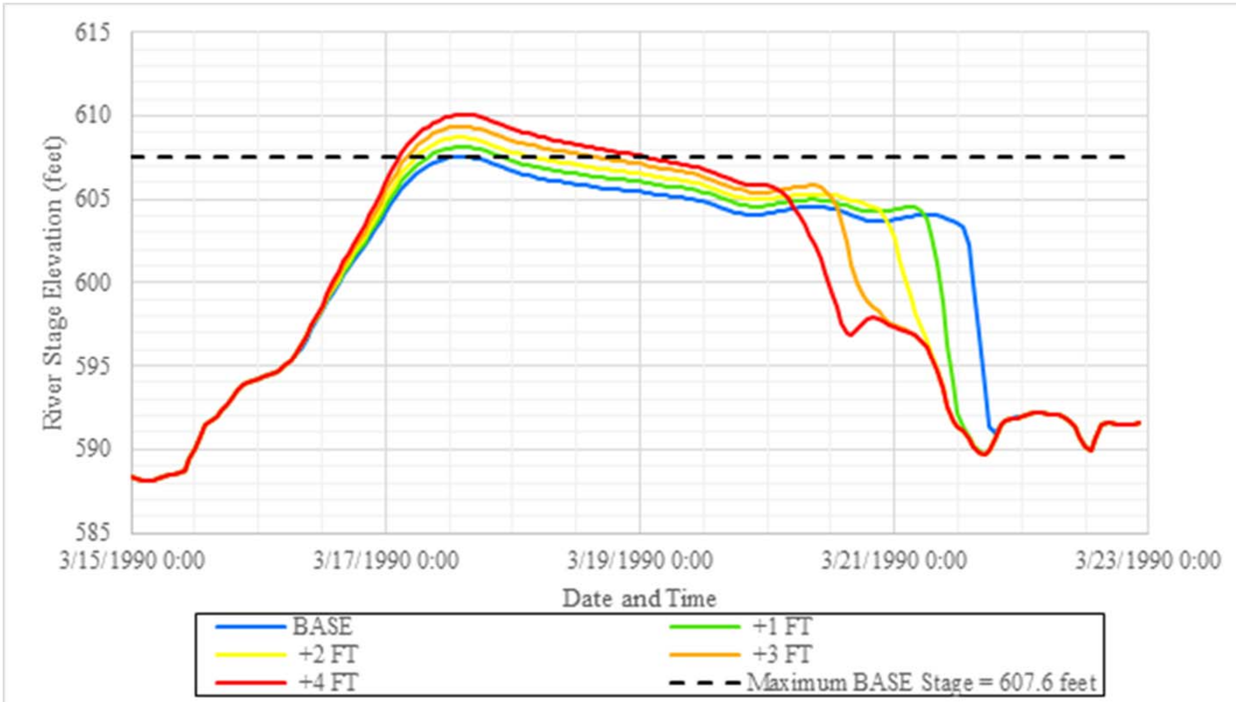
Malone (RM 129.7)



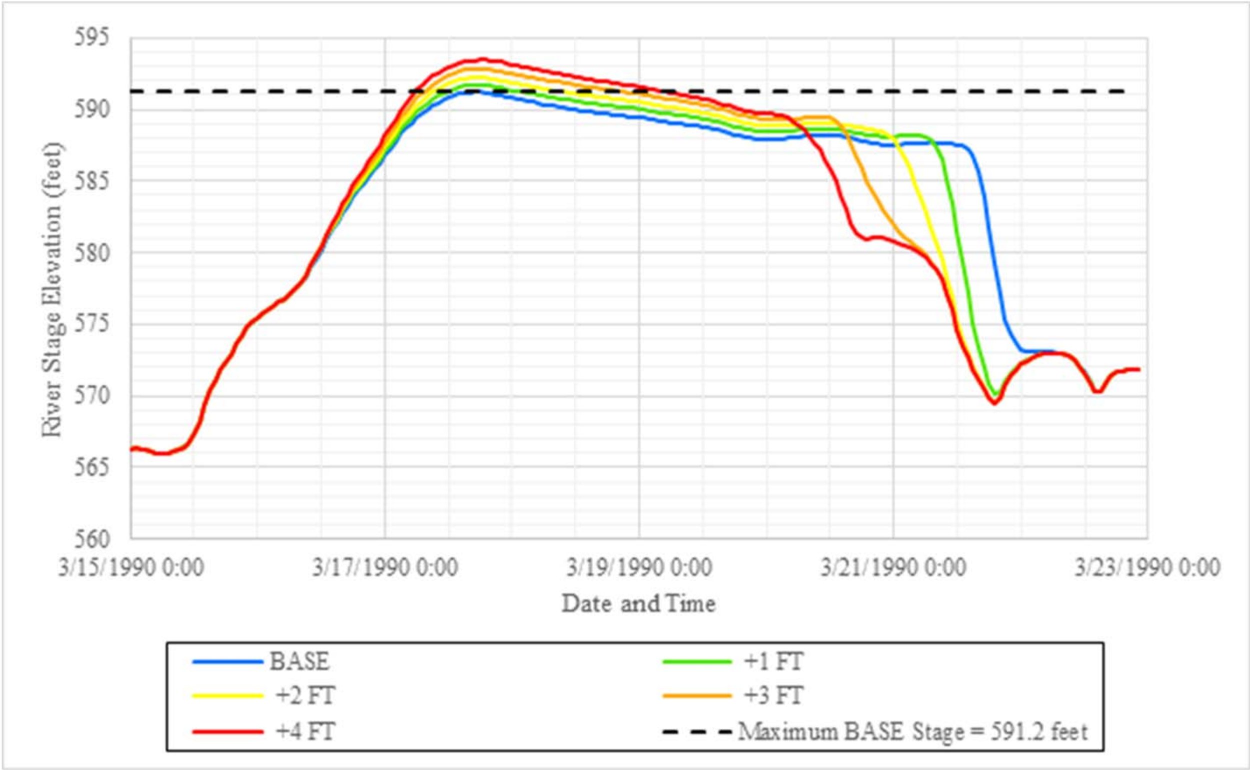
Wadley (RM 122.7)



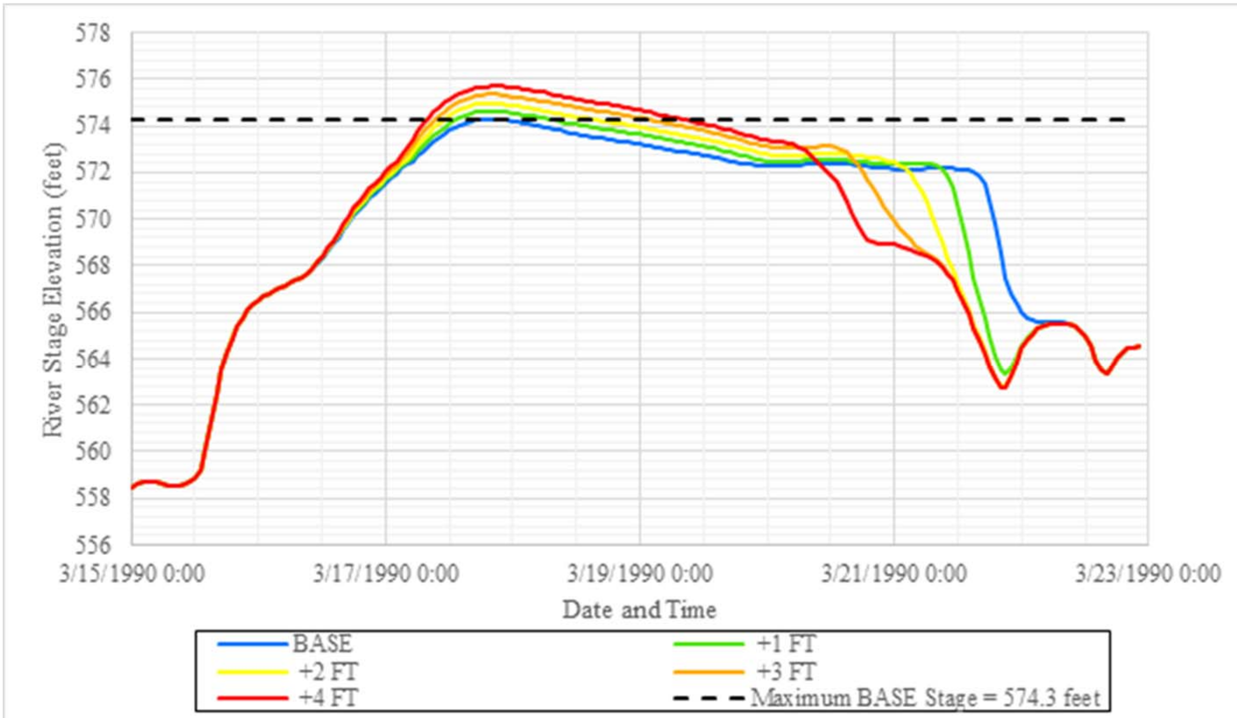
Between Wadley and Horseshoe Bend (RM 115.7)



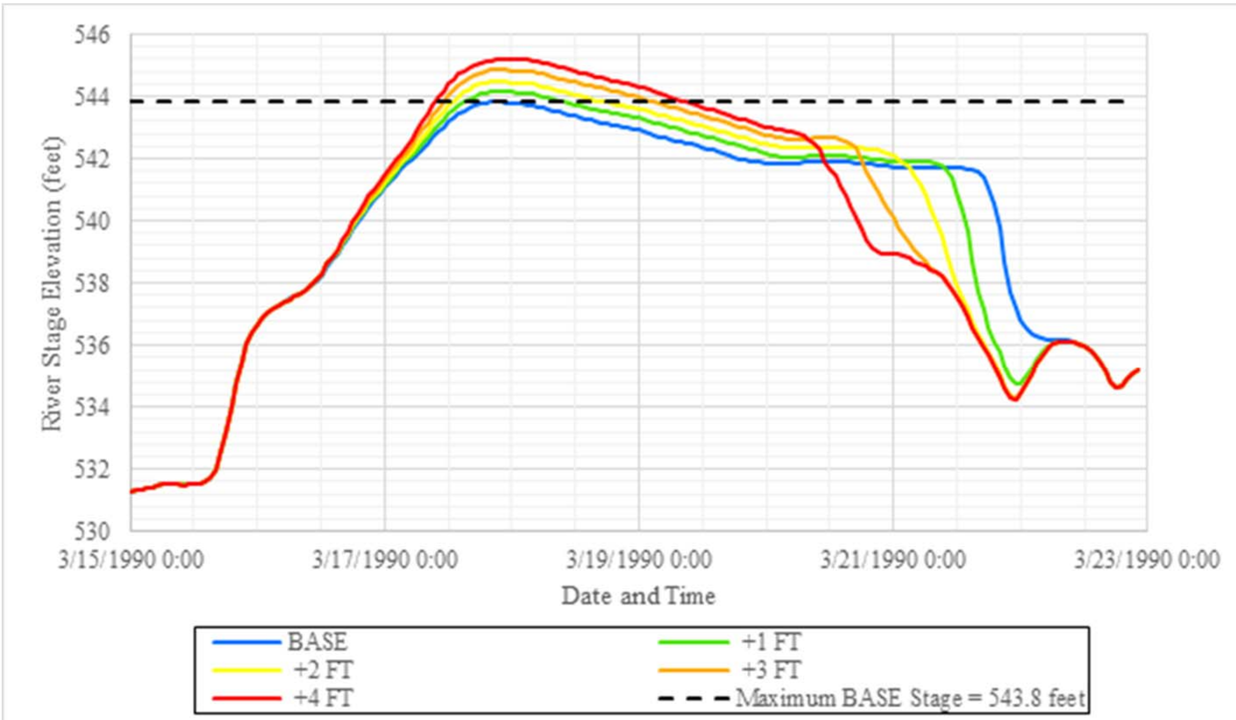
Between Wadley and Horseshoe Bend (RM108.7)

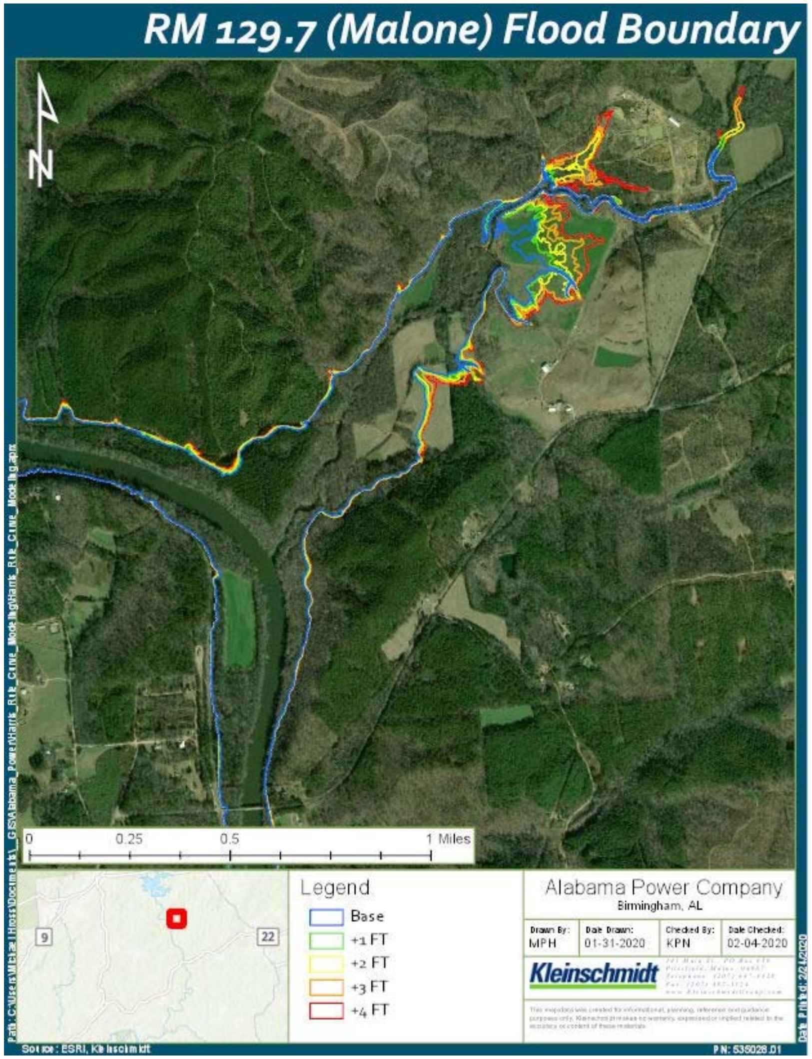


Between Wadley and Horseshoe Bend (RM 101.7)

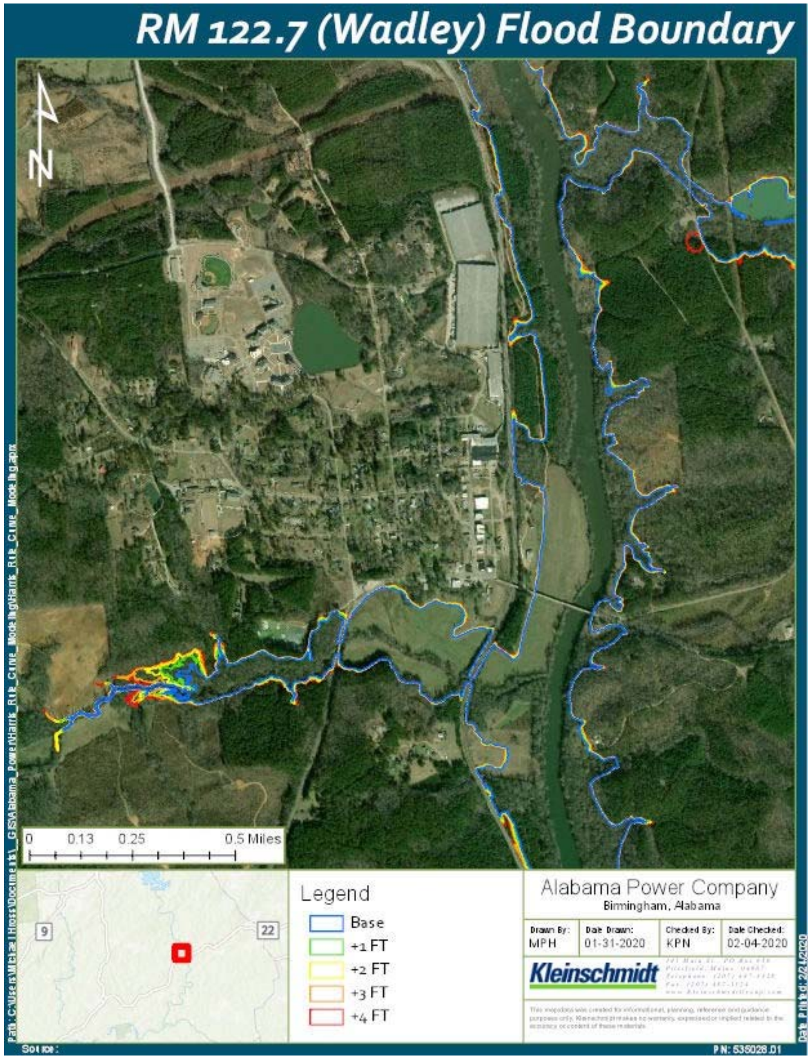


Horseshoe Bend (RM 93.7)





RM 129.7 (Malone) Flood Boundary
0
0.25
0.5
1 Miles
Legend
Base
+1 FT
+2 FT
+3 FT
+4 FT
Alabama Power Company
Birmingham, AL
Drawn By: MPH
Date Drawn: 01-31-2020
Checked By: KPN
Date Checked: 02-04-2020
Kleinschmidt
Source: ESRI, Kleinschmidt
PN: 535028.01



RM 122.7 (Wadley) Flood Boundary
0
0.13
0.25
0.5 Miles
Legend
Base
+1 FT
+2 FT
+3 FT
+4 FT
Alabama Power Company
Birmingham, Alabama
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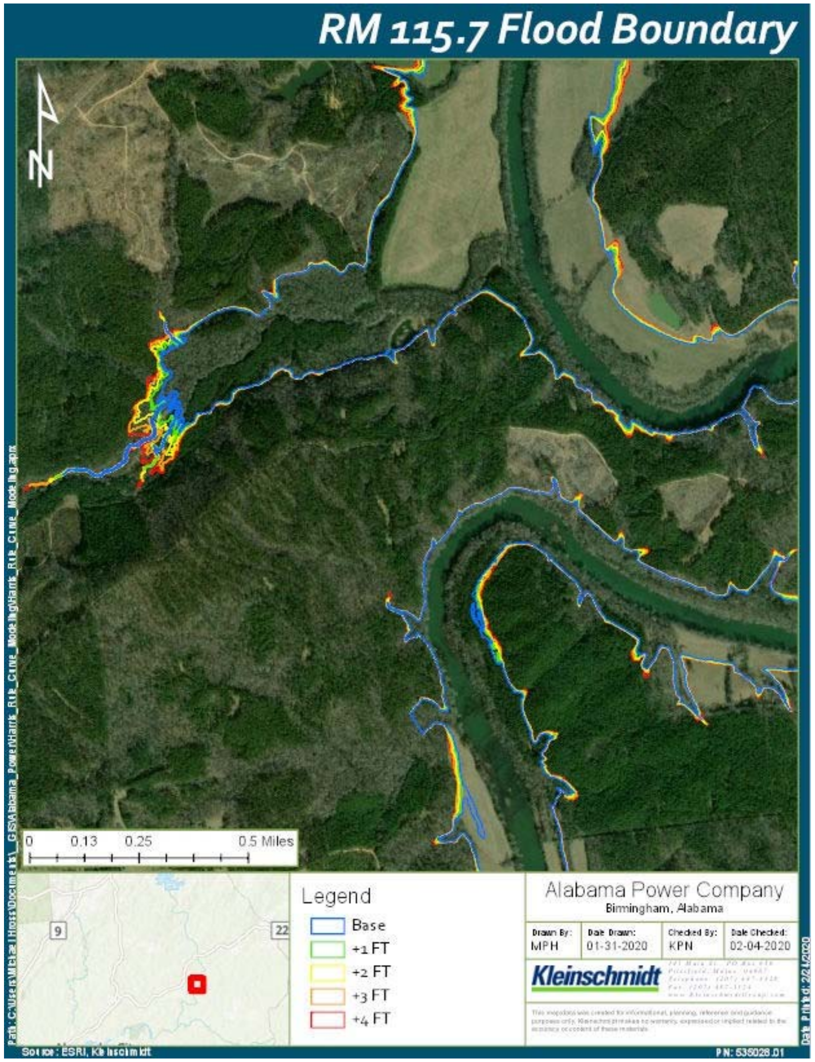
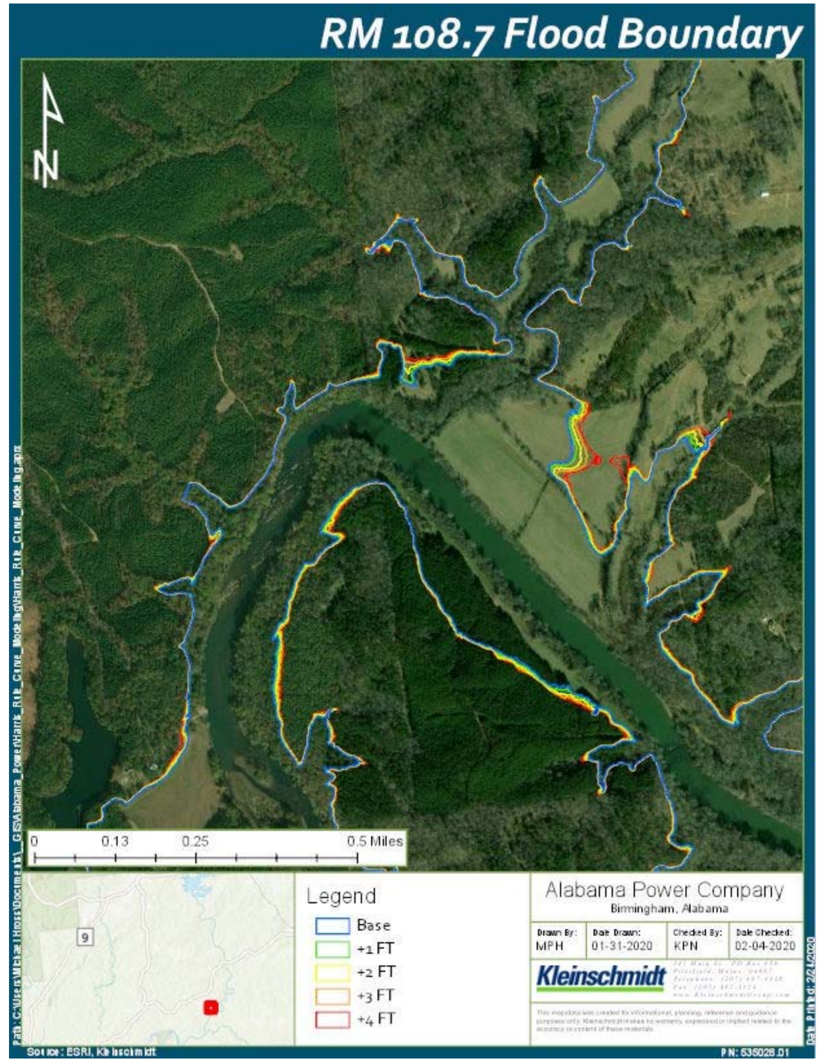
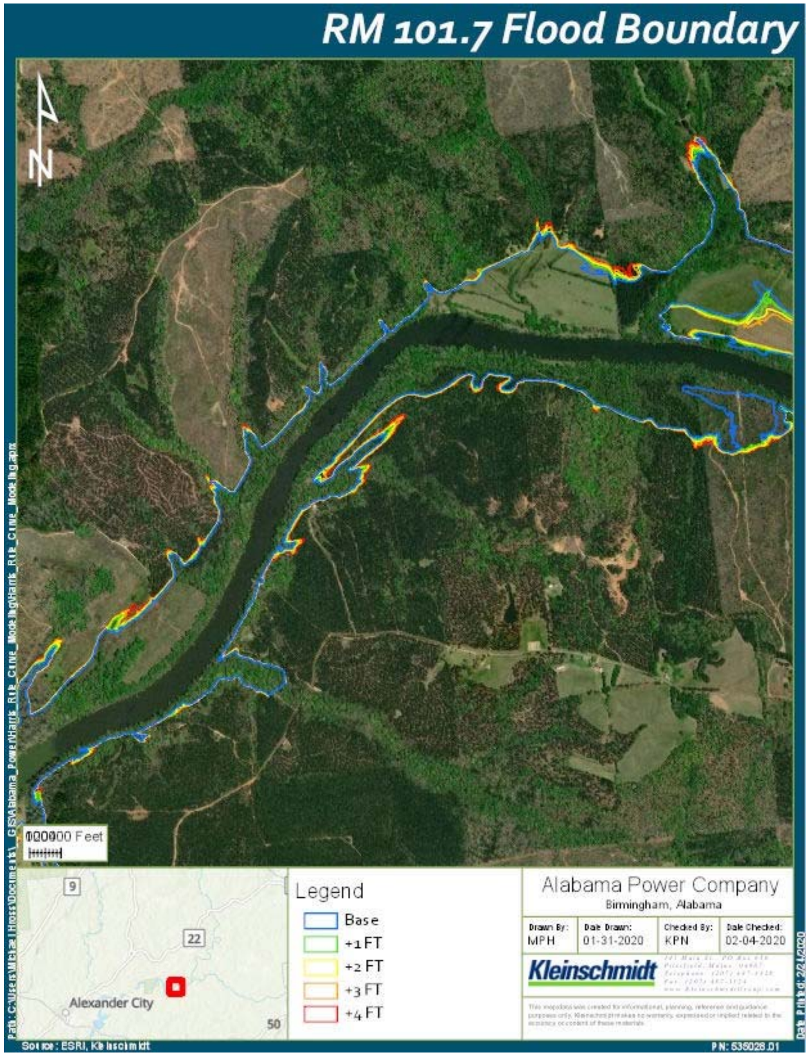
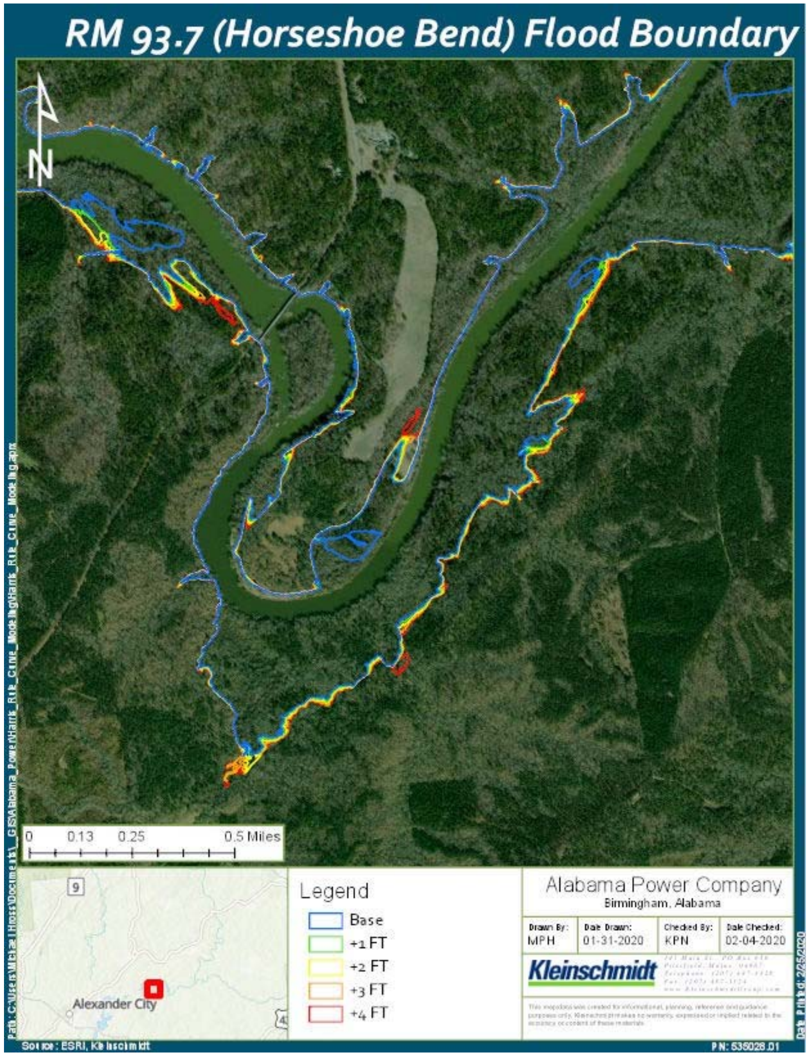

RM 115.7 Flood Boundary
0
0.13
0.25
0.5 Miles
Legend
Base
+1 FT
+2 FT
+3 FT
+4 FT
Alabama Power Company
Birmingham, Alabama
Drawn By: MPH
Date Drawn: 01-31-2020
Checked By: KPN
Date Checked: 02-04-2020
Kleinschmidt
Source: ESRI, Kleinschmidt
PN: 535028.01


RM 108.7 Flood Boundary
0
0.13
0.25
0.5 Miles
Legend
Base
+1 FT
+2 FT
+3 FT
+4 FT
Alabama Power Company
Birmingham, Alabama
Drawn By: MPH
Date Drawn: 01-31-2020
Checked By: KPN
Date Checked: 02-04-2020
Kleinschmidt
Source: ESRI, Kleinschmidt
PN: 535028.01


RM 101.7 Flood Boundary
Legend
Base
+1 FT
+2 FT
+3 FT
+4 FT
Alabama Power Company
Birmingham, Alabama
Drawn By: MPH
Date Drawn: 01-31-2020
Checked By: KPN
Date Checked: 02-04-2020
Kleinschmidt
Alexander City
Source: ESRI, Kleinschmidt
PN: 535028.01


RM 93.7 (Horseshoe Bend) Flood Boundary
0 0.13 0.25 0.5 Miles
Legend
Base
+1 FT
+2 FT
+3 FT
+4 FT
Alabama Power Company
Birmingham, Alabama
Drawn By: MPH
Date Drawn: 01-31-2020
Checked By: KPN
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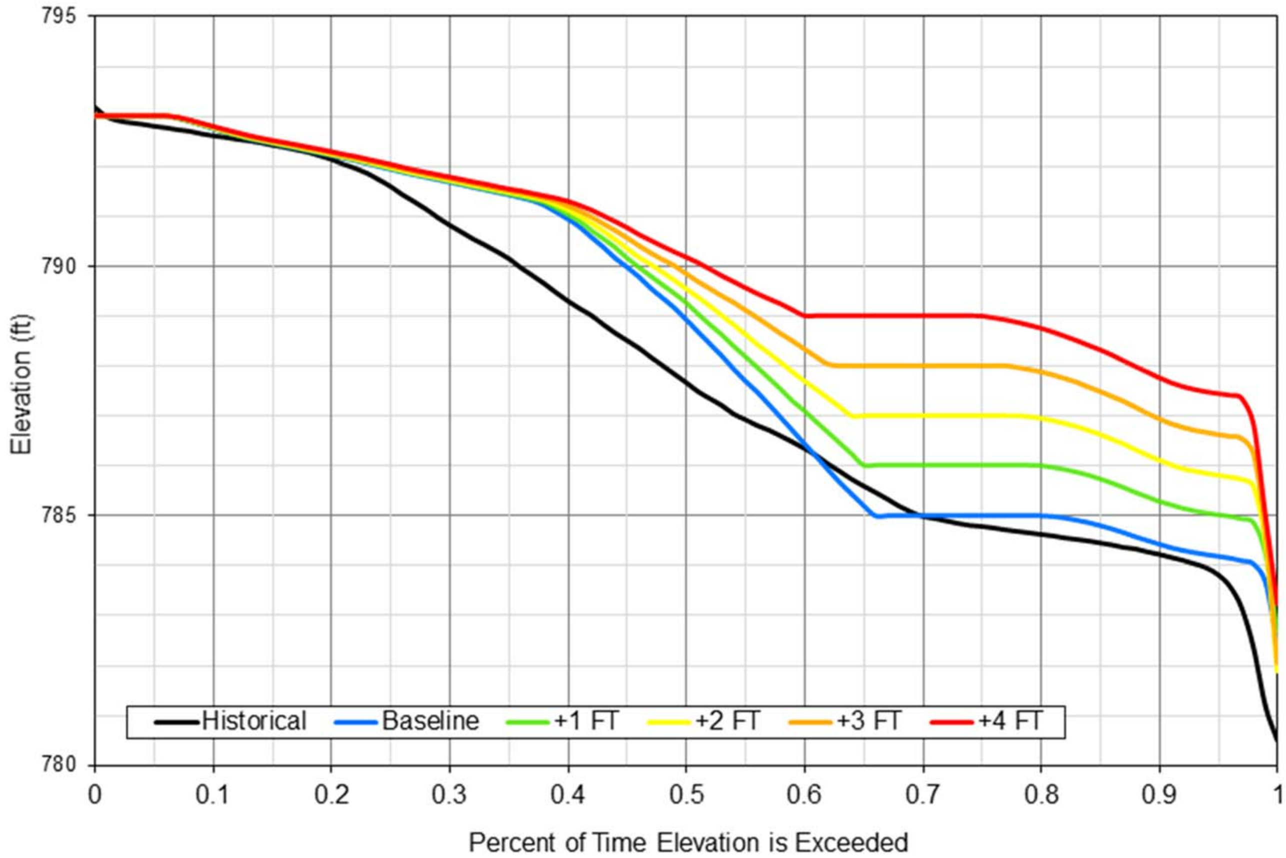
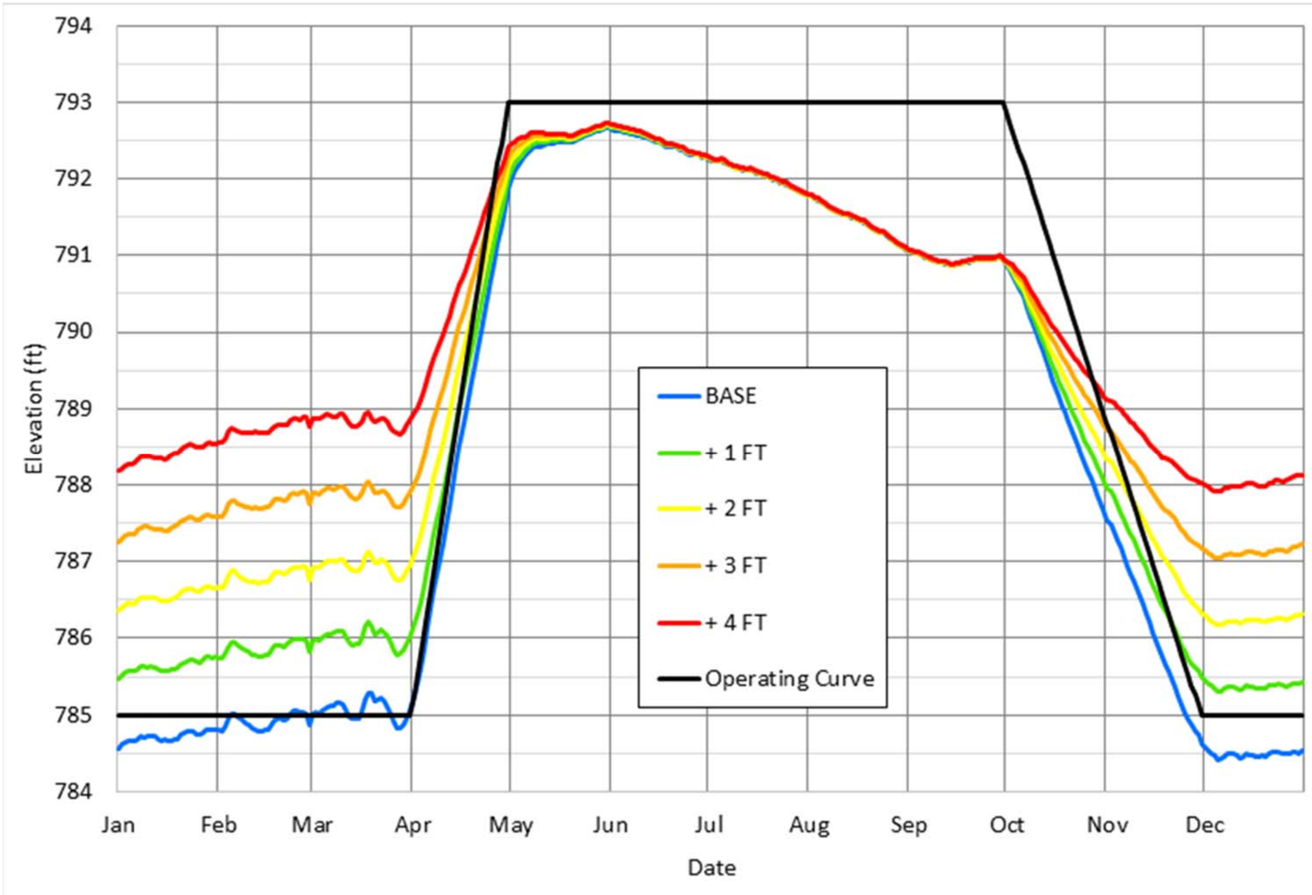
Kleinschmidt
Alexander City
Source: ESRI, Kleinschmidt
PN: 535028.01

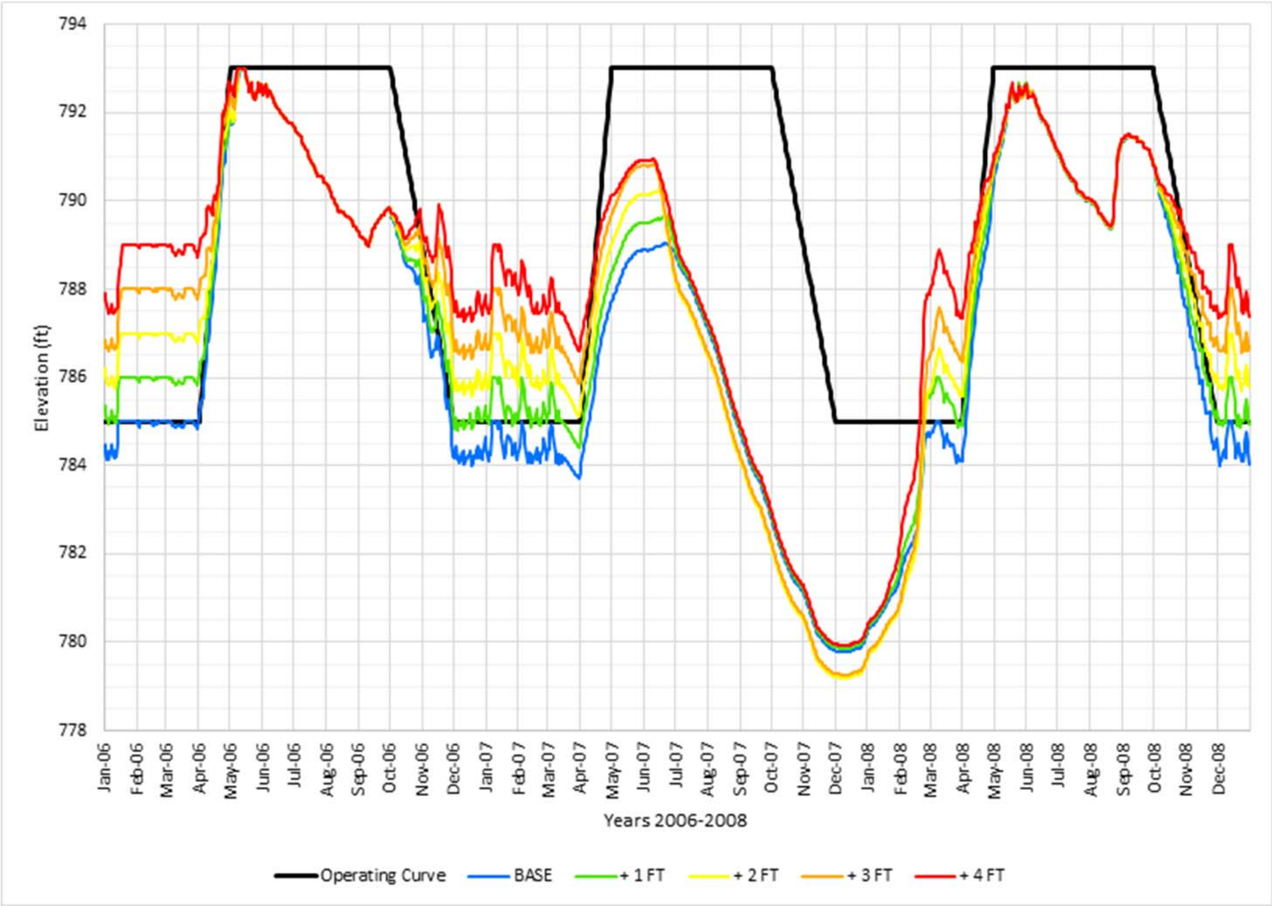
Annual stage duration-frequency curve



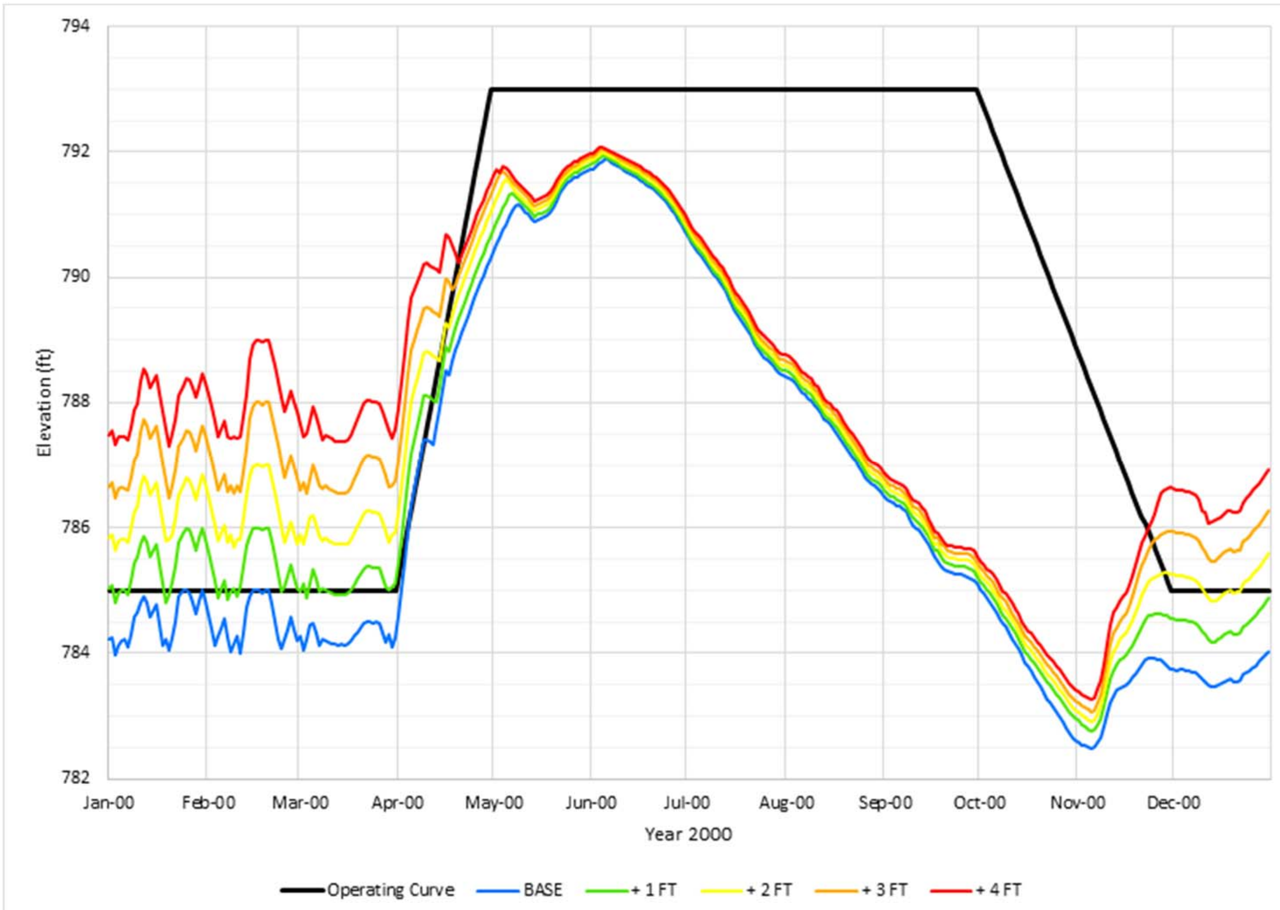
Average Daily Elevations



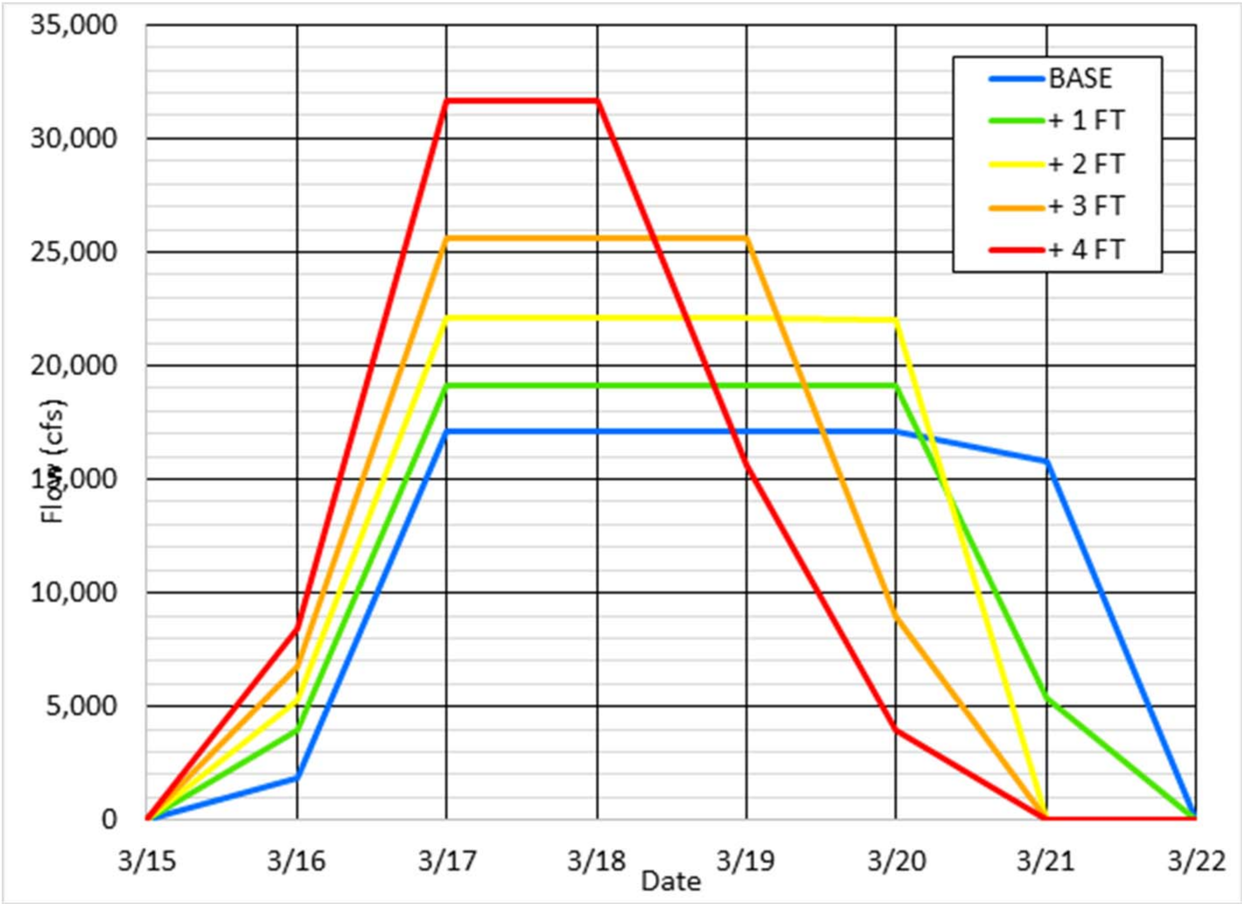
?????? (still working on this one) Drought



Effects of winter pool increases in 2000



Change in magnitude and duration of release for modeled 1990 spill event



Effects on Navigation

Percentage of Time in Each Navigation Level					
Navigation Channel Depth	**Baseline (785 ft msl)**	**+1 foot**	**+2 feet**	**+3 feet**	**+4 feet**
9.0 ft	73%	73%	73%	73%	73%
7.5 ft	6%	6%	6%	6%	6%
None	21%	21%	21%	21%	21%

Effects on Drought Operations

Percent of Time in Each Drought Intensity Level (DIL)					
DIL	**Baseline (785 ft msl)**	**+ 1 foot**	**+ 2 feet**	**+ 3 feet**	**+ 4 feet**
0	81%	81%	81%	81%	81%
1	13%	13%	13%	13%	14%
2	4%	4%	4%	4%	4%
3	1%	1%	1%	1%	1%

Effects on Downstream Release and Green Plan Flows

-- changes are negligible

Alabama Power

From:	Hathorn, James E Jr CIV USARMY CESAM (US)
To:	Anderegg, Angela Segars
Cc:	Peeples, Alan L.; Odom, Kenneth; Graham, Stacey A.; Harvey, Randall B CIV USARMY CESAM (USA)
Subject:	RE: Corps presentation
Date:	Thursday, April 16, 2020 1:59:33 PM

EXTERNAL MAIL: Caution Opening Links or Files

Hey Angie,

Thank you for the responses and additional information. I will let you know if I have any follow-up questions or data request.

Have a great day!

James

From: Anderegg, Angela Segars [mailto:ARSEGARS@southernco.com]
Sent: Thursday, April 16, 2020 1:05 PM
To: Hathorn, James E Jr CIV USARMY CESAM (US) <James.E.Hathorn.Jr@usace.army.mil>
Cc: Peeples, Alan L. <ALPEEPLE@southernco.com>; Odom, Kenneth <KODOM@SOUTHERNCO.COM>; Graham, Stacey A. <SGRAHAM@SOUTHERNCO.COM>; Harvey, Randall B CIV USARMY CESAM (USA) <Randall.B.Harvey@usace.army.mil>
Subject: [Non-DoD Source] RE: Corps presentation

Hi James,

Below are answers for your questions. Please let me know if you have anything else.

Thanks!

Slide 2 – What is the year of the calibration? This is from the May 2013 event.

Slide 16, 17, 18 – Is it possible to add APC flowage easement and the FEMA 100yr & 500yr FIRM mapping layers? Alabama Power does not have any easements or flowage rights below Harris Dam (not until you get to the top of Martin). The 100-year flood elevation downstream of Harris Dam is an approximation. No hydraulic study has been performed and no base flood elevations or flood depths are shown on the FEMA maps. There is also no defined 500-year flood elevation downstream of Harris to include in the mapping layers.

Will USACE have an opportunity to review the ResSim/RAS hourly and daily models along with the output? Yes, the models and output will be made available to all stakeholders.

Angie Anderegg
Hydro Services
(205)257-2251
arsegars@southernco.com

From: Hathorn, James E Jr CIV USARMY CESAM (US) <James.E.Hathorn.Jr@usace.army.mil>
Sent: Tuesday, April 14, 2020 6:41 PM
To: Anderegg, Angela Segars <ARSEGARS@southernco.com>
Cc: Peeples, Alan L. <ALPEEPLE@southernco.com>; Odom, Kenneth <KODOM@SOUTHERNCO.COM>; Graham, Stacey A. <SGRAHAM@SOUTHERNCO.COM>; Harvey, Randall B CIV USARMY CESAM (USA) <Randall.B.Harvey@usace.army.mil>
Subject: RE: Corps presentation

EXTERNAL MAIL: Caution Opening Links or Files

Hey Angie,

I have a few questions regarding the presentation.

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James Hathorn, Jr
Chief, Water Management Section
US Army Corps of Engineers, Mobile District
Office: 251-690-2730
Cell: 251-509-5368
Email: james.e.hathorn.jr@usace.army.mil
Web: Blockedwww.sam.usace.army.mil [sam.usace.army.mil]

Essayons!

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Sent: Tuesday, April 14, 2020 10:54 AM
To: Hathorn, James E Jr CIV USARMY CESAM (US) <James.E.Hathorn.Jr@usace.army.mil>
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From: APC Harris Relicensing
To: "harrisrelicensing@southernco.com"
Bcc: 1942jthompson420@gmail.com; 9sling@charter.net; alcondir@aol.com; allan.creamer@ferc.gov; alpeeple@southernco.com; amanda.fleming@kleinschmidtgroup.com; amanda.mcbride@ahc.alabama.gov; amccartn@blm.gov; ammcvica@southernco.com; amy.silvano@dcnr.alabama.gov; andrew.nix@dcnr.alabama.gov; arsegars@southernco.com; athall@fujifilm.com; aubie84@yahoo.com; awhorton@corblu.com; bart_roby@msn.com; baxterchip@yahoo.com; bboozer6@gmail.com; bdavis081942@gmail.com; beckyrainwater1@yahoo.com; bill_pearson@fws.gov; blacklake20@gmail.com; blm_es_inquiries@blm.gov; bob.stone@smimail.net; bradandsue795@gmail.com; bradfordt71@gmail.com; brian.atkins@adeca.alabama.gov; bruce.bradford@forestry.alabama.gov; bsmith0253@gmail.com; butchjackson60@gmail.com; bwhaley@randolphcountyeda.com; carolbuggknight@hotmail.com; celestine.bryant@actribe.org; cengstrom@centurytel.net; ceo@jcchamber.com; cggoodma@southernco.com; cgnav@uscg.mil; chad@cleburnecountychamber.com; chandlermary937@gmail.com; chiefknight2002@yahoo.com; chimneycove@gmail.com; chris.goodell@kleinschmidtgroup.com; chris.greene@dcnr.alabama.gov; chris.smith@dcnr.alabama.gov; chris@alaudubon.org; chuckdenman@hotmail.com; clark.maria@epa.gov; claychamber@gmail.com; clint.lloyd@auburn.edu; cljohnson@adem.alabama.gov; clowry@alabamarivers.org; cmnix@southernco.com; coetim@aol.com; colin.dinken@kleinschmidtgroup.com; cooper.jamal@epa.gov; coty.brown@alea.gov; craig.litteken@usace.army.mil; crystal.davis@adeca.alabama.gov; crystal.lakewedoweedocks@gmail.com; crystal@hunterbend.com; dalerose120@yahoo.com; damon.abernethy@dcnr.alabama.gov; dbronson@charter.net; dcnr.wffdirector@dcnr.alabama.gov; decker.chris@epa.gov; devridr@auburn.edu; dfarr@randolphcountyalabama.gov; dhayba@usgs.gov; djmoore@adem.alabama.gov; dkanders@southernco.com; dolmoore@southernco.com; donnamat@aol.com; doug.deaton@dcnr.alabama.gov; dpreston@southernco.com; drheinzen@charter.net; ebt.drt@numail.org; eilandfarm@aol.com; el.brannon@yahoo.com; elizabeth-toombs@cherokee.org; emathews@aces.edu; eric.sipes@ahc.alabama.gov; evan.lawrence@dcnr.alabama.gov; evan_collins@fws.gov; eveham75@gmail.com; fal@adem.alabama.gov; fredcanoes@aol.com; gardenergirl04@yahoo.com; garyprice@centurytel.net; gene@wedoweelakehomes.com; georgettraylor@centurylink.net; gerryknight77@gmail.com; gfhorn@southernco.com; gjobsis@americanrivers.org; gld@adem.alabama.gov; glea@wgsarrell.com; gordon.lisa-perras@epa.gov; goxford@centurylink.net; granddadth@windstream.net; harry.merrill47@gmail.com; helen.greer@att.net; henry.mealing@kleinschmidtgroup.com; holliman.daniel@epa.gov; info@aeconline.com; info@tunica.org; inspector_003@yahoo.com; irapar@centurytel.net; irwiner@auburn.edu; j35sullivan@blm.gov; james.e.hathorn.jr@sam.usace.army.mil; jason.moak@kleinschmidtgroup.com; jcandler7@yahoo.com; jcarlee@southernco.com; jec22641@aol.com; jeddins@achp.gov; jefbaker@southernco.com; jeff_duncan@nps.gov; jeff_powell@fws.gov; jennifer.l.jacobson@usace.army.mil; jennifer_grunewald@fws.gov; jerrelshell@gmail.com; jessecunningham@msn.com; jfcrew@southernco.com; jhancock@balch.com; jharjo@alabama-quassarte.org; jhaslbauer@adem.alabama.gov; jhouser@osiny.org; jkwdurham@gmail.com; jlowe@alabama-quassarte.org; jnyerby@southernco.com; joan.e.zehrt@usace.army.mil; john.free@psc.alabama.gov; johndiane@sbcglobal.net; jonas.white@usace.army.mil; josh.benefield@forestry.alabama.gov; jpsparrow@att.net; jsrasber@southernco.com; jthacker@southernco.com; jthroneberry@tnc.org; judymcrealtor@gmail.com; jwest@alabamarivers.org; kajumba.ntale@epa.gov; karen.brunso@chickasaw.net; kate.cosnahan@kleinschmidtgroup.com; kcarleton@choctaw.org; kechandl@southernco.com; keith.gauldin@dcnr.alabama.gov; keith.henderson@dcnr.alabama.gov; kelly.schaeffer@kleinschmidtgroup.com; ken.wills@jcdh.org; kenbarnes01@yahoo.com; kenneth.boswell@adeca.alabama.gov; kmhunt@maxxsouth.net; kmo0025@auburn.edu; kodom@southernco.com; kpritchett@ukb-nsn.gov; kristina.mullins@usace.army.mil; lakewedoweedocks@gmail.com; leeanne.wofford@ahc.alabama.gov; leon.m.cromartie@usace.army.mil; leopoldo_miranda@fws.gov; lewis.c.sumner@usace.army.mil; lgallen@balch.com; lgarland68@aol.com; lindastone2012@gmail.com; llangley@coushattatribela.org; lovvornt@randolphcountyalabama.gov; lswinsto@southernco.com; lth0002@auburn.edu; mark@americanwhitewater.org; matt.brooks@alea.gov; matthew.marshall@dcnr.alabama.gov; mayo.lydia@epa.gov; mcoker@southernco.com; mcw0061@aces.edu; mdollar48@gmail.com; meredith.h.ladart@usace.army.mil; mhpwedowee@gmail.com; mhunter@alabamarivers.org; michael.w.creswell@usace.army.mil; midwaytreasures@bellsouth.net; mike.holley@dcnr.alabama.gov; mitchell.reid@tnc.org; mlen@adem.alabama.gov; mnedd@blm.gov; monte.terhaar@ferc.gov; mooretn@auburn.edu; mprandolphwater@gmail.com; nancyburnes@centurylink.net; nanferebee@juno.com; nathan.aycock@dcnr.alabama.gov; orr.chauncey@epa.gov; pace.wilber@noaa.gov; partnersinfo@wwfus.org; patti.powell@dcnr.alabama.gov; patty@ten-o.com; paul.trudine@gmail.com; ptrammell@reddyice.com; publicaffairs@doc.gov; rachel.mcnamara@ferc.gov; raebutler@mcn-nsn.gov; rancococ@teleclipse.net; randall.b.harvey@usace.army.mil; randy@randyrogerslaw.com; randy@wedoweemarine.com; rbmorris222@gmail.com; rcodydeal@hotmail.com; reuteem@auburn.edu; richardburnes3@gmail.com; rick.oates@forestry.alabama.gov; rickmcwhorter723@icloud.com; rifraft2@aol.com; rjdavis8346@gmail.com; robert.a.allen@usace.army.mil; robinwaldrep@yahoo.com; roger.mcneil@noaa.gov; ron@lakewedowee.org; rosoweka@mcn-nsn.gov; russtown@nc-cherokee.com; ryan.prince@forestry.alabama.gov; sabrinawood@live.com; sandnfrench@gmail.com; sarah.salazar@ferc.gov; sbryan@pci-nsn.gov; scsmith@southernco.com; section106@mcn-nsn.gov; sforehand@russelllands.com; sgraham@southernco.com; sherry.bradley@adph.state.al.us; sidney.hare@gmail.com; simsthe@aces.edu; snelson@nelsonandco.com; sonjahollomon@gmail.com; steve.bryant@dcnr.alabama.gov; stewartjack12@bellsouth.net; straylor426@bellsouth.net; sueagnew52@yahoo.com; tdadunaway@gmail.com; thpo@pci-nsn.gov; thpo@tttown.org; timguffey@jcch.net; tlamberth@russelllands.com; tlmills@southernco.com; todd.fobian@dcnr.alabama.gov; tom.diggs@ung.edu; tom.lettieri47@gmail.com; tom.littlepage@adeca.alabama.gov; tpfreema@southernco.com; trayjim@bellsouth.net; triciastearns@gmail.com; twstjohn@southernco.com; variscom506@gmail.com; walker.mary@epa.gov; william.puckett@swcc.alabama.gov; wmcampbell218@gmail.com; wrighr2@aces.edu; wsgardne@southernco.com; wtanders@southernco.com

Subject: Harris Relicensing - Initial Study Report meeting agenda and call-in details
Date: Friday, April 24, 2020 10:23:13 AM
Attachments: 2020-04-28 ISR Meeting Agenda.doc

Good morning

Please join us for the Initial Study Report (ISR) meeting on **April 28, 2020, starting at 9 am central time**. The agenda for the meeting is attached. On Monday April 27th, the presentation will be made available on our website (www.harrisrelicensing.com [harrisrelicensing.com]) and distributed to stakeholders as a pdf.

