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April 10, 2020

VIA ELECTRONIC FILING

Project No. 2628-065
R.L. Harris Hydroelectric Project
Transmittal of the Draft Erosion and Sedimentation 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[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 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 filed its Harris Project Initial Study Report (ISR) on April 10,2020. Concurrently, and consistent with FERC's April 12, 2019 SPD, Alabama Power is filing the Draft Erosion and Sedimentation Study Report (Draft Report) (Attachment 1). This filing also includes the stakeholder consultation for this study beginning May 2019 through March 2020 (Attachment 2). Stakeholders have until June 11, 2020 to submit their comments to Alabama Power on the Draft Report. Comments should be sent directly to harrisrelicensing@southernco.com.

Stakeholders may access the ISR, this Draft Report, and other 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.

[1] Accession Number 20190412-3000

[2] Accession Number 20191030-5053

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 1 – Draft Erosion and Sedimentation Study Report
Attachment 2 – Erosion and Sedimentation Consultation Record (May 2019-March 2020)

cc: Harris Stakeholder List

Attachment 1
Draft Erosion and Sedimentation Study Report

HARRIS DAM
RELICENSING

DRAFT
EROSION AND SEDIMENTATION STUDY REPORT

R. L. HARRIS PROJECT
FERC NO. 2628

Prepared by:

ALABAMA POWER COMPANY
BIRMINGHAM, ALABAMA

Alabama Power

APRIL 2020

DRAFT
EROSION AND SEDIMENTATION STUDY REPORT

R.L. HARRIS PROJECT
FERC NO. 2628

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DRAFT
EROSION AND SEDIMENTATION 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 Company (Alabama Power) is relicensing the 135-megawatt (MW) 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 (Figure 1-1). 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 (Figure 1-2). 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

[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).

lands are leased to, and managed by, the State of Alabama for wildlife management and public hunting and are part of the Skyline WMA (ADCNR 2016b).

For the purposes of this study, "Lake Harris" refers to the 9,870-acre reservoir, adjacent 7,392 acres of Project land, and the dam, spillway, and powerhouse. "Skyline" refers to the 15,063 acres of Project land within the Skyline WMA in Jackson County. "Harris Project" refers to all the lands, waters, and structures enclosed within the FERC Project Boundary, which includes both Lake Harris and Skyline. Harris Reservoir refers to the 9,870-acre reservoir only; Harris Dam refers to the dam, spillway, and powerhouse. The Project Area refers to the land and water in the Project Boundary and immediate geographic area adjacent to the Project Boundary (Alabama Power Company 2018).

Lake Harris and Skyline are located within two river basins: the Tallapoosa and Tennessee River Basins, respectively. The only waterbody managed by Alabama Power as part of their FERC license for the Harris Project is the Harris Reservoir.

Commonly used acronyms that may appear in this report are included in Appendix A.

1.1 STUDY BACKGROUND

During the October 19, 2017 issue identification workshop, several stakeholders noted the location of possible erosion and sedimentation areas at the Harris Project and suggested causes. On November 13, 2018, Alabama Power filed ten proposed study plans for the Harris Project, including a study plan for erosion and sedimentation that included the stakeholder noted locations. 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.

Alabama Power formed the Harris Action Team (HAT) 2 to specifically address erosion and sedimentation issues at Skyline, Lake Harris, and in the Tallapoosa River downstream of Harris Dam that are due to Project operations and/or other causes. Alabama Power distributed an email to HAT 2 participants on May 1, 2019, providing maps of erosion and sedimentation areas identified for evaluation and requesting identification of locations 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 the 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 one additional erosion site in the field assessment.

Although no existing information regarding sedimentation rates or amounts has been identified, Alabama Power has Light Detection and Ranging (LIDAR[2]) data and aerial photography for Lake Harris to assist in evaluating sedimentation issues. In addition, Alabama Power has an Aquatic Vegetation Control group that periodically inspects Lake Harris for nuisance aquatic vegetation. Nuisance aquatic vegetation may occur in areas where excessive sedimentation occurs.

Little Coon Creek, which flows through portions of the Project Boundary at Skyline, is currently included in Alabama's 303(d) impaired waters list due to siltation. The sources of this impairment include non-irrigated crop production and pasture grazing (ADEM 2018).

The goals of this study are to identify any problematic erosion sites and sedimentation areas and determine the likely causes.

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

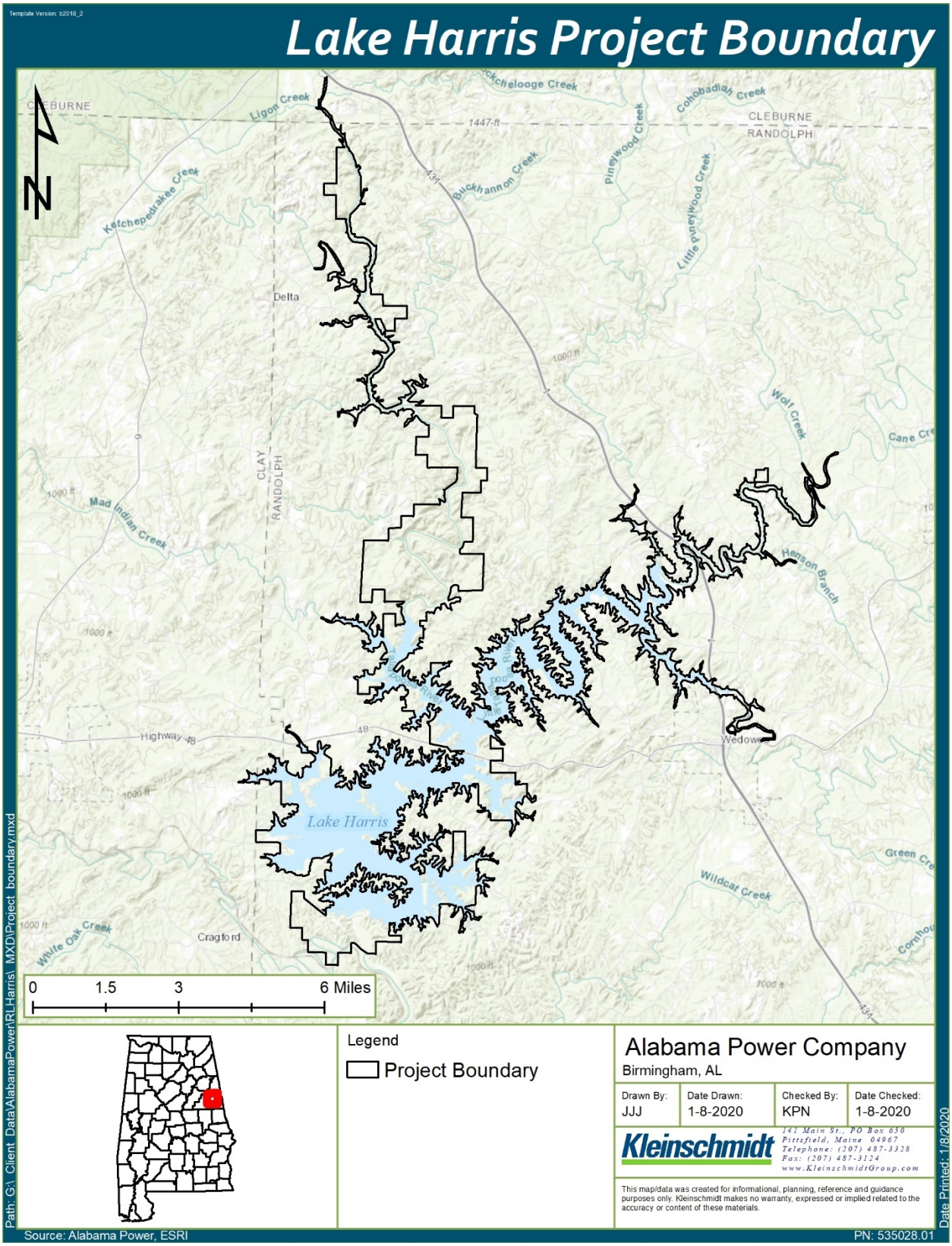

FIGURE 1-1 LAKE HARRIS PROJECT BOUNDARY

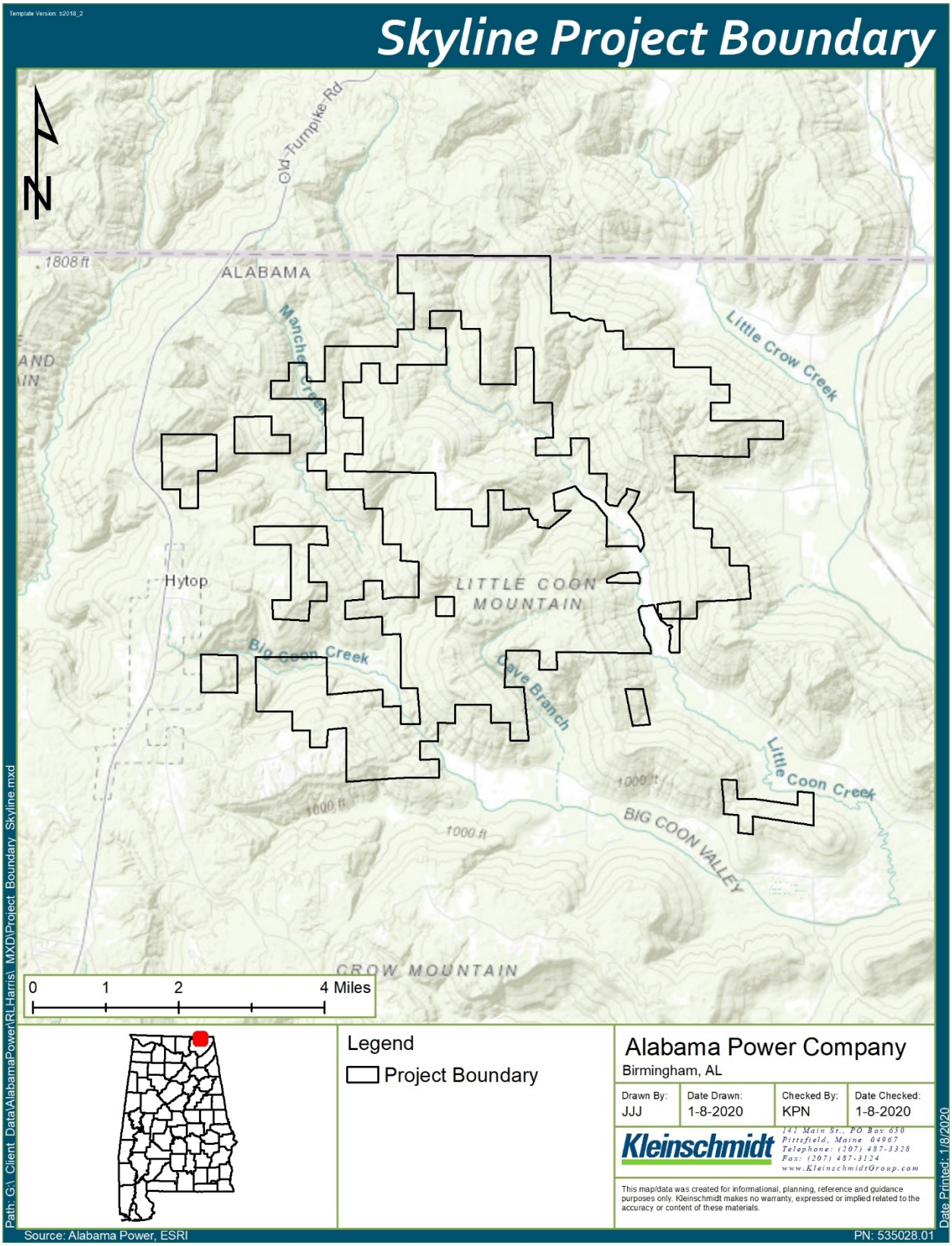

FIGURE 1-2 SKYLINE PROJECT BOUNDARY

2.0 LAKE HARRIS

2.1 METHODS

Erosion and sedimentation sites identified by stakeholders were investigated in December 2019 (Figures 2-1 to 2-5). Each site was photographed, georeferenced, and examined, either in the field or via aerial imagery analysis, to determine the cause of erosion: Harris Project operations, land disturbance (development), or natural processes. Erosion site assessments were completed under the direction of a qualified Erosion and Sediment Control Professional. A soil scientist also provided a Quality Assurance/Quality Control (QA/QC) during the erosion site inventory. Credentials for individuals who performed the assessments are presented in Appendix B. A site evaluation form, as approved by HAT 2 and subsequently provided as an appendix to the FERC-approved study plan, was used to perform and document the assessments and included the following components.

- Location: Each assessed site was assigned a unique identification number along with Global Positioning System (GPS) coordinates.
- Position in Landscape: the general position of the site relative to dominant landscape features.
- Physical Properties: the length, width, shape, and slope of the site.
- Erosion Process: the mode of erosion.
- Adjacent Land Use and Vegetative Cover: classification of the predominant adjacent land use and type/extent of vegetation.
- Hydrologic Impact information: classification of when/if the erosion occurs during extreme flooding, above normal water levels, or within the range of normal water levels.
- Description of the exposed soils.
- General comments about the erosion site.
- Potential cause(s) of erosion/sedimentation.

Sedimentation areas were identified by stakeholders and by examining available satellite imagery/aerial photography and LIDAR data. The LIDAR and historical satellite/aerial imagery data were analyzed using GIS to identify elevation or contour changes around the reservoir to identify areas of sediment accumulation.

The GIS analysis was supported by field observations to verify sedimentation areas. Each of these areas will be surveyed for nuisance aquatic vegetation during the 2020 growing season.

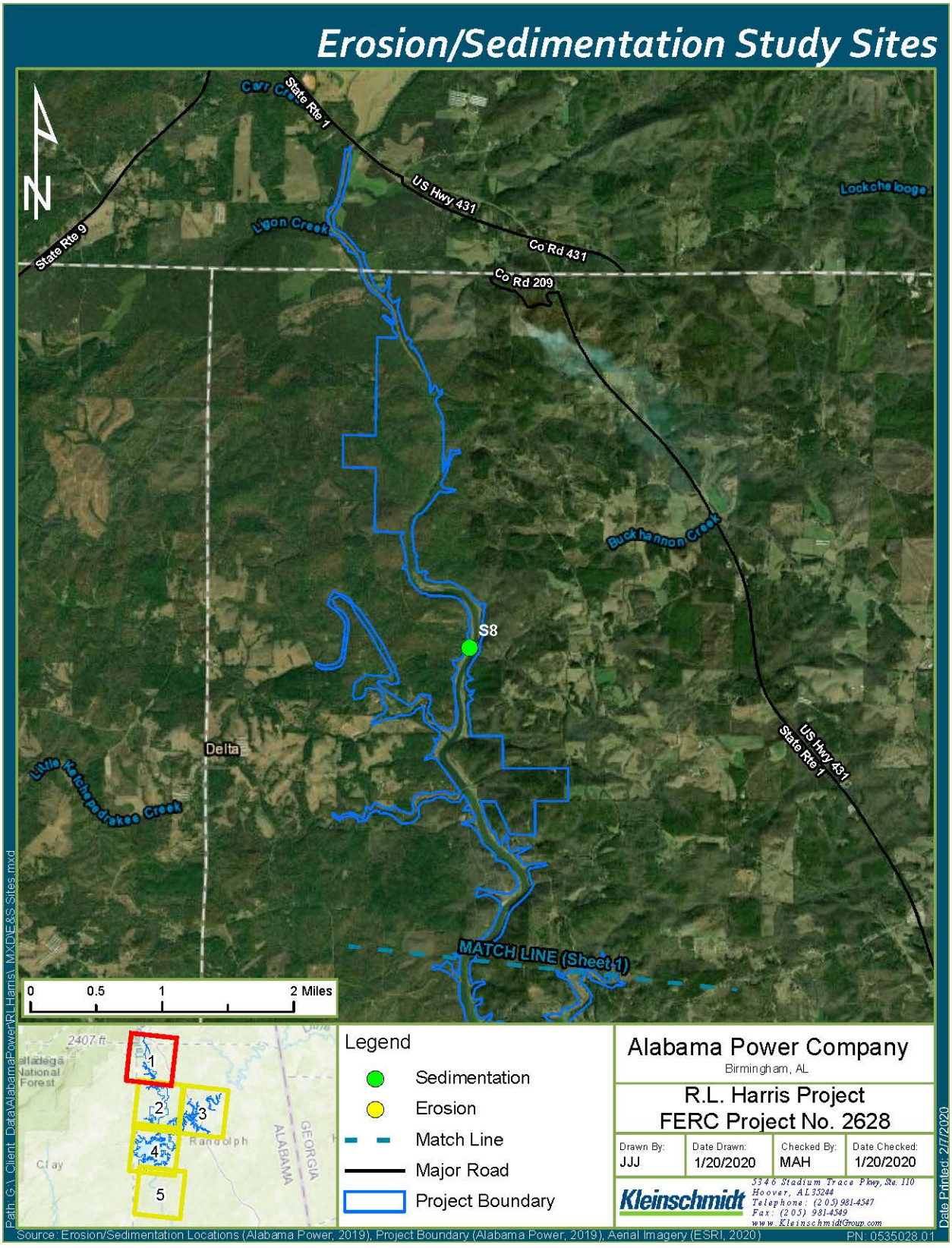

FIGURE 2-1 LAKE HARRIS EROSION AND SEDIMENTATION SITES

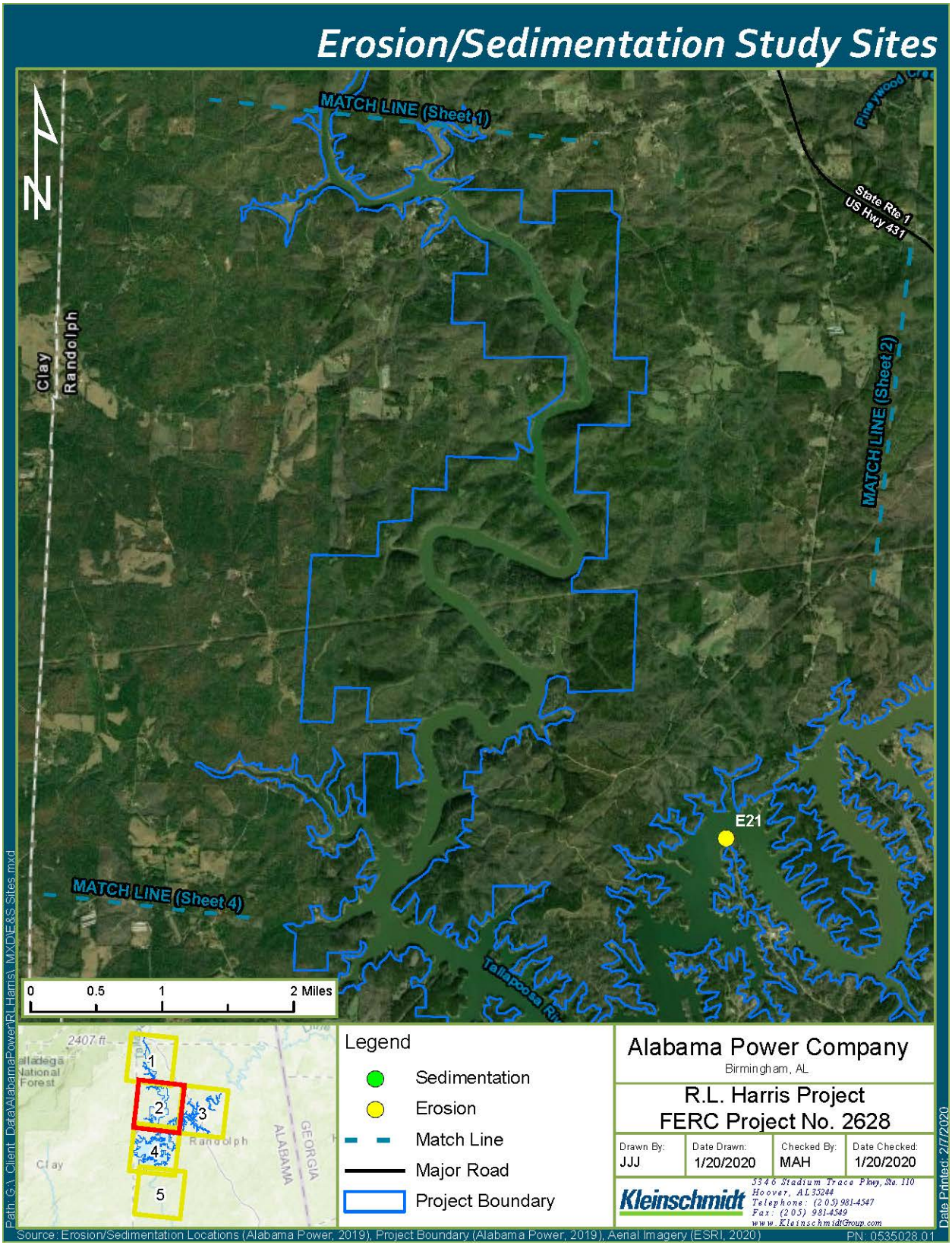

FIGURE 2-2 LAKE HARRIS EROSION AND SEDIMENTATION SITES

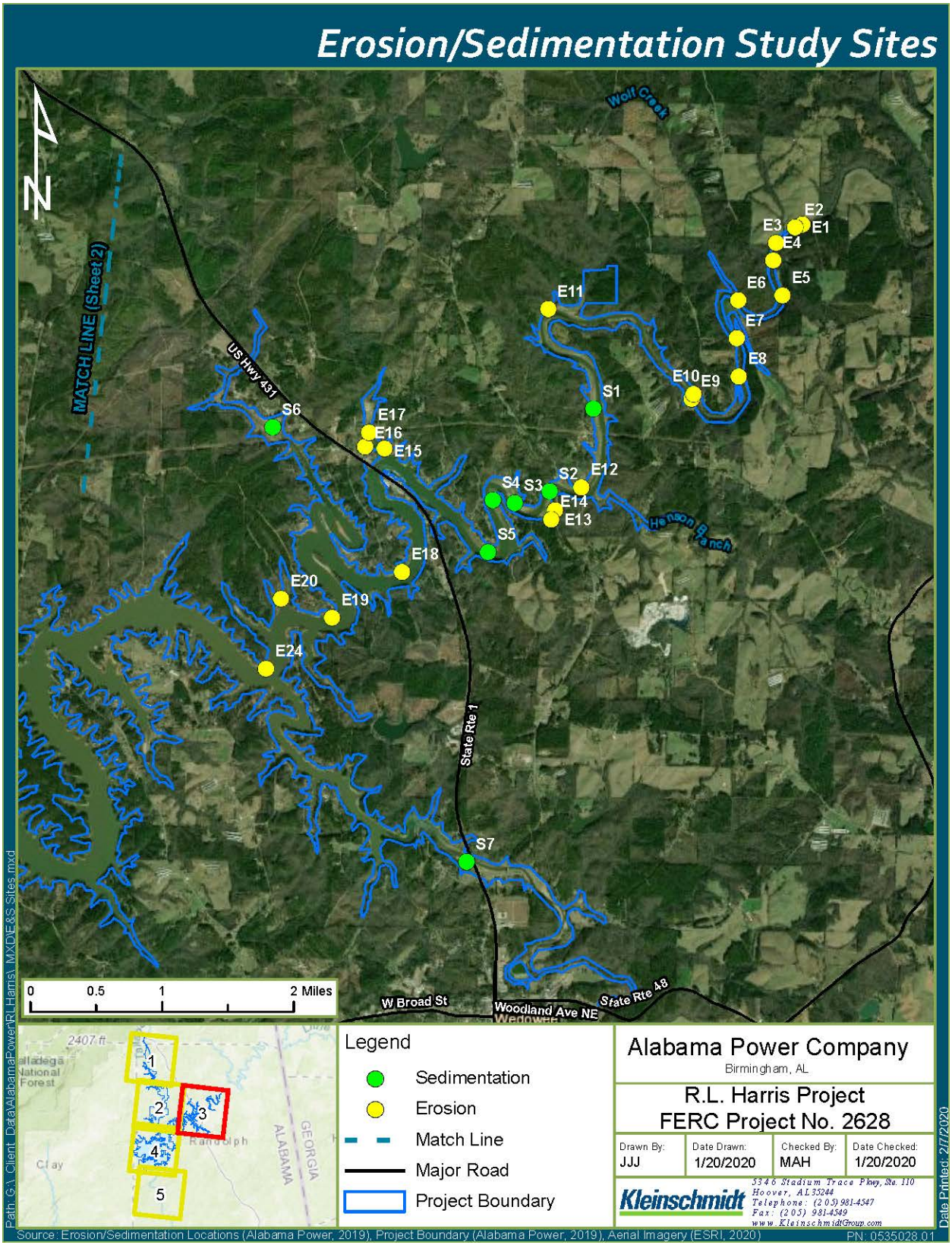

FIGURE 2-3 LAKE HARRIS EROSION AND SEDIMENTATION SITES

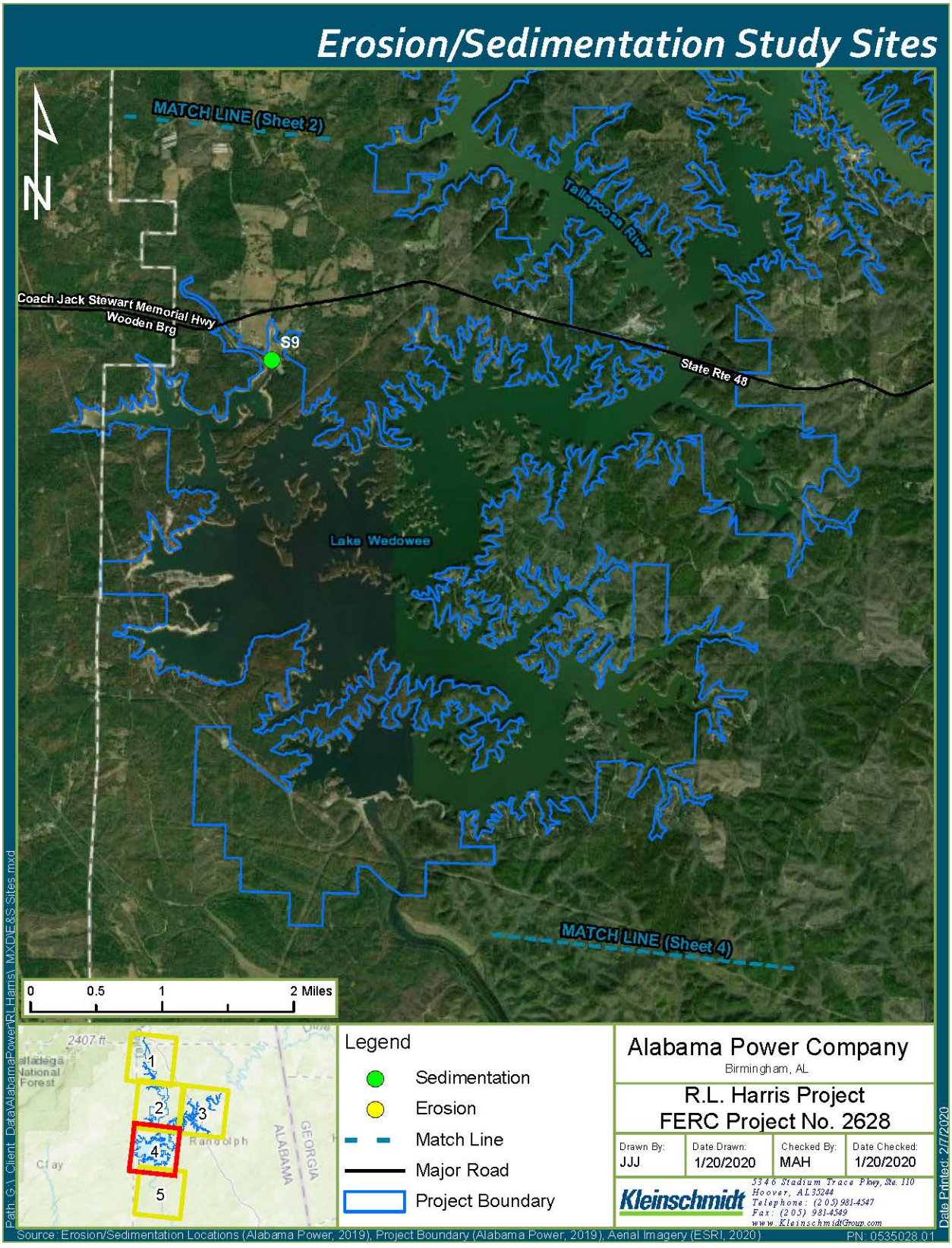

FIGURE 2-4 LAKE HARRIS EROSION AND SEDIMENTATION SITES

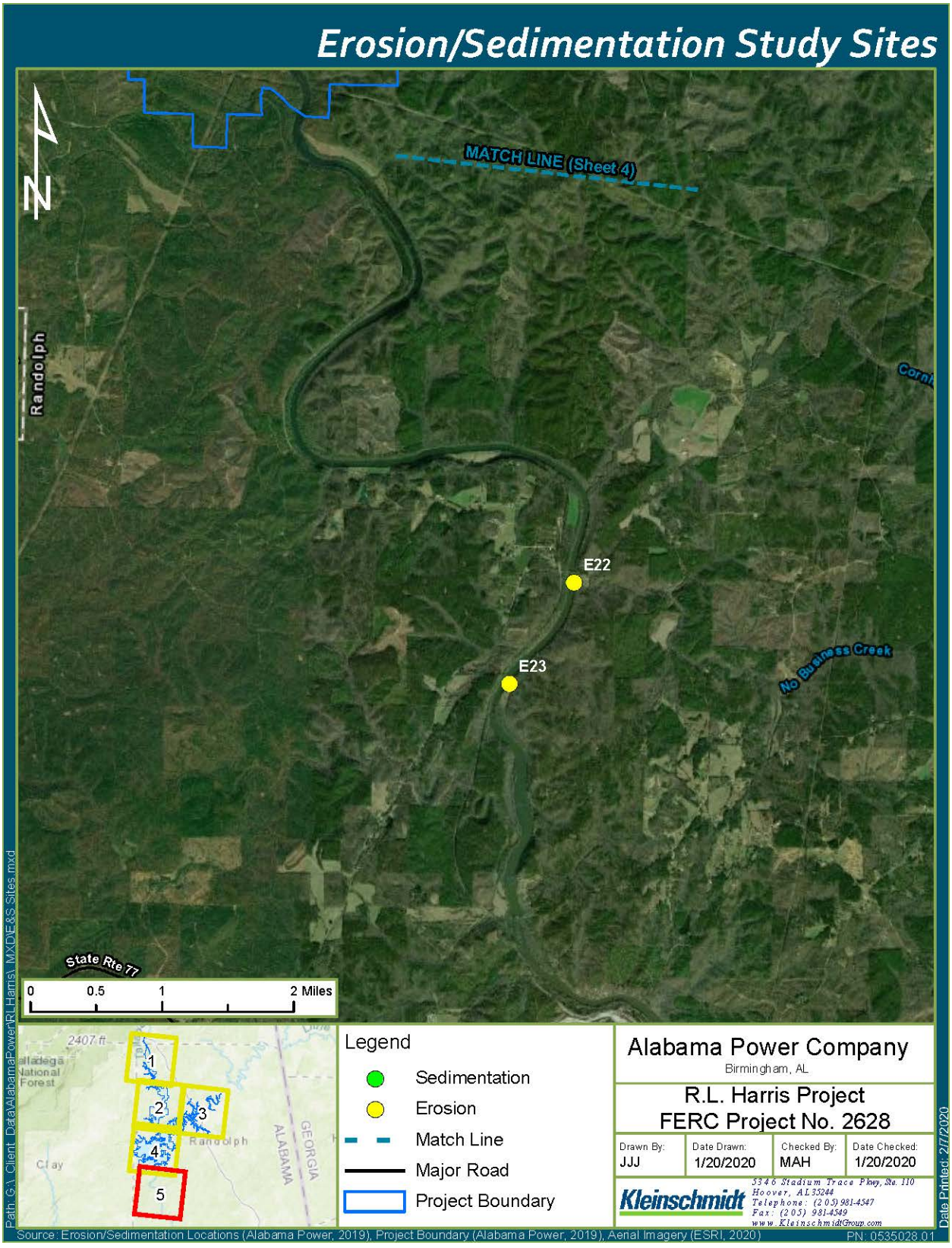

FIGURE 2-5 TALLAPOOSA RIVER EROSION SITES

2.2 RESULTS

2.2.1 EROSION SURVEY

Twenty-four erosion sites were identified for field assessment, and field assessments were conducted in December 2019. Each site was photographed and examined to determine the cause of erosion. Table 2-1 summarizes the findings. No significant signs of active erosion were present at eight of the twenty-four sites (E6, E11, E12, E13, E15, E16, E17, and E20). Copies of the completed site evaluation forms are provided in Appendix C. Photographs of each erosion site are included in Appendix D.

TABLE 2-1 SUMMARY OF LAKE HARRIS EROSION SITE ASSESSMENT

Erosion Site	Latitude	Longitude	Potential Cause of Erosion/ Sedimentation	Length (ft)	Width (ft)	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
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	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

Erosion Site	Latitude	Longitude	Potential Cause of Erosion/ Sedimentation	Length (ft)	Width (ft)	Description of Exposed Soils	Adjacent Land Use
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
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

2.2.2 SEDIMENTATION SURVEY

Nine sedimentation areas were identified by stakeholders and by examining available satellite imagery/aerial photography and LIDAR data using GIS (Figure 2-6 to Figure 2-9) (Table 2-2). The identified sedimentation areas were limited to areas exposed during the winter pool draw-down due to limitations of LIDAR in measuring below water surfaces, therefore, approximate surface area for each of the identified sedimentation area were measured using contours established in a 2015 LIDAR survey of the lake during the draw down. 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. Each of these areas will be surveyed for nuisance aquatic vegetation during the 2020 growing season. This visit coincided the erosion survey effort. Site evaluation sheets and photos can be found in Appendices B and C, respectively.