If you have questions regarding the ISR that you would like Alabama Power to address during the meeting, please send your questions to harrisrelicensing@southernco.com by 4 pm on April 27th. There will also be an opportunity to ask questions during the meeting.

Below is the Skype link and call in instructions. Participating via the Skype link is preferred in order to reduce audio issues. However, if you don't have access to Skype, you can call the number below and follow along with the presentation we'll send out on April 27th.

Join Skype Meeting

To join the ISR Meeting via phone, please call (205) 257-2663 OR (404) 460-0605. At the prompt, enter conference ID 489472 followed by the pound (#) sign.

When you join the call, you will be in the virtual lobby and directed that you are waiting on the leader to admit you. As you are admitted, you will be instructed that you are now joining the meeting and that the meeting has been locked. As soon as everyone has joined, we will conduct a roll call of attendees by organization (for example, I will ask who is on the call from the Alabama Department of Conservation and Natural Resources, etc.). If you do not belong to an organization, you will be given a chance at the end of the roll call to state your name and affiliation. Once the roll call is over, your phone will be muted and the first presentation will begin. As noted above, Alabama Power will take questions following each study review and will unmute participants during that time. Once the phones are unmuted, you will have to press star 6 (*6) in order to be heard.

Please let me know if you have any questions.

Angie Anderegg
Hydro Services
(205)257-2251
arsegars@southernco.com

Meeting Agenda
April 28, 2020
9:00 AM
Skype Meeting

Meeting Purpose: Review the information presented in the Initial Study Report (ISR) filed with FERC on April 10, 2020.

Welcome, Roll Call, Safety, and Agenda

HAT 6: Cultural Resources

HAT 5: Recreation Evaluation

HAT 4: Project Lands

HAT 1: Project Operations

Operating Curve Feasibility Analysis

Downstream Release Alternatives

HAT 2: Water Quality and Use

Water Quality

Erosion and Sedimentation

HAT 3: Fish and Wildlife

Threatened and Endangered Species

Downstream Aquatic Habitat

Aquatic Resources

Next Steps and Questions

From: APC Harris Relicensing
To: "harrisrelicensing@southernco.com"
Bcc: 1942jthompson420@gmail.com; 9sling@charter.net; alcondir@aol.com; allan.creamer@ferc.gov; alpeeple@southernco.com; amanda.fleming@kleinschmidtgroup.com; amanda.mcbride@ahc.alabama.gov; amccartn@blm.gov; ammcvica@southernco.com; amy.silvano@dcnr.alabama.gov; andrew.nix@dcnr.alabama.gov; arsegars@southernco.com; athall@fujifilm.com; aubie84@yahoo.com; awhorton@corblu.com; bart_roby@msn.com; baxterchip@yahoo.com; bboozer6@gmail.com; bdavis081942@gmail.com; beckyrainwater1@yahoo.com; bill_pearson@fws.gov; blacklake20@gmail.com; blm_es_inquiries@blm.gov; bob.stone@smimail.net; bradandsue795@gmail.com; bradfordt71@gmail.com; brian.atkins@adeca.alabama.gov; bruce.bradford@forestry.alabama.gov; bsmith0253@gmail.com; butchjackson60@gmail.com; bwhaley@randolphcountyeda.com; carolbuggknight@hotmail.com; celestine.bryant@actribe.org; cengstrom@centurytel.net; ceo@jcchamber.com; cggoodma@southernco.com; cgnav@uscg.mil; chad@cleburnecountychamber.com; chandlermary937@gmail.com; chiefknight2002@yahoo.com; chimneycove@gmail.com; chris.goodell@kleinschmidtgroup.com; chris.greene@dcnr.alabama.gov; chris.smith@dcnr.alabama.gov; chris@alaudubon.org; chuckdenman@hotmail.com; clark.maria@epa.gov; claychamber@gmail.com; clint.lloyd@auburn.edu; cljohnson@adem.alabama.gov; clowry@alabamarivers.org; cmnix@southernco.com; coetim@aol.com; colin.dinken@kleinschmidtgroup.com; cooper.jamal@epa.gov; coty.brown@alea.gov; craig.litteken@usace.army.mil; crystal.davis@adeca.alabama.gov; crystal.lakewedoweedocks@gmail.com; crystal@hunterbend.com; dalerose120@yahoo.com; damon.abernethy@dcnr.alabama.gov; dbronson@charter.net; dcnr.wffdirector@dcnr.alabama.gov; decker.chris@epa.gov; devridr@auburn.edu; dfarr@randolphcountyalabama.gov; dhayba@usgs.gov; djmoore@adem.alabama.gov; dkanders@southernco.com; dolmoore@southernco.com; donnamat@aol.com; doug.deaton@dcnr.alabama.gov; dpreston@southernco.com; drheinzen@charter.net; ebt.drt@numail.org; eilandfarm@aol.com; el.brannon@yahoo.com; elizabeth-toombs@cherokee.org; emathews@aces.edu; eric.sipes@ahc.alabama.gov; evan.lawrence@dcnr.alabama.gov; evan_collins@fws.gov; eveham75@gmail.com; fal@adem.alabama.gov; fredcanoes@aol.com; gardenergirl04@yahoo.com; garyprice@centurytel.net; gene@wedoweelakehomes.com; georgettraylor@centurylink.net; gerryknight77@gmail.com; gfhorn@southernco.com; gjobsis@americanrivers.org; gld@adem.alabama.gov; glea@wgsarrell.com; gordon.lisa-perras@epa.gov; goxford@centurylink.net; granddadth@windstream.net; harry.merrill47@gmail.com; helen.greer@att.net; henry.mealing@kleinschmidtgroup.com; holliman.daniel@epa.gov; info@aeconline.com; info@tunica.org; inspector_003@yahoo.com; irapar@centurytel.net; irwiner@auburn.edu; j35sullivan@blm.gov; james.e.hathorn.jr@sam.usace.army.mil; jason.moak@kleinschmidtgroup.com; jcandler7@yahoo.com; jcarlee@southernco.com; jec22641@aol.com; jeddins@achp.gov; jefbaker@southernco.com; jeff_duncan@nps.gov; jeff_powell@fws.gov; jennifer.l.jacobson@usace.army.mil; jennifer_grunewald@fws.gov; jerrelshell@gmail.com; jessecunningham@msn.com; jfcrew@southernco.com; jhancock@balch.com; jharjo@alabama-quassarte.org; jhaslbauer@adem.alabama.gov; jhouser@osiny.org; jkwdurham@gmail.com; jlowe@alabama-quassarte.org; jnyerby@southernco.com; joan.e.zehrt@usace.army.mil; john.free@psc.alabama.gov; johndiane@sbcglobal.net; jonas.white@usace.army.mil; josh.benefield@forestry.alabama.gov; jpsparrow@att.net; jsrasber@southernco.com; jthacker@southernco.com; jthroneberry@tnc.org; judymcrealtor@gmail.com; jwest@alabamarivers.org; kajumba.ntale@epa.gov; karen.brunso@chickasaw.net; kate.cosnahan@kleinschmidtgroup.com; kcarleton@choctaw.org; kechandl@southernco.com; keith.gauldin@dcnr.alabama.gov; keith.henderson@dcnr.alabama.gov; kelly.schaeffer@kleinschmidtgroup.com; ken.wills@jcdh.org; kenbarnes01@yahoo.com; kenneth.boswell@adeca.alabama.gov; kmhunt@maxxsouth.net; kmo0025@auburn.edu; kodom@southernco.com; kpritchett@ukb-nsn.gov; kristina.mullins@usace.army.mil; lakewedoweedocks@gmail.com; leeanne.wofford@ahc.alabama.gov; leon.m.cromartie@usace.army.mil; leopoldo_miranda@fws.gov; lewis.c.sumner@usace.army.mil; lgallen@balch.com; lgarland68@aol.com; lindastone2012@gmail.com; llangley@coushattatribela.org; lovvornt@randolphcountyalabama.gov; lswinsto@southernco.com; lth0002@auburn.edu; mark@americanwhitewater.org; matt.brooks@alea.gov; matthew.marshall@dcnr.alabama.gov; mayo.lydia@epa.gov; mcoker@southernco.com; mcw0061@aces.edu; mdollar48@gmail.com; meredith.h.ladart@usace.army.mil; mhpwedowee@gmail.com; mhunter@alabamarivers.org; michael.w.creswell@usace.army.mil; midwaytreasures@bellsouth.net; mike.holley@dcnr.alabama.gov; mitchell.reid@tnc.org; mlen@adem.alabama.gov; mnedd@blm.gov; monte.terhaar@ferc.gov; mooretn@auburn.edu; mprandolphwater@gmail.com; nancyburnes@centurylink.net; nanferebee@juno.com; nathan.aycock@dcnr.alabama.gov; orr.chauncey@epa.gov; pace.wilber@noaa.gov; partnersinfo@wwfus.org; patti.powell@dcnr.alabama.gov; patty@ten-o.com; paul.trudine@gmail.com; ptrammell@reddyice.com; publicaffairs@doc.gov; rachel.mcnamara@ferc.gov; raebutler@mcn-nsn.gov; rancococ@teleclipse.net; randall.b.harvey@usace.army.mil; randy@randyrogerslaw.com; randy@wedoweemarine.com; rbmorris222@gmail.com; rcodydeal@hotmail.com; reuteem@auburn.edu; richardburnes3@gmail.com; rick.oates@forestry.alabama.gov; rickmcwhorter723@icloud.com; rifraft2@aol.com; rjdavis8346@gmail.com; robert.a.allen@usace.army.mil; robinwaldrep@yahoo.com; roger.mcneil@noaa.gov; ron@lakewedowee.org; rosoweka@mcn-nsn.gov; russtown@nc-cherokee.com; ryan.prince@forestry.alabama.gov; sabrinawood@live.com; sandnfrench@gmail.com; sarah.salazar@ferc.gov; sbryan@pci-nsn.gov; scsmith@southernco.com; section106@mcn-nsn.gov; sforehand@russelllands.com; sgraham@southernco.com; sherry.bradley@adph.state.al.us; sidney.hare@gmail.com; simsthe@aces.edu; snelson@nelsonandco.com; sonjahollomon@gmail.com; steve.bryant@dcnr.alabama.gov; stewartjack12@bellsouth.net; straylor426@bellsouth.net; sueagnew52@yahoo.com; tdadunaway@gmail.com; thpo@pci-nsn.gov; thpo@tttown.org; timguffey@jcch.net; tlamberth@russelllands.com; tlmills@southernco.com; todd.fobian@dcnr.alabama.gov; tom.diggs@ung.edu; tom.lettieri47@gmail.com; tom.littlepage@adeca.alabama.gov; tpfreema@southernco.com; trayjim@bellsouth.net; triciastearns@gmail.com; twstjohn@southernco.com; variscom506@gmail.com; walker.mary@epa.gov; william.puckett@swcc.alabama.gov; wmcampbell218@gmail.com; wrighr2@aces.edu; wsgardne@southernco.com; wtanders@southernco.com

Subject: FW: Harris Relicensing - Initial Study Report meeting agenda and call-in details
Date: Monday, April 27, 2020 9:50:21 AM
Attachments: 2020-04-28 ISR Meeting Agenda.doc
2020-4-28 Harris Relicensing - Initial Study Report Meeting presentation.pdf

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Good morning,

Attached is the presentation for tomorrow's Initial Study Report meeting. This presentation can also be found on the relicensing website: www.harrisrelicensing.com.

Thanks,

Angie Anderegg
Hydro Services
(205)257-2251
arsegars@southernco.com

From: APC Harris Relicensing
Sent: Friday, April 24, 2020 10:24 AM
To: 'harrisrelicensing@southernco.com' <harrisrelicensing@southernco.com>
Subject: Harris Relicensing - Initial Study Report meeting agenda and call-in details

Good morning

Please join us for the Initial Study Report (ISR) meeting on **April 28, 2020, starting at 9 am central time**. The agenda for the meeting is attached. On Monday April 27th, the presentation will be made available on our website (www.harrisrelicensing.com [harrisrelicensing.com]) and distributed to stakeholders as a pdf.

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Please let me know if you have any questions.

Angie Anderegg
Hydro Services
(205)257-2251
arsegars@southernco.com

From:	Sarah Salazar
To:	Anderegg, Angela Segars
Cc:	Allan Creamer; Rachel McNamara; Monte Terhaar (CTR)
Subject:	RE: Harris Relicensing - Initial Study Report meeting agenda and call-in details
Date:	Monday, April 27, 2020 5:21:04 PM
Attachments:	FERC-prelim-ISR-Comments+Questions_4-27-20.docx

EXTERNAL MAIL: Caution Opening Links or Files

Hi Angie,

Thanks for the information below about the Skype option for the meeting and for the call back today. As I mentioned, I'm forwarding the attached list of some preliminary (informal) questions we put together for the ISR mtg. tomorrow. We didn't label whose questions they were, but they are generally grouped by study report/topic. So for the most part the questions originate from our team member who is covering that resource area during relicensing. Feel free to call me tomorrow before the meeting if you have any follow-up questions or concerns.

Thanks again,

Sarah L. Salazar ✧ *Environmental Biologist* ✧ *Federal Energy Regulatory Commission* ✧ *888 First St, NE, Washington, DC 20426* ✧ *(202) 502-6863* ***Please consider the environment before printing this email.***

From: APC Harris Relicensing <g2apchr@southernco.com>
Sent: Monday, April 27, 2020 10:51 AM
To: APC Harris Relicensing <g2apchr@southernco.com>
Subject: FW: Harris Relicensing - Initial Study Report meeting agenda and call-in details

Good morning,

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Thanks,

Angie Anderegg
Hydro Services
(205)257-2251
arsegars@southernco.com

From: APC Harris Relicensing
Sent: Friday, April 24, 2020 10:24 AM
To: 'harrisrelicensing@southernco.com' <harrisrelicensing@southernco.com>
Subject: Harris Relicensing - Initial Study Report meeting agenda and call-in details

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Join Skype Meeting

To join the ISR Meeting via phone, please call (205) 257-2663 OR (404) 460-0605. At the prompt, enter conference ID 489472 followed by the pound (#) sign.

When you join the call, you will be in the virtual lobby and directed that you are waiting on the leader to admit you. As you are admitted, you will be instructed that you are now joining the meeting and that the meeting has been locked. As soon as everyone has joined, we will conduct a roll call of attendees by organization (for example, I will ask who is on the call from the Alabama Department of Conservation and Natural Resources, etc.). If you do not belong to an organization, you will be given a chance at the end of the roll call to state your name and affiliation. Once the roll call is over, your phone will be muted and the first presentation will begin. As noted above, Alabama Power will take questions following each study review and will unmute participants during that time. Once the phones are unmuted, you will have to press star 6 (*6) in order to be heard.

Please let me know if you have any questions.

Angie Anderegg
Hydro Services
(205)257-2251
arsegars@southernco.com

4/27/20

R.L. Harris Initial Study Report (ISR):

FERC Licensing Team's Preliminary Comments and Questions

General Comments and Questions:

1. Comments on all the studies should be filed with the Commission by 6/11/20, as stated in the cover letter of the ISR, and not (solely) sent directly to Alabama Power via email, as stated in the cover letters of the Draft Downstream Release Alternatives Phase 1 Report, Draft Operating Curve Change Feasibility Analysis Phase 1 Report, Draft Erosion and Sedimentation Study Report, Draft Water Quality Study Report, Draft T&E Species Assessment, Draft Phase 1 Project Lands Evaluation Study Report, and the Traditional Cultural Properties Identification Plan and Inadvertent Discovery Plan.

2. Several of the studies reference the use of Geographic Information System (GIS) data. To facilitate stakeholder review and analysis of the study results it would be helpful if all GIS data collected or developed as part of the studies is filed with the study reports.

3. Please describe whether you have experienced or anticipate any delays to studies as a result of COVID-19 related closures or social distancing measures.

Draft Operating Curve Change Feasibility Analysis (Phase 1) Report:

1. As we understand it, downstream effects with regard to flooding were assessed for a 100-year design flood. However, the relationship between the downstream flow alternative analysis and the Harris Reservoir winter flood pool analysis is not clear under alternative flood scenarios. What would happen in a scenario other that a 100-year flood? Would operations at Harris Dam under the alternative flood scenario, including different flow release scenarios, have any impact on the Harris Reservoir winter pool analysis, or vice versa?

2. Table 5-2, page 51 of the report…What is it about RM 115.7 that appears to create a hydraulic control, such that the maximum increase in depth under any winter pool elevation scenario occur about mid-way down the Tallapoosa River?

3. Figures 5-20 and 5-21 appear incomplete, as they only show the results for one alternative…baseline (? based on color). Please address this apparent omission.

Draft Downstream Release Alternatives (Phase 1) Report:

1. Modeling scenarios…as it stands now, the report presents the results for three downstream release alternatives: Pre-Green Plan operation, Green Plan operation, and Pre-Green Plan operation with a 150 cfs continuous minimum flow. Why was modelling of minimum flow limited to 150 cfs? Also, have you considered modeling Green Plan releases with continuous minimum flow scenarios? On what basis did you choose not to do so?

Draft Erosion and Sedimentation Report:

1. Section 5.0, Discussion and Conclusions states that at some sites, "land clearing and landscaping, and other construction activities affecting runoff towards the reservoir" cause erosion. Is it possible to provide areal images showing the areas of active erosion in relation to the project boundary as part of the final study report?

2. Appendix D – photos…it would be helpful if the captions for the photos included better location descriptors (e.g., Harris Reservoir, Harris Reservoir-?? Embayment, Harris Reservoir-?? River Arm, Tallapoosa River, etc.). For the Harris Reservoir sites, it would be helpful if the contours within which peaking operations occur (lake fluctuation zone) could be identified.

3. Could you make the video footage that was collected as part of this study available for stakeholders to view?

4. Will the nuisance aquatic vegetation surveys still be possible to conduct in Lake Harris this summer?

5. On page 24, in section 3.2, the report includes the following statement: "A total of 20 sites, rather than 15 sites, were provided for the left bank segments as many segments were tied with a score of (slightly impaired)." Please explain what is meant by many of the streambank segments being "tied with a score of (slightly impaired" and clarify the relationship between the number of streambank segments/sites and the bank condition score.

6. On page 25, in Table 3-2, shouldn't the heading/label of the first column of the table be "Site Number" instead of "Rank" given that the rank options are only 1 through 5 (according to Table 3-1) and there appear to be 20 sites?

7. On page 11, of the Tallapoosa River High Definition Stream Survey Final Report (Appendix E of the Erosion and Sedimentation Study Report), it states that prior to the survey, flows were monitored to ensure relatively normal flow conditions

during the survey. For clarity, what were the "relatively normal flow conditions" during the survey? Were they slightly higher or lower than average?

8. In Figures 13 and 16 of the Tallapoosa River High Definition Stream Survey Final Report, the scale is small and so it appears that most of the riverbanks are unmodified and the modified banks identified on the individual site surveys are not visible. It would be helpful if the figures in the report showed labeled points for the erosion/sedimentation sites that are identified in the report.

9. Page 20 of Tallapoosa River High Definition Stream Survey Final Report states that a confidence rating was used to indicate the clarity of the streambanks in the video and figures 14 and 17 of that report show areas where the video clarity was impaired and therefore the confidence in the accuracy of the streambank conditions/classifications is lower. As stated above, it would be helpful if the figures in the report showed labeled points for the erosion/sedimentation sites that are identified in the report. Do any of the areas with impaired video clarity coincide with areas that stakeholders identified as erosion/sedimentation sites or other sites that Alabama Power identified as part of this study? Do you intend to take any steps to deal with the impaired clarity data? Is so, how?

10. In Figure 18 of the Tallapoosa River High Definition Stream Survey Final Report, there appears to be a missing ranking at river mile 37 for the right streambank. Could you explain this gap in the ranking?

11. For Figures 20 through 23 of the Tallapoosa River High Definition Stream Survey Final Report, please label the river mile ranges on the maps to help reviewers understand the starting and ending points of the study area and which segments of river are included.

12. In Figure 26 of the Tallapoosa River High Definition Stream Survey Final Report, please move the scale bar and sources so that they are not covering the river segment and bank conditions at the bottom of the map.

13. Can you identify where peaking pulses are attenuated downstream from Harris Dam under the current operating regime and volume of typical downstream releases? If so, are there any patterns in the downstream streambank conditions and observed levels of erosion along the segments of streambanks within the attenuation zone? Where are the identified erosion sites in relation to the length of the attenuation zone?

Draft Water Quality Report:

1. Page 18…figure 3-8…please explain what is happening with the vertical DO profiles where DO increases in May, June, July, and August, where otherwise the DO should be declining.

2. Page 23 discusses Alabama DEM monitoring data for the Harris Dam tailrace (i.e., immediately downstream from Harris Dam). Was this data collected during generation, or does it also reflect non-generation periods?

3. Pages 39-41 present DO and temperature data for downstream continuous water quality monitoring station. On page 16 of the ISR, Alabama Power is not proposing any additional monitoring beyond what was approved in the Commission's SPD. Why is there not a second year of monitoring for the downstream continuous monitoring station? How confident are Alabama Power and the HAT2 members that 1 year of monitoring at the downstream station includes a worst-case scenario?

Draft T&E Species Report:

1. Have the GIS overlays of T&E species habitat information and maps been completed (i.e., the map figures in Appendix B of the draft T&E species study report)? Or are there still steps to complete this component of the study?

   We suggest including project features, recreation areas, and other managed areas (e.g., timber harvest areas, wildlife management areas, etc.) on the T&E species maps in order to help determine the proximity of species ranges/habitats to project-related activities and identify the need for species-specific field surveys.

2. While the draft T&E species study report indicates that additional field surveys for the fine-lined pocketbook freshwater mussel are planned for May 2020, the report does not include a description of the criteria used to determine which of the species on FWS's official (IPaC) list of T&E species would be surveyed in the field. Please describe which species will be surveyed in the field and explain how and why they were selected. In addition, please describe any correspondence Alabama Power has had with FWS and state agencies regarding the T&E species selected for additional field surveys.

3. Page 7 lists the sources for the ESA species information. The sources included FWS's Environmental Conservation Online System (ECOS) but did not include IPaC. The official list is obtained through the IPaC report. Has an IPaC report been downloaded or are you using the IPaC report filed to the record by FERC staff?

4. Page 8 states that the existing land use data is not specific enough to determine if the 3,068 acres of coniferous forest within the project boundary at Lake Harris would be suitable for red cockaded woodpecker. How do you propose assess the suitability for red cockaded woodpecker?

5. On pages 3, 10, and 26 there is mention of additional fieldwork planned for two mussel species (i.e., fine-lined pocketbook and Southern pigtoe) for May 2020. Please elaborate on the details of the additional survey work (e.g., survey location(s), sampling protocols and methodologies employed, and clarify which species will be included in the May 2020 assessment, etc.).

6. The descriptions of Alabama lampmussel and rabbitsfoot mussel on pages 11, 13, and 14 do not provide these species' host fish species. Are the host fish species currently unknown, or was this an inadvertent omission?

7. There appears to be a typo on page 16, in the description of southern pigtoe mussel. The middle of the first paragraph refers to the glochidia of the finelined pocketbook mussel. Is this sentence misplaced, or does the information pertain to the southern pigtoe mussel (the subject of section 3.12)? Please clarify.

8. On page 19, in the first paragraph about the northern long-eared bat (NLEB), it is unclear why the discussion includes the statement about a low occurrence of this species in the "…southwestern region of Alabama" given that the project areas are located in the northeastern and mid-eastern portions of Alabama. Please clarify or correct this statement.

9. The draft T&E species study report states that there are no known NLEB hibernacula or maternity roost trees *within the project boundary*. However, it does not include information on known NLEB hibernacula *within 0.25 mile of the project boundary* and known NLEB maternity roosts *within 150 feet of the project boundary* (i.e., at Harris Lake and Skyline). In addition, the report mentions a couple of best management practices (BMPs), protective of some bat species, that Alabama Power implements during timber harvest activities and states that the BMPs have been expanded but not incorporated in the existing license. However, the report does not include the locations of Alabama Power's timber harvesting and other tree removal activities, or detailed descriptions of timber harvesting protocols and BMPs currently implemented within the project boundary. This information is important to understanding the affected environment for Indiana bat, NLEB, and/or other T&E species. This information could also be used for the streamlined consultation option for analyzing the potential project effects on NLEB (including within the buffer areas for hibernacula and maternity roost trees).

Please complete the FWS's NLEB streamlined consultation form and include it in the final T&E species study report. This form can be found at: https://www.fws.gov/southeast/pdf/guidelines/northern-long-eared-bat-streamlined-checklist.pdf. We recommend using FWS's definition of "tree removal" to guide your responses on the form (i.e., "cutting down, harvesting, destroying, trimming, or manipulating in any other way the trees, saplings, snags, or any other form of woody vegetation likely to be used by northern long-eared bats").[1]

Also, please update figures 3.14-1, 3.14-2, 3.14-3, 3.15-1, 3.15-2, and 3.15-3 which currently show "forested area" or "karst landscape" in relation to NLEB and Indiana bat habitats, to show Alabama Power's timber management areas within the project boundary, and other proposed managed areas (e.g., new/improved recreation areas, new quail management areas). This type of information is needed to meet another component of this study (i.e., "determine if [T&E species habitat at the project] are potentially impacted by Harris Project operations", as described on slide 5 of the Aug. 27, 2019, HAT 3 meeting).

10. On page 21 and 22, in section 3.17, the discussion mentions an occurrence of little amphianthus within the project boundary at Lake Harris (Flat Rock Park) that was documented in 1995 and may be extirpated. Did the botanical surveys in that area of the project target that species? The top of page 22, states that "Vernal pools were not identified due to a lack of available data." Did the botanical surveys identify vernal pools in this area?

11. On page 22, in section 3.18, the report states that the National Wetland Inventory data is not detailed enough to identify wetlands within the project area that contain white fringeless orchid's unique wetland habitat characteristics. Do you propose collecting more data on this subject?

12. On page 23, in section 3.19, the report states that the 16 extant populations of Prices' potato bean in Jackson County, occur on Sauta Cave National Wildlife Refuge, and near Little Coon Creek in the Skyline WMA. Please clarify whether or not any of the 16 populations occur within the project boundary at Skyline WMA.

13. In Appendix B, figure 3.19, showing Price's potato-bean habitat range, there is a 100-foot Stream Buffer within the Limestone Landscape layer shown on the map and legend. Please explain the significance of this buffer, including any regulatory

[1] 81 Fed. Reg. 1902 (January 14, 2016).

requirements associated with this buffer. Please include this information in the final T&E species study report.

14. In the August 27, 2019, HAT 3 meeting summary, please clarify the following:
    a. How does Alabama Power define terms such as "sensitive time periods" in the context of timber harvesting?
    b. Evan Collins, of FWS, stated that the palezone shiner may be present in some of the lower reaches of the Tennessee River tributaries. Please clarify where these tributaries are located in relation to the project boundary.

Draft Lands Evaluation (Phase 1) Report:

1. On page 9, the proposed definition for the "Recreation" classification includes a reference to permitting processes for various types of recreations activities. Will the permitting processes be updated as part of the revised SMP?

2. On page 9, the proposed definition of the "Hunting" classification includes a reference to the existing Harris Project Wildlife Mitigation Plan. How do you envision the existing Project Wildlife Mitigation Plan relating to the proposed Wildlife Management Plan that is to be developed as part of Phase 2 of the Lands Evaluation?

3. On page 9, the proposed definition of the "Natural/Undeveloped" classification mentions that one of the allowable uses would be "normal forestry management practices." Please clarify what these practices would include.

4. On page 10, there are descriptions of two new proposed land use classifications, including "Flood Storage" which would include lands between the 793 ft and 795 ft msl contours, and "Scenic Buffer Zone" which would include lands between the 795 ft and 800 ft msl contours. Would these classifications overlap with other land use classifications? Also, are there any buildings/structures currently within these elevation bands around Lake Harris?

5. Page 11 discusses the results of the desktop evaluation and site visit to identify any suitable bobwhite quail habitat within the project boundary at Skyline WMA. Could you elaborate on the methods for evaluating the availability of bobwhite quail habitat and how it was determined that no suitable habitat occurred within the project boundary at Skyline WMA? Also, could the report include a figure showing a map of the 7 locations in the Skyline WMA where Alabama DCNR conducts spring/fall quail call surveys, and has documented quails, relative to the project boundary at Skyline WMA?

6. Appendix B provides maps and general descriptions of proposed changes in land use classifications at Lake Harris that were also discussed during the 9/11/19 HAT 4 meeting. It would be helpful if the maps of the proposed changes in land use classifications included legends to identify the various classifications, as well as north arrows and scale bars to facilitate orientation and review.

   In addition, during the 9/11/19 HAT 4 meeting, we (FERC staff) asked if terrestrial and cultural resource surveys were being conducted on lands proposed for removal from the project boundary and Alabama Power staff responded that they were. Could you provide descriptions of the terrestrial and riparian habitat types for areas that you are proposing to remove from the project boundary. Could you also describe the terrestrial and riparian habitat types for area "RC4" that you propose to reclassify from "Recreation" to "Commercial Recreation"? Do these areas contain suitable habitat for any of the T&E species that may occur at the Harris Lake portion of the project? What were the results of the cultural resource surveys for areas proposed to be removed from the project boundary?

   Also, it would be helpful if the map of area A6 included the existing birding trail and the proposed extension of the trail.

7. Appendix C provides the Anniston Museum of Natural History's Flat Rock Botanical Inventory (inventory) report and the consultation record includes the Anniston Museum of Natural History's letter transmitting the report, Ken Wills' (Coordinator of the Alabama Glade Conservation Coalition) emails, along with several additional observations and recommendations from them.

   Approximately 365 plant species, including some rare species were documented at the site during the botanical inventory. The surveyors, Ken Wills, and FERC staff observed damages caused by vehicles traversing the site (SUV observed by surveyors; ATVs tire marks on granite outcrops observed by Ken Wills and FERC staff during scoping/environmental site review). The consultation record for this study includes recommendations from Anniston Museum of Natural History and Ken Wills' to manage/preserve/restore the site. The proposed definition of the "Natural/Undeveloped" classification, proposed for the rare plant site, does not indicate what types of recreation activities/vehicle access would be prohibited or how Alabama Power would manage such a site. Considering all of this, do you think that Alabama Power's proposed definition of "Natural/Undeveloped" would be effective in protecting this site? Could the definition of this classification be expanded/more detailed, or would you consider another, more protective land use classification type/designation for this site?

   Also, what has Alabama Power done to protect the rare plants that were identified during the inventory and were subsequently damaged by ongoing ATV use observed by Ken Wills? Can vehicles be excluded from these sensitive areas to protect rare plants while the relicensing process proceeds?

8. Has the request from Randolph County regarding the proposed water treatment intake/plant been resolved/processed?

Draft Inadvertent Discovery Protocol (IDP)

1. Section 2.3.1 of the IDP includes provisions for previously unidentified human remains and or historic properties.

    a. Staff recommend changing the term "historic properties" to "cultural resources" because at the time a previously-undocumented resource is discovered, it has not been assessed for eligibility for the National Register of Historic Places, and cannot, by definition, be considered a "historic property" until its eligibility is determined.

    b. Item 2.3.1(b) seems to indicate that at some point after discovery, an evaluation of eligibility for a newly discovered cultural resource will occur. The process for determining National Register-eligibility should be outlined in the plan.

Draft Traditional Cultural Property Identification Plan

2. No specific comments.

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Alabama Power

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May 12, 2020

VIA ELECTRONIC FILING

Project No. 2628-065
R.L. Harris Hydroelectric Project
Initial Study Report Meeting Summary

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 utilizing the Federal Energy Regulatory Commission's (FERC) Integrated Licensing Process (ILP) to complete the relicensing process for the Harris Hydroelectric Project (FERC No. 2628-065). On April 28, 2020, Alabama Power held an Initial Study Report Meeting pursuant to 18 C.F.R. Section 5.15 (c) of the ILP. Due to concerns with COVID-19, Alabama Power held the Initial Study Report meeting via conference call.

The meeting summary, including a list of attendees and the meeting presentation, is attached.

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

Sincerely,

Angela Anderegg

Angie Anderegg
Harris Relicensing Project Manager

Attachment - Initial Study Report Meeting Summary

cc: Harris Stakeholder List

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Meeting Summary

Initial Study Report Meeting via Conference Call

April 28, 2020 ~ 9:00 AM to 4 PM

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APPENDICES

1 OVERVIEW

Angie Anderegg (Alabama Power) opened the Harris Project (FERC No. 2628) (Project) Initial Study Report (ISR) meeting and reviewed the ISR meeting purpose. Angie conducted a roll call, reviewed phone etiquette, and presented a safety moment. A list of participants is included in Appendix A[1]. Alabama Power presented information on the progress of each study, which included applicable study results, requested variances, and any additional studies or requested study modifications. The ISR presentation was made available to all participants on the Harris Relicensing website (www.harrisrelicensing.com) prior to the meeting and is included in this report as Appendix B.

In this ISR Meeting Summary, Alabama Power presents the questions and comments that were provided prior to and during the ISR meeting[2]. Each question or comment is followed by Alabama Power's responses and discussion in **bold** text. FERC staff as well as three stakeholders submitted written questions/comments in advance of the ISR meeting via email. Where appropriate, Alabama Power provides a full response. However, many responses to the questions will be addressed in the applicable Final Study Reports and in additional analyses (Phase 2) to be conducted in 2020/2021.

FERC staff raised three general questions in its April 27, 2020 email to Alabama Power. Alabama Power's responses to FERC's general questions are provided below.

1.1 FERC's Questions submitted in advance of the meeting

- Q1 - Comments on all the studies should be filed with the Commission by 6/11/20, as stated in the cover letter of the ISR, and not (solely) sent directly to Alabama Power via email, as stated in the cover letters of the Draft Downstream Release Alternatives Phase 1 Report, Draft Operating Curve Change Feasibility Analysis Phase 1 Report, Draft Erosion and Sedimentation Study Report, Draft Water Quality Study Report, Draft T&E Species Assessment, Draft Phase 1 Project Lands Evaluation Study Report, and the Traditional Cultural Properties Identification Plan and Inadvertent Discovery Plan.

  Alabama Power emphasized that all stakeholders should file comments with FERC on the Harris Project (P-2628-065) on or before June 11, 2020. Alabama Power also noted that if any stakeholder has a question about filing comments with FERC, they could email those questions to harrisrelicensing@southernco.com.

- Q2 - Several of the studies reference the use of Geographic Information System (GIS) data. To facilitate stakeholder review and analysis of the study results it would be helpful if all GIS data collected or developed as part of the studies is filed with the study reports.

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[1] Because this meeting was conducted over Skype, there may be participants who joined after the roll call and are not listed in Appendix A.

[2] These notes summarize the major items discussed during the meeting and are not intended to be a transcript or analysis of the meeting.

Alabama Power will file GIS data, as applicable, with the Final Study reports.

- Q3 - Please describe whether you have experienced or anticipate any delays to studies as a result of COVID-19 related closures or social distancing measures.

  Alabama Power has experienced delays conducting field work and meeting with the Harris Action Teams (HATs) due to COVID-19 closures and restrictions. Alabama Power anticipates that it may be months before HATs can meet in person. However, meetings can still occur using teleconferencing.

2 CULTURAL RESOURCES PROGRAMMATIC AGREEMENT AND HISTORIC PROPERTIES MANAGEMENT PLAN STUDY

Amanda Fleming (Kleinschmidt) presented the Cultural Resources documents that were filed with the ISR: the Inadvertent Discovery Plan (IDP) and the Traditional Cultural Properties (TCP) Identification Plan. Amanda reviewed the study purpose, data collection to date, initial results, and a variance request to file the Area of Potential Effects (APE) in June 2020.

2.1 FERC's Questions submitted in advance of the meeting

- Q1 - Staff recommend changing the term "historic properties" to "cultural resources" because at the time a previously-undocumented resource is discovered, it has not been assessed for eligibility for the National Register of Historic Places, and cannot, by definition, be considered a "historic property" until its eligibility is determined.

  Alabama Power will make adjustments to the term "historic properties" and will include both the Inadvertent Discovery Plan (IDP) and Traditional Cultural Properties (TCP) Identification Plan as appendices to the Historic Properties Management Plan (HPMP).

- Q2 - Item 2.3.1(b) seems to indicate that at some point after discovery, an evaluation of eligibility for a newly discovered cultural resource will occur. The process for determining National Register-eligibility should be outlined in the plan.

  Alabama Power will add this process to the IDP. The National Register-eligibility process will also be addressed in the Historic Properties Management Plan (HPMP) being developed by Alabama Power.

- Q3 - Rachel McNamara asked about defining the area of potential effects (APE) and the possibility of extending the APE downstream. Rachel stated there is a need for more discussion.

  Alabama Power noted that it intends to schedule a Harris Action Team (HAT) 6 meeting in May to further discuss the APE.

2.2 Carol Knight's Questions submitted in advance of the meeting

- Q4 - How far down river from the dam does Alabama Power have responsibility for the river?

  Alabama Power's responsibility downstream of Harris dam is the Harris Project Boundary below the dam.

- Q5 - How far up each side of the bank does Alabama Power have below the dam?

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The State of Alabama owns the river channel, and the riverbanks are private property.

- Q6 - How do they (Alabama Power) enforce their responsibilities?

  Alabama Power follows all guidelines and regulations for lands and waters within the Harris Project Boundary.

- Q7 - Are they [Alabama Power] aware of archaeological sites that are endangered below the dam? That each time they open the flood gates, erosion occurs washing away cultural remains?

  Alabama Power is reviewing potential effects of Harris Project operations on cultural resources downstream of the dam in the Tallapoosa River. However, Alabama Power cannot enforce preservation policies on private lands. If a landowner encounters a burial site, they should report it immediately to the State Historic Preservation Officer (SHPO)/Alabama Historical Commission (AHC). The SHPO or AHC can provide additional details on regulations and authority regarding archaeological properties or cultural remains.

- Q8 - Are they [Alabama Power] aware of the destruction of the fish weirs down river?

  Alabama Power is reviewing potential effects of Harris Project operations on cultural resources downstream of the dam in the Tallapoosa River. In addition, Alabama Power may work with stakeholders to develop best management practices related to cultural resources.

2.3 <u>Participant Questions</u>

- Q9 - Elizabeth Toombs (Cherokee Nation) **–** Do the HPMP, TCP Identification Plan, and IDP documents apply to the Skyline portion of the Project or is this limited to the reservoir?

  Yes, all of the cultural resources documents and procedures apply to all lands within the Harris Project Boundary.

3 RECREATION EVALUATION STUDY

Amanda Fleming (Kleinschmidt) presented the Recreation Evaluation Study progress. Amanda reviewed the study purpose, data collection to date, initial results, and a variance request to file the draft Recreation Evaluation Study Report in August 2020 instead of June 2020.

3.1 Donna Matthews' Questions submitted in advance of the meeting

- Q1 - Increased downstream, Alabama Power managed, public access. An impediment to public use of the river to swim, fish or float is lack of access. What plans are underway to correct this omission?

  Alabama Power is evaluating downstream use as part of the recreation study, and any additional access needs will be discussed with HAT 5 and addressed in the licensing proposal.

- Q2 - Safety from Rapid Water Level Rises. Over the last 40 years, even locals have been dissuaded from using their river because of erratic and dramatic variations in water levels. Completely aside from the issue of how unnaturally the river is distended from pre-dam normals on an hour by hour basis remains the unaddressed danger to humans recreating in/on the river during episodes of rapid water level rise. The potential threat is created by water release at the dam. APC must alert downstream subscribers of planned and imminent water release. Current cell phone technology is well suited to send safety alerts.

  Alabama Power is evaluating downstream flows and recreation use as part of the recreation evaluation study as well as gathering information/input from public access sites, downstream landowners, and Tallapoosa River users.

  Alabama Power uses the Smart Lakes App and the Alabama Power website to inform stakeholders of water releases. There are times, however, that system demands require a change in the generation schedule. Prior to any generation releases, Alabama Power sounds a notification siren. The generating units will not load unless the siren activates.

3.2 Participant Questions

- Q3 - Ken Wills (Alabama Glade Conservation Coalition) - Why was the operating schedule reduced for Flat Rock and will the operating schedule be modified in 2020 due to COVID-19?

  The operating schedule in August 2019 was condensed based on low attendance. Last year's schedule is not indicative of the 2020 summer schedule. Currently, no changes from the normal operating schedule are proposed, and the goal is to open

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by Memorial Day. Alabama Power will follow all state and federal guidelines related to COVID-19.

- Q4 - Several questions and comments were raised by participants about flood control operations and water releases downstream.

  Alabama Power addresses operational questions in Section 6 of this meeting summary.

- Q5 - Keith Henderson, Alabama Department of Conservation and Natural Resources (ADCNR) - Why did the Lake Harris questionnaires start in May 2019 (rather than March 2019) and what were the four survey questions?

  In its April 2019 Study Plan Determination, FERC requested that Alabama Power add the Lake Harris questionnaire. Therefore, Alabama Power started those surveys in May 2019. The study questions are listed in Appendix C to the Recreation Evaluation Study Plan, which can be found at www.harrisrelicensing.com.

4 PROJECT LANDS EVALUATION STUDY

Kelly Schaeffer (Kleinschmidt) presented the Project Lands Phase 1 Evaluation Study Report progress. Kelly reviewed the study purpose and data collection to date, which included the development of maps showing Alabama Power's proposal to add, remove, or modify lands in the Project Boundary. Kelly also reviewed the remaining activities in this study, which include the use of other relicensing studies to develop the Phase 2 Wildlife Management Program (WMP) and the Shoreline Management Plan (SMP). Kelly noted that no variances to this study plan are requested. Alabama Power distributed the Draft Phase 1 Project Lands Evaluation Report to stakeholders in April 2020, concurrently with filing the ISR.

4.1 FERC's Questions submitted in advance of the meeting

- Q1 - On page 9, the proposed definition for the "Recreation" classification includes a reference to permitting processes for various types of recreations activities. Will the permitting processes be updated as part of the revised Shoreline Management Plan (SMP)?

  Alabama Power will review the existing permitting processes during development of the SMP and determine if any updates are needed.

- Q2 - On page 9, the proposed definition of the "Hunting" classification includes a reference to the existing Harris Project Wildlife Mitigation Plan. How do you envision the existing Project Wildlife Mitigation Plan relating to the proposed Wildlife Management Plan that is to be developed as part of Phase 2 of the Lands Evaluation?

  Any existing information (i.e., the existing Wildlife Mitigation Plan) will be reviewed to determine if any portion of the plan might apply to the new WMP, which would be implemented in the next license term.

- Q3 - On page 9, the proposed definition of the "Natural/Undeveloped" classification mentions that one of the allowable uses would be "normal forestry management practices." Please clarify what these practices would include.

  All forestry practices that would be allowable in the Natural/Undeveloped land use classification will be included in the WMP, which will be filed with the final license proposal.

- Q4 - Rachel McNamara (FERC) - Some lands classified as "Recreation" are proposed to be changed to "Natural/Undeveloped". She noted that it may be helpful in the final report for Alabama Power to be very clear about the project purpose in retaining those lands rather than removing from the project boundary.

  Alabama Power intends to clearly state the project purpose of all lands proposed to be reclassified in the Final Licensing Proposal.

- Q5 - On page 10, there are descriptions of two new proposed land use classifications, including "Flood Storage" which would include lands between the 793 ft and 795 ft msl contours, and “Scenic Buffer Zone” which would include lands between the 795 ft and 800 ft msl contours. Would these classifications overlap with other land use classifications? Also, are there any buildings/structures currently within these elevation bands around Lake Harris?

The land use classifications will not overlap. In areas where the lands above the 800 ft msl contour (i.e. “back acreage”) are project lands, the project lands below the 800 ft msl contour would be classified to match the back acreage. In areas where the lands above the 800 ft msl contour are non-project lands, the lands below the 800 ft msl contour would consist of these two classifications. However, the classifications would not overlap but would be adjacent (one band in front of the other). Alabama Power could not confirm at the meeting whether any buildings or structures currently exist within those contours, but current permitting practices allow property owners to build piers, etc. in these bands.

- Q6 - Page 11 discusses the results of the desktop evaluation and site visit to identify any suitable bobwhite quail habitat within the project boundary at Skyline WMA. Could you elaborate on the methods for evaluating the availability of bobwhite quail habitat and how it was determined that no suitable habitat occurred within the project boundary at Skyline WMA? Also, could the report include a figure showing a map of the 7 locations in the Skyline WMA where Alabama DCNR conducts spring/fall quail call surveys, and has documented quail, relative to the project boundary at Skyline WMA?

  The Final Phase 1 Project Lands Evaluation Report will contain detailed methods for the evaluation of suitable bobwhite quail habitat at Skyline. Alabama Power will also include a figure showing the ADCNR’s quail call survey locations.

- Q7 - Appendix B provides maps and general descriptions of proposed changes in land use classifications at Lake Harris that were also discussed during the 9/11/19 HAT 4 meeting. It would be helpful if the maps of the proposed changes in land use classifications included legends to identify the various classifications, as well as north arrows and scale bars to facilitate orientation and review.

  Alabama Power will add a legend, north arrows, and a scale bar to the final maps in the Final Phase 1 Project Lands Evaluation Report.

- Q8 - In addition, during the 9/11/19 HAT 4 meeting, we (FERC staff) asked if terrestrial and cultural resource surveys were being conducted on lands proposed for removal from the project boundary and Alabama Power staff responded that they were. Could you provide descriptions of the terrestrial and riparian habitat types for areas that you are proposing to remove from the project boundary. Could you also describe the terrestrial and riparian habitat types for area “RC4” that you propose to reclassify from “Recreation” to “Commercial Recreation”? Do these areas contain suitable habitat for any of the T&E species that may occur at the Harris Lake portion of the project? What were the results of the cultural resource surveys for areas proposed to be removed from the project boundary?

Many other resource studies are being conducted concurrently with the development of the Project lands proposal. Alabama Power intends to use information from other relicensing studies to inform the final decision on the Project lands proposal, which will be included in the final licensing proposal. Additionally, Alabama Power will include within its final licensing proposal descriptions of the terrestrial and riparian habitat types for all areas proposed to be removed from the Project as well as the area "RC4" proposed to be reclassified to "Commercial Recreation".

- Q9 - Sarah Salazar (FERC) - Alabama Power needs to be sure to get information on the record so that FERC can use that information to inform their decision on the project related effects. The Final Phase 1 Project Lands Evaluation should explain the rationale for adding, removing or reclassifying lands in the Project Boundary. Also, it would be helpful if the map of area A6 included the existing birding trail and the proposed extension of the trail.

  The project purpose for the lands to be removed, added, or reclassified will be included in the final licensing proposal. Alabama Power will also add the birding trail and trail extension on the respective map as included in the Final Phase 1 Project Lands Evaluation Report.

- Q10 - Appendix C provides the Anniston Museum of Natural History's Flat Rock Botanical Inventory (inventory) report and the consultation record includes the Anniston Museum of Natural History's letter transmitting the report, Ken Wills' (Coordinator of the Alabama Glade Conservation Coalition) emails, along with several additional observations and recommendations from them.

  Approximately 365 plant species, including some rare species were documented at the site during the botanical inventory. The surveyors, Ken Wills, and FERC staff observed damages caused by vehicles traversing the site (SUV observed by surveyors; ATVs tire marks on granite outcrops observed by Ken Wills and FERC staff during scoping/environmental site review). The consultation record for this study includes recommendations from Anniston Museum of Natural History and Ken Wills' to manage/preserve/restore the site. The proposed definition of the "Natural/Undeveloped" classification, proposed for the rare plant site, does not indicate what types of recreation activities/vehicle access would be prohibited or how Alabama Power would manage such a site. Considering all of this, do you think that Alabama Power's proposed definition of "Natural/Undeveloped" would be effective in protecting this site? Could the definition of this classification be expanded/more detailed, or would you consider another, more protective land use classification type/designation for this site?

  Also, what has Alabama Power done to protect the rare plants that were identified during the inventory and were subsequently damaged by ongoing ATV use observed by Ken Wills? Can vehicles be excluded from these sensitive areas to protect rare plants while the relicensing process proceeds?

Alabama Power noted that that it has SMPs for its other projects that contain different classifications because of unique areas and circumstances. Therefore, the Natural/Undeveloped land use classification may need to be modified to address the rare plants at Flat Rock Park. Alabama Power will work with the HAT on reviewing the classifications and their definitions.

Sheila Smith (Alabama Power) noted that Alabama Power has been working with a contractor to barricade the area to prevent vehicle traffic. The barricade work has been completed. Alabama Power plans to continue monitoring the site to discourage vehicle and all-terrain vehicle (ATV) access.

- Q11 - Sarah Salazar (FERC) asked if the area also gets a lot of mountain bike use?

  Ken Wills (AGCA) noted that vehicles are the primary issue in that area and that mountain biking would not likely cause the effects they are seeing. He also noted that in the rural areas, ATVs were much more common.

- Q12 - Has the request from Randolph County regarding the proposed water treatment intake/plant been resolved/processed?

  Alabama Power is working with Randolph County to find an acceptable site that is similar to their original request. Alabama Power intends to file a land use variance request with FERC's Division of Hydropower Administration and Compliance, and, therefore, this request would not be a part of the relicensing process.

4.2 Participant Questions

- Q13 - Maria Clarke (EPA): It was my understanding there was a court case that involved Skyline Property. What happened? Why was the Skyline property reduced? Is this case closed?

  Alabama Power filed an application with FERC to amend its current Harris Project Boundary at Skyline (Accession No. 20200302-5424), which would add 13.1 acres of land and remove 62.2 acres of land, all within the approximately 15,063 acres of the Harris Project Boundary at Skyline.

5 OPERATING CURVE CHANGE FEASIBILITY ANALYSIS STUDY

Kelly Schaeffer (Kleinschmidt) presented the Operating Curve Change Feasibility Analysis Phase 1 Report progress. Kelly reviewed the study purpose and data collected to date, which included the development of models and the initial modeling results. Kelly also reviewed the remaining activities for this study, including the use of other relicensing studies to conduct the Phase 2 analyses. Kelly noted that no variances to this study plan are requested. Alabama Power distributed the Draft Operating Curve Change Feasibility Analysis Phase 1 Report to stakeholders in April 2020, concurrently with filing the ISR.

5.1 FERC's Questions submitted in advance of the meeting

- Q1 - As we understand it, downstream effects with regard to flooding were assessed for a 100-year design flood. However, the relationship between the downstream flow alternative analysis and the Harris Reservoir winter flood pool analysis is not clear under alternative flood scenarios. What would happen in a scenario other that a 100-year flood? Would operations at Harris Dam under the alternative flood scenario, including different flow release scenarios, have any impact on the Harris Reservoir winter pool analysis, or vice versa?

  The "100-year flood" scenario used for modeling is based on an actual local storm event in the Tallapoosa River basin that is scaled up to equal a 100-year flood event. Other flood flow scenarios would likely have downstream flooding effects but at a smaller amount and duration. Alabama Power evaluated the effects of the 100-year flood, because FEMA uses the 100-year flood for its analysis and is the "gold standard". This is also consistent with modeling efforts that Alabama Power has conducted in previous relicensing processes. Kenneth Odom (Alabama Power) explained that if a 50-year flood scenario is used, there will still be downstream flooding. It will just result in less of an impact than the 100-year scenario. If Alabama Power used a 25-year flood, there would be fewer impacts than the 50-year flood scenario. Ultimately, reducing the flood frequency interval reduces the total amount of flow. However, there is no way to determine the differences in the total amount of flow downstream without modeling.

- Q2 - Table 5-2, page 51 of the report…What is it about RM 115.7 that appears to create a hydraulic control, such that the maximum increase in depth under any winter pool elevation scenario occur about mid-way down the Tallapoosa River?

  The surveyed bathymetric transects of the river indicate that the channel bottom rises at RM 113.63 and RM 114.5, constricting the channel area and creating a hydraulic control. Examination of aerial imagery shows what appears to be a shoal across the river at RM 114.5 and a shoal and island complex at RM 113.63.

- Q3 - Figures 5-20 and 5-21 appear incomplete, as they only show the results for one alternative…baseline (? based on color). Please address this apparent omission.

These figures are complete. However, Alabama Power will review them to determine if the information can be presented with more clarity. The Y axis shows the different winter curve change alternative elevations (+1 is 786 ft, +2 is 787 ft, etc.). For example, at the 786 ft msl winter pool elevation, there are 12 additional days of spill over baseline. Figure 5-21 is similar but includes the additional days of capacity operations for each alternative.

5.2 Participant Questions

- Q4 - Jimmy Traylor, Donna Matthews, and Albert Eiland (Downstream Landowners) expressed concern regarding how Alabama Power is operating the Harris Project, particularly during high flow events. All expressed that flood control has been worse since the dam has been in place. There were specific comments regarding various dates where flow conditions were a concern including February 6, 11, and 13, 2020. There were also questions regarding operations and use of flood gates on April 9, 2020. This discussion on operations during high flow events transitioned to comments and questions on the efficiency of the turbines at Harris and whether Alabama Power ever evaluated the efficiency of the turbines. Does raising the winter pool help with the generation efficiency, or are there any studies ongoing to improve the efficiency of generation for the dam? What about the dam turbines or equipment upgrades?

  Alabama Power operates Harris in accordance with U.S. Army Corps of Engineers flood control procedures provided in the Harris Reservoir Regulation Manual. Alabama Power follows these procedures and cannot evacuate water in anticipation of a high flow event. Kenneth Odom (Alabama Power) explained that raising the winter pool to the levels being evaluated in this study does not appreciably affect the efficiency of generation. Turbine or powerhouse equipment upgrades have a much greater impact on efficiency. However, the order of magnitude for total generation capacity for Harris would remain the same regardless of any equipment upgrades. Kenneth noted that the efficiency of the turbines is addressed during a turbine upgrade, which typically occurs at the end of the useful life of the turbine. There are no planned turbine upgrades during this relicensing.

  Additionally, Kenneth Odom reviewed the reservoir levels that were raised by a stakeholder earlier in the meeting. He noted that on February 6, 2020, the reservoir level was 785 ft msl. A large rain event had occurred, and both units were generating at best gate. The reservoir's elevation rose to 790 ft msl (5 feet above winter curve) on February 11, 2020 and both units began operating at full gate. The reservoir continued to rise. On February 13, 2020, the Harris reservoir was 6.5 feet above the winter curve elevation of 785 ft msl. In accordance with Harris flood control procedures, Alabama Power opened flood gates. Kenneth further confirmed that Alabama Power was not using any flood gates to pass water downstream of Harris Dam on April 9, 2020.

- Q5 - Donna Matthews (Downstream Landowner): Is the public ever involved in discussions regarding turbine or equipment upgrades; why not consider using the HEC-RAS modeling to redesign the turbines? Could you find the optimal solution to turbine design and flow scenarios to solve those issues? How do we know what to ask for if all the possible solutions aren't offered for us to consider?

Angie Anderegg (Alabama Power) stated that the public is not usually involved with discussions on equipment upgrades. She noted that there seemed to be confusion between the turbine design/efficiency versus the downstream flow scenarios. The two existing turbines have a specific capacity and generate a finite number of megawatts with the amount of water that passes through them, which is inherent in the design of the turbines. When it is time to upgrade, Alabama Power desires to achieve more power with less water, creating an increase in efficiency. It is not possible to completely redesign the turbines, because the Harris Project was originally designed to generate a certain number of megawatts using a certain amount of water at specific times (i.e., peak) to support system operations. Angie gave an example of the system peak that happens during a hot summer afternoon and how hydropower is used to meet the system demand. As part of the downstream release alternatives study, the benefit or impact of providing a continuous minimum flow are being analyzed (a continuous minimum flow would also ideally produce power). Angie reiterated that the results from this study, as well as the other studies, will be analyzed together to develop the best proposal.

Kenneth Odom (Alabama Power) added that a redesign of the turbines or new "runners" would focus on improving the efficiency but deliver the same general number of megawatts.

FERC staff stated that, if a licensee determines that upgrades are necessary, it must file a license amendment application with FERC. She explained that license amendment applications are subject to the NEPA process, and depending on the potential for environmental effects, FERC would issue a public notice and solicit public input.

- Q6 - Donna Matthews: Who controls the amount of number of megawatts generated? What if the number of megawatts is too much for the river? Why can't you change it?

  The number of megawatts that a project is authorized to generate is set by FERC, as described in the original license order. Changing the generating capacity would affect the energy grid beyond Harris, because Alabama Power is required to supply a certain amount of power across the entire system. There is a reliability factor from the Harris Project that supports the entire power grid.

- Q7 - Question from Instant Messenger, Martha Hunter (Alabama Rivers Alliance): Wasn't there a turbine upgrade a few years ago?

  No, a turbine upgrade has not been completed at the Harris Project.

- Q8 - James Hathorn (USACE): How were the intervening flows considered in the Harris model?

The intervening flow hydrograph for the contributions to the Tallapoosa River from the drainage area between Harris and Wadley was calculated by Alabama Power, as described in Section 4.4 of the study report. The hydrograph was included in the model as a uniform lateral hydrograph entering the river between RM 136.6 and 122.97. Kleinschmidt developed an intervening flow hydrograph for the contributions to the river from the drainage area between Wadley and Horseshoe Bend by comparing the daily flood hydrographs from the Wadley and Horseshoe Bend gages for the March 1990 event. A comparison of the daily average flow hydrographs gages showed a similar shape for both gages. The hourly hydrograph for the Wadley intervening flow, calculated by Alabama Power, was adjusted by multiplying each hourly ordinate of the hydrograph by a ratio of the Horseshoe Bend to Wadley gages. The data was then adjusted to subtract out the flow from the Wadley gage so that the lateral inflow was only equal to the flow intervening between the two gages. The hydrograph was included as a uniform lateral inflow between RM 122.97 and RM 93.66. The development of the hydrograph is described in Section 4.5.3 of the report.

- Q9 - James Hathorn: What types of structures will be analyzed in the phase 2 structure study? Will there be any crop/farmland analysis?

  Alabama Power has not conducted a full economic analysis of each structure, land type, or property type. Crop or farmland analysis is not currently in the FERC-approved methodology.

- Q10- James Hathorn: For the HEC-RAS modeling, it only uses a 100-year design flood, or different types of storms?

  Alabama Power has not proposed to model other storm events. However, if FERC needs this information for its analysis, Alabama Power can model other storm events.

  Angie Anderegg (Alabama Power) explained that the 100-year flood has been used as the standard by FEMA. To move forward with other flood scenarios, Alabama Power will need to know exactly which additional floods need to be modeled.

  Sarah Salazar (FERC) reiterated that the process is in the information gathering stage, and no decisions are being made right now. However, we do want to know all of the alternatives that are possible moving forward in order to make the best decision later. She encouraged all stakeholders to file comments on or before June 11, 2020.

- Q11 - Alan Creamer (FERC) - Regarding the flood design, what would the downstream flows look like using a 50-year or 25-year flood scenario? I know the worst-case scenario is the 100-year flood. I'm wondering if it would present as a straight line, or a curve in terms of how it presents downstream? Maybe the 100-year flood isn't the end–all.

Kelly Schaeffer (Kleinschmidt) asked if FERC was requesting that Alabama Power add specific flood events other than the 100-year flood to the study plan (the 25 and 50-year flood scenarios).

Alan Creamer (FERC) answered that he thought it would be helpful to see how the flows would work under different scenarios.

Kelly Schaeffer responded that if there are additional modeling requests, Alabama Power would need to know those scenarios as soon as possible to avoid getting to December 2020 (after completing the majority of the Phase 2 analysis) and have to re-run the model for additional flood events and revisit the Phase 2 analyses.

Kenneth Odom (Alabama Power) explained that the "100-year flood" scenario that Alabama Power uses for modeling is based on a local storm event in the Tallapoosa River basin, but it is scaled up to equal a 100-year flood event. If it is a 50-year flood scenario, downstream flooding will still occur. It is just less impact than the 100-year scenario. If Alabama Power used a 25-year flood, there would be fewer impacts than the 50-year flood scenario. FEMA bases its flood maps on the 100-year flood. Other storms can be examined, but ultimately, reducing the flood frequency interval reduces the total amount of flow. However, there is no way to determine what the differences would be in the total amount of flow downstream without modeling.

Angie Anderegg (Alabama Power) commented that Alabama Power's intent is to use the 100-year flood to determine whether it will propose a lake level change.

- Q12 - Regarding the 100-year flood, are they taking climate change into account when they're looking at these scenarios? Martha Hunter also added that along with additional rains we are seeing we need to anticipate the different droughts that are coming and wants that to be part of the decision for how the river is operated in the next 50 years.

  Alan Creamer (FERC) stated that he did not recall that climate change was part of the study design or approved study plan.

- Q13 - Maria Clark (EPA) noted that that the EPA, U.S. Geological Survey, and FEMA have been working together to address data shortfalls on climate information. She noted that the 100-year event may not be appropriate at this point or if Alabama Power does use the 100-year, they should also supplement with local events. Maria plans to pass along this information from EPA.

  Kelly Schaeffer (Kleinschmidt) asked if Maria could include that information or provide a reference in its comments on the ISR. Kenneth Odom (Alabama Power) also noted that the 100-year design flood used in the Harris modeling was based on an actual storm event that was scaled up to equal a 100-year event.

- Q14 – Charles Denman via email following the meeting: I believe a comparison of historical (pre-dam) and recent flooding downstream of the dam would help stakeholders understand the effectiveness of the Dam for flood control. Also include a model with same parameters (land use, storm intensity and duration, etc.) but without the dam attenuation. This would help downstream stakeholders understand what effects the Dam has on flooding downstream. Are the original studies and permitting materials available for stakeholders to review?

The Harris Project, as it exists today, is considered baseline with regard to FERC analyses and is used in FERC's decision whether to issue a new operating license and under what conditions. Alabama Power structured this study to review and analyze flood conditions with the Harris Dam in place, consistent with FERC's guidance on existing projects and the evaluation of pre-project conditions. FERC approved this study plan in April 2019. All Harris Relicensing study plans, meeting documentation, and other permitting materials are available to stakeholders at www.harrisrelicensing.com. These documents may also be provided upon request if needed.

6 DOWNSTREAM RELEASE ALTERNATIVES STUDY

Kelly Schaeffer (Kleinschmidt) presented the Draft Downstream Release Alternatives Phase 1 Study Report progress. Kelly reviewed the study purpose and the data collected to date, which included the development of models and initial modeling results. Kelly also reviewed the remaining activities for this study, including the use of other relicensing studies to conduct the Phase 2 analyses. Kelly noted that no variances to this study plan are requested. Alabama Power distributed the Draft Downstream Release Alternatives Phase 1 Report to stakeholders in April 2020, concurrently with filing the ISR.

6.1 FERC's Questions submitted in advance of the meeting

- Q1 - Modeling scenarios…as it stands now, the report presents the results for three downstream release alternatives: Pre-Green Plan operation, Green Plan operation, and Pre-Green Plan operation with a 150 cfs continuous minimum flow. Why was modelling of minimum flow limited to 150 cfs? Also, have you considered modeling Green Plan releases with continuous minimum flow scenarios? On what basis did you choose not to do so?

  Alabama Power proposed these three modeling scenarios for downstream releases in the study plan. These scenarios have been discussed for at least 18 months with stakeholders and were developed in the study plan process and approved by FERC in its April 12, 2019 Study Plan Determination.

6.2 Alabama Rivers Alliance's Questions submitted in advance of the meeting

- Q2 - Why is the only continuous minimum flow regime being studied a 150 cfs flow? Why was this particular value chosen? Previous commenters have encouraged the study of a wide variety of flow conditions and operational scenarios. Does Alabama Power plan to study a broader range of continuous minimum flows?

  As noted above, the various flow scenarios were determined in the development of the study plan. The 150 cfs minimum flow is equal to the same daily volume as three 10-minute Green Plan pulses. If stakeholders desire additional flow conditions and operational scenarios, they need to request additional modeling per the FERC study plan modification process. Kelly Schaeffer (Kleinschmidt) explained that the modeling is resource intensive and while the HEC-RAS model is built and functioning, the process to review other flow scenarios is resource intensive.

- Q3 - The study report states that with full power storage available, Harris is programmed to generate 3.84 hours per day. Is all of that peaking generation, or is some percentage of the programmed operation for non-peaking generation?

  Yes, that number is in the daily Res-SIM model. It is really an average of all the plants in Alabama Power's system at full pool. That number is not connected to peaking operations.

- Q4 - In the Green Plan Release Criteria attached as Exhibit B, item 4 concerns Spawning Windows and states that "Spring and Fall spawning windows will be scheduled as conditions permit. The operational criteria during spawning windows will supersede the above criteria." Can you elaborate on when "conditions permit" for scheduling spawning windows?

  It is dependent on where the reservoir elevation is in relation to its rule curve and what flows are coming into the reservoir to provide stable operations. Keith Chandler (Alabama Power) gave an example: Alabama Power tried to hold a spawning window and only ran 10-minute pulses to see what it would do downstream. By going by the criteria (three 10-minute pulses) Alabama Power wanted to see if it would create a spawning window for the downstream fishery.

- Q5 - Jack West (Alabama Rivers Alliance) asked if Alabama Power had data that permitted for the spawning windows.

  There is some data. Alabama Power's Reservoir Management group has summaries of each year, and the effort in the most recent year is summarized in the baseline report included with the Pre-Application Document (PAD). A portion of this analysis is being done as part of the aquatic resources study and will be detailed in the Draft Aquatic Resources Report.

6.3 Participant Questions

- Q6 - Lisa Gordon (EPA) asked if she could be directed to the 3 downstream release alternative scenarios to find the document where the analysis occurred to model 150 cfs continuous minimum flow. So continuous minimum flow means there is no pulsing?

  Correct; there will not be pulsing with a continuous minimum flow. The flow scenarios are documented in the meeting summaries from December 2018, as well as meetings and filings in 2019 prior to the FERC Study Plan Determination (April 12, 2019). Angie Anderegg (Alabama Power) noted that all the meeting summaries and presentations (from PAD to present) are available on the Harris relicensing website.

- Q7 - Lisa Gordon asked if flows would be adaptively managed. Would these be set, locked in flows, or would there be modified flows when needed?

  Alabama Power is evaluating a continuous minimum flow with no variations or modifications; however, Alabama Power is currently in the data gathering and analysis phase. With this information, a decision about flows can be made. What Alabama Power has been doing in the years leading up to relicensing is an adaptive management process. Alabama Power also has another project that flows are being adaptively managed in a bypassed reach.

- Q8 - Sarah Salazar recalls during the study plan meeting that we discussed alternatives and the stakeholders generally didn't feel comfortable proposing alternatives at that point but said they would once they saw results from the three modeled scenarios included in

Alabama Power's study plan. The information gathering stage does not last forever so now is the time to propose other flow scenarios for modeling. Alabama Power needs those flow scenarios now.

- Q9 - Alan Creamer (FERC) said he agreed with Sarah's summary. Alan would like to see an operating scenario that includes the Green Plan with minimum flows. Alan acknowledged that the fisheries studies have not been completed, so stakeholders do not currently have that information. Once all the studies are complete and reports are available, Alan noted that there should be another opportunity for stakeholders to revisit phase 1 in terms of modeling and not simply go to phase 2 once all the information is presented to stakeholders. Also, what does the 150 cfs represent in terms of percentage of average annual flow? Where does it fall on flow duration curve?

  Alabama Power is in the process of getting that additional information by conducting the FERC approved studies. However, Alabama Power needs to hear from stakeholders now—based on the extensive amount of data currently available on the project—regarding alternative flow scenarios. Any additional scenarios are needed now. Once the phase 2 portions of the operations studies begin, any need to come back to modeling various flow scenarios may result in delays and an incomplete application, which is not acceptable to Alabama Power. There is a lot of data on the Harris Project that has been compiled and presented, and Alabama Power wants stakeholders to meet halfway with regard to putting forward additional flow alternatives to analyze.

- Q10 - Alan Creamer agreed but also reiterated that he doesn't believe we have complete information and that stakeholders should have the opportunity to modify the study plan after receiving and reviewing the study results. Alan noted that there are three studies that are not complete, and FERC and Alabama Power will have to work through this issue so that there is an additional opportunity. Normally at an ISR, Alan stated that all the first-year studies are done. In this case, there are still outstanding studies. He indicated that he doesn't think there is adequate information for stakeholders to make suggestions on alternative flow scenarios.

  The due dates in the studies were approved by FERC. Alabama Power and FERC discussed the draft study reports that were not scheduled to be included in the ISR and discussed the two studies for which Alabama Power is requesting a variance. Angie Anderegg (Alabama Power) noted that the Recreation Evaluation Draft Report is delayed, because Alabama Power incorporated a stakeholder request for an additional survey, which was just completed in April. However, the original due date approved by FERC for the Draft Recreation Evaluation Report was June 2020. Alabama Power stated that there are some reports that were not scheduled to be filed as part of the ISR. The ILP may anticipate that studies will be completed in one year and reports filed as part of the ISR, but that is not a requirement of the ILP or the ISR.

- Q11 - Sarah said that in Alabama Power's proposed and revised study plan that the schedule listed the ISR as a milestone and FERC interpreted that to mean that all the first phases of the study would be complete by then. Any other milestone that went beyond that phase would be a follow up of that report. FERC sets up the study seasons for one year. There are usually two study seasons in each ILP, and she noted that perhaps this accounts for the disparity between FERC and Alabama Power's understanding of where we should be at this moment. Maybe we need to have another discussion.

Six study reports are available for review and comment. If there is disagreement after stakeholder review and comment of the remaining three reports and cultural documents, Alabama Power would enlist FERC for a dispute resolution. Alabama Power desires that everyone has the opportunity to comment on these study reports. Angie Anderegg (Alabama Power) referred to the study schedule and noted that Alabama Power has met the ILP obligations and, where necessary, Alabama Power has asked for a variance on two studies (Recreation and Cultural APE document).

- Q12 - Rachel McNamara agreed with Alabama Power's characterization of the Recreation Evaluation and understood the rationale for modifying the schedule. For the Recreation Evaluation Draft Report, Rachel emphasized that there's need for adequate time for stakeholders to comment on the draft report and that all comments be filed with FERC. There are ways we [FERC] can handle the comment period and I think FERC staff needs to discuss that and figure out the best strategy to address comments and study plan modifications.

  Angie Anderegg (Alabama Power) assured the participants that they would have ample time to comment on the remaining draft study reports (Recreation, Aquatic Resources, Downstream Aquatic Habitat, and the Cultural APE document).

- Q13 - Jimmy Traylor raised the issue of the downstream temperature and the relationship with the minimum flow. He noted that the Tallapoosa River below Harris Dam is not supposed to be a cold-water fishery. If Alabama Power is going to release a 150 cfs continuous minimum flow, it has to be at a temperature that more like that of a warm water fishery.

  Angie Anderegg (Alabama Power) indicated that temperature would be addressed in the aquatic resources' studies (HAT 3) and requested that this question be addressed later in the meeting.

- Q14 - Barry Morris (LWPOA) asked if he was right in assuming these alternative releases would have no impacts on the lake level. Barry asked if 150 cfs was equivalent to the Green Plan flow, would it be twice as much water?

  Based on the model, a 150 cfs minimum flow would not affect the lake level. However, a larger continuous minimum flow could impact lake levels. Regarding the amount of water, Kenneth Odom (Alabama Power) stated that in response to Barry's second question, no, it is not twice as much water. Kenneth stated that the part of generation that is now used solely for Green Plan flows would be replaced by 150 cfs continuous flow. Alabama Power would not pass a continuous minimum flow and continue to pulse.

- Q15 - Rachel asked if you are generating with minimum flow.

  Yes, ideally the minimum flow would be generating, not spill. Chris Goodman (Alabama Power) said that a 150 cfs minimum flow would not affect lake levels but would constrain Alabama Power's ability to peak with the same flexibility as they currently have.

- Q16 - Maria Clark (EPA) encouraged Alabama Power to review their March 2019 comments on this issue. She asked why 2001 was selected as an average year.

  2001 was an average or normal water year determined by the Flood Frequency Analysis study for the Tallapoosa. Additionally, 2001 was pre-Green Plan, which provided pre-Green Plan operations and hourly data to run through HEC-RAS model.

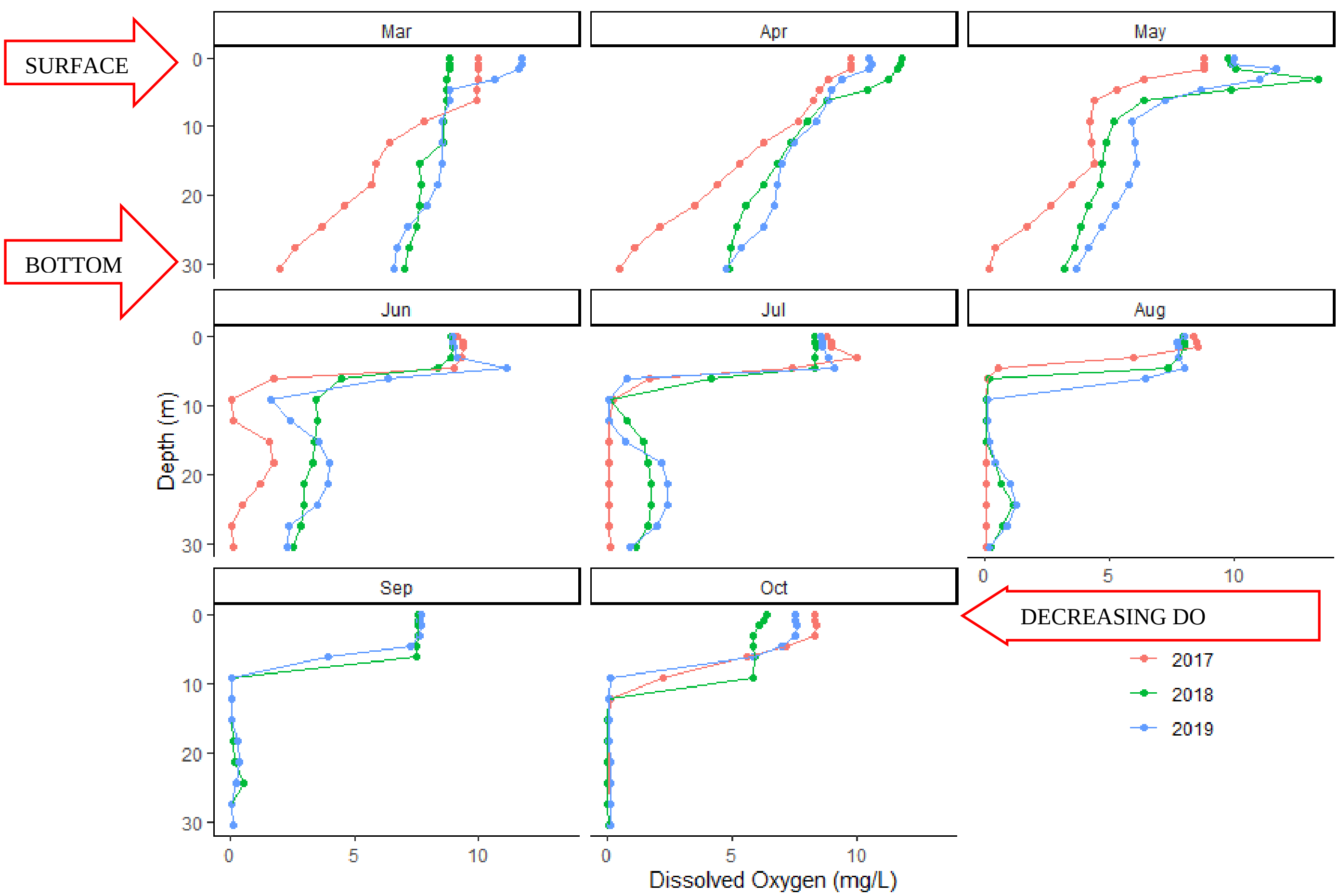
7 WATER QUALITY STUDY

Jason Moak (Kleinschmidt) presented the progress on the Draft Water Quality Study, which included the study purpose, data and activities collected to date, and remaining activities. Jason noted that no variances to this study plan are requested. However, the schedule has been updated to reflect Alabama Power's plan to file the 401 Water Quality Certification application in April 2021. Alabama Power distributed the Draft Water Quality Study report to stakeholders on March 9, 2020, and also in April 2020, concurrently with filing the ISR.

7.1 <u>FERC's Questions submitted in advance of the meeting</u>

- Q1 - Page 18…figure 3-8…please explain what is happening with the vertical DO profiles where DO increases in May, June, July, and August, where otherwise the DO should be declining.

  Jason Moak (Kleinschmidt) said it could be how the graphs are interpreted. The data shows the reservoir stratifying as expected in a reservoir during the warmer months of the year. Jason recommended an offline discussion but stated that Alabama Power will also try to clarify in the Final Water Quality Study Report.



- Q2 - Page 23 discusses Alabama DEM monitoring data for the Harris Dam tailrace (i.e., immediately downstream from Harris Dam). Was this data collected during generation, or does it also reflect non-generation periods?

  These were events when ADEM went out monthly and took a grab sample. All samples were completed during non-generation. Alabama Power will clarify this in the Final Water Quality Study Report.

- Q3 - Pages 39-41 present DO and temperature data for downstream continuous water quality monitoring station. On page 16 of the ISR, Alabama Power is not proposing any additional monitoring beyond what was approved in the Commission's SPD. Why is there not a second year of monitoring for the downstream continuous monitoring station? How confident are Alabama Power and the HAT 2 members that 1 year of monitoring at the downstream station includes a worst-case scenario?

  A second year of monitoring was not included in the FERC-approved study plan. Alabama Power is confident in the data collected thus far. Regarding a worst-case scenario, Alabama Power could monitor for 5 years and may not see a worst-case scenario. Although 2017 may have been a bad year, Alabama Power missed that opportunity to collect a continuous data set at the approved location in the study plan.

7.2 Alabama Rivers Alliance's Questions submitted in advance of the meeting

- Q4 - Previous data from 2017-2019 mentioned in Table 1-1 is not continuous, year-round data. Is Alabama Power now collecting continuous, year-round data at multiple locations?

  No. The study plan approved collecting continuous data at the downstream monitor during 2019.

- Q5 - The Alabama Power data listed on Table 1-1 shows monitoring during generation only. Is data during non-generation periods available prior to 2019?

  No.

- Q6 - The report states that a continuous monitor was "recently installed" at Malone. Was it installed on March 12, 2019 corresponding to the "Downstream Monitor 2019" tab of the WQ data excel spreadsheet?

  The monitor at Malone is owned and operated by ADEM. Data from the Malone monitor was not included in the spreadsheet. However, Alabama Power can add it to the Final Water Quality Report.

- Q7 - Is there only the one continuous monitoring station downstream from Harris Dam at Malone?

  Yes.

- Q8 - The Draft Water Quality Study Report contains significant water temperature data, but the discussion and conclusions focus almost exclusively on dissolved oxygen levels, and do not discuss temperature. Will the effects of temperature be discussed in the final report or reported on in the Aquatic Habitat or Aquatic Resources study reports?

  The effects of temperature on aquatic resources will be addressed in the Aquatic Resources Report.

- Q9 - Is Alabama Power studying, or planning to study, methods to account for low water temperatures, including using an alternative intake structure that would allow for mixing of warmer and cooler water to raise average temperatures or withdrawing water from a higher depth in the reservoir to allow for warmer releases?

  Alabama Power intends to study technologies that can address temperature, as needed, once a temperature issue has been determined and defined through on-going study and data analyses.

7.3 Participant Questions

- Q10 - Alan Creamer (FERC) noted that there was only one year of continuous monitoring data. How confident is Alabama Power that the data represents what could be a worst-case drought or is truly reflective of the worst water quality could be? Also, Alan asked why Alabama Power couldn't get more than one year of continuous data? If stakeholders want to look at this and want to know how confident Alabama Power is in this data and that it truly represents a drought period.

  Jason Moak (Kleinschmidt) said he does not think 2019 was a worst-case scenario and that it is not known if 2020 would be either. Angie Anderegg (Alabama Power) said that Alabama Power proposed one year of monitoring in the study plan, which was approved. Angie also noted that it is time consuming and expensive to service the continuous monitor but that will not prevent further monitoring should it be required.

  Alan stated that when FERC approved the Water Quality Study Plan, it was with the intent that collectively, we would use year one data to determine if additional data were needed. Angie Anderegg (Alabama Power) asked if FERC sees a need for an additional year. Alan said there are instances where we drop below what we are trying to achieve, so if this is not the worst-case scenario, you could have more years where the DO drops below that criteria. Alan further stated that it is hard to make decisions on just one year. Alan also pointed out that the one year included in the report was not one that could be considered a drought, so in a drought Alabama Power may only meet water quality criteria 90% of the time. Angie noted that because Alabama Power is filing the 401 application in 2021, Alabama Power is collecting data at the tailrace monitor in 2020, resulting in an additional year of data. Alan Creamer noted that the tailrace monitor is only capturing generation. He indicated that FERC wants to know what happens to water quality during both generation and non-generation.

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Keith Chandler (Alabama Power) noted that 2019 was not a drought year, but it was a hot year and that ADEM is continuing to collect data downstream. Keith further said Alabama Power ran only green plan flows a lot of the time during the monitoring season.

Alan Creamer said the most important part of this is what is happening right below Harris Dam or less than half a mile downstream. The other gages further downstream are also accounting for other influence. In reading this report Alabama Power met the criteria near 100% of the time but that may not be reflective of what's happening closer to the dam.

- Q11 - Jimmy Traylor (Downstream Landowner) asked if anyone has identified the sulfur smell in released water? Jimmy said he noticed it in the summer especially during the first 45 minutes or so of generation. Near Malone you get a foul smell. Seems to go hand-in-hand with drought conditions. As you get further into the summer months, it worsens.

  Alabama Power is not aware of a sulfur smell in the water. Jason Moak (Kleinschmidt) asked if there was a time of year that the smell is worse. Jason said he has noticed that smell at other hydro projects and said it probably had something to do with natural lake stratification and biological processes that occur on the lake bottom.

- Q12 - Sarah Salazar (FERC) asked if the Draft Water Quality Report covered where in the water column that Alabama Power is drawing water from in Lake Harris? This would be helpful to include in the report.

  The intake at Harris has a movable sill. Alabama Power will add this information to the Final Water Quality Report.

- Q13 - Albert Eiland (Downstream Landowner) asked to please summarize the conversation between him and Jason Moak about mercury. Has the content changed in the reservoir? How bad is it in the lake?

  Jason Moak (Kleinschmidt) said he was not sure. It could be coming from atmospheric deposition in the lake. Jason noted it is a widespread issue among reservoirs all over the country and an issue with large bodies of water and fish.

- Q14 - Maria Clark mentioned a Georgia Project where they do maintenance in the intake because a lot of debris accumulates, and they let the water run which causes the debris to mix into the water that is being released. Clearing that helped alleviate the smell. This was a smaller dam.

  Jason Moak (Kleinschmidt) said there is not much of a debris issue due to the size of the Harris Dam.

8 EROSION AND SEDIMENTATION STUDY

Jason Moak (Kleinschmidt) presented the progress on the Draft Erosion and Sedimentation Study, which included the study purpose, data and activities collected to date, and remaining activities. Jason noted that no variances to this study plan are requested. Alabama Power distributed the Draft Study report to stakeholders on March 17, 2020, and also in April 2020, concurrently with filing the ISR.

8.1 FERC's Questions submitted in advance of the meeting

- Q1 - Section 5.0, Discussion and Conclusions states that at some sites, "land clearing and landscaping, and other construction activities affecting runoff towards the reservoir" cause erosion. Is it possible to provide areal images showing the areas of active erosion in relation to the project boundary as part of the final study report?

  Yes. Alabama Power will add aerial photos showing the project boundary, winter pool, and summer pool contours.

- Q2 - Appendix D – photos…it would be helpful if the captions for the photos included better location descriptors (e.g., Harris Reservoir, Harris Reservoir-?? Embayment, Harris Reservoir-?? River Arm, Tallapoosa River, etc.). For the Harris Reservoir sites, it would be helpful if the contours within which peaking operations occur (lake fluctuation zone) could be identified.

  Alabama Power will add captions with location descriptors to the photos in Appendix D. Because Harris is a storage reservoir, there are no daily fluctuations in reservoir level, only seasonal fluctuations in accordance with the operating curve.

- Q3 - Could you make the video footage that was collected as part of this study available for stakeholders to view?

  Yes, Alabama Power is investigating how to make the video footage available.

- Q4 - Will the nuisance aquatic vegetation surveys still be possible to conduct in Lake Harris this summer?

  Yes, the nuisance aquatic vegetation surveys are scheduled for summer 2020.

- Q5 - On page 24, in section 3.2, the report includes the following statement: "A total of 20 sites, rather than 15 sites, were provided for the left bank segments as many segments were tied with a score of (slightly impaired)." Please explain what is meant by many of the streambank segments being "tied with a score of slightly impaired" and clarify the relationship between the number of streambank segments/sites and the bank condition score.

Alabama Power will edit the text to make this section clearer. All assessed streambank segments (each 0.1 mi of the study reach) were sorted based on their condition score, from lowest to highest. Sites with the 15 worst scores (i.e., ranked 1 through 15) were presented in Table 3-2. Since 14 of the left bank segments in the list had the same score for condition (3.0), they were included in the list.

- Q6 - On page 25, in Table 3-2, shouldn't the heading/label of the first column of the table be "Site Number" instead of "Rank" given that the rank options are only 1 through 5 (according to Table 3-1) and there appear to be 20 sites?

  Please see the response to Q5 above. Alabama Power understands that this table is confusing and will rework it to make the results clearer in the Final Erosion and Sedimentation Study Report.

- Q7 - On page 11, of the Tallapoosa River High Definition Stream Survey Final Report (Appendix E of the Erosion and Sedimentation Study Report), it states that prior to the survey, flows were monitored to ensure relatively normal flow conditions during the survey. For clarity, what were the "relatively normal flow conditions" during the survey? Were they slightly higher or lower than average?

  As seen in the graphs of discharge on page 12 of Appendix E, flows during the study were very close to the long-term median value.

- Q8 - In Figures 13 and 16 of the Tallapoosa River High Definition Stream Survey Final Report, the scale is small and so it appears that most of the riverbanks are unmodified and the modified banks identified on the individual site surveys are not visible. It would be helpful if the figures in the report showed labeled points for the erosion/sedimentation sites that are identified in the report.

  Alabama Power will provide figures with a larger scale and with labeled erosion sites in the Final Report.

- Q9 - Page 20 of Tallapoosa River High Definition Stream Survey Final Report states that a confidence rating was used to indicate the clarity of the streambanks in the video and figures 14 and 17 of that report show areas where the video clarity was impaired and therefore the confidence in the accuracy of the streambank conditions/classifications is lower. As stated above, it would be helpful if the figures in the report showed labeled points for the erosion/sedimentation sites that are identified in the report. Do any of the areas with impaired video clarity coincide with areas that stakeholders identified as erosion/sedimentation sites or other sites that Alabama Power identified as part of this study? Do you intend to take any steps to deal with the impaired clarity data? Is so, how?

  Alabama Power will reexamine these areas to determine if sites with lower confidence coincided with identified erosion sites. If so, we will perform targeted surveys of these areas and update the Final Report accordingly.

- Q10 - In Figure 18 of the Tallapoosa River High Definition Stream Survey Final Report, there appears to be a missing ranking at river mile 37 for the right streambank. Could you explain this gap in the ranking?

  Alabama Power is reexamining this area and will include rankings in the Final Report.

- Q11 - For Figures 20 through 23 of the Tallapoosa River High Definition Stream Survey Final Report, please label the river mile ranges on the maps to help reviewers understand the starting and ending points of the study area and which segments of river are included.

  In Figure 26 of the Tallapoosa River High Definition Stream Survey Final Report, please move the scale bar and sources so that they are not covering the river segment and bank conditions at the bottom of the map.

  Alabama Power will revise this figure accordingly.

- Q12 - Can you identify where peaking pulses are attenuated downstream from Harris Dam under the current operating regime and volume of typical downstream releases? If so, are there any patterns in the downstream streambank conditions and observed levels of erosion along the segments of streambanks within the attenuation zone? Where are the identified erosion sites in relation to the length of the attenuation zone?

  Alabama Power will incorporate a discussion of water level fluctuations and any potential correlations with streambank erosion into the discussion section of the Final Report.

8.2 <u>Alabama Rivers Alliance's Questions submitted in advance of the meeting</u>

- Q13 - Will we have access to the High Definition Stream Survey video created by Trutta Environmental Solution as part of the Downstream Bank Stability Report?

  Yes, Alabama Power is investigating how to make the video footage available.

- Q14 - Table 3-2 shows streambank scored for the 15 most impaired areas downstream of Harris Dam. How was the Average Combination Bank Condition score (final column) computed? It does not appear to be an average of the "Average Left Bank Condition" and "Average Right Bank Condition" scores, which would yield a lower average scored. The averages showing for the left and right banks are mostly 3.0 or higher while the average combined bank condition scores are mostly below 3.0.

  Jason Moak (Kleinschmidt) noted that one column looks only at left bank and the other the only right bank. Every tenth mile those scores were averaged and ranked. Jack West (Alabama Rivers Alliance) said it still doesn't make sense why you have larger averages on both sides, and they are reduced in combination. Sarah Salazar (FERC) said that part of the table was confusing as well, and she is not certain that last column is informative. Jason said he agrees and was thinking that it may only make sense when there are impacts on both sides, like a transmission line crossing.

- Q15 - The report concludes in Section 5.0 that "None of the erosion sites surveyed were the result of fluctuations due to project operations." This conclusion seems in conflict with the assessment in the HDSS that impairment areas "were due to the fluctuating flows eroding the streambank within a few feet of the water surface and streambank interface." (Pg. 43 of Trutta Report).

  This statement refers to the reservoir. Because Harris is a storage reservoir, most of the erosion occurring in the reservoir is due to wave action from boats or winds.

- Q16 - Is Alabama Power completing a total suspended sediment analysis during the pre-pulse, pulse, and post-pulse time periods to see what sediment is getting moved from and to various locations?

  No, Alabama Power is not completing a total suspended sediment analysis.

- Q17 - Is Alabama Power conducting a historical, cumulative effects study of erosion since the dam's construction?

  Alabama Power is not performing a cumulative effects study.

- Q18 - Is Alabama Power assessing whether having a continuous minimum flow downstream may help with erosion and sedimentation problems?

  Yes. Alabama Power will use the model outputs to assess the difference in water level fluctuations.

- Q19 - Jack West asked why it seems that none of the erosion sites are due to operations.

  Most of the erosion issues downstream are not due exclusively to operations. For example, areas where trees and vegetation are being cleared are not due exclusively to operations, but water fluctuations could exacerbate erosion.

8.3 <u>Donna Matthews' Questions submitted in advance of the meeting</u>

- Q20 - Better Visualization of Erosion over the Past 50 Years: Do the erosion studies conducted during this permitting period compare pre-dam (baseline) river shape/contour with the current status of the river? Pre-dam analog photographs exist for comparison to current satellite imagery.

  Alabama Power has not compared pre-dam conditions to current conditions. Historical photographs may provide useful information for the cumulative impacts section of the license application and for FERC's use.

8.4 <u>Participant Questions</u>

- Q21 - Jimmy Traylor (Downstream Landowner) said he has no trees on the bank at his property and has little bank remaining. He asked Jason what he would consider that? Mr. Traylor noted that his trees have been falling in and steps that his grandfather built are disappearing since the dam was built and operation.

Jason Moak said he would locate Mr. Traylor's property on the data file to see how that area was scored. Jimmy Traylor responded that the Draft Erosion and Sedimentation Report says, "not much erosion" at his property. Mr. Traylor also noted that there is significant sedimentation in areas like Cornhouse Creek and No Business Creek where the water backs up during generation. He characterized it as "a mud pit" and this has significantly affected these tributaries. He believes Alabama Power is missing the mark on erosion. Mr. Traylor also noted that since the inception of the Green Plan, erosion has decreased. He noted that a continuous minimum flow would also help reduce erosion. Jack West (ARA) asked about data Alabama Power may have regarding bank conditions and erosion from the 1980s (pre-project and just after project was constructed), 1990s, and in the 2000s to do a cumulative effects study. If there is data, he asked that Alabama Power make it available so we can assess the impacts on a larger scale.

Carol Knight concurs with Jimmy Traylor and Albert Eiland can give anecdotal evidence of how the banks have eroded. Carol indicated that she has old maps from 40s and 50s of conditions during that time to compare what it is now. Those trees weren't necessarily clear cut. People downstream know what it used to be, and they know what it is now. She noted that they are having a hard time reconciling these things. There is significant erosion. It is not just because somebody is cutting trees or that they are letting cows access the river.

Jason Moak (Kleinschmidt) explained that he was not suggesting that where erosion occurs it is the landowners' fault. Jason emphasized that it is very important for downstream property owners to comment on any areas that downstream property owners believe the Draft Erosion and Sedimentation Report has mischaracterized the erosion and source of the erosion.

Maria Clark wanted to know why not do a GIS study. We have a lot of data, including the areas that are impaired. We have pictures. What I can see by following the data you have looks like the erosion is mostly in the river bends. With other projects, we have seen landowners have a lot to do with it by cutting trees for their river view. If we analyze with GIS what happened when the dam was built and 50 years later, we will be able to see the development. It is important to bring this information out for Alabama Power to show more clearly these project impacts using GIS.

Donna Matthews said she's been playing with maps and someone took old aerial photos and coordinates from landowners when they came to a meeting and shared erosion hot spots. One set is from 1964 and one set is from the 1940s. Donna indicated that if anyone is interested, they can overlay the google earth pictures. There are certain markers that local people have put together.

Jimmy Traylor said that his land is undeveloped except for maybe 200 yards and said they have never cut the timber, one of the last virgin hardwood bottoms around. Losing trees and losing bank. That is erosion.

Albert Eiland noted he lives about 2 miles below Jimmy Traylor and is on the outside of a natural curve, which will experience more damage than an inside curve. Mr. Eiland noted that historically there were 7-8 islands in the Tallapoosa River. Those old maps will show that. There is only one island left. Jimmy asked if it's Hodge's island. Albert said the island is on an inside curve, that's why it's still there. In spring of 2017 we experienced a lot of flooding. I lost 2 big trees. Has been losing trees and the bank. We have hauled a lot of rocks in there to keep it from washing away. Would be eroded away without the rocks.

Relevant to this discussion, Carol Knight submitted a comment via IM from a participant that had to drop off the meeting conference call. Her issue is that there are serious erosion issue and has gotten worse this year with all the rain and the river fluctuating up and down. Several places have large holes in the banks and many of the trees have washed away. She indicated that the water is extremely high even if there isn't a scheduled release.

- Q29 - Lake Watch: Has there been assessment/consideration of sedimentation in the Tallapoosa where it enters Lake Martin, where the bulk of the sediment settles out as the river current declines, as seen by large sediment bars that have formed below where Hillabee Creek enters the river?

  An assessment has not been done in that area. The Study Area extends through Horseshoe Bend. It is likely that bedload sediment naturally transported down Hillabee Creek settles out as it enters the upper reaches of Lake Martin, similar to what happens in the Little Tallapoosa River at the headwaters of Lake Harris.

- Q30 - Rachel asked about erosion areas on the lake that are anthropogenically attributed: She recommended that Alabama Power include in the Final Study Report the shoreline management classifications in the area where it appears erosion is occurring. Rachel noted that FERC identified erosion and sedimentation as something they would analyze for cumulative effects. There is a sense that the license application will need information on cumulative effects. Some of this will be anecdotal and this information may go into the analysis. FERC does look at cumulative effects, but it may not be something addressed directly by study report.

  Summer and winter pool contours would also be helpful for cumulative effects analysis, and Alabama Power will add the suggested information to the Final Report.

- Q31 – Charles Denman via email following the meeting: I agree with other participants that a comparison of historical photos with current conditions of the river would help to understand the flushing effects operations of the dam have on downstream erosion.

9 THREATENED AND ENDANGERED SPECIES STUDY

Jason Moak (Kleinschmidt) presented the progress on the Draft Threatened and Endangered Species study, which included the study purpose, data and activities collected to date, and remaining activities. Additional fieldwork is planned for summer 2020 for this study. Jason noted that no variances to this study plan are requested. Alabama Power distributed the Draft Desktop Assessment Report to stakeholders in April 2020, concurrently with filing the ISR.

9.1 FERC's questions submitted in advance of the meeting

- Q1 - Have the GIS overlays of T&E species habitat information and maps been completed (i.e., the map figures in Appendix B of the draft T&E species study report)? Or are there still steps to complete this component of the study? We suggest including project features, recreation areas, and other managed areas (e.g., timber harvest areas, wildlife management areas, etc.) on the T&E species maps in order to help determine the proximity of species ranges/habitats to project-related activities and identify the need for species-specific field surveys.

  Those maps are completed. Alabama Power will consider making the suggested additions.

- Q2 - While the draft T&E species study report indicates that additional field surveys for the fine-lined pocketbook freshwater mussel are planned for May 2020, the report does not include a description of the criteria used to determine which of the species on USFWS's official (IPaC) list of T&E species would be surveyed in the field. Please describe which species will be surveyed in the field and explain how and why they were selected. In addition, please describe any correspondence Alabama Power has had with FWS and state agencies regarding the T&E species selected for additional field surveys.

  Alabama Power is consulting with USFWS to determine which species have known historical occurrences or critical habitat intersecting the Project boundary or could reasonably be found within the Project boundary. Surveys will be performed for the palezone shiner due to information from USFWS regarding the possibility of existence in some tributaries within Skyline. Surveys of fine-lined pocketbook are being performed due to existing critical habitat in the upper Tallapoosa River above Lake Harris. Correspondence between Alabama Power and USFWS and state agencies as of the ISR filing is included as Attachment 2 of the Draft Threatened and Endangered Species Desktop Assessment.

- Q3 - Page 7 lists the sources for the ESA species information. The sources included USFWS's Environmental Conservation Online System (ECOS) but did not include IPaC. The official list is obtained through the IPaC report. Has an IPaC report been downloaded or are you using the IPaC report filed to the record by FERC staff?

The ECOS website was used as a source for life history, habitat, and range information in preparation of the desktop assessment. The IPaC list was used to identify species to include in the desktop assessment and potential field surveys.

- Q4 - Page 8 states that the existing land use data is not specific enough to determine if the 3,068 acres of coniferous forest within the Project Boundary at Lake Harris would be suitable for red-cockaded woodpecker. How do you propose to assess the suitability for red-cockaded woodpecker?

  Field observation at these coniferous forests could determine whether these areas contain suitable habitat. Specifically, Alabama Power would look for areas with little or no hardwood mid-story and over-story trees. Alabama Power would also look for larger, older longleaf pines, which make ideal cavity trees for this species in areas that were lacking hardwood mid-story and over-story. Alabama Power will perform this field observation if USFWS deems it necessary.

- Q5 - On pages 3, 10, and 26 there is mention of additional fieldwork planned for two mussel species (i.e., fine-lined pocketbook and Southern pigtoe) for May 2020. Please elaborate on the details of the additional survey work (e.g., survey location(s), sampling protocols and methodologies employed, and clarify which species will be included in the May 2020 assessment, etc.).

  In November 2019, surveys were conducted for fine-lined pocketbook on a 3.75 mile stretch of the Tallapoosa River where critical habitat is known to occur from the County 36 bridge to a shoal below the Highway 431 bridge. This endpoint was chosen, because only pool habitat was available another half mile downstream of this bridge. Six surveyors including USFWS, Alabama Power, and Kleinschmidt searched for the target species in 20-minute to one-hour segments at areas containing critical habitat and searched for additional areas with suitable habitat. Silty areas and piles of shells left by muskrats and raccoons were also searched. The introduced *Corbicula fluminea* (Asian clam) was the only bi-valve species observed in these piles. Because high water impeded the search in some areas and the cold weather may have caused mussels to burrow out of site, USFWS suggested another effort be made in the spring. Surveyors will search for fine-lined pocketbook and suitable habitat again in late spring/summer 2020, pending any COVID-19 restrictions. Southern pigtoe is not a species that we would reasonably expect to find in the Project boundary. It is known to occur in Cleburne County, which overlaps the Project boundary. However, documented historical range in that county exists exclusively in the Coosa River drainage basin. The Lake Harris Project Area does not contain any critical habitat areas for Southern pigtoe identified by the USFWS.

- Q6 - The descriptions of Alabama lampmussel and rabbitsfoot mussel on pages 11, 13, and 14 do not provide these species' host fish species. Are the host fish species currently unknown, or was this an inadvertent omission?

  The host fish species are currently unknown. Suitable hosts for rabbitsfoot populations west of the Mississippi River are shiner species such as blacktail shiner, cardinal shiner, red shiner, spotfin shiner, and bluntface shiner. There is not much

available information about rabbitsfoot host fishes east of the Mississippi River. Research has shown that lampmussels can successfully utilize rock bass, green sunfish, bluegill, smallmouth bass, spotted bass, largemouth bass, and redeye bass as host fish. It has also been reported that banded sculpin are potential host fish for lampmussels.

- Q7 - There appears to be a typo on page 16, in the description of Southern pigtoe mussel. The middle of the first paragraph refers to the glochidia of the finelined pocketbook mussel. Is this sentence misplaced, or does the information pertain to the southern pigtoe mussel (the subject of section 3.12)? Please clarify.

  This is a typo, and the information refers to the Southern pigtoe. The host fishes are accurate.

- Q8 - On page 19, in the first paragraph about the northern long-eared bat (NLEB), it is unclear why the discussion includes the statement about a low occurrence of this species in the "…southwestern region of Alabama" given that the project areas are located in the northeastern and mid-eastern portions of Alabama. Please clarify or correct this statement.

  This information is correct. The sentence is intended to describe the general distribution of the species in Alabama.

- Q9 - The draft T&E species study report states that there are no known NLEB hibernacula or maternity roost trees *within the Project Boundary*. However, it does not include information on known NLEB hibernacula *within 0.25 mile of the Project Boundary* and known NLEB maternity roosts *within 150 feet of the Project Boundary* (i.e., at Harris Lake and Skyline). In addition, the report mentions a couple of best management practices (BMPs), protective of some bat species, that Alabama Power implements during timber harvest activities and states that the BMPs have been expanded but not incorporated in the existing license. However, the report does not include the locations of Alabama Power's timber harvesting and other tree removal activities, or detailed descriptions of timber harvesting protocols and BMPs currently implemented within the Project Boundary. This information is important to understanding the affected environment for Indiana bat, NLEB, and/or other T&E species. This information could also be used for the streamlined consultation option for analyzing the potential project effects on NLEB (including within the buffer areas for hibernacula and maternity roost trees).

  Please complete the USFWS's NLEB streamlined consultation form and include it in the final T&E species study report. This form can be found at: https://www.fws.gov/southeast/pdf/guidelines/northern-long-eared-bat-streamlined-checklist.pdf. We recommend using FWS's definition of "tree removal" to guide your responses on the form (i.e., "cutting down, harvesting, destroying, trimming, or manipulating in any other way the trees, saplings, snags, or any other form of woody vegetation likely to be used by northern long-eared bats").[3]

Also, please update figures 3.14-1, 3.14-2, 3.14-3, 3.15-1, 3.15-2, and 3.15-3 which currently show "forested area" or "karst landscape" in relation to NLEB and Indiana bat habitats, to show Alabama Power's timber management areas within the Project Boundary, and other proposed managed areas (e.g., new/improved recreation areas, new quail management areas). This type of information is needed to meet another component of this study (i.e., "determine if [T&E species habitat at the project] are potentially impacted by Harris Project operations", as described on slide 5 of the Aug. 27, 2019, HAT 3 meeting).

Alabama Power will complete the NLEB streamlined consultation form to be included in the Final T&E Species Report and update the requested figures.

- Q10 - On page 21 and 22, in section 3.17, the discussion mentions an occurrence of little amphianthus within the Project Boundary at Lake Harris (Flat Rock Park) that was documented in 1995 and may be extirpated. Did the botanical surveys in that area of the project target that species? The top of page 22, states that "Vernal pools were not identified due to a lack of available data." Did the botanical surveys identify vernal pools in this area?

  The botanical inventory targeted all plant species existing within the Inventory Area, which is defined as the Blake's Ferry Pluton and is located adjacent to Flat Rock Park. Of the 365 plant species documented in the Inventory Area. Vernal pools were observed during surveys performed in 2019, however little amphianthus was not found in any of the pools.

- Q11 - On page 22, in section 3.18, the report states that the National Wetland Inventory data is not detailed enough to identify wetlands within the project area that contain white fringeless orchid's unique wetland habitat characteristics. Do you propose collecting more data on this subject?

  Alabama Power is consulting with USFWS and Alabama Natural Heritage Program experts to determine if these habitats are present within the Project Boundary.

- Q12 - On page 23, in section 3.19, the report states that the 16 extant populations of Prices' potato bean in Jackson County, occur on Sauta Cave National Wildlife Refuge, and near Little Coon Creek in the Skyline WMA. Please clarify whether or not any of the 16 populations occur within the Project Boundary at Skyline WMA.

  One extant population intersects the Project Boundary at Skyline and comprises 11 percent of the extant population occurring at Little Coon Creek. However, 89 percent of this single population occurs outside of the Project Boundary.

[3] 81 Fed. Reg. 1902 (January 14, 2016).

- Q13 - In Appendix B, figure 3.19, showing Price's potato bean habitat range, there is a 100-foot Stream Buffer within the Limestone Landscape layer shown on the map and legend. Please explain the significance of this buffer, including any regulatory requirements associated with this buffer. Please include this information in the Final T&E Species Study Report.

  Price's potato bean is known to exist in Little Coon Creek. This species seems to prefer low areas along near or along the banks of streams and rivers. The buffer indicated on the figure is not regulatory. It is meant to depict areas where this species could potentially occur based on known habitat preferences. We will include this information in the final report.

- Q14 - In the August 27, 2019, HAT 3 meeting summary, please clarify the following: How does Alabama Power define terms such as "sensitive time periods" in the context of timber harvesting? Evan Collins, of FWS, stated that the palezone shiner may be present in some of the lower reaches of the Tennessee River tributaries. Please clarify where these tributaries are located in relation to the Project Boundary.

  Alabama Power will include its timber harvesting BMPs as an appendix to the Final T&E species study report. Alabama Power is consulting with USFWS to perform an assessment to determine if palezone shiner are present in Little Coon Creek, which flows through portions of the Project Boundary at Skyline.

9.2 Alabama Rivers Alliance's Questions submitted in advance of the meeting

- Q15 - Is the additional fieldwork to identify mussels scheduled for May being pushed back or proceeding on schedule?

  The mussel identification fieldwork is proceeding on schedule; however, fieldwork dates are subject to change due to COVID-19 restrictions. Alabama Power will proceed with fieldwork at the earliest possible date during the spring/summer 2020.

9.3 Participant Questions

- Q16 - Ken Wills (Alabama Glade Conservation Association) - Are the 138.4 acres of granite geology west of the Project Boundary on Alabama Power land, other private land, or public land? How much is public and private land and how much is Flat Rock?

  There are private property outcroppings in that area. The Flat Rock Park itself is approximately 25 acres.

- Q17 - Jimmy Traylor asked why there are no [Threatened and Endangered Species] studies below the dam and how Skyline effects water below the dam.

  Based on consultation with USFWS, no threatened or endangered species have been identified below the dam. Skyline does not affect the water below the dam.

- Q18 - Sarah Salazar (Federal Energy Regulatory Commission (FERC) asked if Alabama Power could elaborate on how they decided which species to perform field surveys for. How was the list of species being surveyed narrowed down with USFWS?

  Determining which species to search for in the field is an ongoing process. The consultation details will be in the final report. This desktop assessment is being used as an initial step toward determining which species to focus on in the field.

- Q19 - Sarah asked if IPaC was being used to determine which threatened or endangered species were in the Project Boundary. If USFWS makes any changes to the inventory of listed species in the Project Boundary, that needs to be considered.

  The ECOS website was used as a source for life history, habitat, and range information in preparation of the desktop assessment. The IPaC list was used to identify species to include in the desktop assessment and potential field surveys.

- Q20 - Sarah said that additional information is needed for a streamlined consultation on the Northern long-eared bat. The buffer zones, which are within 0.25 miles of a hibernaculum at any time or within 150 feet of a known occupied maternity roost tree from June through July, were not included in the report. The report seems to be focused on what has been reported in the Project Boundary, but the effects of tree removal need to be analyzed.

  Consultation on the Northern long-eared bat is ongoing.

- Q21 - Evan Collins (USFWS) said he does not have a copy of the best management practices for consultation on bats and that information would be beneficial to mapping the buffer zone.

  Alabama Power has this information and will provide it to Evan Collins.

- Q22 - Jimmy Traylor asked why no federally listed species below the dam are being studied.

  No listed species have been documented in the Tallapoosa River below the Harris Dam.

10 DOWNSTREAM AQUATIC HABITAT STUDY

Jason Moak (Kleinschmidt) presented the progress on the Downstream Aquatic Habitat Study, which included the study purpose, data and activities collected to date, and remaining activities. Jason noted that no variances to this study plan are requested, and the Draft Study Report will be distributed to stakeholders in June 2020.

10.1 Participant Questions

- Q1 - Jimmy Traylor (Downstream Landowner) asked if the temperature component would be included in the draft report? Jimmy commented that 3 months of data will not provide enough information.

  Depending upon the timeframe for date processing, Alabama Power may be able to include the temperature component in the draft report. Jason Moak (Kleinschmidt) clarified that the level loggers have been operational since June 2019 and will continue to gather data through June 2020.

- Q2 - Alan Creamer (FERC) stated that only a limited number of alternatives are being tested and that there may be additional scenarios that stakeholders would like to see modeled based on the outcomes of these studies. Alan suggested that FERC may need to meet with Alabama Power to decide how best to approach this study and decide whether a modified study plan is needed.

  Jason Moak (Kleinschmidt) indicated that once the model is complete, it would be possible to run different operational scenarios.

- Q3 - Donna Matthews asked if the completed model could analyze optimal conditions, or what would be needed to achieve optimal conditions. Could the model be adjusted to see the effects of change on the outputs?

  Alan Creamer (FERC) suggested that FERC may need to meet with Alabama Power to decide how best to approach this study and decide whether a modified study plan is needed.

- Q4 - Jimmy Traylor (Downstream Landowner) asked if Elise Irwin's studies are being considered.

  The previous studies conducted by Elise Irwin are being used in the Aquatic Resources study and in the desktop assessment.

11 AQUATIC RESOURCES STUDY

Jason Moak (Kleinschmidt) presented the progress on the Aquatic Resources Study, which included the study purpose, data and activities collected to date, and remaining activities. Auburn University has a primary role in conducting this study, which includes fieldwork and laboratory testing (i.e., bioenergetics). Jason noted that no variances to this study plan are requested, and the Draft Study Report will be distributed to stakeholders in July 2020.

11.1 Participant Questions

- Q1 - Ken Wills asked if there were any dates set for our next electronic meeting.

  Angie Anderegg said meetings have not been scheduled to-date, but Alabama Power will let the HAT participants know as soon as dates are selected.

12 NEXT STEPS IN THE ILP

Kelly Schaeffer reviewed the next steps in the ILP. She noted that participants should file their comments on the ISR meeting summary and the draft study reports with FERC no later than June 11, 2020.

- Q1 - Maria Clark asked if the questions or comments would be posted on the website?

  Alabama Power will file the ISR meeting summary with FERC on May 12, 2020, and the document will also be posted on the Harris relicensing website (www.harrisrelicensing.com).

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APPENDIX A

ISR Meeting Participants

Harris Relicensing Initial Study Report Meeting
April 28, 2020

Attendees:

Alabama Department of Conservation and Natural Resources
Damon Abernethy
Todd Fobian
Keith Gauldin
Keith Henderson
Matt Marshall
Amy Silvano
Chris Smith

Alabama Department of Economic and Community Affairs, Office of Water Resources
Brian Atkins
Dow Johnston

Alabama Department of Environmental Management
Jennifer Haslbauer
Fred Leslie
David Moore

Alabama Glade Conservation Coalition
Ken Wills

Alabama Historical Commission
Amanda McBride
Eric Sipes

Alabama Power
Angie Anderegg
Dave Anderson
Wes Anderson
Jeff Baker
Jason Carlee
Keith Chandler
Jim Crew
William Gardner
Mike Godfrey
Chris Goodman
Stacey Graham
Rodger Jennings
Ashley McVicar
Tina Mills

Alabama Power (continued)
Kenneth Odom
Courtenay O'Mara (Georgia Power)
Alan Peeples
Jennifer Rasberry
Shelia Smith
Thomas St. John

Alabama Rivers Alliance
Martha Hunter
Jack West

Auburn University
Dennis Devries
Ehlana Stell
Rusty Wright

Cherokee Nation
Elizabeth Toombs

Downstream Property Owners
David Chandler, Historian
Albert Eiland, Wadley
Carol Knight, Wadley
Donna Matthews, Wedowee
Jimmy Traylor, Malone
Melissa Willis, Clay County Extension

Environmental Protection Agency
Maria Clark
Lisa Perras Gordon
Lydia Mayo

Federal Energy Regulatory Commission
Allan Creamer
Danielle Elefritz
Rachel McNamara
Sarah Salazar
Monte Terhaar

General Stakeholders
Charles Denman
Matthew Stryker

Kleinschmidt
Kate Cosnahan
Colin Dinken
Amanda Fleming
Mike Hross
Jason Moak
Kevin Nebiolo
Kelly Schaeffer
Dr. Kevin Hunt - Recreation Subconsultant

Lake Martin Resource Association
Steve Forehand
John Thompson

Lake Wedowee Property Owners Association
Barry Morris

Muscogee (Creek) Nation
RaeLynn Butler
Turner Hunt
LeeAnn Wendt

National Park Service
Jeff Duncan

U.S. Army Corps of Engineers
Cindy Donald
James Hathorn

U.S. Fish and Wildlife Service
Evan Collins

U.S. Geological Survey
Elise Irwin

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APPENDIX B

ISR Meeting Presentation

R.L. Harris Dam Relicensing
FERC No. 2628

Initial Study Report Meeting
April 28, 2020

HARRIS DAM
RELICENSING

Welcome and Roll Call

Roll Call by Organization

HARRIS DAM
RELICENSING

Phone Etiquette

- ❑Be patient with any technology issues
- ❑Follow the facilitator’s instructions
- ❑Phones will be muted during presentations
- ❑Follow along with PDF of presentations
- ❑Write down any questions you have for the designated question section
- ❑Clearly state name and organization when asking questions
- ❑Facilitator will ask for participant questions following each section of the presentation

HARRIS DAM
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Agenda

- 9 AM Introduction/Roll Call/Safety Moment
- Initial Study Report Overview
  - Cultural Resources (HAT 6)
  - Recreation Evaluation (HAT 5)
  - Project Lands Evaluation (HAT 4)
  - Operating Curve Feasibility Analysis and Downstream Release Alternatives (HAT 1)
  - Water Quality and Erosion and Sedimentation (HAT 2)
  - Threatened and Endangered Species; Downstream Aquatic Habitat; Aquatic Resources (HAT 3)
- Next Steps in the FERC Process

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HAT 6 Cultural Resources

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CULTURAL RESOURCES PROGRAMMATIC AGREEMENT AND HISTORIC PROPERTIES MANAGEMENT PLAN

Study Purpose and Methods Summary

- ❑ Develop Historic Properties Management Plan and Programmatic Agreement.

Study Progress

- ❑ Identify Sites for Further Evaluation and Initial Evaluation Methods
- ❑ Propose Historic Properties Management Plan Outline
- ❑ Five HAT Meetings, including one Site Visit
- ❑ Inadvertent Discovery Plan, Traditional Cultural Properties Identification Plan Filed in April 2020

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Cultural Resources Programmatic Agreement and Historic Properties Management Plan

Variance from Study Plan and Schedule

- Alabama Power continues to work with the Alabama SHPO for concurrence regarding the Harris APE
- File the final APE (with maps) by June 30, 2020

Remaining Activities /Modifications/Other Proposed Studies

- Survey of Sites Identified for Further Evaluation (96 sites)
- Finalize Area of Potential Effects (June 2020)
- Continue developing Historic Properties Management Plan
- Complete survey work and TCP identification (February 2021)
- Complete eligibility assessments for known cultural resources (July 2021)
- Issue determination of effect on historic properties (July 2021)
- Draft HPMP (July 2021)
- No additional studies have been proposed beyond that in FERC's SPD

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QUESTIONS?