TABLE 2-2 SEDIMENTATION AREAS AND APPROXIMATE SIZE

Name	Latitude	Longitude	Acreage
S1	33.37625	-85.4717	23.83
S2	33.3672	-85.4775	4.96
S3	33.3659	-85.4821	10.51
S4	33.36622	-85.485	5.49
S5	33.36051	-85.4856	6.68
S6	33.37432	-85.5138	13.55
S7	33.32641	-85.4885	26.14
S8	33.45383	-85.6098	10.59
S9	33.30647	-85.6286	18.25

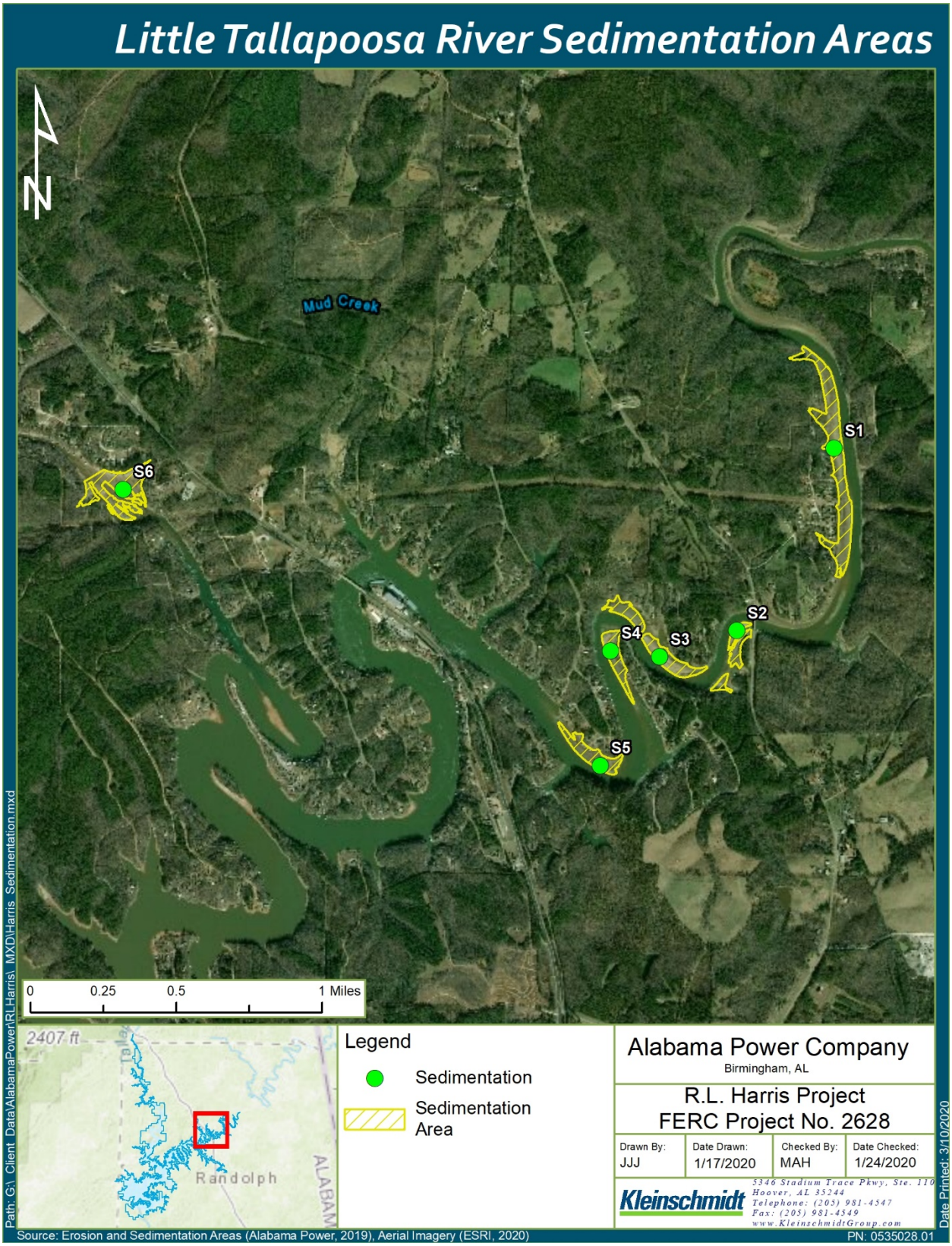

FIGURE 2-6 LITTLE TALLAPOOSA RIVER ARM SEDIMENTATION AREAS

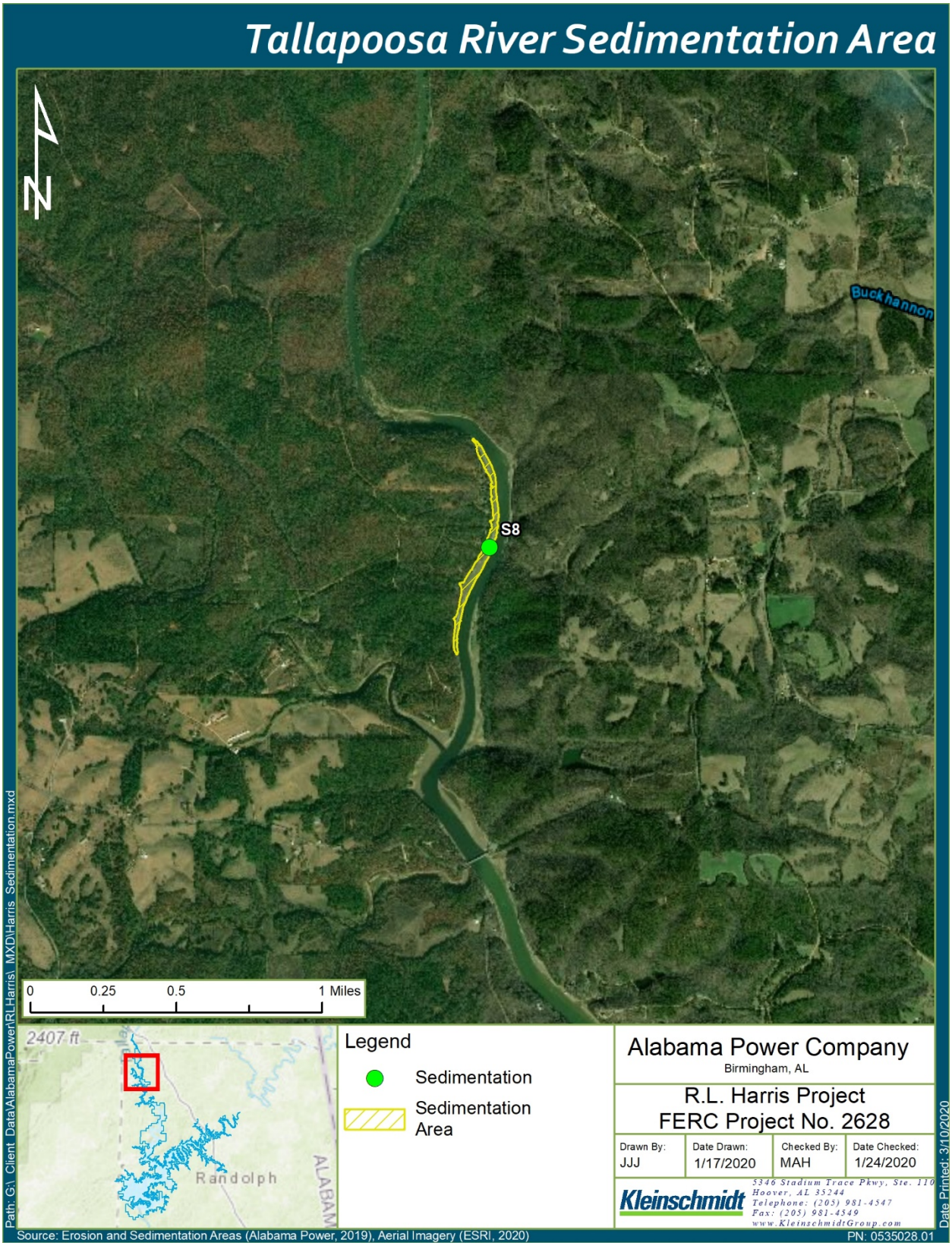

FIGURE 2-7 TALLAPOOSA RIVER ARM SEDIMENTATION AREAS

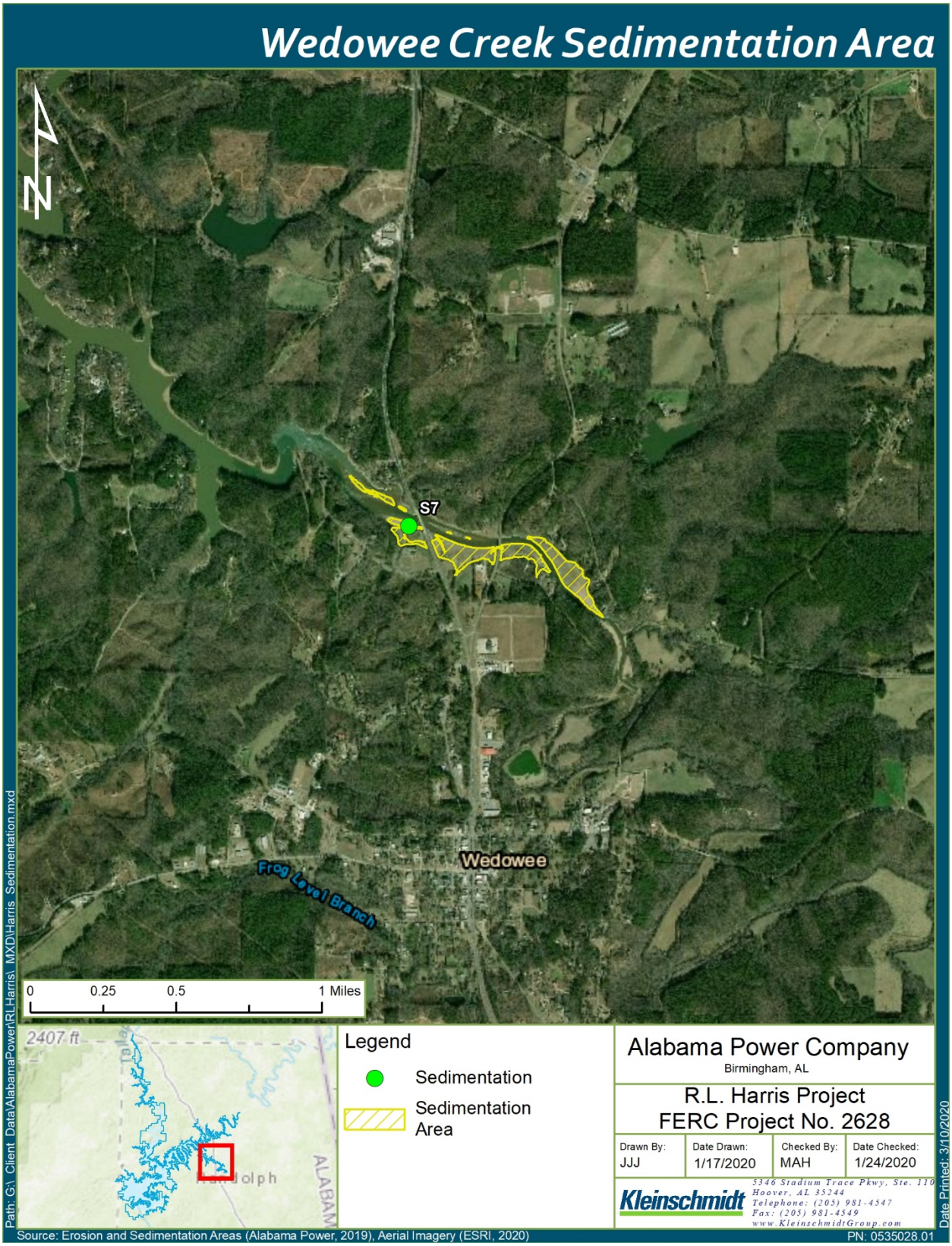

FIGURE 2-8 WEDOWEE CREEK ARM SEDIMENTATION AREAS

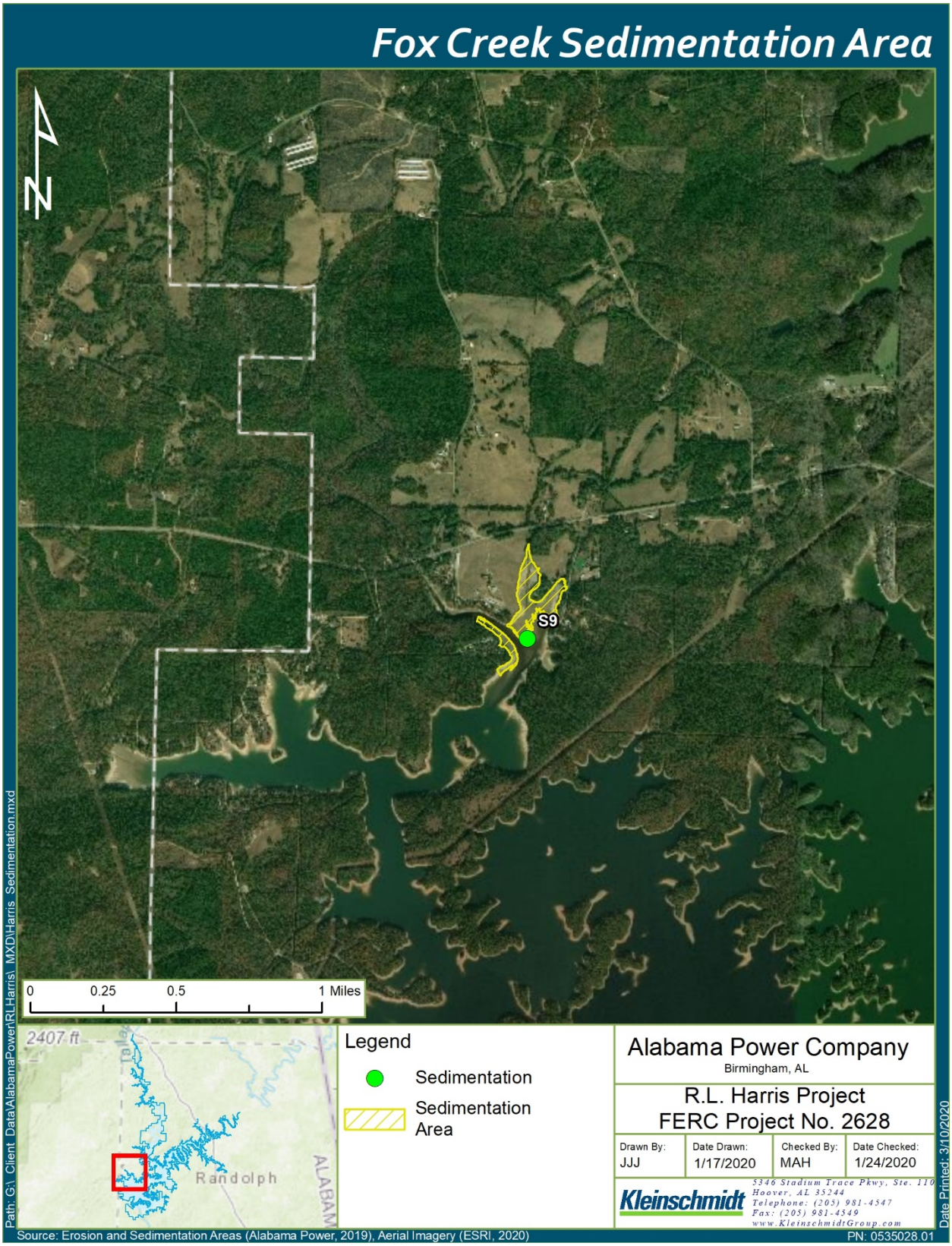

FIGURE 2-9 FOX CREEK ARM SEDIMENTATION AREAS

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 (Figure 2-10 and Figure 2-11). Table 2-3 shows the results of this analysis. Twenty-five percent of the Little Tallapoosa River basin has been converted to hay/pasture fields (MRLC 2019). Land clearing and conversion to agricultural fields is a significant contributing factor to sedimentation in the Little Tallapoosa arm of Lake Harris. A USGS model of total phosphorus, total nitrogen, suspended sediment, and streamflow for the southeastern U.S. supports this conclusion, showing high sediment yield for the Little Tallapoosa River basin (Hoos and Roland 2019).

TABLE 2-3 LITTLE TALLAPOOSA RIVER BASIN NATIONAL LAND COVER DATABASE (NLCD) LAND USE CLASSIFICATIONS

NLCD Landcover Classification	2001 Acreage	%	2016 Acreage	%	2001 to 2016 Change in Acreage
Barren Land	1,775.6	0.46%	680.4	0.18%	-1,095.2
Cultivated Crops	78.4	0.02%	55.8	0.01%	-22.6
Deciduous Forest	123,507.5	32.16%	117,241.3	30.53%	-6,266.2
Developed, High Intensity	1,224.9	0.32%	1,613.5	0.42%	388.6
Developed, Low Intensity	12,076.8	3.14%	13,544.9	3.53%	1,468.1
Developed, Medium Intensity	2,577.3	0.67%	3,382.5	0.88%	805.2
Developed, Open Space	20,734.5	5.40%	22,599.1	5.89%	1,864.6
Emergent Herbaceous Wetlands	0.0	0.00%	266.6	0.07%	266.6
Evergreen Forest	70,452.0	18.35%	62,627.8	16.31%	-7,824.2
Hay/Pasture	106,940.6	27.85%	98,125.5	25.55%	-8,815.1
Herbaceous	20,811.2	5.42%	16,410.1	4.27%	-4,401.1
Mixed Forest	1,995.2	0.52%	24,769.8	6.45%	22,774.6
Open Water	6,217.0	1.62%	6,244.0	1.63%	27.0
Shrub/Scrub	8,341.6	2.17%	10,098.5	2.63%	1,756.9
Woody Wetlands	7,277.3	1.90%	6,351.2	1.65%	-926.1
Total	**384009.9**	**100%**	**384010.8**	**100%**	

Source: MRLC, 2019

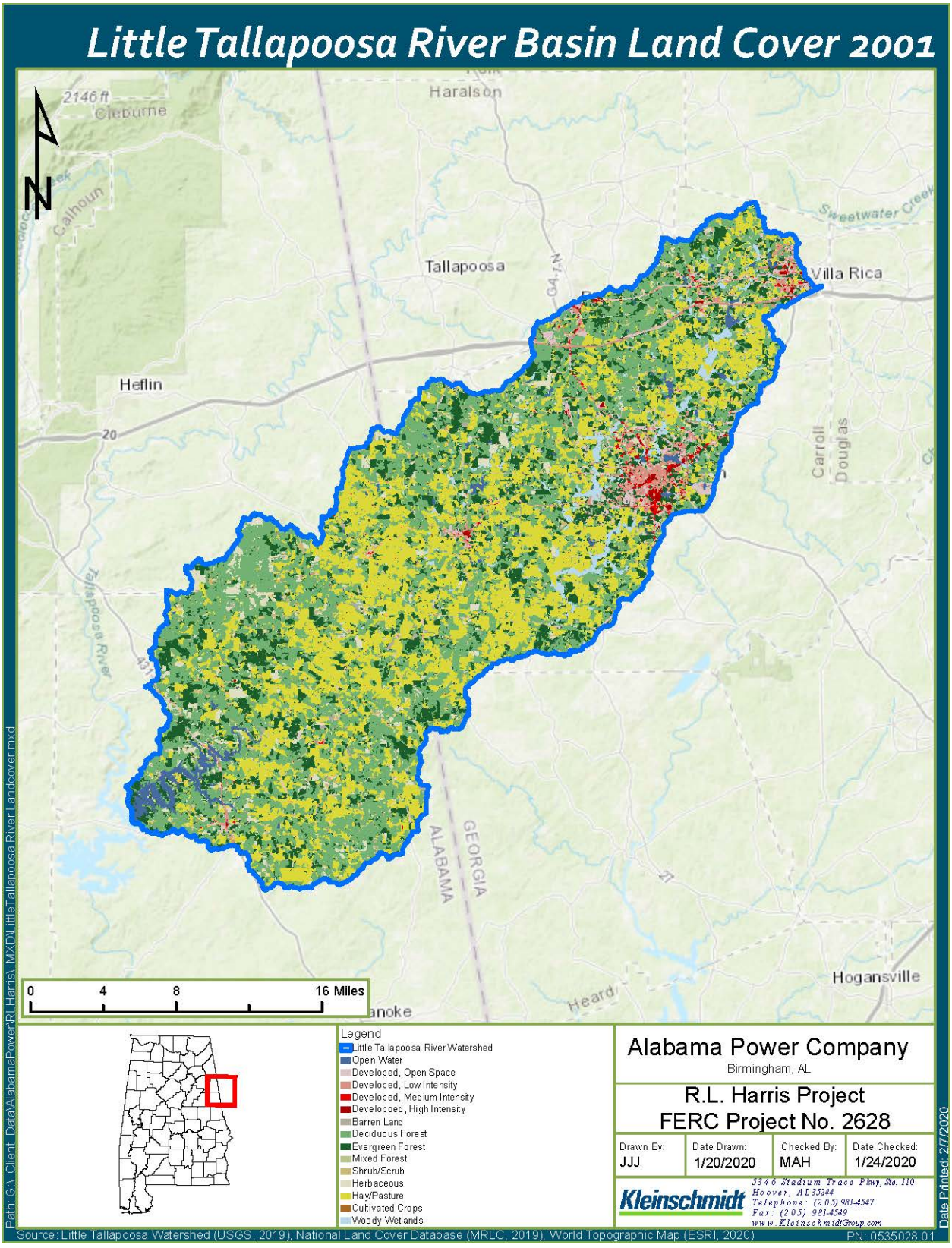

FIGURE 2-10 LITTLE TALLAPOOSA RIVER BASIN LAND USE CLASSIFICATIONS 2001

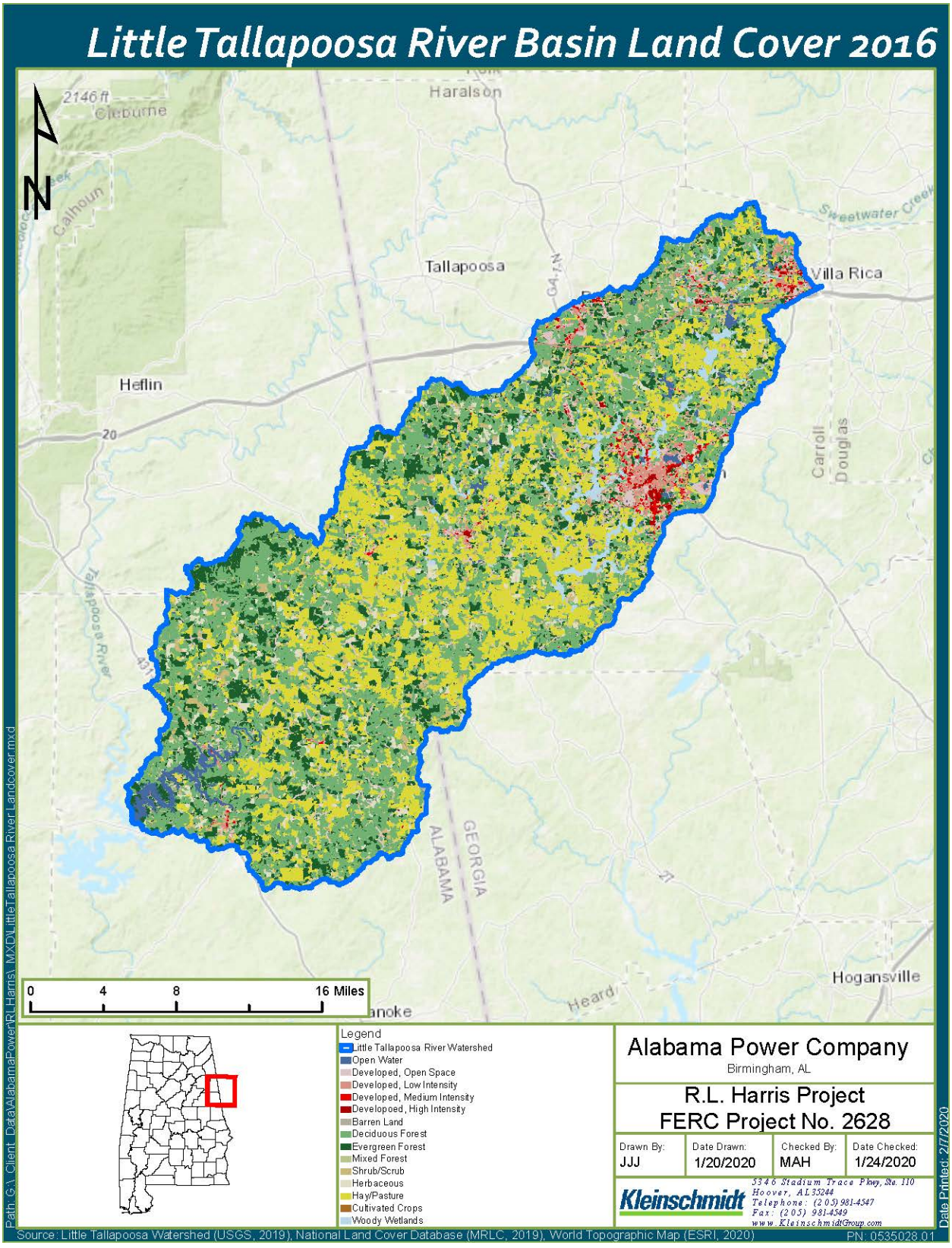

FIGURE 2-11 LITTLE TALLAPOOSA RIVER BASIN LAND USE CLASSIFICATIONS 2016

3.0 TALLAPOOSA RIVER DOWNSTREAM OF HARRIS DAM

3.1 METHODS

Trutta Environmental Solutions (Trutta) used two boat High Definition Stream Survey (HDSS) systems to collect geo-referenced video (forward, left, and right), water depth, side-scan sonar, and high-resolution GPS information on forty-four miles of the Tallapoosa River between Harris Dam and Peters Island. The boats ran in roughly parallel tracks, with one boat closer to the left bank and one closer to the right bank. The duel tracklog approach was used due to the width of the river and provided high-quality imagery of instream and streambank conditions. The downstream survey results were also used to assess conditions for identified erosion sites 22 and 23 shown in Figure 2-5.

All data were collected, organized, and classified for analysis by creating aquatic habitat GIS layers for depth and left and right streambank condition. The GPS time, location, and depth information were linked to each second of the left and right tracklogs. This resulted in video referenced to a common location and time. The individual files were assembled to form a continuous stream-view tracklog of the Tallapoosa River[3]. The video was classified using HDSS video coder software which allowed an appropriate assessment score to be applied to each second of the video and associated GPS location. To standardize the results from the dual track surveys, the data were mapped onto a centerline so that the data collected from the separate boats along the same area of the river could be compared.

Left and right bank condition was visually assessed from the high definition video for both sides of the river. Each streambank was viewed independently during the classification process. To avoid error due to different observers, scoring of Bank Condition was performed by a single experienced classifier from Trutta. The Bank Condition score consisted of five bank condition levels ranging from Fully Functional (1) to Non-functional (5) and were continuously assessed for the entire sampling area (Table 3-1). Further details describing the Bank Condition scoring system can be found in the Tallapoosa River High Definition Stream Survey Final Report (Appendix E) (Trutta 2019).

[3] In the Tallapoosa River from Harris Dam downstream to Peters Island.

TABLE 3-1 BANK CONDITION SCORE

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.		

3.2 RESULTS

Streambank condition point data collected during the Trutta survey was averaged into 0.1-mile (161 m) segments to help facilitate finding failing streambank areas. Using this data, Trutta developed a ranking system to understand specific areas of failing streambanks on the Tallapoosa River (Table 3-2 and Figure 3-1). 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 3 (slightly impaired). Notably, only one area scored as impaired to non-functional. This area was located on the right bank between river mile 16.3 to 16.9 (Figure 3-2). Trutta's report is provided in Appendix E.

The downstream survey results were also used to assess conditions for identified erosion sites 22 and 23 shown in Figure 2-5. These sites were assessed using the same criteria as the erosion sites located within Lake Harris (Appendix C). Both sites were confirmed to have areas of erosion primarily caused by adjacent land use/clearing and natural riverine processes.

TABLE 3-2 TALLAPOOSA RIVER DOWNSTREAM OF HARRIS DAM: 15 MOST IMPAIRED STREAMBANK AREAS

Rank	Left Bank River Mile	Avg Left Bank Condition	Right Bank River Mile	Avg Right Bank Condition	Both Bank River Mile	Avg Combination Bank Condition
1	10.00	3.22	16.70	4.45	16.70	3.23
2	19.20	3.11	16.60	3.96	16.50	3.12
3	17.90	3.09	7.70	3.57	7.70	2.99
4	20.60	3.05	16.50	3.55	16.60	2.98
5	36.50	3.05	16.30	3.35	34.50	2.95
6	36.60	3.04	16.90	3.20	43.90	2.83
7	10.10	3.00	16.40	3.18	39.50	2.82
8	11.10	3.00	43.80	3.17	39.60	2.74
9	11.20	3.00	34.40	3.07	10.10	2.69
10	17.80	3.00	34.50	3.00	16.30	2.68
11	36.40	3.00	5.00	3.00	23.80	2.67
12	36.70	3.00	42.00	3.00	10.00	2.65
13	36.80	3.00	42.10	3.00	2.70	2.63
14	36.90	3.00	42.20	3.00	24.00	2.62
15	37.70	3.00	6.60	2.99	24.10	2.61
16	37.80	3.00	N/A	N/A	N/A	N/A
17	39.50	3.00	N/A	N/A	N/A	N/A
18	39.60	3.00	N/A	N/A	N/A	N/A
19	39.70	3.00	N/A	N/A	N/A	N/A
20	42.90	3.00	N/A	N/A	N/A	N/A

Source: Trutta 2019

Note:

Bank Condition Scores: 1-Fully Functional 2-Functional, 3-Slightly Impaired, 4-Impaired, 5-Non-Functional. (Reference Table 3-1) N/A- Only top 15 impaired streambank areas selected. Left Bank includes sites 16-20 due to tie in Bank Condition score (Trutta 2019).

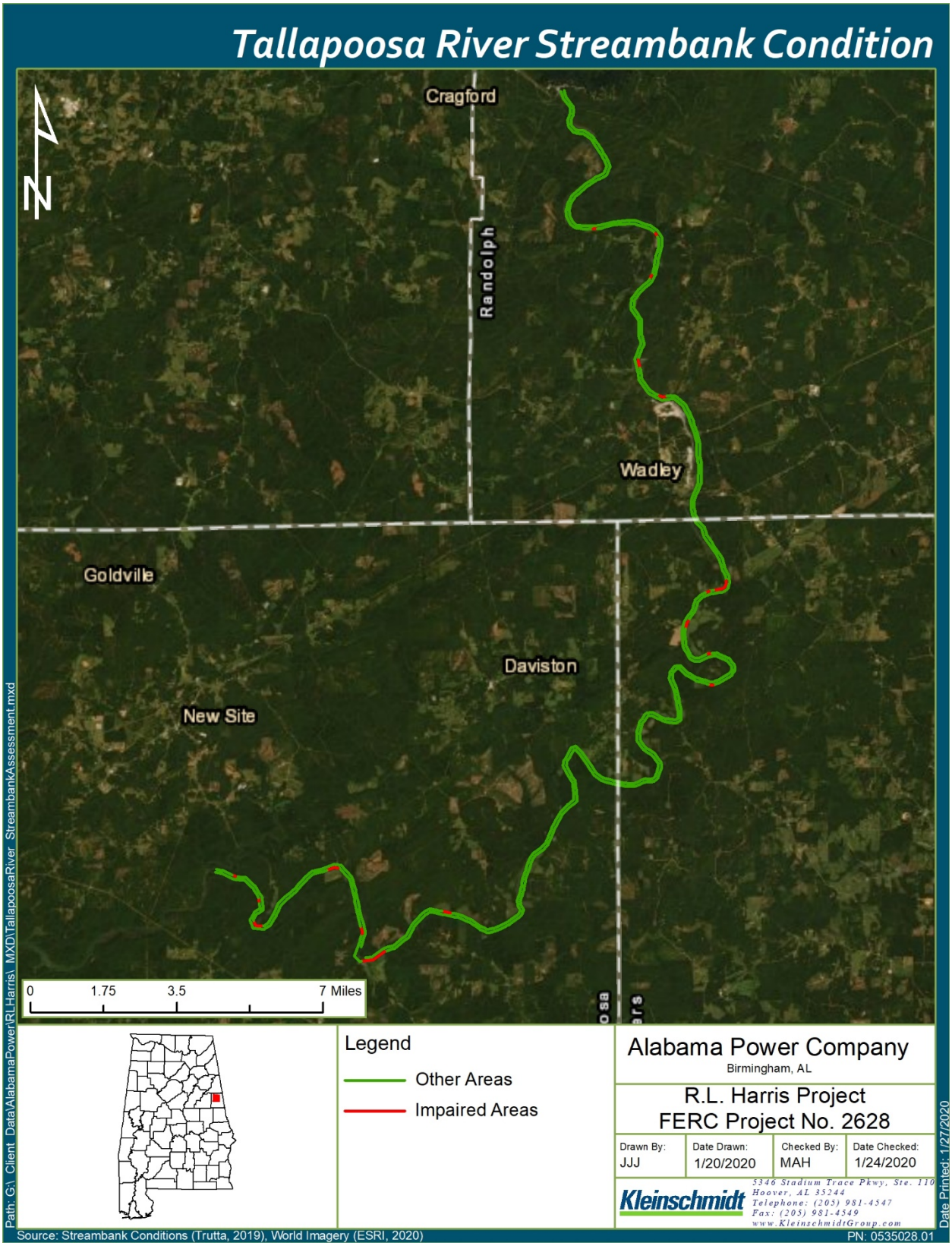

FIGURE 3-1 TALLAPOOSA IMPAIRED STREAMBANK CONDITION AREAS

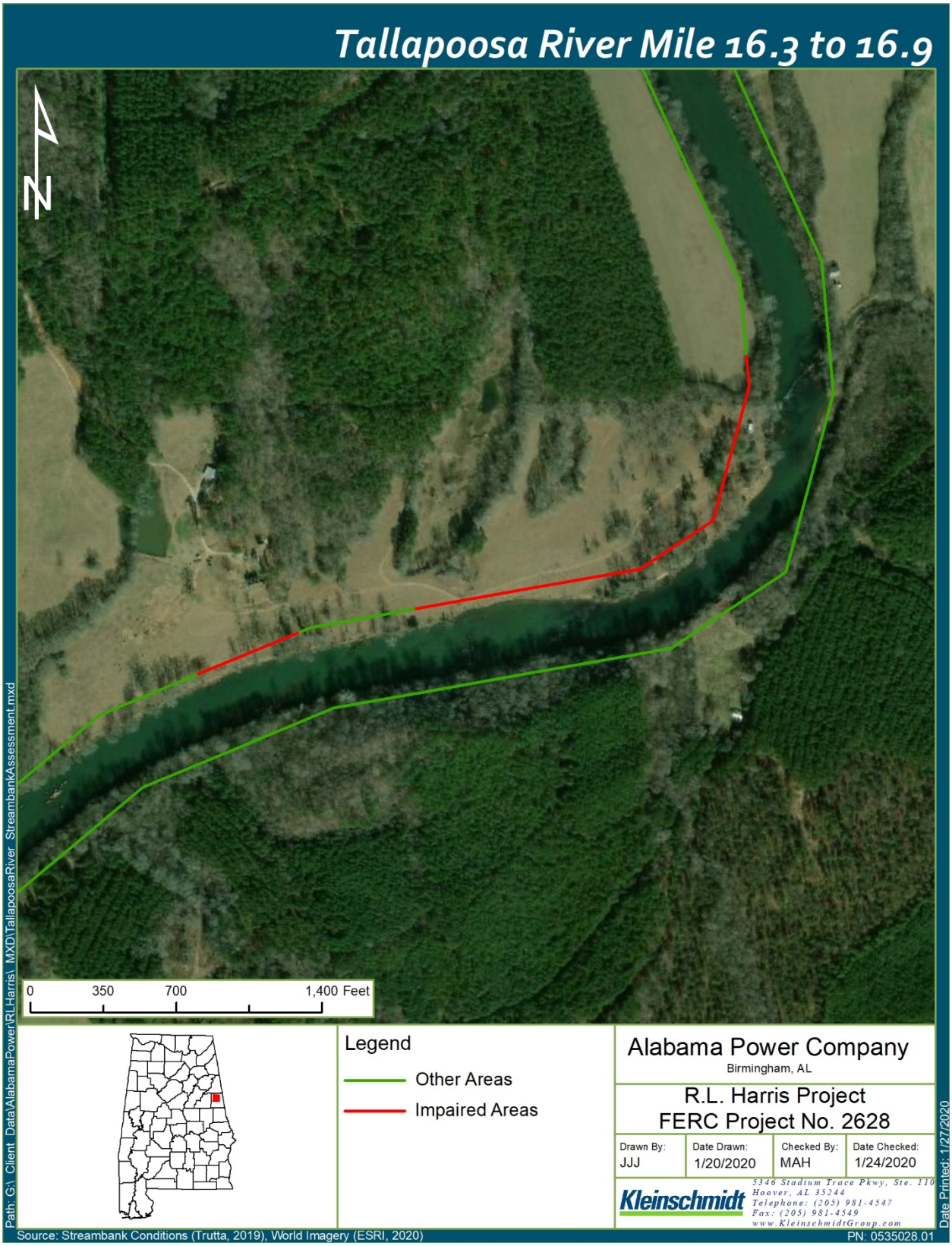

FIGURE 3-2 TALLAPOOSA WORST STREAMBANK CONDITION AREA

4.0 SKYLINE

4.1 METHODS

Little Coon Creek, which flows through portions of the Project Boundary at Skyline, is currently listed as impaired due to siltation. The sources of this impairment include non-irrigated crop production and pasture grazing (ADEM 2018). A GIS analysis of land use classifications within the Project Boundary at Skyline was conducted to assess the impact of agriculture on Little Coon Creek. Land use data is provided by the multi-resolution land characteristics (MRLC) consortium. The MRLC is a group of federal agencies who coordinate and generate consistent and relevant land cover information at the national scale for a wide variety of environmental, land management, and modeling applications.

4.2 RESULTS

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) for this analysis. A summary of land use classification within the Project Boundary at Skyline is presented in Table 4-1. This analysis shows 8.8% of land within the watershed is used for agriculture (i.e. cultivated crops and hay/pasture), increasing from 2001 to 2016. The predominant location of these areas is adjacent to Little Coon Creek (Figure 4-1). 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 the Creek, resulting in sedimentation of the creek bottom.

TABLE 4-1 LITTLE COON CREEK WATERSHED LAND USE CLASSIFICATION CHANGE

NLCD Landcover Classification	2001 Acreage	%	2016 Acreage	%	2001 to 2016 Change in Acreage
Barren Land	8.1	0.0%	9.6	0.0%	1.5
Cultivated Crops	257.6	1.3%	394.0	2.0%	136.4
Deciduous Forest	15,426.6	79.4%	16,018.7	82.4%	592.1
Developed, Low Intensity	22.6	0.1%	22.7	0.1%	0.1
Developed, Medium Intensity	N/A	0.0%	0.2	0.0%	0.2
Developed, Open Space	191.4	1.0%	231.7	1.2%	40.3
Emergent Herbaceous Wetlands	3.0	0.0%	29.1	0.1%	26.1
Evergreen Forest	273.2	1.4%	188.7	1.0%	-84.5
Hay/Pasture	1,301.6	6.7%	1,316.7	6.8%	15.1
Herbaceous	261.0	1.3%	32.5	0.2%	-228.5
Mixed Forest	874.3	4.5%	783.6	4.0%	-90.7
Open Water	7.5	0.0%	9.2	0.0%	1.7
Shrub/Scrub	704.9	3.6%	262.2	1.3%	-442.7
Woody Wetlands	102.8	0.5%	141.9	0.7%	39.1
Total	**19434.6**	**100%**	**19440.7**	**100%**	

Source: MRLC, 2019

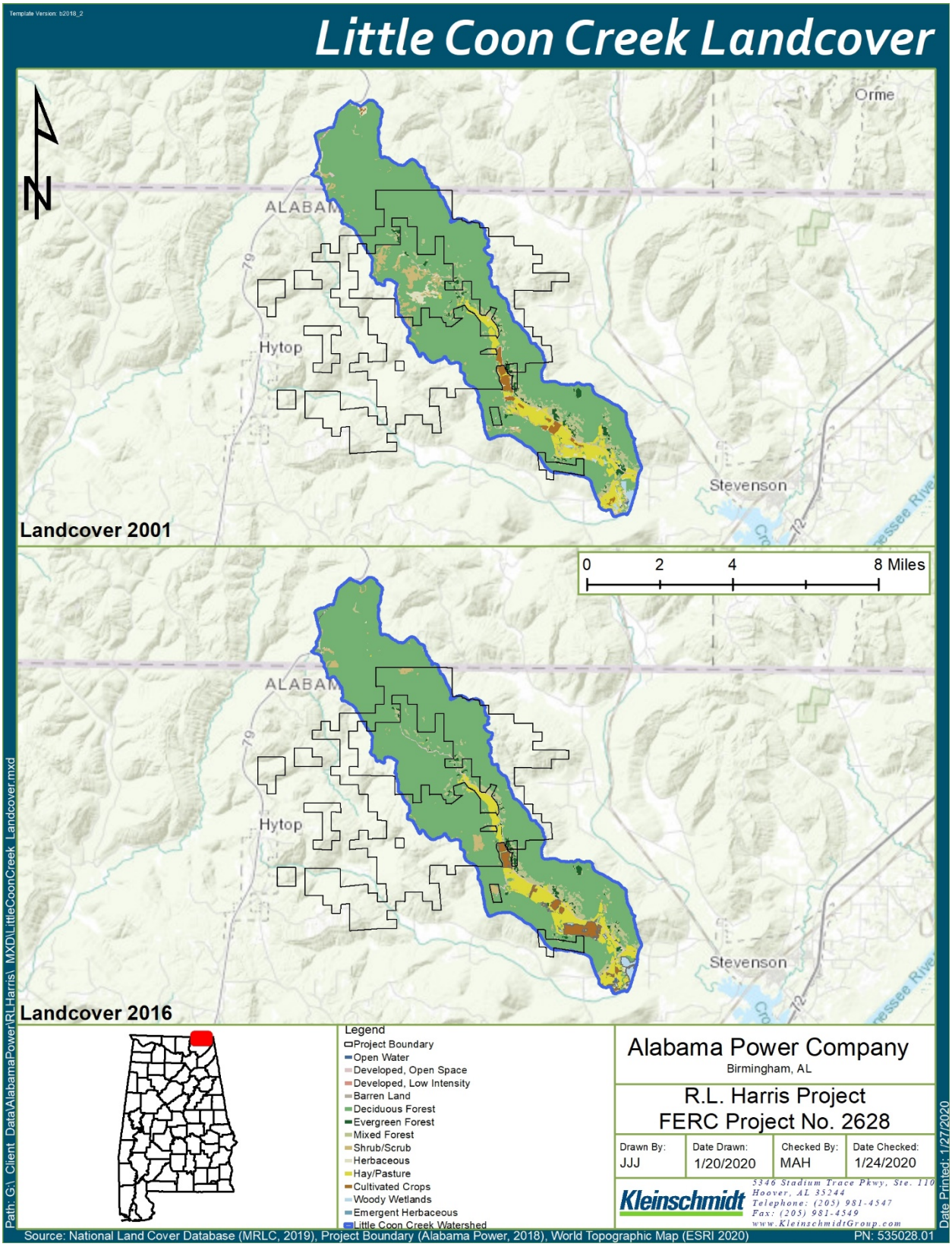

FIGURE 4-1 LITTLE COON CREEK LAND COVER CLASSIFICATIONS

5.0 DISCUSSION AND CONCLUSIONS

Of the twenty-four erosion sites identified on Lake Harris and the Tallapoosa River downstream of Harris Dam, eight sites were found to have no significant signs of active erosion. On Lake Harris, the remaining sites that did show signs of active erosion at or above normal reservoir elevation were a result of anthropogenic and/or natural processes independent of project operations. Examples of anthropogenic effects include wave action due to boating activity, land clearing and landscaping, and other construction activities affecting runoff towards the reservoir (MSU 2020). Natural erosion processes observed included wind generated wave action and bank scour due to channelized flows at the toe of banks. These processes would occur independently of any project operations. None of the erosion sites surveyed were the result of fluctuations due to project operations.

The 2,155 ft (0.4 mi) of total shoreline affected by erosion on Lake Harris is extremely small given the 367 miles of shoreline exposed to potential effects of project operations. The erosion that does occur is generally in areas affected by adjacent land use and local soil conditions, i.e., finer grain or sandy soils that are more susceptible to erosion. The Lake Harris shorelines are predominantly well armored due to exposed bed rock, shoreline erosion Best Management Practices (BMPs) such as rip-rap or seawalls, or undisturbed riparian habitat such as areas protected by the scenic easement enforced at Harris.