HAT 5 Recreation Evaluation

Recreation Evaluation

Study Purpose and Summary of Methods

❑Evaluate baseline recreation at the Harris Project and downstream

- Gather baseline information on existing Project recreation facilities, existing Project recreational use and capacity, and estimated future demand and needs at the Harris Project
- Determine how flows in the Tallapoosa River downstream of Harris Dam affect recreational users and their activity

Study Progress

❑ Lake Harris Public Access User Counts – March to December 2019

❑ Lake Harris Public Access Questionnaires – May to December 2019

❑ Tallapoosa River User and Surveys – May to October 2019

❑ Skyline Use Data from ADCNR – August 2019

❑ Recreation Facilities Inventory – October 2019

❑ HAT 5 Meeting to discuss Tallapoosa River Landowner Survey Research Plan (Research Plan) - December 11, 2019

❑ Downstream Landowner and Anonymous User Surveys – February – April 2020

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RECREATION EVALUATION –DETAILS OF LAKE HARRIS PUBLIC ACCESS, USER COUNTS

- 1,368 Shifts
- Paper Forms Vehicle and Activity Counts
- "Instantaneous Count"
- Reduced Flat Rock Park Schedule
- Daylight Savings Time
- Data Cleaning
- Data Analysis

HARRIS DAM
RELICENSING

Recreation Evaluation –Details of Lake Harris Public Access, Questionnaires

- 1,357 Completed
- Majority Collected at Highway 48, Flat Rock Park, and Big Fox Creek
- Four Questions
- Intercept Technique
- Paper Forms

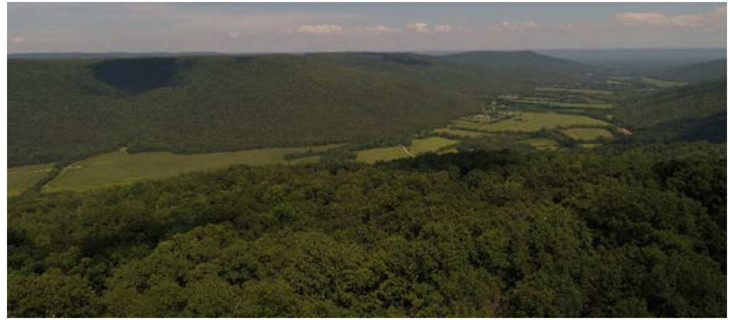
HARRIS DAM RELICENSING

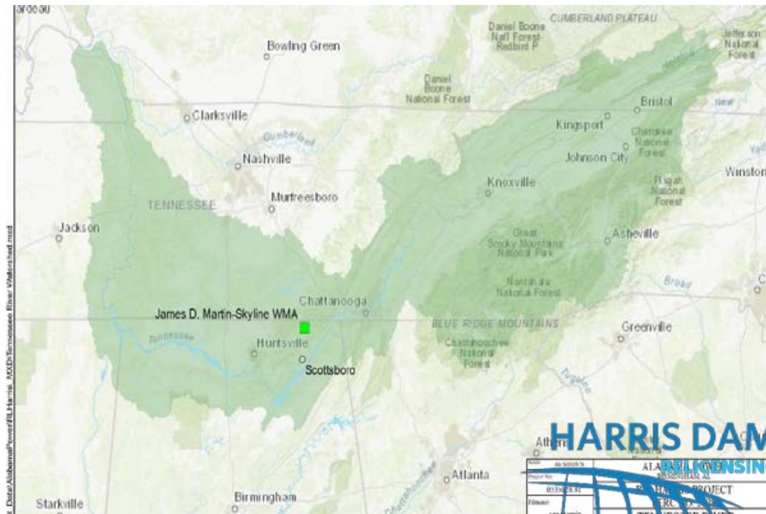
RECREATION EVALUATION – TALLAPOOSA RIVER USER, METHODS

- Calculated Total Visitation (Effort) and Daily Use
- Measured User Attitudes/Perceptions About Instream Flow and Trip Satisfaction
- Obtained Catch Information from Anglers
- Determined How Instream Flow Affected Effort, Perception of Instream Flow and Trip Satisfaction, and Species of Fish Targeted, Caught, and Retained

HARRIS DAM
RELICENSING

Recreation Evaluation- Skyline Use Data (ADCNR)





RECREATION EVALUATION –DETAILS OF LAKE HARRIS PUBLIC ACCESS, INVENTORY

- ❑ Inventoried and Mapped
- ❑ Summarized Who Owns, Operates, and Manages
- ❑ Evaluated the Condition of the Recreation Sites and Facilities
  - Opportunities for Persons with Disabilities to Participate in Recreation, Where Feasible
  - Public Safety Features

RECREATION EVALUATION – TALLAPOOSA RIVER LANDOWNERS SURVEY RESEARCH PLAN

- ❑ Downstream Landowners
- ❑ Recreational Users
- ❑ December 11, 2019 HAT 5 Meeting
- ❑ December 19, 2019 Tallapoosa River Landowner Survey Research Plan

Preview- Draft Recreation Evaluation Report

- Introduction
- Background
- Methods
  - Data Collection
  - Analysis
- Results
  - Existing Use
  - Future Use
  - Needs
- Conclusions
- References
- Appendices

HARRIS DAM RELICENSING

RECREATION EVALUATION

Variance from the Study Plan and Schedule

- ❑ Added the Tallapoosa River Downstream Landowner Survey and Tallapoosa River Recreation User Survey
- ❑ File the Draft Harris Project Recreation Evaluation report in August 2020 (rather than June 2020)
- ❑ March 2020 HAT 1 meeting cancelled due to COVID-19

Remaining Activities/Modifications/Other Proposed Studies

- ❑ Recreation Data Reports from Subcontractors
- ❑ Draft Recreation Evaluation Study Report
- ❑ No additional studies have been proposed beyond that in FERC's SPD

HARRIS DAM RELICENSING

QUESTIONS?

HAT 4 Project Lands Evaluation

HARRIS DAM
RELICENSING

Project Lands Evaluation

Study Purpose and Methods Summary

- **Phase I**: Identified lands to be added to, removed from, or reclassified within the current Harris Project Boundary.
  - HAT 4 meeting, desktop analysis, draft map of changes
- **Phase II**: develop a Wildlife Management Program (WMP) and a Shoreline Management Plan (SMP) to be filed with License Application.
  - Utilizes results from Phase I evaluation, incorporation of study data

Study Progress

- Presented proposed land changes, including tract by tract description and maps
- HAT 4 meeting to discuss proposed changes (09/11/2019)
- Requested feedback from HAT 4 regarding the Project Lands proposal
- Evaluated acreage at Skyline to determine suitability for bobwhite quail habitat
- Prepared Draft Phase 1 Project Lands Evaluation Study Report
- Conducted a botanical inventory of a 20-acre parcel at Flat Rock (field work & final report complete)

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RELICENSING

PROJECT LANDS EVALUATION

Variance from the Study Plan and Schedule

- ❑ No variance from the study plan or schedule.

Remaining Activities/Modification/Other Proposed Studies

- ❑ Review comments on Draft Phase 1 Project Lands Study Report and modify Final Report, as applicable
- ❑ Conduct the botanical inventory survey on additional 21 acres adjacent to previously surveyed area at Flat Rock Park (Spring and Fall 2020; report in January 2021)
- ❑ Complete Phase 2 methods and develop draft Wildlife Management Plan and Shoreline Management Plan
- ❑ No additional studies have been proposed beyond that in FERC's SPD

QUESTIONS?

HARRIS DAM
RELICENSING

HAT 1 Project Operations

- ❑Operating Curve Change Feasibility Analysis
- ❑Downstream Release Alternatives

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Operating Curve Change Feasibility Analysis

Study Purpose and Methods Summary

- To evaluate, in increments of 1 foot, from 786 feet msl to 789 feet msl, Alabama Power's ability to increase the winter pool elevation and continue to meet Project purposes

Study Progress

- RES-Sim outflow hydrographs developed
- HEC-RAS model complete; all four winter curve changes have been modeled with design flood
- Navigation, ADROP and Hydrobudget analyses
- Flood frequency analysis
- Draft report distributed to stakeholders

HARRIS DAM
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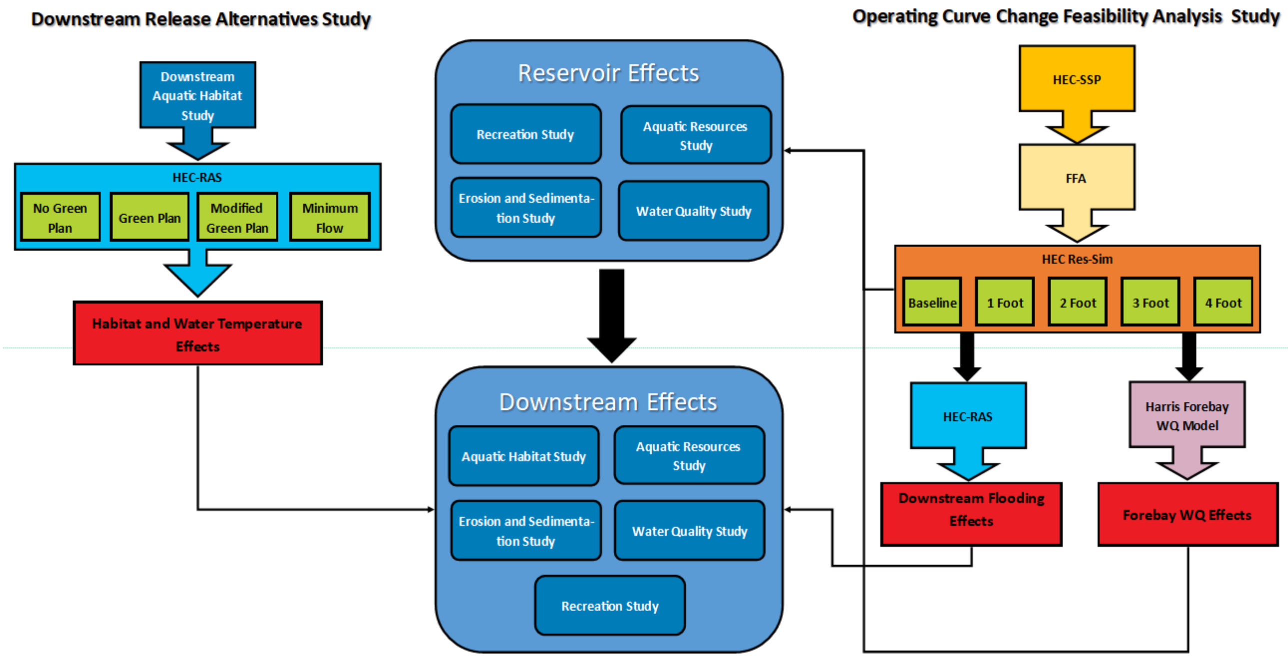
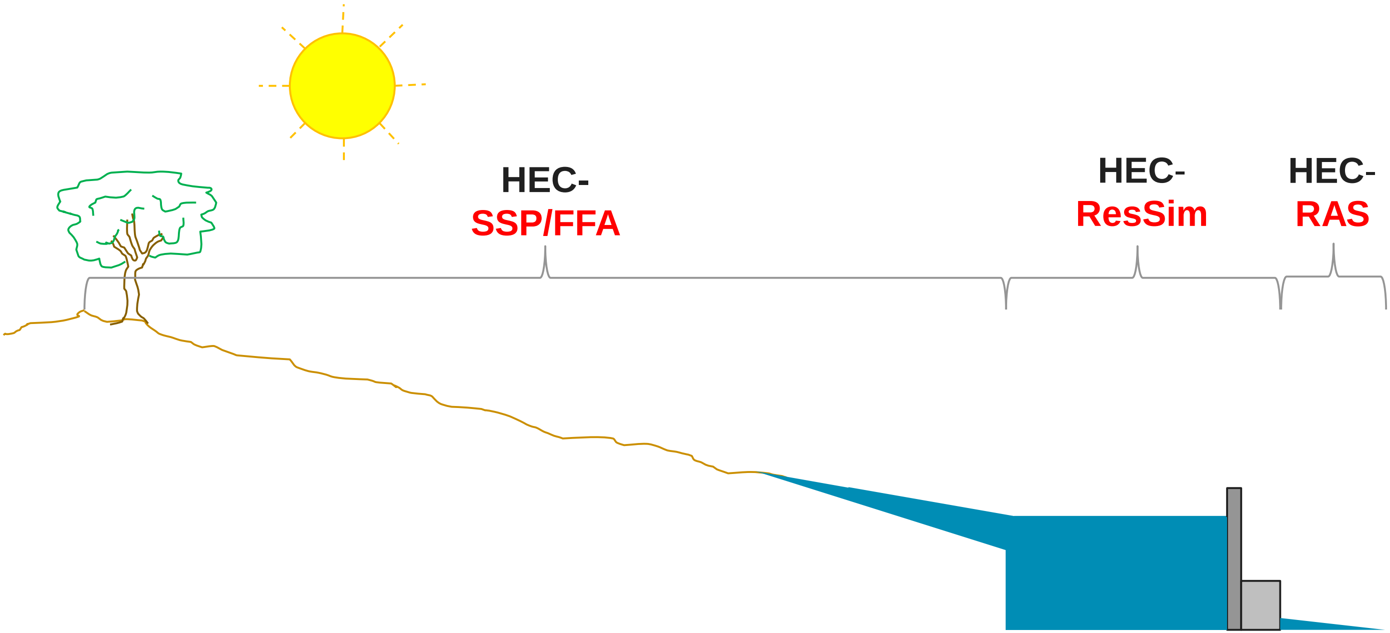
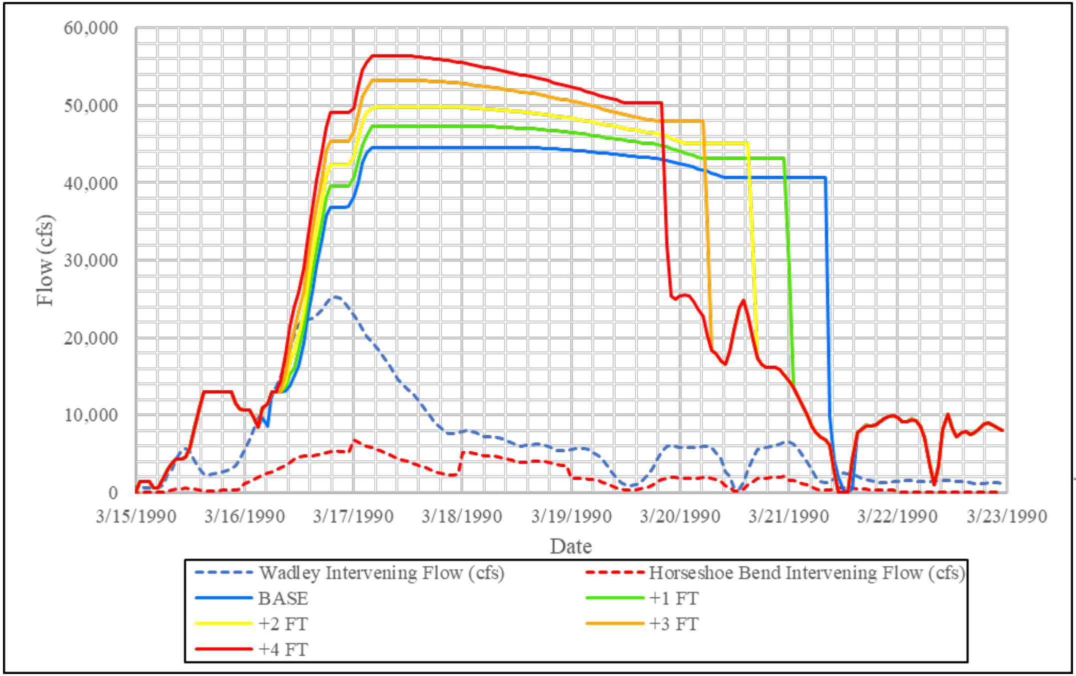

Downstream Release Alternatives Study
Downstream Aquatic Habitat Study
HEC-RAS
No Green Plan
Green Plan
Modified Green Plan
Minimum Flow
Habitat and Water Temperature Effects
Reservoir Effects
Recreation Study
Aquatic Resources Study
Erosion and Sedimentation Study
Water Quality Study
Downstream Effects
Aquatic Habitat Study
Aquatic Resources Study
Erosion and Sedimentation Study
Water Quality Study
Recreation Study
Operating Curve Change Feasibility Analysis Study
HEC-SSP
FFA
HEC Res-Sim
Baseline
1 Foot
2 Foot
3 Foot
4 Foot
HEC-RAS
Harris Forebay WQ Model
Downstream Flooding Effects
Forebay WQ Effects

Where the models are used…



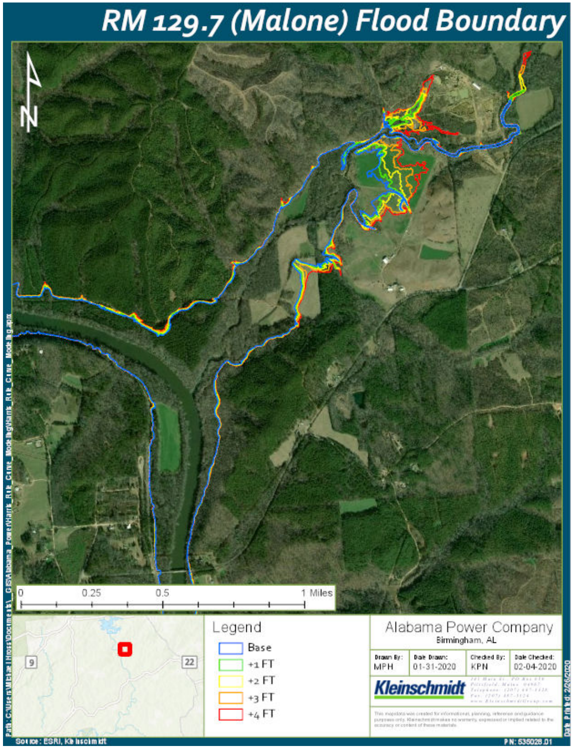
HEC-RAS – MODELED FLOWS

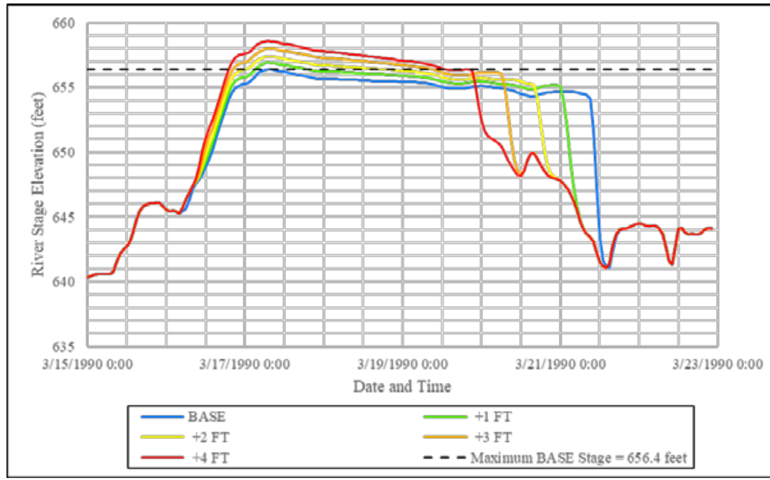
- Base scenario (i.e., existing) and 4 rule curve simulations
  - +1 ft, +2 ft, +3 ft, +4ft
- Intervening flows included in model
  - Flows contributed to river by watershed downstream of the dam
  - Between Harris Dam and Wadley, AL
  - Between Wadley, AL and Horseshoe Bend



HARRIS DAM RELICENSING

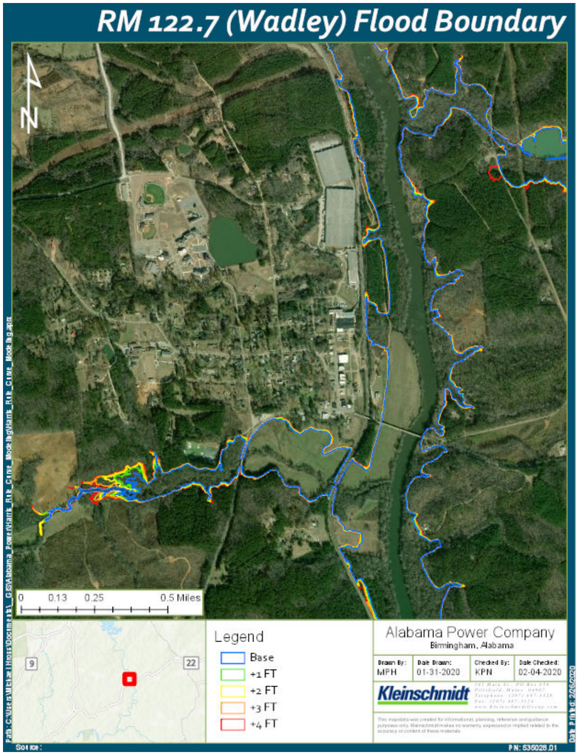
HEC-RAS – MODELING RESULTS

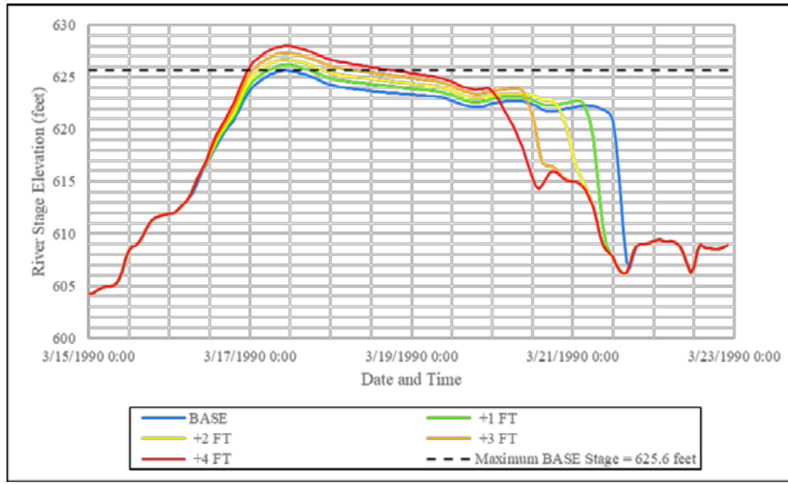




HARRIS DAM
RELICENSING

HEC-RAS – MODELING RESULTS





HARRIS DAM
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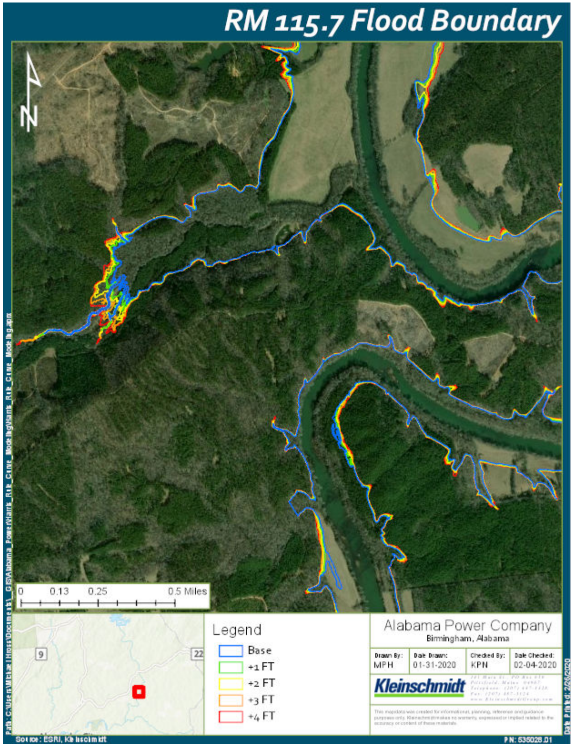
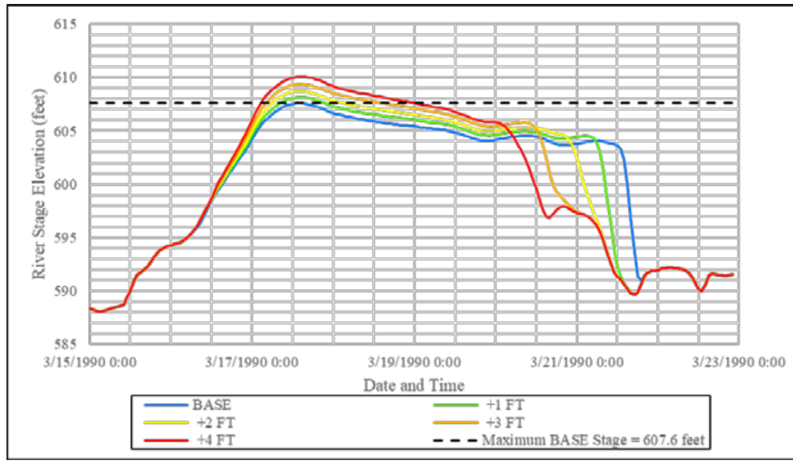
HEC-RAS – MODELING RESULTS





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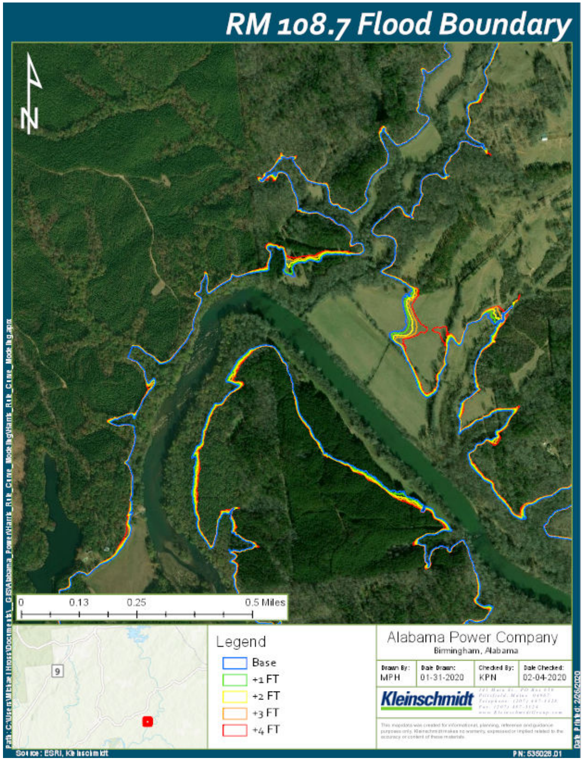
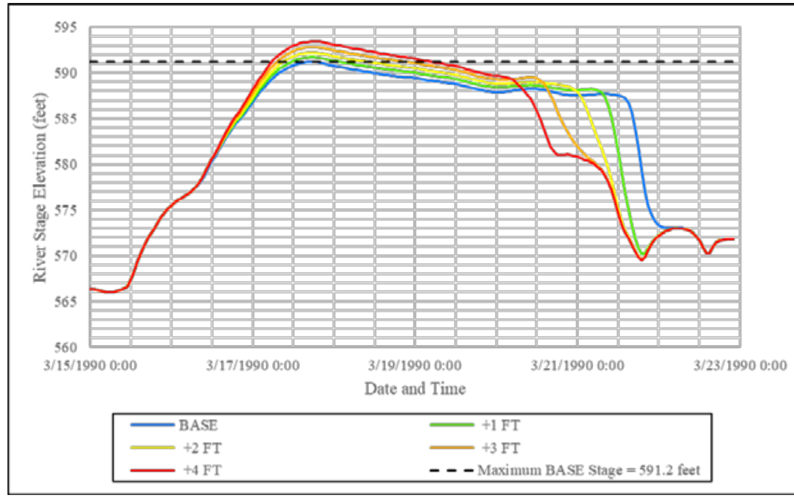
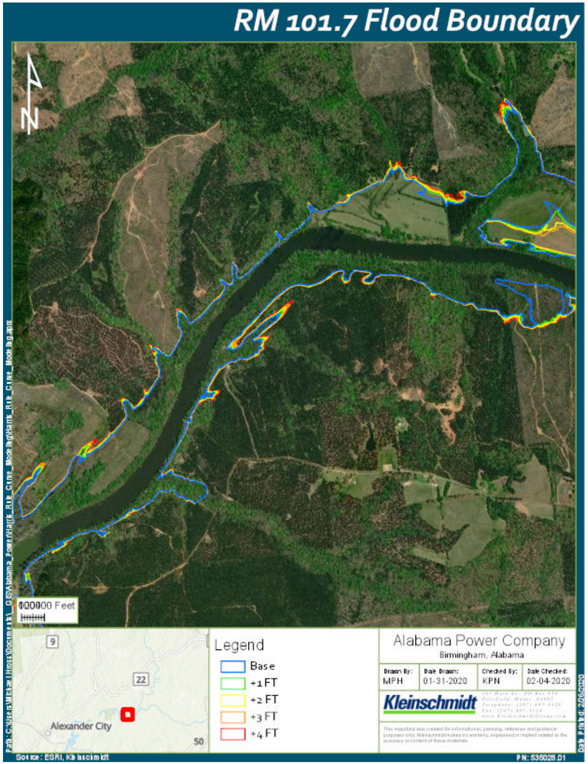
HEC-RAS – MODELING RESULTS

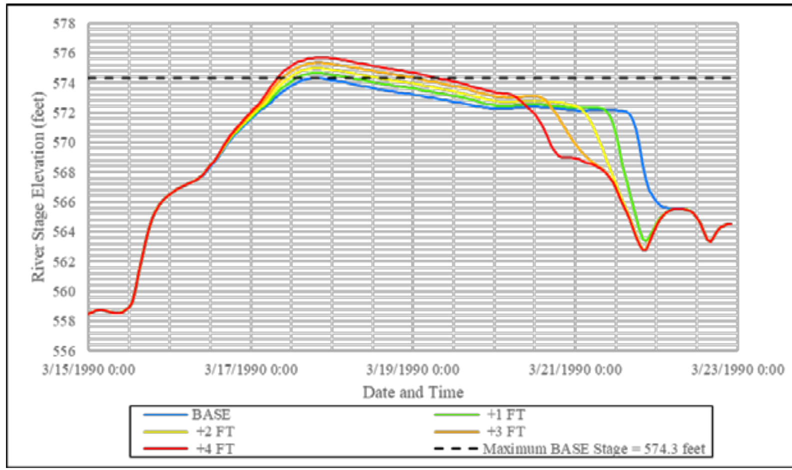




HARRIS DAM RELICENSING

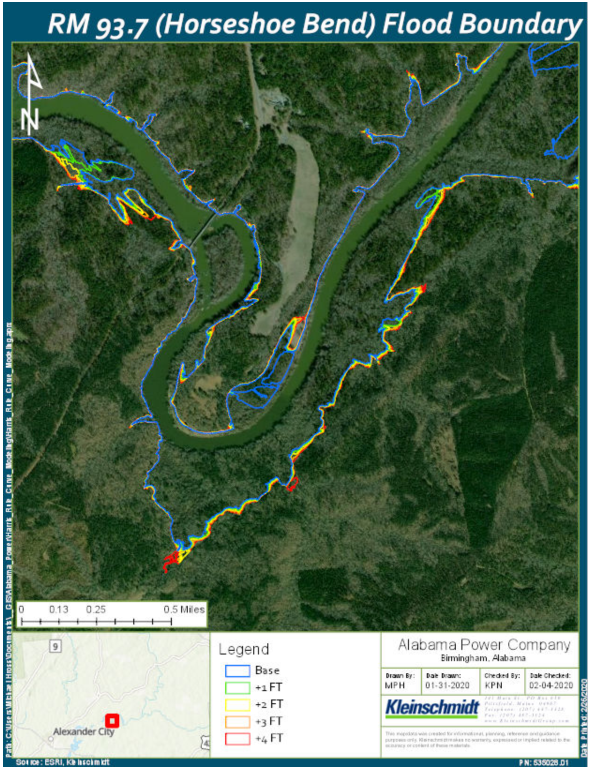
HEC-RAS – MODELING RESULTS

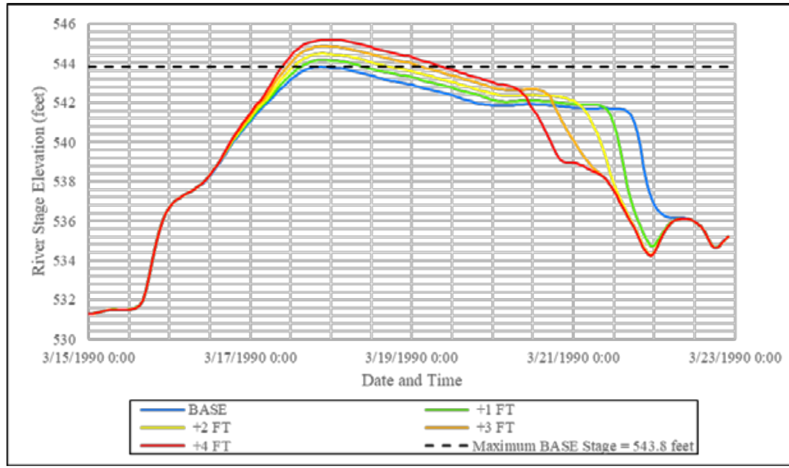




HARRIS DAM
RELICENSING

HEC-RAS – MODELING RESULTS





HARRIS DAM RELICENSING

HEC-RAS – MODEL RESULTS

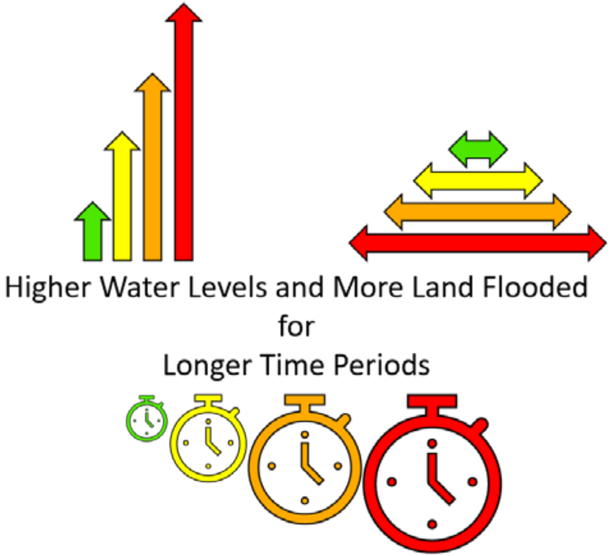
Location	Distance from Dam (miles)	Max Water Surface Rise (feet)			
		+ 1 foot	+ 2 feet	+ 3 feet	+ 4 feet
RM 129.7 (Malone, AL)	7	0.5	1.0	1.6	2.2
RM 122.7 (Wadley, AL)	14	0.5	1.1	1.7	2.4
RM 115.7	21	0.6	1.1	1.8	2.5
RM 108.7	28	0.5	1.0	1.6	2.2
RM 101.7	35	0.4	0.7	1.1	1.4
RM 93.7 (Horseshoe Bend)	43	0.3	0.7	1.0	1.4

Location	Distance from Dam (miles)	Duration above Baseline Condition Max Elevation (hours)			
		+ 1 foot	+ 2 feet	+ 3 feet	+ 4 feet
RM 129.7 (Malone, AL)	7	15	43	61	67
RM 122.7 (Wadley, AL)	14	12	19	32	43
RM 115.7	21	13	21	34	46
RM 108.7	28	14	26	38	48
RM 101.7	35	17	27	40	48
RM 93.7 (Horseshoe Bend)	43	18	29	39	47

HARRIS DAM
RELICENSING

HEC-RAS - SUMMARY

- ❑Any change in the operating curve causes:
  - ❑ increased maximum stage
  - ❑ increase in inundation,
  - ❑ increase in duration
- ❑ Most flooding occurs where tributaries enter Tallapoosa River
- ❑ Will need to evaluate effects on downstream structures



HARRIS DAM
RELICENSING

OPERATING CURVE CHANGE FEASIBILITY ANALYSIS

Variance from Study Plan and Schedule

- ❑ March 2020 HAT 1 meeting cancelled due to COVID-19

Remaining Activities/Modification/Other Proposed Studies

- ❑ Draft Phase 1 study report comments due June 11, 2020
- ❑ Begin Phase 2 analysis on effects of winter operating curve on other resources
- ❑ Present methods for the Lake Recreation Structure Usability at Winter Pool Alternatives phase 2 analysis to HAT 1 and HAT 5
- ❑ Present methods for evaluating effects on inundated structures downstream of Harris Dam
- ❑ No additional studies have been proposed beyond that in FERC's SPD

QUESTIONS?

HARRIS DAM
RELICENSING

Downstream Release Alternatives

Study Purpose and Methods Summary

- To evaluate the effects of pre- and post- implementation of Green Plan operations, a continuous minimum flow of 150 cfs, and an alternative/modified Green Plan operation on Project resources.

Study Progress

- RES-Sim outflow hydrographs developed
- HEC-RAS model complete;
- Navigation, ADROP and Hydrobudget analyses
- Draft report distributed to stakeholders

HARRIS DAM RELICENSING

HEC-RAS – MODELED SCENARIOS

- 3 Downstream Release Alternative Plans
  - Pre-Green
  - Green Plan
  - 150 cfs Continuous Minimum Flow
- 2001 Selected as an average year
  - Intervening flows included in model
    - Flows contributed to river by watershed downstream of the dam
    - Between Harris Dam and Wadley, AL
    - Between Wadley, AL and Horseshoe Bend
  - Intervening flow data from USGS gages at Wadley, 02414500 and near Horseshoe Bend, 02414715

HARRIS DAM
RELICENSING

PHASE 1 MODELING RESULTS

- ❑Lake Level Impacts: none
- ❑Generation Impacts
  - Pre-Green Plan: + $357,000 per year
  - Green Plan: none (current operation mode)
  - 150 cfs Continuous Minimum Flow: undetermined
- ❑Flood Control Impacts: none
- ❑Navigation Impacts: none
- ❑Drought Operation Impacts: none

DOWNSTREAM RELEASE ALTERNATIVES

Variance from Study Plan and Schedule

- March 2020 HAT 1 meeting cancelled due to COVID-19

Remaining Activities/Modification/Other Proposed Studies

- Draft Phase 1 study report comments due June 11, 2020
- Begin Phase 2 analysis on effects of downstream release alternatives on other resources
- No additional studies have been proposed beyond that in FERC's SPD

QUESTIONS?

HARRIS DAM
RELICENSING

HAT 2 Water Quality and Use

- ❑ Water Quality Study
- ❑ Erosion and Sedimentation Study

HARRIS DAM RELICENSING

WATER QUALITY

Study Purpose and Methods Summary

- ❑Summarizes data collected from 2017 through 2019 from Alabama Power, Alabama Department of Environmental Management (ADEM), and Alabama Water Watch (AWW)
- ❑Supports the required 401 Water Quality Certification by conducting dissolved oxygen and water temperature monitoring in the tailrace and Harris Reservoir forebay
- ❑Identifies any possible areas of water quality concern by HAT 2 participants

Study Progress

- ❑ Held HAT 2 meeting on September 11, 2019
- ❑HAT 2 stakeholders identified one location of water quality concern: the Foster's Bridge area at Lake Harris
- ❑Distributed Draft Water Quality Report March 9, 2020
- ❑Collected dissolved oxygen (DO) and temperature data at two locations downstream of the dam and monthly vertical profiles in the Harris Reservoir forebay

HARRIS DAM RELICENSING

Water Quality

Data Collection Results

- ❑ Generation data immediately downstream of Harris Dam in 2018 and 2019 had dissolved oxygen (DO) readings greater than 5 milligrams per liter (mg/L) for 94 percent of all measurements
- ❑Continuous monitoring for generation and non-generation in 2019 had DO levels greater than 5 mg/L for 99.9 percent of all measurements
- ❑Several low DO level readings in 2017 can be attributed to severe drought that impacted the Harris Reservoir in the summer and fall of 2016, where inflows to the lake were at historic lows, causing stronger stratification of Lake Harris
- ❑Data collected by ADEM at Harris Dam, Wadley, and Horseshoe Bend had DO levels above 5 mg/L at each sampling event
- ❑Continuous monitoring at Malone indicated that the DO levels were greater than 5 mg/L for 99 percent of the monitoring period

HARRIS DAM RELICENSING

WATER QUALITY

Variance from the Study Plan and Schedule

- ❑Alabama Power intends to submit an application to ADEM for the 401 Water Quality Certification in April 2021, not in April 2020 as noted in the FERC SPD.

Remaining Activities/Modification/Other Proposed Studies

- ❑Comments on Draft Water Quality Study Report due June 11, 2020
- ❑Review comments on the Draft Water Quality Study Report and modify the Final Report, as applicable
- ❑ Prepare the 401 WQC application and submit to ADEM in April 2021
- ❑ No additional studies have been proposed beyond that in FERC's SPD

QUESTIONS?

HARRIS DAM RELICENSING

EROSION AND SEDIMENTATION

Study Purpose and Methods Summary

- ❑ Identify any problematic erosion sites and sedimentation areas and determine the likely causes
  - Identify erosion and sedimentation sites
  - Assess lake erosion sites using a qualified Erosion and Sediment Control Professional
  - Assess bank erosion susceptibility in Tallapoosa River from Harris Dam through Horseshoe Bend
  - Assess sedimentation sites by examining available lake photography and data (LIDAR) and analyzing with Geographic Information System (GIS)

Study Progress

- ❑ May 1, 2019 email to HAT 2 members distributed maps of sites identified for assessment and requested additional sites
- ❑ September 11, 2019 HAT 2 meeting – Reviewed study plan and last call for erosion and sedimentation sites
- ❑ Lake erosion site assessments performed in December 2019
- ❑ Bank erosion susceptibility assessment performed in May 2019
- ❑ Draft Erosion and Sedimentation Study Report distributed to HAT 2 on March 17, 2020

EROSION AND SEDIMENTATION

Lake Harris Erosion Assessment

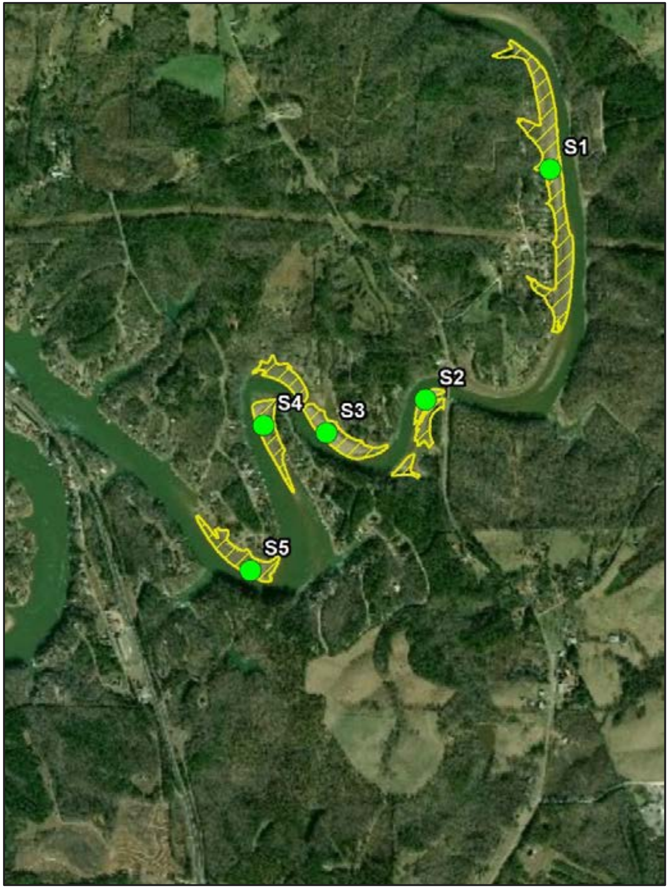
- ❑24 sites assessed
  - 8 sites – no erosion
  - 16 sites with erosion due to land use (12), anthropogenic (6), and/or natural factors independent of Project operations (8).

HARRIS DAM RELICENSING

EROSION AND SEDIMENTATION

Lake Harris Sedimentation Assessment

- 9 sites assessed – most in Little Tallapoosa arm
- GIS analysis estimated 120 acres
- 25% of Little Tallapoosa River basin is hay/pasture fields



Erosion and Sedimentation

Tallapoosa River Assessment

- High Definition Stream Survey (HDSS)
- Left and right banks scored independently
- Only one area was impaired to non-functional

Bank Condition Score	Bank Condition Class	Description	Erosion Potential	Human Impact
1	Fully Functional	Banks with low erosion potential, such as, bedrock outcroppings, heavily wooded areas with low slopes and good access to flood plain.	Low to High	Low to High
2	Functional	Banks in good condition with minor impacts present, such as, forested with moderate bank angles and adequate access to flood plains.		
3	Slightly Impaired	Banks showing moderate erosion impact or some impact from human development.		
4	Impaired	Surrounding area consists of more than 50% exposed soil with low riparian diversity or surface protection. Obvious impacts from cattle, agriculture, industry, and poorly protected streambanks		
5	Non-functional	Surrounding area consists of short grass or bare soil and steep bank angles. Evidence of active bank failure with very little stabilization from vegetation. Contribution of sediment likely to be very high in these areas.		

HARRIS DAM RELICENSING

Erosion and Sedimentation


1 –Fully Functional


4 – Impaired

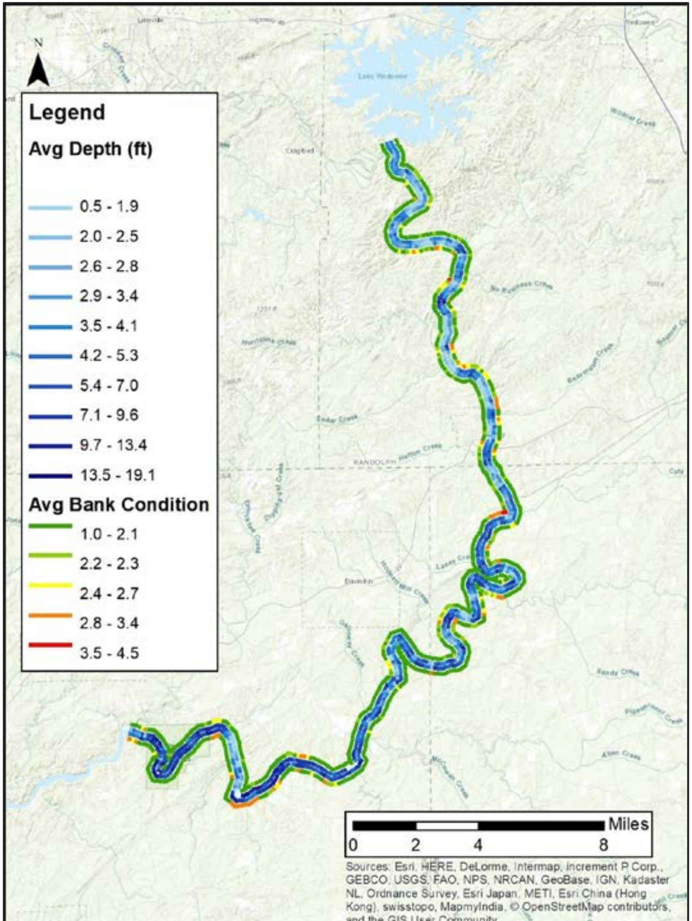

2 –Functional


5 – Non-Functional


3 – Slightly Impaired

HARRIS DAM
RELICENSING

EROSION AND SEDIMENTATION



EROSION AND SEDIMENTATION

Variance from the Study Plan and Schedule

- ❑ No variance from the study plan or schedule.

Remaining Activities/Modification/Other Proposed Studies

- ❑ Draft Erosion and Sedimentation Study Report comments due June 11, 2020
- ❑ Additional reconnaissance at Lake Harris sedimentation site during full (summer) pool conditions to determine if any nuisance aquatic vegetation is present
- ❑ No additional studies have been proposed beyond that in FERC's SPD

QUESTIONS?

HARRIS DAM RELICENSING

HAT 3 Fish and Wildlife

- ❑ Threatened and Endangered Species Study
- ❑ Downstream Aquatic Habitat Study
- ❑ Aquatic Resources Study

HARRIS DAM
RELICENSING

Threatened & Endangered Species

Study Purpose and Methods Summary

- ❑Determine if listed species occur in the Project Area and identify potential project impacts
  - Compile a list of T&E species and critical habitats
  - Review literature of agreed upon species to gather habitat requirement data and describe historical range.
  - Identify factors affecting the status of each species.
  - Use GIS to map habitat information to determine possible areas in the geographic scope that T&E species may utilize.
  - 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.
  - Perform field surveys, as appropriate

Study Progress

- ❑August 27, 2019 – Reviewed Study Plan and discussed need for field surveys
- ❑Surveyed for fine-lined pocketbook (mussel) in Tallapoosa River (November 2019)
- ❑Draft Threatened and Endangered Species Desktop Assessment complete

HARRIS DAM RELICENSING

THREATENED & ENDANGERED DESKTOP STUDY

Federally Threatened and Endangered Species Potentially Occurring in AL Counties within Project Vicinity

- 20 species: 7 threatened, 13 endangered
  - Harris – 7 species
    - Red-cockaded woodpecker
    - Southern pigtoe and fine-lined pocketbook
    - Indiana bat and northern long-eared bat
    - Little amphianthus and white fringeless orchid
  - Skyline – 16 species
    - Palezone shiner and spotfin chub
    - 8 mussel species
    - Indiana bat, northern long-eared bat, and gray bat
    - White fringeless orchid, Price's potato bean, Morefield's leather flower

HARRIS DAM RELICENSING

Threatened & Endangered Desktop Study

Species	Skyline	Lake Harris
	Habitat Occurrence	
Fine-lined pocketbook		✓
Southern pigtoe		✓
Gray bat	✓	
Indiana bat	✓	✓
Northern long-eared bat	✓	✓
Little amphianthus		✓
Price’s potato bean	✓	
White fringeless orchid	✓	✓
Red-cockaded woodpecker		✓

HARRIS DAM RELICENSING

THREATENED & ENDANGERED DESKTOP STUDY

USFWS Designated Critical Habitat

- ❑Fine-lined pocketbook
- ❑Indiana bat
- ❑Rabbitsfoot
- ❑Slabside pearlymussel
- ❑Southern pigtoe
- ❑Spotfin chub

HARRIS DAM RELICENSING

Threatened & Endangered Species

Variance from the Study Plan and Schedule

- ❑March 2020 HAT 3 meeting was cancelled due to COVID-19

Remaining Activities/Modifications/Other Proposed Studies

- ❑Comments on Draft Threatened and Endangered Species Desktop Assessment due June 11, 2020
- ❑Additional consultation with USFWS as needed
- ❑Additional surveys in spring/summer 2020: palezone shiner and fine-lined pocketbook
- ❑No additional studies have been proposed beyond that in FERC's SPD

QUESTIONS?

HARRIS DAM
RELICENSING

DOWNSTREAM AQUATIC HABITAT

Study Purpose and Methods Summary

- To develop a model that describes the relationship between Green Plan operations and aquatic habitat.

Study Progress

- Use HEC-RAS to evaluate the effect of current operations on the amount and persistence of wetted aquatic habitat, especially shoal/shallow-water habitat.
  - Model runs of Green Plan vs Pre-Green Plan operations
- Mesohabitat analysis (classified as riffle, run, or pool) complete
- 20 Level/temperature loggers deployed in 2019
- HAT 3 March 20, 2019 Meeting – Reviewed Study Plan and draft mesohabitat analysis
- HAT 3 December 11, 2019 – Reviewed study progress and proposed methodology for analyzing results from HEC-RAS
- February 20, 2020 – HAT 3 Meeting to review proposed analysis methodology and initial results of wetted perimeter analysis

HARRIS DAM RELICENSING

DOWNSTREAM AQUATIC HABITAT

Variance from the Study Plan and Schedule

- ❑March 2020 HAT 3 meeting was cancelled due to COVID-19

Remaining Activities/Modifications/Other Proposed Studies

- ❑Level loggers continue to collect data through June 2020
- ❑Analysis of HEC-RAS results
- ❑Develop temperature component of HEC-RAS model (spring 2020)
- ❑Draft Report in June 2020
- ❑No additional studies have been proposed beyond that in FERC's SPD

QUESTIONS?

HARRIS DAM
RELICENSING

Aquatic Resources

Study Purpose and Methods Summary

❑Evaluate the effects of the Harris Project on aquatic resources.

Study Progress

❑Desktop Assessment of Aquatic Resources (Kleinschmidt)

❑Downstream Fish Population Research (Auburn)

- Fish Temperature Requirements
- Assessment of Temperature Data from Regulated and Unregulated Reaches
- Fish Community Surveys
  - Wadeable standardized (30+2) sampling
  - Boat Electrofishing
- Bioenergetics Modeling

HARRIS DAM RELICENSING

DOWNSTREAM FISH POPULATION RESEARCH

- Literature review of temperature requirements of target species: Redbreast Sunfish, Channel Catfish, Tallapoosa Bass, and Alabama Bass
  - Spotted Bass temperature review will be used in place of Alabama Bass
- Fish sampling at Horseshoe Bend, Wadley, Lee's Bridge (control site), and Harris Dam tailrace
  - Sampling in April, May, July, September, November 2019 and January and March 2020
  - Individual fish weighed, measured, sexed, had gonads removed and weighed, had diets removed from stomachs and preserved, and had otoliths removed and stored to be evaluated
  - To date, all diets quantified, all prey items identified, and all diet data entered into databank
- Target species specimens being used in respirometry tests
  - Intermittent flow static respirometry tests: data will be used in bioenergetics models
  - Swimming respirometry to quantify performance capabilities of fish

HARRIS DAM RELICENSING

Aquatic Resources

Variance from Study Plan and Schedule

- ❑March 2020 HAT 3 meeting was cancelled due to COVID-19
- ❑Auburn University exploring alternatives to electromyogram radio tags

Remaining Activities/Modifications/Other Proposed Studies

- ❑Desktop Assessment of Aquatic Resources
- ❑Downstream Fish Population Research
  - Fish Temperature Requirements
  - Assessment of Temperature Data from Regulated and Unregulated Reaches
  - Fish Community Surveys
    - Wadeable standardized (30+2) sampling
    - Boat Electrofishing
  - Bioenergetics Modeling
  - Consider Alternative “Control” Site Upstream of Reservoir
  - Tag and Track Fish During Summer 2020
  - Continue Static Respirometry Tests at 10 and 21°C
  - Continue Measuring Active Metabolic Rates (Combination of Increasing Water Velocity and Decreasing Water Temperature)
- ❑Draft Aquatic Resources Study Report in July 2020
- ❑No additional studies have been proposed beyond that in FERC’s SPD

HARRIS DAM
RELICENSING

QUESTIONS?

Next Steps

Next Steps

- ❑Alabama Power will file a summary of the ISR meeting on **May 12, 2020**
- ❑Comments on the ISR and ISR meeting summary should be submitted to FERC by **June 11, 2020**
- ❑ Any requests for modifying the FERC approved study plan must follow 18 CFR Section 5.15 (d) and (e)
- ❑Comments on the draft study reports should be submitted to Alabama Power at harrisrelicensing@southernco.com by **June 11, 2020**

HARRIS DAM RELICENSING

Next Steps in Relicensing Process

- ❑Additional HAT meetings (2020-2021)
- ❑Second Study Season/Phase II (2020/2021)
- ❑Progress Update (10/2020)
- ❑File Updated Study Report (4/12/2021)
- ❑ File Updated Study Report Meeting Summary (4/27/2021)
- ❑File Preliminary Licensing Proposal (PLP) (by 7/3/2021)
- ❑Comments on Preliminary Licensing Proposal, Additional Information Request (if necessary) (90 days from issuance of PLP or by 10/1/2021)
- ❑File Final License Application (11/30/2021)

Questions?

HARRIS DAM RELICENSING

HARRIS DAM
RELICENSING

Alabama Power

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rachel.mcnamara@ferc.gov; raebutler@mcn-nsn.gov; rancococ@teleclipse.net; randall.b.harvey@usace.army.mil; randy@randyrogerslaw.com; randy@wedoweemarine.com; rbmorris222@gmail.com; rcodydeal@hotmail.com; reuteem@auburn.edu; richardburnes3@gmail.com; rick.oates@forestry.alabama.gov; rickmcwhorter723@icloud.com; rifraft2@aol.com; rjdavis8346@gmail.com; robert.a.allen@usace.army.mil; robinwaldrep@yahoo.com; roger.mcneil@noaa.gov; ron@lakewedowee.org; rosoweka@mcn-nsn.gov; russtown@nc-cherokee.com; ryan.prince@forestry.alabama.gov; sabrinawood@live.com; sandnfrench@gmail.com; sarah.salazar@ferc.gov; sbryan@pci-nsn.gov; scsmith@southernco.com; section106@mcn-nsn.gov; sforehand@russelllands.com; sgraham@southernco.com; sherry.bradley@adph.state.al.us; sidney.hare@gmail.com; simsthe@aces.edu; snelson@nelsonandco.com; sonjahollomon@gmail.com; steve.bryant@dcnr.alabama.gov; stewartjack12@bellsouth.net; straylor426@bellsouth.net; sueagnew52@yahoo.com; tdadunaway@gmail.com; thpo@pci-nsn.gov; thpo@tttown.org; timguffey@jcch.net; tlamberth@russelllands.com; tlmills@southernco.com; todd.fobian@dcnr.alabama.gov; tom.diggs@ung.edu; tom.lettieri47@gmail.com; tom.littlepage@adeca.alabama.gov; tpfreema@southernco.com; trayjim@bellsouth.net; triciastearns@gmail.com; twstjohn@southernco.com; variscom506@gmail.com; walker.mary@epa.gov; william.puckett@swcc.alabama.gov; wmcampbell218@gmail.com; wrighr2@aces.edu; wsgardne@southernco.com; wtanders@southernco.com

Subject: Harris Relicensing - Initial Study Report Meeting Summary
Date: Tuesday, May 12, 2020 12:16:34 PM
Attachments: 2020-05-12 ISR Meeting Summary.pdf

Harris relicensing stakeholders,

The meeting summary from the April 28th Initial Study Report meeting, including a list of attendees and the meeting presentation, was filed with FERC today. The meeting summary is attached and can also be found at www.harrisrelicensing.com.

Thanks,

Angie Anderegg
Hydro Services
(205)257-2251
arsegars@southernco.com

HAT 1 and HAT 5 meeting - June 4

APC Harris Relicensing <g2apchr@southernco.com>
Wed 5/20/2020 6:45 PM

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Please join us for a HAT 1 and HAT 5 meeting on Thursday, June 4, 2020 from 9 AM-11 AM. This meeting will be a combined HAT meeting because one of the analyses pertains to both the Operations HAT and the Recreation HAT. The two methodologies we will present include:

1. Methodology for analyzing downstream structures that would be affected by increased flooding downstream of Harris Dam as a result of raising the winter operating curve 1-4 feet higher than existing conditions. This analysis will be part of Phase 2 of the Operating Curve Change Feasibility Analysis Study.
2. Methodology for evaluating the private and public structures (i.e., boat ramps, boat docks/courtesy piers, etc.) on Lake Harris that would be useable at each of the four winter operating curve elevations. This analysis is referred to in both the Recreation Evaluation Study and the Operating Curve Change Feasibility Analysis Study.

Participants will have an opportunity to ask questions and comment on these methods.

Join Skype Meeting

Trouble Joining? Try Skype Web App

Join by phone

+1 (205) 257-2663

Conference ID: 3264749

Thanks,

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HAT 1 and 5 meeting - tomorrow

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Wed 6/3/2020 8:14 PM

To: 'harrisrelicensing@southernco.com' <harrisrelicensing@southernco.com>
Bcc: damon.abernethy@dcnr.alabama.gov <damon.abernethy@dcnr.alabama.gov>; nathan.aycock@dcnr.alabama.gov <nathan.aycock@dcnr.alabama.gov>; steve.bryant@dcnr.alabama.gov <steve.bryant@dcnr.alabama.gov>; todd.fobian@dcnr.alabama.gov <todd.fobian@dcnr.alabama.gov>; chris.greene@dcnr.alabama.gov <chris.greene@dcnr.alabama.gov>; keith.henderson@dcnr.alabama.gov <keith.henderson@dcnr.alabama.gov>; mike.holley@dcnr.alabama.gov <mike.holley@dcnr.alabama.gov>; evan.lawrence@dcnr.alabama.gov <evan.lawrence@dcnr.alabama.gov>; matthew.marshall@dcnr.alabama.gov <matthew.marshall@dcnr.alabama.gov>; brian.atkins@adeca.alabama.gov <brian.atkins@adeca.alabama.gov>; tom.littlepage@adeca.alabama.gov <tom.littlepage@adeca.alabama.gov>; jhaslbauer@adem.alabama.gov <jhaslbauer@adem.alabama.gov>; cljohnson@adem.alabama.gov <cljohnson@adem.alabama.gov>; mlen@adem.alabama.gov <mlen@adem.alabama.gov>; fal@adem.alabama.gov <fal@adem.alabama.gov>; djmoore@adem.alabama.gov <djmoore@adem.alabama.gov>; arsegars@southernco.com <arsegars@southernco.com>; dkanders@southernco.com <dkanders@southernco.com>; wtanders@southernco.com <wtanders@southernco.com>; jefbaker@southernco.com <jefbaker@southernco.com>

2 attachments (2 MB)

2020-6-4 HAT 1 and 5 meeting - Phase 2 structure analysis.pdf; 2020-6-4 HAT 1 and 5 meeting - downstream structure survey.pdf;

Attached are the presentations for tomorrow's HAT 1 and 5 meeting.

Thanks,

Angie Anderegg
Hydro Services
(205)257-2251
arsegars@southernco.com

Please join us for a HAT 1 and HAT 5 meeting on Thursday, June 4, 2020 from 9 AM-11 AM. This meeting will be a combined HAT meeting because one of the analyses pertains to both the Operations HAT and the Recreation HAT. The two methodologies we will present include:

1. Methodology for analyzing downstream structures that would be affected by increased flooding downstream of Harris Dam as a result of raising the winter operating curve 1-4 feet higher than existing conditions. This analysis will be part of Phase 2 of the Operating Curve Change Feasibility Analysis Study.
2. Methodology for evaluating the private and public structures (i.e., boat ramps, boat docks/courtesy piers, etc.) on Lake Harris that would be useable at each of the four winter operating curve elevations. This analysis is referred to in both the Recreation Evaluation Study and the Operating Curve Change Feasibility Analysis Study.