Undisturbed riparian habitat along much of the Tallapoosa River downstream of Harris Dam provides good bank stability for a majority of the reach. Trutta noted that many other Southeastern U.S. rivers have much more extensive bank erosion issues (Trutta 2019). The identified failing streambanks downstream of Lake Harris are adjacent to clear-cut areas with trees cleared to the waterline. The observed erosion at these sites is a result of adjacent land use and clearing of riparian plant cover destabilizing soils along the affected banks, though erosion at theses site may be exacerbated as a result of flow releases from Harris Dam.

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. Land uses in the basin upstream of Lake Harris and adjacent to the river contribute sediment load to the upper reaches of Lake Harris. 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 3 in the form of a technical memorandum. At Skyline, the conversion of vegetated land to cultivated crops and hay/pasture land use adjacent to Little Coon Creek may explain the impairment noted by the Alabama Department of Environmental Management (ADEM 2018).

6.0 REFERENCES

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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

ASSESSOR CREDENTIALS

EnviroCert International, Inc.®

certifies that

Trey Scott Stevens

Subscribes to the Code of Ethics and Professional Conduct and has met the requirements established for the CPESC® Program as a

Certified Professional in Erosion and Sediment Control®

CPESC® Number: 8812

Certificate Date: August 23, 2017

Alan Black, Director, Technical Committee Chair

Robert Anderson, EnviroCert Board President

The CPESC® Certification was established in 1983

South Carolina

Department of Health and Environmental Control

Certifies that:

Jordan Johnson

Successfully Completed Certification Requirements for:

Erosion Prevention & Sediment Control Inspector

REG. NO.
13254

EXPIRATION
6/30/2023

APPENDIX C

SITE EVALUATION SHEETS

R. L. HARRIS PROJECT

EROSION & SEDIMENTATION STUDY SITE EVALUATION FORM

Water Body: Altamaha River Date: 12-4-19

Field Personnel: [signature] Photo No.: 1

1. Erosion Area Location:
   ID: 1 Lat: _____ Long: _____ Time: 2:58

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

3. Physical Properties:
   Length: 100 ft
   Width: 20ft
   Shape: _____
   Slope:
   - [x] Steep (> 20%)
   - [ ] Moderate (8% to 20%)
   - [ ] Gentle (< 8%)

4. Erosion Processes:
   - [x] Direct scour from river or tributary flows
   - [ ] Piping
   - [x] Slumping due to scoured toe of bank
   - [ ] Gully or rill erosion from overland flows towards lake
   - [x] Other: Cows trampling bank down to river

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

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

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

8. General Comments:
   Cows primary cause for erosion
   Riparian Zone Width: _____ (Provide additional comments on back of sheet)

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

   Explain Reasoning for Potential Cause of Erosion/Sedimentation: _____

R. L. HARRIS PROJECT

EROSION & SEDIMENTATION STUDY SITE EVALUATION FORM

Water Body: RL Harris Date: 12-4-19

Field Personnel: Photo No.: 2

1. Erosion Area Location:
   ID: 2 Lat: _____ Long: _____ Time: 305

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

3. Physical Properties:
   Length: 150 ft
   Width: 90ft
   Shape: _____
   Slope:
   - ☐ Steep (> 20%)
   - ☐ Moderate (8% to 20%)
   - ☐ Gentle (< 8%)

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

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

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

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

8. General Comments:
   Cows entering river eroding bank. High & low sloughing bank disturbed bank.
   Riparian Zone Width: 20' (Provide additional comments on back of sheet)

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

   Explain Reasoning for Potential Cause of Erosion/Sedimentation: _____

R. L. HARRIS PROJECT

EROSION & SEDIMENTATION STUDY SITE EVALUATION FORM

Water Body: RL Harris Date: 12-4-19

Field Personnel: Photo No.: 3

1. Erosion Area Location:
   ID: 3 Lat: _____ Long: _____ Time: 3:15

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

3. Physical Properties:
   Length: 50 ft
   Width: 30 ft
   Shape: _____
   Slope:
   - [ ] Steep (> 20%)
   - [x] Moderate (8% to 20%)
   - [ ] Gentle (< 8%)

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

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

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

7. Description of Exposed Soils including Types and Depths:
   sands, silts

8. General Comments:
   Cows entering river, trampling bank vegetation
   Riparian Zone Width: 20 ft (Provide additional comments on back of sheet)

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

   Explain Reasoning for Potential Cause of Erosion/Sedimentation: _____

R. L. HARRIS PROJECT
EROSION & SEDIMENTATION STUDY SITE EVALUATION FORM

Water Body: RL Harris Date: 12-17-19

Field Personnel: Photo No.: Site 4

1. Erosion Area Location:
   ID: 4 Lat: 33.392527 Long: -85.447967 Time: _____

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

3. Physical Properties:
   Length: intermittent minor localized erosion
   Width: _____
   Shape: _____
   Slope:
   - ☒ Steep (> 20%)
   - ☐ Moderate (8% to 20%)
   - ☐ Gentle (< 8%)

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

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

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

7. Description of Exposed Soils including Types and Depths:
   sand - clay

8. General Comments:
   Survey via drone. Bank stable despite tree clearing. Minor scour at toe of bank. Bank stabilized w/ early successional vegetation.
   Riparian Zone Width: _____ (Provide additional comments on back of sheet)

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

   Explain Reasoning for Potential Cause of Erosion/Sedimentation: Some small rivers of scour at top of bank from overland flow towards river.

R. L. HARRIS PROJECT
EROSION & SEDIMENTATION STUDY SITE EVALUATION FORM

Water Body: RL Harris Date: 12-17-19

Field Personnel: [signature] Photo No.: Site 5

1. Erosion Area Location:
   ID: 5 Lat: 33.388696 Long: -85.446767 Time: _____

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

3. Physical Properties:
   Length: 100 ft
   Width: 10 ft
   Shape: _____
   Slope:
   - ☐ Steep (> 20%)
   - ☒ Moderate (8% to 20%)
   - ☐ Gentle (< 8%)

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

5. Adjacent Land Use / Vegetative Cover:
   - ☐ Agricultural
   - ☐ Undeveloped, Grassy
   - ☐ Undeveloped, Wooded
   - ☐ Road Crossing/Bridge
   - ☐ Roadway, Gravel
   - ☐ Roadway, Paved
   - ☐ Park
   - ☒ Unvegetated
   - ☐ Early successional vegetation
   - ☒ Exposed roots or root undercutting
   - ☒ Leaning or fallen trees
   - ☒ Other: residential/private property, clearcut/weedy

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

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

8. General Comments:
   Land recently clear-cut. Overland and riparian vegetation removal destabilizing soils
   Riparian Zone Width: 0 (Provide additional comments on back of sheet)

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

   Explain Reasoning for Potential Cause of Erosion/Sedimentation: Clear-cutting by land owners destabilizing banks and soils.

R. L. HARRIS PROJECT

EROSION & SEDIMENTATION STUDY SITE EVALUATION FORM

Water Body: RL Harris Date: 12-17-19

Field Personnel: Photo No.: site 6

1. Erosion Area Location:
   ID: 6 Lat: 33.388166 Long: -85.452611 Time: _____

2. Position in Landscape:
   - ☐ Levee/Embankment
   - ☐ Steep bank
   - ☐ Floodplain Terrace
   - ☒ Main Channel/Main Body of Lake
   - ☐ Cove
   - ☒ Other: creek - river confluence

3. Physical Properties:
   Length: _____
   Width: _____
   Shape: _____

   Slope:
   - ☐ Steep (> 20%)
   - ☒ Moderate (8% to 20%)
   - ☐ Gentle (< 8%)

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

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

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

7. Description of Exposed Soils including Types and Depths:
   sand - silt

8. General Comments:
   sedimentation at confluence. banks stable and vegetated. Survey via drone
   Riparian Zone Width: wooded, undeveloped (Provide additional comments on back of sheet)

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

   Explain Reasoning for Potential Cause of Erosion/Sedimentation: _____

R. L. HARRIS PROJECT
EROSION & SEDIMENTATION STUDY SITE EVALUATION FORM

Water Body: RL Harris Date: 12-17-19

Field Personnel: [signature] Photo No.: Site 7

1. Erosion Area Location:
   ID: 7 Lat: 33.383992 Long: -85.452846 Time: _____

2. Position in Landscape:
   - ☐ Levee/Embankment
   - ☐ Steep bank
   - ☐ Floodplain Terrace
   - ☒ Main Channel/Main Body of Lake
   - ☐ Cove
   - ☒ Other: confluence creek and river

3. Physical Properties:
   Length: 75 ft
   Width: ~5 ft
   Shape: _____

   Slope:
   - ☐ Steep (> 20%)
   - ☒ Moderate (8% to 20%)
   - ☐ Gentle (< 8%)

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

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

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

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

8. General Comments:
   Survey via drone. Confluence of creek and river. Some sedimentation at confluence. Some bank erosion
   Riparian Zone Width: undeveloped, wooded (Provide additional comments on back of sheet)

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

   Explain Reasoning for Potential Cause of Erosion/Sedimentation: Natural fluvial processes.

R. L. HARRIS PROJECT

EROSION & SEDIMENTATION STUDY SITE EVALUATION FORM

Water Body: RL Harris Date: 12-4-19

Field Personnel: [signature] Photo No.: 8

1. Erosion Area Location:
   ID: 8 Lat: _____ Long: _____ Time: 2:20

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

3. Physical Properties:
   Length: 100 ft
   Width: 10 ft
   Shape: _____
   Slope:
   - ☐ Steep (> 20%)
   - ☒ Moderate (8% to 20%)
   - ☐ Gentle (< 8%)

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

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

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

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

8. General Comments:
   Tree clearing along river bank exacerbating natural erosion from river flows
   Riparian Zone Width: _____ (Provide additional comments on back of sheet)

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

   Explain Reasoning for Potential Cause of Erosion/Sedimentation: _____

R. L. HARRIS PROJECT
EROSION & SEDIMENTATION STUDY SITE EVALUATION FORM

Water Body: RL Harris Date: 12-17-19

Field Personnel: Photo No.: Site 9

1. Erosion Area Location:
   ID: 9 Lat: 33.377324 Long: -85.458787 Time: _____

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

3. Physical Properties:
   Length: 450 ft
   Width: ~5 ft
   Shape: _____
   Slope:
   - ☐ Steep (> 20%)
   - ☐ Moderate (8% to 20%)
   - ☒ Gentle (< 8%)

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

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

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

7. Description of Exposed Soils including Types and Depths:
   Sand - silt

8. General Comments:
   Survey via drone footage

   Riparian Zone Width: 0 (Provide additional comments on back of sheet)

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

   Explain Reasoning for Potential Cause of Erosion/Sedimentation: Bank destabilization due to tree clearing. Prone at the of slope

R. L. HARRIS PROJECT
EROSION & SEDIMENTATION STUDY SITE EVALUATION FORM

Water Body: RL Harris Date: 12-17-19

Field Personnel: Photo No.: Site 10

1. Erosion Area Location:
   ID: 10 Lat: 33.377848 Long: -85.458511 Time: _____

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

3. Physical Properties:
   Length: 150 ft
   Width: ~5 ft
   Shape: _____
   Slope:
   - ☐ Steep (> 20%)
   - ☐ Moderate (8% to 20%)
   - ☒ Gentle (< 8%)

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

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

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

7. Description of Exposed Soils including Types and Depths:
   sand - silt

8. General Comments:
   Rip-rap along toe of upstream portion of bank. Survey was done
   Riparian Zone Width: 0 (Provide additional comments on back of sheet)

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

   Explain Reasoning for Potential Cause of Erosion/Sedimentation: Clear cutting of riparian veg destabilizing bank. Portions covered with rock. Some erosion from overland flow into river outside top of bank

R. L. HARRIS PROJECT

EROSION & SEDIMENTATION STUDY SITE EVALUATION FORM

Water Body: RL Harris Date: 12-4-19

Field Personnel: Photo No.: 11

1. Erosion Area Location:
   ID: 11 Lat: _____ Long: _____ Time: _____

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

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

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

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

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

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

8. General Comments:
   No erosion. vegetated and stable
   _____
   Riparian Zone Width: _____ (Provide additional comments on back of sheet)

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

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

R. L. HARRIS PROJECT
EROSION & SEDIMENTATION STUDY SITE EVALUATION FORM

Water Body: RL Harris Date: 12-4-19

Field Personnel: Photo No.: 12

1. Erosion Area Location:
   ID: 12 Lat: _____ Long: _____ Time: 1105

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

3. Physical Properties:
   Length: 80ft+
   Width: 1ft+
   Shape: _____

   Slope:
   - ☐ Steep (> 20%)
   - ☐ Moderate (8% to 20%)
   - ☒ Gentle (< 8%)

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

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

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

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

8. General Comments:
   No erosion of note. Isolated undercutting near start of seawall from wave action
   Riparian Zone Width: _____ (Provide additional comments on back of sheet)

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

   Explain Reasoning for Potential Cause of Erosion/Sedimentation: _____

R. L. HARRIS PROJECT
EROSION & SEDIMENTATION STUDY SITE EVALUATION FORM

Water Body: RL Harris Date: 12-4-19

Field Personnel: Photo No.: 13

1. Erosion Area Location:
   ID: 13 Lat: _____ Long: _____ Time: 10:58

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

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

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

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

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

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

8. General Comments:
   Isolated undercutting @ normal high water, No erosion of note. More severe undercutting of bank adjacent upstream bank. Old road bed entering.
   Riparian Zone Width: _____ (Provide additional comments on back of sheet)

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

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

R. L. HARRIS PROJECT

EROSION & SEDIMENTATION STUDY SITE EVALUATION FORM

Water Body: RL Harris Date: 12-4-19

Field Personnel: Photo No.: 14

1. Erosion Area Location:
   ID: 14 Lat: _____ Long: _____ Time: 1053

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

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

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

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

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

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

8. General Comments:
   Base of Hwy. Drainage erosion above PBL
   Riparian Zone Width: _____ (Provide additional comments on back of sheet)

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

   Explain Reasoning for Potential Cause of Erosion/Sedimentation: _____

R. L. HARRIS PROJECT

EROSION & SEDIMENTATION STUDY SITE EVALUATION FORM

Water Body: RL Harris Date: 10-4-19

Field Personnel: Photo No.: 15

1. Erosion Area Location:
   ID: 15 Lat: _____ Long: _____ Time: 10:01

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

3. Physical Properties:
   Length: 0
   Width: _____
   Shape: _____

   Slope:
   - ☐ Steep (> 20%)
   - ☐ Moderate (8% to 20%)
   - ☐ Gentle (< 8%)

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

5. Adjacent Land Use / Vegetative Cover:
   - ☐ Agricultural
   - ☐ Undeveloped, Grassy
   - ☐ Undeveloped, Wooded
   - ☐ Road Crossing/Bridge
   - ☐ Roadway, Gravel
   - ☐ Roadway, Paved
   - ☐ Park
   - ☐ Unvegetated
   - ☐ Early successional vegetation
   - ☐ Exposed roots or root undercutting
   - ☐ Leaning or fallen trees
   - ☒ Other: developed, wooded and grassy residential

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

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

8. General Comments:
   No erosion, sea wall and rip rap installed on adjacent banks
   _____
   Riparian Zone Width: _____ (Provide additional comments on back of sheet)

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

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

R. L. HARRIS PROJECT
EROSION & SEDIMENTATION STUDY SITE EVALUATION FORM

Water Body: RL Harris Date: 12-4-19

Field Personnel: Photo No.: 16

1. Erosion Area Location:
   ID: 16 Lat: _____ Long: _____ Time: 10:05

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

3. Physical Properties:
   Length: 10 ft
   Width: _____
   Shape: _____
   Slope:
   - ☐ Steep (> 20%)
   - ☐ Moderate (8% to 20%)
   - ☒ Gentle (< 8%)

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

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

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

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

8. General Comments:
   Drainage coming into lake. Erosion above PBL.

   Riparian Zone Width: _____ (Provide additional comments on back of sheet)

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

   Explain Reasoning for Potential Cause of Erosion/Sedimentation: _____

R. L. HARRIS PROJECT

EROSION & SEDIMENTATION STUDY SITE EVALUATION FORM

Water Body: RL Harris Date: 12-4-19

Field Personnel: [signature] Photo No.: 17

1. Erosion Area Location:
   ID: 17 Lat: _____ Long: _____ Time: 10:11

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

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

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

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

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

7. Description of Exposed Soils including Types and Depths:
   None

8. General Comments:
   Power line crossing, No erosion of note. Slight undercutting at normal pool level
   Riparian Zone Width: _____ (Provide additional comments on back of sheet)

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

   Explain Reasoning for Potential Cause of Erosion/Sedimentation: _____

R. L. HARRIS PROJECT

EROSION & SEDIMENTATION STUDY SITE EVALUATION FORM

Water Body: RL Harris Date: 12-4-19

Field Personnel: Photo No.: 18

1. Erosion Area Location:
   ID: 18 Lat: _____ Long: _____ Time: 9:45 am

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

3. Physical Properties:
   Length: 300
   Width: 2-5 ft
   Shape: _____
   Slope:
   - ☐ Steep (> 20%)
   - ☐ Moderate (8% to 20%)
   - ☒ Gentle (< 8%)

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

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

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

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

8. General Comments:
   Collapsed ~~scarps~~ ~~vertical~~ side-walls along bank

   Riparian Zone Width: 0 (Provide additional comments on back of sheet)

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

   Explain Reasoning for Potential Cause of Erosion/Sedimentation: Land clearing destabilization of shoreline, wave action undercutting bank, appears to be shoreline

R. L. HARRIS PROJECT

EROSION & SEDIMENTATION STUDY SITE EVALUATION FORM

Water Body: RL Harris Date: 12/19

Field Personnel: [signature] Photo No.: 19

1. Erosion Area Location:
   ID: 19 Lat: _____ Long: _____ Time: 9:35

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

3. Physical Properties:
   Length: 150 ft
   Width: 3 ft
   Shape: _____
   Slope:
   - ☐ Steep (> 20%)
   - ☐ Moderate (8% to 20%)
   - ☒ Gentle (< 8%)

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

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

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

7. Description of Exposed Soils including Types and Depths:
   Clay soil with rip-rap installed

8. General Comments:
   Seawalls along adjacent banks.
   Riparian Zone Width: 0' (Provide additional comments on back of sheet)

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

   Explain Reasoning for Potential Cause of Erosion/Sedimentation: _____

R. L. HARRIS PROJECT

EROSION & SEDIMENTATION STUDY SITE EVALUATION FORM

Water Body: RL Harris Date: 10-4-19

Field Personnel: Photo No.: 20

1. Erosion Area Location:
   ID: 20 Lat: _____ Long: _____ Time: 9:30

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

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

4. Erosion Processes:
   - ☐ Direct scour from river or tributary flows
   - ☐ Piping
   - ☐ Slumping due to scoured toe of bank
   - ☐ Gully or rill erosion from overland flows towards lake
   - ☒ Other: no erosion of note, slight undercutting of normal high water

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

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

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

8. General Comments:
   No erosion of note. slight undercutting at normal summer pool due wave action
   Riparian Zone Width: 0' (Provide additional comments on back of sheet)

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

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

R. L. HARRIS PROJECT

EROSION & SEDIMENTATION STUDY SITE EVALUATION FORM

Water Body: RL Harris Date: 12-4-19

Field Personnel: Photo No.: 21

1. Erosion Area Location:
   ID: 21 Lat: _____ Long: _____ Time: 9:00

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

3. Physical Properties:
   Length: 100'
   Width: 2'
   Shape: _____
   Slope:
   - ☐ Steep (> 20%)
   - ☐ Moderate (8% to 20%)
   - ☒ Gentle (< 8%)

4. Erosion Processes:
   - ☐ Direct scour from river or tributary flows
   - ☐ Piping
   - ☒ Slumping due to scoured toe of bank (minor, isolated areas)
   - ☐ Gully or rill erosion from overland flows towards lake
   - ☐ Other: _____

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

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

7. Description of Exposed Soils including Types and Depths:
   sands, recent rip-rap along portion of bank

8. General Comments:

   Riparian Zone Width: 20' trees (Provide additional comments on back of sheet)

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

   Explain Reasoning for Potential Cause of Erosion/Sedimentation: _____

R. L. HARRIS PROJECT

EROSION & SEDIMENTATION STUDY SITE EVALUATION FORM

Water Body: RL Harris/ Date: 12-17-19

Field Personnel: [illegible] Photo No.: E22

1. Erosion Area Location:
   ID: 22 Lat: _____ Long: _____ Time: _____

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

3. Physical Properties:
   Length: 30
   Width: 4
   Shape: _____
   Slope:
   - ☒ Steep (> 20%)
   - ☐ Moderate (8% to 20%)
   - ☐ Gentle (< 8%)

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

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

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

7. Description of Exposed Soils including Types and Depths:
   silts/sands, Fine Sandy Loam

8. General Comments:
   Land clearing adjacent, residential / camp area

   Riparian Zone Width: ~5ft (Provide additional comments on back of sheet)

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

   Explain Reasoning for Potential Cause of Erosion/Sedimentation: clearing of bank vegetation in areas

R. L. HARRIS PROJECT

EROSION & SEDIMENTATION STUDY SITE EVALUATION FORM

Water Body: RL Harris Date: 12-17-19

Field Personnel: [illegible] Photo No.: E23

1. Erosion Area Location:
   ID: 23 Lat: _____ Long: _____ Time: _____

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

3. Physical Properties:
   Length: 400
   Width: 10
   Shape: _____
   Slope:
   - ☒ Steep (> 20%)
   - ☐ Moderate (8% to 20%)
   - ☐ Gentle (< 8%)

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

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

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

7. Description of Exposed Soils including Types and Depths:
   Fine sandy loam

8. General Comments:
   very little riparian veg., older growth cut down and removed for much of bank
   Riparian Zone Width: ~ 0-5ft (Provide additional comments on back of sheet)

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

   Explain Reasoning for Potential Cause of Erosion/Sedimentation: _____

R. L. HARRIS PROJECT

EROSION & SEDIMENTATION STUDY SITE EVALUATION FORM

Water Body: RL Harris Date: 12/4/19

Field Personnel: Photo No.: 24

1. Erosion Area Location:
   ID: 24 Lat: _____ Long: _____ Time: 9:15

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

3. Physical Properties:
   Length: 30ft
   Width: 5 ft
   Shape: _____
   Slope:
   - ☐ Steep (> 20%)
   - ☒ Moderate (8% to 20%)
   - ☐ Gentle (< 8%)

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

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

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

7. Description of Exposed Soils including Types and Depths:
   Clay, 5ft

8. General Comments:
   undeveloped wooded area. isolated more severe erosion area. some undercutting along, and present banks. Busiest area late summer
   Riparian Zone Width: _____ (Provide additional comments on back of sheet)

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

   Explain Reasoning for Potential Cause of Erosion/Sedimentation: _____

R. L. HARRIS PROJECT

EROSION & SEDIMENTATION STUDY SITE EVALUATION FORM

Water Body: RL Harris Date: 6-4-19

Field Personnel: Photo No.: Sed-1

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

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

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

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

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

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

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

8. General Comments:
   Right descending bank. sediment result of river inflow
   _____
   Riparian Zone Width: _____ (Provide additional comments on back of sheet)

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

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

R. L. HARRIS PROJECT

EROSION & SEDIMENTATION STUDY SITE EVALUATION FORM

Water Body: RL Harris Date: 12-4-19

Field Personnel: [illegible] Photo No.: sed-2

1. Erosion Area Location:
   ID: sed-2 Lat: _____ Long: _____ Time: 11:00

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

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

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

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

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

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

8. General Comments:
   left descending bank below bridge to Erosion pt 14 cove
   sediment result of river inflow
   Riparian Zone Width: _____ (Provide additional comments on back of sheet)

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

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

R. L. HARRIS PROJECT

EROSION & SEDIMENTATION STUDY SITE EVALUATION FORM

Water Body: RL Harris Date: 12-4-19

Field Personnel: [illegible] Photo No.: 4-sed and 3-sed

1. Erosion Area Location:
   ID: 4-sed and 3-sed Lat: _____ Long: _____ Time: _____

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

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

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

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

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

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

8. General Comments:
   left descending bank. almost joined w/ sed-3. Sed-3 on right descending upstream. sediment result of river inflow
   Riparian Zone Width: _____ (Provide additional comments on back of sheet)

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

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

R. L. HARRIS PROJECT

EROSION & SEDIMENTATION STUDY SITE EVALUATION FORM

Water Body: RL Harris Date: 12-4-19

Field Personnel: [illegible] Photo No.: sed-5

1. ~~Erosion~~ Sed Area Location:
   ID: 5 Lat: _____ Long: _____ Time: 1038

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

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

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

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

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

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

8. General Comments:
   Along Right Descending Bank, several docks inaccessible @ water level
   Sed steps [illegible] descending bank to mouth of cove as well, sediment [illegible] of river flow
   Riparian Zone Width: _____ (Provide additional comments on back of sheet)

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

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

R. L. HARRIS PROJECT

EROSION & SEDIMENTATION STUDY SITE EVALUATION FORM

Water Body: RL Harris Date: 12-16-17

Field Personnel: [signature] Photo No.: sed-6

1. Erosion Area Location:
   ID: 6 Lat: _____ Long: _____ Time: _____

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

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

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

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

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

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

8. General Comments:
   Could not access via boat. Survey via aerial imagery. Sedimentation result of pinewood creek inflow.
   Riparian Zone Width: _____ (Provide additional comments on back of sheet)

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

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

R. L. HARRIS PROJECT

EROSION & SEDIMENTATION STUDY SITE EVALUATION FORM

Water Body: RL Harris Date: 12-17-19

Field Personnel: [signature] Photo No.: Sed-7

1. Erosion Area Location:
   ID: Sed-7 Lat: _____ Long: _____ Time: _____

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

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

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

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

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

7. Description of Exposed Soils including Types and Depths:
   Survey via aerial imagery, site inaccessible via Boat.

8. General Comments:
   No local construction, sediment from Wedowee creek inflow.
   Riparian Zone Width: _____ (Provide additional comments on back of sheet)

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

   Explain Reasoning for Potential Cause of Erosion/Sedimentation: _____

R. L. HARRIS PROJECT

EROSION & SEDIMENTATION STUDY SITE EVALUATION FORM

Water Body: RL Harris Date: 12-17-19

Field Personnel: [illegible] Photo No.: sed-8

1. Erosion Area Location:
   ID: sed-8 Lat: _____ Long: _____ Time: _____

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

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

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

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

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

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

8. General Comments:
   inaccessible via boat- survey via aerial imagery, along right downstream bank. sediment result river inflow
   Riparian Zone Width: _____ (Provide additional comments on back of sheet)

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

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

R. L. HARRIS PROJECT

EROSION & SEDIMENTATION STUDY SITE EVALUATION FORM

Water Body: RL Harris Date: 12-17-19

Field Personnel: [signature] Photo No.: Sed-9

1. ~~Erosion~~ Area Location:
   ID: Sed-9 Lat: _____ Long: _____ Time: _____

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

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

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

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

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

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

8. General Comments:
   Inaccessible via boat. Sediment result of creek inflows. No local construction or source identified. Local agricultural fields possible source.
   Riparian Zone Width: _____ (Provide additional comments on back of sheet)

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

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

APPENDIX D

PHOTOGRAPHS OF EROSION SITES

Erosion Site 1

Erosion Site 2

Erosion Site 3

Erosion Site 4

Erosion Site 5

Erosion Site 6

Erosion Site 7

Erosion Site 8

Erosion Site 9

Erosion Site 10

Erosion Site 11

Erosion Site 12

Erosion Site 13

Erosion Site 14

Erosion Site 15

Erosion Site 16

Erosion Site 17

Erosion Site 18

Erosion Site 19

Erosion Site 20

Erosion Site 21

Erosion Site 22

Erosion Site 23

Erosion Site 24

Sedimentation Site 1

Sedimentation Site 2

Sedimentation Site 3

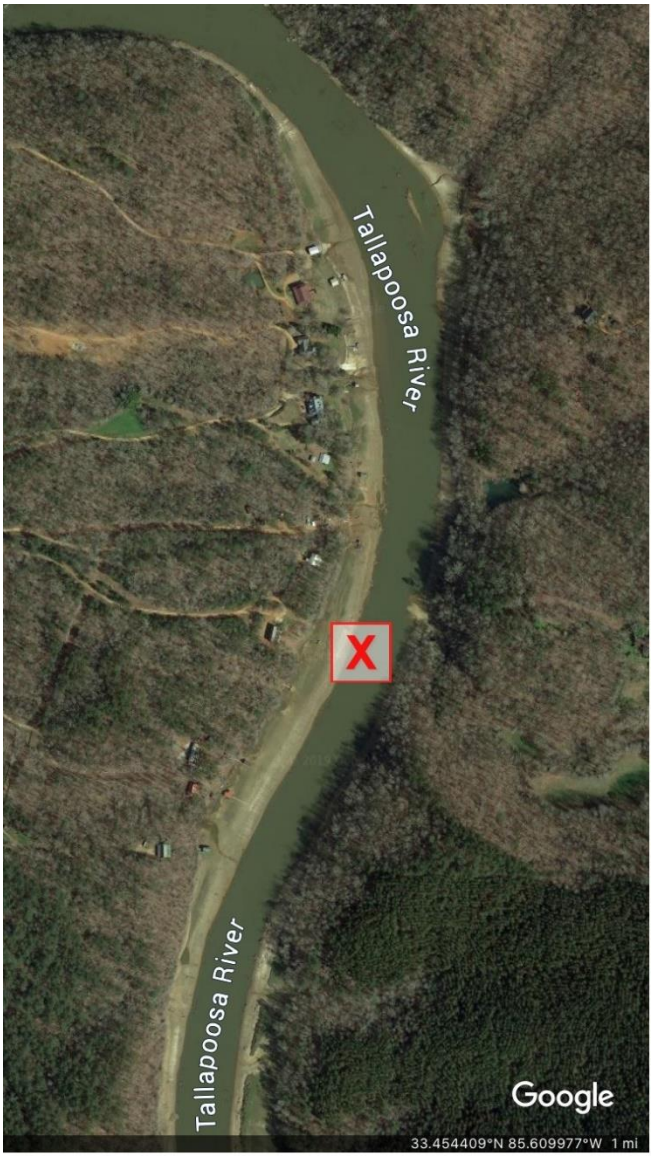
Sedimentation Site 4

Sedimentation Site 5

Sedimentation Site 6

Sedimentation Site7

Sedimentation Site 8

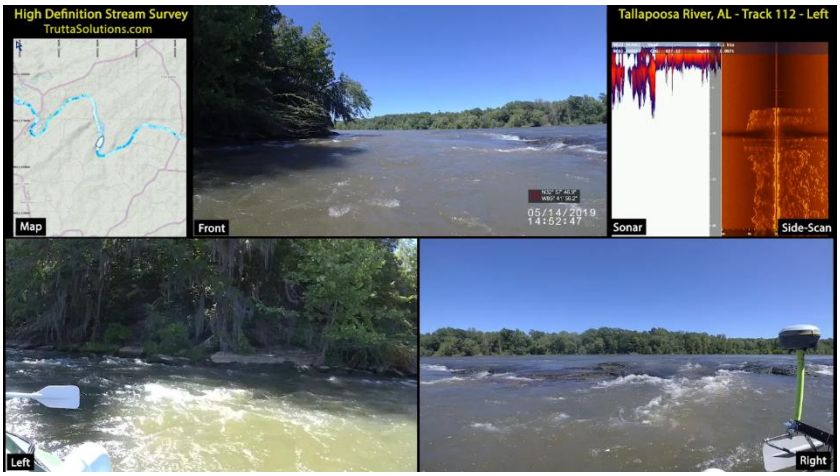


Sedimentation Site 9

APPENDIX E

DOWNSTREAM BANK STABILITY STUDY REPORT

Tallapoosa River
High Definition Stream Survey
Final Report



December 22, 2019

Submitted to:
Angela Anderegg,
Alabama Power Company

Submitted by:
James Parham, Ph.D. and Brett Connell, M.S.

TRUTTA
ENVIRONMENTAL SOLUTIONS, LLC

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Introduction

The Tallapoosa River has a 4,675 square mile watershed that begins in Georgia and flows through eastern Alabama. There are four impoundments formed on the Tallapoosa River located just before it joins the Coosa River near Montgomery to become the Alabama River. Alabama Power Company (APC) manages these impoundments. As part of the re-licensing process for the R.L. Harris Hydroelectric Project, APC is conducting a study to identify and assess erosion and sedimentation and to determine the relationship between operations and wetted habitat in the Tallapoosa River downstream of Harris Dam. The area of focus for the Tallapoosa River is the 44-mile stretch of river below Harris Dam and continuing downstream to the Peters Island Landing (Figure 1 and Figure 2).

To better understand conditions in the Tallapoosa River study reach, APC contracted Trutta Environmental Solutions (TRUTTA) to complete a High Definition Stream Survey. In general, the HDSS approach follows a standardized series of steps which rapidly and systematically collects and processes large amounts of river condition information. TRUTTA completed both longitudinal and cross-section channel depth profiles to collect bathymetric data and streambank condition. The objectives of this project were to:

- collect duel track high-resolution, geo-referenced longitudinal surveys on 44 miles of the main channel of Tallapoosa River.
- produce stream-view video, classify left and right bank condition (on a scale of 1-5, with 1 being Fully Functional condition and 5 being Non-Functional condition), and water depth to create a database of information collected,
- analyze data by creating aquatic habitat GIS layers for left and right bank condition scores, and water depth,
- create 0.1-mile (160 m) segments of tracklog in order to average left, right and combined streambanks to prioritize the worst areas of erosion,
- complete 40 survey-grade cross sections.

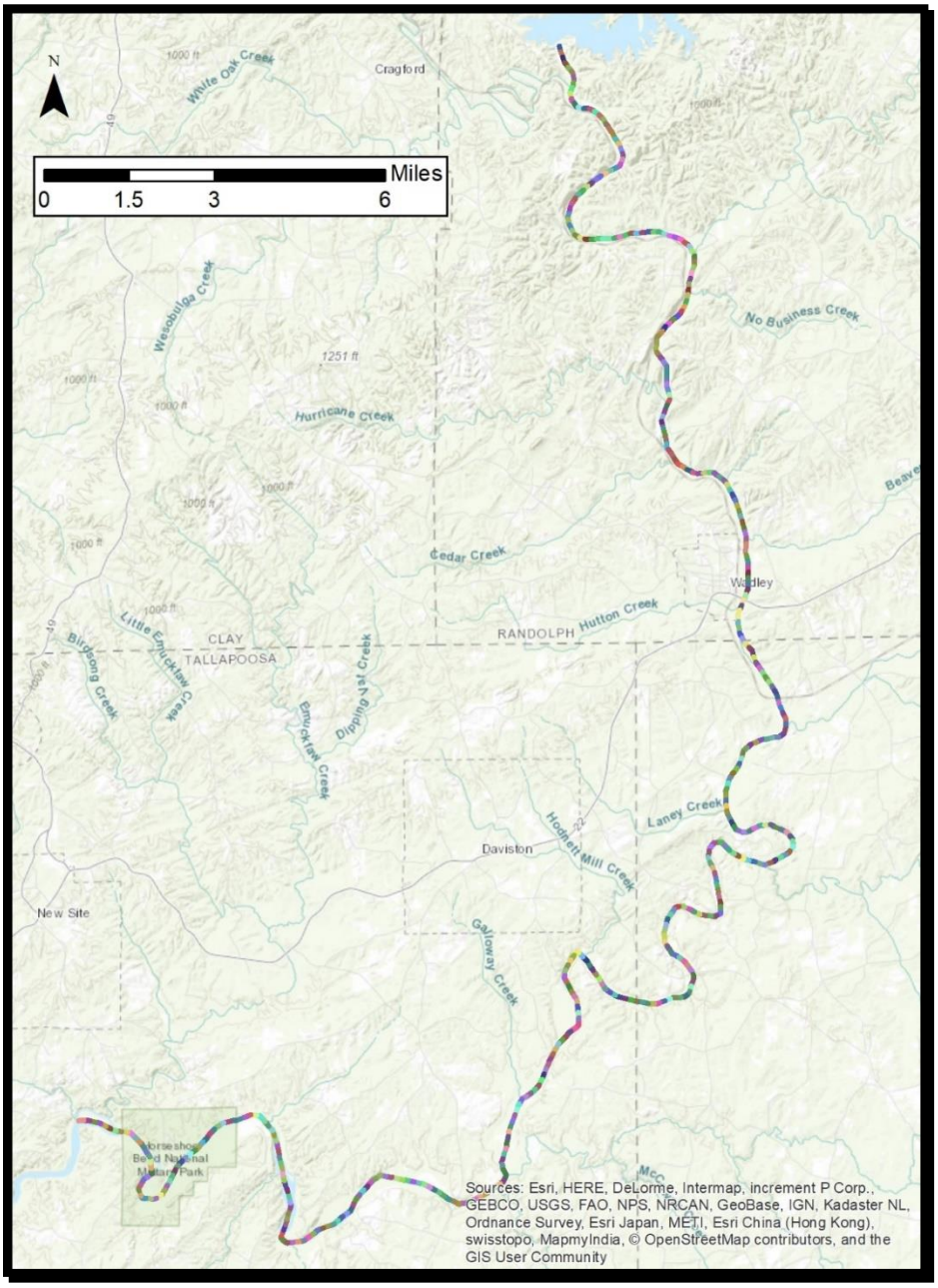


Figure 1: Survey distance on Tallapoosa River downstream of R.L. Harris dam. Colors are 0.1 mile increments.

Figure 2: The Tallapoosa River below the R. L. Harris Dam.

Methods

Field Methods

Longitudinal and Cross-section High Definition Stream Survey

Two boat HDSS systems collected geo-referenced video (forward, left, and right), water depth, side-scan sonar, and high-resolution GPS information on 44 miles of the Tallapoosa River. The survey started below the R. L. Harris Dam and continued to an access point at the end of Peters Island Road. The boats ran in roughly parallel tracks, with one boat closer to the left bank and one closer to the right bank. The duel tracklog approach was used due to the width of the river and provided high-quality imagery of instream and streambank conditions.

In addition to the longitudinal survey, 40 cross-section water depth transects were surveyed in the area requested by APC. The cross-section sonar recordings were linked with RTK GPS using cellphone towers as GPS base stations where network coverage allowed. We recorded the highest precision for surface water elevation for each transect and the latitude, longitude, and water depth for each GPS point on the transect.

Analysis

Data Classification

All data were collected, organized, and classified to analyze data by creating aquatic habitat GIS layers for depth and left and right streambank condition. The GPS time, location, and depth information were linked to each second of the left and right tracklogs. This resulted in video referenced to a common location and time. The individual files were assembled to form a continuous stream-view tracklog of the Tallapoosa River. The video was classified using HDSS video coder software which allowed an appropriate assessment score to be applied to each second of the video and associated GPS location. To standardize the results from the dual track surveys, the data were mapped onto a centerline so that the data collected from the separate boats along the same area of the river could be compared (Figure 3).

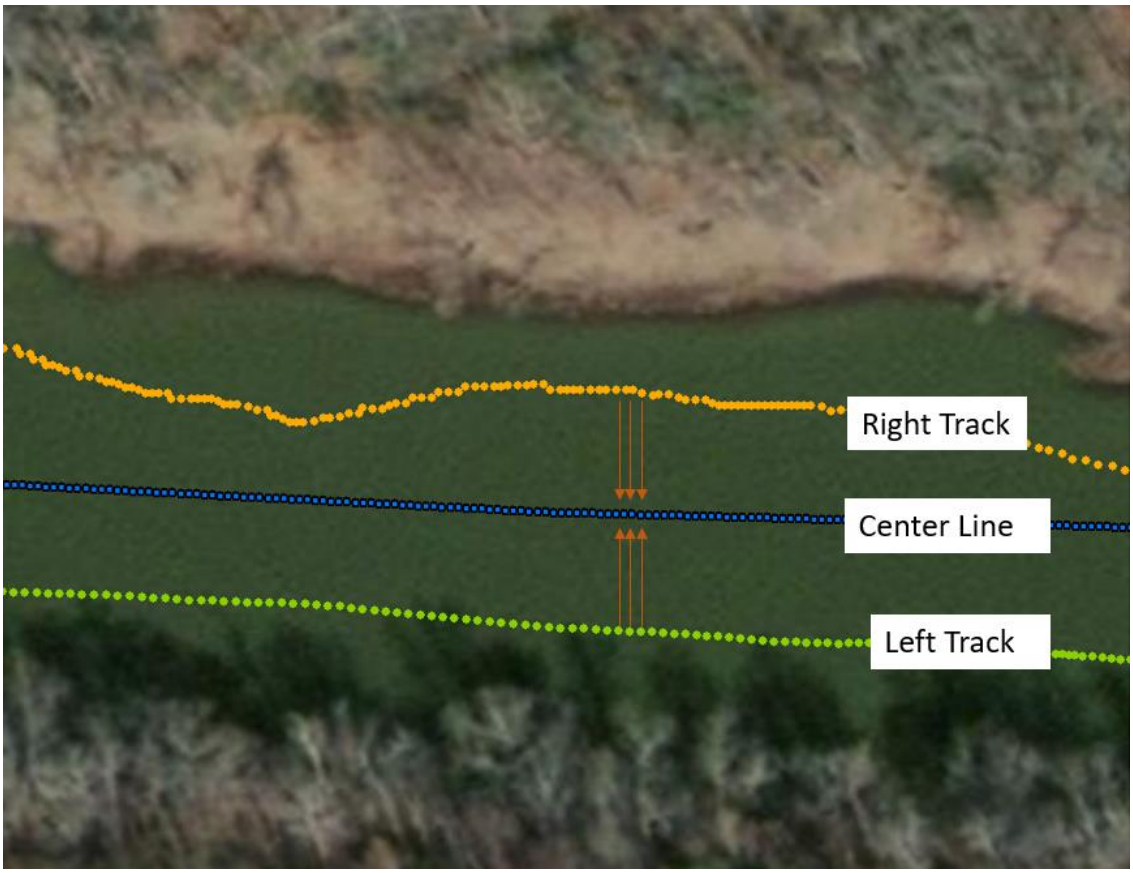


Figure 3: Example of mapping the data from the left and right boat survey tracks to a common centerline to allow the comparison of data at a single location.

Bank Condition

Naturally occurring streambank erosion provides a direct supply of sediment to fluvial systems creating the habitats necessary to support a wide array of species. However, excessive erosion is often damaging

to the riverine systems by reducing habitat heterogeneity, increasing water temperatures, lowering dissolved oxygen, and smothering and suffocating aquatic life (Wilber 2001). This excess erosion contributes to the total load in sediment impaired streams.

Multiple methods focusing on the stream bank condition and erosion potential have been used to determine the source and magnitude of stream bank erosion. The most commonly used method to assess stream bank erosion is the Bank Erosion Hazard Index (BEHI) developed by Rosgen (1996). This method requires a trained individual to collect data in the field on bank height, bank full height, root depth, root density, surface protection, and bank angle to determine its potential for erosion. The Bank Erosion Susceptibility Index (BESI) developed by Connell (2012) collects parameters similar to BEHI such as bank angle, bank height, surface protection, and riparian diversity but utilizes a Streambank Video Mapping System to visually score the habitat, allowing for a rapid assessment of erosion susceptibility at the landscape scale. Utilizing his method, Connell (2012) determined he was able to rapidly identify areas susceptible to erosion and that field time, costs, and environmental impacts were reduced.

The method used to score Bank Condition for this project was similar to BESI developed by Connell (2012) for landscape scale assessments of streambank erosion susceptibility. Bank Condition scores reflect the potential for streambank erosion or streambank failure and is a visual integration of streambank angle, height, surface protection, and riparian condition. Compared to the BEHI method developed by Rosgen (1996), our method utilized a riparian condition parameter as a surrogate for root depth and root density and data were viewed on high definition video captured from the HDSS system. Sass and Keane (2012) created and validated a similar surrogate for the BEHI root parameters while assessing streambank erosion in Kansas. Additionally, video has been used with success to determine streambank erosion rates (Hensley and Ayers 2018) and areas susceptible to erosion (Connell 2012). The major advantages of this method over traditional erosion assessments is the reduction of field time, cost, and uncertainty when extrapolating data to represent the entire river.

Left and right bank condition was visually assessed from the high definition video for both sides of the river. Each streambank was viewed independently during the classification process. To avoid error due to different observers, scoring of Bank Condition was performed by a single experienced classifier. The Bank Condition score consisted of five bank condition levels ranging from Fully Functional (1) to Non-functional (5) (Figure 4 and Table 1) and were continuously assessed for the entire sampling area.

Figure 4: Example of the HDSS Bank Condition Scoring System.

Table 1: Bank Condition Scores, description and relative erosion potential and human impact.

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.		

Cross-Section Transects

The cross-section data collected on the river was plotted in ArcGIS 10.2 to identify the cross-section points from the longitudinal points. A line was created through the points and the points were snapped to the line (Figure 5). The cross-sectional data was then assembled with a Transect ID, coordinate information for each point location, water depth, water surface elevation and the bottom elevation for each point.

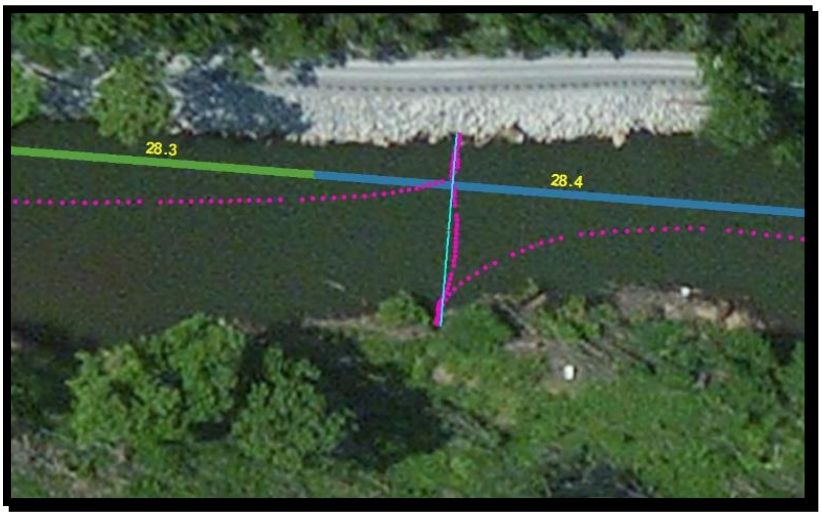


Figure 5: Example of cross section data (magenta dots) and final line (thin, light blue line) created in post-processing. The number on the thick green and blue line refer to the river miles in 0.1 increments. This example is from the Harpeth River, TN.

Results

River Discharge

The two flow gages most relevant to the Tallapoosa River flows were the USGS 02414500 TALLAPOOSA RIVER AT WADLEY, AL and USGS 02414715 TALLAPOOSA RIVER NR NEW SITE, AL. (HORSESHOE BEND). Prior to survey, flows were monitored to ensure relatively normal flow conditions during the survey. During the surveys, flows closer to the R. L. Harris dam had higher fluctuation than further downstream near Horseshoe Bend. (Figure 6 and Figure 7).

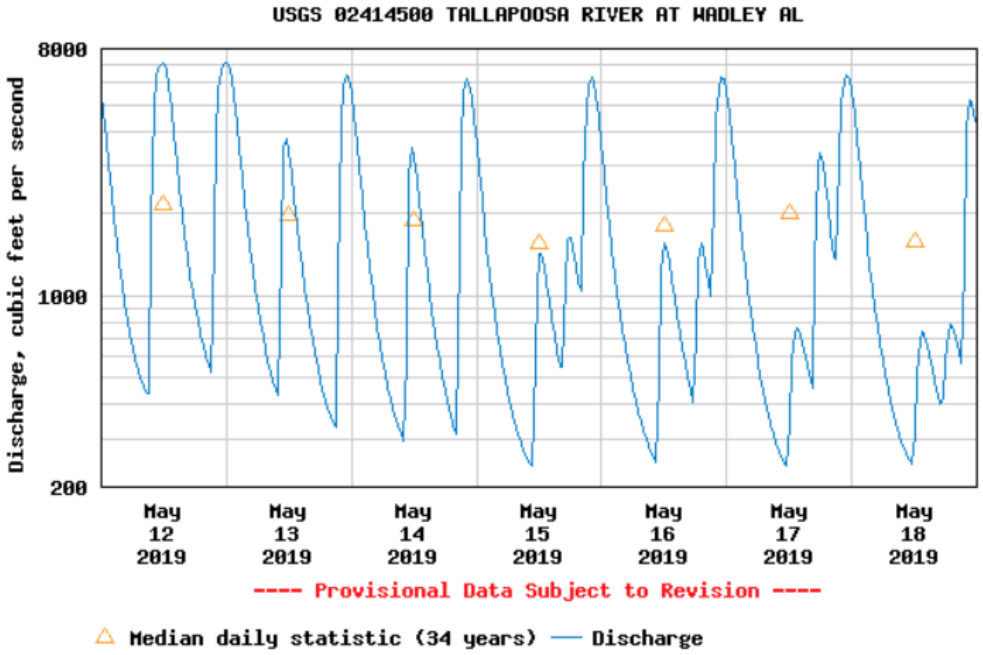


Figure 6: USGS 02414500 TALLAPOOSA RIVER AT WADLEY, AL.

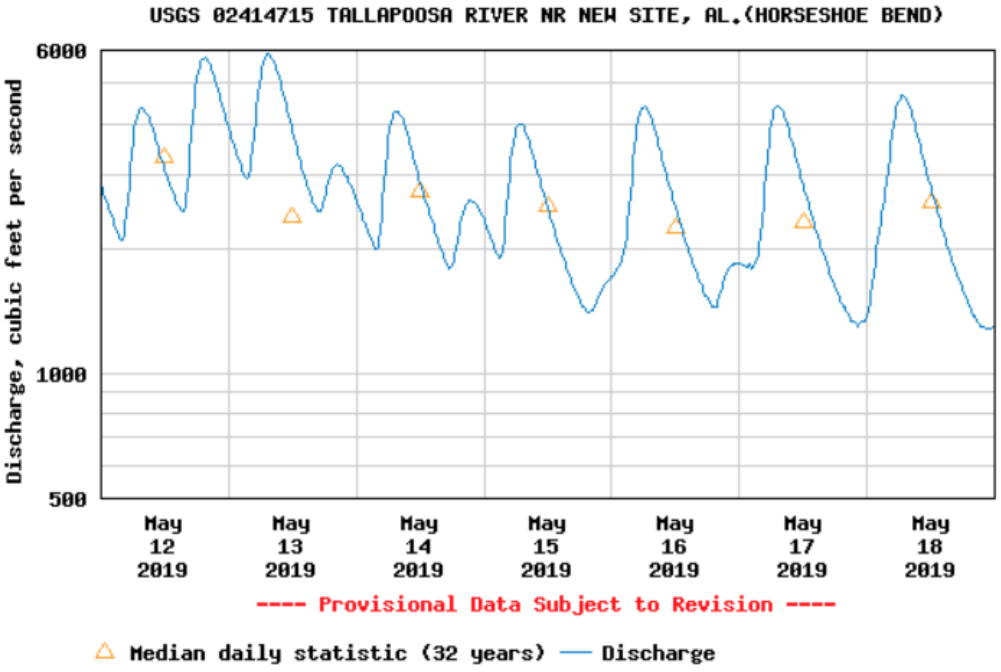


Figure 7: USGS 02414715 TALLAPOOSA RIVER NR NEW SITE, AL. (HORSESHOE BEND).

HDSS

HDSS Survey

The first objective of this survey was to document water depth and streambank conditions during the survey. We completed the surveys on 5-14-2019, 5-15-2019 and 5-16-2019. Table 2 provides the survey track number with associated start date and time. The Track number is a three-digit number that represents the Day-Boat (riverside)-Track for reference to the Video Tracks of the survey (Figure 8 and Figure 9). We used the HDSS platform to gather a right and left track to document the streambank and water depth for the full survey. We created stream-view video for both left and right survey tracks (Figure 10)

Table 2: Survey Track collection information.

Track	Day	Date	Start Time
111	1	2019-05-14	12:52:23
112	1	2019-05-14	14:17:33
113	1	2019-05-14	15:47:39
121	1	2019-05-14	12:54:36
122	1	2019-05-14	14:24:40
123	1	2019-05-14	15:59:46
211	2	2019-05-15	08:11:33
212	2	2019-05-15	10:16:40
213	2	2019-05-15	12:26:48
214	2	2019-05-15	14:06:54
221	2	2019-05-15	08:10:23
222	2	2019-05-15	10:15:52
223	2	2019-05-15	12:26:01
224	2	2019-05-15	14:06:05
311	3	2019-05-16	13:17:53
312	3	2019-05-16	14:33:49
313	3	2019-05-16	16:23:56
321	3	2019-05-16	13:17:36
322	3	2019-05-16	14:32:34
323	3	2019-05-16	16:17:40

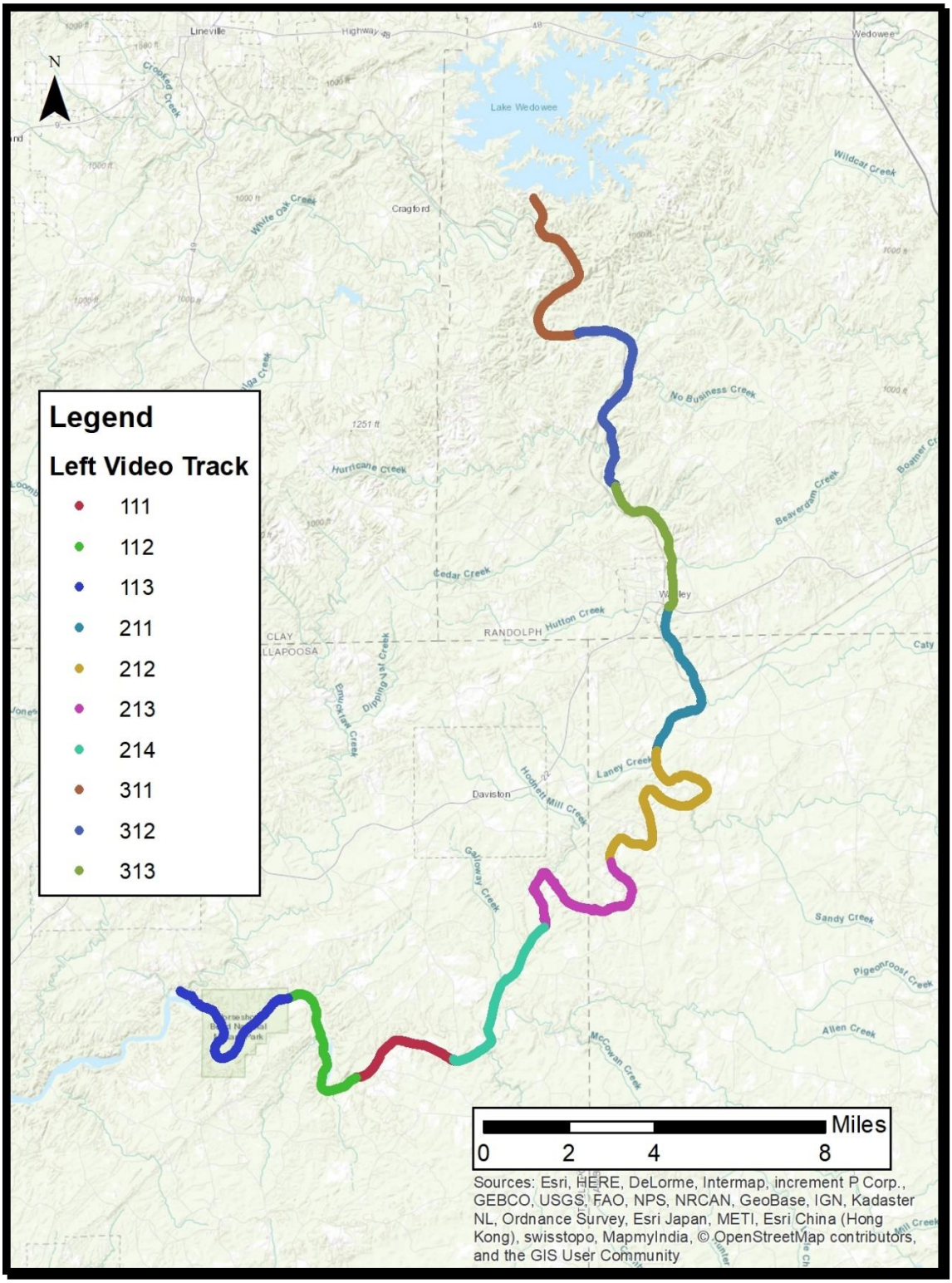


Figure 8: Left HDSS Video Tracks for the Tallapoosa River.

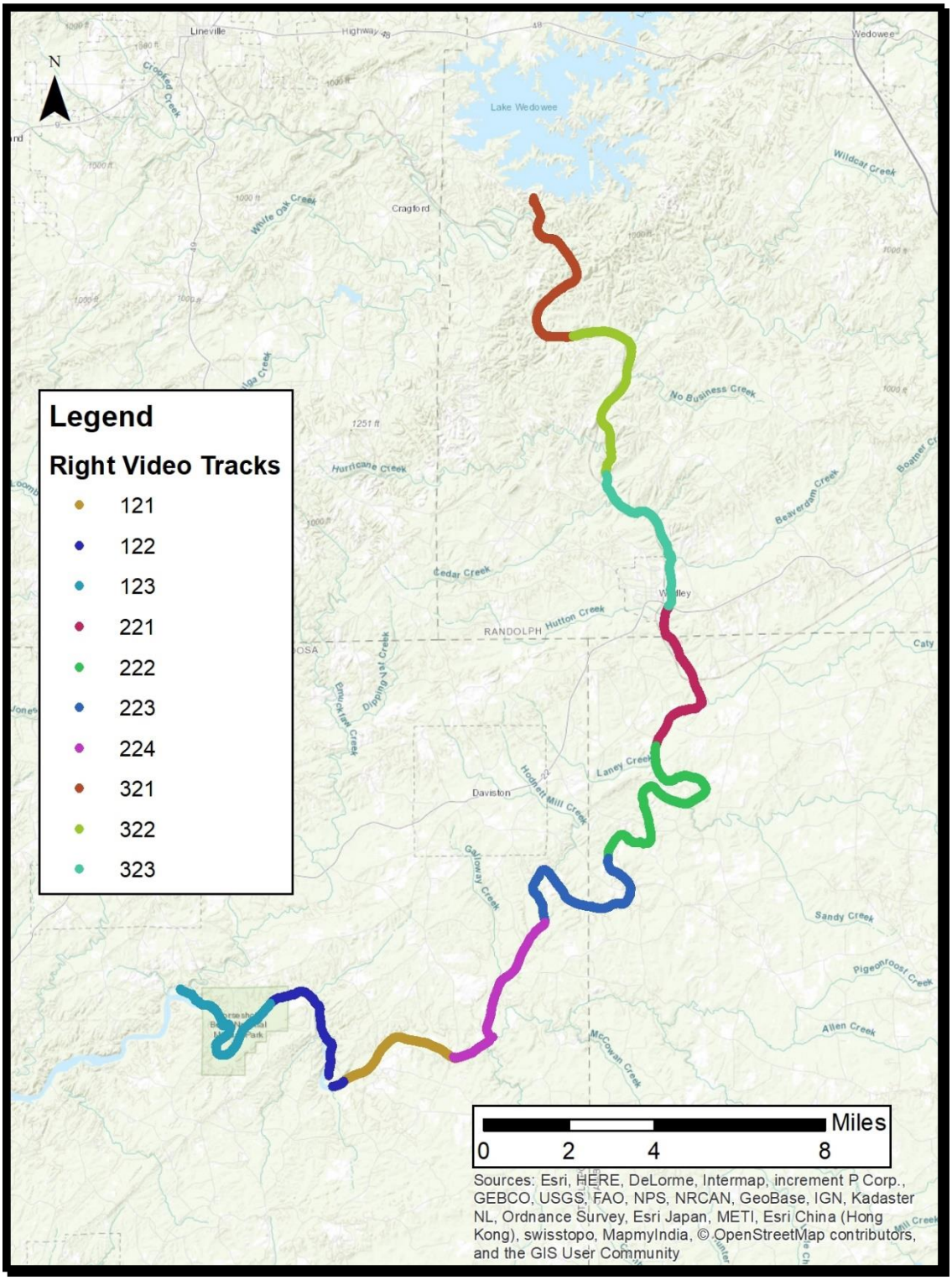


Figure 9: Right HDSS Video Tracks for the Tallapoosa River.

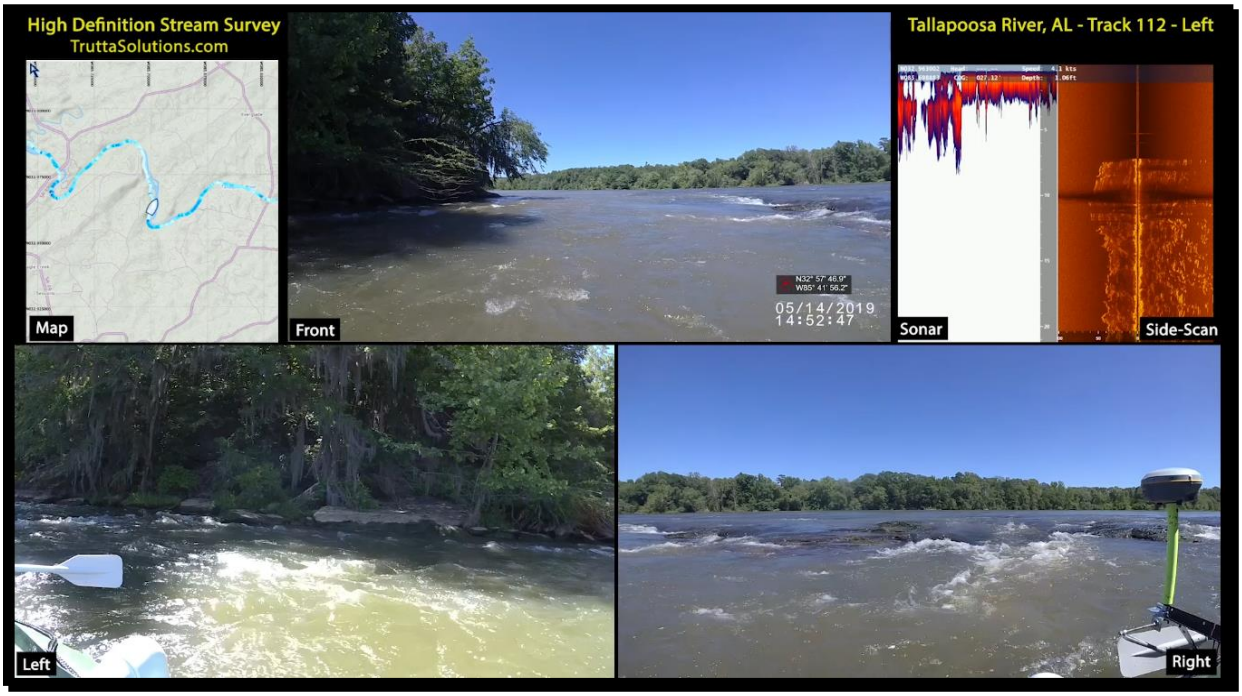
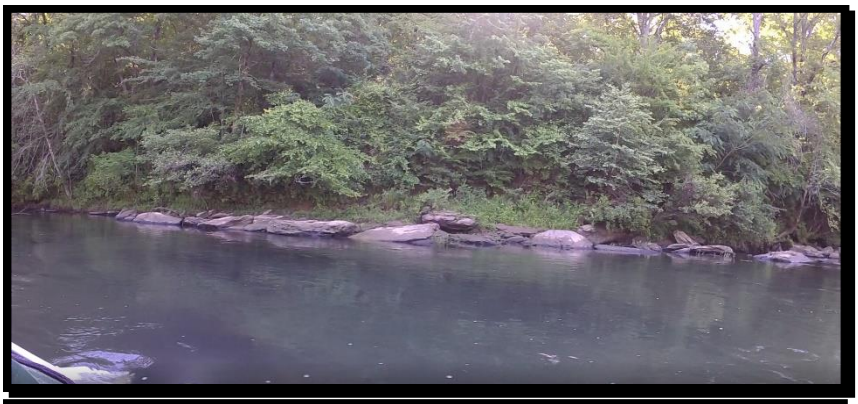


Figure 10: Example of Video Track output from the Tallapoosa HDSS project. Video Track number is in the upper right corner of the video.

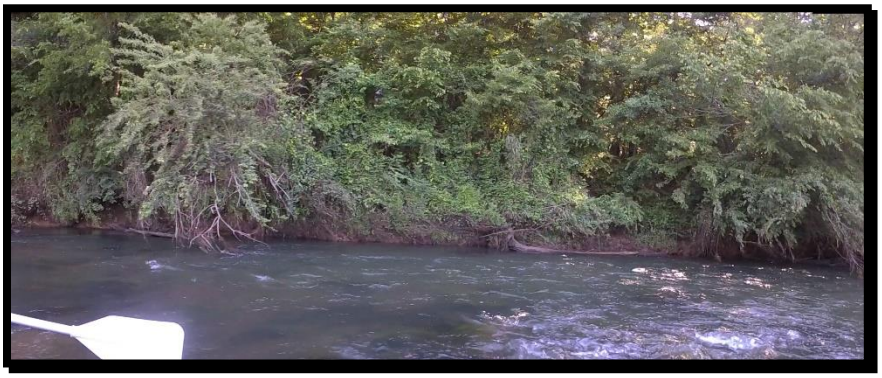
Assessing the condition of the streambanks

One of the goals of the Tallapoosa River HDSS project was to document and classify the streambank condition for the left and right banks of the river. To do this, we classified the HDSS video into one of five classes representing the extent of impairment on the streambank. The following images (Figure 11) from the Tallapoosa River survey provide example of the five classes use in the streambank scoring.

1: Fully Functional



2: Functional



3: Slightly Impaired

4: Impaired

5: Non-Functional

Figure 11: Examples from the Tallapoosa River survey of the five streambank impairment classification levels.

In addition to classifying the streambank condition, we also classified the extent of human modification to the streambank. This classification scores modification into three classes: No modification, moderate modification, and high modification. In general, these scores represent the extent of streambank hardening observed. Moderate modification is typically rip-rap or some other non-impervious modification while high modification is impervious concrete shoreline. We also added a classification confidence to the streambank classification score. The confidence rating reflected the clarity of the streambank in the HDSS field video. The Tallapoosa River had extensive rocky shoals and in a number of places these shoals forced the boat operator away from the streambank decreasing the visibility of the streambank to the video classifier. There were three classes used in the classification – Good visibility, Impaired visibility and no visibility. The majority of the survey was in the Good Visibility class.

The following map images show the following classification results:

Left Bank:

- Streambank Condition - Figure 12
- Streambank Modification - Figure 13
- Streambank Data Confidence – Figure 14

Right Bank:

- Streambank Condition - Figure 15
- Streambank Modification - Figure 16
- Streambank Data Confidence - Figure 17

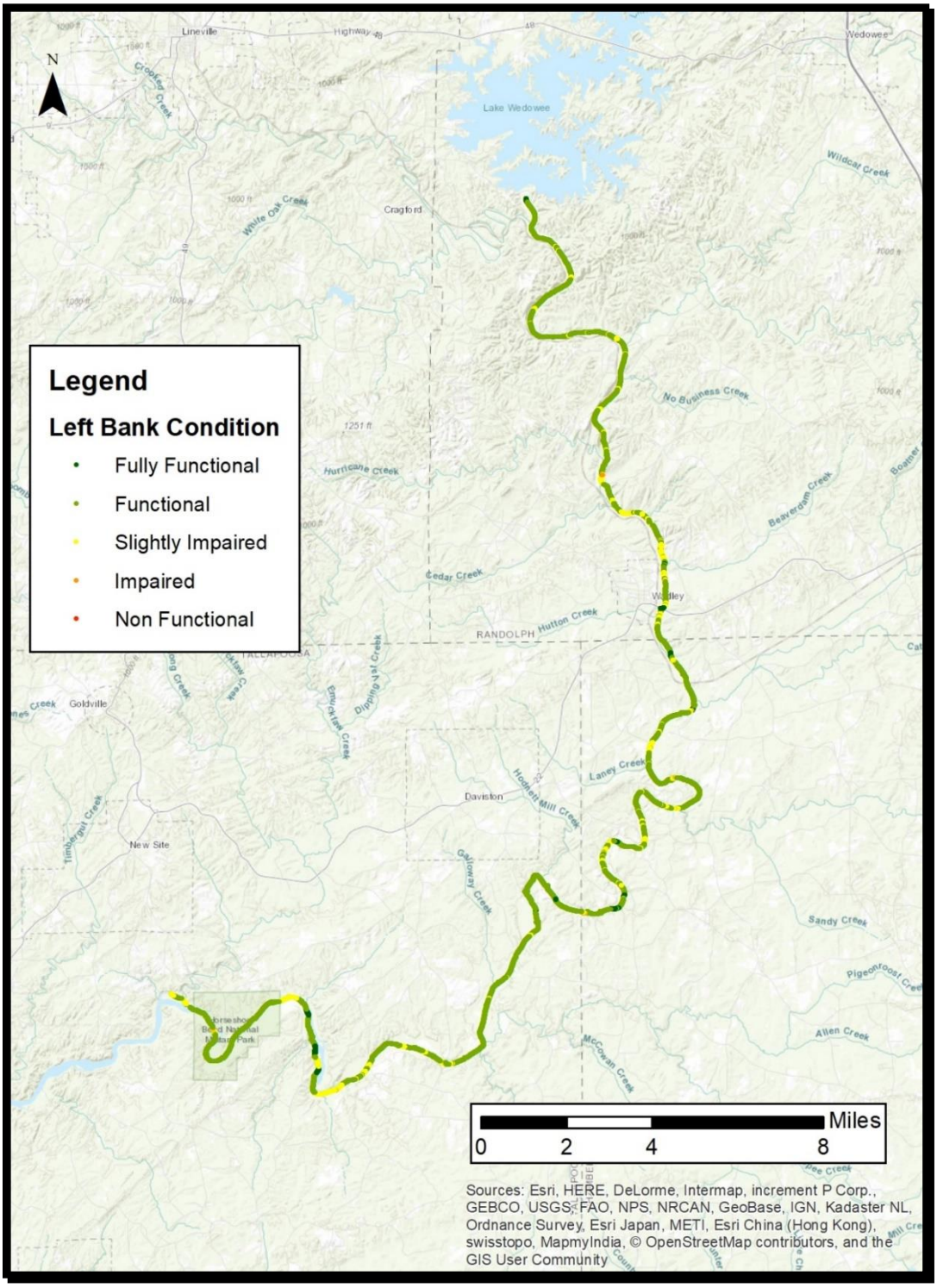


Figure 12: Left Bank Condition Score for the Tallapoosa River HDSS project.

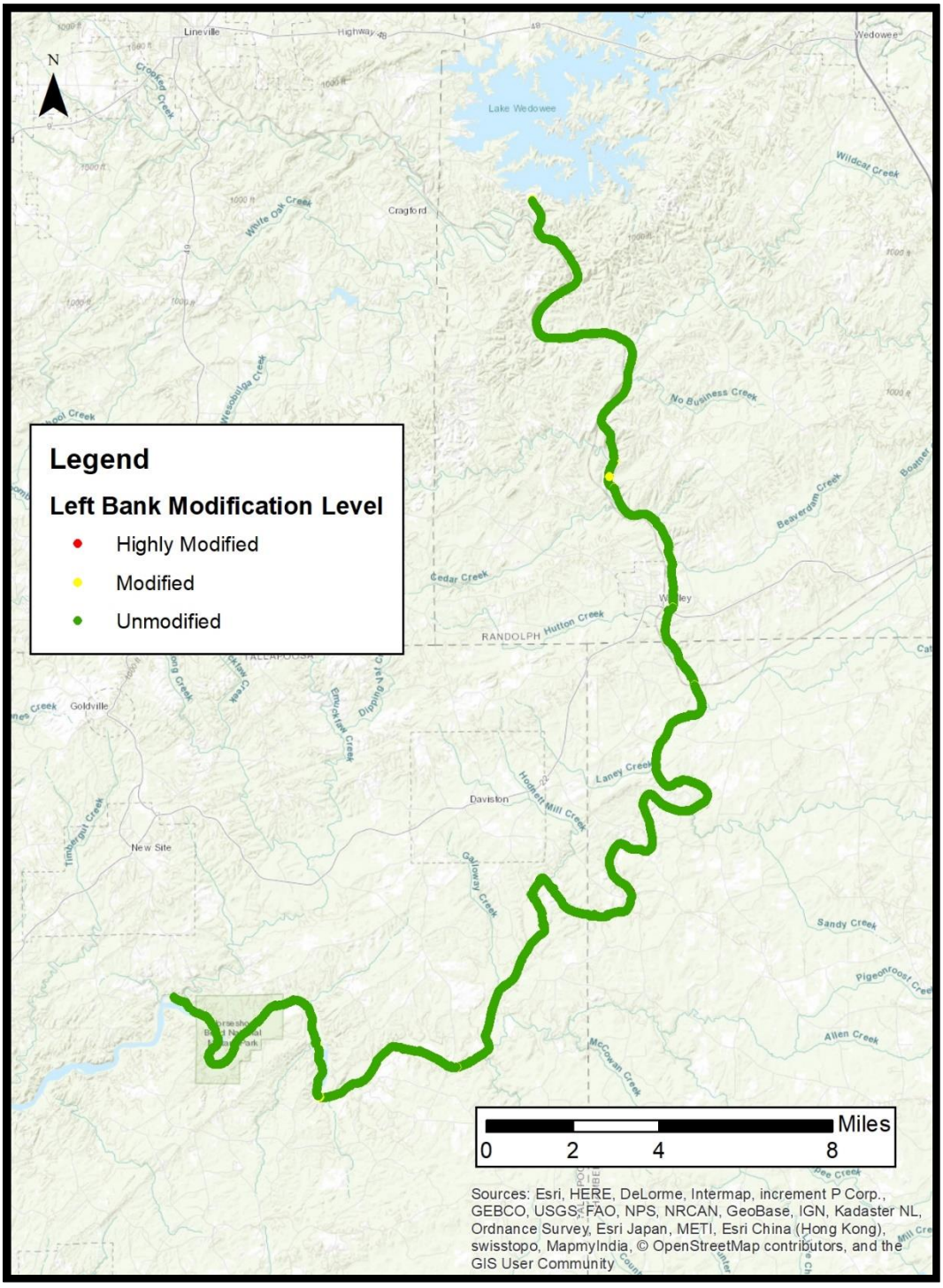


Figure 13: Left Bank Modification Score for the Tallapoosa River HDSS project.

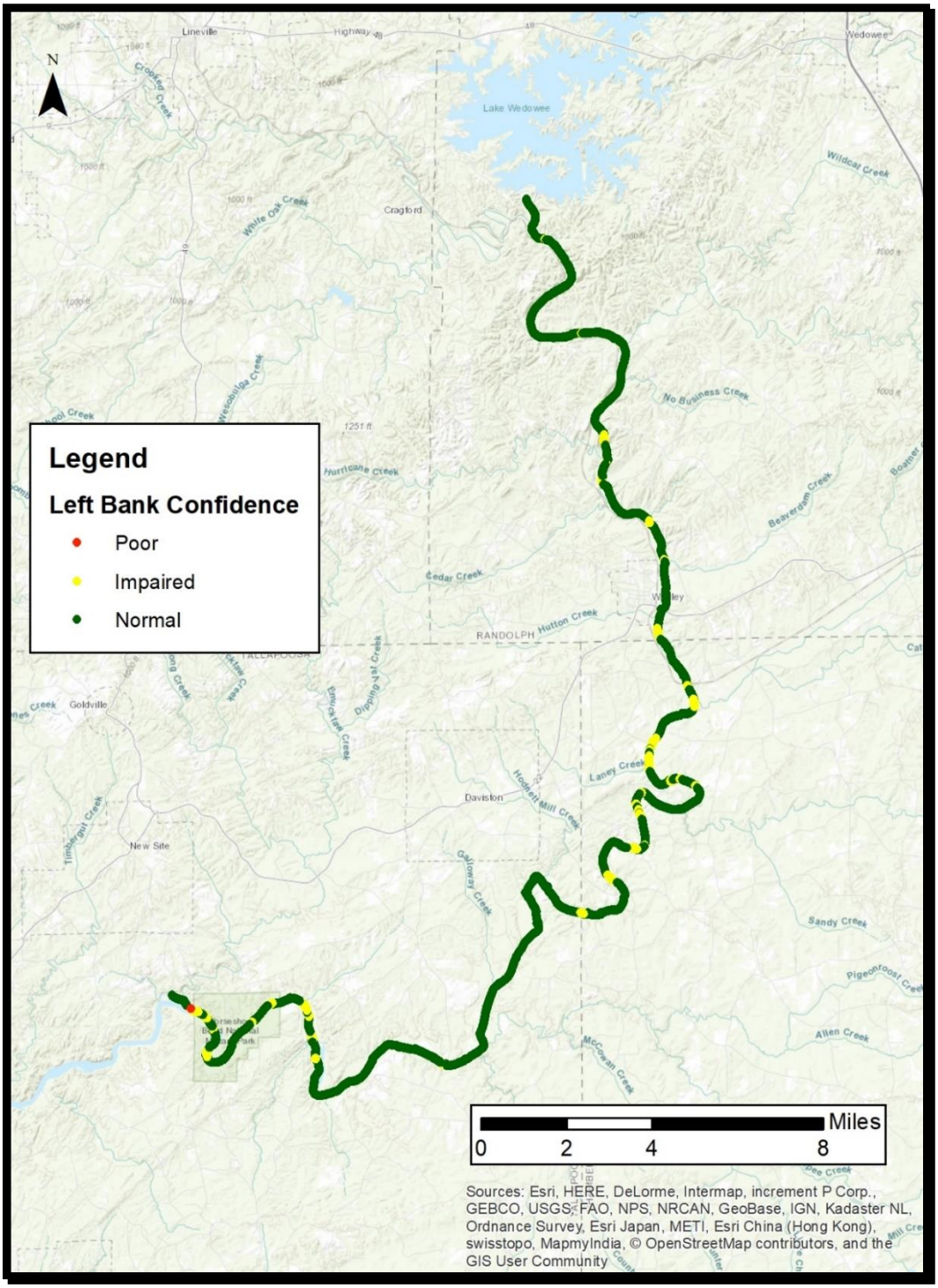


Figure 14: Left Bank Data Confidence Score for the Tallapoosa River HDSS project.