Participants will have an opportunity to ask questions and comment on these methods.

Join Skype Meeting

Trouble Joining? Try Skype Web App

Join by phone

+1 (205) 257-2663
Conference ID: 3264749

Thanks,

R.L. Harris Dam Relicensing
FERC No. 2628

HAT 1 Meeting
June 4, 2020

Operating Curve Change Feasibility Analysis

Phase II Downstream Structure Survey

Phone Etiquette

- ❑Be patient with any technology issues
- ❑Follow the facilitator’s instructions
- ❑Phones will be muted during presentations
- ❑Follow along with PDF of presentations
- ❑Write down any questions you have for the designated question section
- ❑Clearly state name and organization when asking questions
- ❑Facilitator will ask for participant questions following each section of the presentation

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Harris Downstream Structure Survey

- An operating curve change may affect areas downstream of Harris Dam
  - Effects are associated with flooding

- Phase 2 of the Operating Curve Change Feasibility Analysis will include:
  - Identifying affected structures
  - # of structures
  - Location
  - Depth & duration of inundation

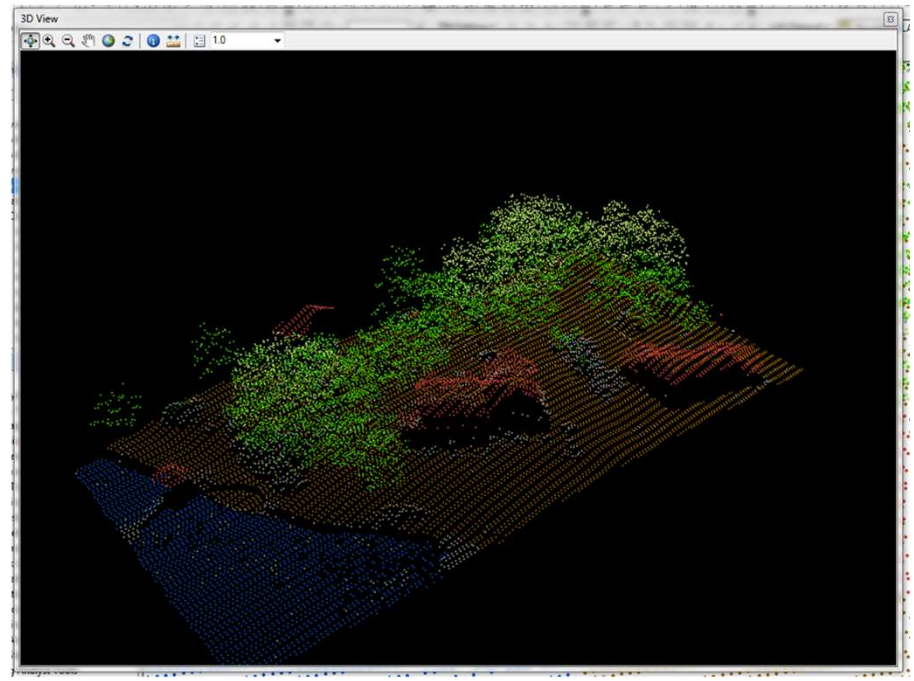
- Identifying structures is no small task

Methods: Remote Sensing

- LiDAR – 4 points per m^2

- 1 m USDA NAIP 4 band image (R, G, B, NiR)

- Classification Workflow:
  - Data management
  - Create training data
  - Classify image pixels
  - QAQC – Confusion Matrix



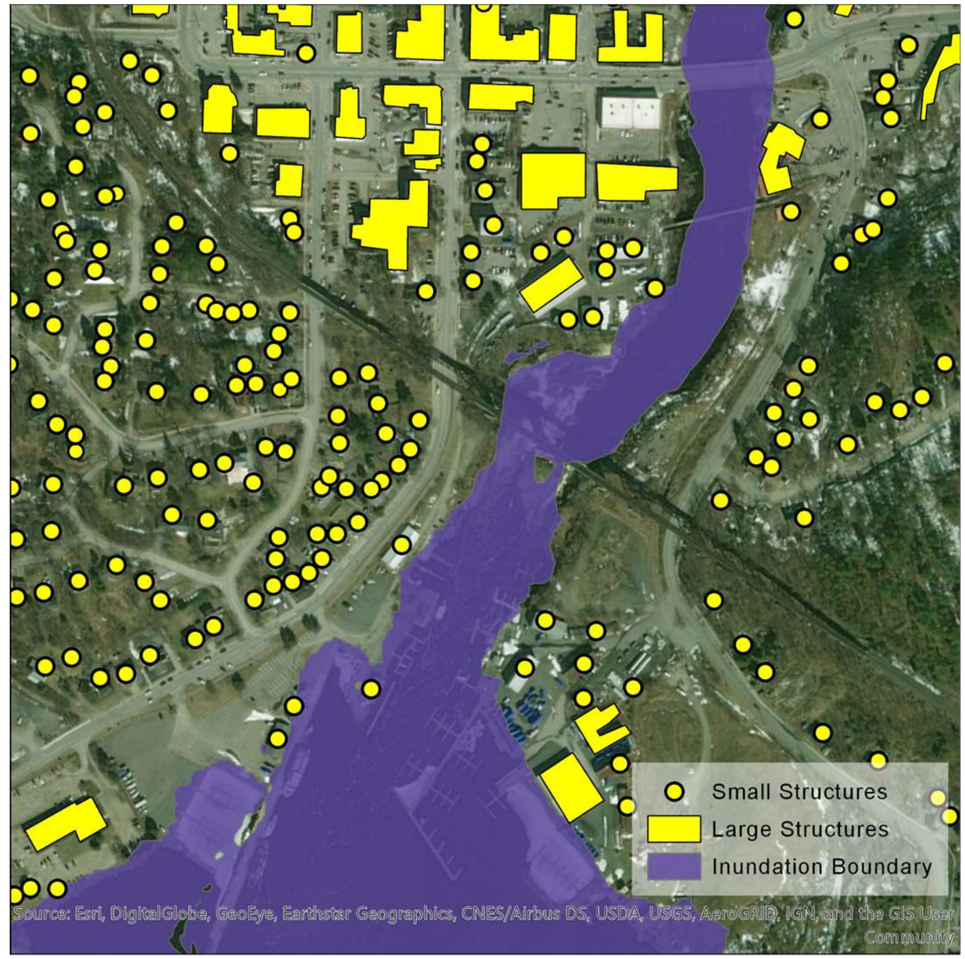
Methods: OBIA

- Object Based Image Analysis in ArcGIS Pro Image Analyst

1. Group pixels into objects - segmentation
2. Create training data
3. Classify Image
4. Assess quality with Confusion Matrix
5. Heads up digitizing
6. Spatial intersection & summarize

Anticipated Output

- Once identified – we will use a GIS to find structures impacted with a spatial intersection
- Series of maps showing location of all structures with symbols for flooded vs. not flooded
- Summary statistics in report
  - # of structures affected by rule curve
  - Min., Avg., Max. depth of inundation
  - Min., Avg., Max. duration of inundation
- Results will be in Phase II Report



R.L. Harris Dam Relicensing
FERC No. 2628

HAT 1 & 5 Meetings
June 4, 2020

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Operating Curve Change Feasibility Analysis

Phase II Lake Recreation Structure Usability at Winter Pool Alternatives

Phone Etiquette

- ❑Be patient with any technology issues
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- ❑Phones will be muted during presentations
- ❑Follow along with PDF of presentations
- ❑Write down any questions you have for the designated question section
- ❑Clearly state name and organization when asking questions
- ❑Facilitator will ask for participant questions following each section of the presentation

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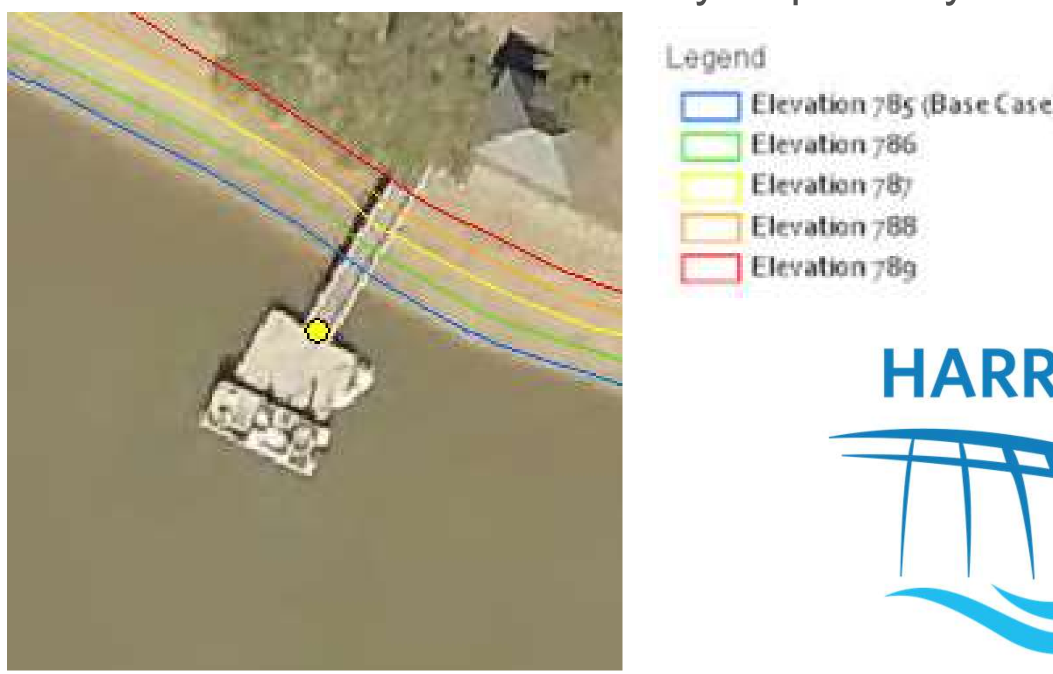
Recreation Structure Usability at Winter Pool Alternatives

<u>Objectives Described in the Study Plan</u>

- Evaluate "…the number of <u>private docks</u> usable during the current winter drawdown and the lowest possible elevation that <u>public boat ramps</u> can be used."
- Private docks defined as <u>boathouses, floats, piers, wet slips, and boardwalks</u>
- Will "…compare the number of access points (both private docks and public boat ramps) available at each 1-foot increment change…"

<u>Methods</u>

- LiDAR used to measure elevation (785, 786, 787, 788, 789 ft msl contours)
- Elevation data used to calculate depth at point
- Depth for points beyond the 785 ft msl contour will be estimated by slope analysis



HARRIS DAM RELICENSING

Recreation Structure Usability at Winter Pool Alternatives

Boathouses

- Point moved to the back of each of these structures
- Structure considered usable with 2 ft of water at the back edge

HARRIS DAM RELICENSING

Recreation Structure Usability at Winter Pool Alternatives

Floats

- Point moved to the back of each of these structures
- Structure considered usable with 2 ft of water at the back edge

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Recreation Structure Usability at Winter Pool Alternatives

Piers

- Classified into 3 subcategories:
  - Platform (*bottom left*):
    - Piers with a square-shaped platform on the end
    - Point moved to back edge of the platform
    - Analyzed similarly to floats
  - Mooring (*bottom right*):
    - Straight piers > 30 ft
    - Point moved 30 ft back from front edge
  - Fishing (*right*):
    - Straight piers ≤ 30 ft
    - Point moved halfway back from the front edge
- Depth of 2 ft to be usable

HARRIS DAM
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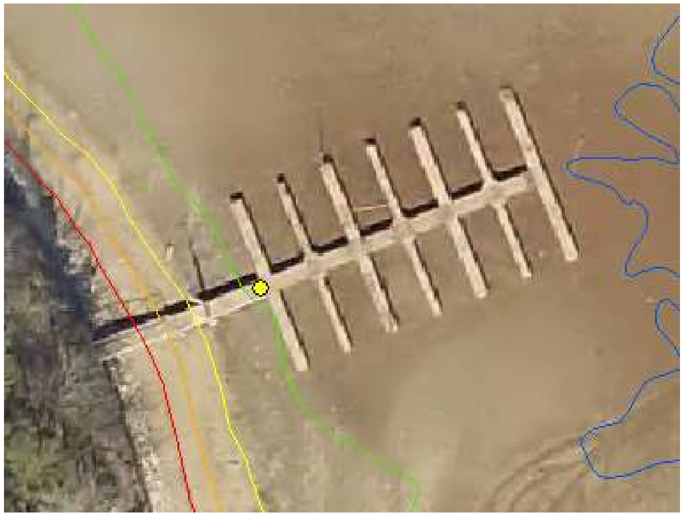
Recreation Structure Usability at Winter Pool Alternatives

Wet Slips

- Some oriented parallel to the bank (*bottom left*) and some perpendicular (*bottom right*)
- The back edge is always the outside edge facing the bank
- Wet slips with multiple slips (*right*) will be considered usable when all slips are usable
- Depth of 2 ft to be usable



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Recreation Structure Usability at Winter Pool Alternatives

Boardwalks

- Point moved to front of structure
- Objective is aesthetics
- Depth of 1 ft at point

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Recreation Structure Usability at Winter Pool Alternatives

Public Boat Ramps

- ADCNR typically uses the following criteria for public ramps at low pool:
  - 15% grade at bottom portion of ramp
  - Depth of 4.5 ft at the end of the ramp
  - Able to launch up to 26 ft boat at low pool

HARRIS DAM RELICENSING

Recreation Structure Usability at Winter Pool Alternatives

Public Boat Ramps

- Highway 48 Bridge:
  - Built using ADCNR standards
  - Usable at 785 ft msl

Recreation Structure Usability at Winter Pool Alternatives

Public Boat Ramps

- Lee's Bridge:
  - Bottom of ramp is ~785.5 ft msl
  - Use a slope analysis to determine the grade
  - Possibly usable ~790.0 ft msl

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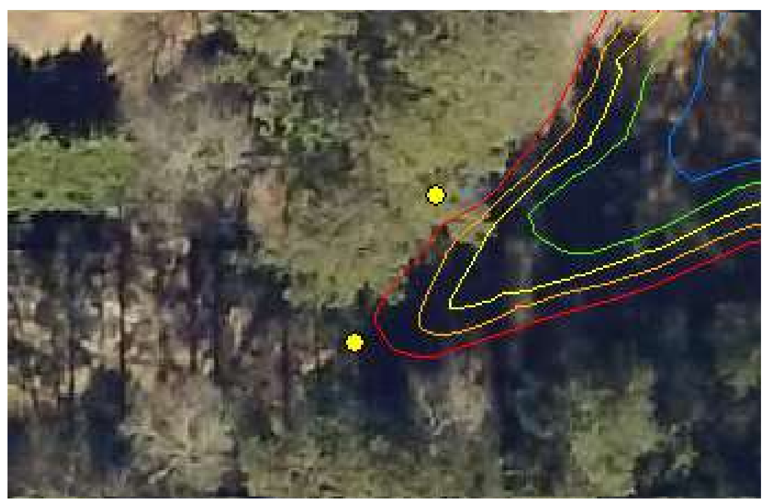
Recreation Structure Usability at Winter Pool Alternatives

Field Observations

- No imagery (*left*):
  - Imagery predates structures
  - ~10.0% of structures
- Not visible (right):
  - Structure obscured by foliage or shadow
  - ~2.5% of structures



HARRIS DAM RELICENSING

Recreation Structure Usability at Winter Pool Alternatives

Presentation of Data: All Structures

The number and percentage of all usable structures at each winter pool alternative

Winter Pool Elevation (feet msl)	Number of Usable Structures	Percent Usable Structures
785		
786		
787		
788		
789		
>789		

HARRIS DAM RELICENSING

Recreation Structure Usability at Winter Pool Alternatives

Presentation of Data: By Structure

The number and percentage of usable structures by type at each winter pool alternative

Winter Pool Elevation (feet msl)	Number of Usable Structures	Percent Usable Structures
Boardwalks		
785		
786		
787		
788		
789		
>789		
Boathouses		
785		
786		
787		
788		
789		
>789		
Floats		
785		
786		
787		
788		
789		
>789		

HARRIS DAM RELICENSING

Questions?

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Alabama Power

FEDERAL ENERGY REGULATORY COMMISSION
WASHINGTON, D.C. 20426
June 10, 2020

OFFICE OF ENERGY PROJECTS

Project No. 2628-065 – Alabama
R.L. Harris Hydroelectric Project
Alabama Power Company

VIA FERC Service

Ms. Angie Anderegg
Harris Relicensing Project Manager
Alabama Power Company
600 North 18th Street Birmingham,
AL 35203

Subject: Staff Comments on the Initial Study Report and Initial Study Report Meeting Summary for the R.L. Harris Hydroelectric Project

Dear Ms. Anderegg:

Staff have reviewed Alabama Power Company's (Alabama Power) Initial Study Report (ISR) and associated draft study reports for the R.L. Harris Hydroelectric Project (Harris Project) filed on April 10, 2020, attended the ISR Meeting held via teleconference on April 28, 2020, and reviewed the ISR Meeting Summary filed on May 12, 2020. Alabama Power filed its ISR two days earlier than the published deadline of April 12, 2020. However, staff is maintaining the original deadline posted in previously issued process plans, June 11, 2020, for filing: comments on the ISR and draft study reports; comments on the ISR Meeting summary; requests for modifications to the approved study plan; and proposals for new studies.

Any stakeholder requests for study plan modifications or new studies should follow the Commission's regulations at 18 C.F.R. § 5.9(b) and 5.15 (2019), which are attached for stakeholder convenience (Attachment B). A copy of the Commission's Integrated Licensing Process (ILP) schedule for the Harris Project pre-filing milestones is attached as a reminder (Attachment C).

Based on a review of the ISR, associated draft study reports, discussions at the ISR Meeting, and a review of the ISR Meeting Summary, staff provide comments and recommended updates on Alabama Power's filings in Attachment A. Unless otherwise noted, please address the comments in Attachment A in the Updated Study Report or the

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preliminary licensing proposal and license application, as appropriate. Alabama Power's requests for variances to their approved schedules for the Water Quality Study, the Draft Recreation Evaluation Study Report, and the Cultural Resources Study[1] will be addressed after the close of the ISR comment period.

If you have questions please contact Sarah Salazar at (202) 502-6863, or at sarah.salazar@ferc.gov.

Sincerely,

Allan E. Creamer

for Stephen Bowler, Chief
South Branch
Division of Hydropower Licensing

Enclosures: Attachment A
Attachment B
Attachment C

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[1] Alabama Power intends to submit its Clean Water Act section 401 Water Quality Certification application to the Alabama Department of Environmental Management in April 2021 instead of in 2020, as originally proposed. Alabama Power proposes to file its Draft Recreation Evaluation Study Report in August 2020 instead of June 2020 to allow time to complete two new recreation surveys, the Tallapoosa River Downstream Landowner Survey and the Tallapoosa River Recreation User Survey. Alabama Power also proposes to finalize the Area of Potential Effect (APE) for its Cultural Resources Study and file it with documentation of consultation in June 2020.

Attachment A

Staff comments on the Initial Study Report (ISR) and Initial Study Report Meeting Summary

Draft Operating Curve Change Feasibility Analysis (Phase 1) Study Report

1. Figure 5-3, on page 39 of the Draft Operating Curve Change Feasibility Analysis (Phase 1) Study Report, shows how changing the winter pool elevation from the current project operating curve to the +1, +2, +3, and +4-foot winter operating curves could affect reservoir elevations in Lake Harris throughout the year. Moreover, the figure documents the interaction between higher winter pool levels and low-inflow periods. During the period between 2006 and 2008, which encompasses two low-flow periods, the model showed that increasing the winter pool elevation can result in higher reservoir elevations during low-flow years, compared to the existing operating curve. However, Figure 5-3 shows that from about July 2007 through mid-February 2008, modeled reservoir levels for the +2 and +3-foot winter pool curve alternatives were lower than that of the other operating curve alternatives for the same operating period. Please explain what appears to be an anomaly in the modeling result in the final report.

Draft Downstream Release Alternatives (Phase 1) Study Report

2. During the ISR Meeting, Alabama Power requested that stakeholders provide downstream flow alternatives for evaluation in the models developed during Phase 1 of the Downstream Release Alternatives Study. Stakeholders expressed concerns about their ability to propose flow alternatives without having the draft reports for the Aquatic Resources and Downstream Aquatic Habitat Studies, which are scheduled to be available in July 2020 and June 2020, respectively. It is our understanding that during Phase 2 of this study, Alabama Power would run stakeholder-proposed flow alternatives that may be provided with ISR comments, as well as additional flow alternatives that stakeholders may propose after the results for the Aquatic Resources and Downstream Aquatic Habitat Studies are available. Please clarify your intent by July 11, 2020, as part of your response to stakeholder comments on the ISR.

3. According to the approved study plan, the goal of the Downstream Release Alternatives Study is to evaluate the effects of four downstream flow release alternatives on project resources. The four release alternatives are: (1) the Green Plan, or Alabama Power's current pulsing operation; (2) the Pre-Green Plan, or Alabama Power's historic peaking operation; (3) the Pre-Green Plan with a continuous baseflow of 150 cubic feet per second (cfs); and (4) a modified Green Plan. The Phase 1 Report, filed on April 10, 2020, presented complete results for Pre-Green Plan operation and Green Plan operation, partial results for the Pre-Green Plan with a 150-cfs baseflow, and no results for the modified Green-Plan alternative.

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During the ISR Meeting, Alabama Power requested that stakeholders identify and propose downstream flow release alternatives so that the proposed alternative's effects on environmental resources can be assessed during Phase 2 of the study. To facilitate modelling of downstream flow release alternatives, we recommend that Alabama Power run base flows of 150 cfs, 350 cfs, 600 cfs, and 800 cfs through its model for each of the three release scenarios (i.e., the Pre-Green Plan, the Green Plan, and the modified Green Plan flow release approach). The low-end flow of 150 cfs was proposed by Alabama Power as equivalent to the daily volume of three 10-minute Green Plan pulses. This flow also is about 15 percent of the average annual flow at the United States Geological Survey's flow gage (#02414500) on the Tallapoosa River at Wadley, Alabama, and represents "poor" to "fair" habitat conditions.[1] We recommend 800 cfs as the upper end of the base flow modeling range because it represents "good" to "excellent" habitat,[2] and is nearly equivalent to the U.S. Fish and Wildlife Service's Aquatic Base Flow guideline for the Tallapoosa River at the Wadley gage.[3] The proposed base flows of 350 cfs and 600 cfs cover the range between 150 cfs and 800 cfs.

In addition, we recommend that the modeling for Alabama Power's Aquatic Resources Study and Downstream Aquatic Habitat Study,[4] as well as any Phase 2

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[1] *See* Tennant, D.L. 1976. Instream flow regimens for fish, wildlife, recreation, and related environmental resources. in Instream flow needs, Volume II: Boise, ID, Proceedings of the symposium and specialty conference on instream flow needs, May 3-6, American Fisheries Society, p. 359-373. Tennant (1976) defines habitat quality (measured by average depth and velocity of flow) as a percentage of the average annual flow. Poor habitat is represented by 0.1 (10 percent of the average annual flow), fair habitat is represented by 0.1 to 0.3 (10 to 30 percent of the average annual flow), and good habitat is represented by 0.3 to 0.4 (30 to 40 percent of the average annual flow), depending on season.

[2] *Id*.

[3] For purposes of this analysis, we assumed an aquatic base flow of 0.5 cubic feet per second per square mile (or cfsm) of drainage area (1,675 square miles at the Wadley gage). *See* U.S. Fish and Wildlife Service. 1981. Interim Regional Policy for New England Streams Flow Recommendations. Region 5. Boston, Massachusetts.

[4] The Aquatic Resources Study involves the use of a bioenergetics model to conduct simulations needed to test potential influence of water temperature and flow on growth rates of fish species downstream from Harris Dam. The Downstream Aquatic Habitat Study involves using a HEC-RAS model to evaluate the effect of alternative operations on the amount and persistence of wetted aquatic habitat in the Tallapoosa River downstream from Harris Dam.

assessment(s) include all the downstream flow release alternatives identified and evaluated as part of the Downstream Flow Release Alternatives Study. The results of all the modeling for the Aquatic Resources Study and Downstream Aquatic Habitat Study should be included in the final study reports and filed with the Updated Study Report, due by April 12, 2021.

4. The Draft Downstream Release Alternatives (Phase 1) Study Report refers to data sets (e.g., topographic and geometric data on pages 12-13 and 17-19) that were used to develop the models. To assist us in interpreting the models, we recommend including in the final study report a table and/or figure that summarizes all of the data sets used in the models and identifies their spatial extents in terms such as watershed segments, river miles (RMs), and square miles covered by each dataset (as appropriate), with reference to other geographic landmarks (e.g., nearest city, dam, bridge, etc.). Please incorporate into the table and/or figure, the stakeholder- and Alabama Power-identified erosion areas of concern. In addition, please provide the metadata for each data set used.

5. Page 14 of the Draft Downstream Release Alternatives (Phase 1) Study Report includes a description of the HEC-ResSim model that was developed for the project. Harris Dam was modeled in HEC-ResSim with both a minimum release requirement and maximum constraint at the downstream gage at Wadley. The draft report states that the minimum release requirement is based on the flow at the upstream Heflin gage, which is located on the Tallapoosa River arm of Harris Reservoir and has 68 years of discharge records. Page 5 of the draft report indicates that there is also a gage (Newell) on the Little Tallapoosa River Arm of the reservoir, which has 45 years of discharge records. It appears that only the Heflin gage was used in developing the minimum release requirement. As part of your response to stakeholder comments on the ISR, please explain the rationale for basing the minimum releases in the HEC-ResSim model only on the flows at the Heflin gage and not also on the flows at the Newell gage.

6. Pages 15 and 16 of the Draft Downstream Release Alternatives (Phase 1) Study Report, state that the drought indicator thresholds, or triggers, are only evaluated on the 1st and the 15th of every month in the model and that once a drought operation is triggered, the drought intensity level can only recover from drought condition at a rate of one level per "period." Please clarify in the final report if one "period" is equal to 15 days (i.e., the interval for evaluating drought triggers) and if this protocol is used for managing reservoir operations currently, or if it is only a parameter used in the model.

<u>Draft Erosion and Sedimentation Study Report</u>

7. The Erosion and Sedimentation Study in the approved study plan states that Alabama Power would analyze its existing lake photography and Light Detection and Ranging (LIDAR) data using a geographic information system (GIS) to identify elevation or contour changes around the reservoir from historic conditions and quantify changes in

lake surface area to estimate sedimentation rates and volumes within the reservoir. In addition, the approved study plan states that Alabama Power will verify and survey sedimentation areas for nuisance aquatic vegetation. According to the study schedule, Alabama Power will prepare the GIS overlay and maps from June through July 2019 and conduct field verification from fall 2019 through winter 2020.

The Draft Erosion and Sedimentation Study Report does not include a comparison of reservoir contour changes from past conditions or the results of nuisance aquatic vegetation surveys. The report states that limited aerial imagery of the lake during winter draw down and historic LIDAR data for the reservoir did not allow for comparison to historic conditions and that Alabama Power will conduct nuisance aquatic vegetation surveys during the 2020 growing season.

It is unclear why the existing aerial imagery and Alabama Power's LIDAR[5] data did not allow for comparison with past conditions or why the nuisance aquatic vegetation surveys will be conducted during the 2020 growing season instead of during the approved field verifications from fall 2019 to winter 2020. As part of your response to stakeholder comments on the ISR, please clarify what existing aerial imagery and LIDAR data was used and why it was not suitable for comparison with past conditions. Also, please explain the change in timing for conducting the nuisance aquatic vegetation surveys.

<u>Draft Water Quality Report</u>

8. Figure 3-8, on page 18 of the Draft Water Quality Study Report shows dissolved oxygen (DO) profiles for the Harris Project forebay. While much of the data is typical of the DO stratification pattern in a southern reservoir, the figure also shows that in June, July, and August of 2017 and 2019, there was a 2.0 to 3.0 milligram per liter increase in DO concentration at a depth of about 20 to 25 meters in Lake Harris, which is uncommon in such reservoirs. Please include Alabama Power's interpretation of this DO anomaly in the final Water Quality Study Report.

<u>Draft Threatened and Endangered (T&E) Species Study Report</u>

9. The goals of Alabama Power's T&E Species Study are to assess the probability of T&E species populations and/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

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[5] During the June 4, 2020 Harris Action Team #1 and #5 meeting, Alabama Power stated it has LIDAR data sets from different years and would check its records to confirm the number of LIDAR data sets, and for which years the LIDAR data were collected.

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management, etc.) to those species and critical habitats. According to the study schedule, Alabama Power would develop the GIS overlays and maps from April through July 2019, and conduct field verifications, if required, from October 2019 through September 2020.

The Draft T&E Species Study Report does not provide information on the presence or absence of potentially suitable habitat within the project boundary for all of the T&E species (e.g., red cockaded woodpecker,[6] northern long-eared bat,[7] pool sprite,[8] and white fringeless orchid[9]) on the official species list for the project.[10] Therefore, Alabama Power was unable to determine whether or not these species are likely to occur within the project boundary or identify a complete list of T&E species that require field surveys.

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[6] Page 8 the report states that land use data is not specific enough to determine if the 3,068 acres of coniferous forest in the project boundary at Lake Harris has the specific habitat characteristics suitable for red-cockaded woodpeckers.

[7] Page 19 of the report states that the Lake Harris and Skyline project boundaries fall within the range of the northern long eared bat and that there are no known hibernacula or summer roost trees within the project boundaries. However, as discussed in the ISR meeting, the report does not state whether any known northern long-eared bat hibernacula occur within a 0.25-mile radius of the project boundaries, or whether known summer roost trees occur within a 150-foot radius of the project boundaries. The report also does not provide information about timber/vegetation management practices within the project boundary. This information is needed in order to determine known occurrences of northern long-eared bats within or adjacent to the project boundaries and to determine potential project effects to this species.

[8] Page 21 of the reports states that pool sprite was documented at Lake Harris in Flat Rock Park in 1995. While subsequent surveys have not detected pool sprite, the report indicates that there are 138.4 acres of granite geology within the project boundary at Lake Harris. However, this species' vernal pool habitat was not identified at the project due to "a lack of available data."

[9] Page 22 the report states that National Wetland Inventory data is not detailed enough to identify potentially suitable habitat for white fringeless orchid within the project boundary.

[10] See FWS's official lists of T&E species within the Harris Project boundaries (i.e., at Lake Harris and Skyline) that were accessed on July 27, 2018, by staff using the FWS's Information for Planning and Conservation website (https://ecos.fws.gov/ipac/) and filed on July 30, 2018.

As part of your response to stakeholder comments on the ISR, please provide: (1) the maps and assessment of the availability of potentially suitable habitat within the project boundary for all of the T&E species on the official species list for the project; (2) documentation of consultation with FWS regarding the species-specific criteria for determining which T&E species on the official species list will be surveyed in the field; (3) a complete list of T&E species that will be surveyed during the 2nd study season as part of the T&E Species Study; and (4) confirmation that Alabama Power will complete the field verification scheduled by September 2020.

Draft Project Lands Evaluation (Phase 1) Report

10. The goals of the Project Lands Evaluation include: (1) identifying and classifying lands at the project that are needed for Harris Project purposes; (2) evaluating existing land use classifications at Lake Harris and determining if any changes are needed to conform to Alabama Power's current land classification system and other Alabama Power Shoreline Management Plans; and (3) identifying lands to be added to, or removed from the current project boundary.

Appendix B of the Draft Project Lands Evaluation (Phase 1) Report includes a small scale map of Lake Harris and the existing shoreline classifications, as well as larger scale maps showing parcels of land within the project boundary for which Alabama Power is considering either changing the existing land use classification, adding parcels to the project boundary, or removing parcels from the project boundary. However, the report does not include large scale maps showing the land use classifications for all of the existing shoreline. To facilitate review of the existing shoreline land use classifications, please file larger scale maps of all the shoreline areas as a supplement to the Draft Project Lands Evaluation Report, as part of your response to stakeholder comments on the ISR. Please include land use classifications on the maps. In addition, if available, please file the GIS data layers of the existing and proposed shoreline land use classifications.

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Attachment B

Excerpt from 18 C.F.R. § 5.15

(d) *Criteria for modification of approved study*. Any proposal to modify an ongoing study . . . must be accompanied by a showing of good cause why the proposal should be approved, and must include, as appropriate to the facts of the case, a demonstration that:

- (1) Approved studies were not conducted as provided for in the approved study plan; or
- (2) The study was conducted under anomalous environmental conditions or that environmental conditions have changed in a material way.

(e) *Criteria for new study*. Any proposal for new information gathering or studies . . . must be accompanied by a showing of good cause why the proposal should be approved, and must include, as appropriate to the facts of the case, a statement explaining:

- (1) Any material changes in the law or regulations applicable to the information request;
- (2) Why the goals and objectives of any approved study could not be met with the approved study methodology;
- (3) Why the request was not made earlier;
- (4) Significant changes in the project proposal or that significant new information material to the study objectives has become available; and
- (5) Why the new study request satisfies the study criteria in § 5.9(b).

Excerpt from 18 C.F.R. § 5.9(b)

(b) *Content of study request*. Any information or study request must:

- (1) Describe the goals and objectives of each study proposal and the information to be obtained;
- (2) If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied;
- (3) If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study;
- (4) Describe existing information concerning the subject of the study proposal, and the need for additional information;
- (5) Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how

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the study results would inform the development of license requirements;

(6) Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate filed season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge; and

(7) Describe considerations of level of effort and cost, as applicable, and why proposed alternative studies would not be sufficient to meet the stated information needs.

Attachment C

R.L. Harris Process Plan and Schedule for the Integrated Licensing Process (ILP)

(shaded milestones are unnecessary if there are no study disputes; if due date falls on a weekend or holiday, the due date is the following business day)

18 C.F.R.	Lead	Activity	Timeframe	Deadline
§ 5.5(a)	Alabama Power	Filing of NOI and PAD	Actual filing date	6/1/2018
§ 5.7	FERC	Initial Tribal Consultation Meeting	No later than 30 days from NOI and PAD	7/1/2018
§5.8	FERC	FERC Issues Notice of Commencement of Proceeding and Scoping Document (SD1)	Within 60 days of NOI and PAD	7/31/2018
§5.8 (b)(3)(viii)	FERC/ Stakeholders	Public Scoping Meetings and Environmental Site Review	Within 30 days of NOI and PAD notice and issuance of SD1	8/28/2018 - 8/29/2018
§ 5.9	Stakeholders/ FERC	File Comments on PAD, SD1, and Study Requests	Within 60 days of NOI and PAD notice and issuance of SD1	9/29/2018
§5.10	FERC	FERC Issues Scoping Document 2 (SD2), if necessary	Within 45 days of deadline for filing comments on SD1	11/13/2018
§5.11(a)	Alabama Power	File Proposed Study Plans	Within 45 days of deadline for filing comments on SD1	11/13/2018
§5.11(e)	Alabama Power/ Stakeholders	Study Plan Meetings	Within 30 days of deadline for filing proposed Study Plans	12/13/2018
§5.12	Stakeholders	File Comments on Proposed Study Plan	Within 90 days after proposed study plan is filed	2/11/2019
§5.13(a)	Alabama Power	File Revised Study Plan	Within 30 days following the deadline for filing comments on proposed Study Plan	3/13/2019
§5.13(b)	Stakeholders	File Comments on Revised Study Plan (if necessary)	Within 15 days following Revised Study Plan	3/28/2019
§5.13(c)	FERC	FERC Issues Study Plan Determination	Within 30 days following Revised Study Plan	4/12/2019
§5.14(a)	Mandatory Conditioning Agencies	Notice of Formal Study Dispute (if necessary)	Within 20 days of Study Plan determination	5/2/2019
§5.14(l)	FERC	Study Dispute Determination	Within 70 days of notice of formal study dispute	7/11/2019
§5.15(a)	Alabama Power	Conduct First Season Field Studies	Spring/Summer 2019	

18 C.F.R.	Lead	Activity	Timeframe	Deadline
§5.15(c)(1)	Alabama Power	File Initial Study Reports	No later than one year from Study Plan approval	4/12/2020
§5.15(c)(2)	Alabama Power	Initial Study Results Meeting	Within 15 days of Initial Study Report	4/28/2020
§5.15(c)(3)	Alabama Power	File Study Results Meeting Summary	Within 15 days of Study Results Meeting	5/12/2020
§5.15(c)(4)	Stakeholders/ FERC	File Meeting Summary Disagreements/Modifications to Study/Requests for New Studies	Within 30 days of filing Meeting Summary	6/11/2020
§5.15(c)(5)	Alabama Power	File Responses to Disagreements/Modifications/ New Study Requests	Within 30 days of disputes	7/11/2020
§5.15(c)(6)	FERC	Resolution of Disagreements/ Study Plan Determination (if necessary)	Within 30 days of filing responses to disputes	8/10/2020
§5.15	Alabama Power	Conduct Second Season Field Studies	Spring/Summer 2020	
§5.15 (f)	Alabama Power	File Updated Study Reports	No later than two years from Study Plan approval	4/12/2021
§5.15(c)(2)	Alabama Power	Second Study Results Meeting	Within 15 days of Updated Study Report	4/27/2021
§5.15(c)(3)	Alabama Power	File Study Results Meeting Summary	With 15 days of Study Results Meeting	5/12/2021
§5.15(c)(4)	Stakeholders/ FERC	File Meeting Summary Disagreements/ Modifications to Study Requests/Requests for New Studies	Within 30 days of filing Meeting Summary	6/11/2021
§5.15(c)(5)	Alabama Power/ Stakeholders	File Responses to Disagreements/Modifications/ New Study Requests	Within 30 days of disputes	7/11/2021
§5.15(c)(6)	FERC	Resolution of Disagreements/ Study Plan Determination (if necessary)	Within 30 days of filing responses to disagreements	8/10/2021
§5.16(a)	Alabama Power	File Preliminary Licensing Proposal (or Draft License Application) with the FERC and distribute to Stakeholders	Not later than 150 days before final application is filed	7/3/2021
§5.16 (e)	FERC/ Stakeholders	Comments on Alabama Power's Preliminary Licensing Proposal, Additional Information Request (if necessary)	Within 90 days of filing Preliminary Licensing Proposal (or Draft License Application)	10/1/2021
§5.17 (a)	Alabama Power	License Application Filed		11/30/2021

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STATE OF ALABAMA
DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
WILDLIFE AND FRESHWATER FISHERIES DIVISION

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The mission of the Wildlife and Freshwater Fisheries Division is to manage, protect, conserve, and enhance the wildlife and aquatic resources of Alabama for the sustainable benefit of the people of Alabama.

CHARLES F. "CHUCK" SYKES
DIRECTOR

FRED R. HARDERS
ASSISTANT DIRECTOR

June 11, 2020

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

RE: Comments on the Harris Project Initial Study Report (ISR) including Project Lands Evaluation, Operating Curve Change Feasibility, Downstream Release Alternatives Study, Water Quality Study, Erosion and Sedimentation Study, Threatened and Endangered Species Desktop Assessment, Cultural Resources Programmatic Agreement and Historic Properties, Management Plan Study, Area of Potential Effects (APE) and Harris Relicensing Initial Study Report Meeting April 28, 2020 for the R. L. Harris Hydroelectric Project (FERC No. 2628).

Dear Ms. Bose:

The Alabama Department of Natural Resources (ADCNR) Division of Wildlife and Freshwater Fisheries (WFF), has reviewed the filed Harris Project Initial Study Report (ISR) in regards to the relicensing of R.L. Harris Hydroelectric Project No. 2628 and submits the following comments and recommendations for your consideration:

Initial Study Report (ISR)

- On page 11, section 4.1 of Initial Study Report, "*i.e.*" ("that is") should be changed to "*e.g.*" ("for example"). The alternative/modified Green Plan operation downstream release alternative will be evaluated as part of Phase 2. Results from the other three scenarios as well as from the Aquatic Resources Study are needed to design the alternative to be studied. Downstream Aquatic Habitat Study and Recreational Evaluation Study results should be included in footnotes in order to fully evaluate and recommend an alternative Green Plan to be modeled and evaluated as a downstream release alternative. Without the ability to fully evaluate the Aquatic Resources Study, Downstream Aquatic Habitat Study and Recreational Evaluation Study results at this time, ADCNR recommends multiple base flow scenarios calculated from available aquatic inflow and base flow records and guidelines representative for the tailwaters downstream to the Horseshoe Bend with Pre-Green Plan, Green Plan and Modified Green Plan be modeled during the evaluation process. All operational changes to downstream releases should evaluate methods for how these flows could be provided while maintaining state dissolved oxygen guidelines and a natural temperature regime, at all times for the sustainable benefit of aquatic resources.

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- On page 12, section 4.2 of Initial Study Report, remove the descriptive words "slight" and "worse" when detailing if alternatives will increase or decrease average annual economic costs to Alabama Power customers and provide estimated amount ranges for each alternative. If, "there are currently too many unknowns at this time to generate accurate and reliable Hydro Budget results", please explain how an assumption of whether it will be "same" or "worse" can be made. For comparisons of alternatives, additional details are recommended to provide how a Pre-Green Plan peaking operation with a 150 cfs continuous minimum flow regardless of generation or no generation to produce the minimum flow would not be a significant economic gain, if not evaluating capital and O&M costs into the equation.

- On page 15, section 5.2 of Initial Study Report, remove "well' in statement, "showed dissolved oxygen levels were well above 5 mg/L during each of their sampling events."

- On page 15, section 5.2 of Initial Study Report, additional data, evidence or other alternatives should be provided to make the statement that "The low dissolved oxygen events in 2017 may be attributed to conditions in the Harris Reservoir that were impacted by severe drought in the summer and fall of 2016, where inflows to the lake were at historic lows." On page 17, Figure 3-7 of the Water Quality Study does not indicate that temperature stratification occurred differently in 2017 verses 2018 or 2019. Year 2017 data, on page 37, Figure 4-4, and downstream water quality data on page 46, Figure 6-1 of the Water Quality Study disputes the theory that conditions were caused by previous year conditions. Inflows were above average during 2017, which means discharge was higher. This is another reason low dissolved oxygen could have been more pronounced in 2017. This same scenario has been observed in Lake Martin, where higher spring/summer rainfall leads to increased discharge, which leads to poorer water quality below the thermocline (Sammons and Glover, 2013). If a dam is drawing from the hypolimnion under these conditions, it can lead to a discharge of lower oxygenated water during a high precipitation spring/summer. In addition to evaluating potential causes of the 2017 low dissolved oxygen events, changes and improvements that can be made to detect, adjust and improve operations to prevent another 2017 event from occurring again should be considered and evaluated for the sustained benefit of downstream aquatic resources.

- On page 17, section 6.1 of Initial Study Report delete "likely" and insert, "potential" prior to cause(s).

- On page 18, section 6.2.1 of Initial Study Report, include additional details of how causes of erosion were determined. Methods primarily cover how sites of erosion were identified, not caused.

- On page 18, section 6.2.1 of Initial Study Report, verify and confirm accuracy of statement "Twenty-five percent of the Little Tallapoosa River basin has been converted to hay/pasture fields (MRLC 2019)". Table 2-3, of the Erosion and Sedimentation Study, indicate a net loss of Hay/Pasture in the Little Tallapoosa River Basin of -8,815.1 acres from 2001 to 2016. These two statements appear to be contradictory.

- On page 19, section 6.2.2 of Initial Study Report, it states "Notably, only one area scored as impaired to non-functional (located on the right bank between river mile [RM] 16.3 to 16.9)." On page 33, Figure 21 of Appendix E Downstream Bank Stability Study Report of the Erosion and Sedimentation Study, a red section is downstream of No Business Creek within the 3.5-5 range appears present. Explain and verify that this area is not considered a second impaired site.

- On page 19, section 6.2.2 of Initial Study Report, "primarily caused" should be changed to "potentially caused". Remove "natural riverine processes" and replace with "regulated riverine processes" or define how natural riverine processes are defined in this context and occur below a controlled and regulated tailrace.

- On page 19 section 6.2.2. of Initial Study Report. Providing the dissolved oxygen percent of measurements greater than 5 milligrams per liter is correct but misleading in regards to aquatic resources protection. It is important to note when presenting this data that it only takes a single incident of depleted dissolved oxygen to cause an aquatic species kill event. A caveat or footnote is recommended to address this fact.

- On page 19, section 6.2.2 of Initial Study Report, it states, "Questions have also been raised regarding potential effects the Harris Project may have on other aquatic fauna within the Project Area, including macroinvertebrates such as mollusks and crayfish. Alabama Power is investigating the effects of the Harris

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Project on these aquatic species and is performing an assessment of the Harris Project's potential effects on species mobility and population health." There are currently records of mussel species Under Review for federal listing with substantial 90-day findings that occur and occurred historically in the Tallapoosa River and its tributaries. Alabama Spike (*Elliptio arca*) and Delicate Spike (*Ellipto arctata*) are currently state protected species and Under Review by United States Fish and Wildlife Service (USFWS) with a substantial 90-day finding. Threatened and Endangered Species study plan states in the methods that additional species of concern may be added at the request of USFWS and/or ADCNR if determined to be appropriate. Please provide details on what specific mollusks and crayfish species will be evaluated. A list of state protected species currently being evaluated during the relicensing process is recommended.

- Page 27, section 9.1 of Initial Study Report, there are additional state protected species that are not T&E. The final report may not address all state protected species and a statement should be included to clarify. The Initial Study Report plan used the term "and/or".

Draft Phase 1 Project Lands Evaluation Study Report

- Appendix B includes Figure of Maps and Supporting Information of Proposed Changes of the Project Lands Evaluation Study Report. These maps indicate there are several recreational properties which are being re-classified away from recreation (net loss of 600 acres- page 14, Table 6-1). In addition to the acreages provided, it would be beneficial to provide and understand the amount of linear feet of shoreline for each parcel being proposed for addition, re-classification or removal. Undisturbed natural shorelines and shorelines designated for recreational use benefit wildlife and aquatic resources and also provide recreational opportunities for anglers and hunters. Impacts to shoreline habitat in Lake Harris can negatively impact aquatic, semi-aquatic, and terrestrial species. Studies have shown that undeveloped shoreline areas provide the most suitable habitat for maintaining abundance, diversity, and species richness of aquatic, semi-aquatic, and terrestrial species. We recommend that natural vegetated shorelines remain undisturbed as much as possible when evaluating land classifications and future shoreline land use. When evaluating classification changes, linear lake front footage would be a useful metric to provide. ADCNR would like to ensure a suitable site(s) is(are) identified and reserved for future construction of an appropriately sized boating access facility(ies). Future boating demand on Lake Harris is currently unknown for the entire duration of the license, therefore ADCNR continues to request consultation with Alabama Power in the selection of future recreational sites to safeguard they are located in suitable areas for anglers and boaters. The sites need to be large enough to suit any future demand of boaters and anglers and the sites need to meet the engineering requirements for an appropriately sized facility. We recommend any suitable identified property continue to be classified as recreational. The distribution of public boat ramps in the lake should be fully evaluated when considering reclassifying recreation zoned areas. In areas of the lake with few public boating access points or high boat ramp usage, there should be recreational zoned properties for future boat ramp additions available to meet angler demand.

- Appendix B, Figures R1-R6 of the Project Lands Evaluation Study Report, indicates that these acreages are not suitable for recreation due to their location within areas of the lake with limited demand for public recreation opportunities. ADCNR requests the opportunity to evaluate the results from the Recreation Evaluation Study prior to this determination for these zoning reclassifications.

- On page 9, of the Project Lands Evaluation Study Report, the third bullet named Project Operations (formerly titled Prohibited Access) states "For security, the allowable uses in this classification are primarily restricted to Alabama Power personnel; however, in some cases, such as guided public tours, limited public access is available." ADCNR recommends that bank fishing be included in the "some cases" exemptions statement for these areas. Canoe or kayak access points should also be evaluated in these areas during the relicensing process, since they are currently nonexistent.

Draft Operating Curve Change Feasibility Analysis Phase1 Report

- On page 6, section 2.1.1.5 Lower Tallapoosa River of the Operation Curve Change Feasibility Analysis Study discusses downstream gages. Include years of discharge and stage data for these gages, similar to previous gages years of discharge and stage data discussed and included in the document.

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- On pages 45-50, Figures 5-7 through 5-12 of the Operation Curve Change Feasibility Analysis Study visually indicate inundation boundaries for the baseline of four winter pool alternatives. Include a Table with calculated totals of inundated acreages for the baseline and four winter pool increase alternatives to assist with the quantitative evaluation of inundation effects downstream of the dam.

Draft Downstream Release Alternatives Phase 1 Report

- The Downstream Release Alternatives Study as is, presents the results for three downstream release alternatives: Pre-Green Plan operation, Green Plan operation, and Pre-Green Plan operation with a 150 cfs continuous minimum flow. Throughout the document the "Pre-Green Plan operation with a 150 cfs continuous minimum flow", is often referenced as "continuous minimum flow of 150 cfs". When referencing this downstream release alternative in the document it would be helpful to use the full "Pre-Green Plan operation with a 150 cfs continuous minimum flow" to clarify and fully identify the alternative. If a modified Green Plan, details pending, is evaluated with a continuous minimum flow, the addition will assist in differentiating the alternatives.

- A fourth Modified Green Plan downstream release alternative was included to be evaluated in the initial Study Plan for the Downstream Release Alternatives Study. ADCNR maintains its recommendation for a fourth alternative Modified Green Plan be fully evaluated. Details and design of a Modified Green Plan alternative are pending results from the Aquatic Resources Study. For a complete Downstream Release Alternative Study comparing four release alternatives, the Modified Green Plan alternative should be completed and included in this study or Phase 2. ADCNR requests the opportunity to provide specific recommendations for the Modified Green Plan alternative after assessing all of the planned study reports. ADCNR has consistently stated and provided published peer reviewed references that support recommendations for downstream flows to mimic a natural flow regime with an adaptive management of flows that follows state dissolved oxygen guidelines and provides natural temperature regimes, at all times for the sustained long term benefit and conservation of aquatic species (See *ADCNR*, P-2628-005 FERC ¶ 20181002-5006).

- On page 1, section 1.0 of the Downstream Release Alternatives Study, replace "However, some stakeholders noted that the temperature of the turbine releases could have potential effects on aquatic resources in the Tallapoosa River below Harris Dam." with "However, some stakeholders noted that the temperature of the turbine releases has documented negative impacts on aquatic resources in the Tallapoosa River below Harris Dam." (See *ADCNR*, P-2628-005 FERC ¶ 20181002-5006).

- On page 2, section 1.1, of the Downstream Release Alternatives Study, change "*i.e.*" to "*e.g.*" It should be "for example" not "that is" if an Aquatic Resources Study is required to evaluate and design the alternative to be studied as stated in footnote of the page. Downstream Aquatic Habitat Study and Recreational Evaluation Study results should be considered as inclusions in the footnote as prerequisites to fully evaluate and recommend an alternative Modified Green Plan to be modeled and evaluated as a downstream release alternative.

- On page 21, section 4.3.3 Model Flow Data of the Downstream Release Alternatives Study, ADCNR recommends re-stating that the Modified Green Plan alternative is not included in this model section pending results from additional studies and will be evaluated in Phase 2. This section states why 2001 data was used and presented but does not specify why the date range of 1/1/01-1/31/01 was specifically selected from the entire year data. ADCNR recommends including why this month was selected and providing additional figures similar to Fig. 4-3. showing a months' worth of data at four 1-month intervals covering spring, summer and fall sample portions of hydrographs to fully illustrate model flow data throughout the year.

- On page 25, section 5.2 of the Downstream Release Alternatives Study, remove the descriptive words "slight" and "worse" when detailing if alternatives will increase or decrease average annual economic costs to Alabama Power customers and provide estimated amount ranges for each alternative. If, "there are currently too many unknowns at this time to generate accurate and reliable Hydro Budget results", please explain how an assumption of whether it will be "same" or "worse" can be made. For comparisons of alternatives,

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additional details should be provided describing how a Pre-Green Plan peaking operation with a 150 cfs continuous minimum flow, regardless of generation or no generation to produce the minimum flow, would not be a significant economic gain, if not evaluating capital and O&M costs into the equation.

- On page 27, section 6.0 Conclusions of the Downstream Release Alternatives Study, a space between "results indicate" should be included.

Draft Water Quality Study Report

- On pages ii-iv., Table of Contents, of the Water Quality Study, some of the page numbering does not coincide with the document contents. For example, Lake Levels and Hydrology page 7 of Table of Contents is on page 8.

- On page 3, section 1.1, of the Water Quality Study, after "A summary of data sources for this report is provided in" a large space creates and extra page that appears to be unnecessary and should be removed.

- On page 8, section 2.0, of the Water Quality Study "October of 2107" should be changed to 2017.

- On page 9, Figure 2-2 of the Water Quality Study, specify if the 1987-2016 data is a monthly average or long-term average in the figure key or label.

- On page 22, Table 3-2 of the Water Quality Study, include minimum and maximum ranges of data to this Table, if available.

- On page 25, Figure 4-1 of the Water Quality Study, provide major tributary names and periodic river mile markings to aid in location descriptions.

- On page 27, Table 4-3 of the Water Quality Study, include minimum and maximum ranges of data to this Table, if available.

- On page 39, of the Water Quality Study, "Error! Reference source not found?" should be removed or corrected.

- On page 42, Table 4-11 of the Water Quality Study, if available, separate and provide this data into Pre-Green Plan and Post-Green Plan implementation year groupings to further examine if operational differences affect water quality.

- On page 46, section 6.2 of the Water Quality Study, additional data, evidence or other alternatives should be provided to make the statement that "The low dissolved oxygen events in 2017 may be attributed to conditions in Harris Reservoir that were impacted by severe drought in the summer and fall of 2016, where inflows to the lake were at historic lows (Figure 6-1)" On page 17, Figure 3-7 of the Water Quality Study does not indicate that temperature stratification occurred differently in 2017 versus 2018 or 2019. Year 2017 data, on page 37, Figure 4-4, and downstream water quality data on page 46, Figure 6-1 of the Water Quality Study disputes the theory that conditions were caused by previous year conditions. Inflows were above average during 2017, which means discharge was higher. This is another reason low dissolved oxygen could have been more pronounced in 2017. This same scenario has been observed in Lake Martin, where higher spring/summer rainfall leads to increased discharge, which leads to poorer water quality below the thermocline (Sammons and Glover 2013). If a dam is drawing from the hypolimnion under these conditions, it can lead to a discharge of lower oxygenated water during a high precipitation spring/summer. In addition to evaluating potential causes of the 2017 low dissolved oxygen events, changes and improvements that can be made to detect, adjust and improve operations to prevent another 2017 event from occurring again should be considered and evaluated for the sustained benefit of downstream aquatic resources.

Draft Erosion and Sedimentation Study Report

- Throughout the Erosion and Sedimentation Study when referencing "cause of erosion" change to "potential cause(s) of erosion/sedimentation." On page 2, section 2.0 Goals and Objectives in the Erosion and Sedimentation Study Plan it states, "The goals of this study are to identify any problematic erosion sites and sedimentation areas and determine the likely causes." "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)."

- On page 6, section 2.0 Lake Harris, 2.1 Methods in the Erosion and Sedimentation Study, replace, "determine the cause of erosion:" with "determine areas of erosion and potential cause(s):" For the potential cause(s) categories considered, provide a definition of each and additional details into the methods utilized to characterize how each cause was determined and differentiated. The methods described appear to detail how areas of erosion were identified but do not detail how potential cause(s) were determined. A reference to the Erosion and Sedimentation Study Plan Study Plan methods or inclusion of section 4.1 study plan methods should be provided.

- On page 12, section 2.2 Results, 2.2.1 Erosion Survey in the Erosion and Sedimentation Study insert "potential cause(s)" into "Each site was photographed and examined to determine the cause of erosion."

- On page 20, section, of the Erosion and Sedimentation Study, verify and confirm accuracy that Table 2-3 indicates a net loss of Hay/Pasture in the Little Tallapoosa River Basin of -8,815.1 acres from 2001 to 2016. Text indicates a "Twenty-five percent of the Little Tallapoosa River basin has been converted to hay/pasture fields (MRLC 2019)" These two statements appear to be contradictory.

- On page 24, section 3.2 Results of the Erosion and Sedimentation Study, change "primarily caused" to "potentially caused". Remove "natural riverine processes" and replace with "regulated riverine processes" or define how natural riverine processes are defined in this context and occur below a controlled and regulated tailrace.

- On page 25, Table 3-2 of the Erosion and Sedimentation Study, add score ranges (minimum and maximum scores) in addition to the means. If previous sites E22 and E23 are included in this Table, provide an asterisk and footnote specifying which ones they are. Include in discussion section how this scoring method compared to the method used at sites E22 and E23.

- On page 26, Figure 3-1 of the Erosion and Sedimentation Study, include site numbers from Table 3-2 into this map or provide incremental river mile markers.

- On page, Table 4-1 of the Erosion and Sedimentation Study indicates a 592.1 acreage increase in deciduous forest. Deciduous forest stream buffers have been shown to reduce nitrogen, phosphorous and sedimentation from surface water runoff into streams, lakes and estuaries. This could be included in the discussion section as a positive observed land use trend in the area (Klapproth and Johnson 2009; Roy *et al.* 2006).

- On page 31, Section 5.0 Discussion and Conclusions of the Erosion and Sedimentation Study, provide additional information on definitions and methodology in how cause(s) were determined before the conclusion that erosion was a result of anthropogenic and/or natural processes independent of project operations. As is, the use of the word "potential" should be included. Provide the current definition of "project operations" for this study and include it prior to other document "project operations" statements. If referring to "fluctuations" from project operations, this should be clearly stated throughout Erosion and Sedimentation Study. Among Study plans there appears to be variations in the provided definition of "Project operations" and "project related impacts". For example, on page 4 the Erosion and Sedimentation Study Plan states "Project operations" as "(*i.e.*, water level fluctuations or construction/maintenance activities on/at Project facilities or lands)", but on page 2 of the Threatened and Endangered Species Study Plan it states "project related impacts" as "(*i.e.*, lake fluctuations, downstream flows, recreation and shoreline management activities, timber management, etc.)". Providing consistency of these definitions among studies would be beneficial during the relicensing evaluation process. In addition, including "etc." which indicates that "further, similar items are included" after using "*i.e.*" or "that is" is a contradictory use of the terms.

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- On page 31, section 5.0 Discussion and Conclusions of the Erosion and Sedimentation Study, replace "extremely small" with "relatively small".

- On page 31, section 5.0 Discussion and Conclusions of the Erosion and Sedimentation Study, insert "potentially" prior to "affected"

- On page 31, section 5.0 Discussion and Conclusions of the Erosion and Sedimentation Study, insert "potentially" prior to "clear-cut". Reword sentence to read: "The observed erosion at the these sites is the potential result of adjacent land use and clearing of riparian plant cover destabilizing soils along the affected banks, although erosion at these sites may have been initially caused or exacerbated as result of altered flow releases from Harris Dam."

- On page 31, section 5.0 Discussion and Conclusions of the Erosion and Sedimentation Study, insert "in the reservoir" after decrease in "Sedimentation in Lake Harris is most pronounced in the Little Tallapoosa River arm where sediment transported from upstream settles out of the water column as water velocities decrease" statement.

- In Appendix E Downstream Bank Stability Study Report of the Erosion and Sedimentation Study, include periodic river mile markers and corresponding segment numbers in figures of the study.

- On page 33, Figure 21 of Appendix E Downstream Bank Stability Study Report of the Erosion and Sedimentation Study, a red section in downstream of No Business Creek within the 3.5-5 range appears present. In results or discussion explain how this area is not included as a second impaired site.

- On page 34, Table 3 of Appendix E Downstream Bank Stability Study Report of the Erosion and Sedimentation Study, if available, include ranges (minimum and maximum scores) with segment data.