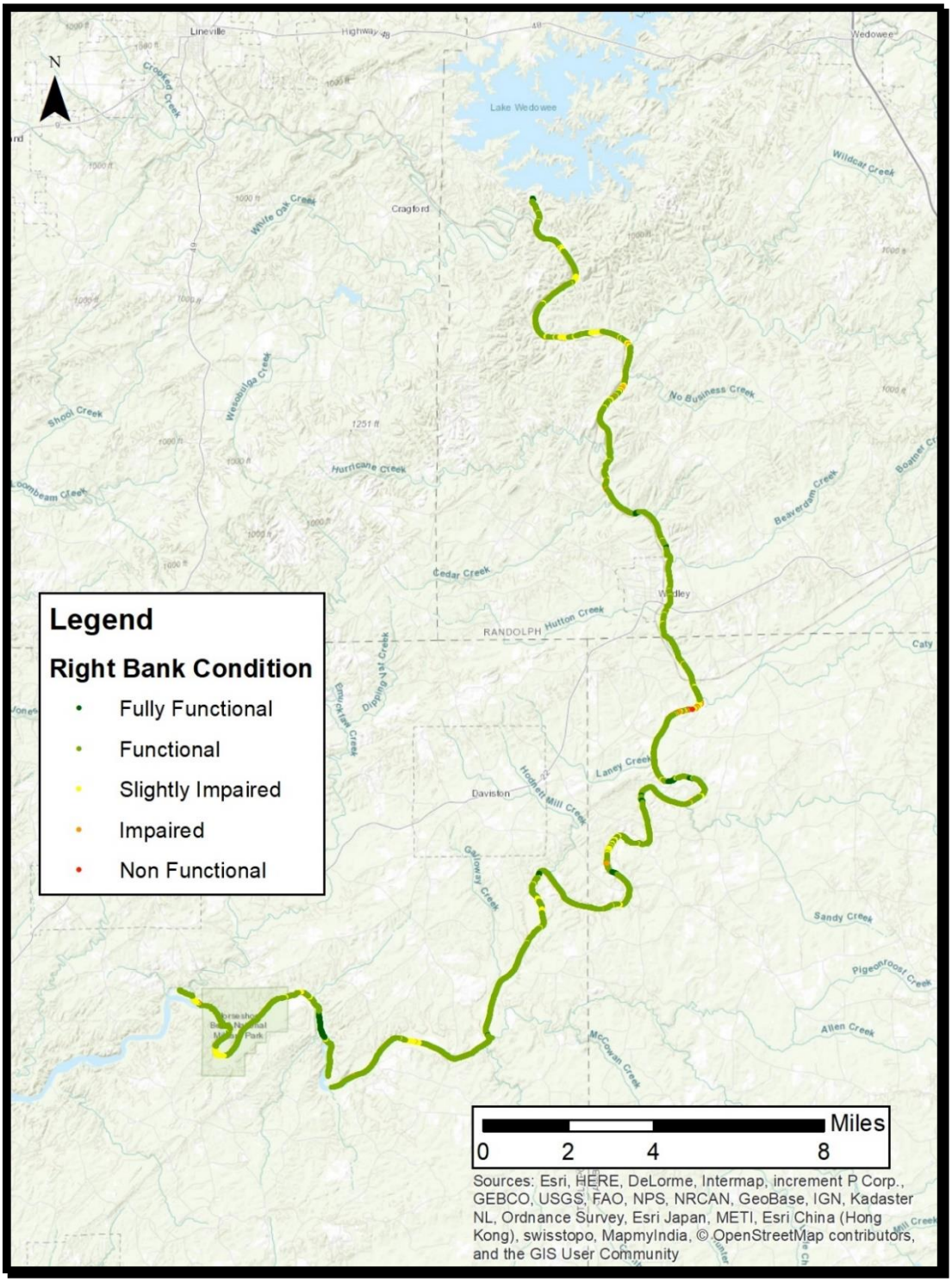


Figure 15: Right Bank Condition Score for the Tallapoosa River HDSS project.

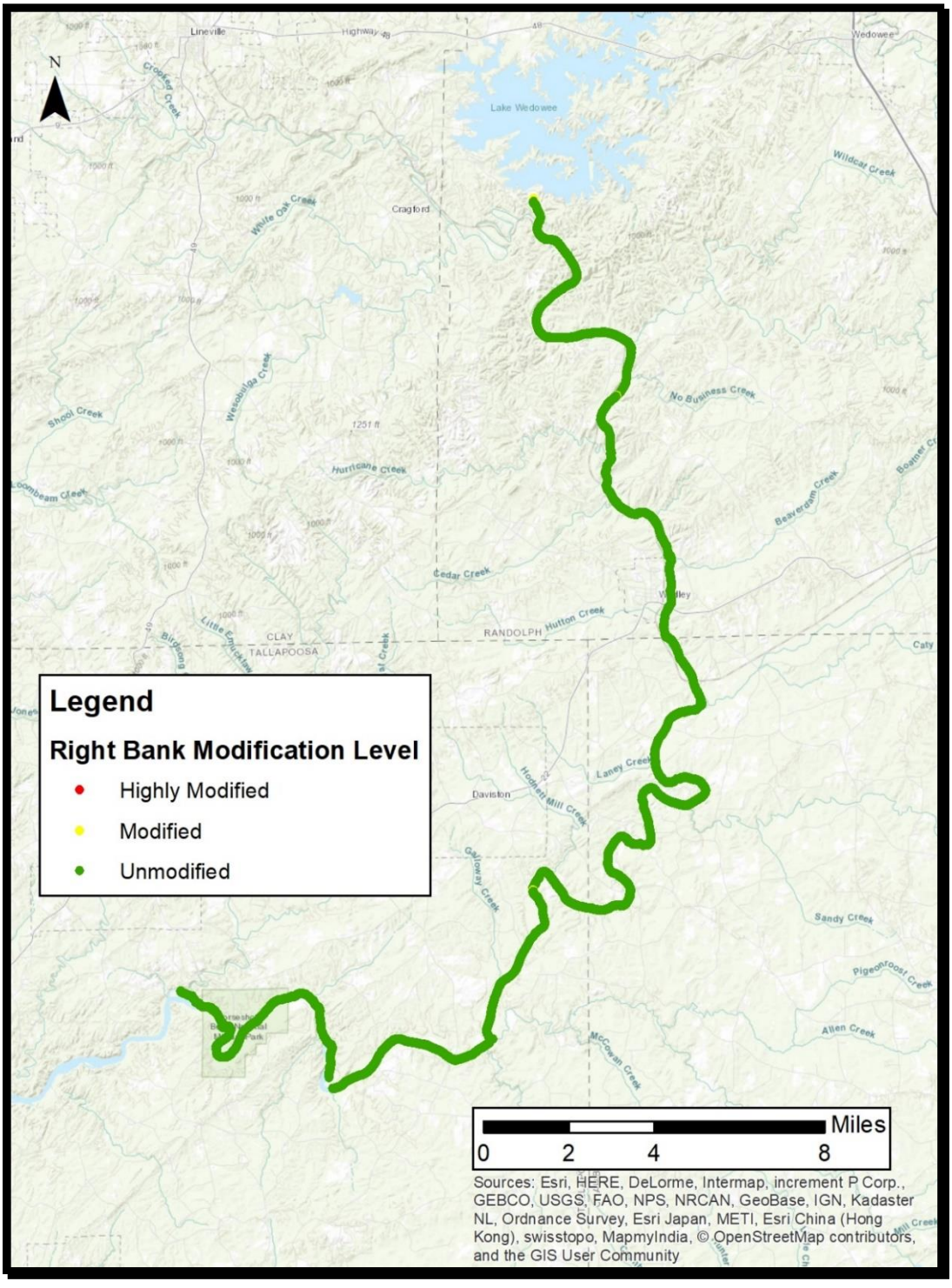


Figure 16: Right Bank Modification Score for the Tallapoosa River HDSS project.

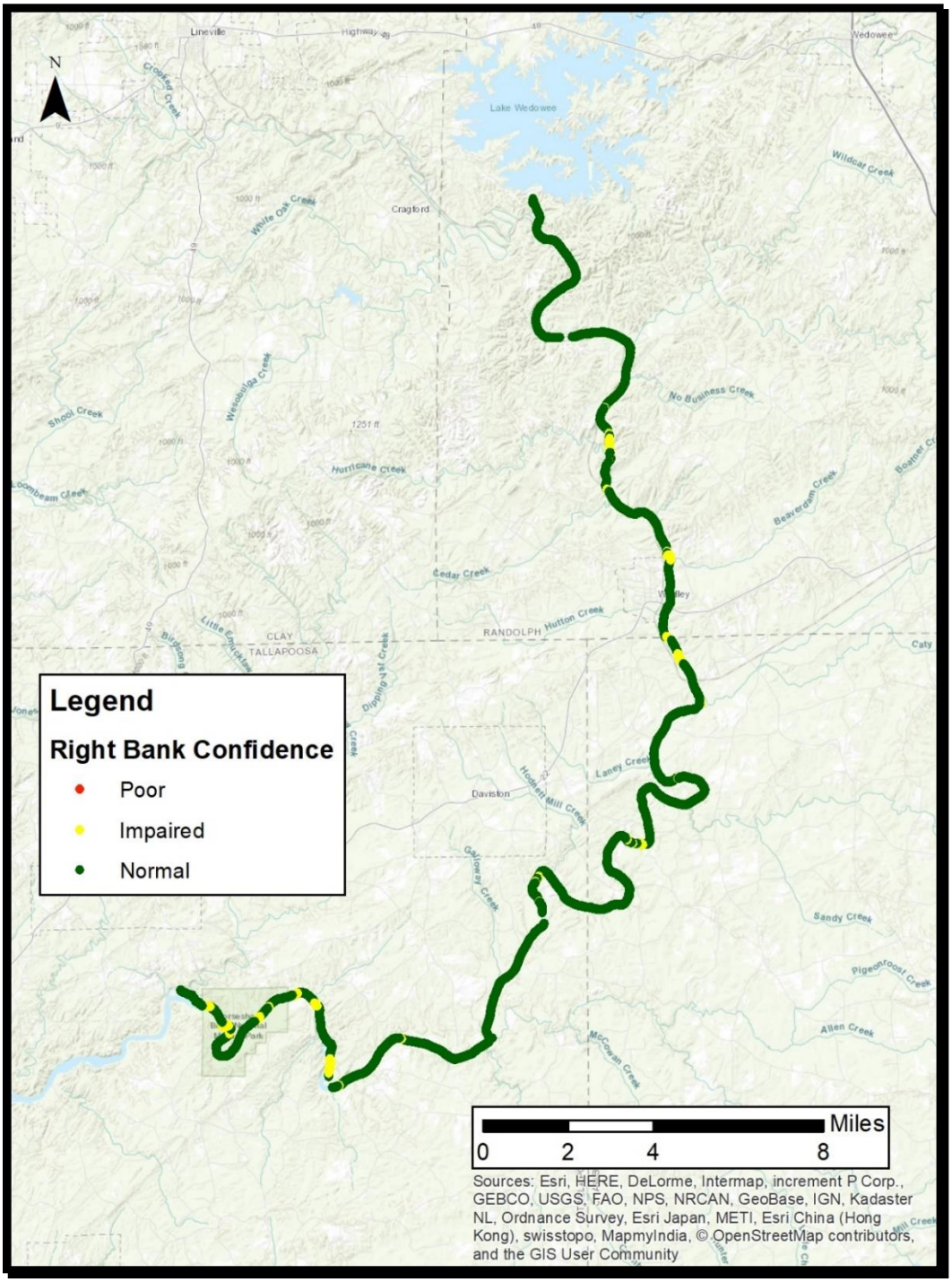


Figure 17: Right Bank Confidence Score for the Tallapoosa River HDSS project.

Average River Conditions

The data for both tracklogs were integrated onto a centerline track of the Tallapoosa River to facilitate comparisons. There was little trend, either increasing or decreasing in a downstream direction for the occurrence of bank condition scores (Figure 18). The average water depth deepened in a downstream direction, but shallow shoals were still present throughout the survey segment (Figure 19). As with the point data for water depth, the discharge fluctuations associated with power generation influence both between-day and during-day water depths and should be used with caution. Integrated maps of left and right track water depth and left and right streambank condition are shown in figures:

- Full survey area - Figure 20
- Upper survey area - Figure 21
- Middle survey area - Figure 22
- Lower survey area - Figure 23

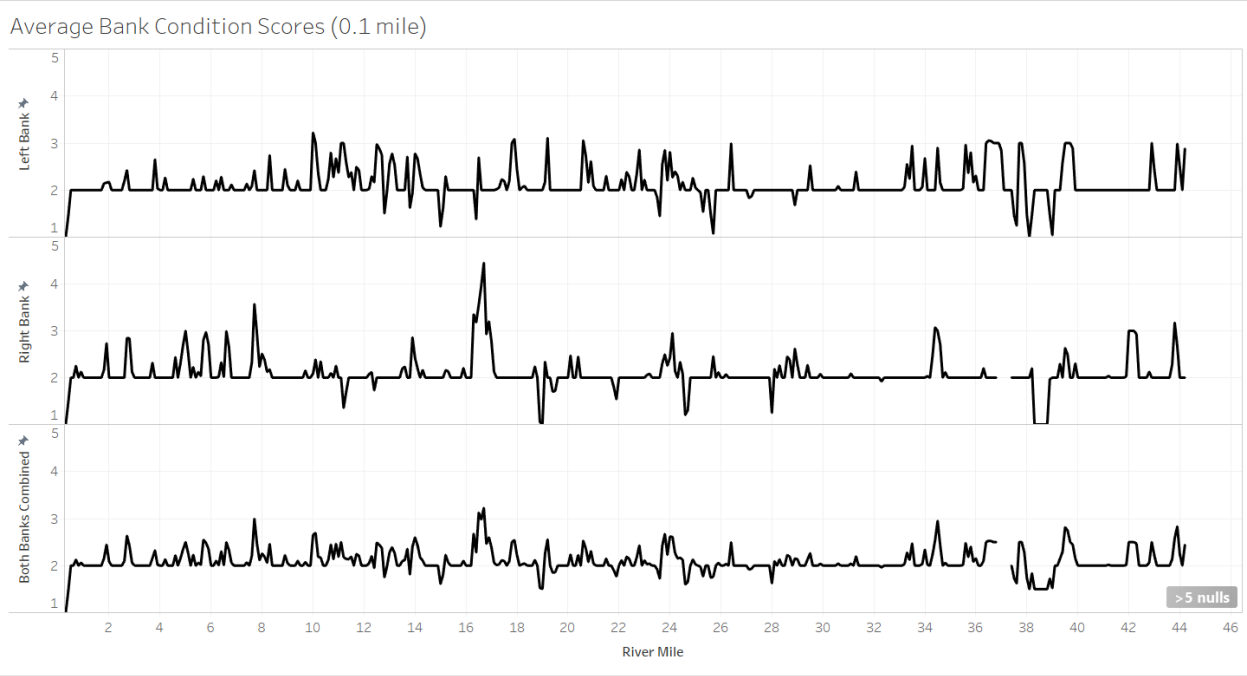


Figure 18: Average bank condition score by river mile (0.1 mile)

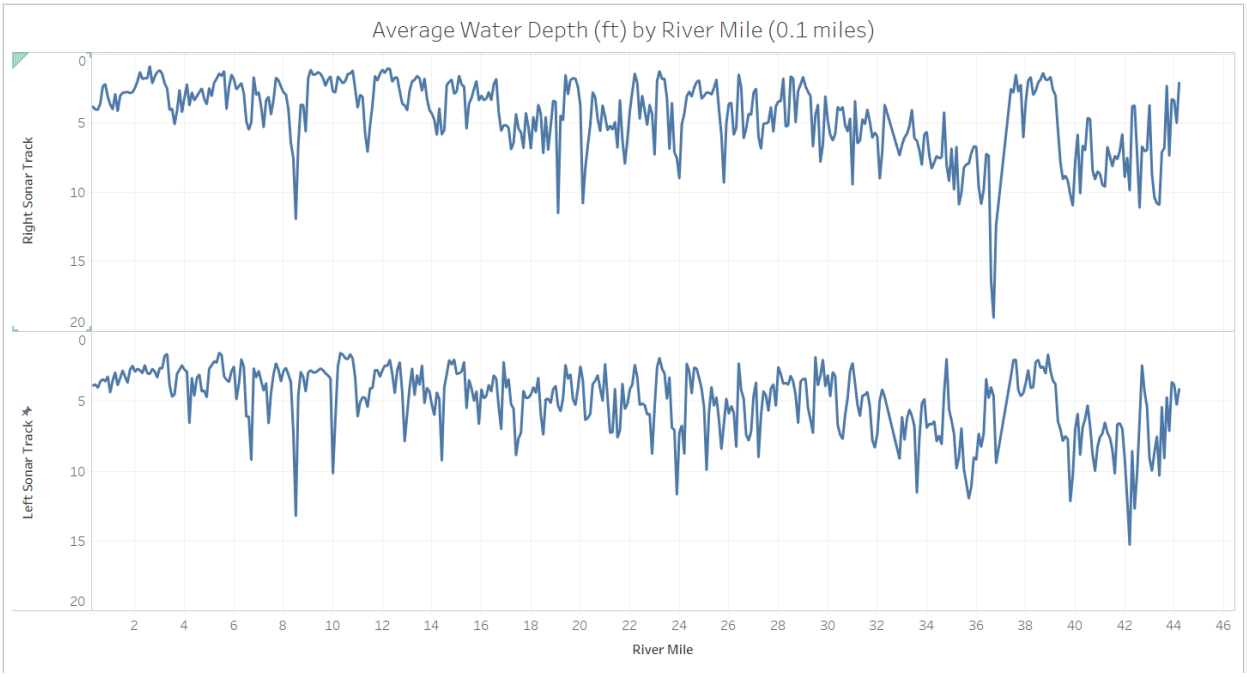


Figure 19: Average water depth (ft) by river mile (0.1 mile)

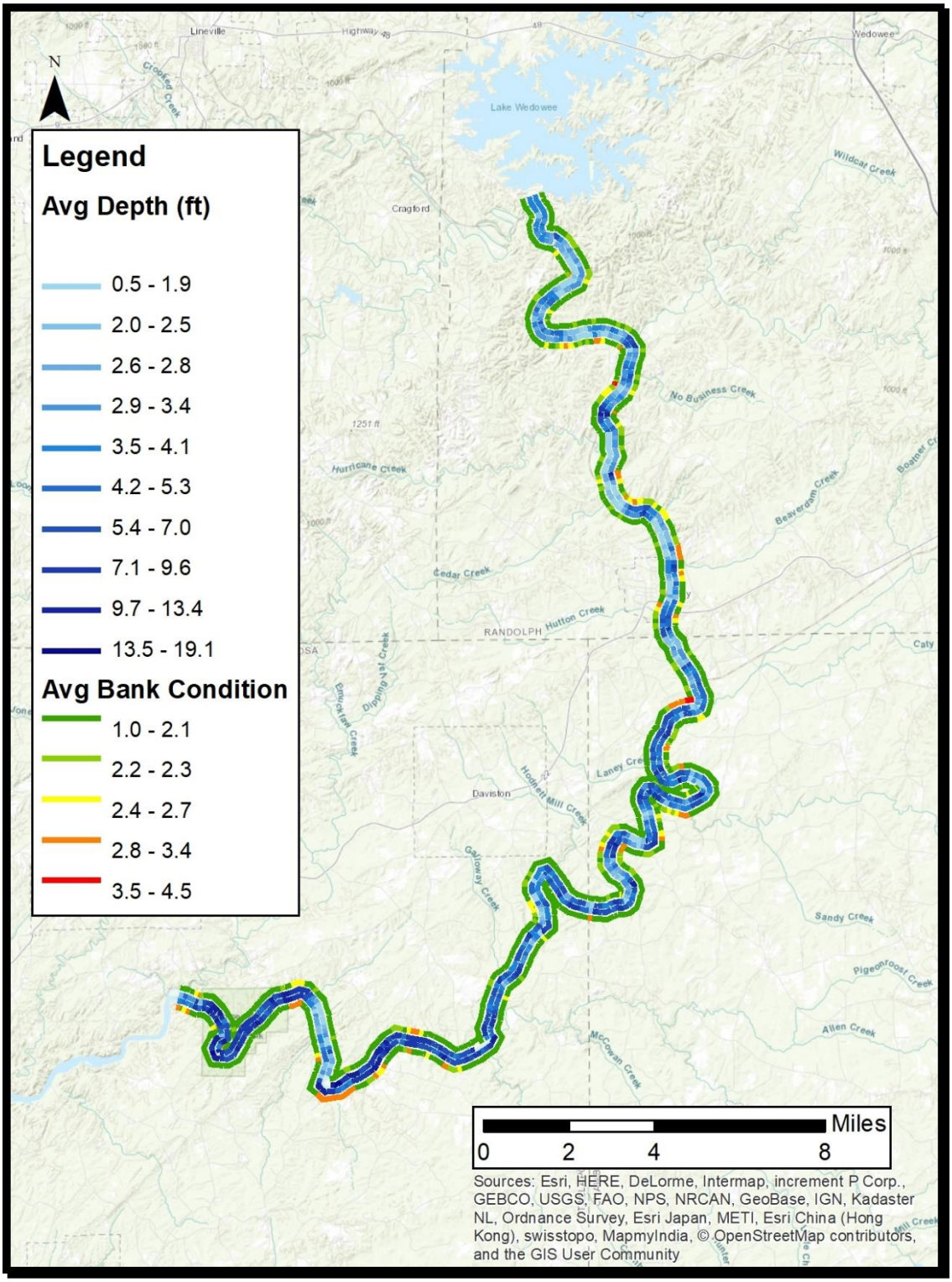


Figure 20: Water depth and relative bank condition for the Tallapoosa survey area.

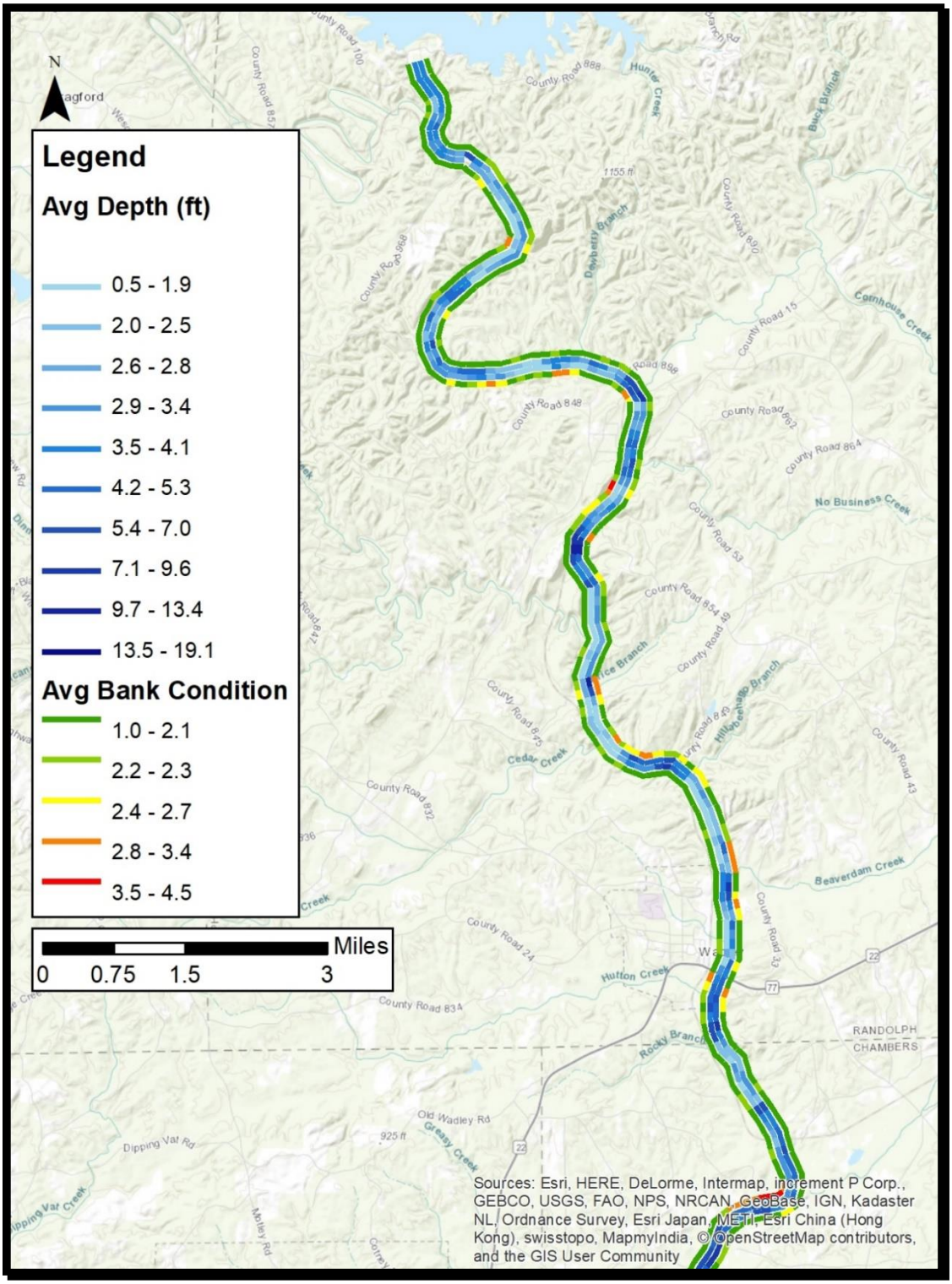


Figure 21: Water depth and relative bank condition for the upper Tallapoosa River survey area.

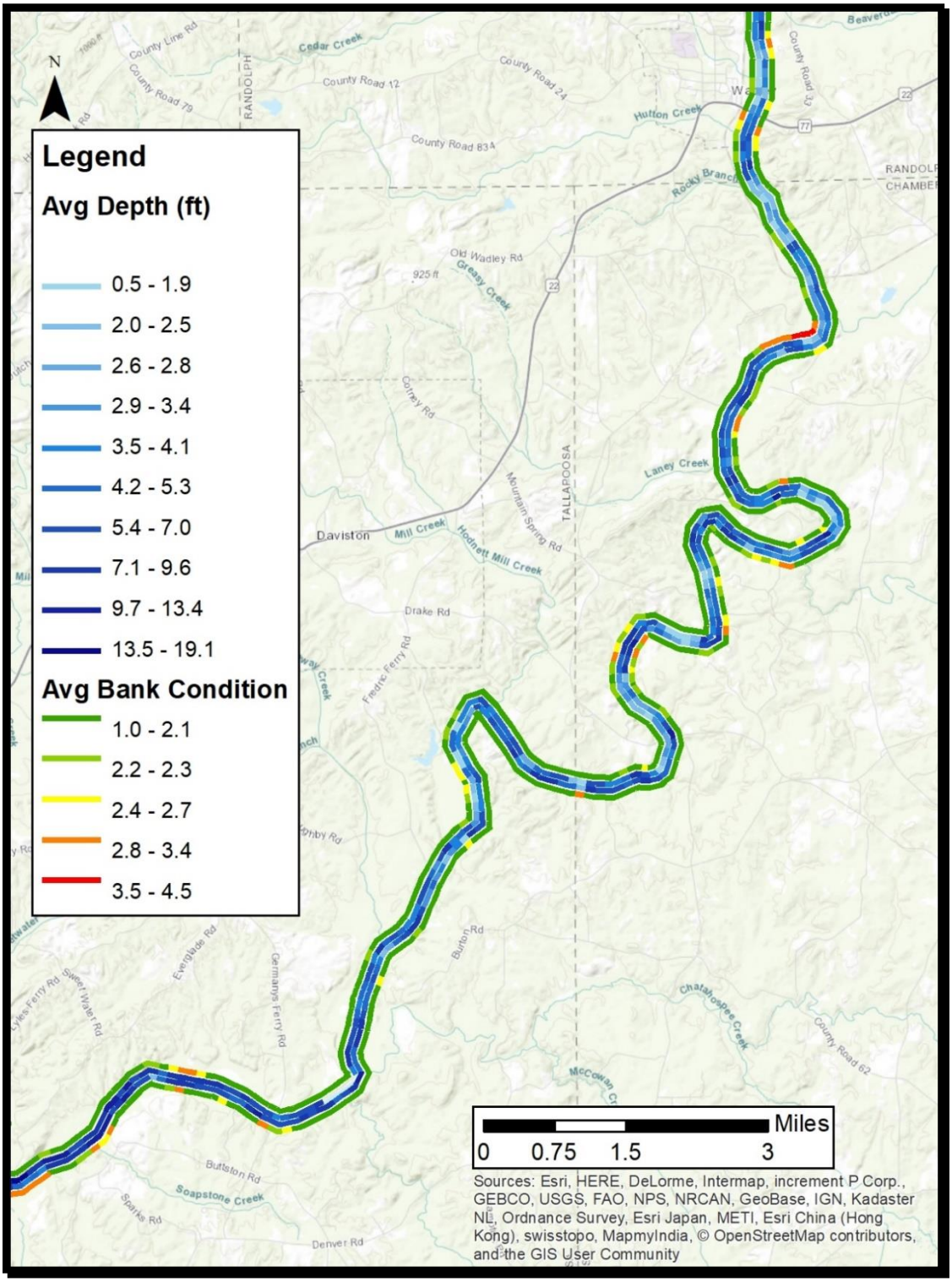


Figure 22: Water depth and relative bank condition for the middle Tallapoosa River survey area.

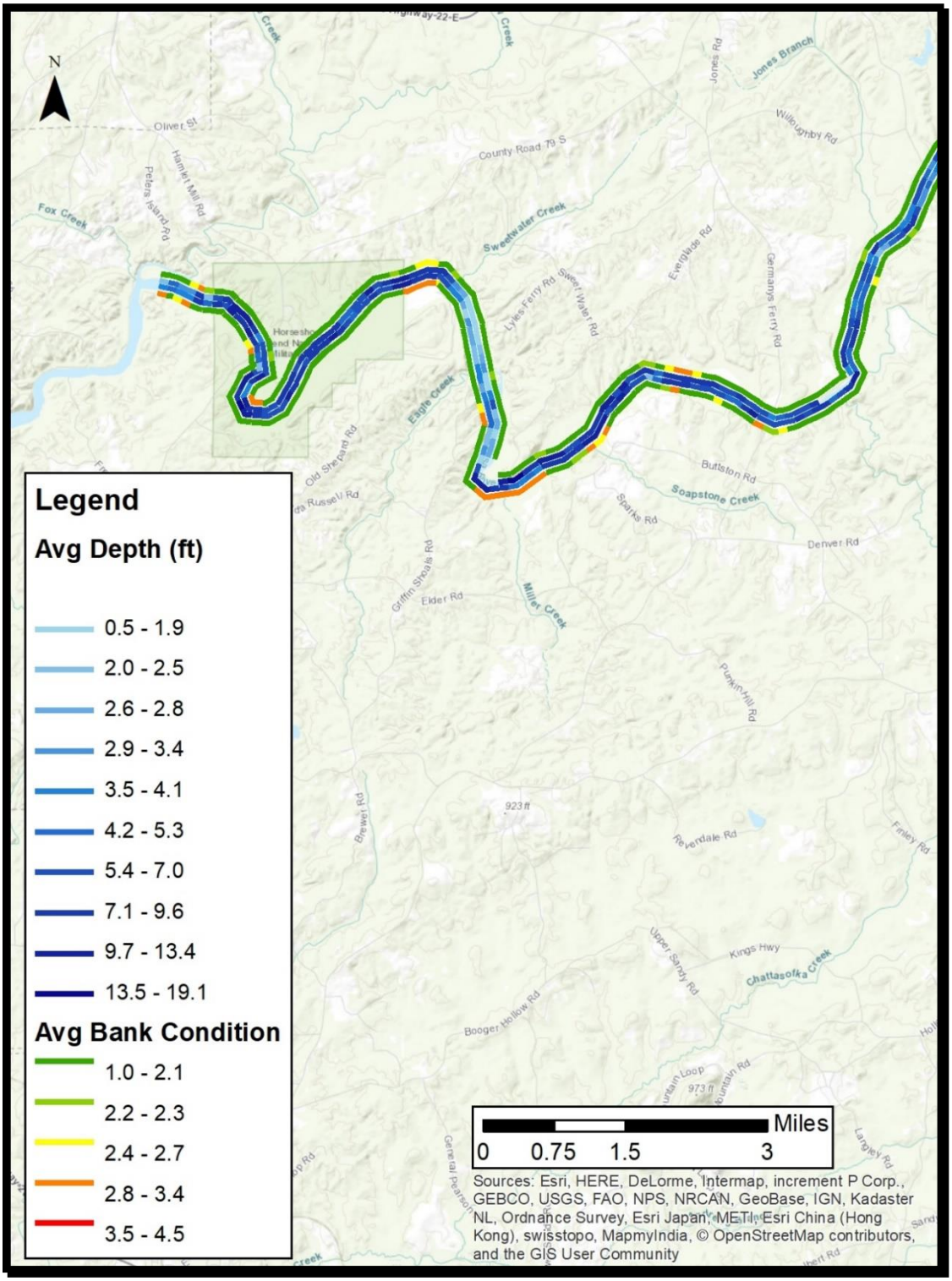


Figure 23: Water depth and relative bank condition for the lower Tallapoosa River survey area.

Ranking the Streambank Areas in most need of management concern

Another goal of the project was to rank the Top 15 worst streambank areas to allow managers to better understand specific areas of failing streambank on the Tallapoosa River. We averaged the point information into 0.1-mile (161m) segments to help facilitate finding the problem areas. Table 3 and Figure 25 to Figure 28 show the results of this ranking. A total of 20 sites were provided for the left bank segments as many segments were tied with a score of 3 (slightly impaired).

Interestingly, only one area scored as impaired to non-functional. This area was located on the right bank between river mile 16.3 to 16.9 (Figure 24). This is a very positive finding as many rivers we have surveyed in the Southeastern US have much more extensive bank erosion issues.

Figure 24: Example images of worst area on right bank of the Tallapoosa River between river mile 16.3 and 16.9.

Table 3: Ranking for the river segments in most need of management concern. Twenty sites are provided for the left bank due to ties in Average Left Bank Condition Scores among segments.

Rank	Left Bank River Mile	Avg Left Bank Condition	Right Bank River Mile	Avg Right Bank Condition	Both Bank River Mile	Avg Combination Bank Condition
1	10.00	3.22	16.70	4.45	16.70	3.23
2	19.20	3.11	16.60	3.96	16.50	3.12
3	17.90	3.09	7.70	3.57	7.70	2.99
4	20.60	3.05	16.50	3.55	16.60	2.98
5	36.50	3.05	16.30	3.35	34.50	2.95
6	36.60	3.04	16.90	3.20	43.90	2.83
7	10.10	3.00	16.40	3.18	39.50	2.82
8	11.10	3.00	43.80	3.17	39.60	2.74
9	11.20	3.00	34.40	3.07	10.10	2.69
10	17.80	3.00	34.50	3.00	16.30	2.68
11	36.40	3.00	5.00	3.00	23.80	2.67
12	36.70	3.00	42.00	3.00	10.00	2.65
13	36.80	3.00	42.10	3.00	2.70	2.63
14	36.90	3.00	42.20	3.00	24.00	2.62
15	37.70	3.00	6.60	2.99	24.10	2.61
16	37.80	3.00				
17	39.50	3.00				
18	39.60	3.00				
19	39.70	3.00				
20	42.90	3.00				

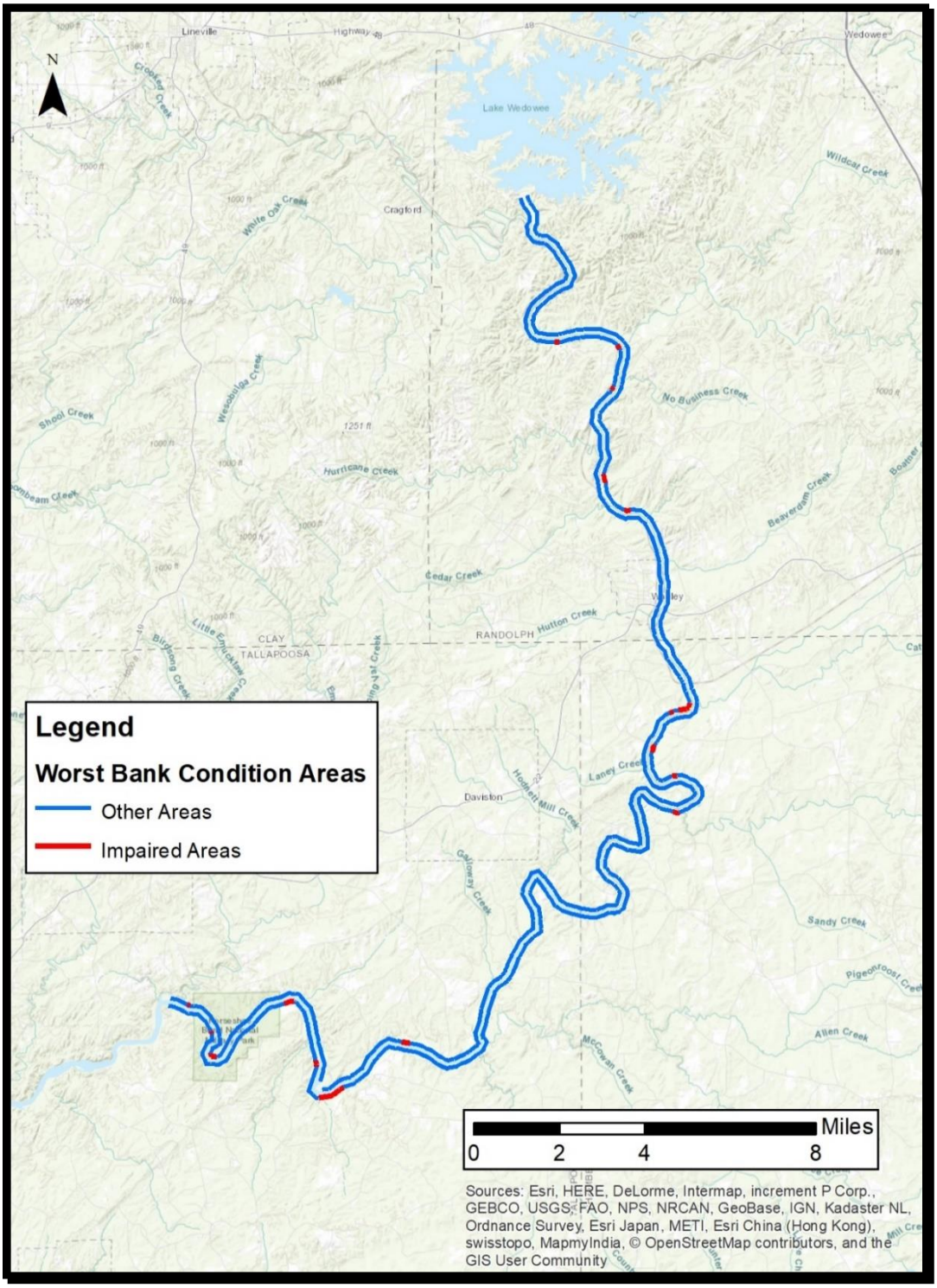


Figure 25: Worst Bank Condition Areas from the HDSS results for the Tallapoosa River.

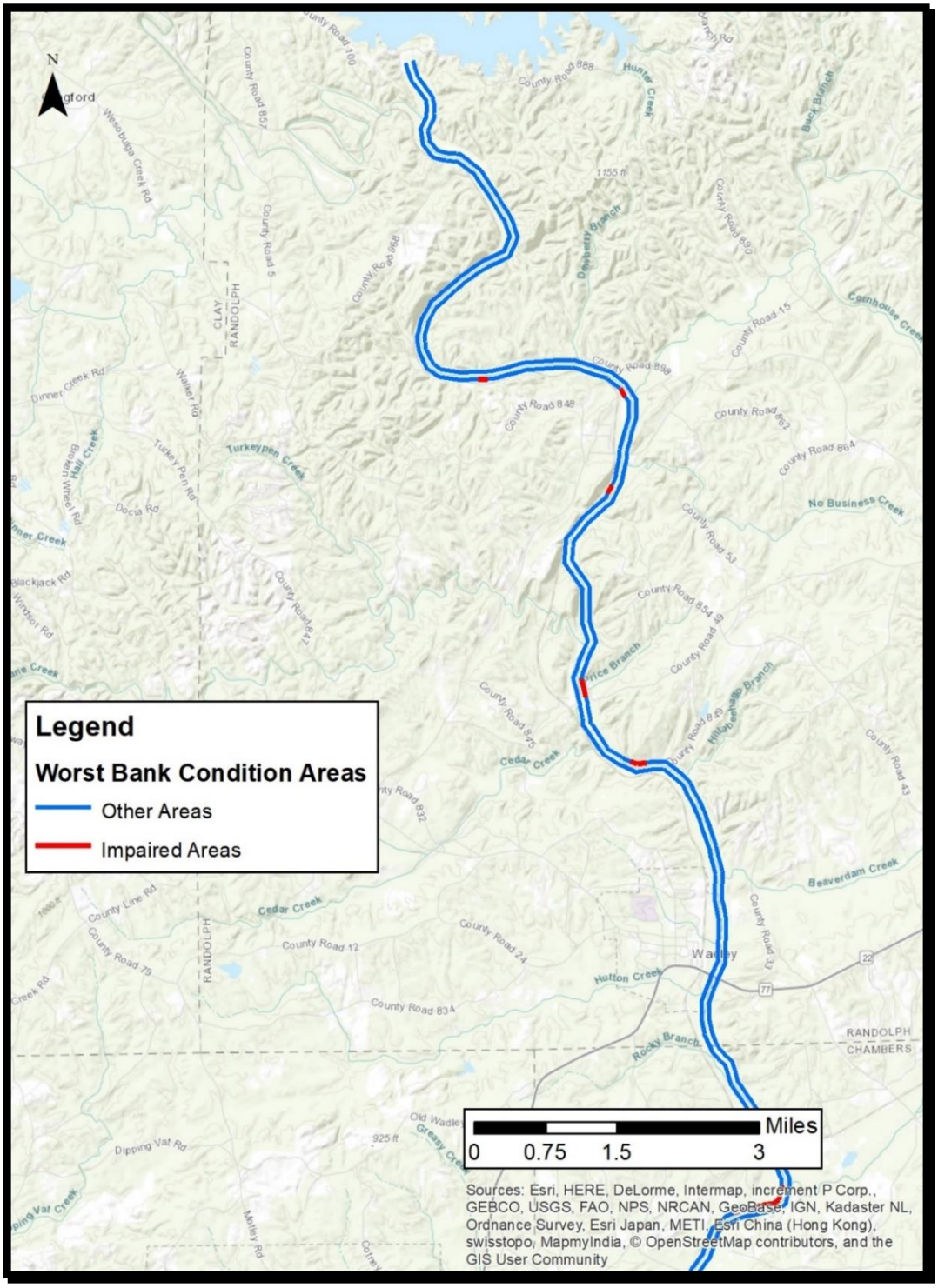


Figure 26: Worst Bank Condition Areas from the HDSS results for the upper survey section of the Tallapoosa River.

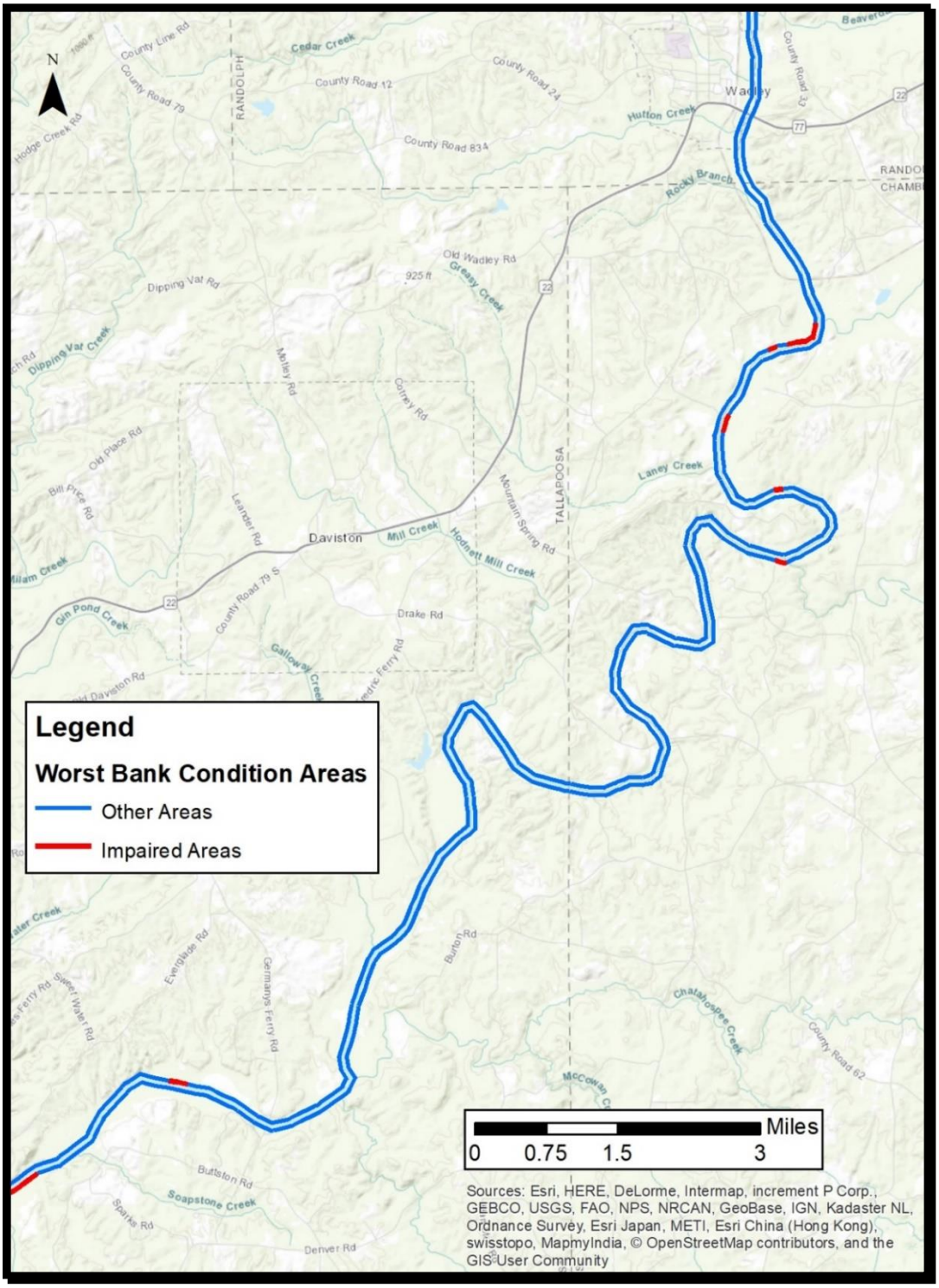


Figure 27: Worst Bank Condition Areas from the HDSS results for the middle survey section of the Tallapoosa River.

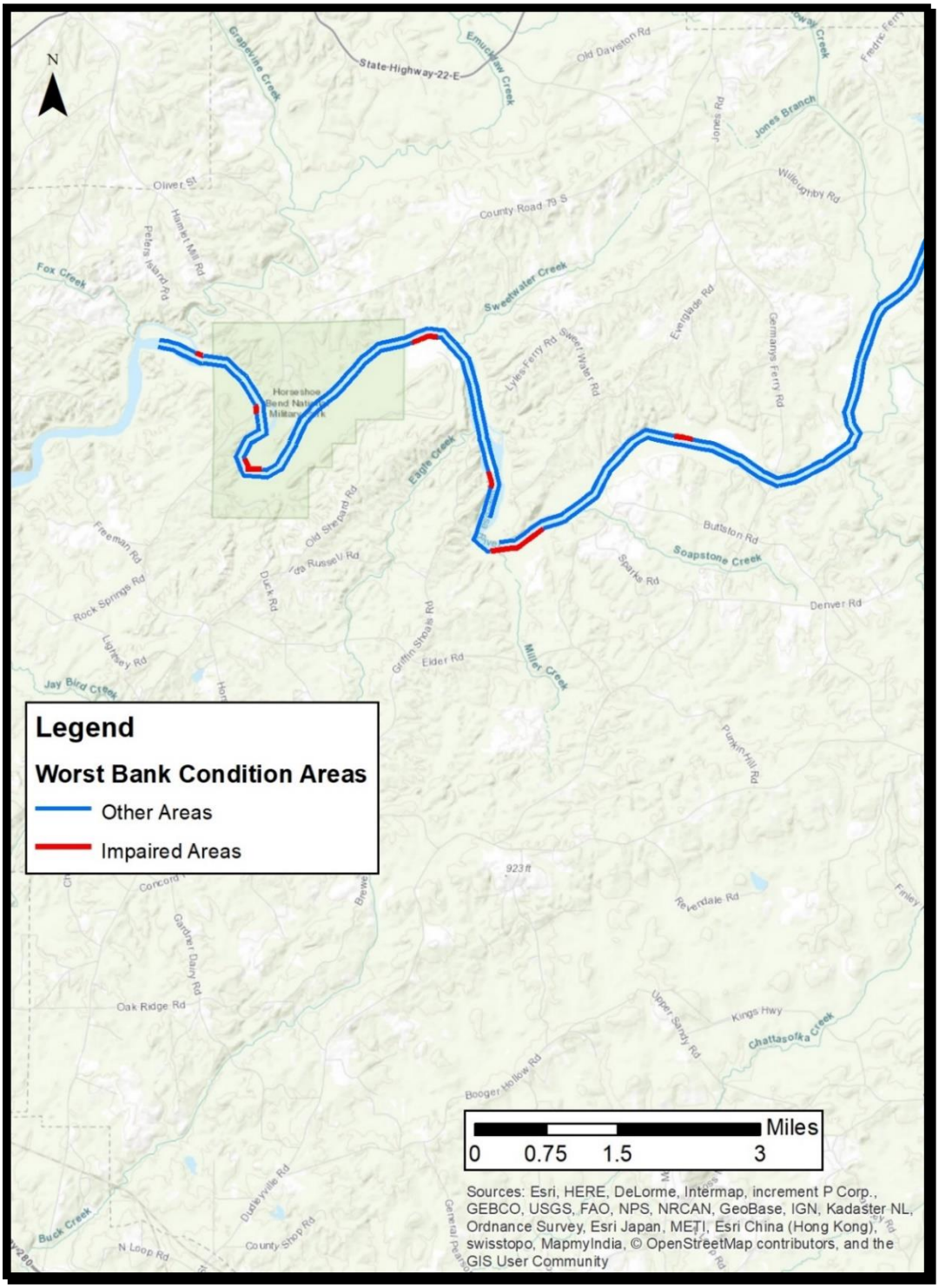


Figure 28: Worst Bank Condition Areas from the HDSS results for the lower survey section of the Tallapoosa River.

Cross-Sectional Transects

A total of 40 cross-sectional bathymetric transects (XS) were completed for the Tallapoosa River HDSS project. The HDSS survey covered 44 miles of the Tallapoosa River below R. L. Harris Dam and while we attempted cross-sections at 82 different locations, many had to be dropped due to very poor GPS coverage resulting from the distance from cellular base stations, tall trees and high bluffs along the river. Map locations for the 40 transects are shown in Figure 29. An additional survey day (Day 4), 2019-05-17 was needed to repeat some areas surveyed from Day 1 to fill in missing transect areas.

We provided the transect information in digital format for use in modeling flow conditions in the river segment below R. L. Harris dam. The Tallapoosa River is a regulated river with fluctuating flows as the result of power generation. We traveled down river and observed changes in stage height as a result of the power peaking flows. Some measures showed a rise in downstream water surface elevation, likely due to catching up with the flow pulse. Additionally, surveys among days showed different water surface elevations in similar areas. We reported the survey day and date to help address these river discharge related issues (Table 4).

A plot of water surface elevation as compared to River Mile showed that the river was generally falling at a consistent rate except for a large elevation drop between miles 37.2 and 38.8 (Figure 30). A linear trend model was computed for Surface Water Elevation given River Mile (Table 5). The model was significant at $p <= 0.001$. The generalized slope model predicts that the Tallapoosa River drops 2.4 ft per mile.

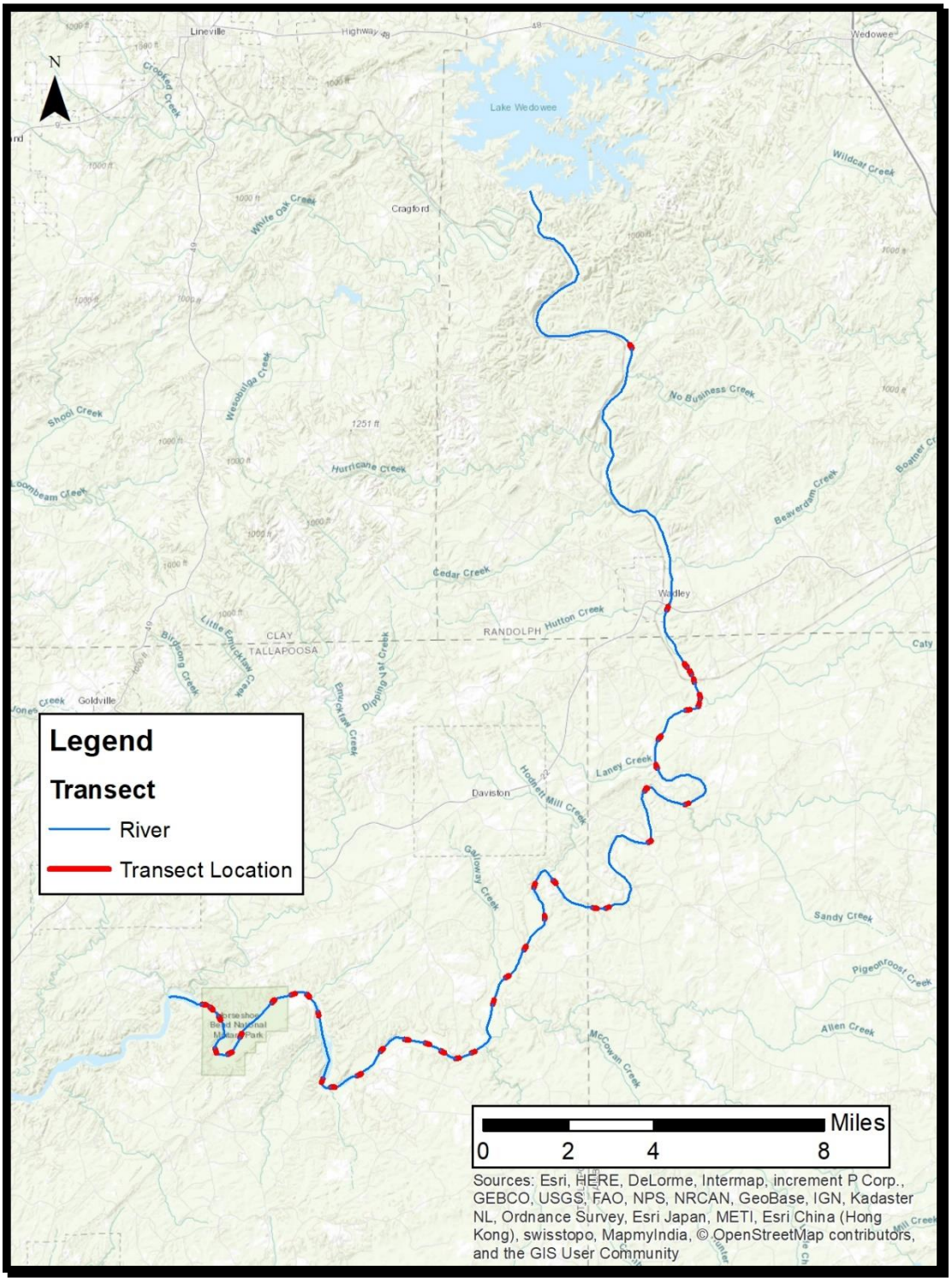


Figure 29: Location of the 40 cross-sectional bathymetric transects on the Tallapoosa River.

Table 4: Bathymetric transect information for the Tallapoosa survey.

Transect Number	River Mile	Water Surface Elevation (ft)	Date	Survey day
1	6.7	641.03	2019-05-16	3
2	13.9	603.84	2019-05-15	2
3	15.4	596.17	2019-05-15	2
4	15.6	596.13	2019-05-15	2
5	15.8	595.61	2019-05-15	2
6	16.2	595.56	2019-05-15	2
7	16.4	594.37	2019-05-15	2
8	16.7	592.66	2019-05-15	2
9	17.7	592.54	2019-05-15	2
10	18.4	592.27	2019-05-15	2
11	20.5	586.77	2019-05-15	2
12	21.6	586.01	2019-05-15	2
13	22.9	584.65	2019-05-15	2
14	26.0	570.65	2019-05-15	2
15	26.3	570.58	2019-05-15	2
16	27.5	567.82	2019-05-15	2
17	28.3	565.08	2019-05-15	2
18	29.1	561.52	2019-05-15	2
19	30.0	561.01	2019-05-15	2
20	30.8	560.80	2019-05-15	2
21	31.5	560.73	2019-05-15	2
22	32.9	562.08	2019-05-17	4
23	33.3	561.86	2019-05-17	4
24	33.7	561.64	2019-05-17	4
25	34.1	560.67	2019-05-14	1
26	34.6	560.53	2019-05-14	1
27	35.3	560.30	2019-05-14	1
28	36.1	560.14	2019-05-14	1
29	36.8	560.09	2019-05-14	1
30	37.2	560.47	2019-05-17	4
31	38.8	541.87	2019-05-17	4
32	39.3	536.60	2019-05-17	4
33	39.7	534.19	2019-05-14	1
34	40.2	534.02	2019-05-14	1
35	41.3	533.61	2019-05-14	1
36	41.8	533.55	2019-05-14	1

37	42.2	533.47	2019-05-14	1
38	43.1	532.22	2019-05-14	1
39	43.4	532.09	2019-05-14	1
40	43.6	532.74	2019-05-17	4

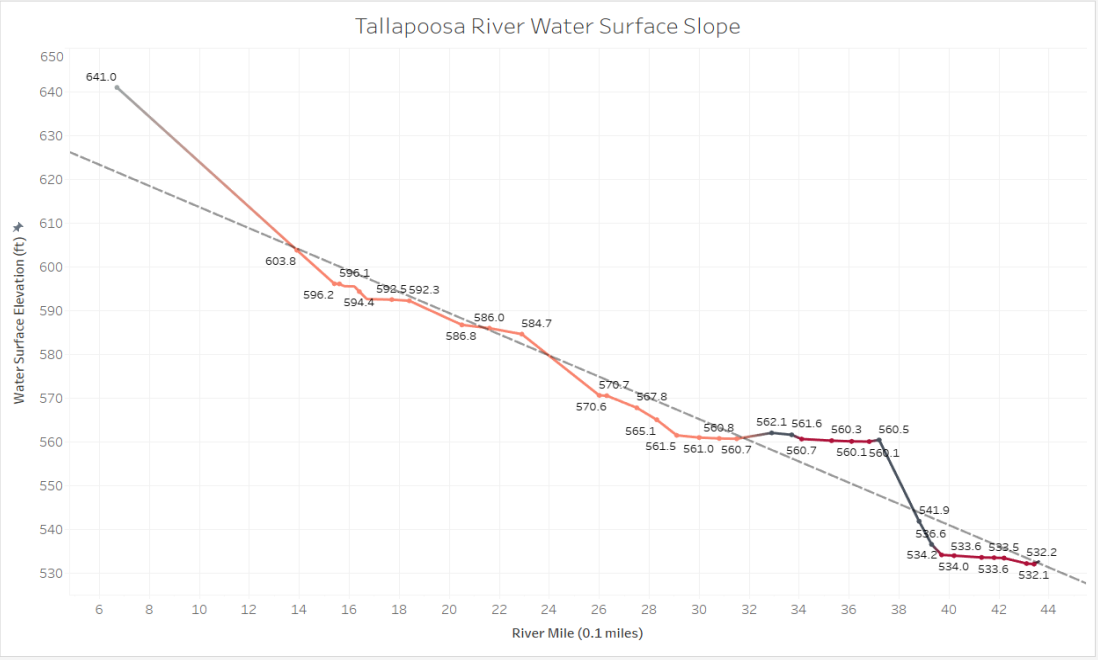


Figure 30: Water Surface Elevation to River Mile for the Tallapoosa survey. Colors reflect different days of the survey. The dotted line is the linear trend line.

Table 5: Trend line statistics for the generalized slope relationship for the Tallapoosa River.

P-value: < 0.0001

Equation: Elevation = -2.42269*R Mile + 637.847

Coefficients

Term	Value	StdErr	t-value	p-value
R Mile	-2.42269	0.0942128	-25.7151	< 0.0001
intercept	637.847	2.92464	218.094	< 0.0001

Conclusions

The High Definition Stream Survey (HDSS) approach proved to be a rapid method to collect a wide range of useful information about the Tallapoosa River. We surveyed 44 miles and collected data on the stream bottom, water depth, and the condition of both riverbanks. The resulting data will be highly useful for a range of river management issues. The cross-section transect information is useful to help better understand the quantity of water available at different discharges, while the longitudinal information can be used to support targeted restoration, habitat improvement or other water management projects.

The HDSS video is exceptionally useful in providing a baseline documentation of conditions throughout a long stretch of the bypass reach during May of 2019. If future surveys are completed, comparison with this survey completed in 2019 allowed us to directly compare the changes in river conditions between surveys. This repeated approach would allow trends in change to the river corridor conditions over time to be accurately documented.

Finally, use of the HDSS video allows for a wide range of interested viewers to see the conditions throughout the river. It is unlikely that most river managers, public officials, decision-makers, or other interested parties will have time to spend boating down the Tallapoosa River to look for problem areas. With the HDSS video, it is easy to review the instream conditions and view specific problem areas. The availability of this video should improve decision-making throughout the river as the worst problems can be identified and addressed using a comparative prioritization scheme.

A more specific discussion of what we observed during our Tallapoosa River HDSS survey focuses on the general condition of the streambanks and difficulties associated with collecting bathymetric transects. The general condition of the streambanks on the Tallapoosa River was relatively good. On average, much of the river scored as functional or slightly impaired streambank condition. Much of the slight impairment areas were due to the fluctuating flows eroding the streambank within a few feet of the water surface and streambank interface. Only one area scored in the impaired/non-functional class, and this area would be an excellent area to focus streambank rehabilitation efforts. Any sedimentation issues observed in the river downstream of R.L. Harris dam likely are not due to streambank failure as currently much of the river is in decent condition. Although we did not directly survey areas outside of the main river channel, if sedimentation issues are observed in the Tallapoosa main channel, it is likely due to sedimentation coming in from tributary streams and not from the main channel streambanks.

The Tallapoosa River below R. L. Harris dam is a wide river with numerous rocky shoals. Changes in river stage due to the hydropower peaking releases changed river conditions rapidly and required substantial effort to accurately collect bathymetric cross-section transects. Quantifying the travel time of discharge pulses would help the transects more appropriately reflect a more standard (stable) water surface elevation. Additionally, we recommend that satellite-based GPS correction be used for the Tallapoosa River transects in the future. The satellite-based GPS correction is not as precise as the cellular-based GPS corrections but will be available in a much wider area an allow many more transects to be collected in a more even distribution pattern. The loss in vertical resolution is likely much less than the error associated with the constantly fluctuating discharge so resolution loss may not be a big issue.

Overall, the HDSS project on the Tallapoosa River was an interesting project. The HDSS method provides water managers with an integrated suite of stream corridor information to support effective decision-making. We collected continuous geo-referenced imagery of instream, streambank, and bathymetric data over a long reach. Using the HDSS approach, we delivered to managers and stakeholders more data at lower cost as compared to traditional methods. The HDSS platform allowed us to provide data-rich, 1-meter resolution GIS layers representing numerous instream and streambank parameters. These parameters can be combined in informative ways to create powerful decision-support tools allowing for a new holistic approach to river and stream management.

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Attachment 2
Erosion and Sedimentation Consultation Record
(May 2019-March 2020)

HAT 2 - Erosion and Sedimentation Study and Water Quality Study - INPUT REQUEST

Anderegg, Angela Segars

Wed 5/1/2019 4:04 PM

To:'harrisrelicensing@southernco.com' <harrisrelicensing@southernco.com>;

Bcc:damon.abernethy@dcnr.alabama.gov <damon.abernethy@dcnr.alabama.gov>; Steve Bryant - Alabama Department of Conservation and Natural Resources <Steve Bryant - Alabama Department of Conservation and Natural Resources>; 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>; nick.nichols@dcnr.alabama.gov <nick.nichols@dcnr.alabama.gov>; amy.silvano@dcnr.alabama.gov <amy.silvano@dcnr.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>; jcarlee@southernco.com <jcarlee@southernco.com>; kechandl@southernco.com <kechandl@southernco.com>; gfhorn@southernco.com <gfhorn@southernco.com>; pjmcdani@southernco.com <pjmcdani@southernco.com>; ammcvica@southernco.com <ammcvica@southernco.com>; tlmills@southernco.com <tlmills@southernco.com>; jsrasber@southernco.com <jsrasber@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>; irwiner@auburn.edu <irwiner@auburn.edu>; Eric Reutebuch (reuteem@auburn.edu) <reuteem@auburn.edu>; lgallen@balch.com <lgallen@balch.com>; jhancock@balch.com <jhancock@balch.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>; henry.mealing@kleinschmidtgroup.com <henry.mealing@kleinschmidtgroup.com>; jason.moak@kleinschmidtgroup.com <jason.moak@kleinschmidtgroup.com>; kelly.schaeffer@kleinschmidtgroup.com <kelly.schaeffer@kleinschmidtgroup.com>; sforehand@russelllands.com <sforehand@russelllands.com>; 1942jthompson420@gmail.com <1942jthompson420@gmail.com>; Jesse Cunningham (jessecunningham@msn.com) <jessecunningham@msn.com>; nancyburnes@centurylink.net <nancyburnes@centurylink.net>; lgarland68@aol.com <lgarland68@aol.com>; rbmorris333@gmail.com <rbmorris333@gmail.com>; mitchell.reid@tnc.org <mitchell.reid@tnc.org>; richardburnes3@gmail.com <richardburnes3@gmail.com>; Albert Eiland (eilandfarm@aol.com) <eilandfarm@aol.com>; eveham75@gmail.com <eveham75@gmail.com>; jec22641@aol.com <jec22641@aol.com>; donnamat@aol.com <donnamat@aol.com>; harry.merrill47@gmail.com <harry.merrill47@gmail.com>; mhpwedowee@gmail.com <mhpwedowee@gmail.com>; midwaytreasures@bellsouth.net <midwaytreasures@bellsouth.net>; inspector_003@yahoo.com <inspector_003@yahoo.com>; Matt and Ann Campbell (wmcampbell218@gmail.com) <wmcampbell218@gmail.com>; decker.chris@epa.gov <decker.chris@epa.gov>; gordon.lisa-perras@epa.gov <gordon.lisa-perras@epa.gov>; holliman.daniel@epa.gov <holliman.daniel@epa.gov>; jeff_duncan@nps.gov <jeff_duncan@nps.gov>; Chuck Denman <chuckdenman@hotmail.com>;

3 attachments (8 MB)

2019-05-01 Draft E&S Sites_Aerial Maps.pdf; 2019-05-01 Draft E&S Sites_Street Maps.pdf; 2019-05-01 Erosion-Sedimentation Draft Site List.pdf;

Dear Harris Action Team (HAT) 2,

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Please make every effort to submit your information to me by **May 24, 2019** so that we can finalize the **Erosion and Sedimentation Study** and the **Water Quality Study** lists and begin to evaluate each site according to the FERC-approved study plan.

If you have any questions or require assistance, please don't hesitate to email or call me at ARSEGARS@southernco.com or (205) 257-2251.

Thank you,

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

APC Harris Relicensing

From: Anderegg, Angela Segars
Sent: Wednesday, May 1, 2019 1:32 PM
To: 'Jimmy Traylor'
Subject: FW: HAT 2 - Erosion and Sedimentation Study and Water Quality Study - INPUT REQUEST
Attachments: 2019-05-01 Draft E&S Sites_Aerial Maps.pdf; 2019-05-01 Draft E&S Sites_Street Maps.pdf; 2019-05-01 Erosion-Sedimentation Draft Site List.pdf

Hi Jimmy,

I sent the email below to Harris Action Team 2 soliciting input on erosion and sedimentation sites around Lake Harris and downstream. I noticed that you aren't on HAT 2. Would you like to be added so you can stay plugged into the erosion and sedimentation evaluation?

Also, I was looking at the photos you filed along with your comments (link below). Would you mind providing a description (location, date, etc.) of these pics? That would be extremely helpful.

Docket(s): P-2628-065
Lead Applicant: Alabama Power Company
Filing Type: Project Safety Compliance Report
Description: Application (Specify...) of james T Traylor under P-2628.

To view the document for this Filing, click here https://urldefense.proofpoint.com/v2/url?u=http-3A__elibrary.FERC.gov_idmws_file-5Flist.asp-3Faccession-5Fnum-3D20190328-2D5164&d=DwICAw&c=AgWC6Nl7SIwpc9jE7UoQH1_Cvyci3SsTNfdLP4V1RCg&r=3qWv32MayddUzrbqJnBFwNmttMUUbdCuXZrVDKTC5gg&m=4amW4W58x8GzI0Io1AISi6_0iwHli6tFIGIW3g9R1LE&s=-UByZc5Gfu5z7L8_qUv6WAz0kd8CPIY5g1CK3gOsV80&e=

Thanks!

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

From: Anderegg, Angela Segars
Sent: Wednesday, May 1, 2019 11:06 AM
To: 'harrisrelicensing@southernco.com' <harrisrelicensing@southernco.com>
Subject: HAT 2 - Erosion and Sedimentation Study and Water Quality Study - INPUT REQUEST

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Thank you,

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

APC Harris Relicensing

From: Anderegg, Angela Segars
Sent: Thursday, May 2, 2019 3:07 PM
To: Carol Knight
Subject: FW: HAT 2 - Erosion and Sedimentation Study and Water Quality Study - INPUT REQUEST
Attachments: 2019-05-01 Draft E&S Sites_Aerial Maps.pdf; 2019-05-01 Draft E&S Sites_Street Maps.pdf; 2019-05-01 Erosion-Sedimentation Draft Site List.pdf

FYI

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

From: Anderegg, Angela Segars
Sent: Wednesday, May 1, 2019 11:06 AM
To: 'harrisrelicensing@southernco.com' <harrisrelicensing@southernco.com>
Subject: HAT 2 - Erosion and Sedimentation Study and Water Quality Study - INPUT REQUEST

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If you have any questions or require assistance, please don't hesitate to email or call me at ARSEGARS@southernco.com or (205) 257-2251.

Thank you,

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

APC Harris Relicensing

From: Anderegg, Angela Segars
Sent: Thursday, May 2, 2019 4:17 PM
To: Jimmy Traylor
Cc: Donna Matthews
Subject: RE: Harris Dam

Hi Jimmy,

As part of the Erosion and Sedimentation Study, we are doing a bank susceptibility assessment of the entire stretch of river from Harris Dam to Horseshoe Bend. In addition, we are currently identifying known erosion and sedimentation areas around Lake Harris and downstream, with help from stakeholders. Yesterday, I forwarded you an email that went to Harris Action Team 2 where we're asking for everyone's input. If you didn't get that, please let me know. Once we compile all of these sites, we will perform site assessments (surveys).

As far as level loggers go, we have determined 20 locations that will collect representative data to inform the studies. We will be sharing the location information with the HATs once they are all deployed and the data they collect will be incorporated into the study results.

Please let me know if you have any other questions.

Thanks,

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

From: Jimmy Traylor <Jimmy.Traylor@southerntoolinc.com>
Sent: Thursday, May 2, 2019 10:21 AM
To: Anderegg, Angela Segars <ARSEGARS@southernco.com>
Cc: Donna Matthews <donnamatthews2014@gmail.com>
Subject: Harris Dam

Angie,

How do you request an erosion survey or a level logger?

Thank you,

Jimmy Traylor
President
205.862.3140
jimmy.traylor@southerntoolinc.com
www.southerntoolinc.com [southerntoolinc.com]

APC Harris Relicensing

From: Anderegg, Angela Segars
Sent: Tuesday, May 7, 2019 8:51 AM
To: eilandfarm@aol.com
Subject: RE: HAT 2 - Erosion and Sedimentation Study and Water Quality Study - INPUT REQUEST

Thanks, Albert!

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

From: eilandfarm@aol.com <eilandfarm@aol.com>
Sent: Monday, May 6, 2019 2:18 PM
To: Anderegg, Angela Segars <ARSEGARS@southernco.com>
Subject: Re: HAT 2 - Erosion and Sedimentation Study and Water Quality Study - INPUT REQUEST

-----Original Message-----
From: Anderegg, Angela Segars <ARSEGARS@southernco.com>
To: Albert Eiland (eilandfarm@aol.com) <eilandfarm@aol.com>
Sent: Wed, May 1, 2019 1:24 pm
Subject: FW: HAT 2 - Erosion and Sedimentation Study and Water Quality Study - INPUT REQUEST

Hi Albert,

I was looking back at the pictures that Donna Matthews filed as a supplement to your comments. I tried to add the pictures as an attachment to this email but the file size was too large. The link below is for the filing. The last page has a list of the names for each picture (39 inch polar from flood of June 2017, etc.). If you have any additional description or background for these pictures or any others that you would like to provide, please send my way.

Docket(s): P-2628-065

Lead Applicant: Alabama Power Company

Filing Type: Comment on Filing

Description: Comment of Donna F Matthews under P-2628. These 15 photos are meant to be an addendum to the written comments of Albert Eiland (F476937). Accession number 20190328-5003; PDF # 12802723

To view the document for this Filing, click here https://urldefense.proofpoint.com/v2/url?u=http-3A__elibrary.FERC.gov_idmws_file-5Flist.asp-3Faccession-5Fnum-3D20190328-2D5247&d=DwICAw&c=AgWC6Nl7Slwpc9jE7UoQH1_Cvyci3SsTNfdLP4V1RCg&r=3qWv32MayddUzrbqJnBFwNmttMUUbdCuXZrVDKTC5gg&m=31WkQegfY4qIjt3kaJ9Cas_8uXmAdP-Xp6l49Wz9FC0&s=s2RZqDc_ThFUFH2BaBUObb-ljqZMTA4NqWQnQ0dRs6w&e=

Thanks!

Angie Anderegg

Hydro Services

(205)257-2251

arsegars@southernco.com

From: Anderegg, Angela Segars
Sent: Wednesday, May 1, 2019 11:06 AM
To: 'harrisrelicensing@southernco.com' <harrisrelicensing@southernco.com>
Subject: HAT 2 - Erosion and Sedimentation Study and Water Quality Study - INPUT REQUEST

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Thank you,

Angie Anderegg

Hydro Services

(205)257-2251

arsegars@southernco.com

Images listed below show evidence of results of the management of water levels;

- **1.** 39" diameter popular down from the flood of June 2017 because flood water saturated the ground around it, and it finally gave way. All of these trees listed below were healthy trees prior to the flooding. There were MANY, MANY more trees other than the ones pictured here.

- **2.** 39" diameter popular down from the flood of June 2017 because flood water saturated the ground around it.

- **3.** 39" diameter popular down from the flood of June 2017 because flood water saturated the ground around it.

- **4.** 39" diameter popular down from the flood of June 2017 because flood water saturated the ground around it.

- **5.** Loss of a River Birch tree from the flood of March 2017 due to flood water standing around the base of the tree and the dirt around it was saturated with water.

- **6.** Flood of March 2017. The water got much higher than this, notice the leaves.

- **7.** River Birch in the left corner before the flood of March 2017. All five of those trees are now gone, all due to the cause of high water. This picture was taken in 2010 before the grass was as bad as it is now. THE GRASS is currently consuming the river.

- **8.** River Birch lost from the flood of March 2017.

- **9.** River Birch lost from flood of March 2017.

- **10**. This image was taken in 2010 while my family was enjoying the river. The grass had already grown tremendously and was very bad at this point, but it is much worse now. I'm afraid it is going to take over the river. There was NO GRASS prior to the dam. The water was about 1.5 to 2 feet higher than on a normal run, compared to when the gates are closed. The rocks were always covered with water before. Currently, kayakers have a very hard time getting through these areas, and continuously have to get out and physically pull the kayaks through the grassy areas in the river to get downstream.

- **11.** February 21, 2019 flood at the Wadley gauge.

- **12.** January 25, 2019 flood at the Wadley gauge.

- **13.** February 21, 2019 level at lake, NOTICE the level of the lake only rose about 1.5 feet and is still about 7 feet below full pool. Downstream continues to be flooded and out of the banks thus destroying our shade trees, the under-growth and the roots and soil that hold our land together.

- **14.** January 25, 2019 level at lake, NOTICE the level of the lake only raised up less than 1.5 feet, which is still DOWN over 7 feet below full pool. At the same time downstream was being flooded.

- **15.** This picture was taken in 2010. A retainer wall we made in front of the camp to keep it from washing away. We are on an outside natural curve, so had we not made this in the 80's, there is no doubt in my mind it would have eroded all of the way back to the rock bluff. We had to make it after the water washed several huge trees in front of the shelter away. We are continually doing repair to it due to the cause of the HIGH LEVELS and VOLUME of water. This shelter was to replace the one that was there that was washed away in 2003.

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 ?

APC Harris Relicensing

From: Anderegg, Angela Segars
Sent: Wednesday, May 22, 2019 9:58 AM
To: 'Maria R. Clark '
Subject: FW: Harris water quality monitor locations
Attachments: E&S Sites.mpk; HAT 2 - Erosion and Sedimentation Study and Water Quality Study - INPUT REQUEST

Hi Maria,

Attached is a Map Package (.mpk) that contains the .mxd and associated shapefiles used to create the Erosion and Sedimentation site maps I sent out on May 1 soliciting input from HAT 2 (email attached). Note that no specific locations of areas of water quality concern had been identified by stakeholders when I sent the email out; therefore, none are shown on these maps as of yet.

Let me know if you have any questions.

Thanks,

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

From: Clark, Maria <Clark.Maria@epa.gov>
Sent: Tuesday, May 21, 2019 1:14 PM
To: Anderegg, Angela Segars <ARSEGARS@southernco.com>
Subject: RE: Harris water quality monitor locations

Hi Angie,

My apologies if I wasn't clear regarding what we need. We would like to have the GIS files (.mxd preferable) from the Monitoring Location Maps, so we can open them and digitize our suggested sites in there. The .mxd files would allow us to submit to you more detailed information of the proposed sites. If we can digitize our own proposed sites we can extract the coordinates and other information that would help you to capture our recommendations.

Please let me know if you have any questions.
Thank you!!

Maria R. Clark
NEPA Section - Region 4
Strategic Programs Office
U.S. Environmental Protection Agency

61 Forsyth, Street South West
Atlanta, GA 30303
404-562-9513

From: Anderegg, Angela Segars <ARSEGARS@southernco.com>
Sent: Tuesday, May 21, 2019 1:48 PM
To: Clark, Maria <Clark.Maria@epa.gov>
Subject: Harris water quality monitor locations

Hi Maria,

I got your voicemail concerning the monitor locations for the Harris water quality study. Below are the lat/longs for the Generation monitor and the Continuous monitor. The Forebay location is for profiles, so there isn't a specific lat/long for those. Let me know if you have any questions.