- On page 43, Conclusions section of Appendix E Downstream Bank Stability Study Report of the Erosion and Sedimentation Study include a definition and discussion about the potential for head cutting in tributaries due to main river channel operations. Head cutting is a process by which the upstream portion of a stream channel becomes destabilized and erodes progressively in an upstream direction. Accelerated velocities can lead to an increase in head cutting upstream from affected areas (Annear *et al.* 2002).

<u>Draft Threatened and Endangered Species Desktop Assessment</u>

- Throughout the Threatened and Endangered Species Desktop Assessment, capitalize species common names. When a species is first used in the document, include the scientific name in parentheses. The common name can then be used in the remaining sections of the document.

- Range Figures included in the Threatened and Endangered Species Desktop Assessment illustrating aquatic species habitat ranges, include the tributaries and streams names on the maps.

- On page 6, Table 1-1 of the Threatened and Endangered Species Desktop Assessment in Scientific names column change "*Villosa trabalis*" to "*Venustaconcha trabalis*", "*Quadrula cylindrica*" to "*Theliderma cylindrica*". Correct error for scientific name of Shiny Pigtoe to "*Fusconaia cor*" (Williams *et al.* 2017).

- On page 6, Table 1-1 of the Threatened and Endangered Species Desktop Assessment all of the species listed in this table are now State Protected, see Alabama Regulations relating to game, fish and furbearing animals. 2019-2020. Alabama Department of Conservation and Natural Resources, with the exception of the plant species listed, Little Amphianthus, White Fringeless Orchid, Price's Potato-bean and Morefield's Leather Flower.

- On page 6, Table 1-1 of the Threatened and Endangered Species Desktop Assessment change column heading "Occurrence" column to "Recent Documented Occurrence in Harris Project Boundary". Within the

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document "Recent" should be defined, for example, "In this report any documented occurrence within the past 25 years will be classified as a Recent Documented Occurrence".

- On page 6, Table 1-1 of the Threatened and Endangered Species Desktop Assessment, Williams *et al.* (2008) is cited but this resource is not utilized anywhere else in the document. Recommend including the most up to date resources in the following species descriptions.

- On Page 9, 3.2 Palezone Shiner section of the Threatened and Endangered Species Desktop Assessment if an updated survey is proposed for this species suggest including and discussing or note that it will be included in an additional Phase 2 study report.

- On page 10, 3.4 Finelined Pocketbook section of the Threatened and Endangered Species Desktop Assessment, include "primarily" in the statement, "this mussel lives in large to small streams in habitats "primarily" above the fall line." See Williams *et al.* 2008 distribution map and distribution descriptions.

- On page 10, 3.4 Finelined Pocketbook section of the Threatened and Endangered Species Desktop Assessment, include, if any, the last mussel survey completed in the Tallapoosa Harris Tailrace and tributaries. Include a statement indicating if a mollusk tailrace study has been considered in the study plan development process and why it was not deemed necessary for this species.

- On page 10, 3.4 Finelined Pocketbook section of the Threatened and Endangered Species Desktop Assessment, a statement should be included notifying that ADCNR and USFWS are currently reintroducing the Finelined Pocketbook into suitable historical habitats within the state (USFWS 2019).

- On page 10, 3.4 Finelined Pocketbook section of the Threatened and Endangered Species Desktop Assessment, the reasons for decline could be updated and improved by summarizing statements from USFWS (2019), Nine Mobile River Basin mussels (Finelined Pocketbook (*Hamiota (=Lampsilis) altilis*), Orangenacre Mucket (*Hamiota (=Lampsilis) perovalis*), Alabama Moccasinshell, (*Medionidus acutissimus*), Coosa Moccasinshell (*Medionidus parvulus*), Southern Clubshell (*Pleurobema decisum*), Dark Pigtoe *(Pleurobema furvum*), Southern Pigtoe (*Pleurobema georgianum*), Ovate Clubshell (*Pleurobema perovatum*), Triangular Kidneyshell (*Ptychobranchus greenii*)) 5-year review. This review states that suitable habitats and water quality, free of excessive sedimentation and other pollutants, are required for Finelined Pocketbook. The primary cause of curtailment of range and fragmentation of habitat for these mussel species has been contributed to the historic construction of dams and impoundment of large reaches of major river channels (Federal Register 58 FR 14330). Although most of these actions took place in the past, the impacted conditions and habitat continue to affect the species. In recent years, some improvements have been made to improve riverine conditions. For example, flow improvements have been made below Weiss Dam on the Coosa River that benefit existing populations of Southern Clubshell. Watershed-specific threats continue to negatively impact the species. These threats include: 1) coal mining activities 2) oil and gas exploration 3) water withdrawal 4) hypolimnetic discharges 5) poor water quality due to insufficient releases from dams 6) instream aggregate mining 7) navigation channel maintenance activities (8) agricultural practices that degrade water quality by increasing nutrients, herbicide/surfactant compounds, and hormones in surface waters; (9) hydropeaking dams that alter downstream flow conditions, water temperatures, and dissolved oxygen (10) increasing urban development that degrades water quality and stream geomorphology; and (11) climate change, which is expected to result in more frequent and extreme dry and wet years in the Southeast over the next century.

- On page 10, 3.4 Finelined Pocketbook section of the Threatened and Endangered Species Desktop Assessment, change statement "No populations were identified within the Project Boundary at Lake Harris, but future surveys have been proposed by Alabama Power." to "To date, no populations were identified within the Project Boundary at Lake Harris, but surveys focused on the 3.75 mile stretch of the Tallapoosa River where critical habitat is known to occur from the County 36 bridge to a shoal below the Highway 431 bridge are currently being conducted by Alabama Power and USFWS."

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- On page 11, 3.5 Alabama Lampmussel section of the Threatened and Endangered Species Desktop Assessment, a statement should be included notifying that ADCNR and USFWS is currently reintroducing the Alabama Lampmussel into suitable historical habitats within the state (USFWS 2012).

- On page 11, 3.5 Alabama Lampmussel section of the Threatened and Endangered Species Desktop Assessment, reasons for imperilment should be updated and improved summarizing statements from USFWS released a Five-Year Review for the species (USFWS 2012).

- On page 11, 3.5 Alabama Lampmussel section of the Threatened and Endangered Species Desktop Assessment, include that in laboratory trials Alabama Lampmussel glochidia have been found to utilize Rock Bass (*Ambloplites rupestris*), Green Sunfish (*Lepomis cyanellus*), Bluegill (*Lepomis macrochirus*), Smallmouth Bass (*Micropterus dolomieu*), Spotted Bass (*Micropterus punctulatus*), Largemouth Bass (*Micropterus salmoides*), and Redeye Bass (*Micropterus coosae*) as host fish and that Banded Sculpin (Cottus carolinae) appear to be marginal hosts (Williams et. Al. 2008).

- On page 12, 3.6 Cumberland Bean section of the Threatened and Endangered Species Desktop Assessment, a statement should be included notifying that ADCNR and USFWS is currently reintroducing the Cumberland Bean into suitable historical habitats within the state (USFWS 2020).

- On page 12, 3.6 Cumberland Bean section of the Threatened and Endangered Species Desktop Assessment, reasons for imperilment should be updated and improved summarizing statements from USFWS released a Five-Year Review for the species (USFWS 2020).

- On page 12, 3.7 Fine-Rayed Pigtoe section of the Threatened and Endangered Species Desktop Assessment, reasons for species decline should be updated and improved summarizing statements from USFWS released a Five-Year Review for the species (USFWS 2013b).

- On page 13, 3.8 Pale Lilliput section of the Threatened and Endangered Species Desktop Assessment, a statement should be included notifying that ADCNR and USFWS is currently reintroducing the Pale Lilliput Mussel into suitable historical habitats within the state (USFWS 2011).

- On page 13, 3.8 Pale Lilliput section of the Threatened and Endangered Species Desktop Assessment, reasons for imperilment should be updated and improved summarizing statements from USFWS released a Five-Year Review for the species (USFWS 2011).

- On page 13, 3.8 Pale Lilliput section of the Threatened and Endangered Species Desktop Assessment, include, in laboratory trials by ADCNR, Pale Lilliput glochidia have been found to utilize Northern Studfish (*Fundulus catenatus*), Blackspotted Topminnow (*Fundulus olivaceus*) and Blackstripe Topminnow (*Fundulus notatus*) as primary hosts. (Fobian *et al.* 2015)

- On page 13, 3.9 Rabbitsfoot section of the Threatened and Endangered Species Desktop Assessment, a statement should be included notifying that ADCNR and USFWS is currently reintroducing the Rabbitsfoot into suitable historical habitats statewide.

- On page 13, 3.9 Rabbitsfoot section of the Threatened and Endangered Species Desktop Assessment, include, suitable fish hosts for Rabbitsfoot populations west of the Mississippi River include Blacktail Shiner (*Cyprinella venusta*) from the Black and Little rivers and Cardinal Shiner (*Luxilus cardinalis*), Red Shiner (*Cyprinella lutrensis*), Spotfin Shiner (*Cyprinella spiloptera*), and Bluntface Shiner (*Cyprinella camura*) from the Spring River, but host suitability information is lacking for most of the eastern range (Fobian 2007). A host study by ADCNR in 2011, found Scarlet Shiner (*Lythrurus fasciolari*), Whitetail Shiner (*Cyprinella galactura*) and Striped Shiner (*Luxilus chrysocephalus*) to be sympatric hosts with Rabbitsfoot from Paint Rock River, AL. Marginal minnow hosts from studies have included Central Stoneroller (*Campostoma anomalum*), Emerald Shiner (*Notropis atherinoides*), Rosyface Shiner (*Notropis rubellus*), Bullhead Minnow (*Pimephales vigilax*) and Rainbow Darter (*Etheostoma caeruleum*), but not in all stream populations tested (Fobian 2007, Watters *et al.* 2005).

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- On page 14, 3.10 Snuffbox section of the Threatened and Endangered Species Desktop Assessment, update and include that in 2019, USFWS released a Five-Year Review for the species (USFWS 2019b). Reasons for imperilment could be added and improved summarizing statements from this document as well.

- On page 15, 3.11 Shiny Pigtoe Mussel section of the Threatened and Endangered Species Desktop Assessment, reasons for imperilment should be updated and improved summarizing statements from USFWS released a Five-Year Review for the species (USFWS 2013c).

- On page 16, 3.12 Southern Pigtoe section of the Threatened and Endangered Species Desktop Assessment, change "finelined pocketbook mussel" to "Southern Pigtoe".

- On page 16, 3.12 Southern Pigtoe section of the Threatened and Endangered Species Desktop Assessment, the reasons for decline could be updated and improved by summarizing statements from USFWS (2019), Nine Mobile River Basin mussels (Finelined Pocketbook (*Hamiota (=Lampsilis) altilis*), Orangenacre Mucket (*Hamiota (=Lampsilis) perovalis*), Alabama Moccasinshell, (*Medionidus acutissimus*), Coosa Moccasinshell (*Medionidus parvulus*), Southern Clubshell (*Pleurobema decisum*), Dark Pigtoe *(Pleurobema furvum*), Southern Pigtoe (*Pleurobema georgianum*), Ovate Clubshell (*Pleurobema perovatum*), Triangular Kidneyshell (*Ptychobranchus greenii*)) 5-year review. This review states that suitable habitats and water quality, free of excessive sedimentation and other pollutants, are required for Southern Pigtoe. The primary cause of curtailment of range and fragmentation of habitat for mussel species has been contributed to the historic construction of dams and impoundment of large reaches of major river channels (Federal Register 58 FR 14330). Although most of these actions took place in the past, the impacted conditions and habitat continue to affect the species. In recent years, some improvements have been made to improve riverine conditions. For example, flow improvements have been made below Weiss Dam on the Coosa River that benefit existing populations of Southern Clubshell. Watershed-specific threats continue to negatively impact the species. These threats include: 1) coal mining activities 2) oil and gas exploration 3) water withdrawal 4) hypolimnetic discharges 5) poor water quality due to insufficient releases from dams 6) instream aggregate mining 7) navigation channel maintenance activities (8) agricultural practices that degrade water quality by increasing nutrients, herbicide/surfactant compounds, and hormones in surface waters; (9) hydropeaking dams that alter downstream flow conditions, water temperatures, and dissolved oxygen (10) increasing urban development that degrades water quality and stream geomorphology; and (11) climate change, which is expected to result in more frequent and extreme dry and wet years in the Southeast over the next century.

- On page 17, 3.13 Slabside Pearlymussel section of the Threatened and Endangered Species Desktop Assessment, include that in 2013, USFWS designated critical habitat for the species (Federal Register 78:59555-59620). A statement similar to the Rabbitsfoot section could be included for consistency.

- On page 25, Discussion and Conclusions: section of the Threatened and Endangered Species Desktop Assessment, include a caveat statement or footnote reiterating that this is a desktop assessment and that to be certain of species occurrence, surveys should be conducted by qualified biologists to determine if a sensitive species occurs within a project area. Species not listed for a specific area does not imply that they do not occur there, only that their occurrence there is as yet unrecorded by state or federal agencies. This assessment is currently under review and reflects only our current understanding of species distributions.

- On page 25, Discussion and Conclusions: section of the Threatened and Endangered Species Desktop Assessment, change "…extant populations of 20 federal and state protected T&E species (Appendix B)." to "….extant populations of 20 federally T&E species of which 16 are state protected (Appendix B)."

- Appendix B Species Habitat Range Maps of the Threatened and Endangered Species Desktop Assessment, all figures with "extant population" shown. change to "Recent Documented Occurrence". In addition, make sure "Current Range" and "Documented Historic Range" terminology is defined in the assessment. As is, all Figure Titles in Appendix B should have "Current" inserted before Habitat Range and after the Species name.

- Figure 3.12-1 Appendix B of the Threatened and Endangered Species Desktop Assessment, Southern Pigtoe does not occur in the Tennessee River system. It does not have critical habitat in the Paint Rock River system. This map appears to be inaccurate and should be deleted.

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- Figure 3.13-1 Appendix B of the Threatened and Endangered Species Desktop Assessment, The Paint Rock River has designated critical habitat for this species. See Federal Register 78:59555-59620 for critical habitat details that should be included.

Cultural Resources Programmatic Agreement and Historic Properties, Management Plan Study

- ADCNR has no comments or recommendations at this time.

Area of Potential Effects (APE)

- ADCNR has no comments or recommendations at this time.

Harris Relicensing Initial Study Report Meeting April 28, 2020

- Recreational Evaluation Study discussion. Recreation use data was collected at recreational facilities from March to December 2019, however questionnaires were only filled out from May to December 2019. The Questionnaires missed an active time for anglers. ADCNR is concerned that recreational anglers may not be adequately represented in this data. ADCNR would like to make sure that anglers are adequately represented in the survey since it asks specific questions about specific facilities.

- Downstream Release Alternatives Study discussion. A fourth alternative is proposed in the study plan. It was to be a Modified Green Plan. Aquatic Resources Study is required to evaluate and design the alternative to be studied as stated in the footnotes.

- Erosion and Sedimentation Study discussion. ADCNR recommends including the APC response statement "Most of the erosion issues downstream are not due exclusively to operations. For example, areas where trees and vegetation are being cleared are not due exclusively to operations, but water fluctuations could exacerbate erosion." into the discussion section of the study.

- Threatened and Endangered Species Desktop Assessment discussion. APC stated that "No listed species have been documented in the Tallapoosa River below the Harris Dam." Should be changed to "No listed species have recently been documented in the Tallapoosa River between Harris Dam and Lake Martin." The Documented Historic Range for Finelined Pocketbook includes the Tallapoosa River.

Thank you for the opportunity to comment on the R.L. Harris Hydroelectric Project relicensing filed Harris Project Initial Study Report (ISR). We look forward to continuing our cooperative efforts with the Federal Energy Regulatory Commission, Alabama Power, and other stakeholders during this process.

If you have any questions regarding these comments, please contact me at (334-353-7484) or Todd.Fobian@dcnr.alabama.gov.

Sincerely,

Todd Fobian

Environmental Affairs Supervisor

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Chuck Denman
1810 Oak Grove Road
Titusville Florida
32796

Regarding:Alabama Power Company relicensing for the Harris Hydroelectric Project (FERC No. 2628-065).

Harris Dam additional studies suggested

A general review of historical materials ie newspapers, and other records dealing with the proposals for constructing the Dam. Including comments and conditions provided in initial permitting. With the goal being to determine if the dam has achieved the original benefits expected. Perhaps a score card.

A pre vs post Dam analysis of down stream impacts. Including flooding,erosion and habitat changes to flora and fauna.

1. Flooding :storm runoff model comparing 25,50 and 100 year 24 hour storm events.
2. Erosion : utilizing available remote sensing materials to compare river channel and islands size and shape today and pre dam.
3. Plants: utilize remote sensing materials to map flag grass and invasive plant communities to compare changes from pre Dam.
4. Fisheries: review available materials from locals in the community, fish and game and other resources to determine what effect the Dam has had on down stream fish types and numbers.

June 11,2020

Dear Secretary Bose,

HAT 1.

PROPOSED MODIFICATION TO OPERATING CURVE AND DOWNSTREAM FLOW STUDIES

18 CFR 5.15
For studies using 100 year climate data to model outcomes,

(d) I propose additional modelling based on predictive data from the studies of climate change. It is my understanding Federal Dams do additional modelling to take effects of climate change into account when undergoing licensing. This would include climate change considerations of Operating Curve Rules among others.

This idea was previously presented to FERC in 2019 comments by Maria Clark from the EPA.

Given the long life of the permit, the measurable manifestations of climate change and the Southern Company's goal to shift power generation away from fossil fuels, it seems prudent to take advantage of modelling in preparation to be best able to deal with unexpected situations such as greater reliance on hydro power by APC.

1. To my knowledge climate alternative data has not been modelled
2. Modelling is a very cost effective way to prepare for future events.

P-2628 HAT 2 Comments

Submitted separately are landowner forms reproduced from the study report and completed by landowning downstream stakeholders.They are reporting on erosion at their property sites. They represent lay attempts to recognize and monitor riverfront erosion. Whether or not each geo-located individual completed and submitted a form, each has taken their time to attend at least one meeting to express their grievance with downstream management over the life of the dam.

Also submitted is a screen shot of pinned landowner locations. Additionally, submitted is a page from the Trutta report locating erosion sites. There are correlations with landowner reported erosion and the study map. The Trutta float-the-river erosion survey is baseline information. It is a current day 'snapshot'. It may provide useful data for prospective study. Not being conversant in reading sonar / lidar data, I seek reassurance that riverbank video taken when the river channel is full does not dampen / downplay the classification of erosion sites.
The river's edges evaluated - as landowners experience it - when the water is low may expose more severe erosion than shown on the Trutta video.

Notable is the omission from the report of log/lat data for the sites identified in Figure 3-1 and Table 3-2. (Long/lat data was provided in Table 2-1 Summary of Lake Harris Erosion & Sedimentation)

#1 Request for long/data data for Figure 3-1 and Table 3-2 of the Trutta Report and Request greater resolution image of Figure 3-1

Of major concern to all Harris Project Stakeholders is the Erosion Issue. Foundational to taking steps going forward is looking back to what has been. The University of Alabama maintains an aerial photographic library including images of the Harris Project area beginning in 1942. In existence are digitized prints for 1942, 1950, 1954, 1964, 1973. These are housed at www.alabamamaps.ua.edu. Attached is a mosaic of a portion of the project area as it appeared in 1942. The full sized map is rendered and georeferenced.

#2 Proposed: A New Study of the downstream river using historic images overlaid onto current imagery

18 CFR 5.15 (e)

1. Erosion is a significant and persistent concern. Erosion is problematic for landowners and flora & fauna in and around the river.
2. To my knowledge, this type of GIS comparison using historic data to impact effects of release effects downriver have not been done.
3. At the initial licensing there was no post dam data to compare to compare to the historic data.
4. This is a simple and inexpensive study, using readily available data

18 CFR 5.0(b)

1. The study should look at and provide change analysis for:

a. Analysis of the river bank contour along its length through time. Free flowing rivers are elastic, moving silt and sedimentation from side to side and down its length. A river serving as a channel should show deviations from historic patterns.

b. Any changes in river bank elevation

c. Provide image overlays of historic data onto current imagery with the intent to discover what the data show about the effects of a dam on the downstream river and can be a tool to evaluate effect of future changes made to flow patterns.

d. Begin construction of a detailed GIS map with information relating fish populations, (and a whole host of other parameters) in 3D. That is, not only presence/absence of species along the river length, but presence (where data are available) of species during different decades in time. There are numerous possibilities.

e. APC can gather additional, (say scaled to 1:6000 or the highest resolution feasible) imagery to overlay on the historic public images available at 1:20000. This would provide a baseline for future studies. At our fingertips are 80 years of data.

2. This GIS modeling tool can also be applied to provide opportunity for interagency contribution towards building the most accurate picture of aquatic and other life of the Tallapoosa.

3. Creating the realization of and expounding upon the treasures of the Tallapoosa River is something all parties (APC and stakeholders above/below the dam) can rightly be proud of.

P-2628 HAT5 Comments

#1 Re: NOTIFICATION TO DOWNSTREAM USERS OF WATER RELEASE FROM HARRIS DAM

Downstream rivers users 'don't know what they can't know', They cannot know the mind of market forces determining when the turbines will run. APC and the dam managers have an obligation and responsibility, not to make the river safe for downstream users, but to provide users with accurate, timely and transparent information so users can make informed decisions regarding their own safety. APC must develop an effective way to 'push' dam operation realtime change notifications to those who opt in. Increased river usage as described by riverside landowners, reinforces the need-to-know for downstream users, especially those not already familiar with river level irregularities.

It appears FERC in Atlanta has approved the status quo notification system currently used by APC. The current system provides outdated and insufficient information for downstream users.

Accession Number:	20200317-3033
Description:	Letter order to Alabama Power Company accepting the automated downstream notification system for the Tallapoosa River Projects et al under P-349 et al.

If this issue is not part of the HAT 5 relicensing process, we need to know. When is the proper time to address this recreation / safety issue? Please have APC advise us of the process we need to pursue regarding revamping and modernizing the notification of release operations. This is an important issue, impacting below dam river use at each of APC dam projects.

And…... if this has been addressed and I missed it, I apologize.

PS a copy of the FERC Atlanta office correspondence with APC is sent as a separate PDF.

#2 RE: IMPROVED BELOW THE DAM RIVER ACCESS

As I understand it, part of the initial rational for the APC dam system included a 'give back to the public' component. This is easily realized on the impoundments created by dam construction.

Requiring more effort and thought are ways APC 'gives back' to below-dam river users. The below-the-dam efforts to provide access / ramps are as inherent in the mandate as are the creation of put-ins on the impoundment. To date, I have not seen any APC ideas or proposals put forth regarding downstream access. This is a real public/private partnership opportunity. forIf this is not a relicensing issue, please advise so we can pursue the proper channels. Again, I apologize in advance if I have missed APC correspondence.

Sincerely,

Donna Matthews
Box 1054
105 Woodland Ave E
Wedowee, AL 3278

June 4th HAT 1 and 5 meeting summary

APC Harris Relicensing <g2apchr@southernco.com>

Thu 6/18/2020 10:51 PM

To: 'harrisrelicensing@southernco.com' <harrisrelicensing@southernco.com>
Bcc: damon.abernethy@dcnr.alabama.gov <damon.abernethy@dcnr.alabama.gov>; nathan.aycock@dcnr.alabama.gov <nathan.aycock@dcnr.alabama.gov>; steve.bryant@dcnr.alabama.gov <steve.bryant@dcnr.alabama.gov>; todd.fobian@dcnr.alabama.gov <todd.fobian@dcnr.alabama.gov>; chris.greene@dcnr.alabama.gov <chris.greene@dcnr.alabama.gov>; keith.henderson@dcnr.alabama.gov <keith.henderson@dcnr.alabama.gov>; mike.holley@dcnr.alabama.gov <mike.holley@dcnr.alabama.gov>; evan.lawrence@dcnr.alabama.gov <evan.lawrence@dcnr.alabama.gov>; matthew.marshall@dcnr.alabama.gov <matthew.marshall@dcnr.alabama.gov>; brian.atkins@adeca.alabama.gov <brian.atkins@adeca.alabama.gov>; tom.littlepage@adeca.alabama.gov <tom.littlepage@adeca.alabama.gov>; jhaslbauer@adem.alabama.gov <jhaslbauer@adem.alabama.gov>; cljohnson@adem.alabama.gov <cljohnson@adem.alabama.gov>; mlen@adem.alabama.gov <mlen@adem.alabama.gov>; fal@adem.alabama.gov <fal@adem.alabama.gov>; djmoore@adem.alabama.gov <djmoore@adem.alabama.gov>; arsegars@southernco.com <arsegars@southernco.com>; dkanders@southernco.com <dkanders@southernco.com>; wtanders@southernco.com <wtanders@southernco.com>; jefbaker@southernco.com <jefbaker@southernco.com>

1 attachments (3 MB)

2020-06-04 HAT 1 and 5 Meeting Notes and Presentation.pdf;

HATs 1 and 5,

Attached is a summary, along with the presentation, from our meeting on June 4th. This summary is also on our website: www.harrisrelicensing.com.

Thanks,

Angie Anderegg
Hydro Services
(205)257-2251
arsegars@southernco.com

Harris Action Teams 1 & 5 Meeting Summary
June 4, 2020
9:00 am to 11:00 am
Conference Call

Participants:
See Attachment A

Action Items:

- Alabama Power determine what historic LiDAR data are available and provide the information to FERC via email.
- Kevin Nebiolo will revise figures so that inundated and non-inundated structures will be differentiated on the figures and these figures will also include the winter pool level (i.e., 1 ft, 2 ft, etc.).

Meeting Summary:
Angie Anderegg (Alabama Power Company (Alabama Power)) opened the meeting by introducing everyone and stated the purpose of the meeting: 1) to present the methodology for analyzing the number of usable recreation structures on Lake Harris at the current winter operating curve and the winter operating curve alternatives; and 2) to present the methodology for analyzing how structures located downstream of Harris Dam might be affected by a change in the winter operating curve during a 100-year flood event.

Colin Dinken (Kleinschmidt Associates (Kleinschmidt)) presented the methods for analyzing recreation structure (i.e., boat dock, pier, etc.) usability at current winter pool and the proposed operating curve change alternatives. Light detection and ranging (LiDAR) was used to gather elevation data around the reservoir. The elevation data will be used to measure the depth of water at each recreation structure at each of the proposed winter operating curve elevations. Field observations will occur during full pool (summer 2020) to verify a subset of structures on Lake Harris, namely those that are not visible on the aerial imagery used for this analysis.

Barry Morris (Lake Wedowee Property Owners Association) asked if the usability of sloughs at the winter operating curve change alternatives was being assessed or was this analysis only for structures. Colin said he was not looking into the usability of the sloughs and Angie emphasized that slough usability at the winter operating curve alternatives is not in the overall study plan.

Keith Henderson (Alabama Department of Conservation of Natural Resources (ADCNR)) stated that ADCNR was not involved in the construction of all public ramps on the Harris reservoir, so it cannot be assumed that every ramp has a 15 percent grade at the bottom. Colin noted he can generate a slope analysis on any ramp to determine the grade.

Sarah Salazar (Federal Energy Regulatory Commission (FERC)) asked what the collection year is for the LiDAR data used for this analysis and if there was historical LiDAR data for comparison. Jason Moak (Kleinschmidt) said the LiDAR data was from 2015 and that it covers all of the surrounding banks of the Harris reservoir but nothing beneath the water’s surface. Sarah asked if there was historical LiDAR to be used for sedimentation analysis. Angie said

Alabama Power will determine what historic LiDAR data are available and provide the year information to FERC and stakeholders.

Albert Eiland (Downstream Property Owner) expressed concern that raising the winter operating curve would result in additional water released downstream and subsequent flooding. He noted that for every foot the lake is raised it would increase inundation of downstream property. Colin explained that Kevin Nebiolo (Kleinschmidt) would present the proposed methods for analyzing how an increase in the winter operating curve would affect downstream structures.

James Hathorn (United States Army Corps of Engineers (USACE)) asked if there would be an analysis on the percent of time structures are useable. Kelly Schaeffer (Kleinschmidt) stated this study is determining structure usability during winter pool.

Kevin presented the methods to evaluate how an increase in the winter operating curve could affect downstream structure inundation.

David Bishop (Downstream River User) asked if this analysis was related to the lake or just downstream. Angie replied that this methodology focuses on the structures downstream of Harris Dam. David asked about the accuracy of the generation schedule. Angie noted that this issue has been brought to Alabama Power's attention and they are looking into the best way to address it.

Sarah asked if different types of structures will be differentiated in this analysis. Kevin said this analysis is for any type of structure, habitable or not. Land use data could potentially be differentiated. Sarah said that some landowners have expressed concern about structures such as stairways. Kevin explained the LiDAR provides four points per square meter, which is accurate enough to detect a shed but not necessarily stairs.

James asked if this downstream structure analysis would extend downstream of Martin. Kevin replied that it is extending to Jaybird Landing, the uppermost hydraulic point for Lake Martin.

Sarah asked if there would be maps showing the location of inundated structures for both the lake and downstream. Angie said Alabama Power is only evaluating impacts downstream for a change in the winter pool; therefore, the impact is limited to inundation during a flood event where Alabama Power would be operating under flood control procedures. Kelly stated that for the Operating Curve Change Feasibility Analysis study, Alabama Power is modeling the 100-year design flood to analyze the effect of that flow on downstream structures IF the Harris reservoir is operating one to four feet higher than existing conditions. Sarah commented that hopefully there will be some additional suggested downstream releases to review. The Downstream Release Alternatives study is separate from the Operating Curve Change Feasibility Study, and those downstream release alternatives in that study are not affected by the 100-year flood. Mike Hross (Kleinschmidt) stated that the range of minimum flows in the Downstream Release Alternatives study would likely have a negligible effect on inundation downstream compared to the flood flow. The HEC-ResSim model could evaluate normal and flood control operations at Harris Dam with other minimum flow alternatives to determine any downstream effects on structures.

James asked if any other high flow events (i.e., 10, 15, 25, 50-year flood events) other than the 100-year flood would be analyzed. Angie explained that the 100-year flood event scenario is used by the Federal Emergency Management Agency (FEMA) and Alabama Power will be using that flood event scenario to make decisions regarding changes in Harris Project operations. If FERC requires additional high flow events for their analysis, Alabama Power will model those additional high flow events. Sarah stated if the USACE or other stakeholders have a high flow event scenario they want Alabama Power to analyze, this request should be filed with comments on the Initial Study Report (ISR) by June 11, 2020. Kelly stated that any requests for additional analysis and/or additional studies need to follow FERC regulations. Sarah agreed and said that if anyone wants to request additional studies or request additional analyses that were not incorporated into the April 12, 2019 FERC-approved study plan, stakeholders should follow 18 CFR §5.15.

Martha Hunter (Alabama Rivers Alliance (ARA)) asked if the 100-year flood was happening more often. Kenneth Odom (Alabama Power) said the 100-year storm is a design storm based on an actual event that was scaled to reflect a 100-year event. Stacey Graham (Alabama Power) noted that the 2003 flood event was closest to a 100-year event during the 60 years of data in the flood frequency analysis. Stacey explained that there was enough data from both dry and wet years in the flood frequency analysis to be confident in the 100-year design flood. James stated the USACE will likely submit comments to analyze other high flow scenarios but may have to wait until an operating curve change is selected. Monte Terhaar (FERC) noted that now is the time to state and evaluate any other modeling scenarios.

Sarah asked about the induced surcharge function and storage areas and if these areas are where erosion is occurring. Mike said the location of storage areas (backwater areas and tributaries) will be defined in the Final Operating Curve Change Feasibility Analysis study report and it is possible to overlay those areas with areas that are of concern with regard to erosion.
Charles Denman (Downstream Property Owner) asked about the duration of the 100-year storm event and whether a map showing the contours, flooded land, and structures would be developed. Stacey noted that both the beginning and the end of an event were captured and Mike explained there was no actual hydrologic simulation, just flow analysis. Kenneth stated Alabama Power uses the duration of the actual storm event rather than a set duration. Angie stated that this information is further described in the Phase 1 Draft Operating Curve Change Feasibility Analysis Report. Kevin noted that during this Phase 2 analysis, Alabama Power will provide maps showing the contours and inundated structures.

Jack West (ARA) asked about the primary benefits of raising the winter operating curve. Angie explained that the primary reason for assessing the winter operating curve change is the potential for increased recreation opportunities during the winter. An operating curve change was requested by stakeholders during 2017 discussions. Alabama Power is evaluating both beneficial and adverse effects of raising the winter operating curve in Phase 2 of this study.

Albert asked how raising the winter pool would affect areas downstream. Kenneth explained that using a 100-year design storm, a one to four-foot increase in winter pool would increase the water surface elevation downstream from the increased releases from Harris Dam. Kelly emphasized that Alabama Power is still gathering information and data from other relicensing studies and that they have not proposed any changes in Harris Project operations at this time.

Linda Allen (Downstream Property Owner) stated that most of the acreage her family owns is an island called Price Island (~19 acres) and asked if it would be evaluated. Angie and Sarah emphasized that the scope of the study is from Harris Dam downstream through Horseshoe Bend.

David asked if there are any studies detailing the difference between a 50-year flood and a 100-year flood. He also asked how similar downstream conditions are (in terms of elevation and inundation) to a 100-year flood when both generators are operating. There is no comparison since normal operations is far less than a 100-year flood event. Angie explained that Alabama Power is assessing modifications to current Harris Project operations, not pre-dam conditions. David asked if Alabama Power was prepared for a 100-year flood event and asked how the project would operate. Angie noted that detailed information on how the project operates and the models used for these studies can be found on the project website (www.harrisrelicensing.com). One meeting that may be particularly helpful to review is the HAT 1 meeting from September 11, 2019. Kenneth added that a 100-year flood basically has a 1 percent chance of occurring in any given year and Alabama Power operates according to flood control guidelines developed and approved by the USACE. Monte stated that in most cases, FERC uses the 100-year flood scenario as their standard, but that does not exclude the analysis of other flood events. Kenneth concluded that Alabama Power works with the National Weather Service and USACE on Harris Project operations during flood events.

Donna Matthews (Downstream Property Owner) asked if basing the model on a 100-year flood potentially reduces the overall impact on downstream resources compared to effects from more frequent but lesser storm events. Kenneth said the 100-year flood analysis does not decrease the effect of smaller events and that smaller events have not been modeled.

Albert mentioned the gage at Wadley and a high flow event in early 2020. Angie stated that this particular question was addressed during the ISR meeting and a response provided in the ISR meeting summary.

Sarah commented that the maps shown in Kevin's presentation identify all structures using the same color regardless of whether they were within the inundation boundary and requested that the final analysis display inundated structures with a different color than non-inundated structures. Kevin said that inundated and non-inundated structures will be differentiated on the figures and these figures will also include the winter pool level (i.e., 1 ft, 2 ft, etc.).

David asked if FERC had ever denied a license for a project as large as Harris. Sarah was not familiar with any but encouraged David to send her an email so she could contact him with that information.

Sarah reviewed the relicensing schedule, reminding everyone the information gathering process is ongoing and Alabama Power's draft proposal for Harris Project operations will be presented in the Preliminary Licensing Proposal. Alabama Power will file their Final License Application in November 2021. The schedule is available in the November 16, 2018 Scoping Document 2. Sarah encouraged everyone to read that document and contact her with any questions.

Angie concluded that the meeting notes will be posted to harrisrelciensing.com and reiterated that comments on the ISR are due June 11, 2020 and should be filed with FERC.

ATTACHMENT A
HARRIS ACTION TEAMS 1 AND 5 MEETING ATTENDEES

Linda Allen – Downstream Property Owner
Angie Anderegg – Alabama Power Company (Alabama Power)
Dave Anderson – Alabama Power
Jeff Baker – Alabama Power
David Bishop – Downstream Property Owner
Allan Creamer – Federal Energy Regulatory Commission (FERC)
Charles Denman – Downstream Property Owner
Colin Dinken – Kleinschmidt Associates (Kleinschmidt)
Albert Eiland – Downstream Property Owner
Amanda Fleming – Kleinschmidt
Todd Fobian – Alabama Department of Conservation of Natural Resources (ADCNR)
Tina Freeman – Alabama Power
Chris Goodman – Alabama Power
Stacey Graham – Alabama Power
James Hathorn – United States Army Corps of Engineers (USACE)
Keith Henderson – ADCNR
Martha Hunter – Alabama Rivers Alliance (ARA)
Mike Hross – Kleinschmidt
Carol Knight – Downstream Property Owner
Fred Leslie – Alabama Department of Environmental Management (ADEM)
Matthew Marshall – ADCNR
Donna Matthews – Downstream Property Owner
Rachel McNamara – FERC
Tina Mills – Alabama Power
Jason Moak – Kleinschmidt
Barry Morris – Lake Wedowee Property Owners Association
Kevin Nebiolo – Kleinschmidt
Kenneth Odom – Alabama Power
Jennifer Rasberry – Alabama Power
Sarah Salazar – FERC
Kelly Schaeffer – Kleinschmidt
Chris Smith – ADCNR
Sheila Smith – Alabama Power
Thomas St. John – Alabama Power
Monte Terhaar – FERC
Jack West – ARA

R.L. Harris Dam Relicensing
FERC No. 2628

HAT 1 & 5 Meetings
June 4, 2020

HARRIS DAM RELICENSING

Operating Curve Change Feasibility Analysis

Phase II Lake Recreation Structure Usability at Winter Pool Alternatives

HARRIS DAM RELICENSING

Phone Etiquette

- ❑Be patient with any technology issues
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- ❑Follow along with PDF of presentations
- ❑Write down any questions you have for the designated question section
- ❑Clearly state name and organization when asking questions
- ❑Facilitator will ask for participant questions following each section of the presentation

HARRIS DAM RELICENSING

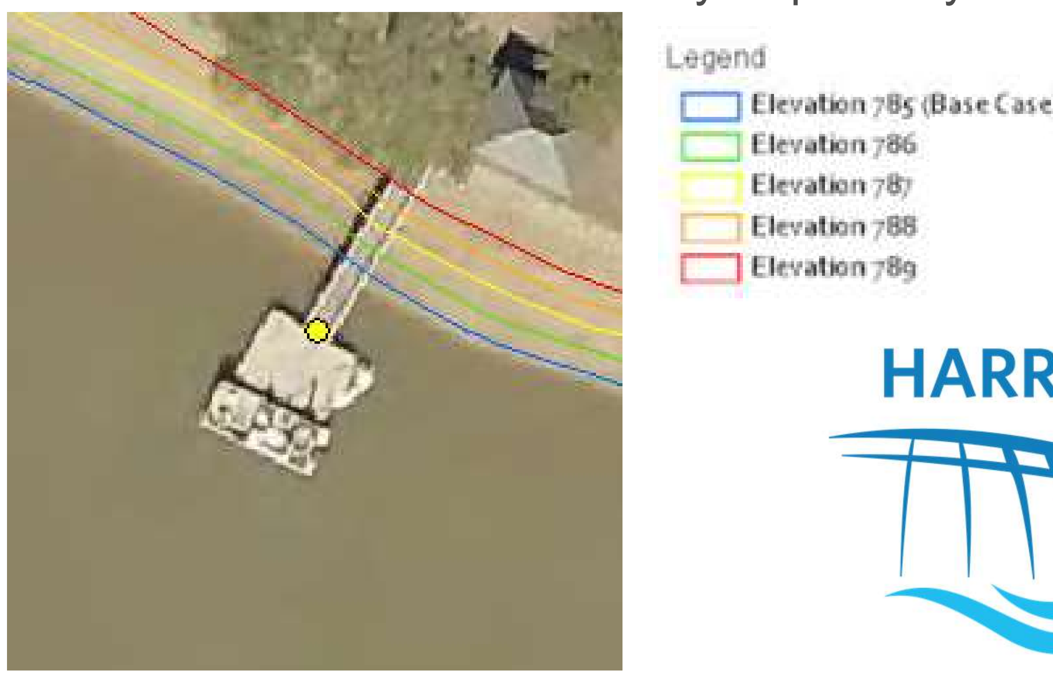
Recreation Structure Usability at Winter Pool Alternatives

Objectives Described in the Study Plan

- Evaluate "…the number of private docks usable during the current winter drawdown and the lowest possible elevation that public boat ramps can be used."
- Private docks defined as boathouses, floats, piers, wet slips, and boardwalks
- Will "…compare the number of access points (both private docks and public boat ramps) available at each 1-foot increment change…"

Methods

- LiDAR used to measure elevation (785, 786, 787, 788, 789 ft msl contours)
- Elevation data used to calculate depth at point
- Depth for points beyond the 785 ft msl contour will be estimated by slope analysis



Recreation Structure Usability at Winter Pool Alternatives

Boathouses

- Point moved to the back of each of these structures
- Structure considered usable with 2 ft of water at the back edge

Recreation Structure Usability at Winter Pool Alternatives

Floats

- Point moved to the back of each of these structures
- Structure considered usable with 2 ft of water at the back edge

Recreation Structure Usability at Winter Pool Alternatives

Piers

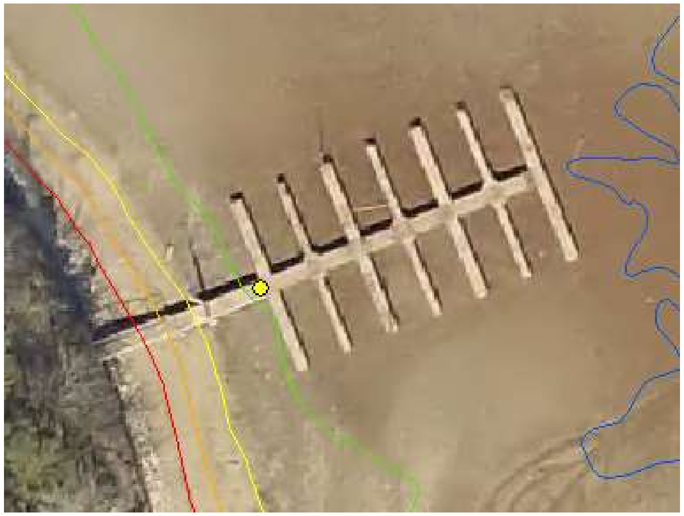
- Classified into 3 subcategories:
  - Platform (*bottom left*):
    - Piers with a square-shaped platform on the end
    - Point moved to back edge of the platform
    - Analyzed similarly to floats
  - Mooring (*bottom right*):
    - Straight piers > 30 ft
    - Point moved 30 ft back from front edge
  - Fishing (*right*):
    - Straight piers ≤ 30 ft
    - Point moved halfway back from the front edge
- Depth of 2 ft to be usable

HARRIS DAM RELICENSING

Recreation Structure Usability at Winter Pool Alternatives

Wet Slips

- Some oriented parallel to the bank (*bottom left*) and some perpendicular (*bottom right*)
- The back edge is always the outside edge facing the bank
- Wet slips with multiple slips (*right*) will be considered usable when all slips are usable
- Depth of 2 ft to be usable



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Recreation Structure Usability at Winter Pool Alternatives

Boardwalks
- Point moved to front of structure
- Objective is aesthetics
- Depth of 1 ft at point

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Recreation Structure Usability at Winter Pool Alternatives

Public Boat Ramps

- ADCNR typically uses the following criteria for public ramps at low pool:
  - 15% grade at bottom portion of ramp
  - Depth of 4.5 ft at the end of the ramp
  - Able to launch up to 26 ft boat at low pool

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Recreation Structure Usability at Winter Pool Alternatives

Public Boat Ramps

- Highway 48 Bridge:
  - Built using ADCNR standards
  - Usable at 785 ft msl

Recreation Structure Usability at Winter Pool Alternatives

Public Boat Ramps

- Lee's Bridge:
  - Bottom of ramp is ~785.5 ft msl
  - Use a slope analysis to determine the grade
  - Possibly usable ~790.0 ft msl

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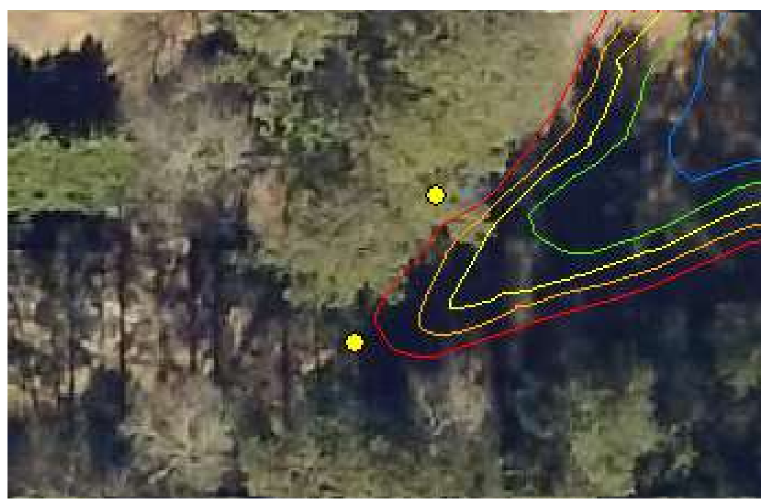
RECREATION STRUCTURE USABILITY AT WINTER POOL ALTERNATIVES

Field Observations

- No imagery (*left*):
  - Imagery predates structures
  - ~10.0% of structures
- Not visible (right):
  - Structure obscured by foliage or shadow
  - ~2.5% of structures



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Recreation Structure Usability at Winter Pool Alternatives

Presentation of Data: All Structures

The number and percentage of all usable structures at each winter pool alternative

Winter Pool Elevation (feet msl)	Number of Usable Structures	Percent Usable Structures
785		
786		
787		
788		
789		
>789		

HARRIS DAM RELICENSING

Recreation Structure Usability at Winter Pool Alternatives

Presentation of Data: By Structure

The number and percentage of usable structures by type at each winter pool alternative

Winter Pool Elevation (feet msl)	Number of Usable Structures	Percent Usable Structures
Boardwalks		
785		
786		
787		
788		
789		
>789		
Boathouses		
785		
786		
787		
788		
789		
>789		
Floats		
785		
786		
787		
788		
789		
>789		

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Questions?

HARRIS DAM
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Alabama Power

R.L. Harris Dam Relicensing
FERC No. 2628

HAT 1 Meeting
June 4, 2020

Operating Curve Change Feasibility Analysis

Phase II Downstream Structure Survey

HARRIS DAM
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- ❑Write down any questions you have for the designated question section
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Harris Downstream Structure Survey

- An operating curve change may affect areas downstream of Harris Dam
  - Effects are associated with flooding

- Phase 2 of the Operating Curve Change Feasibility Analysis will include:
  - Identifying affected structures
  - # of structures
  - Location
  - Depth & duration of inundation

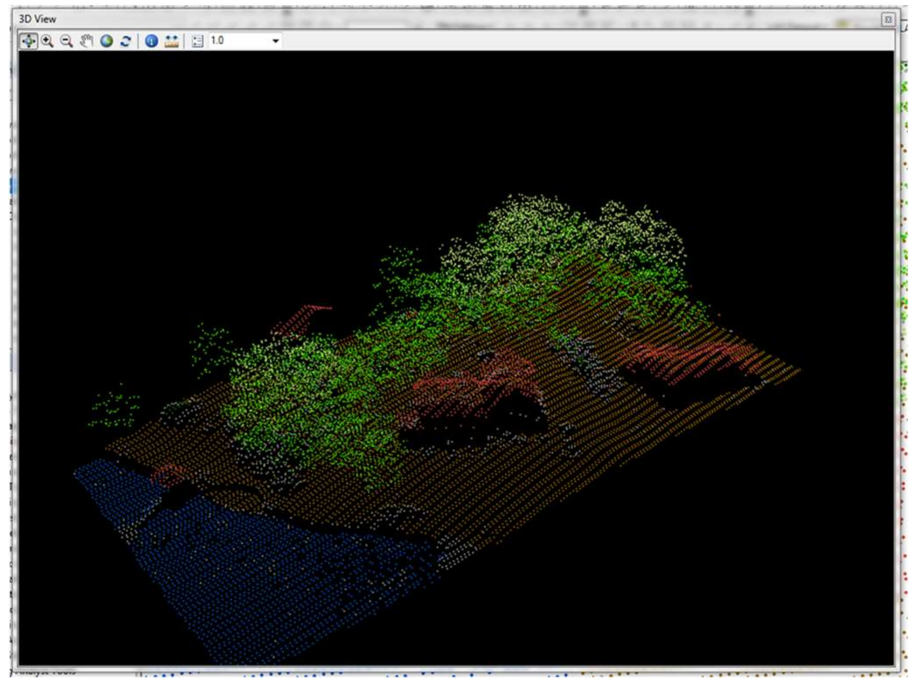
- Identifying structures is no small task

Methods: Remote Sensing

- LiDAR – 4 points per m^2

- 1 m USDA NAIP 4 band image (R, G, B, NiR)

- Classification Workflow:
  - Data management
  - Create training data
  - Classify image pixels
  - QAQC – Confusion Matrix



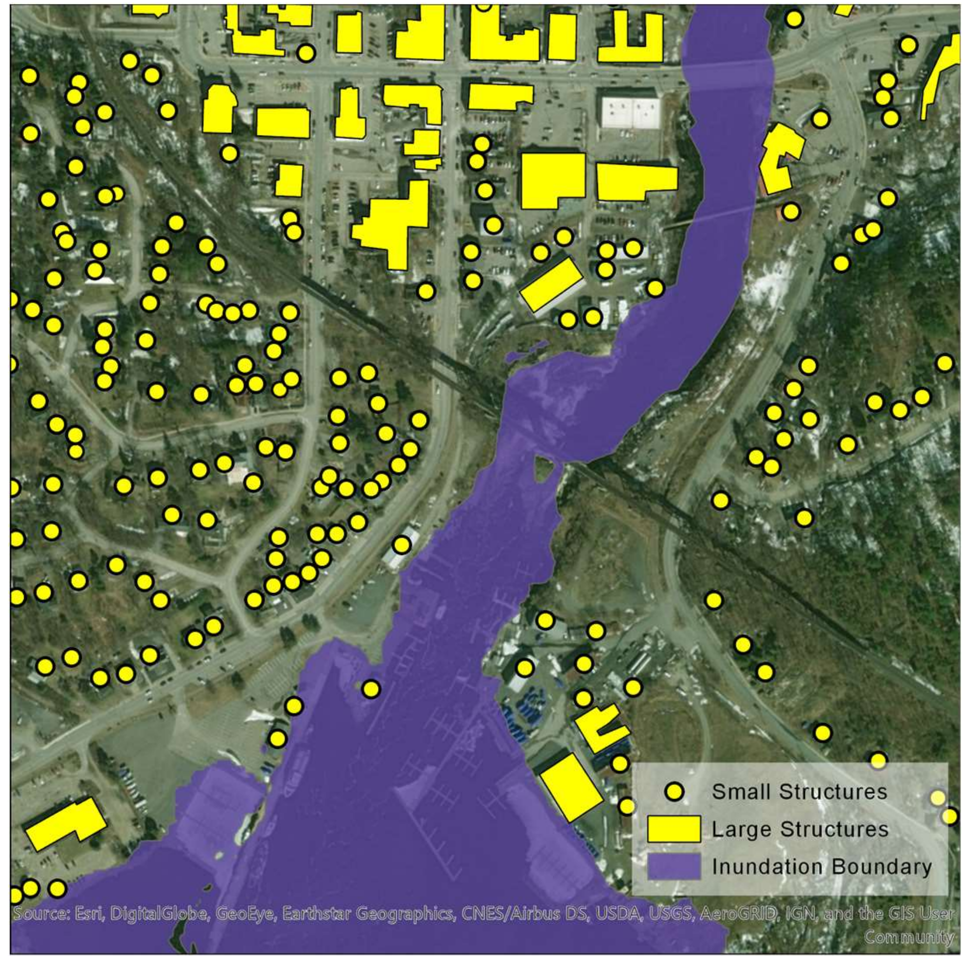
Methods: OBIA

- Object Based Image Analysis in ArcGIS Pro Image Analyst

1. Group pixels into objects - segmentation
2. Create training data
3. Classify Image
4. Assess quality with Confusion Matrix
5. Heads up digitizing
6. Spatial intersection & summarize

Anticipated Output

- Once identified – we will use a GIS to find structures impacted with a spatial intersection
- Series of maps showing location of all structures with symbols for flooded vs. not flooded
- Summary statistics in report
  - # of structures affected by rule curve
  - Min., Avg., Max. depth of inundation
  - Min., Avg., Max. duration of inundation
- Results will be in Phase II Report



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Alabama Power

600 North 18th Street
Hydro Services 16N-8180
Birmingham, AL 35203
205 257 2251 tel
arsegars@southernco.com

July 10, 2020

VIA ELECTRONIC FILING

Project No. 2628-065
R.L. Harris Hydroelectric Project
Response to Initial Study Report (ISR) Disputes or Requests for Modifications of Study Plan

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 April 10, 2020, Alabama Power filed the Initial Study Report (ISR) along with six Draft Study Reports and two cultural resources documents. Alabama Power held the ISR Meeting with stakeholders and FERC on April 28, 2020. On May 12, 2020, Alabama Power filed the ISR Meeting Summary. Comments on the ISR, draft reports, and ISR Meeting Summary were due on June 11, 2020.

On June 10, 2020, FERC staff provided comments on the ISR and the ISR Meeting Summary.[1] FERC requested that Alabama Power respond to specific comments by July 11, 2020. Attachment A of this filing includes Alabama Power's responses to those questions for which FERC requested a July 11 response.

Stakeholders and FERC provided three Additional Study Requests and two study modifications as part of comments on the ISR and ISR Meeting Summary. Two of the requested studies do not meet the criteria outlined in FERC's regulations at 18 C.F.R. § 5.9(b) and 5.15 and/or address pre-project conditions. Although, the other study request meets FERC's criteria, Alabama Power is not incorporating the study request into the relicensing process for the Harris Project. The complete response to these study requests is in Attachment B.

FERC staff, Alabama Rivers Alliance (ARA)[2], and the U.S. Environmental Protection Agency (EPA)[3] also requested the inclusion of additional downstream flow release alternatives as modifications to Alabama

[1] Accession No. 20200610-3059.

[2] Accession No. 20200611-5114.

[3] Accession Nos. 20200612-5025 and 20200612-5079.

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Power's existing Downstream Release Alternatives Study. Alabama Power's response to the recommended modifications is also provided in Attachment B.

Within preliminary comments on the Draft Water Quality Study Report as well as during the ISR Meeting and within comments on the ISR and ISR Meeting Summary, multiple stakeholders requested that Alabama Power continue monitoring water quality downstream of Harris Dam in 2020 and 2021. To collect dissolved oxygen and water temperature data in 2020, Alabama Power installed the continuous monitor on May 4, following the ISR meeting. The generation monitor was installed on June 1 to align with the monitoring season start date in the Water Quality Study Plan. Alabama Power also agrees to collect water quality data at both locations in 2021 (from March 1 – June 30, 2021 at the continuous monitor and June 1 – June 30, 2021 at the generation monitor) to include in the final license application.

The EPA recommended inclusion of water quality monitoring data with the Water Quality report. Alabama Power notes that the Draft Water Quality Study Report contains an appendix with the 2017 – 2019 water quality monitoring data, and the Final Water Quality Study Report will contain a similar appendix with the complete set of water quality monitoring data (including 2020). Any data collected in 2021 and after the Final Water Quality Study Report is provided will be included within the Final Licensing Proposal.

Alabama Power reviewed FERC and stakeholder comments on the ISR and Draft Study Reports and will address all other comments in any Final Study Reports (filed in 2020 and 2021), the Updated Study Report (USR) (due April 10, 2021), or the Preliminary Licensing Proposal (PLP) (due on or before July 3, 2021).

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

Attachment A: Alabama Power's Response to FERC's June 10, 2020 Staff Comments on the Initial Study Report and Initial Study Report Meeting Summary for the R.L. Harris Hydroelectric Project
Attachment B: Alabama Power's Response to Study Modifications and Additional Study Requests Following the May 12, 2020 Initial Study Report and Initial Study Report Meeting Summary for the R.L. Harris Hydroelectric Project

cc: Harris Stakeholder List

Attachment A

Alabama Power's Response to FERC's June 10, 2020 Staff Comments on the Initial Study Report and Initial Study Report Meeting Summary for the R.L. Harris Hydroelectric Project

FERC questions are presented in italic text and the specific information requested is highlighted in yellow; Alabama Power's response follows.

<u>Draft Downstream Release Alternatives (Phase 1) Study Report</u>

Question #2: During the ISR Meeting, Alabama Power requested that stakeholders provide downstream flow alternatives for evaluation in the models developed during Phase 1 of the Downstream Release Alternatives Study. Stakeholders expressed concerns about their ability to propose flow alternatives without having the draft reports for the Aquatic Resources and Downstream Aquatic Habitat Studies, which are scheduled to be available in July 2020 and June 2020, respectively. It is our understanding that during Phase 2 of this study, Alabama Power would run stakeholder-proposed flow alternatives that may be provided with ISR comments, as well as additional flow alternatives that stakeholders may propose after the results for the Aquatic Resources and Downstream Aquatic Habitat Studies are available. Please clarify your intent by July 11, 2020, as part of your response to stakeholder comments on the ISR.

<u>Alabama Power Response:</u>

Alabama Power's response to evaluating additional flow alternatives is discussed in Attachment B.

Regarding the Aquatic Resources and Downstream Aquatic Habitat Studies, it is Alabama Power's intent to provide stakeholders 30 days to review, provide comments, and recommend any additional flow analyses based on the information in the draft reports. It is also Alabama Power's intent to meet with the Harris Action Teams (HATs) between Fall 2020 and Spring 2021 to present preliminary results, including the bioenergetics modeling, and obtain stakeholder input on additional analyses.

Question #5: Page 14 of the Draft Downstream Release Alternatives (Phase 1) Study Report includes a description of the HEC-ResSim model that was developed for the project. Harris Dam was modeled in HEC-ResSim with both a minimum release requirement and maximum constraint at the downstream gage at Wadley. The draft report states that the minimum release requirement is based on the flow at the upstream Heflin gage, which is located on the Tallapoosa River arm of Harris Reservoir and has 68 years of discharge records. Page 5 of the draft report indicates that there is also a gage (Newell) on the Little Tallapoosa River Arm of the reservoir, which has 45 years of discharge records. It appears that only the Heflin gage was used in developing the minimum release requirement. As part of your response to stakeholder comments on the ISR, please explain the rationale for basing the minimum releases in the HEC-ResSim model only on the flows at the Heflin gage and not also on the flows at the Newell gage.

Alabama Power Response:

The HEC-ResSim model bases the releases on the Green Plan, which specifies the use of the Heflin gage. During development of the Green Plan, the Heflin gage was considered the gage that best mimicked the unregulated, natural flow of the Tallapoosa River. Based on available information from stakeholder meetings in early 2000, the Newell gage was not considered. Stakeholders involved in the Green Plan development process did acknowledge that the Heflin gage excluded the flow from Little Tallapoosa River.

Below is a brief summary of the recorded stakeholder discussions that reference the use of the Heflin gage.

- 5/21/2003 Stakeholder Meeting: Stan Cook (Alabama Department of Conservation and Natural Resources (ADCNR)) stated that the Heflin gage is being used to mimic natural events and that the “Big” Tallapoosa River better reflects a larger scale drainage.
- 8/4/2003 Stakeholder Meeting: Elise Irwin presents findings on the models indicate that the Heflin gage is a promising location.
- 11/3/2003 Stakeholder Meeting: Alabama Rivers Alliance (ARA) stated they wanted Alabama Power to evaluate use of a house turbine that would provide capabilities to duplicate the Heflin gage flows. During this meeting, it was mentioned that the Heflin gage does not include flows from the Little Tallapoosa River, and no one stated opposition to use of the Heflin gage.
- 1/1/2006 Stakeholder Meeting: Stakeholders commented that mimicking Heflin flows would allow for some natural variability of flow in the regulated part of the river.