Generation monitor: 33.255448, -85.615760

Continuous monitor: 33.248466, -85.612034

Thanks,

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

APC Harris Relicensing

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Sent: Wednesday, May 22, 2019 9:48 AM
To: Anderegg, Angela Segars
Subject: HAT 2 - Erosion and Sedimentation Study and Water Quality Study - INPUT REQUEST
Attachments: 2019-05-01 Draft E&S Sites_Aerial Maps.pdf; 2019-05-01 Draft E&S Sites_Street Maps.pdf; 2019-05-01 Erosion-Sedimentation Draft Site List.pdf

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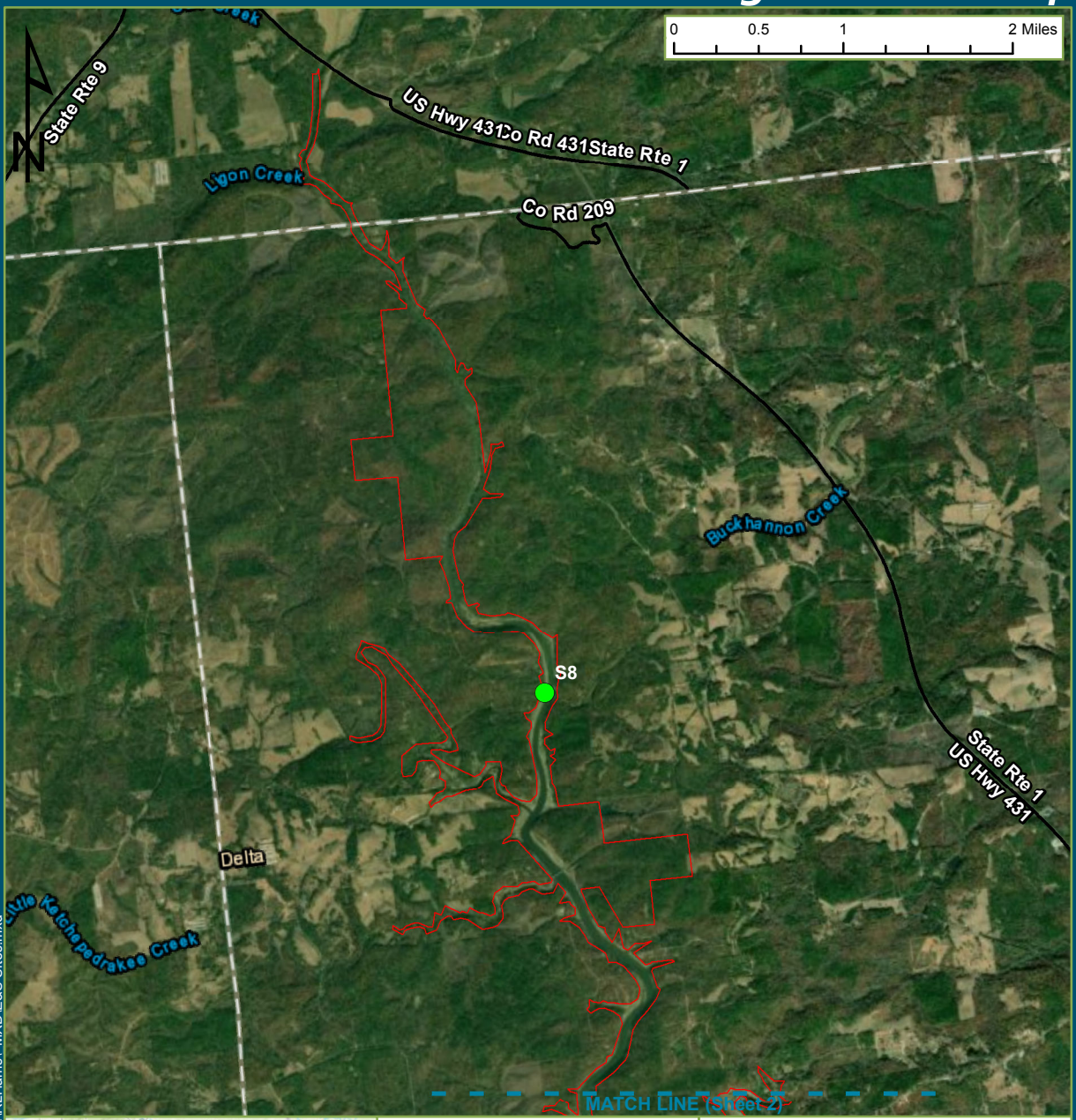
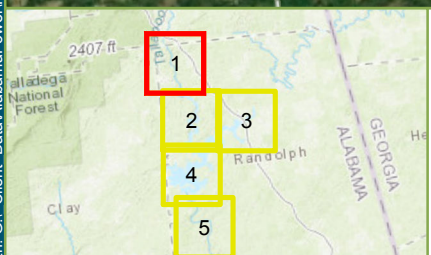
arsegars@southernco.com

Monitoring Location Map





Legend

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

Alabama Power Company
Birmingham, AL

R.L. Harris Project
FERC Project No. 2628

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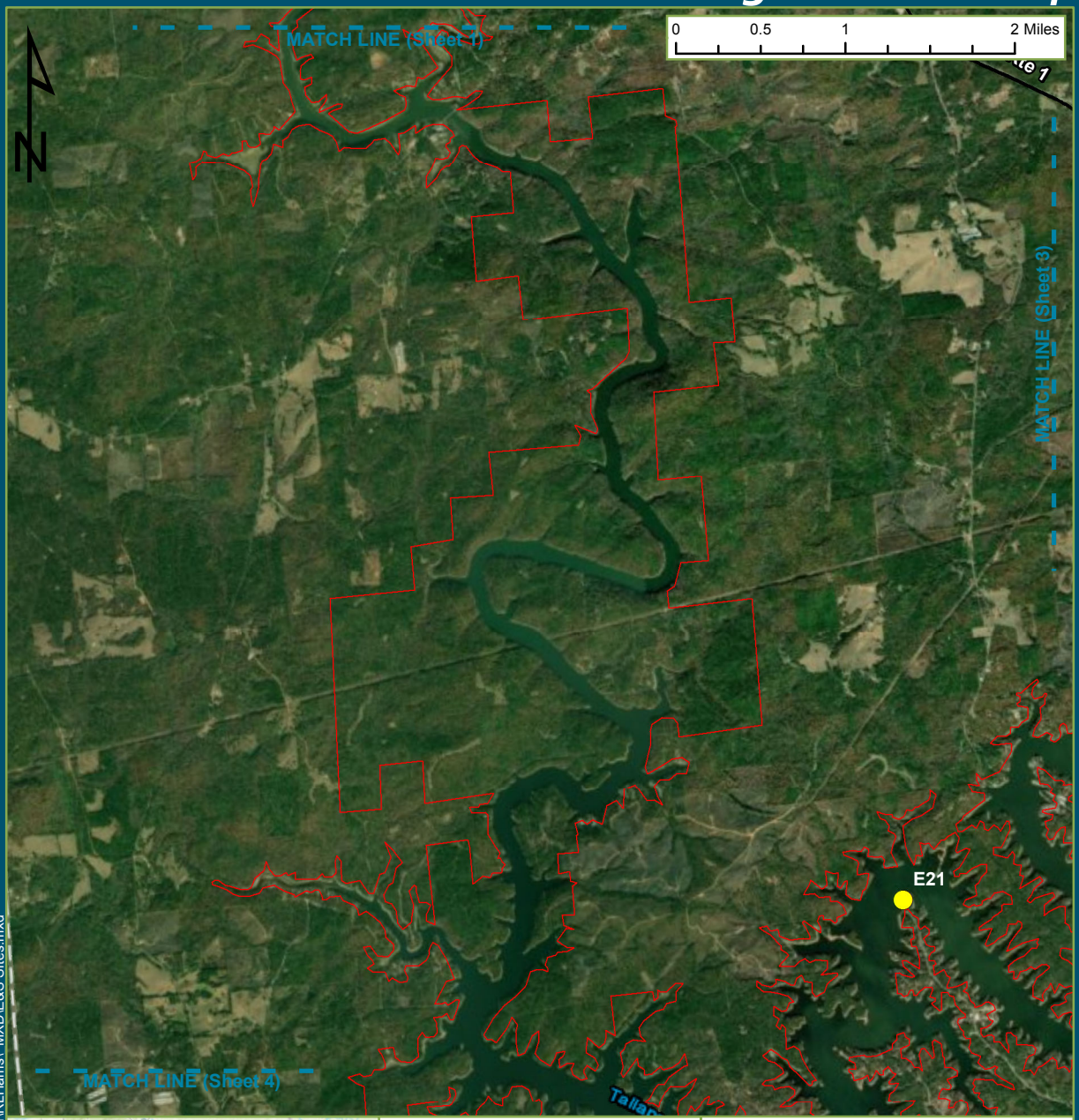
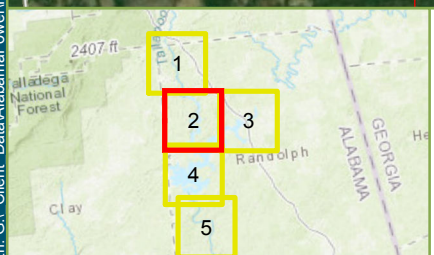
Source: Erosion/Sedimentation Locations (Alabama Power, 2019), Project Boundary (Kleinschmidt, 2018), Steet Map (ESRI, 2019)

PN: 0535028.01

Monitoring Location Map





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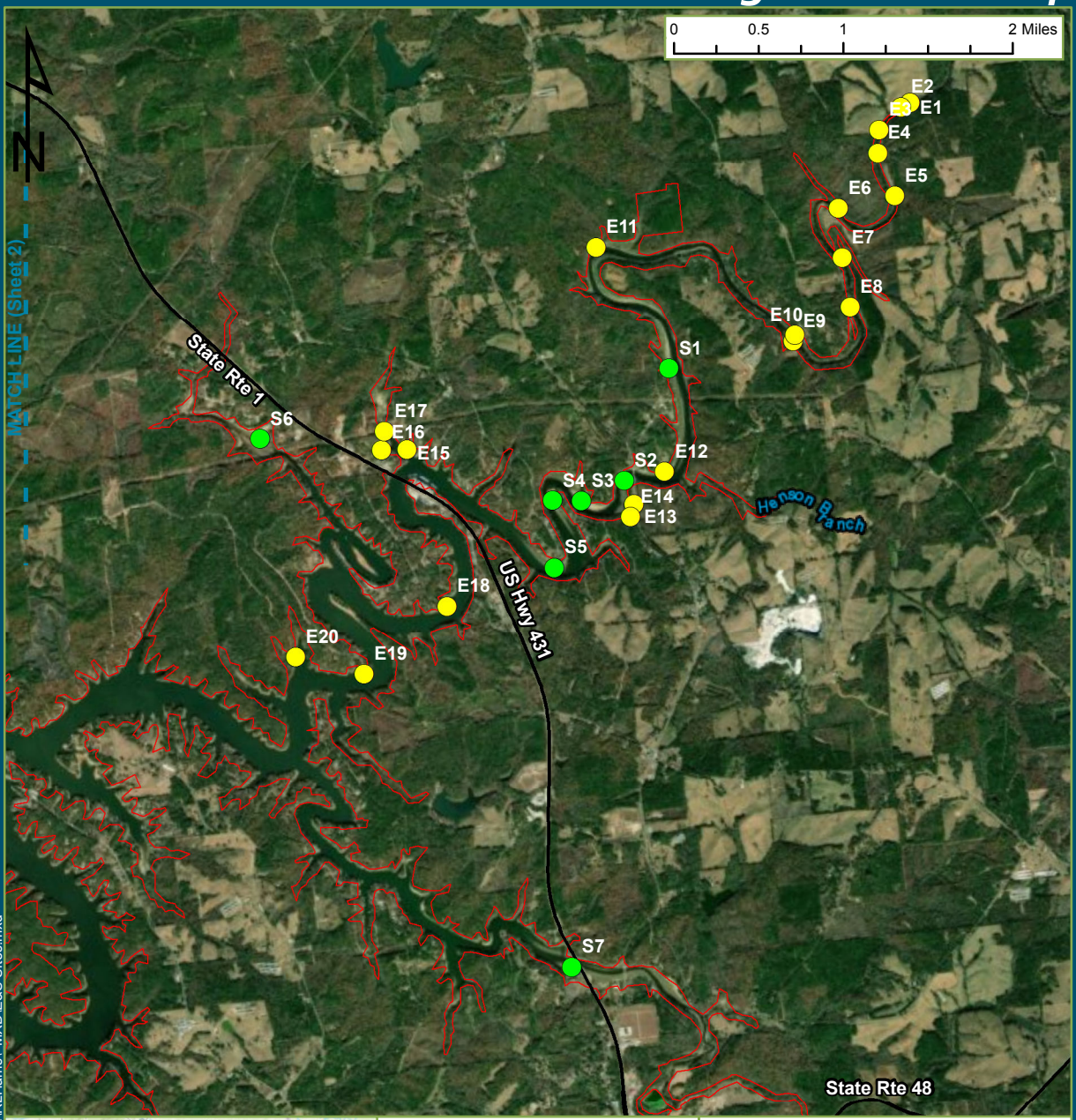

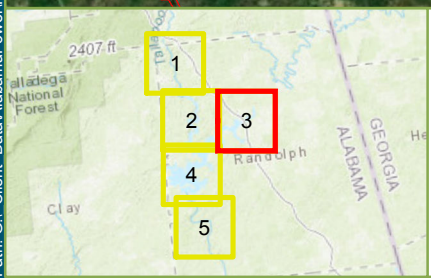

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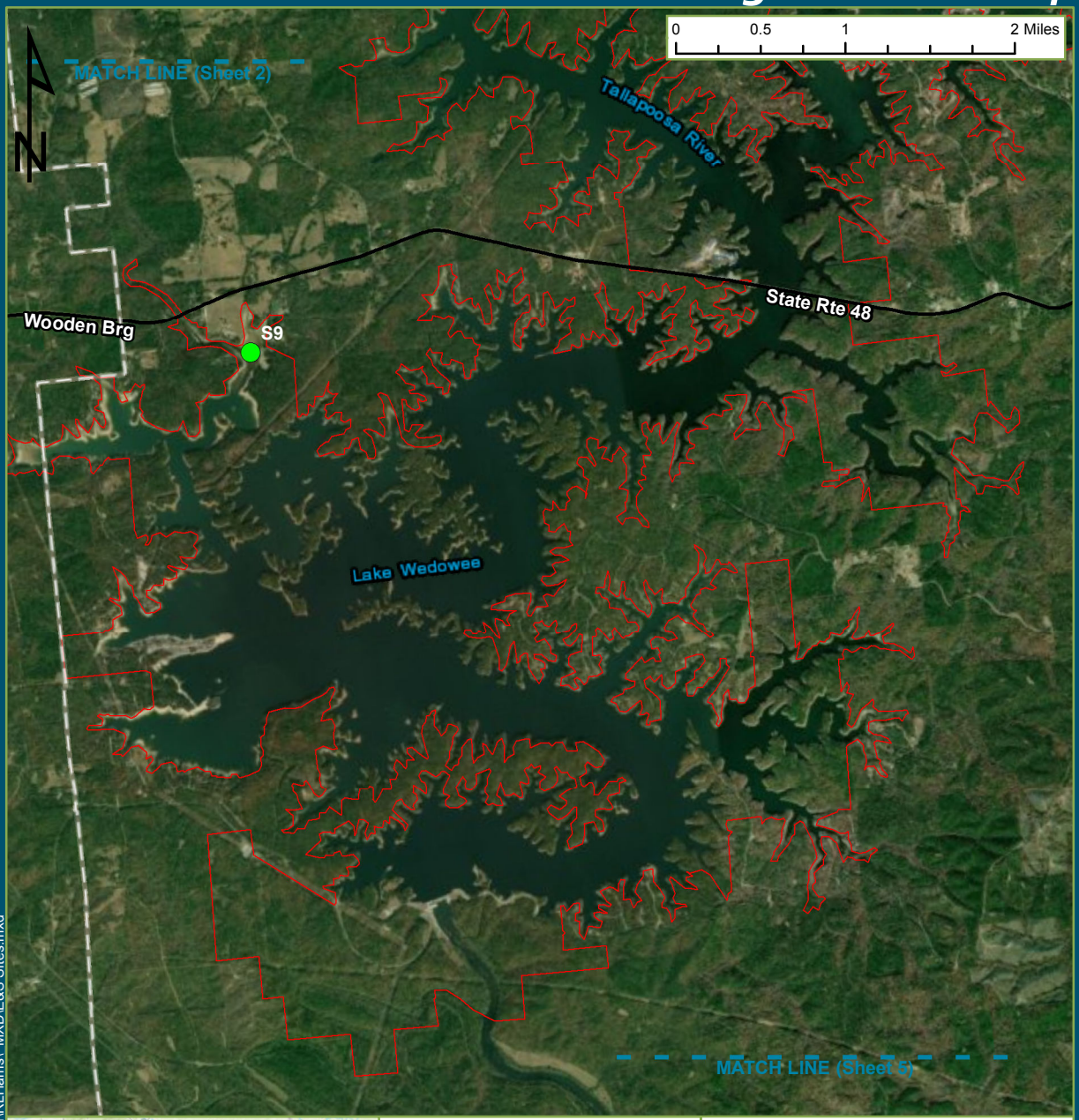

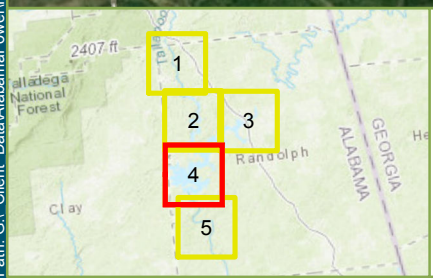

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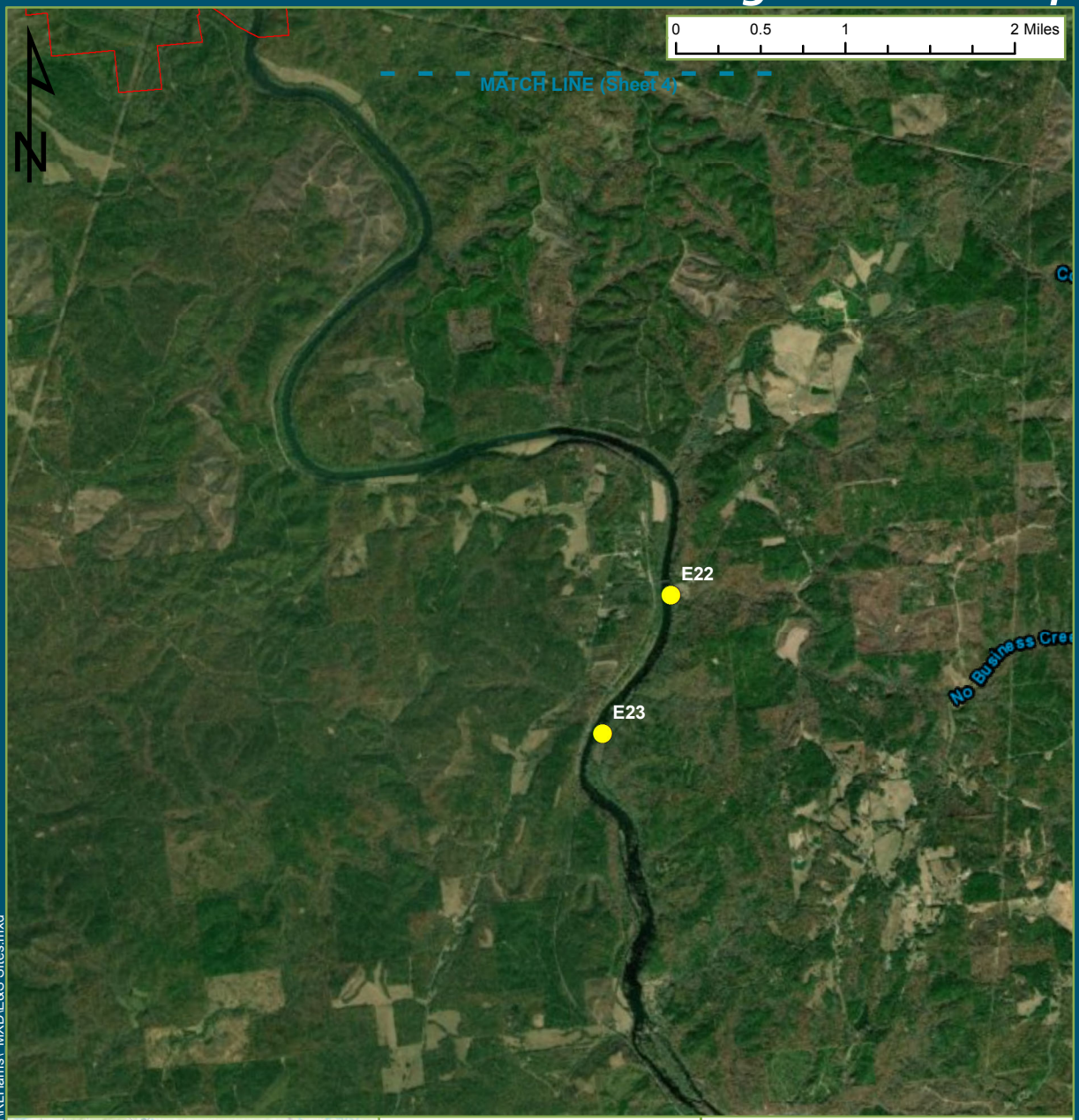

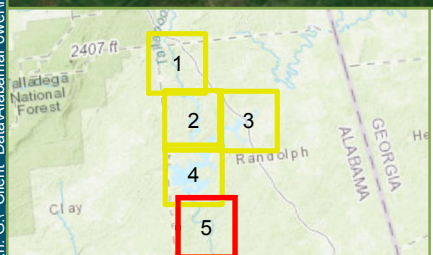

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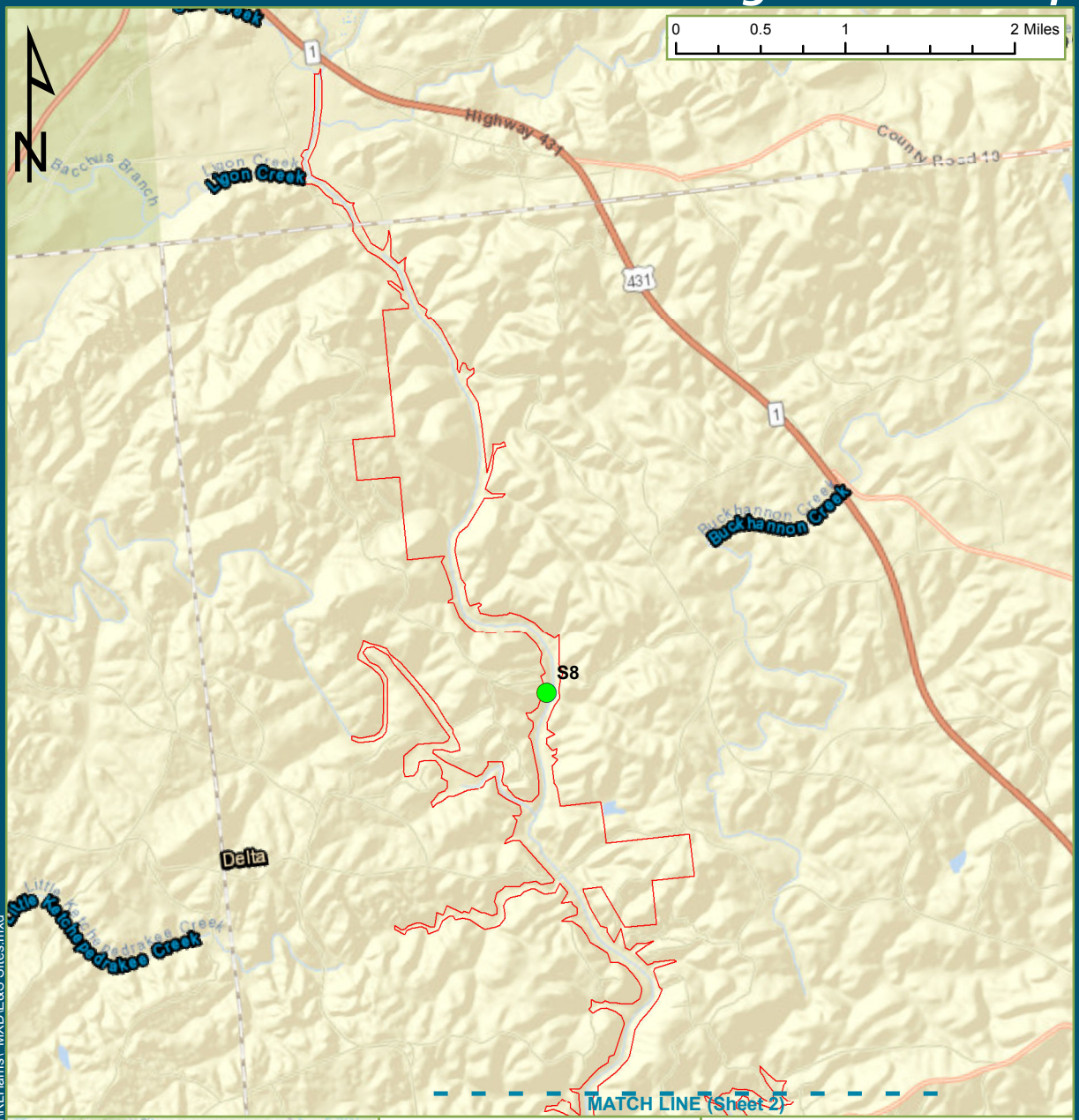

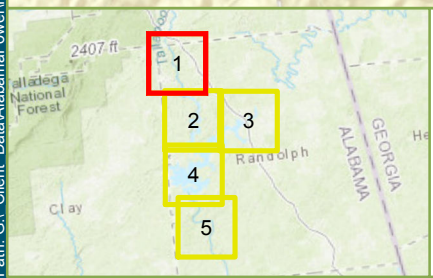

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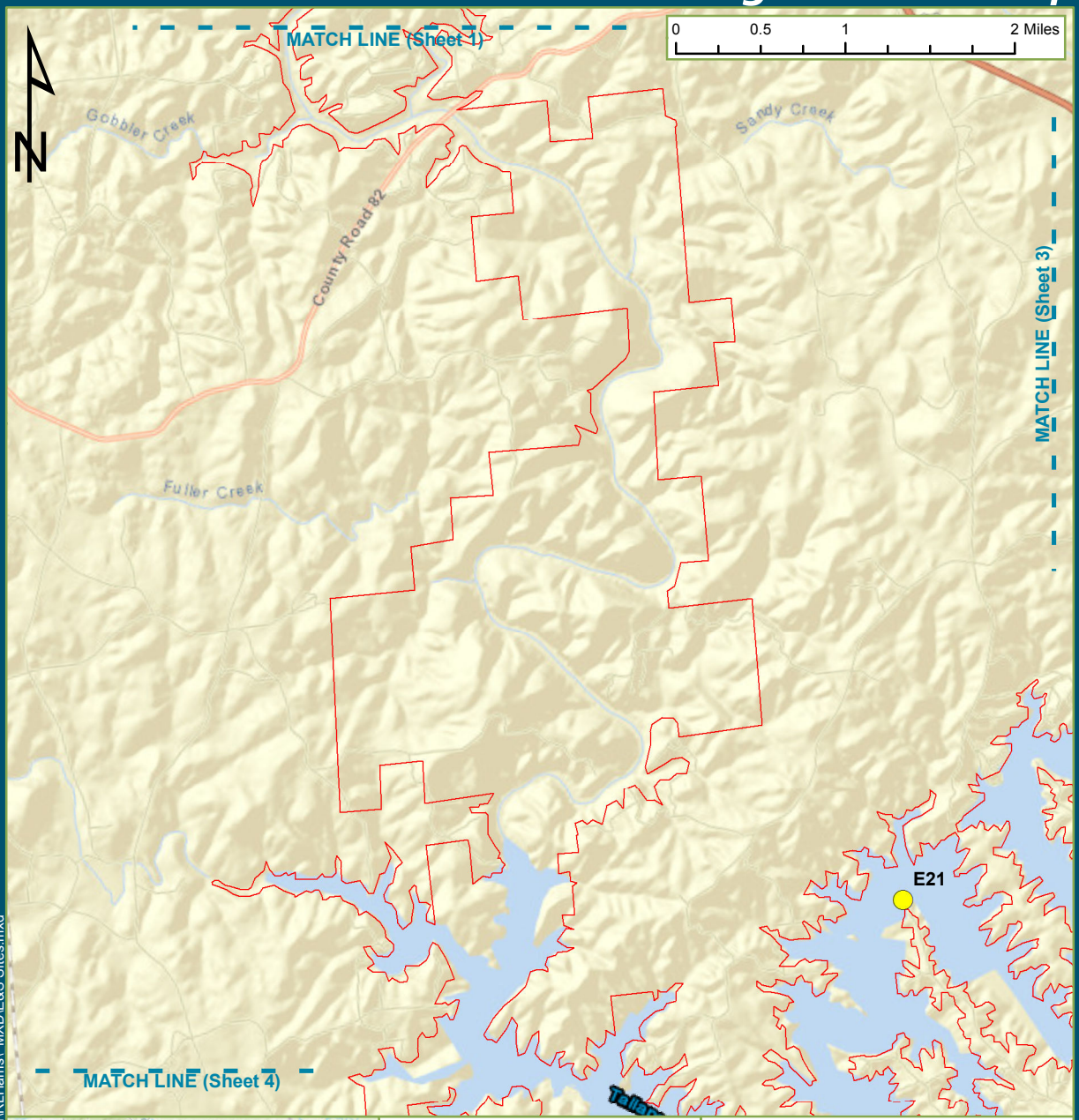

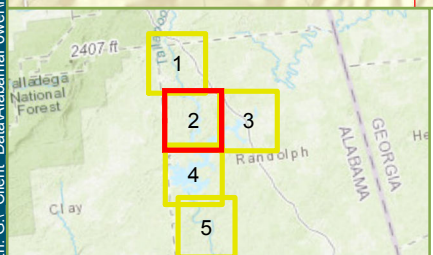

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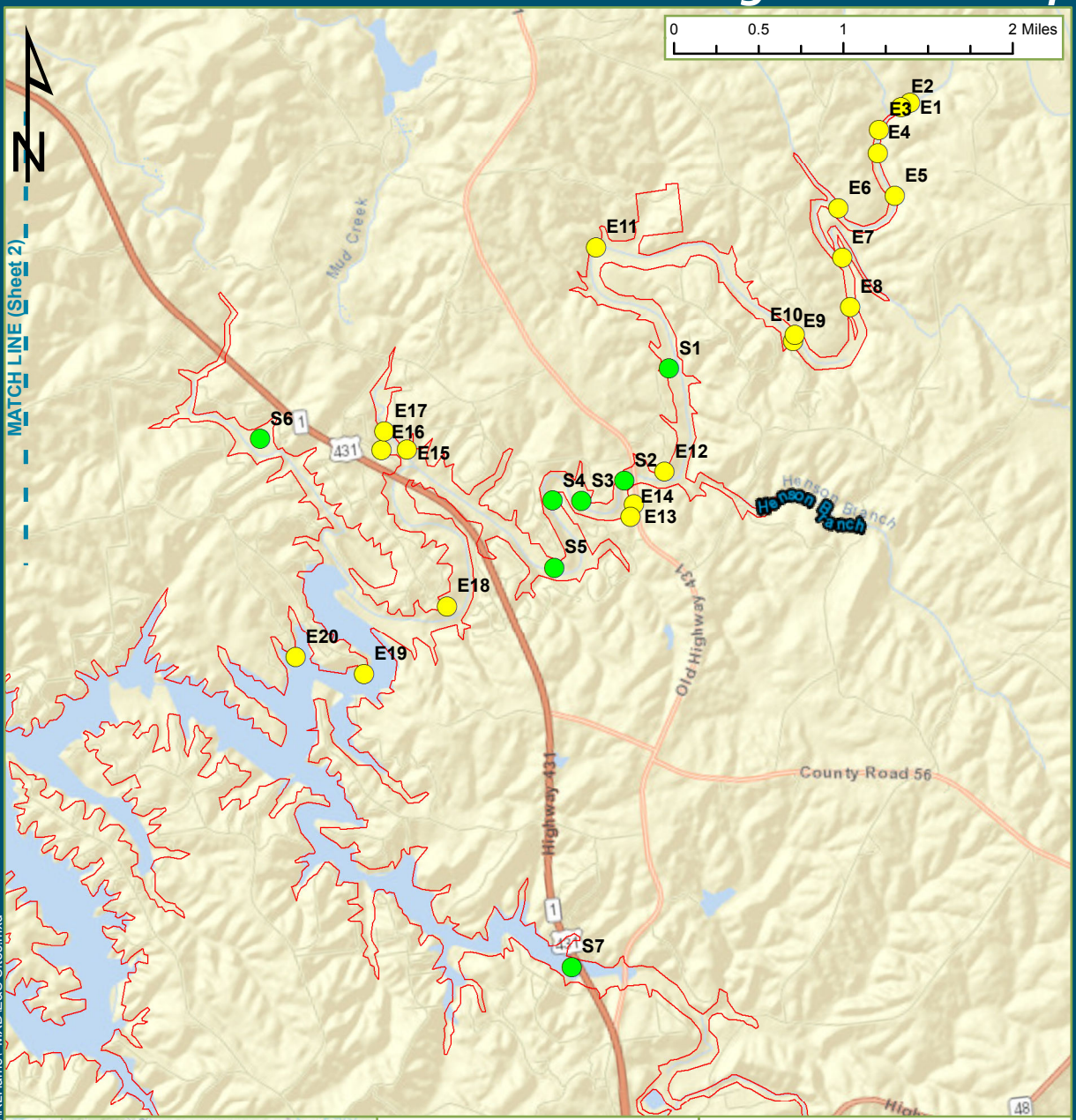

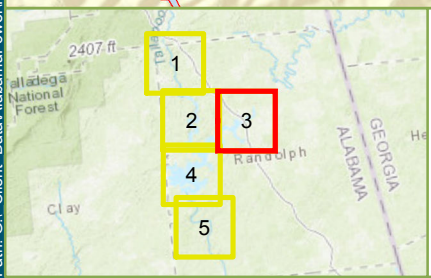

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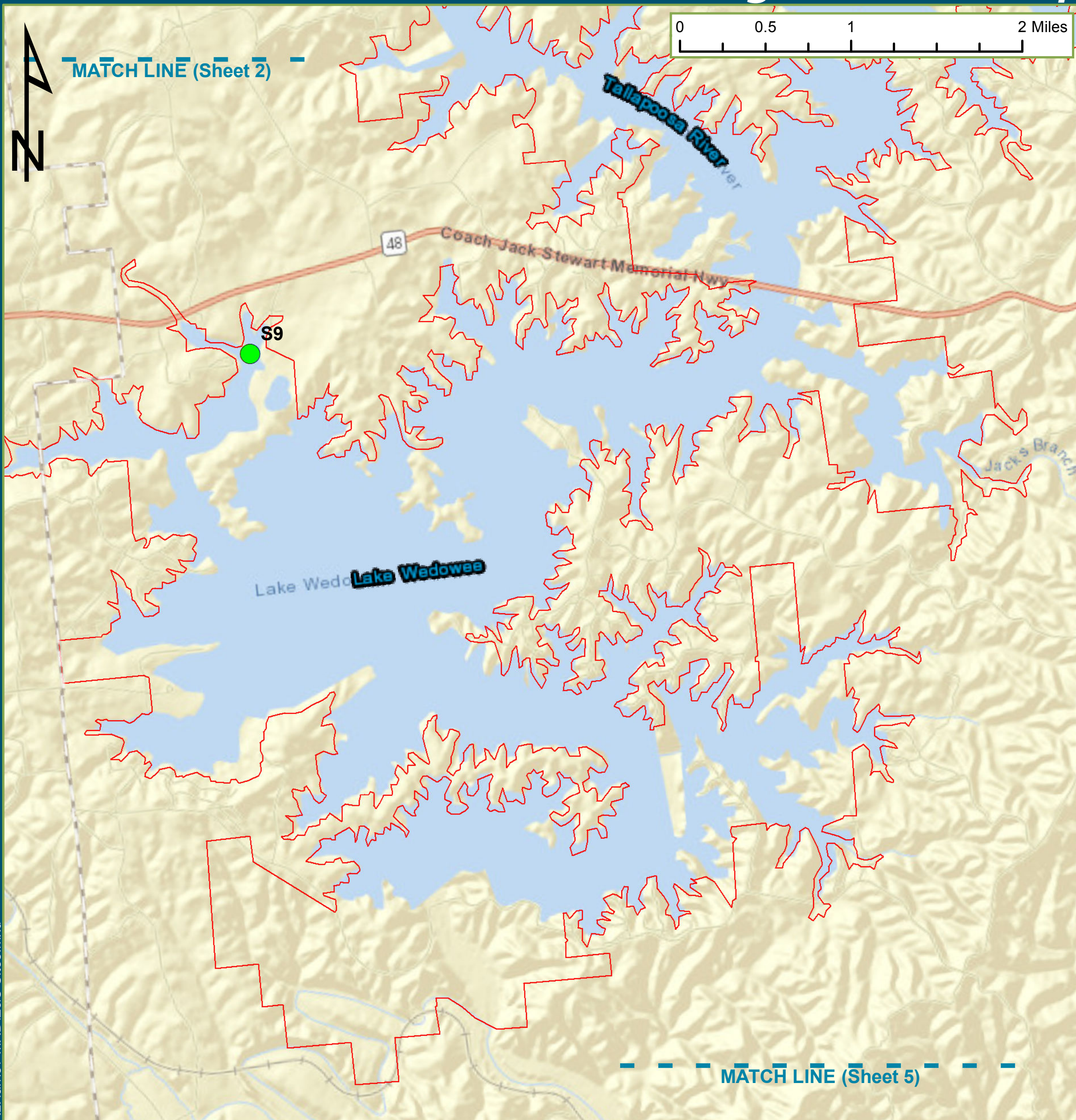

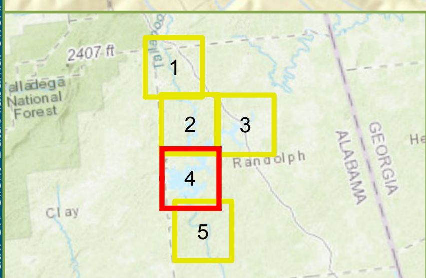

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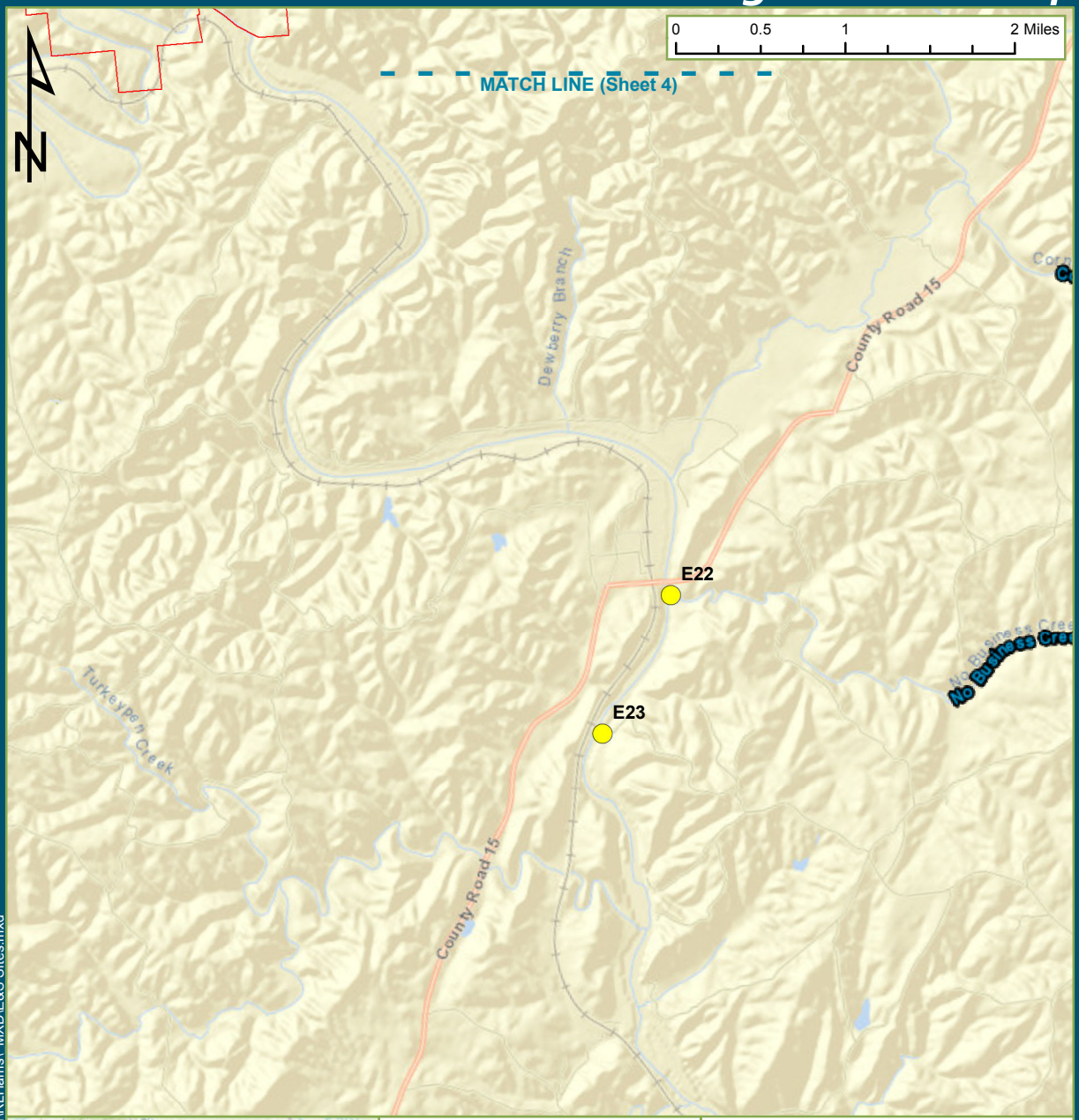

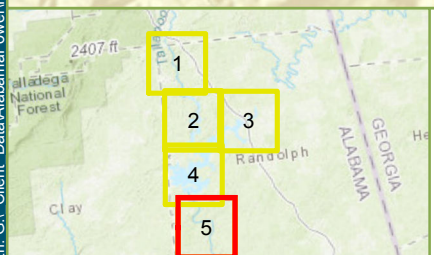

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R.L. Harris Project
Erosion Sedimentation Study
Draft Site List
May 1, 2019

Name	Type	Latitude	Longitude
S1	Sedimentation	33.37624948	-85.47166235
S2	Sedimentation	33.36719999	-85.47747307
S3	Sedimentation	33.36590337	-85.48206374
S4	Sedimentation	33.36621704	-85.48497203
S5	Sedimentation	33.36051157	-85.48560019
S6	Sedimentation	33.37431997	-85.5138457
S7	Sedimentation	33.3264078	-85.4885445
S8	Sedimentation	33.45383479	-85.60980855
S9	Sedimentation	33.30647091	-85.62855097
E1	Erosion	33.39648716	-85.44412236
E2	Erosion	33.39618116	-85.44512448
E3	Erosion	33.39447905	-85.44762594
E4	Erosion	33.39252729	-85.44796667
E5	Erosion	33.38869558	-85.44676742
E6	Erosion	33.38816557	-85.4526412
E7	Erosion	33.38399233	-85.45284646
E8	Erosion	33.3797199	-85.45259528
E9	Erosion	33.37732425	-85.45878731
E10	Erosion	33.37784798	-85.45851087
E11	Erosion	33.38726919	-85.47760635
E12	Erosion	33.36758594	-85.47330665
E13	Erosion	33.36508776	-85.47680031
E14	Erosion	33.36406619	-85.47728423
E15	Erosion	33.37197386	-85.49913637
E16	Erosion	33.37216342	-85.50173268
E17	Erosion	33.37371456	-85.50122349
E18	Erosion	33.35832713	-85.4969299
E19	Erosion	33.3533428	-85.50610579
E20	Erosion	33.35544286	-85.51280286
E21	Erosion	33.33941479	-85.5581353
E22	Erosion	33.1960328	-85.57649228
E23	Erosion	33.18490256	-85.58503087

APC Harris Relicensing

From: Anderegg, Angela Segars
Sent: Tuesday, August 13, 2019 1:51 PM
To: 'harrisrelicensing@southernco.com'
Subject: HAT 2 meeting - September 11, 2019

HAT 2,

Alabama Power 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 2 meeting will be from 11:00 to 11:45. The purpose of the HAT 2 meeting is to review the sedimentation and erosion areas that were previously identified by stakeholders and to prepare for the field investigation in the fall. During this HAT 2 meeting, Alabama Power will also provide an update on water quality study efforts.