Draft Erosion and Sedimentation Study Report

Question #7: The Erosion and Sedimentation Study in the approved study plan states that Alabama Power would analyze its existing lake photography and Light Detection and Ranging (LIDAR) data using a geographic information system (GIS) to identify elevation or contour changes around the reservoir from historic conditions and quantify changes in lake surface area to estimate sedimentation rates and volumes within the reservoir. In addition, the approved study plan states that Alabama Power will verify and survey sedimentation areas for nuisance aquatic vegetation. According to the study schedule, Alabama Power will prepare the GIS overlay and maps from June through July 2019 and conduct field verification from fall 2019 through winter 2020.

The Draft Erosion and Sedimentation Study Report does not include a comparison of reservoir contour changes from past conditions or the results of nuisance aquatic vegetation surveys. The report states that limited aerial imagery of the lake during winter draw down and historic LIDAR data for the reservoir did not allow for comparison to historic conditions and that Alabama Power will conduct nuisance aquatic vegetation surveys during the 2020 growing season. It is unclear why the existing aerial imagery and Alabama Power's LIDAR data did not allow for comparison with past conditions or why the nuisance aquatic vegetation surveys will be conducted during the 2020 growing season instead of during the approved field verifications from fall 2019 to winter 2020. As part of your response to stakeholder comments on the ISR, please clarify what existing aerial imagery and LIDAR data was used and why it was not suitable for comparison with past conditions.

Alabama Power Response:

Alabama Power has 2007 and 2015 Light Detection and Ranging (LiDAR) data for Lake Harris that it will use to develop a comparison for the Final Erosion and Sedimentation Study Report.

Ms. Donna Matthews proposed a new study of the Tallapoosa River downstream of Harris Dam to use historic images overlaid on current imagery to evaluate changes in the Tallapoosa River.[1] Alabama Power's response to this study request is addressed in Attachment B; however, Ms. Matthews noted in the ISR Meeting that she would share various images of the Tallapoosa River pre-Harris Dam and after construction. Alabama Power intends to facilitate obtaining copies of these images to provide to FERC for its use in addressing cumulative effects, as noted in FERC's November 16, 2018 Scoping Document 2.[2]

Regarding the nuisance aquatic vegetation component of the Erosion and Sedimentation study, the growing season is late spring into summer, which did not correspond with the fall 2019 to winter 2020 in the FERC-approved study plan schedule. Therefore, Alabama Power plans to conduct the nuisance aquatic vegetation survey in summer 2020. These results will be provided to HAT 2 participants as a technical memo to supplement the Draft Erosion and Sedimentation Study Report.

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[1] Accession No. 20200612-5018.

[2] Accession No. 20181116-3065.

Question #9: (comment provided below includes only the information requested by FERC) As part of your response to stakeholder comments on the ISR, please provide:

1) *the maps and assessment of the availability of potentially suitable habitat within the project boundary for all of the T&E species on the official species list for the project;*
2) *documentation of consultation with FWS regarding the species-specific criteria for determining which T&E species on the official species list will be surveyed in the field;*
3) *a complete list of T&E species that will be surveyed during the 2nd study season as part of the T&E Species Study; and*
4) *confirmation that Alabama Power will complete the field verification scheduled by September 2020.*

Alabama Power Response:

1) The maps and assessment of the availability of potentially suitable habitat within the Harris Project Boundary were included in the draft Threatened and Endangered Species Desktop Assessment Report and were prepared based on available sources of information. Any maps and assessments of habitat suitability that could not be resolved in the desktop assessment will be included in the Final Threatened and Endangered Species Study Report. Alabama Power is actively consulting with U.S. Fish and Wildlife Service (USFWS) regarding Threatened and Endangered Species (T&E species) where existing information is insufficient to determine their presence/absence and habitat suitability. Alabama Power plans to continue to work with USFWS and the Alabama Natural Heritage Program (ANHP) to resolve questions about the species and perform field surveys as deemed appropriate.

2) Alabama Power met with HAT 3 participants on August 27, 2019 to discuss species included in the Threatened and Endangered Species Study Plan. As a result of that meeting and based on recommendations from USFWS, Alabama Power conducted surveys for Finelined Pocketbook in the Tallapoosa River and Palezone Shiner in Little Coon Creek. Additional surveys for Finelined Pocketbook in tributaries to Lake Harris are ongoing and should be completed in Summer 2020. Alabama Power is consulting with the USFWS and ANHP to determine the need for additional surveys. If requested, Alabama Power may perform surveys for additional species and/or assessments to determine suitability of habitat that could not be resolved in the Threatened and Endangered Species Desktop Assessment. All consultation regarding this process will be included as an appendix to the Final Threatened and Endangered Species Study Report.

3) Alabama Power plans to conduct additional surveys for Finelined Pocketbook in Summer 2020. Based on ongoing consultation with USFWS and with input from ANHP, Alabama Power may perform surveys for Price's Potato Bean, White Fringeless Orchid, and Little Amphianthus (pool sprite) as well as assessments to determine if suitable habitat exists for Red-cockaded Woodpecker and Little Amphianthus.

4) Alabama Power plans to complete field verifications by September 2020.

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Question #10: To facilitate review of the existing shoreline land use classifications, please file larger scale maps of all the shoreline areas as a supplement to the Draft Project Lands Evaluation Report, as part of your response to stakeholder comments on the ISR. Please include land use classifications on the maps. In addition, if available, please file the GIS data layers of the existing and proposed shoreline land use classifications.

Alabama Power Response:

Included with this filing are the larger scale maps, including land classifications, and the GIS files of the existing and proposed shoreline land use classifications.

Attachment B

Alabama Power's Response to Study Modifications and Additional Study Requests Following the May 12, 2020 Initial Study Report and Initial Study Report Meeting Summary for the R.L. Harris Hydroelectric Project

Alabama Power received two recommendations to modify the existing FERC-approved studies and three Additional Study Requests. Alabama Power's response to the study modifications and Additional Study Requests is discussed below.

A. Modifications to Existing Studies

1) FERC Question #3:[1] "To facilitate modelling of downstream flow release alternatives, we recommend that Alabama Power run base flows of 150 cfs, 350 cfs, 600 cfs, and 800 cfs through its model for each of the three release scenarios (i.e., the Pre-Green Plan, the Green Plan, and the modified Green Plan flow release approach). The low-end flow of 150 cfs was proposed by Alabama Power as equivalent to the daily volume of three 10-minute Green Plan pulses. This flow also is about 15 percent of the average annual flow at the United States Geological Survey's flow gage (#02414500) on the Tallapoosa River at Wadley, Alabama, and represents "poor" to "fair" habitat conditions. We recommend 800 cfs as the upper end of the base flow modeling range because it represents "good" to "excellent" habitat and is nearly equivalent to the U.S. Fish and Wildlife Service's Aquatic Base Flow guideline for the Tallapoosa River at the Wadley gage. The proposed base flows of 350 cfs and 600 cfs cover the range between 150 cfs and 800 cfs."

2) ARA's June 11, 2020 comments:[2] "While reserving the right to request other release alternatives be considered once more information is made available to stakeholders, ARA proposes the following study modification request pursuant to 18 C.F.R. § 5.15(d) for additional flow scenarios be analyzed as part of the Downstream Release Alternatives Study:

   (i) A variation of the existing Green Plan where the Daily Volume Release is 100% of the prior day's flow at the USGS Heflin stream gage, rather than the current 75%;

   (ii) A hybrid Green Plan that incorporates both a base minimum flow of 150 cfs and the pulsing laid out in the existing Green Plan release criteria;

   (iii) A constant but variable release that matches the flow at the USGS Wadley stream gage to the UGSG Heflin stream gage to mimic natural flow variability, and

   (iv) 300 cfs and 600 cfs minimum flows.

   Some of these flows, particularly items (iii) and (iv) may have been modeled internally by Licensee as part of the original adaptive management process; however, those models are not currently available as part of this relicensing. Studying a wider range of potential flows during the ILP could result in improved diversity and abundance of aquatic life and habitat, more recreation opportunities, decreased erosion and sedimentation, and gains in water quality."

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[1] Accession No. 20200610-3059.

[2] Accession No. 20200611-5114.

3) In its June 11, 2020 comments[3], EPA "requests that the flow scenarios include the evaluation of an option including both the pulses of the Green Plan with a minimum flow, and a higher minimum flow.

Alabama Power's Response:

Based on FERC, ARA, and EPA's recommendation to modify the Downstream Release Alternatives study, Alabama Power will model the following additional downstream flow scenarios:

- A variation of the existing Green Plan where the Daily Volume Release is 100% of the prior day's flow at the USGS Heflin stream gage, rather than the current 75%;
- A hybrid Green Plan that incorporates both a base minimum flow of 150 cfs and the pulsing laid out in the existing Green Plan release criteria;
- 300 cfs continuous minimum flow;
- 600 cfs continuous minimum flow; and a
- 800 cfs continuous minimum flow.

These recommended flow release alternatives are in addition to Alabama Power's release alternatives in the FERC-approved Study Plan that include:

- Pre-Green Plan (peaking only; no pulsing or continuous minimum flow);
- Green Plan (existing condition);
- Modified Green Plan (changing the time of day in which the Green Plan pulses are released); and
- 150 cfs continuous minimum flow.

Alabama Power has not included ARA's recommended "constant but variable release that matches the flow at the USGS Wadley streamgage to the UGSG Heflin streamgage to mimic natural flow variability", as an alternative to model. This alternative would eliminate peaking operations, which would significantly reduce or eliminate use of the Harris Project for voltage support and system reliability, including black start operations. Alabama Power regards this alternative as a complete change in Project operations (from peaking to run-of-river) that is not consistent with Project purposes.[4]

Furthermore, the units are not capable of adjusting to the extent of simulating natural river flows. The flow through the Harris units varies only to the extent of changes in gross head (the difference between the forebay elevation and tailwater elevation) and the wicket gate opening. Small wicket gate openings lead to excessive pressure drops, which is the primary driver of cavitation[5] initiation. The best way to minimize cavitation and its associated detrimental vibrations is to quickly move the wickets gates from a closed position to the best gate setting. The best gate setting is a permanent setting on the governor system to ensure that the control system will force a fast movement of the wicket gates through the "rough zone" to the best gate position thereby minimizing the time spent in the rough zone. The rough zone is an area on the operating curve where flows that are less than efficient gate cause increased vibrations in the turbine

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[3] Accession Nos. 20200612-5025 and 20200612-5079.

[4] For additional explanation, see Alabama Power's March 13, 2019 letter to FERC (Accession No. 20190313-5060).

[5] Cavitation is a phenomenon in which rapid changes of pressure in a liquid lead to the formation of small vapor-filled cavities in places where the pressure is relatively low.

and cavitation along the low-pressure surfaces of the turbine runner. For these reasons, this is not a viable alternative.

Alabama Power also declines FERC's recommendation to study all of the continuous minimum flows combined with the Pre-Green Plan, Green Plan, and Modified Green Plan. Alabama Power asserts that modeling one combination of a continuous minimum flow AND pulsing (the hybrid Green Plan listed above) is adequate to determine the effect of this downstream release alternative on Project operations and other resources. The eight alternatives Alabama Power will model will provide sufficient information to evaluate the resources of interest, determine any downstream release proposal, and determine protection, mitigation, and enhancement (PM&E) measures to be incorporated into the new license for the Project.

B. <u>Proposed Additional Studies</u>

1) ARA proposed a new study for "Battery Storage Feasibility Study to Retain Full Peaking Capabilities While Mitigating Hydropeaking Impacts".

<u>Alabama Power's Response:</u>

While ARA's additional study request appears to conform to FERC's regulations and criteria for additional study requests, Alabama Power respectfully declines to complete this study for the Harris Project relicensing. Our reasons are provided below:

a. ARA notes that there is a data gap around Project ramping rates. The Harris Project units are not capable of ramping; rather they were designed as peaking units to quickly react to electrical grid needs, and as such, the turbines were not designed to operate in a gradually loaded state—or restricted ramping rate—over an extended period of time. In fact, restricted ramping is avoided to prevent damage to hydroturbine machinery. When transitioning from spinning mode to generating mode, the wicket gates are opened over a period of approximately 45 seconds. One reason for this method of operating is so the turbine spends a minimal amount of time in the rough zone.

b. The goal of this study, as outlined by ARA, is to determine whether a battery energy storage system (BESS) could be economically integrated at Harris. This technology is very new and there is no established methodology for integrating BESS at hydropower facilities. The cost of a BESS system with restricted hydraulic ramping is concerning because the cost must include not only the battery but also the cost of replacing both turbine runners and determining the extent of the effect on the balance of plant. Each unit at Harris makes approximately 60 megawatts (MW) at efficient gate. For an example, a 60 MW/60-megawatt hour (MWhr), 1-hour duration, standalone battery including construction and installation, is estimated to cost $36M dollars.[6] This battery would need to be sized to produce up to 60 MW for one hour so that the full capacity of the turbine could be supplemented from battery power. The battery would need this capacity because ramping would essentially begin at zero MWs with a very small wicket gate opening and then gradually open over the period of one hour. A smaller MW battery would not be large enough to make up the lost MWs in a full ramping scenario. For example, if a 5 MW battery

[6] Fu, Remo and Margolis, "2018 U.S. Utility-Scale Photovoltaics-Plus-Energy Storage System Costs Benchmark", National Renewable Energy Laboratory, NREL/TP-6A20-71714.

were used, the unit would have to ramp very quickly, within 30 to 45 seconds, to an output of 55 MW. The 5 MW battery would then make up for the remaining power to reach the original power output of 60 MW. To be clear, a battery smaller than the unit's power at efficient gate does not allow for full ramping because the unit must quickly be brought up to a point where the unit's power plus the battery's power equals 60 MW.

The cost of $36M would be doubled to $72M since there are two units at Harris Dam and peaking requires the availability of both units. Additionally, this is a one-hour battery, so the unit(s) must be at efficient gate at one hour past the start of generation. If a longer ramping rate was desired, the battery would likely need to be even larger. The cost to upgrade the turbine runners in order to have a much wider operating range would also need to be considered. It is also important to note that it is undetermined, due to the site-specific conditions and the geometry of the water passages in the powerhouse, if a suitable turbine runner with a wide operating range can even be produced.

c. While information and access to battery storage technology is increasing, as ARA notes, integrating BESS at hydropower projects is a relatively new field with no established methodology. This is especially true for the size of BESS needed to replace the full megawatt capacity at Harris. Furthermore, full-scale redesign of the existing turbines is not being considered by Alabama Power during this relicensing.

For these reasons, Alabama Power declines this study proposal and contends that the downstream release alternatives study will provide information for Alabama Power and the stakeholders to effectively evaluate effects of downstream releases on Project resources (both on Lake Harris and in the Tallapoosa River below Harris Dam) and for Alabama Power to propose an operating scenario for the next license term.

2) Pre-and Post-Dam Analysis of Downstream Impacts, including flooding, erosion, and habitat changes to flora and fauna.

Alabama Power's Response:

Mr. Chuck Denman[7] proposed that Alabama Power conduct an additional study that analyzes pre-dam and post-dam impacts on flooding, erosion, plants, and fisheries. This study request did not meet FERC's criteria for an additional study; however, Alabama Power notes that many of the analyses requested by Mr. Denman are in fact occurring as part of the Harris relicensing. FERC does not require a licensee to evaluate pre-project conditions in a relicensing. In FERC's "*Guide to Understanding and Applying the Integrated Licensing Process Study Criteria*" (2012), FERC notes that where information is being sought solely to look at historic effects, FERC staff will not require an applicant to reconstruct pre-project conditions, because that is not the baseline from which the FERC conducts its environmental analysis. The FERC's choice of current environmental conditions as the baseline for environmental analysis in relicense cases was affirmed in American Rivers v. FERC, 187 F.3d 1007, amended and rehearing denied, 201 F.3d 1186 (9th Cir., 1999); Conservation Law Foundation v. FERC, 216 F.3d 41 (D. C. Cir. 2000).

[7] Accession No 20200611-5174.

Alabama Power has consistently communicated and explained that it will use the 100-year flood event to model effects from a change in Harris Project operations on downstream resources. Alabama Power has also completed an erosion evaluation and is reviewing all stakeholder comments on lake and downstream erosion and sedimentation and will address those comments in the Final Erosion and Sedimentation Report. Alabama Power is also evaluating how changes to current Project operations may affect nuisance aquatic vegetation. Finally, Alabama Power has compiled a large amount of existing information on the Tallapoosa River fisheries community and is also conducting three studies investigating fish habitat, aquatic resources in the Tallapoosa River, and water quality and water temperature in both Lake Harris and in the Tallapoosa River. For these reasons, Alabama Power believes the issues raised by Mr. Denman are covered in the FERC-approved Study Plan and a new study is not warranted.

3) A New Study of the Downstream River Using Historic Images Overlaid onto Current Imagery

Alabama Power's Response:

Ms. Donna Matthews[8] proposed that Alabama Power conduct a new study using GIS to compare historic imagery to current imagery to evaluate effects of releases downstream of Harris Dam. Ms. Matthews notes that existing data can be used and that Alabama Power can gather historic images and overlay them on current images to determine the effects of the dam on the river downstream. The primary purpose of this study is to address "significant and persistent concerns about erosion" in the Tallapoosa River downstream of Harris Dam.

Alabama Power notes that while this study does not conform to FERC's criteria for additional studies, Alabama Power is committed to evaluating erosion and sedimentation effects on Lake Harris and in the Tallapoosa River downstream of Harris Dam. Alabama Power is reviewing stakeholder comments on the Draft Erosion and Sedimentation Report and will address these comments in the Final Erosion and Sedimentation Report. Further, the FERC-approved Erosion and Sedimentation Study Plan provides adequate methodology to address erosion and sedimentation issues resulting from Harris Project operations.

As noted above, FERC does not require licensees in the relicensing process to study pre-project conditions; however, Ms. Matthews volunteered in the April 28, 2020 ISR Meeting to provide images to Alabama Power that FERC may consider in conducting its cumulative effects analysis for soils and geologic resources, specifically erosion and sedimentation. Alabama Power intends to contact Ms. Matthews to obtain copies of these photos.

[8] Accession No. 20200611-5169.

Note: The large-scale maps referenced in the response to Question #10 are not included in this version of the filing due to file size recommendations for eFiling.

Harris relicensing - response to ISR comments

APC Harris Relicensing <g2apchr@southernco.com>

Fri 7/10/2020 6:58 PM

To: 'harrisrelicensing@southernco.com' <harrisrelicensing@southernco.com>
Bcc: 1942jthompson420@gmail.com <1942jthompson420@gmail.com>; 9sling@charter.net <9sling@charter.net>; allan.creamer@ferc.gov <allan.creamer@ferc.gov>; alpeeple@southernco.com <alpeeple@southernco.com>; amanda.fleming@kleinschmidtgroup.com <amanda.fleming@kleinschmidtgroup.com>; amanda.mcbride@ahc.alabama.gov <amanda.mcbride@ahc.alabama.gov>; amccartn@blm.gov <amccartn@blm.gov>; ammcvica@southernco.com <ammcvica@southernco.com>; amy.silvano@dcnr.alabama.gov <amy.silvano@dcnr.alabama.gov>; andrew.nix@dcnr.alabama.gov <andrew.nix@dcnr.alabama.gov>; arsegars@southernco.com <arsegars@southernco.com>; athall@fujifilm.com <athall@fujifilm.com>; aubie84@yahoo.com <aubie84@yahoo.com>; awhorton@corblu.com <awhorton@corblu.com>; bart_roby@msn.com <bart_roby@msn.com>; baxterchip@yahoo.com <baxterchip@yahoo.com>; bboozer6@gmail.com <bboozer6@gmail.com>; bdavis081942@gmail.com <bdavis081942@gmail.com>; beckyrainwater1@yahoo.com <beckyrainwater1@yahoo.com>; bill_pearson@fws.gov <bill_pearson@fws.gov>

1 attachments (143 KB)

2020-07-10 Response to ISR Comments.pdf;

Harris relicensing stakeholders,

On April 10, 2020, Alabama Power filed the Initial Study Report (ISR) along with six Draft Study Reports and two cultural resources documents. Alabama Power held the ISR Meeting with stakeholders and FERC on April 28, 2020. On May 12, 2020, Alabama Power filed the ISR Meeting Summary. Comments on the ISR, draft reports, and ISR Meeting Summary were due on June 11, 2020.

Alabama filed a response to ISR comments with FERC today. The response is attached and can also be found on the relicensing website: www.harrisrelicensing.com under “Relicensing Documents.” Note that the larger scale maps requested by FERC can be found in the HAT 4 – Project Lands folder.

Thanks,

Angie Anderegg
Hydro Services
(205)257-2251
arsegars@southernco.com

APC Harris Relicensing

From: Anderegg, Angela Segars
Sent: Monday, July 13, 2020 8:53 AM
To: Barry Morris
Subject: RE: Harris Relicensing: continuous minimum flow in Tallapoosa River

Hi Barry,

The answer is B – the Green Plan includes pulses *plus* releases for generation needs.

The Green Plan is included in the Downstream Release Alternatives study plan and in the Pre-Application Document (Appendix E). However, the best explanation of how we operate is in a presentation Alan Peeples gave on January 31, 2018. The entire presentation is worth watching; however, the specifics of peaking operations and the Green Plan begins around minute 40 in the video and slide 53 in the powerpoint.

http://harrisrelicensing.com/_layouts/15/start.aspx#/HAT%201%20%20Project%20Operations/Forms/AllItems.aspx

I hope this helps!

Angie Anderegg
Hydro Services
(205)257-2251
arsegars@southernco.com

From: Barry Morris <rbmorris222@gmail.com>
Sent: Saturday, July 11, 2020 10:20 AM
To: Anderegg, Angela Segars <ARSEGARS@southernco.com>
Subject: Re: Harris Relicensing: continuous minimum flow in Tallapoosa River

EXTERNAL MAIL: Caution Opening Links or Files

Your explanation is not confusing, but what I can't grasp is why the CMF plus peak demand generating will not cause the lake level to go lower.

OR, has the dam been doing the 3x10 pulsing *plus* peak demand generating for years and I've not been aware of it? In that case obviously the amount of water thru the dam in CMF is the same, just spaced out throughout the day.

Sorry if my ignorance of the green plan is causing you extra work. Does the company have a concise summary of the green plan that I could use to make me and the LWPOA smarter?

Thanks for your help. Barry

On July 10, 2020, at 8:37 AM, "Anderegg, Angela Segars" <ARSEGARS@southernco.com> wrote:

Hi Barry,

A 150 cfs continuous minimum flow is the same daily volume as the 3- 10 minute pulses currently provided by the Green Plan and does not include any releases for peaking operations. The Green Plan pulses are released through the turbines, so a large volume of water is released over a short period of time each time we pulse. The 150 cfs continuous flow spreads the volume provided by the pulses throughout the day. Also, the 150 cfs would have to be provided through some other mechanism than the turbines because they are not designed to operate at that low flow.

I hope this helps, but if it’s still confusing, don’t hesitate to give me a call.

Thanks,

Angie Anderegg
Hydro Services
(205)257-2251
arsegars@southernco.com

From: Barry Morris <rbmorris222@gmail.com>
Sent: Thursday, July 9, 2020 12:49 PM
To: Anderegg, Angela Segars <ARSEGARS@southernco.com>
Subject: Harris Relicensing: continuous minimum flow in Tallapoosa River

EXTERNAL MAIL: Caution Opening Links or Files

Angie: I'm trying to write up relicensing notes for the LWPOA membership and I'm still puzzled as to how a 150 CFS continuous minimum flow (equivalent of a day's generation) would not impact the Lake RL Harris water level. Seems to me it would double the amount of water released thru the dam every day and thus *must* lower the lake. What am I missing here?

I can't find anything in the on line documents, but there's a lot there. Could you please have one of your folks send me some sort of explanation, or direct me to a place in the documents where this is spelled out?

Thanks for your help.

Barry Morris
LWPOA
404 449 3452

Virus-free. www.avg.com [avg.com]
[avg.com]

FEDERAL ENERGY REGULATORY COMMISSION
WASHINGTON, DC 20426
August 10, 2020

OFFICE OF ENERGY PROJECTS

Project No. 2628-065 – Alabama
R.L. Harris Hydroelectric Project
Alabama Power Company

VIA FERC Service

Angie Anderegg
Harris Relicensing Project Manager
Alabama Power Company
600 North 18th Street
Birmingham, AL 35203

Reference: Determination on Requests for Study Modifications for the R.L. Harris Hydroelectric Project

Dear Ms. Anderegg:

Pursuant to 18 C.F.R. § 5.15 of the Commission's regulations, this letter contains the determination on requests for modifications to the approved study plan for Alabama Power Company's (Alabama Power) R.L. Harris Hydroelectric Project No. 2628 (Harris Project). The determination is based on the study criteria set forth in sections 5.9(b) and 5.15(d) and (e) of the Commission's regulations, applicable law, Commission policy and practice, and Commission staff's review of the record of information.

Background

Commission staff issued the study plan determination (SPD) for the Harris Project on April 12, 2019. Alabama Power filed an initial study report (ISR) and associated draft study reports on April 10, 2020, held an ISR meeting on April 28, 2020, and filed an ISR meeting summary on May 12, 2020. Comments on the ISR and meeting summary were filed by Commission staff on June 10, 2020, and by Alabama Department of Conservation and Natural Resources, Alabama Rivers Alliance, David Bishop, Dana Chandler, Wayne Cotney, Chuck Denman, Albert Eiland, Nelson Hay, Sharon Holland, Carol Knight, Joe Meigs, David Royster, Ronnie Siskey, Mike Smith, Michelle Waters, and John Carter Wilkins on June 11, 2020. The Alabama Department of Environmental Management, the U.S. Environmental Protection Agency (EPA), and Donna Matthews

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filed comments on June 12, 2020,[1] and the National Park Service filed comments June 29, 2020. Alabama Power filed reply comments on July 10, 2020.

Comments

Some of the comments received do not specifically request modifications to the approved study plan. This determination does not address these types of comments, which include: comments on the presentation of data and results; requests for additional information; disagreements on study results; recommendations for protection, mitigation, or enhancement measures; or issues that were previously addressed in either the November 16, 2018 Scoping Document 2 or the April 12, 2019 SPD.

Study Plan Determination

Pursuant to section 5.15(d) of the Commission's regulations, any proposal to modify a required study must be accompanied by a showing of good cause, and must demonstrate that: (1) the approved study was not conducted as provided for in the approved study plan, or (2) the study was conducted under anomalous environmental conditions or that environmental conditions have changed in a material way. As specified in section 5.15(e), requests for new information gathering or studies must include a statement explaining: (1) any material change in law or regulations applicable to the information request, (2) why the goals and objectives of the approved study could not be met with the approved study methodology, (3) why the request was not made earlier, (4) significant changes in the project proposal or that significant new information material to the study objectives has become available, and (5) why the new study request satisfies the study criteria in section 5.9(b).

Alabama Power agreed with requests to modify its Water Quality Study, as discussed immediately below. As indicated in Appendix A, two additional study modifications were requested, one of which Alabama Power partially agreed to and is required with staff modifications. In addition, three new studies were requested, one of which is approved herein, with staff modifications. The bases for modifying the study plan or approving new studies are explained in Appendix B (Requested Modifications to Approved Studies). Commission staff considered all study plan criteria in section 5.9 of

[1] Alabama Department of Environmental Management (Alabama DEM) and Donna Matthews' comments were filed on June 11, 2020, just after close of Commission business at 5:00 p.m. EST. Section 385.2001(a)(2) of the Commission's regulations provide that any filing received on a regular business day after close of Commission business is considered filed on the next regular business day. Therefore, the comments by Alabama Department of Environmental Management and Donna Matthews are considered filed on the next regular business day, or June 12, 2020.

the Commission's regulations; however, only the specific study criteria particularly relevant to the study in question are referenced in Appendix B.

Water Quality Study

The draft Water Quality Study Report includes measurements of dissolved oxygen concentration and water temperature at a generation monitor located in the Harris Dam tailrace (3 years of data) and at a continuous monitor located about 0.5 mile downstream from Harris Dam (1 year of data). As requested by Alabama Rivers Alliance and other stakeholders, in its ISR reply comments,[2] Alabama Power agrees to collect additional water quality data in 2020 and 2021. Alabama Power provided a monitoring schedule for 2021 but did not do so for 2020 other than to say that monitoring began on May 4, 2020. Because the approved study plan requires Alabama Power to monitor dissolved oxygen and water temperature through October 31, the 2020 monitoring period should extend until October 31, 2020.

Threatened and Endangered Species Study

As noted in staff's comments on the ISR, the draft Threatened and Endangered (T&E) Species Study Report does not provide an assessment of T&E species populations and/or their habitats at the project, or a record of consultation with the U.S. Fish and Wildlife Service (FWS) regarding the need for field surveys for all of the species on the official T&E species list.[3] In its reply comments, Alabama Power states that existing information is insufficient to determine some of the T&E species' presence/absence and habitat suitability in the project area. Alabama Power also states that it may conduct additional field surveys[4] for T&E species and/or their potentially suitable habitat based on ongoing consultation with the FWS and Alabama Natural Heritage Program, and will provide documentation of this consultation in the Final T&E Species Report which will be filed in January 2021, per the approved study plan schedule filed on May 13, 2019.

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[2] *See* Alabama Power's July 10, 2020 Reply Comments at 2. Alabama Power indicates that the continuous monitor was installed on May 4, 2020, and the tailrace monitor was installed on June 1, 2020.

[3] *See* the official list of T&E species within the Harris Project boundaries (i.e., at Lake Harris and Skyline), accessed on July 27, 2018, by staff using the FWS's Information for Planning and Conservation website (https://ecos.fws.gov/ipac/) and filed on July 30, 2018.

[4] Alabama Power confirmed it would complete T&E species field verifications by September 2020, per the approved study plan schedule.

Requested Variances

In the ISR, Alabama Power requests variances to the approved schedules for the Draft Recreation Evaluation Study Report and the Cultural Resources Study.[5] Specifically, Alabama Power proposes to file its Draft Recreation Evaluation Study Report in August 2020, instead of June 2020, to allow time to complete two new recreation surveys, a Tallapoosa River Downstream Landowner Survey and a Tallapoosa River Recreation User Survey. Alabama Power also proposes to finalize the Area of Potential Effect (APE) for its Cultural Resources Study and file it with documentation of consultation in June 2020, which it did on June 29, 2020. No stakeholders objected to the requested variances and these changes to the approved study schedule will not affect the overall relicensing schedule. Therefore, the requested variances are approved.

Please note that nothing in this determination is intended, in any way, to limit any agency's proper exercise of its independent statutory authority to require additional studies.

If you have any questions, please contact Sarah Salazar at sarah.salazar@ferc.gov or (202) 502-6863.

Sincerely,

for
Terry L. Turpin
Director
Office of Energy Projects

Enclosures: Appendix A – Summary of determinations on requested modifications to approved studies and new study requests

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[5] Alabama Power also requested a variance to the approved schedule for the Water Quality Study, proposing to submit its Clean Water Act section 401 water quality certification (certification) application to the Alabama DEM in April 2021, instead of as originally proposed in 2020. Section 5.23(b) of the Commission's regulations requires the application for certification to be submitted to the certifying agency within 60 days of issuance of the Ready for Environmental Analysis notice, which will occur post-filing. Accordingly, a variance for submitting the certification application prior to filing the license application is not needed.

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Appendix B – Commission staff's recommendations on requested modifications to approved studies and new study requests

APPENDIX A

SUMMARY OF DETERMINATIONS ON REQUESTED MODIFICATIONS TO APPROVED STUDIES (see Appendix B for discussion)

Study	Recommending Entity	Approved	Approved with Modifications	Not Required
Requested Modifications to Approved Studies				
Downstream Release Alternatives Study	Commission staff, Alabama Rivers Alliance, EPA		X	
Operating Curve Change Feasibility Analysis Study and Downstream Release Alternatives Study – Climate Change Assessment	Donna Matthews			X
New Study Requests				
Battery Storage Feasibility Study	Alabama Rivers Alliance		X	
Pre-and Post-Dam Analysis of Downstream Impacts	Chuck Denman			X
Study of the Downstream River Using Historic, Pre-Dam Images Overlaid onto Current, Post-Dam Imagery	Donna Matthews			X

APPENDIX B

STAFF RECOMMENDATIONS ON REQUESTED MODIFICATIONS TO APPROVED STUDIES AND NEW STUDY REQUESTS

Downstream Release Alternatives Study

Background

Alabama Power designed and constructed the Harris Project, which began operation in 1983, as a peaking project. Prior to 2005, Alabama Power, while operating in a peaking mode, would alternately generate electricity for part of the day, and store flow in the reservoir for the rest of the day.[6] While storing flows, there would be no downstream flow releases into the Tallapoosa River other than a license required minimum release of 45 cubic feet per second (cfs), as measured at the United States Geological Survey (USGS) gage located 14 miles downstream at Wadley, Alabama.

In 2005, Alabama Power voluntarily modified project operation to provide downstream pulse flow releases ranging from 15 minutes to 4 hours in length during non-generation periods for the benefit of the aquatic community downstream (called "Green Plan").

The goal of the approved Downstream Release Alternatives Study is to evaluate the effects of the current Green Plan and the historic peaking operation, along with alternative downstream releases, on environmental and developmental resources affected by the project. Throughout the study planning and implementation process, Alabama Power has requested that stakeholders provide alternative flow releases to model as part of the study.[7]

Requested Study Modification

The approved study plan requires Alabama Power to model four downstream release scenarios, including: (1) current operation (the Green Plan); (2) the project's historic peaking operation; (3) a modified Green Plan (i.e., modifying the time of day during which the pulses are released); and (4) a downstream continuous minimum flow of 150 cfs under a historic peaking operation scenario. Based on the findings in the draft Downstream Release Alternatives Study Report, in comments on the ISR, Commission

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[6] *See* Final Downstream Release Alternatives Study Report at 1.

[7] *See* Study Plan Meeting Summary in the Revised Study Plan filed on March 13, 2019; the ISR Meeting Summary filed on May 12, 2020; and Alabama Power's ISR reply comments filed on July 10, 2020.

staff, the Environmental Protection Agency (EPA), and Alabama Rivers Alliance, request that Alabama Power evaluate additional downstream release alternatives. Commission staff request that Alabama Power model continuous minimum flows of 150, 350, 600, and 800 cfs under the historic peaking, Green Plan, and modified Green Plan release scenarios. EPA requests that Alabama Power evaluate: (1) the Green Plan with minimum flows; and (2) continuous minimum flows higher than 150 cfs. Alabama River Alliance requests Alabama Power evaluate the following downstream flow alternatives:

1. a variation of the existing Green Plan where the Daily Volume Release is 100 percent of the prior day's flow at the upstream USGS Heflin stream gage (rather than the current 75 percent);
2. a hybrid Green Plan that incorporates a downstream continuous minimum flow of 150 cfs;
3. releases from the Harris Project that match flow at the downstream USGS Wadley stream gage to the USGS Heflin stream gage to mimic natural flow variability; and
4. downstream continuous minimum flows of 300 and 600 cfs.

Comments on Requested Study Modification

In Attachment B of its reply comments, Alabama Power proposes to model the following five downstream release alternative model runs, in addition to the required four initial alternative model runs, for a total of nine alternative model runs:

1. a variation to the existing Green Plan where the Daily Volume Release is 100 percent of the prior day's flow at the USGS Heflin stream gage;
2. a 150-cfs continuous minimum flow with Green Plan releases;
3. a 300-cfs continuous minimum flow with historic peaking operation;[8]
4. a 600-cfs continuous minimum flow with historic peaking; and
5. an 800-cfs continuous minimum flow with historic peaking.

Alabama Power does not propose to model Alabama Rivers Alliance's requested alternative for a release from the Harris Project that mimics the natural flow variability in the Tallapoosa River. Alabama Power states that such operation would significantly reduce or eliminate use of the project for peaking. Moreover, Alabama Power states that the project's units are not capable of adjusting, to the extent necessary, to simulate natural

[8] In the draft Downstream Release Alternatives Study Report, Alabama Power refers to the continuous minimum flow alternatives solely as minimum flows. To eliminate confusion, we recommend Alabama Power define the minimum flow alternatives, with regard to the associated operational scenario (e.g., 150-cfs continuous minimum flow with Green Plan operation).

river flows. Alabama Power also does not propose to model staff's requested range of minimum flows with the Green Plan (except 150 cfs) or modified Green Plan releases (with any flow). Alabama Power states that modeling one combination of a minimum flow (150 cfs) and Green Plan releases is adequate to determine the effect of this downstream release alternative on project resources.

Discussion and Staff Recommendation

The purpose of the Green Plan releases is to reduce the effects of peaking operation on the aquatic community, including habitat, in the Tallapoosa River downstream from Harris Dam. Monitoring conducted since initiation of the Green Plan in 2005 indicates that there has been an increase in shoal habitat availability, but the response by the fish community has been mixed (Irwin, 2019).

Alabama Rivers Alliance's request for a downstream release alternative, whereby releases from the Harris Project would mimic the Tallapoosa River's natural flow variability, which could benefit the habitat and aquatic community downstream from Harris Dam, would require a change in project operation from peaking to run-of-river. As detailed by Alabama Power in its July 10, 2020, comments,[9] the turbine-generator units at the Harris Project are designed to be operated at best gate and are not capable of adjusting to the extent necessary to simulate natural river flows (i.e., it is unable to operate in a run-of-river mode). Operating the units in this manner would lead to cavitation, which would damage the units. Therefore, operating the Harris Project to mimic the river's natural flow variability under a run-of-river mode would likely require significant redesign and redevelopment of the project (e.g., structural modifications, intake redesign, turbine retrofits, etc.). Because run-of-river operation is not feasible at the Harris Project without a major redesign and redevelopment of the project, we do not consider it to be a reasonable alternative for further consideration as part of our eventual environmental analysis. Therefore, we do not recommend modifying the study to include a release alternative that mimics natural flow variability in the Tallapoosa River.

With respect to the modified Green Plan releases requested by staff, we no longer recommend that Alabama Power model continuous minimum flows with this release strategy because, other than shifting the time of day of the releases, the release characteristics, model results, and environmental benefits would be the same as those for the continuous minimum flows and the Green Plan release strategy being modeled.

As noted above, the current license requires Alabama Power to release flows from the project such that a 45-cfs minimum flow is provided at the downstream USGS Wadley streamflow gage. Incrementally higher minimum flows (e.g., 150, 300, 600, and

[9] *See* Alabama Power's July 10, 2020 comments, Attachment B, page 2.

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800 cfs) would provide additional wetted width, which could improve habitat availability between pulsing releases. Therefore, there is the potential for additional enhancement and protection that we will need to consider as part of our environmental analysis. Modeling a range of continuous minimum flows with the existing Green Plan releases would allow for an evaluation of flows that could improve downstream aquatic habitat. Therefore, in addition to the nine alternative model runs identified by Alabama Power,[10] we recommend Alabama Power model three additional continuous minimum flows with the Green Plan releases (i.e., 300, 600, and 800 cfs).[11]

Operating Curve Change Feasibility Analysis Study and Downstream Release Alternatives Study – Climate Change Assessment

Background

The approved study plan includes two operations-related modeling studies: an Operating Curve Change Feasibility Analysis Study and a Downstream Release Alternative Study. The respective objectives of these approved studies are to: (1) evaluate proposed incremental increases to the winter rule curve for Harris Lake; and (2) evaluate the effects of the historic peaking, existing Green Plan, and alternative downstream release alternatives, on environmental and developmental resources affected by the project.

Requested Study Modification

Donna Matthews requests that the Operating Curve Change Feasibility Analysis and Downstream Release Alternative Studies be modified to include additional modeling of the effect of climate change on flows and Harris Project operation. The additional modeling would use predictive data from climate change studies.

Comments on Requested Study Modification

No comments were filed on this requested study modification.

[10] *See* Alabama Power's July 10, 2020 Reply Comments at Appendix B, page 2.

[11] These flows were selected because they are consistent with those minimum flows selected by Alabama Power for their historic peaking model runs.

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Discussion and Staff Recommendation

We are not aware of any available climate change model or assessment, including the climate change assessment referenced by Ms. Matthews,[12] that would support, with any degree of accuracy and reliability, a prediction of water availability at the individual project level. However, there is historical streamflow data available for the Tallapoosa River upstream of, and downstream from, the Harris Project. This data can be used to evaluate whether climate change has resulted in any changes to hydrologic inputs over time at the project. Therefore, we do not recommend modifying either the Operating Curve Change Feasibility Analysis Study or Downstream Release Alternative Study to include additional modeling using predictive data from climate change studies.

[12] Ms. Matthews references U.S. Department of Energy (2017), which was cited in EPA's March 29, 2019 comments on Alabama Power's Revised Study Plan.

STAFF RECOMMENDATIONS ON REQUESTED NEW STUDIES

Battery Energy Storage Systems (BESS) Study

Background

Harris Lake is a storage reservoir in which flows are stored to supplement inflows from April through December. The daily discharge from the project is based on a percentage of flows measured at the upstream USGS Heflin gage (i.e., the Green Plan calls for daily discharge to be at least 75 percent of flows at Heflin). Hydropower is typically generated during hours when demand for electrical power is highest (i.e., peak energy), causing significant variations in downstream flows. Daily hydropower releases from the dam vary from 0 cfs during off-peak periods to as much as 16,000 cfs, which is approximately best gate,[13] or the maximum turbine discharge.

The project has two turbine-generating units, rated at 67.5 megawatts (MW) each, which produce about 60 MW and have a hydraulic capacity of 8,000 cfs each at best gate opening. Lake elevations can vary 0.5- to 1.5-feet during a 24-hour period as a result of daily peak releases. Daily tailwater levels can vary significantly (up to 5 feet) because of peaking hydropower operations at Harris Dam, characterized by a rapid rise in downstream water levels immediately after generation is initiated, and a rapid fall in elevations as generation is ceased. Except during high flow conditions when hydropower may be generated for more extended periods of time, this peaking power generation scenario with daily fluctuating downstream flows is repeated nearly every weekday. Under the voluntary Green Plan, environmental flows are released through the turbines daily for short periods of time (i.e., 15 minutes to 4 hours).

Recommended New Study

In its comments on the ISR, Alabama Rivers Alliance requests a new study titled "Battery Storage Feasibility Study to Retain Full Peaking Capabilities While Mitigating Hydropeaking Impacts." The goal of the study is to determine whether a battery energy storage system (BESS) could be economically integrated at Harris to mitigate the impacts of peaking, while retaining full system peaking capabilities. Under such a scenario, the BESS would be used to provide power during peak demand periods, which would

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[13] In its reply comments, Alabama Power notes that the best gate setting is a permanent setting on the governor system to ensure that the control system will force a fast movement of the wicket gates to the best gate position thereby minimizing the time spent in the rough zone (i.e., an area on the operating curve in which flows that are less than efficient gate cause increased vibrations in the turbine and cavitation along the low-pressure surfaces of the turbine runner).

decrease the need for peak generation flow releases and reduce flow fluctuations downstream of the project. The objectives of the study are to evaluate battery type and size configurations, costs, and ownership options, as well as technical barriers to implementing BESS. The study would also assess how much operational flexibility could be provided by BESS and allow for more control of discharges downstream of the dam.

Alabama Rivers Alliance acknowledges that BESS at hydropower projects is a new field with no established methodologies. Alabama Rivers Alliance requests a desktop analysis to evaluate the feasibility of BESS at the Harris Project, including a preliminary cost/benefit analysis. Alabama Rivers Alliance estimates the cost of this study would be $20,0000 to $30,000.

Comments on the Study Request

Alabama Power did not adopt this study because it believes the system would have a high cost and the turbines at Harris Dam are not designed to operate in a gradually loaded rate over an extended period. Rather, the turbines are peaking units designed to quickly react to electrical grid needs. Restricted ramping may be possible; however, it would require replacement of both turbine runners at a cost in addition to the cost of the batteries. Alabama Power estimates the cost of one 60 MW-1-hour storage battery unit equivalent to the power of one turbine, would be $36,000,000. A battery equivalent to the power of both turbines would be $72,000,000. There would be additional cost for any necessary modification of the project turbine-generator units. (Alabama Power did not provide an estimate for the cost of modifying/replacing the turbine runners.) Alabama Power dismisses the feasibility of a smaller MW battery. Alabama Power states that a smaller MW battery, i.e., 5 MW, would not be large enough to make up the lost power in full ramping mode. A battery smaller than the turbine's efficient gate would not allow for full ramping of that turbine.

Discussion and Staff Recommendation

We reviewed Alabama Power's cost estimate for the installation of a BESS at the Harris Project. Alabama Power's cost of the battery is based on a 2018 National Renewable Energy Report which estimates the cost of a 60 MW, 1-hour reserve battery at $601/kWh, or about $36,0000,000 to be used in place of the MWs from one turbine at Harris (DOE, 2018). This cost does not include any modifications to the turbine-generator units, which would be necessary. In addition, a battery with 4 hours reserve storage may be necessary, because the Harris Project can generate up to 4 hours in peaking mode. The 2018 National Renewable Energy Report estimates the cost of a 60 MW, 4-hour reserve battery at $380/kWh, or about $91,0000,000 to mirror the MW from one unit at Harris. This option would also require modification of the turbine runners at additional costs.

The goal of Alabama Rivers Alliance's study is to evaluate the feasibility of a storage system which could be economically implemented at the Harris Project. Such a study would require evaluating not only the cost of installing the battery units, but also the potential benefits to both developmental and non-developmental resources. Installing a BESS at the Harris Project has the potential to mitigate project effects on water levels in Harris Lake, and fluctuations in flows released downstream during peaking operations. Potential hydrologic changes could be achieved by spreading out the releases throughout the day/night rather than releasing most of flows during peak hours. Assuming the same daily volume of flow is released, installing one 60-MW battery to provide an equivalent amount of the power provided by one turbine-generator unit could reduce daily fluctuations in Harris Lake by half. Harris Lake water levels, which currently fluctuate up to 1.5 feet daily, could be reduced to 0.75 feet daily. Downstream releases during peaking could be reduced from 16,000 cfs to 8,000 cfs, and the tailwater surface elevation could be reduced by 2.8 feet.[14] To consider the environmental benefits potentially associated with such changes in hydrologic conditions described above, the changes in releases from the project would have to be considered in the context of Alabama Power's approved Downstream Release Alternatives Study, which provides for identifying and evaluating Alternative Release scenarios.

Sections 4(e) and 10(a) of the Federal Power Act require the Commission to give equal consideration to all uses of the waterway on which a project is located. When reviewing a proposed action, the Commission must consider the environmental, recreational, fish and wildlife, and other non-developmental values of the project. We currently have insufficient information to evaluate the potential environmental benefits of a BESS. The cost of conducting the study, between $20,000 and $30,000, is relatively low and would provide information that does not already exist and is needed for our analysis.

Alabama Rivers Alliance's study methodology includes a description of operational flexibility associated with installing a range of battery sizes. Alabama Power did not consider a smaller battery because of the operational limits of the existing turbines. Alabama Power's analysis should not be limited to the existing turbines but should also consider the feasibility and cost of modifying or replacing a turbine necessary to support operation of a smaller battery, which may be more cost-effective and provide some environmental benefits. At minimum, the study should look at the costs and

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[14] The tailwater elevation below Harris dam is 667.7 feet msl when two units are operating and 664.9 feet msl when one unit is operating, a difference of 2.8 feet.

environmental benefits of replacing one 60 MW unit, as discussed above, and at least one smaller battery and its associated changes in project releases.

Alabama Rivers Alliance's study methodology includes a survey of battery cost estimates based on public resources, future projections for battery costs, and potential incentives to offset battery cost. Alabama Power used a 2018 Department of Energy Report which provides a reasonable methodology for estimating the cost of a technology which has not been widely implemented in hydropower. The cost of batteries, however, is rapidly decreasing,[15] and future projections in the cost of a battery should be considered in the cost analysis.

In summary, we recommend that Alabama Power conduct a BESS Study, along with the Downstream Release Alternative Study. The Downstream Release Alternative Study should be amended to include at least two new release alternatives: (a) a 50 percent reduction in peak releases associated with installing one 60 MW battery unit, and (b) a proportionately smaller reduction in peak releases associated with installing a smaller MW battery unit (i.e. 5, 10 or 20 MW battery). Alabama Power should include in its cost estimates for installing a BESS any specific structural changes, any changes in turbine-generator units, and costs needed to implement each battery storage type. Finally, consistent with the Downstream Release Alternative Study Plan, Alabama Power should evaluate how each of these release alternatives (i.e., items (a) and (b) above) would affect recreation and aquatic resources in the project reservoir and downstream.

Change Analyses: Project Operation Effects on Environmental Resources in the Tallapoosa River Downstream from Harris Dam

Background

The purpose of the Erosion and Sedimentation Study relative to downstream resources is to identify problematic erosion sites and sedimentation areas on the Tallapoosa River downstream from Harris Dam as well as determine the likely causes. The plan calls for sites downstream of Harris Dam to be identified, including by stakeholders; documented by observation and video; and assessed for the location, extent, and potential causes of erosion or sedimentation. As outlined in the approved study plan, during Phase 1 of the Operating Curve Change Feasibility Analysis Study, Alabama Power modeled the effect of increasing the winter elevation of Harris Lake by 1-, 2-, 3-, and 4-feet on the ability to provide flood control and downstream releases, among other operational parameters. Information from the Erosion and Sedimentation Study will be used in Phase 2 of both the Downstream Release Alternatives Study and the Operating

[15] The National Energy Research Laboratory reports that since 2018, battery costs have been reduced by about 15 percent, with further decreases expected.

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Curve Change Feasibility Analysis Study to assess the effects of potential changes in project operation on resources downstream from Harris Dam, including erosion and sedimentation in the Tallapoosa River.

Recommended New Studies

Pre-and Post-Dam Analysis of Downstream Impacts

Chuck Denman requests a new study with the goal of analyzing pre-dam and post-dam impacts on environmental resources downstream from Harris Dam, including flooding, erosion, and habitat changes to flora and fauna. Specifically, Mr. Denman requests the following information:

1. a storm runoff model comparing 25-, 50-, and 100-year 24-hour storm events.
2. use of available remote sensing materials to identify erosion by comparing the current river channel and islands' sizes and shapes with pre-dam conditions.
3. use of remote sensing to map flag grass[16] and invasive plant communities to compare changes from pre-dam conditions.
4. review available materials from local individuals in the community, as well as fish and game and other resources to determine what effect the dam has had on downstream fish species and population sizes.

Study of the Downstream River Using Historic, Pre-Dam Images Overlaid onto Current, Post-Dam Imagery

Donna Matthews states that erosion is a significant and persistent concern that is problematic for landowners, flora, and fauna in and around the Tallapoosa River downstream from Harris Dam. Ms. Matthews requests that Alabama Power use existing aerial imagery[17] and other available data to analyze changes in erosion, fisheries, and other environmental resources downstream from Harris Dam. As part of the study, Ms. Matthews requests that Alabama Power prepare a detailed geographic information system (GIS) map with existing information relating fish populations and other parameters in three dimensions (3D). The 3D GIS map would display presence/absence of species along the river length and during different decades, where data are available. Ms.

[16] Staff assumes that "flag grass" here refers to a non-native plant in the genus *Acorus*, such as *Acorus calamus*, given that the range of the native *Acorus americanus*, or "American sweetflag," is northern United States and Canada (USDA, 2020).

[17] Ms. Matthews filed an image of the Tallapoosa River in the Harris Project area from 1942 and provided a source for obtaining additional existing aerial imagery of the project area from 1950, 1954, 1964, and 1973.

Matthews states that the results could be used to evaluate the potential effects of future changes to downstream flow patterns.

Comments on the Study Requests

Alabama Power indicates that it is conducting many of the requested analyses as part of the approved study plan, including evaluations of how existing operation affects, and alternative operations may affect, erosion and sedimentation, nuisance aquatic vegetation, fisheries/aquatic resources, and water quality in the Tallapoosa River downstream from Harris Dam. Alabama Power also states that the approved Erosion and Sedimentation Study provides an adequate methodology to evaluate project-related effects on erosion and sedimentation downstream from Harris Dam. To support the Commission's cumulative effects analysis for soils and geologic resources (i.e., erosion and sedimentation), Alabama Power indicates that it intends to contact Ms. Matthews to obtain copies of the aerial images referenced in her study request and file them with the Commission.[18]

Discussion and Staff Recommendation

Mr. Denman and Ms. Matthews present their new study requests as collecting data on pre-dam conditions, which is not necessary with the context of the Commission's environmental baseline (i.e., current conditions) for evaluating project effects during a relicensing proceeding and does not relate to the eventual proposed action, which is relicensing an existing hydroelectric project.[19] The images of the project area that Ms. Matthews identifies were all taken prior to the construction and operation of the Harris Project. Analysis of these images would not be helpful in evaluating project-related erosion.

The flood analysis component of the Operating Curve Change Feasibility Analysis is intended to assess the effects of a large-scale flood, which could address some of the existing stormwater runoff and erosion issues that Mr. Denman identifies in his proposed study. The Downstream Release Alternatives Study calls for Alabama Power to model potential changes in operational flow releases. Modeling these potential operational scenarios will support an analysis of flow effects downstream of Harris Dam under a range of scenarios more effectively than additional modeling of smaller floods. The 100-year flood serves as a representative large flood for risk assessment and planning purposes. Therefore, modeling the 100-year flood scenario is sufficient.

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[18] *See* Alabama Power August 4, 2020 Memo.

[19] *Am. Rivers v. FERC*, 187 F.3d 1007, *amended by and denying reh'g*, 201 F.3d 1186 (9th Cir. 1999); *Conservation Law Found. v. FERC*, 216 F.3d 41 (D. C. Cir. 2000).

The data collected as part of the approved studies, including the Downstream Release Alternatives Study, Erosion and Sedimentation Study, Aquatic Resource Study, and Downstream Aquatic Habitat Study, include much of the information that Mr. Denman and Ms. Matthews request with regard to current conditions. The results of Phase 2 of the Downstream Release Alternatives Study that is being conducted currently (during the second study season, April 2020 through April 2021) will also provide information responsive to most of Mr. Denman and Ms. Mathews' requests. The information gained through the approved studies should be adequate to assess the effects of project operation on downstream resources, including erosion and sedimentation and related invasive species effects, fisheries, water quality and use, terrestrial resources, recreation, and cultural resources. Therefore, we do not recommend that Alabama Power conduct Mr. Denman's or Ms. Matthews' requested new studies.

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Determination on Study Modifications

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granddadth@windstream.net <granddadth@windstream.net>; harry.merrill47@gmail.com
<harry.merrill47@gmail.com>; helen.greer@att.net <helen.greer@att.net>;
henry.mealing@kleinschmidtgroup.com <henry.mealing@kleinschmidtgroup.com>; holliman.daniel@epa.gov
<holliman.daniel@epa.gov>; info@aeconline.com <info@aeconline.com>; info@tunica.org <info@tunica.org>;
inspector_003@yahoo.com <inspector_003@yahoo.com>; irapar@centurytel.net <irapar@centurytel.net>;
irwiner@auburn.edu <irwiner@auburn.edu>; j35sullivan@blm.gov <j35sullivan@blm.gov>;
james.e.hathorn.jr@sam.usace.army.mil <james.e.hathorn.jr@sam.usace.army.mil>;
jason.moak@kleinschmidtgroup.com <jason.moak@kleinschmidtgroup.com>; jcandler7@yahoo.com
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<jec22641@aol.com>; jeddins@achp.gov <jeddins@achp.gov>; jefbaker@southernco.com
<jefbaker@southernco.com>; jeff_duncan@nps.gov <jeff_duncan@nps.gov>; jeff_powell@fws.gov
<jeff_powell@fws.gov>; jennifer.l.jacobson@usace.army.mil <jennifer.l.jacobson@usace.army.mil>;
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jkwdurham@gmail.com <jkwdurham@gmail.com>; jlowe@alabama-quassarte.org <jlowe@alabama-
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<joan.e.zehrt@usace.army.mil>; john.free@psc.alabama.gov <john.free@psc.alabama.gov>;
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<jonas.white@usace.army.mil>; josh.benefield@forestry.alabama.gov <josh.benefield@forestry.alabama.gov>;
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kmhunt@maxxsouth.net <kmhunt@maxxsouth.net>; kmo0025@auburn.edu <kmo0025@auburn.edu>;
kodom@southernco.com <kodom@southernco.com>; kpritchett@ukb-nsn.gov <kpritchett@ukb-nsn.gov>;
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<leopoldo_miranda@fws.gov>; lewis.c.sumner@usace.army.mil <lewis.c.sumner@usace.army.mil>;
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<mdollar48@gmail.com>; meredith.h.ladart@usace.army.mil <meredith.h.ladart@usace.army.mil>;
mhpwedowee@gmail.com <mhpwedowee@gmail.com>; mhunter@alabamarivers.org
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midwaytreasures@bellsouth.net <midwaytreasures@bellsouth.net>; mike.holley@dcnr.alabama.gov
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Harris relicensing stakeholders,

Yesterday FERC issue a determination on study modifications for the Harris Project. It can be found on FERC elibrary and on the Harris relicensing website (www.harrisrelicensing.com) in the Relicensing Documents folder.

Thanks,

Angie Anderegg
Hydro Services
(205)257-2251
arsegars@southernco.com

HAT 1 - Final Operating Curve Change Feasibility Analysis Phase 1 Report

APC Harris Relicensing <g2apchr@southernco.com>

Mon 8/31/2020 8:08 PM

To: APC Harris Relicensing <harrisrelicensing@southernco.com>
Bcc: damon.abernethy@dcnr.alabama.gov <damon.abernethy@dcnr.alabama.gov>; robert.a.allen@usace.army.mil <robert.a.allen@usace.army.mil>; lgallen@balch.com <lgallen@balch.com>; arsegars@southernco.com <arsegars@southernco.com>; dkanders@southernco.com <dkanders@southernco.com>; wtanders@southernco.com <wtanders@southernco.com>; brian.atkins@adeca.alabama.gov <brian.atkins@adeca.alabama.gov>; nathan.aycock@dcnr.alabama.gov <nathan.aycock@dcnr.alabama.gov>; jefbaker@southernco.com <jefbaker@southernco.com>; dbronson@charter.net <dbronson@charter.net>; steve.bryant@dcnr.alabama.gov <steve.bryant@dcnr.alabama.gov>; nancyburnes@centurylink.net <nancyburnes@centurylink.net>; richardburnes3@gmail.com <richardburnes3@gmail.com>; wmcampbell218@gmail.com <wmcampbell218@gmail.com>; jcarlee@southernco.com <jcarlee@southernco.com>; kechandl@southernco.com <kechandl@southernco.com>; kmo0025@auburn.edu <kmo0025@auburn.edu>; mcoker@southernco.com <mcoker@southernco.com>; kate.cosnahan@kleinschmidtgroup.com <kate.cosnahan@kleinschmidtgroup.com>; allan.creamer@ferc.gov <allan.creamer@ferc.gov>

HAT 1,

Today, Alabama Power filed the Final Operating Curve Change Feasibility Analysis Phase 1 Report with FERC. This final report can be found on the Harris relicensing website in the HAT 1 folder and on FERC elibrary.

Thanks,

Angie Anderegg
Hydro Services
(205)257-2251
arsegars@southernco.com

APC Harris Relicensing

From: APC Harris Relicensing
Sent: Wednesday, September 16, 2020 8:52 AM
To: james traylor
Subject: RE: HAT 3 - Additional Comments on Aquatic Resources Report

Hi Jimmy,

Harris is operated for flood control in accordance with rules prescribed by the U.S. Army Corps of Engineers. Our intention is to follow those specified rules/operations for all high flow events, including this event.

Those rules do not call for pre-evacuation of the Harris pool. The reason is that significant pre-evacuation can have the impact of exacerbating downstream flooding, when following the rules could have allowed Harris to operate for its flood control purpose and prevent that from happening. Couple that with uncertainties in forecasts, including this event forecast, and it further supports following those prescribed rules.

Thanks,

Angie Anderegg
Hydro Services
(205)257-2251
arsegars@southernco.com

From: james traylor <trayjim@bellsouth.net>
Sent: Tuesday, September 15, 2020 8:47 AM
To: APC Harris Relicensing <g2apchr@southernco.com>
Subject: Re: HAT 3 - Additional Comments on Aquatic Resources Report

Can someone please explain to me why APC is keeping Harris full when we are expecting 8-10" of rain?

What are the intentions of APC?

Jimmy Traylor
Sent from iPhone

> On Sep 3, 2020, at 11:41 AM, APC Harris Relicensing <g2apchr@southernco.com> wrote:
>
> HAT 3,
>
> Below are one additional set of comments on the draft Aquatic Resources Report.
>
> Thanks,

Angie Anderegg
Hydro Services
(205)257-2251
arsegars@southernco.com

From: Donna Matthews <donnamatthews2014@gmail.com>
Sent: Monday, August 31, 2020 4:12 PM
To: APC Harris Relicensing <g2apchr@southernco.com>
Subject: Fwd: Aquatic Life Studies

---------- Forwarded message ---------
From: **Donna Matthews** <donnamatthews2014@gmail.com>
Date: Sat, Aug 29, 2020 at 12:01 AM
Subject: Aquatic Life Studies
To: <arsegars@southercompany.com>

28 Aug 2020
re : P-2628
Aquatic Resources Study

Dear Angie,
Below are my comments on the proposed Aquatic/Bioenergetic studies.

This is a huge and complex area of study, far beyond my scope.
However, I have one major concern:

Given the wide array of study data already available, it seems prudent to design studies built upon previously gleaned knowledge and understanding. This river has been studied for decades. It is known that regulation of rivers including erratic flows and induced temperature variations are detrimental to downstream aquatic life. I saw no mention of previous 'Wisconsin" Bioenergetic Studies in the literature review. If creation of a model adaped for this study is breaking new ground, how is it superior to previous methodologies of *in situ* fish and critter counts at various points along the river? What does it aspire to contribute to the knowledge of the aquatic life, in all its totality, of the Tallapoosa River? What information will it (Bioeneretic Model) provide that other study methods do not? What information is not collected from a bioenergetic study which might be present in biological monitoring studies?

My understanding was the 20 or so level loggers set out last year were to record temp and flow data every 15 minutes. Are the level logger locations being used to collect fish samples for any of the studies? Since the locations of the level loggers are known, they become reference points from which to gather and study species of concern.

Since the data comparing regulated/unregulated temperatures is retrospective sec (3.2.2) are there plans to collect temp and flow data at the study/collection sites? Looking for species of concern at these specific locations will provide clear baseline data available for future scientists.

Constructing a new bioenergetics model to assess aquatic life seems excessive. Adding data to protocols for established aquatic biological monitoring would appear to be the better use of resources and allow better comparison of data from years past going forward.

Sincerely,
Donna Matthews

Harris Relicensing Progress Update

APC Harris Relicensing <g2apchr@southernco.com>

Fri 10/30/2020 5:37 PM

To: APC Harris Relicensing <harrisrelicensing@southernco.com>
Bcc: 1942jthompson420@gmail.com <1942jthompson420@gmail.com>; 9sling@charter.net <9sling@charter.net>; abnoel@southernco.com <abnoel@southernco.com>; allan.creamer@ferc.gov <allan.creamer@ferc.gov>; alpeeple@southernco.com <alpeeple@southernco.com>; amanda.fleming@kleinschmidtgroup.com <amanda.fleming@kleinschmidtgroup.com>; amanda.mcbride@ahc.alabama.gov <amanda.mcbride@ahc.alabama.gov>; amccartn@blm.gov <amccartn@blm.gov>; ammcvica@southernco.com <ammcvica@southernco.com>; amy.silvano@dcnr.alabama.gov <amy.silvano@dcnr.alabama.gov>; andrew.nix@dcnr.alabama.gov <andrew.nix@dcnr.alabama.gov>; arsegars@southernco.com <arsegars@southernco.com>; athall@fujifilm.com <athall@fujifilm.com>; aubie84@yahoo.com <aubie84@yahoo.com>; awhorton@corblu.com <awhorton@corblu.com>; bart_roby@msn.com <bart_roby@msn.com>; baxterchip@yahoo.com <baxterchip@yahoo.com>; bboozer6@gmail.com <bboozer6@gmail.com>; bdavis081942@gmail.com <bdavis081942@gmail.com>; Beason, Jeffrey A. <JABEASON@southernco.com>; beckyrainwater1@yahoo.com <beckyrainwater1@yahoo.com>; bill_pearson@fws.gov <bill_pearson@fws.gov>; blacklake20@gmail.com <blacklake20@gmail.com>; blm_es_inquiries@blm.gov <blm_es_inquiries@blm.gov>; bob.stone@smimail.net <bob.stone@smimail.net>; bradandsue795@gmail.com <bradandsue795@gmail.com>; bradfordt71@gmail.com <bradfordt71@gmail.com>; brian.atkins@adeca.alabama.gov <brian.atkins@adeca.alabama.gov>; bruce.bradford@forestry.alabama.gov <bruce.bradford@forestry.alabama.gov>; bruce@bruceknapp.com <bruce@bruceknapp.com>; bsmith0253@gmail.com <bsmith0253@gmail.com>; btseale@southernco.com <btseale@southernco.com>; butchjackson60@gmail.com <butchjackson60@gmail.com>; bwhaley@randolphcountyeda.com <bwhaley@randolphcountyeda.com>; carolbuggknight@hotmail.com <carolbuggknight@hotmail.com>; celestine.bryant@actribe.org <celestine.bryant@actribe.org>; cengstrom@centurytel.net <cengstrom@centurytel.net>; ceo@jcchamber.com <ceo@jcchamber.com>; cggoodma@southernco.com <cggoodma@southernco.com>; cgnav@uscg.mil <cgnav@uscg.mil>; chad@cleburnecountychamber.com <chad@cleburnecountychamber.com>; chandlermary937@gmail.com <chandlermary937@gmail.com>; chiefknight2002@yahoo.com <chiefknight2002@yahoo.com>; chimneycove@gmail.com <chimneycove@gmail.com>; chris.goodell@kleinschmidtgroup.com <chris.goodell@kleinschmidtgroup.com>; chris.greene@dcnr.alabama.gov <chris.greene@dcnr.alabama.gov>; chris.smith@dcnr.alabama.gov <chris.smith@dcnr.alabama.gov>; chris@alaudubon.org <chris@alaudubon.org>; chuckdenman@hotmail.com <chuckdenman@hotmail.com>; clark.maria@epa.gov <clark.maria@epa.gov>; claychamber@gmail.com <claychamber@gmail.com>; clint.lloyd@auburn.edu <clint.lloyd@auburn.edu>; cljohnson@adem.alabama.gov <cljohnson@adem.alabama.gov>; clowry@alabamarivers.org <clowry@alabamarivers.org>; cmnix@southernco.com <cmnix@southernco.com>; coetim@aol.com <coetim@aol.com>; colin.dinken@kleinschmidtgroup.com <colin.dinken@kleinschmidtgroup.com>; cooper.jamal@epa.gov <cooper.jamal@epa.gov>; coty.brown@alea.gov <coty.brown@alea.gov>; craig.litteken@usace.army.mil <craig.litteken@usace.army.mil>; crystal.davis@adeca.alabama.gov <crystal.davis@adeca.alabama.gov>; crystal.lakewedoweedocks@gmail.com <crystal.lakewedoweedocks@gmail.com>; crystal@hunterbend.com <crystal@hunterbend.com>; dalerose120@yahoo.com <dalerose120@yahoo.com>; damon.abernethy@dcnr.alabama.gov <damon.abernethy@dcnr.alabama.gov>; dbronson@charter.net <dbronson@charter.net>; dcnr.wffdirector@dcnr.alabama.gov <dcnr.wffdirector@dcnr.alabama.gov>; decker.chris@epa.gov <decker.chris@epa.gov>; devridr@auburn.edu <devridr@auburn.edu>; dfarr@randolphcountyalabama.gov <dfarr@randolphcountyalabama.gov>; dhayba@usgs.gov <dhayba@usgs.gov>; djmoore@adem.alabama.gov <djmoore@adem.alabama.gov>; dkanders@southernco.com <dkanders@southernco.com>; donnamat@aol.com <donnamat@aol.com>; doug.deaton@dcnr.alabama.gov <doug.deaton@dcnr.alabama.gov>; dpreston@southernco.com <dpreston@southernco.com>; drheinzen@charter.net <drheinzen@charter.net>; ebt.drt@numail.org <ebt.drt@numail.org>; eddieplemons@charter.net <eddieplemons@charter.net>; eilandfarm@aol.com <eilandfarm@aol.com>; el.brannon@yahoo.com <el.brannon@yahoo.com>; elizabeth-toombs@cherokee.org <elizabeth-toombs@cherokee.org>; emathews@aces.edu <emathews@aces.edu>; eric.sipes@ahc.alabama.gov <eric.sipes@ahc.alabama.gov>; erin_padgett@fws.gov <erin_padgett@fws.gov>; evan.lawrence@dcnr.alabama.gov <evan.lawrence@dcnr.alabama.gov>; evan_collins@fws.gov <evan_collins@fws.gov>; eveham75@gmail.com <eveham75@gmail.com>; fal@adem.alabama.gov <fal@adem.alabama.gov>; fredcanoes@aol.com <fredcanoes@aol.com>; gardenergirl04@yahoo.com <gardenergirl04@yahoo.com>; garyprice@centurytel.net <garyprice@centurytel.net>; gene@wedoweelakehomes.com <gene@wedoweelakehomes.com>; georgettraylor@centurylink.net <georgettraylor@centurylink.net>; gerryknight77@gmail.com <gerryknight77@gmail.com>; gfhorn@southernco.com <gfhorn@southernco.com>; gjobsis@americanrivers.org <gjobsis@americanrivers.org>; gld@adem.alabama.gov <gld@adem.alabama.gov>; glea@wgsarrell.com <glea@wgsarrell.com>; gordon.lisa-perras@epa.gov <gordon.lisa-perras@epa.gov>; 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Harris Relicensing stakeholders,

In the Harris Project Final Study Plans, filed with FERC on May 13, 2019, Alabama Power agreed to file voluntary Progress Updates with FERC in October 2019 and October 2020. The purpose of the Progress Update is to ensure that stakeholders and FERC can review the study progress to date and plan for future reports, meetings, and overall relicensing activities. This is a voluntary action that is not required under the ILP. Alabama Power has filed the October 2020 Progress Update with FERC and posted it to the Harris Project relicensing website: www.harrisrelicensing.com [harrisrelicensing.com] (in the Relicensing Documents folder).

Thanks,

Angie Anderegg
Hydro Services
(205)257-2251
arsegars@southernco.com

Document Accession #: 20201030-5215 Filed Date: 10/30/2020

Alabama Power

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October 30, 2020

VIA ELECTRONIC FILING

Project No. 2628-065
R.L. Harris Hydroelectric Project
Progress Update

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 March 13, 2019[1], Alabama Power filed 10 study plans for FERC approval as part of the Integrated Licensing Process (ILP) for the Harris Project. On April 12, 2019[2], FERC approved Alabama Power's study plans with FERC modifications. Alabama Power filed the Final Study Plans with FERC on May 13, 2019[3] and posted the Final Study Plans to the Harris Project relicensing website at www.harrisrelicensing.com. Alabama Power filed the Initial Study Report along with six Draft Study Reports and two cultural resources documents on April 10, 2020[4].

As part of the May 13, 2019 filing, Alabama Power recognized the complexity of tracking the 10 relicensing studies and committed to filing a voluntary Progress Update with FERC in October 2019 and October 2020. Alabama Power filed the 2019 Progress Update on October 30, 2019[5]. The purpose of this Progress Update (Attachment A) is to ensure that stakeholders and FERC can review the study progress to date and plan for future reports, meetings, and overall relicensing activities. This is a voluntary action that is not required under the ILP. A summary of the Harris Project relicensing activities for the six established Harris Action Teams (HAT) and their associated studies from April 10, 2020 to date is outlined in the Progress Update. Alabama Power will post this 2020 Progress Update to the Harris Project relicensing website. The current HAT distribution lists are included as Attachment B.

[1] Accession No. 20190313-5060
[2] Accession No. 20190412-3000
[3] Accession No. 20190513-5093
[4] Accession No. 20200410-5084
[5] Accession No. 20191030-5053

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

Sincerely,

Angela Anderegg

Angie Anderegg
Harris Relicensing Project Manager

Attachments (2)

cc: Harris Stakeholder List

Attachment A
October 2020 Harris Project Progress Update

Document Accession #: 20201030-5215 Filed Date: 10/30/2020

HARRIS PROGRESS UPDATE REPORT

R.L. HARRIS HYDROELECTRIC PROJECT

FERC NO. 2628

Prepared for:

Alabama Power Company

Prepared by:

Kleinschmidt Associates

October 2020

harrisrelicensing.com

TABLE OF CONTENTS

1.0 INTRODUCTION

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 June 1, 2018, Alabama Power filed a Pre-Application Document and began the Integrated Licensing Process (ILP) for the Harris Project[1].

On November 13, 2018, Alabama Power filed ten proposed study plans for the Harris Project. FERC issued a Study Plan Determination on April 12, 2019, which included FERC staff recommendations. Alabama Power incorporated FERC's recommendations and filed the Final Study Plans with FERC on May 13, 2019[2]. Based upon FERC's prior comments and as part of the Final Study Plans, Alabama Power incorporated within each study plan's schedule a milestone to file a voluntary Progress Update in October 2019 and October 2020. This Progress Update is designed to inform stakeholders and FERC of the study progress, future reports, Harris Action Team (HAT) meetings, and overall relicensing activities.

Three activities apply to all the HATs that are described here: the Initial Study Report (ISR), ISR Meeting, and the ISR Meeting Summary. On April 10, 2020, Alabama Power filed the ISR[3] along with six Draft Study Reports and two cultural resources documents. Alabama Power held an ISR Meeting with stakeholders and FERC on April 28, 2020 and filed the ISR Meeting Summary on May 12, 2020[4]. Comments on the ISR and ISR Meeting Summary were due June 11, 2020. On July 10, 2020, Alabama Power filed its response to questions/comments on the ISR and additional studies/study modifications for the Harris Project.[5]

On August 10, 2020, FERC sent a letter to Alabama Power discussing the Determination on Requests for Study Modifications for the R.L. Harris Hydroelectric Project[6]. In that letter, FERC recommended that Alabama Power conduct a new study titled Battery Energy Storage System (BESS). FERC recommended that the BESS study be conducted with the

[1] Accession No. 20180601-5125
[2] Accession No. 20190513-5093
[3] Accession No. 20200410-5084
[4] Accession No. 20200512-5083
[5] Accession No. 20200710-5122
[6] Accession No. 20200810-3007

Downstream Release Alternative Study and include at least two new release alternatives: (a) a 50 percent reduction in peak releases associated with installing one 60 MW battery unit, and (b) a proportionately smaller reduction in peak releases associated with installing a smaller MW battery unit (i.e., 5, 10 or 20 MW battery). FERC further recommended that Alabama Power include in its cost estimates for installing a BESS, any specific structural changes, any changes in turbine-generator units, and costs needed to implement each battery storage type. Finally, FERC recommended that, consistent with the Downstream Release Alternative Study Plan, Alabama Power evaluate how each of the release alternatives (i.e., items (a) and (b) above) would affect recreation and aquatic resources in the Harris Project reservoir and downstream. Alabama Power is conducting the BESS study as recommended by FERC and will prepare and file a BESS report in first quarter 2021.

Sections 2-7 of this Progress Report summarize the relicensing activities of the six established HATs from the ISR filing to date.

2.0 HAT 1 – PROJECT OPERATIONS

2.1 DOWNSTREAM RELEASE ALTERNATIVES STUDY PLAN

- Alabama Power downloaded the lever logger data and incorporated these data into the HEC-RAS (Hydrologic Engineering Center's River Analysis System) model.
- Alabama Power filed the Draft *Downstream Release Alternatives Phase 1 Report* on April 10, 2020[7] with comments due June 11, 2020. This report was also distributed to the HAT 1 (Project Operations) participants and posted on the Harris Relicensing website at www.harrisrelicensing.com.
- Alabama Power filed the Final *Downstream Release Alternatives Phase 1 Report* on July 27, 2020[8]. This report was also distributed to the HAT 1 participants and posted on the Harris Relicensing website at www.harrisrelicensing.com.
- As noted in the Alabama Power Response to ISR Disputes or Requests for Modifications of Study Plan filed on July 10, 2020 and recommended in FERC's August 10, 2020 Determination on Study Modifications, Alabama Power is analyzing additional downstream releases and using qualitative and quantitative data to identify potential resource impacts from changes in the downstream releases. Alabama Power will present this information in the Phase 2 Report. The Draft Phase 2 report will be filed on or before April 12, 2021.

2.2 OPERATING CURVE CHANGE FEASIBILITY ANALYSIS STUDY PLAN

- Alabama Power filed the Draft *Operating Curve Change Feasibility Analysis Phase 1 Report* on April 10, 2020[9] with comments due June 11, 2020. This report was also distributed to the HAT 1 (Project Operations) participants and posted on the Harris Relicensing website at www.harrisrelicensing.com.
- Alabama Power hosted a HAT 1 meeting on June 4, 2020, to present the methodologies for analyzing how structures on Lake Harris and downstream

[7] Accession No. 20200410-5069
[8] Accession No. 20200727-5088
[9] Accession No. 20200410-5086

of Harris Dam might be affected by the proposed winter operating curve alternatives and posted the meeting summary on the Harris Relicensing website at www.harrisrelicensing.com.

- Alabama Power filed the Final *Operating Curve Change Feasibility Analysis Phase 1 Report* on August 31, 2020[10]. This report was also distributed to the HAT 1 participants and posted on the Harris Relicensing website at www.harrisrelicensing.com.
- Alabama Power is analyzing qualitative and quantitative data in Phase 2 to identify potential resource impacts from a change in the operating curve. The Draft Phase 2 report will be filed on or before April 12, 2021.

[10] Accession No. 20200831-5339

3.0 HAT 2 – WATER QUALITY AND USE

3.1 EROSION AND SEDIMENTATION STUDY PLAN

- Alabama Power distributed the Draft *Erosion and Sedimentation Study Report* to HAT 2 (Water Quality and Use) participants for review on March 18, 2020. Alabama Power provided this report to HAT 2 participants prior to the official ISR comment period to allow additional time for review.
- Alabama Power filed the Draft *Erosion and Sedimentation Study Report* on April 10, 2020[11] with comments due June 11, 2020. This report was also distributed to the HAT 2 participants and posted on the Harris Relicensing website at www.harrisrelicensing.com.
- Alabama Power posted the videos associated with the *Tallapoosa River High Definition Stream Survey Final Report* on the Harris Relicensing website at www.harrisrelicensing.com.
- Alabama Power facilitated obtaining from a stakeholder copies of various images of the Tallapoosa River pre-Harris Dam and post-construction. Alabama Power filed these images as Consultation Regarding Historic Photographs of the Tallapoosa River with FERC on August 4, 2020[12]. These photos were also posted to the Harris Relicensing website at www.harrisrelicensing.com.
- Alabama Power performed additional reconnaissance at identified sedimentation sites on Lake Harris during full (summer) pool conditions to determine if any nuisance aquatic vegetation is present and will provide the results of that assessment to HAT 2 participants in the form of a technical memorandum on or before April 12, 2021.
- Alabama Power will file the Final *Erosion and Sedimentation Study Report* on or before April 12, 2021.

[11] Accession No. 20200410-5091
[12] Accession No. 20200804-5252

3.2 WATER QUALITY STUDY PLAN

- Alabama Power distributed the *Draft Water Quality Study Report* to HAT 2 participants for review on March 11, 2020. Alabama Power provided this report to HAT 2 participants prior to the official ISR comment period to allow additional time for review.
- Alabama Power filed the *Draft Water Quality Study Report* on April 10, 2020[13] with comments due June 11, 2020. This report was also distributed to the HAT 2 participants and posted on the Harris Relicensing website at www.harrisrelicensing.com.
- As filed in the Response to ISR Disputes or Requests for Modifications of Study Plan on July 10, 2020, Alabama Power is collecting additional water quality data in 2020 and 2021 as requested by Alabama Rivers Alliance and other stakeholders.
- To collect dissolved oxygen and water temperature data in 2020, Alabama Power installed the continuous monitor on May 4, 2020, following the ISR meeting. The generation monitor was installed on June 1, 2020, to align with the monitoring season start date in the Water Quality Study Plan.
- Alabama Power will collect water quality data at both locations in 2021 (from March 1 – June 30, 2021 at the continuous monitor and June 1 – June 30, 2021 at the generation monitor) to include in the Final License Application (FLA).
- Alabama Power will file the Final *Water Quality Study Report* on or before April 12, 2021.

[13] Accession No. 20200410-5095

4.0 HAT 3 – FISH AND WILDLIFE

4.1 AQUATIC RESOURCES STUDY PLAN

- Alabama Power hosted a HAT 3 (Fish and Wildlife) meeting on June 2, 2020. Auburn University presented its research to date and informed meeting participants of remaining work on the Aquatic Resources Study. Alabama Power posted the June 2, 2020 HAT 3 meeting summary on the Harris Relicensing website at www.harrisrelicensing.com.
- Auburn has conducted fish sampling in May, July, and September 2020 and will also sample in November 2020.
- Auburn deployed eight acoustic receivers from Harris Dam to Malone to detect overall fish movement and responses and two acoustic receivers at Wadley. Auburn tagged 13 Alabama Bass and 3 Tallapoosa Bass and has also performed manual tracking of these fish. Results of this tagging will be compiled and presented in Auburn's report in 2021.
- Auburn continues to perform static and swimming respirometry testing of target fish species.
- Auburn continues to analyze temperature data and work on the bioenergetics modeling protocols.
- Alabama Power filed the Draft *Aquatic Resources Report* on July 28, 2020[14] with comments due August 28, 2020. This report was also distributed to the HAT 3 participants and posted on the Harris Relicensing website at www.harrisrelicensing.com.
- Alabama Power will host a HAT 3 meeting on November 5, 2020; a meeting agenda was provided to HAT 3 participants on October 16, 2020.
- Alabama Power will file the Final *Aquatic Resources Report* on or before April 12, 2021.

[14] Accession No. 20200728-5120

4.2 Downstream Aquatic Habitat Study Plan

- Alabama Power filed the Draft *Downstream Aquatic Habitat Study Report* on June 30, 2020[15] with comments due August 1, 2020. This report was also distributed to the HAT 3 participants and posted on the Harris Relicensing website at www.harrisrelicensing.com.
- Alabama Power will host a HAT 3 meeting on November 5, 2020; a meeting agenda was provided to HAT 3 participants on October 16, 2020.
- Alabama Power will file the Final *Downstream Aquatic Habitat Report*, including all Geographic Information System (GIS) Shapefiles and HEC-RAS model outputs on or before April 12, 2021.

4.3 Threatened And Endangered (T&E) Species Study Plan

- Alabama Power filed the Draft *Threatened and Endangered Species Desktop Assessment* on April 10, 2020[16] with comments due June 11, 2020. This report was also distributed to the HAT 3 participants and posted on the Harris Relicensing website at www.harrisrelicensing.com.
- In accordance with FERC's Determination on Requests for Study Modifications for the R.L. Harris Hydroelectric Project, Alabama Power conducted additional field surveys for Threatened & Endangered species and/or their potentially suitable habitat based on ongoing consultation with the United States Fish and Wildlife Service (USFWS), Alabama Department of Conservation and Natural Resources (ADCNR), and Alabama Natural Heritage Program.
- Alabama Power will host a HAT 3 meeting on November 5, 2020; a meeting agenda was provided to HAT 3 participants on October 16, 2020.

  Alabama Power will provide documentation of consultation in the Final *Threatened and Endangered Species Report*, which will be filed in January 2021.

[15] Accession No. 20200630-5200
[16] Accession No. 20200410-5094

5.0 HAT 4 – PROJECT LANDS

5.1 PROJECT LANDS EVALUATION STUDY PLAN

- Alabama Power filed the Draft *Phase 1 Project Lands Evaluation Study Report* on April 10, 2020[17] with comments due June 11, 2020. This report was also distributed to the HAT 4 (Project Lands) participants and posted on the Harris Relicensing website at www.harrisrelicensing.com.
- Alabama Power filed the Final *Phase 1 Project Lands Evaluation Study Report* on October 2, 2020[18]. This report was also distributed to the HAT 3 participants and posted on the Harris Relicensing website at www.harrisrelicensing.com.
- Spring and summer fieldwork at the Flat Rock botanical area was completed, and researchers are planning one additional site visit to document any remaining plant species that bloom in late autumn. To date, 403 species have been documented from the Flat Rock botanical area. Researchers will submit a draft report in December 2020 on the additional research at the Flat Rock Botanical area, and a final report in Q1 2021; this report will be included in the Updated Study Report.
- On October 5, 2020, Alabama Power distributed the Final *Project Lands Evaluation Study Report* as well as a Draft Shoreline Management Plan (SMP) and Draft Wildlife Management Plan (WMP) Annotated Outline to HAT 4 for review and comment.
- Alabama Power held a HAT 4 meeting on October 19, 2020 to review and discuss the Draft SMP and WMP outline. A meeting summary was distributed to HAT 4 participants and posted on the Harris relicensing website at www.harrisrelicensing.com.
- Phase 2 of the Project Lands Evaluation Study will use the Phase 1 evaluation information, as well as results from other studies, to develop a WMP and a SMP, and draft versions of both plans will be filed with the FLA.

[17] Accession No. 20200410-5092
[18] Accession No. 20201002-5139

6.0 HAT 5 – RECREATION

6.1 RECREATION EVALUATION STUDY PLAN

- In the April 10, 2020 ISR, Alabama Power noted a variance in the Recreation Evaluation Study Plan due to the additional study elements and an extended deadline for landowners and the public to participate in the recreation surveys. Alabama Power noted a variance for filing the Draft *Recreation Evaluation Study Report* in August 2020 rather than in April 2020. FERC concurred with this variance on August 10, 2020.
- Alabama Power held a HAT 5 (Recreation) meeting on June 4, 2020 to present the methodologies for analyzing how structures on Lake Harris might be affected by the proposed winter operating curve alternatives and posted the HAT 5 meeting summary on the Harris Relicensing website at www.harrisrelicensing.com.
- Alabama Power filed the Draft *Recreation Evaluation Study Report* on August 24, 2020[19] with comments due September 30, 2020. This report was also distributed to the HAT 5 participants and posted on the Harris Relicensing website at www.harrisrelicensing.com.
- Alabama Power hosted a HAT 5 meeting on October 19, 2020 to present the methodology for analyzing boatable flows in the Tallapoosa River and present initial recreation protection, mitigation and enhancement measures and posted the meeting summary on the Harris Relicensing website at www.harrisrelicensing.com.
- Alabama Power will file the Final *Recreation Evaluation Study Report* in November 2020.

[19] Accession No. 20200824-5241

7.0 HAT 6 – CULTURAL RESOURCES

7.1 CULTURAL RESOURCES PROGRAMMATIC AGREEMENT AND HISTORIC PROPERTIES MANAGEMENT PLAN STUDY PLAN

- Alabama Power filed the Inadvertent Discovery Plan (IDP) and Traditional Cultural Properties (TCP) Identification Plan on April 10, 2020[20] with comments due June 11, 2020. These documents were also distributed to the HAT 6 (Cultural Resources) participants and posted on the Harris Relicensing website at www.harrisrelicensing.com.
- In the April 10, 2020 ISR, Alabama Power noted a variance in the Cultural Resources Programmatic Agreement and Historic Properties Management Plan Study Plan to finalize and file the Area of Potential Effects (APE) and associated consultation by June 30, 2020 (revised from April 2020).
- Alabama Power distributed the Draft *Harris Project Area of Potential Effects Report* to HAT 6 on May 15, 2020 and posted the report on the Harris Relicensing website at www.harrisrelicensing.com.
- Alabama Power held a HAT 6 meeting on May 28, 2020, to discuss the Draft *Harris Project Area of Potential Effects Report* and review the status of the cultural resources surveys. Stakeholders comments were due June 15, 2020.
- Alabama Power posted a public version of the May 28, 2020 HAT 6 meeting summary on the Harris Relicensing website at www.harrisrelicensing.com; however, due to the privileged information discussed in the meeting, distribution of some of the meeting materials were limited.
- On June 18, 2020, the Alabama State Historic Preservation Office (SHPO) concurred with the Harris Project APE as defined by Alabama Power.
- Alabama Power filed the Final *Harris Project Area of Potential Effects Report* on June 29, 2020[21].
- On August 11, 2020, FERC found Alabama Power's proposed APE for the Harris Project appropriate[22].

[20] Accession Nos. 20200410-5067, 20200410-5068
[21] Accession No. 20200629-5328
[22] Accession No. 20200811-3007

- Alabama Power and the Office of Archeological Research (OAR) completed approximately 80 percent of all of the preliminary archeological assessments (96 sites) around Lake Harris. The remaining 20 percent will be completed as the water level of Lake Harris lowers in the winter months of 2020-2021 and the necessary shoreline is accessible.
- Alabama Power and OAR completed cultural resources assessments at Skyline (30 sites). In addition, OAR finished approximately 90 percent of the cave art survey sample in Skyline (14 caves were investigated, and OAR will reevaluate 3 cave sites).
- Alabama Power and OAR continue TCP consultation with the Muscogee (Creek) Nation. To date, there have been seven discussions.

  OAR identified known cultural resources sites in the Tallapoosa River downstream of Harris Dam. Alabama Power and OAR are evaluating effects on cultural resources due to any changes in Harris Project operations.

Attachment B
Harris Action Team Distribution Lists

HAT 1 – Project Operations

Full Name	Company
Damon Abernethy	Alabama Department of Conservation and Natural Resources
Bob Allen	U.S. Army Corps of Engineers
Brian Atkins	Alabama Department of Economic and Community Affairs
Nathan Aycock	Alabama Department of Conservation and Natural Resources
Richard Bronson	Stakeholder
Steve Bryant	Alabama Department of Conservation and Natural Resources
Nancy Burnes	Lake Wedowee Property Owners Association
Richard Burnes	Property Owner
Matt and Ann Campbell	Stakeholder
Kristie Coffman	Auburn University
Allan Creamer	Federal Energy Regulatory Commission
Doug & Jan Crisp	Stakeholder
Robin Crockett	Stakeholder
Gene Crouch	Keller Williams Realty Group; Lake Wedowee
Jesse Cunningham	Lake Martin HOBO
Dennis Devries	Auburn University
Mike Dollar	Lake Martin HOBO
Jeff Duncan	U.S. National Park Service
Albert Eiland	Property Owner
Todd Fobian	Alabama Department of Conservation and Natural Resources
Steve Forehand	Lake Martin Resource Association
Sylvia French	Lake Wedowee Property Owners Association
Tom Garland	Lake Wedowee Property Owners Association
Lisa Perras Gordon	U.S. Environmental Protection Agency
Chris Greene	Alabama Department of Conservation and Natural Resources
Jennifer Grunewald	U.S. Fish and Wildlife
Andrew Hall	Property Owner
Randall Harvey	U.S. Army Corps of Engineers
Jennifer Haslbauer	Alabama Department of Environmental Management
James Hathorn	U.S. Army Corps of Engineers
Dave Heinzen	Lake Martin HOBO
Keith Henderson	Alabama Department of Conservation and Natural Resources
Mike Holley	Alabama Department of Conservation and Natural Resources
Dan Holliman	U.S. Environmental Protection Agency
Sonja Hollomon	Stakeholder
Martha Hunter	Alabama Rivers Alliance
Elise Irwin	Auburn University
Butch Jackson	Stakeholder

Full Name	Company
Gerrit Jobsis	American Rivers
Chris Johnson	Alabama Department of Environmental Management
Evan Lawrence	Alabama Department of Conservation and Natural Resources
Michael Len	Alabama Department of Environmental Management
Fred Leslie	Alabama Department of Environmental Management
Tom Littlepage	Alabama Department of Economic and Community Affairs
Cindy Lowry	Alabama Rivers Alliance
Matthew Marshall	Alabama Department of Conservation and Natural Resources
Donna Matthews	Stakeholder
Lydia Mayo	U.S. Environmental Protection Agency
Rachel McNamara	Federal Energy Regulatory Commission
David Moore	Alabama Department of Environmental Management
Barry Morris	Lake Wedowee Property Owners Association
Ginny Oxford	Stakeholder
Erin Padgett	U.S. Fish and Wildlife
Mellie Parrish	Stakeholder
Ira Parsons	Lake Wedowee Property Owners Association
Jeff Powell	U.S. Fish and Wildlife
Becky Rainwater	ReMax Lakefront
Mitch Reid	Nature Conservancy
Sarah Salazar	Federal Energy Regulatory Commission
Jerrel Shell	Stakeholder
Barry Smith	Stakeholder
David Smith	Stakeholder
Paul Smith	Stakeholder
Linda Stone	Stakeholder
Chuck Sumner	U.S. Army Corps of Engineers
Monte Terhaar	Federal Energy Regulatory Commission
David Thomas	Stakeholder
David Thompson	Property Owner
John Thompson	Lake Martin Resource Association
George Traylor	Property Owner
Jimmy Traylor	Stakeholder
Steve Traylor	Stakeholder
Jack West	Alabama Rivers Alliance
Jonas White	U.S. Army Corps of Engineers
Russell Wright	Auburn University

HAT 2 – Water Quality and Use

Full Name	Company
Damon Abernethy	Alabama Department of Conservation and Natural Resources
Nathan Aycock	Alabama Department of Conservation and Natural Resources
Steve Bryant	Alabama Department of Conservation and Natural Resources
Nancy Burnes	Lake Wedowee Property Owners Association
Richard Burnes	Property Owner
Matt and Ann Campbell	Stakeholder
Maria Clark	U.S. Environmental Protection Agency
Kristie Coffman	Auburn University
Allan Creamer	Federal Energy Regulatory Commission
Jan and Doug Crisp	Stakeholder
Robin Crockett	Stakeholder
Jesse Cunningham	Lake Martin HOBO
Chris Decker	U.S. Environmental Protection Agency
Chuck Denman	Stakeholder
Jeff Duncan	U.S. National Park Service
Albert Eiland	Property Owner
Todd Fobian	Alabama Department of Conservation and Natural Resources
Steve Forehand	Lake Martin Resource Association
Tom Garland	Lake Wedowee Property Owners Association
Lisa Perras Gordon	U.S. Environmental Protection Agency
Chris Greene	Alabama Department of Conservation and Natural Resources
Evelyn Hammrick	Property Owner
Jennifer Haslbauer	Alabama Department of Environmental Management
Keith Henderson	Alabama Department of Conservation and Natural Resources
Mike Holley	Alabama Department of Conservation and Natural Resources
Dan Holliman	U.S. Environmental Protection Agency
Martha Hunter	Alabama Rivers Alliance
Elise Irwin	Auburn University
Gerrit Jobsis	American Rivers
Chris Johnson	Alabama Department of Environmental Management
Carol Knight	Stakeholder
Michael Len	Alabama Department of Environmental Management
Fred Leslie	Alabama Department of Environmental Management
Cindy Lowry	Alabama Rivers Alliance
Matthew Marshall	Alabama Department of Conservation and Natural Resources
Donna Matthews	Stakeholder
Lydia Mayo	U.S. Environmental Protection Agency
Rachel McNamara	Federal Energy Regulatory Commission

Full Name	Company
Harry Merrill	Stakeholder
David Moore	Alabama Department of Environmental Management
Barry Morris	Lake Wedowee Property Owners Association
Mellie Parrish	Stakeholder
Jerry & Mary Lee Poss	Stakeholder
Mitch Reid	Nature Conservancy
Eric Reutebuch	Auburn University
Sarah Salazar	Federal Energy Regulatory Commission
Amy Silvano	Alabama Department of Conservation and Natural Resources
David Smith	Stakeholder
Monte Terhaar	Federal Energy Regulatory Commission
John Thompson	Lake Martin Resource Association
Jack West	Alabama Rivers Alliance

HAT 3 – Fish and Wildlife

Full Name	Company
Damon Abernethy	Alabama Department of Conservation and Natural Resources
Nathan Aycock	Alabama Department of Conservation and Natural Resources
Steve Bryant	Alabama Department of Conservation and Natural Resources
Matt and Ann Campbell	Stakeholder
Kristie Coffman	Auburn University
Evan Collins	U.S. Fish and Wildlife
Allan Creamer	Federal Energy Regulatory Commission
Robin Crockett	Stakeholder
Chris Decker	U.S. Environmental Protection Agency
Dennis Devries	Auburn University
Jeff Duncan	U.S. National Park Service
Todd Fobian	Alabama Department of Conservation and Natural Resources
Steve Forehand	Lake Martin Resource Association
Tom Garland	Lake Wedowee Property Owners Association
Chris Greene	Alabama Department of Conservation and Natural Resources
Jennifer Grunewald	U.S. Fish and Wildlife
Keith Henderson	Alabama Department of Conservation and Natural Resources
Mike Holley	Alabama Department of Conservation and Natural Resources
Dan Holliman	U.S. Environmental Protection Agency
Martha Hunter	Alabama Rivers Alliance
Elise Irwin	Auburn University
Gerrit Jobsis	American Rivers
Evan Lawrence	Alabama Department of Conservation and Natural Resources
Cindy Lowry	Alabama Rivers Alliance
Matthew Marshall	Alabama Department of Conservation and Natural Resources
Donna Matthews	Stakeholder
Lydia Mayo	U.S. Environmental Protection Agency
Rachel McNamara	Federal Energy Regulatory Commission
Barry Morris	Lake Wedowee Property Owners Association
Chris Oberholster	Birmingham Audubon
Erin Padgett	U.S. Fish and Wildlife
Mellie Parrish	Stakeholder
Bill Pearsons	U.S. Fish and Wildlife
Jeff Powell	U.S. Fish and Wildlife
Mitch Reid	Nature Conservancy
Sarah Salazar	Federal Energy Regulatory Commission
Amy Silvano	Alabama Department of Conservation and Natural Resources
Tricia Stearns	Stakeholder

Full Name	**Company**
Monte Terhaar	Federal Energy Regulatory Commission
Jimmy Traylor	Stakeholder
Steve Traylor	Stakeholder
Jack West	Alabama Rivers Alliance
Pace Wilber	National Oceanic and Atmospheric Administration
Ken Wills	Alabama Glade Conservation Coalition
Russell Wright	Auburn University

HAT 4 – Project Lands

Full Name	Company
Damon Abernethy	Alabama Department of Conservation and Natural Resources
Nathan Aycock	Alabama Department of Conservation and Natural Resources
Matt Brooks	Alabama Law Enforcement Agency
Coty Brown	Alabama Law Enforcement Agency
Steve Bryant	Alabama Department of Conservation and Natural Resources
Matt and Ann Campbell	Stakeholder
Kristie Coffman	Auburn University
Evan Collins	U.S. Fish and Wildlife
Allan Creamer	Federal Energy Regulatory Commission
Robin Crockett	Stakeholder
Gene Crouch	Keller Williams Realty Group; Lake Wedowee
Todd Fobian	Alabama Department of Conservation and Natural Resources
Steve Forehand	Lake Martin Resource Association
Tom Garland	Lake Wedowee Property Owners Association
Keith Gauldin	Alabama Department of Conservation and Natural Resources
Chris Greene	Alabama Department of Conservation and Natural Resources
Jennifer Grunewald	U.S. Fish and Wildlife
Keith Henderson	Alabama Department of Conservation and Natural Resources
Mike Holley	Alabama Department of Conservation and Natural Resources
Martha Hunter	Alabama Rivers Alliance
Elise Irwin	Auburn University
Gerrit Jobsis	American Rivers
Bruce Knapp	Stakeholder
Evan Lawrence	Alabama Department of Conservation and Natural Resources
Cindy Lowry	Alabama Rivers Alliance
Diane Lunsford	Lake Wedowee Property Owners Association
Matthew Marshall	Alabama Department of Conservation and Natural Resources
Donna Matthews	Stakeholder
Lydia Mayo	U.S. Environmental Protection Agency
Allison McCartney	U.S. Bureau of Land Management
Rachel McNamara	Federal Energy Regulatory Commission
Harry Merrill	Stakeholder
Brad Mitchell	Lake Wedowee Property Owners Association
Barry Morris	Lake Wedowee Property Owners Association
Stan Nelson	Nelson and Company
Chris Oberholster	Birmingham Audubon
Erin Padgett	U.S. Fish and Wildlife
Mellie Parrish	Stakeholder

Full Name	Company
Jerry & Mary Lee Poss	Stakeholder
Jeff Powell	U.S. Fish and Wildlife
Mark Prestridge	Randolph County Water Authority
Mitch Reid	Nature Conservancy
Sarah Salazar	Federal Energy Regulatory Commission
Amy Silvano	Alabama Department of Conservation and Natural Resources
Chris Smith	Alabama Department of Conservation and Natural Resources
David Smith	Stakeholder
Glenell Smith	Stakeholder
Paul Smith	Stakeholder
John Sullivan	U.S. Bureau of Land Management
Monte Terhaar	Federal Energy Regulatory Commission
John Thompson	Stakeholder
Jack West	Alabama Rivers Alliance
Ken Wills	Alabama Glade Conservation Coalition

HAT 5 – Recreation

Full Name	Company
Damon Abernethy	Alabama Department of Conservation and Natural Resources
Nathan Aycock	Alabama Department of Conservation and Natural Resources
Matt Brooks	Alabama Law Enforcement Agency
Coty Brown	Alabama Law Enforcement Agency
Matt and Ann Campbell	Stakeholder
Kristie Coffman	Auburn University
Allan Creamer	Federal Energy Regulatory Commission
Robin Crockett	Stakeholder
Jesse Cunningham	Lake Martin HOBO
Mike Dollar	Lake Martin HOBO
Jeff Duncan	U.S. National Park Service
Todd Fobian	Alabama Department of Conservation and Natural Resources
Steve Forehand	Lake Martin Resource Association
Sylvia French	Stakeholder
Tom Garland	Stakeholder
Keith Gauldin	Alabama Department of Conservation and Natural Resources
Chris Greene	Alabama Department of Conservation and Natural Resources
Dave Heinzen	Lake Martin HOBO
Keith Henderson	Alabama Department of Conservation and Natural Resources
Mike Holley	Alabama Department of Conservation and Natural Resources
Sonja Hollomon	Stakeholder
Kevin Hunt	Consultant
Martha Hunter	Alabama Rivers Alliance
Elise Irwin	Auburn University
Butch Jackson	Property Owner
Gerrit Jobsis	American Rivers
Gerry Knight	Stakeholder
Evan Lawrence	Alabama Department of Conservation and Natural Resources
Cindy Lowry	Alabama Rivers Alliance
Matthew Marshall	Alabama Department of Conservation and Natural Resources
Donna Matthews	Stakeholder
Lydia Mayo	U.S. Environmental Protection Agency
Rachel McNamara	Federal Energy Regulatory Commission
Harry Merrill	Stakeholder
Brad Mitchell	Lake Wedowee Property Owners Association
Barry Morris	Lake Wedowee Property Owners Association
Chris Oberholster	Birmingham Audubon
Ginny Oxford	Stakeholder

Full Name	Company
Mellie Parrish	Stakeholder
Ira Parsons	Lake Wedowee Property Owners Association
Jerry and Mary Lee Poss	Stakeholder
Mitch Reid	Nature Conservancy
Sarah Salazar	Federal Energy Regulatory Commission
Chris Smith	Alabama Department of Conservation and Natural Resources
Paul Smith	Stakeholder
Jim Sparrow	Alabama Bass Federation
Tricia Stearns	Stakeholder
Monte Terhaar	Federal Energy Regulatory Commission
Jack West	Alabama Rivers Alliance
Bryant Whaley	Randolph County Economic / Industrial Development

HAT 6 – Cultural Resources

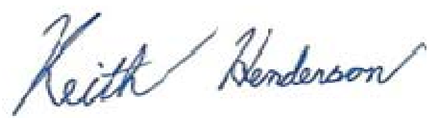
Full Name	Company
Nathan Aycock	Alabama Department of Conservation and Natural Resources
Steve Bryant	Alabama Department of Conservation and Natural Resources
Nancy Burnes	Lake Wedowee Property Owners Association
RaeLynn Butler	Muscogee (Creek) Nation of Oklahoma
Rae-Lynn Butler	Muscogee (Creek) Nation of Oklahoma
Bryant Celestine	Alabama-Coushatta Tribe of Texas
Kristie Coffman	Auburn University
Allan Creamer	Federal Energy Regulatory Commission
Robin Crockett	Stakeholder
Jeff Duncan	U.S. National Park Service
Todd Fobian	Alabama Department of Conservation and Natural Resources
Matthew Gage	Office of Archaeological Research
Chris Greene	Alabama Department of Conservation and Natural Resources
Larry Haikey	Poarch Band of Creek Indians
Evelyn Hamrick	Property Owner
Mike Holley	Alabama Department of Conservation and Natural Resources
Martha Hunter	Alabama Rivers Alliance
Gerrit Jobsis	American Rivers Alliance
Dr. Linda Langley	Coushatta Tribe of Louisiana
Janice Lowe	Alabama Quassarte Tribe
Matthew Marshall	Alabama Department of Conservation and Natural Resources
Donna Matthews	Stakeholder
Janet Maylen	Thlopthlocco Tribal Town
Lydia Mayo	U.S. Environmental Protection Agency
Amanda McBride	Alabama Historical Commission
Allison McCartney	U.S. Bureau of Land Management
Rachel McNamara	Federal Energy Regulatory Commission
Barry Morris	Lake Wedowee Property Owners Association
Karen Pritchett	United Keetoowah Band of Cherokee Indians
Mitch Reid	Nature Conservancy
Sarah Salazar	Federal Energy Regulatory Commission
Eric D. Sipes	Alabama Historical Commission
Barry Smith	Stakeholder
Robin Soweka	Muscogee (Creek) Nation of Oklahoma
John Sullivan	U.S. Bureau of Land Management
Monte Terhaar	Federal Energy Regulatory Commission
Elizabeth Toombs	Tribal Historic Preservation Office Cherokee Nation
Russ Townsend	Eastern Band of Cherokee Indians

Full Name	Company
Jack West	Alabama Rivers Alliance
Lee Anne Wofford	Alabama Historical Commission

From:	Henderson, Keith <Keith.Henderson@dcnr.alabama.gov>
Sent:	Friday, October 30, 2020 12:58 PM
To:	Colin Dinken
Subject:	RE: Lonnie White ramp

You are very welcome!

Sincerely,



Keith Henderson
Fisheries Development Coordinator
Wildlife & Freshwater Fisheries
64 N. Union St., Suite 551
Montgomery, Ala. 36130
Office: (334)-353-7485
Cell: (334)-850-4206
Fax: (334)-242-2061

From: Colin Dinken <Colin.Dinken@Kleinschmidtgroup.com>
Sent: Friday, October 30, 2020 12:55 PM
To: Henderson, Keith <Keith.Henderson@dcnr.alabama.gov>
Subject: RE: Lonnie White ramp

Perfect. Thanks!

From: Henderson, Keith <Keith.Henderson@dcnr.alabama.gov>
Sent: Friday, October 30, 2020 12:54 PM
To: Colin Dinken <Colin.Dinken@Kleinschmidtgroup.com>
Subject: RE: Lonnie White ramp

The ramp (prior to being torn out) extended approximately 15' into the water at low pool. After we are completed the ramp will extend approximately 30' into the water at low pool water levels on a 15% grade. That would put the end of the ramp at approximately 5' deep.

Sincerely,

Keith Henderson

Keith Henderson
Fisheries Development Coordinator
Wildlife & Freshwater Fisheries
64 N. Union St., Suite 551
Montgomery, Ala.   36130
Office: (334)-353-7485
Cell: (334)-850-4206
Fax: (334)-242-2061

From: Colin Dinken <Colin.Dinken@Kleinschmidtgroup.com>
Sent: Friday, October 30, 2020 12:48 PM
To: Henderson, Keith <Keith.Henderson@dcnr.alabama.gov>
Subject: RE: Lonnie White ramp

Ok one more question if you have an answer haha: Do you know about how deep the edge of the concrete slab is for Lonnie White at winter pool or how far that ramp currently extends into the reservoir? Thanks!

From: Henderson, Keith <Keith.Henderson@dcnr.alabama.gov>
Sent: Thursday, October 29, 2020 7:42 AM
To: Colin Dinken <Colin.Dinken@Kleinschmidtgroup.com>
Subject: Re: Lonnie White ramp

You are welcome!

KH

Get Outlook for iOS

From: Colin Dinken <Colin.Dinken@Kleinschmidtgroup.com>
Sent: Wednesday, October 28, 2020 11:30:53 PM
To: Henderson, Keith <Keith.Henderson@dcnr.alabama.gov>
Subject: Re: Lonnie White ramp

Haha yeah that answers everything. For now. Thanks man!

Sent from my iPhone

On Oct 28, 2020, at 12:45 PM, Henderson, Keith <Keith.Henderson@dcnr.alabama.gov> wrote:

To clear up any confusion, the picture on the left is White's Bridge, and the picture on the right is Swagg. At low water White's Bridge (Lonnie White) used to extend about 15' into the water and people were backing off the end of the ramp and damaging equipment. Swagg is short and ends at the water at low pool. We did not build either of those ramps, we just took them over at some point in time. I don't think Swagg is as big of a deal because it is a lower use facility and is obvious that it ends. We were getting more complaints from White's Bridge. We are going to complete at the end of the drawdown due to other projects statewide. We will actually pour the concrete on dry land, let it cure, then push it down into the water. Then pour the rest of the way up the hill to connect into the remaining slab.

Did that answer everything! Ha!

Sincerely,

<image004.png>

Keith Henderson
Fisheries Development Coordinator
Wildlife & Freshwater Fisheries
64 N. Union St., Suite 551
Montgomery, Ala. 36130
Office: (334)-353-7485
Cell: (334)-850-4206
Fax: (334)-242-2061
<image005.jpg>

From: Colin Dinken <Colin.Dinken@Kleinschmidtgroup.com>
Sent: Tuesday, October 27, 2020 2:23 PM
To: Henderson, Keith <Keith.Henderson@dcnr.alabama.gov>
Subject: RE: Lonnie White ramp

I was thinking I had Lonnie White and Swagg confused because it looks like a bunch of people have been using Lonnie but only a few have been using Swagg. Swagg's ramp looks like it ends right at the water's edge during low pool. I'm not sure if the fella pictured just can't back a trailer straight or if he needs to launch that way.
<image001.jpg>
<image002.jpg>

From: Colin Dinken
Sent: Tuesday, October 27, 2020 1:41 PM
To: Henderson, Keith <Keith.Henderson@dcnr.alabama.gov>
Subject: RE: Lonnie White ramp

Ahh I see. I was wondering because on aerial imagery it looks like folks have been using it at low pool, but I guess they've just been backing off the edge of the slab or launching shorter boats. When are those changes supposed to be finished? And just out of curiosity, how do they extend the ramp out 15' without drawing the reservoir down below winter pool? Thanks!

From: Henderson, Keith <Keith.Henderson@dcnr.alabama.gov>
Sent: Tuesday, October 27, 2020 12:41 PM
To: Colin Dinken <Colin.Dinken@Kleinschmidtgroup.com>
Subject: Re: Lonnie White ramp

I think it will be about 15' longer than what it was and some of the launching slab is being replaced in the process.

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From: Henderson, Keith <Keith.Henderson@dcnr.alabama.gov>
Sent: Tuesday, October 27, 2020 12:39:32 PM
To: Colin Dinken <Colin.Dinken@Kleinschmidtgroup.com>
Subject: Re: Lonnie White ramp

We are extending to ramp to make it usable year round.

KH

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From: Colin Dinken <Colin.Dinken@Kleinschmidtgroup.com>
Sent: Monday, October 26, 2020 12:42:06 PM
To: Henderson, Keith <Keith.Henderson@dcnr.alabama.gov>
Subject: Lonnie White ramp

Hey man,

Do you have any specific info on the types of repairs being made to the Lonnie White boat ramp on Harris? It was briefly mentioned during that HAT 5 meeting the other week, but I can't recall anything specific. Thanks!

-Colin

Colin Dinken
Associate Scientist
<image003.gif>
Office: 205-588-4613
www.KleinschmidtGroup.com

HAT 1 Meeting - March 18th

APC Harris Relicensing <g2apchr@southernco.com>
Wed 3/3/2021 9:19 PM

To: APC Harris Relicensing <harrisrelicensing@southernco.com>
Bcc: damon.abernethy@dcnr.alabama.gov <damon.abernethy@dcnr.alabama.gov>; nathan.aycock@dcnr.alabama.gov <nathan.aycock@dcnr.alabama.gov>; steve.bryant@dcnr.alabama.gov <steve.bryant@dcnr.alabama.gov>; todd.fobian@dcnr.alabama.gov <todd.fobian@dcnr.alabama.gov>; chris.greene@dcnr.alabama.gov <chris.greene@dcnr.alabama.gov>; keith.henderson@dcnr.alabama.gov <keith.henderson@dcnr.alabama.gov>; mike.holley@dcnr.alabama.gov <mike.holley@dcnr.alabama.gov>; evan.lawrence@dcnr.alabama.gov <evan.lawrence@dcnr.alabama.gov>; matthew.marshall@dcnr.alabama.gov <matthew.marshall@dcnr.alabama.gov>; brian.atkins@adeca.alabama.gov <brian.atkins@adeca.alabama.gov>; tom.littlepage@adeca.alabama.gov <tom.littlepage@adeca.alabama.gov>; jhaslbauer@adem.alabama.gov <jhaslbauer@adem.alabama.gov>; cljohnson@adem.alabama.gov <cljohnson@adem.alabama.gov>; mlen@adem.alabama.gov <mlen@adem.alabama.gov>; fal@adem.alabama.gov <fal@adem.alabama.gov>; djmoore@adem.alabama.gov <djmoore@adem.alabama.gov>; arsegars@southernco.com <arsegars@southernco.com>; dkanders@southernco.com <dkanders@southernco.com>; wtanders@southernco.com <wtanders@southernco.com>; jefbaker@southernco.com <jefbaker@southernco.com>

HAT 1,

We will have a HAT 1 meeting on **March 18th** from 9:00-3:00 (Central Time) in order to review the results of the Phase 2 analyses of both the Operating Curve Change Feasibility and Downstream Release Alternatives Studies. The agenda and Teams meeting information is below. Let me know if you have any questions.

Thanks,

Angie Anderegg
Hydro Services
(205)257-2251
arsegars@southernco.com

-

Agenda

9:00-11:00 Review results of Downstream Release Alternatives Phase 2 analysis

11:00-1:00 Break for lunch

1:00-3:00 Review results of Operating Curve Change Feasibility Phase 2 analysis

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Microsoft Teams meeting

Join on your computer or mobile app
Click here to join the meeting
Join with a video conferencing device
southerncompany@m.webex.com
Video Conference ID: 112 415 227 9
Alternate VTC dialing instructions
Or call in (audio only)
+1 470-705-0860,,740663097# United States, Atlanta
Phone Conference ID: 740 663 097#
Find a local number | Reset PIN

Meeting Postponed

APC Harris Relicensing <g2apchr@southernco.com>

Wed 3/17/2021 2:44 PM

To: APC Harris Relicensing <harrisrelicensing@southernco.com>
Bcc: damon.abernethy@dcnr.alabama.gov <damon.abernethy@dcnr.alabama.gov>; nathan.aycock@dcnr.alabama.gov <nathan.aycock@dcnr.alabama.gov>; steve.bryant@dcnr.alabama.gov <steve.bryant@dcnr.alabama.gov>; todd.fobian@dcnr.alabama.gov <todd.fobian@dcnr.alabama.gov>; chris.greene@dcnr.alabama.gov <chris.greene@dcnr.alabama.gov>; keith.henderson@dcnr.alabama.gov <keith.henderson@dcnr.alabama.gov>; mike.holley@dcnr.alabama.gov <mike.holley@dcnr.alabama.gov>; evan.lawrence@dcnr.alabama.gov <evan.lawrence@dcnr.alabama.gov>; matthew.marshall@dcnr.alabama.gov <matthew.marshall@dcnr.alabama.gov>; brian.atkins@adeca.alabama.gov <brian.atkins@adeca.alabama.gov>; tom.littlepage@adeca.alabama.gov <tom.littlepage@adeca.alabama.gov>; jhaslbauer@adem.alabama.gov <jhaslbauer@adem.alabama.gov>; cljohnson@adem.alabama.gov <cljohnson@adem.alabama.gov>; mlen@adem.alabama.gov <mlen@adem.alabama.gov>; fal@adem.alabama.gov <fal@adem.alabama.gov>; djmoore@adem.alabama.gov <djmoore@adem.alabama.gov>; arsegars@southernco.com <arsegars@southernco.com>; dkanders@southernco.com <dkanders@southernco.com>; wtanders@southernco.com <wtanders@southernco.com>; jefbaker@southernco.com <jefbaker@southernco.com>

HAT 1,

Given the severe weather forecast for most of the southeast today and throughout tonight and the uncertainty in what the impact may be and how many of us may be without power, we have decided to postpone tomorrow's HAT 1 meeting until **Thursday, April 1** from 9:00-3:00 (Central Time). The agenda will be the same.

I apologize for any inconvenience. Please be weather aware and stay safe!

Angie Anderegg
Hydro Services
(205)257-2251
arsegars@southernco.com

HAT 1,

We will have a HAT 1 meeting on **March 18th** from 9:00-3:00 (Central Time) in order to review the results of the Phase 2 analyses of both the Operating Curve Change Feasibility and Downstream Release Alternatives Studies. The agenda and Teams meeting information is below. Let me know if you have any questions.

Thanks,

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Agenda

9:00-11:00 Review results of Downstream Release Alternatives Phase 2 analysis

11:00-1:00 Break for lunch

1:00-3:00 Review results of Operating Curve Change Feasibility Phase 2 analysis

Microsoft Teams meeting

Join on your computer or mobile app

Click here to join the meeting

Join with a video conferencing device

southerncompany@m.webex.com

Video Conference ID: 112 415 227 9

Alternate VTC dialing instructions

Or call in (audio only)

+1 470-705-0860,,740663097# United States, Atlanta

Phone Conference ID: 740 663 097#

Find a local number

Southern Company

APC Harris Relicensing

From: APC Harris Relicensing
Sent: Wednesday, March 17, 2021 1:23 PM
To: Barry Morris
Subject: RE: Meeting Postponed

Hi Barry,

You're right that the study report won't be ready prior to the April 1 meeting. We have quite a bit that we're working on wrapping up right now in order to meet the April 12 Updated Study Report filing. We will file the full report on that date.

We have been working with Southern Company in-house battery experts to answer the BESS questions, including capital and O&M costs and how the battery would be charged, and will file that info on April 12th as well.

Stay safe today!

Angie Anderegg
Hydro Services
(205)257-2251
arsegars@southernco.com

From: Barry Morris <rbmorris222@gmail.com>
Sent: Wednesday, March 17, 2021 11:45 AM
To: APC Harris Relicensing <g2apchr@southernco.com>
Subject: Re: Meeting Postponed

Angie: Barry Morris with the Lake Wedowee Property Owners Association. Too bad about the postponement. Is it safe to conclude that the HAT 1 Operations Phase 2 Study results will not be available until the April 1 meeting? I'd love to get a pre-read.

Also, it seems to me that installing a 60MW battery won't fix anything unless the company has a way to charge it from a source other than generating from the dam. Maybe charging it overnight with excess steam plant capacity? Dare I ask the cost and cycles/lifespan of a 60MW battery? These are rhetorical questions. Don't worry about having one of the experts give a detailed reply. I'm sure it will be covered in the meeting.

See you (sort of) on April Fools day. Barry

On Wed, Mar 17, 2021 at 9:44 AM APC Harris Relicensing <g2apchr@southernco.com> wrote:

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Find a local number

Southern Company

APC Harris Relicensing

From: Anderegg, Angela Segars
Sent: Monday, March 29, 2021 1:09 PM
To: APC Harris Relicensing
Subject: HAT 1 Meeting - April 1st

HAT 1,

The presentations we will be walking through this Thursday in our HAT 1 meeting are on the relicensing website in the HAT 1 folder: HAT 1 - Project Operations - All Documents (harrisrelicensing.com). Agenda and Teams meeting info is below.

Thanks,

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