Please RSVP by Friday, September 6, 2019. Lunch will be provided 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 meetings, please email or call me at ARSEGARS@southernco.com or (205) 257-2251.

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Conference ID: 892052380

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

APC Harris Relicensing

From: Clark, Maria <Clark.Maria@epa.gov>
Sent: Wednesday, September 4, 2019 6:51 AM
To: APC Harris Relicensing
Subject: RE: HAT 2 meeting - September 11, 2019

Thank you so much Angie.

From: APC Harris Relicensing <g2apchr@southernco.com>
Sent: Tuesday, September 03, 2019 3:58 PM
To: Clark, Maria <Clark.Maria@epa.gov>
Subject: FW: HAT 2 meeting - September 11, 2019

FYI – I've added you to this list now so you'll get these emails in the future.

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

From: Anderegg, Angela Segars <ARSEGARS@southernco.com>
Sent: Tuesday, August 13, 2019 1:51 PM
To: APC Harris Relicensing <g2apchr@southernco.com>
Subject: HAT 2 meeting - September 11, 2019

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

HAT 2 (Water Quality & Erosion/Sedimentation)
Stakeholder Meeting Summary
September 11, 2019
11:00 am to 11:45 am
Oxford Civic Center, Oxford, AL

Participants:
See Attachment A

Participants by Phone:
Maria Clark – Environmental Protection Agency (EPA), Atlanta
Chuck Denman – Downstream Property Owner
Sarah Salazar – Federal Energy Regulatory Commission (FERC)

Action Items:

- Alabama Power will post the HAT 2 meeting summary and all meeting materials to the Harris Relicensing website (www.harrisrelicensing.com)
- Alabama Power will make a link to the Google Earth files of identified erosion and sedimentation sites, as well as identified water quality hotspots, available on Harris Relicensing website

Summary
The Harris Action Team (HAT) 2 (Water Quality & Erosion/Sedimentation) met on September 11, 2019. 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 reviewed the HAT 2 meeting purpose, safety procedures, and introduced the participants in the meeting room and on the phone via Skype. The purpose of the HAT 2 meeting was to finalize the erosion and sedimentation sites and to provide an update on the water quality data collection.

Erosion and Sedimentation Study – Jason Moak (Kleinschmidt)
Jason reviewed the study plan goal and scope and reminded HAT 2 stakeholders that Alabama Power, on May 1, 2019, distributed a map (see Attachment C) and request for input to the erosion and sedimentation sites. Jason noted that Alabama Power didn't receive any additional erosion and sedimentation sites other than those sites previously identified by stakeholders, Alabama Power surveillance contractors, and agencies. Jason stated that Alabama Power's next step is to assess each site with certified erosion specialists and record the assessment results on the survey form (attached to the May 2019 Final Study Plan). Alabama Power will complete the Lake Harris erosion and sedimentation assessment once Lake Harris reaches winter pool in fall/winter 2019.

Jason explained that Trutta Environmental Solutions completed the downstream soils and erosion survey from Harris Dam to Jaybird Landing and that Trutta's report will be available in first quarter (Q1) 2020. Barry Morris (Lake Wedowee Property Owners Association -LWPOA) noted there were no sites on the Big Tallapoosa and asked if stakeholders could provide

additional erosion/sedimentation sites for Alabama Power to consider. Jason responded yes but that stakeholders should do so in today's meeting or very soon after, because Alabama Power is gearing up for the field work on Lake Harris in October. During the discussion, Barry realized the site he was going to request be added was already in the sedimentation and erosion site list. Harry Merrill (LWPOA) indicated that there is a lot of sedimentation at Fosters Bridge. Jason noted that Fosters Bridge is part of the erosion and sedimentation evaluation. Jason provided a Google Earth "tour" of all the erosion and sedimentation sites that are part of this study. Angie Anderegg told the group that the Google Earth "tour" would be available on the Harris Relicensing website (Note: Rather than place the Google Earth file on the website, the data can be viewed in a web browser here: https://drive.google.com/open?id=1mv1mUDi6CSUbFV5K38fCZmWuOxJDwLcW&usp=sharing. The data can also be downloaded from this link for use in Google Earth).

Albert Eiland (Downstream property owner) explained that the pulsing – river going up and down "like a washboard" - is causing a lot of erosion downstream. Jason noted there are many causes of erosion and that the erosion/sedimentation assessment form has an area for the assessor to indicate possible causes of the erosion. Angie noted that this study serves to collect baseline information that will inform the other operations studies, for example, to determine if a change in the winter pool would affect the frequency or magnitude of downstream flooding, which may cause additional erosion. Albert prefers continuous flows where what is coming into the reservoir is going out. Jason explained that the Harris Project was not designed to be "run-of-river" but that he recognizes the desire for a steady flow.

Barry Morris asked Jason what Alabama Power will do with the assessment when completed. In other words, what types of mitigation/enhancement measures will Alabama Power implement? Jason noted that Alabama Power will determine if the erosion/sedimentation site has reached equilibrium, is worsening, is vegetated, or needs additional monitoring before determining next steps. Sarah Salazar (FERC) stated that the current assessment form doesn't have anywhere to note the width of the vegetative/riparian zone. She asked if Alabama Power could include this on the assessment form. Alabama Power agreed to add the riparian/vegetative zone width to the assessment form to ensure that all assessors consistently report this feature. Angie and Jason also noted that Alabama Power will upload the map (and associated Google Earth files) to the Harris Relicensing website. Barry also asked Jason to explain #7 on the assessment form ("Description of Exposed Soils including Types and Depths"). Jason responded that sometimes you can see a layer of sand, silt, and/or rock, and the assessors would include this description on the form. Jason also noted that aerial and water observations will inform Alabama Power of the adjacent land activities.

Water Quality Study – Jason Moak (Kleinschmidt)

Jason reviewed the study goal, geographic scope, and the components of this study. He noted that ADEM agreed to a generation monitoring site about 800 feet downstream of Harris Dam. Alabama Power has also installed a continuous monitor about ½ mile downstream of Harris Dam. Jason reviewed some of the existing data and other monitoring locations (i.e., Malone gage). Jason Carlee (Alabama Power) noted that Alabama Power maintains the monitors about every 10 days. On May 1, 2019, Alabama Power asked HAT 2 stakeholders to send in any areas of water quality concern; Alabama Power did not receive additional areas of water quality concern. Jason noted that Fosters Bridge is the one area that had been previously identified as having potential water quality concerns. Barry Morris asked that if the chicken processing plant was reopened in the future, would that activity be under the Alabama Department of

Environmental Management's (ADEM) regulatory authority. Jason responded yes, and there would likely be a public comment period. Harry Merrill noted that a big cattle operation was creating a lot of pollution on the Big Tallapoosa where it crosses the 431 Bridge (below Hollis Crossroads). Sheila Smith (Alabama Power) noted this area is near the existing canoe put in site. Harry believes that fish are not in this area. He also noted that the chicken litter on the pastures combined with the cows entering the water at this location has resulted in a very polluted site. Jason noted that this site is one that was identified for further water quality evaluation.

Barry Morris asked if temperature is going to be addressed in a different HAT. Jason responded that Alabama Power is collecting temperature data at all 20 level logger sites on the Tallapoosa River below Harris Dam. Auburn University and ADEM are also collecting temperature data. Sarah Salazar noted that there are a couple of freshwater mussels on the U.S. Fish and Wildlife Service's (USFWS) Information for Planning and Consultation (IPaC) list and advised Alabama Power to check area water quality if any of these species were found within the Harris Project Boundary. Jason commented that there is at least one threatened and endangered (T&E) that occurs upstream of the Harris Project Boundary. The HAT 3 (T&E) is aware of the presence of this mussel upstream of the Harris Project and is planning accordingly.

Maria Clark (EPA) noted that the EPA recommends year-round monitoring for at least one full year and also noted that one year of monitoring water quality may not be enough data. She indicated that EPA will send an official request on the monitoring. Maria added that EPA had previously made this comment, and it had not been incorporated into the Harris Water Quality Study Plan. Jason responded that the comment period for the Harris study plans was extensive and that FERC approved the study plans in April 2019. Alabama Power is not planning to monitor year-round. Jason indicated that based on years of experience, studies from other projects, and water quality experts, it is atypical for dissolved oxygen to be adversely affected during the winter months in the southeast, USA. Maria indicated that EPA would send their comments to Angie on the need for long-term, year-round water quality monitoring during the Harris relicensing process.

Donna Matthews asked how far north Alabama Power would look to see if the endangered mussel exists around the Highway 431 Bridge and the Harris Project Boundary. Jason noted that Alabama Power does not control the water quality or quantity coming into Lake Harris. If there are non-point source water quality issues above the Harris Project, the regulating entities would be responsible for addressing effects on mussel populations outside of the Harris Project Boundary.

Albert Eiland noted that his cousin, Chuck Denman, has commented that, if you have an open wound (i.e., cut), you should not get into the Tallapoosa River. He stated it is likely to get infected.

The meeting concluded at 11:50 am.

ATTACHMENT A
HARRIS ACTION TEAM 2 MEETING ATTENDEES

HARRIS PROJECT RELICENSING

HAT 2 SIGN-IN SHEET

September 11, 2019 9:00 AM

	Name/ Affiliation or Organization	Email
1	*John Smith/ Stakeholder*	*jsmith@email.com*
2	Thomas St. John /APC	twstjohn@southernco.com
3	Fred Leslie	fal@adem.alabama.gov
4	Jennifer Rusberry	
5	Jason Carlee	
6	Jennifer Hasibauer	jhasibauer@adem.alabama.gov
7	David Moore	
8	Nathan Aycock	
9	Mike Holley	
10	David Smith	
11	Glenell Smith	
12	Kristie Coffman	

HARRIS DAM
RELICENSING

HARRIS PROJECT RELICENSING

HAT 2 SIGN-IN SHEET

September 11, 2019 9:00 AM

	Name/ Affiliation or Organization	Email
13	Josh Yerby APC	
14	Taconya Goar ADCNR	
15	Mitch Redd TNC	
16	Kelly Yates, Env. Affairs	klyates@southernco.com
17	Tom Garland	
18	Donna Matthews	
19	ALBERT EILAND	
20	Stan Nelson, Nelson & Co	s nelson
21	Joel Stevens	
22	Trey Stevens	
23	Tina Freeman	
24	Sheila Smith	

HARRIS DAM
RELICENSING

HARRIS PROJECT RELICENSING

HAT 2 SIGN-IN SHEET

September 11, 2019 9:00 AM

	Name/ Affiliation or Organization	Email
25	~~Stacy~~ Thompson APC	
26	Barry Morris	
27	Stacey Graham	
28		
29		
30		
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34		
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ATTACHMENT B
SEPTEMBER 11, 2019 HAT 2 PRESENTATION

R.L. Harris Project Relicensing

HAT 2 Meeting

September 11, 2019

Erosion and Sedimentation Study

Goal

Identify any problematic erosion sites and sedimentation areas and determine the likely causes

Geographic Scope

Little Coon Creek and Crow Creek Watersheds at Skyline, Lake Harris, and the Tallapoosa River from Harris Dam downstream through Horseshoe Bend.

Study Components

- Identify erosion and sedimentation sites
- Assess 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)

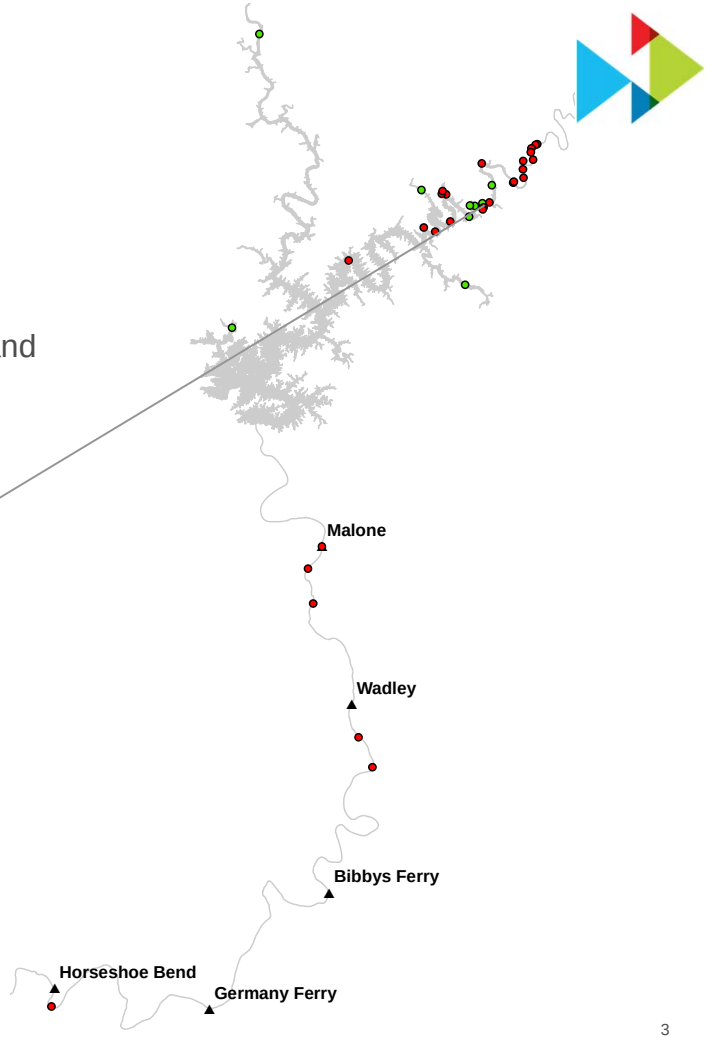
Study Sites

Erosion (red dots)

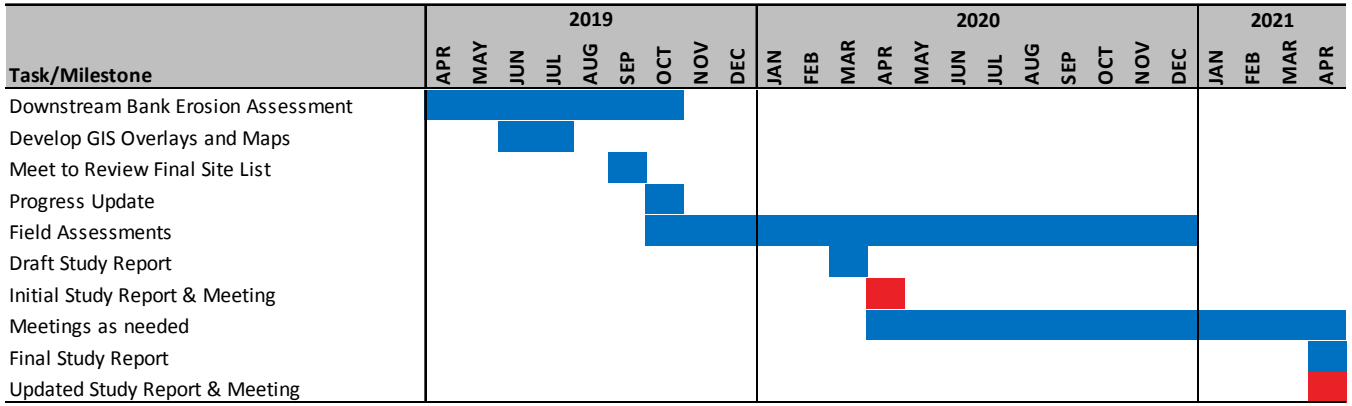
- 21 sites on Lake Harris
  - All on Little Tallapoosa arm of lake
  - 17 sites upstream of 431
- 6 sites on Tallapoosa between Harris Dam and Horseshoe Bend

Sedimentation (green dots)

- 9 sites on Lake Harris



E & S Study Schedule



Water Quality Study

Goal

Supplement the 2018 Baseline Water Quality Report; identify and assess potential areas of water quality concern.

Geographic Scope

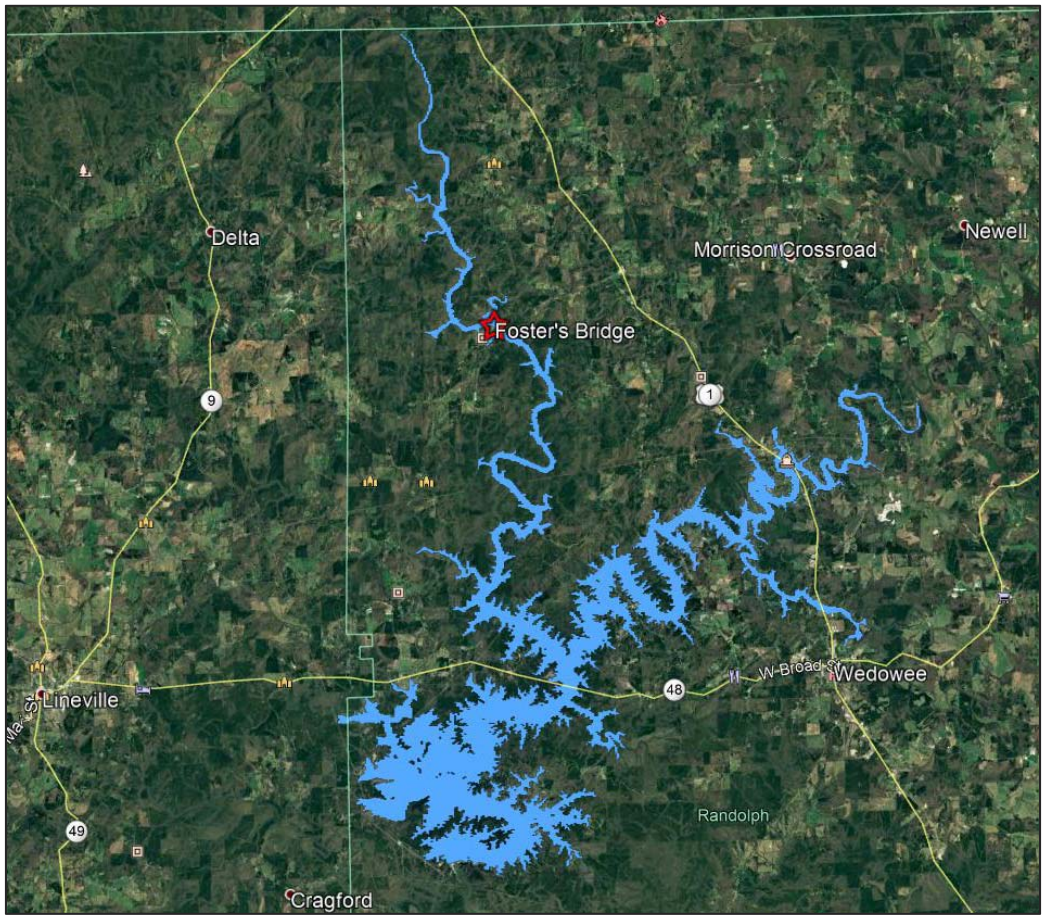
Lake Harris and its tributaries; Tallapoosa River from Harris Dam through Horseshoe Bend; Little Coon Creek and Crow Creek watersheds at Skyline.

Study Components

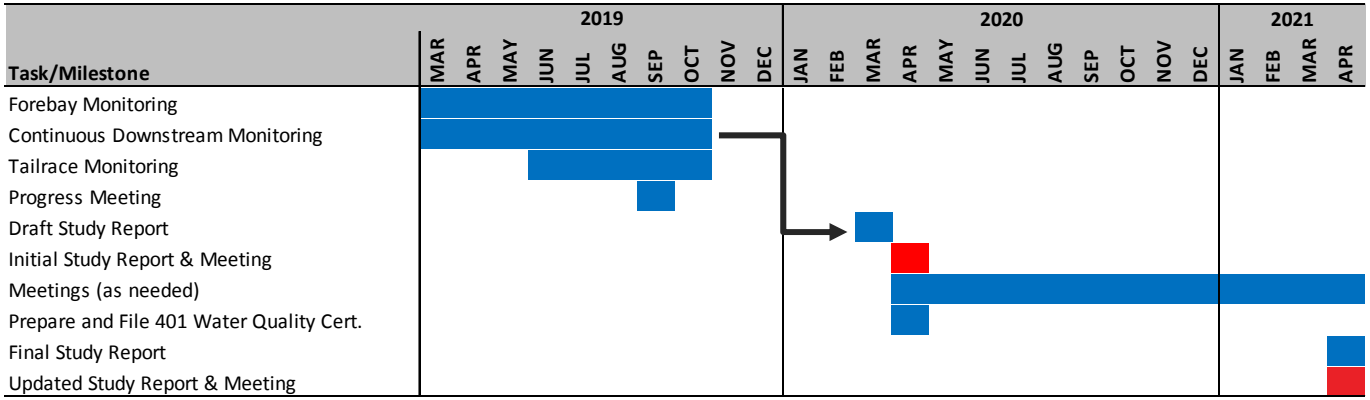
- Monitor dissolved oxygen and temperature during generation at the existing site 800 ft downstream of Harris Dam (June 1 – October 31)
- Monitor dissolved oxygen and temperature continuously at new location 0.5 miles downstream of Dam (March 1 – October 31)
- Collect monthly vertical profiles of dissolved oxygen and temperature in reservoir forebay (March – October)
- Identify and assess areas in reservoir where water quality may be degraded
- Compile new data from other credible sources (e.g., USGS, ADEM, AWW)

Monitoring Locations

Areas of Concern

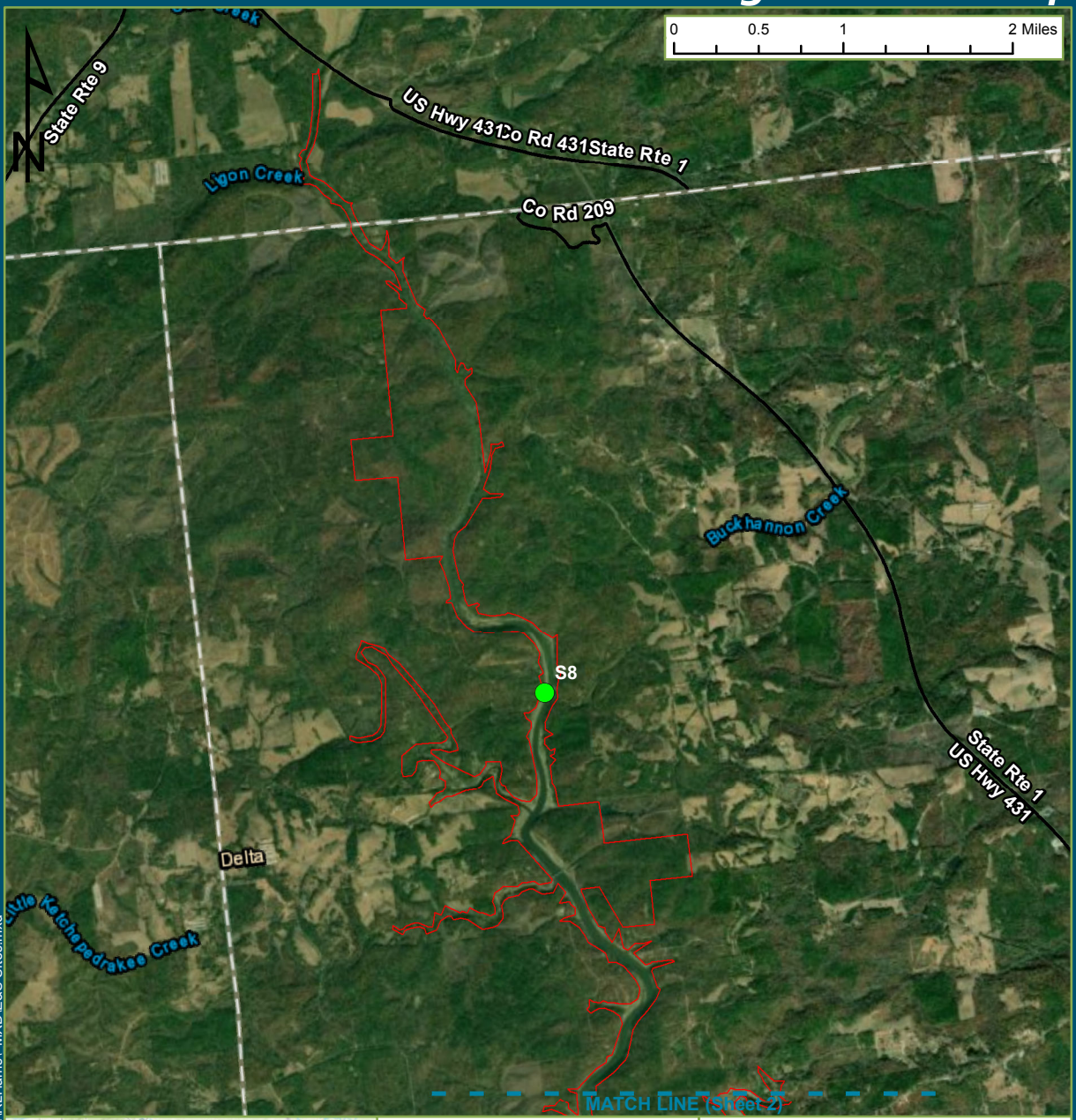


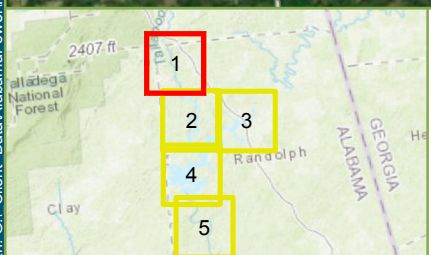
Study Schedule



ATTACHMENT C
HAT 2 MAP OF EROSION/SEDIMENTATION STUDY SITES

Monitoring Location Map





Legend

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

Alabama Power Company
Birmingham, AL

R.L. Harris Project
FERC Project No. 2628

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Source: Erosion/Sedimentation Locations (Alabama Power, 2019), Project Boundary (Kleinschmidt, 2018), Steet Map (ESRI, 2019)

PN: 0535028.01

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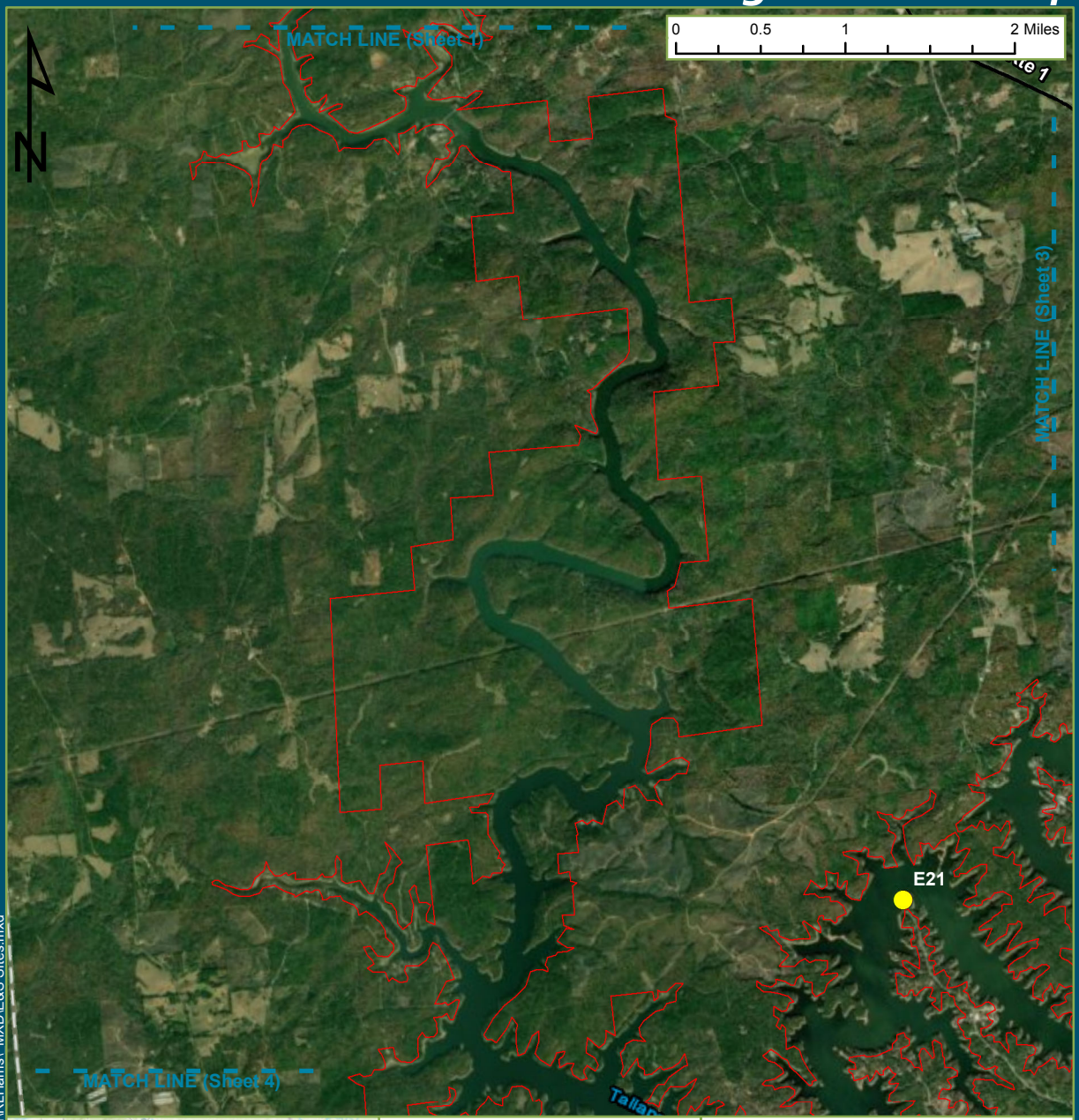

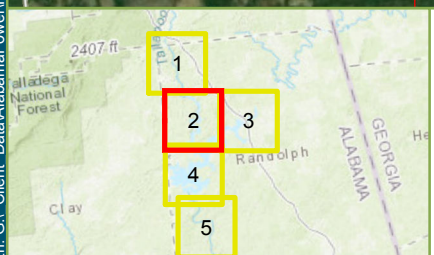

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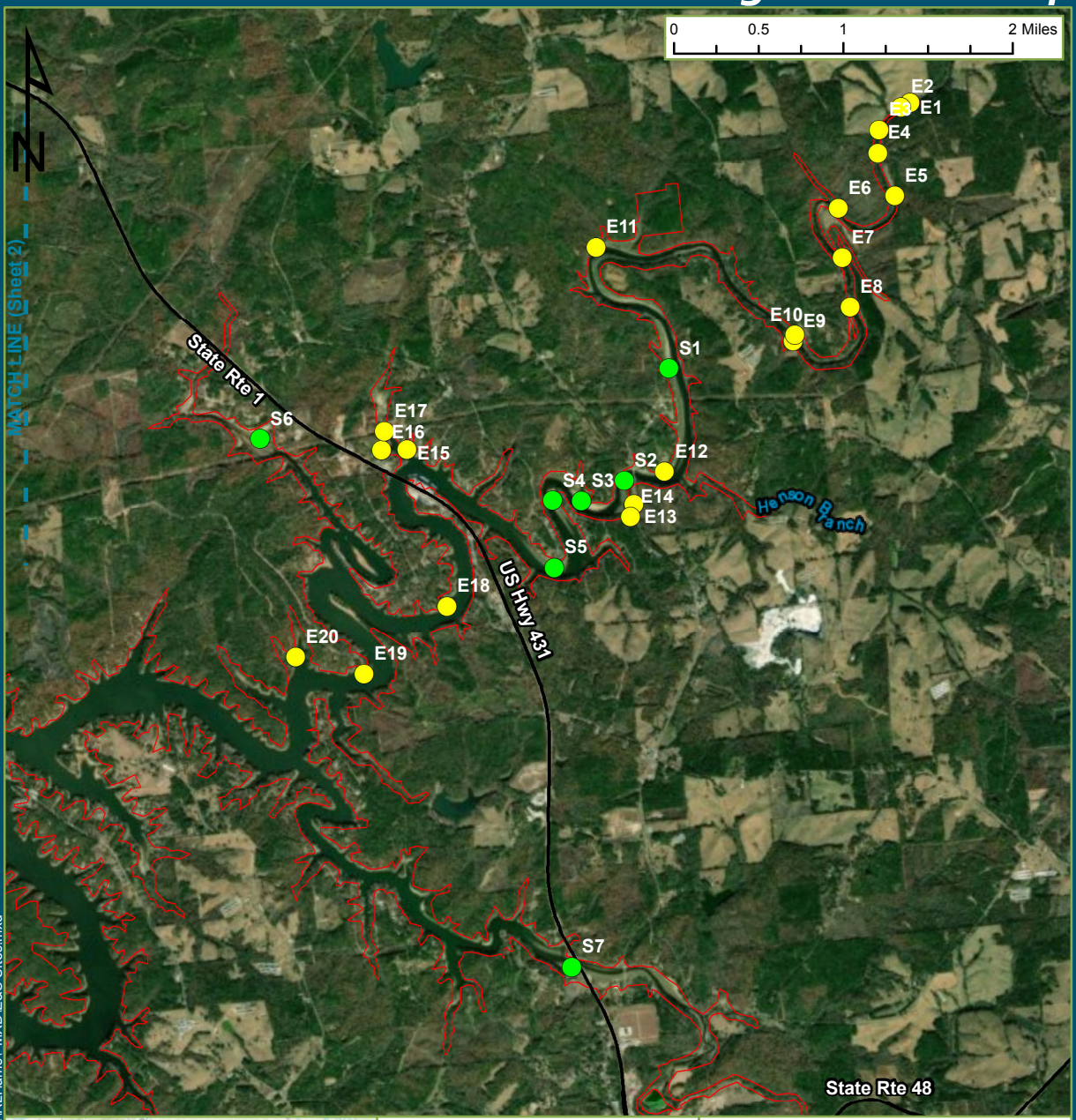

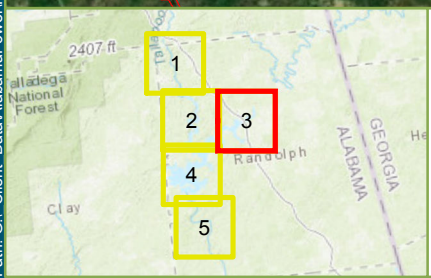

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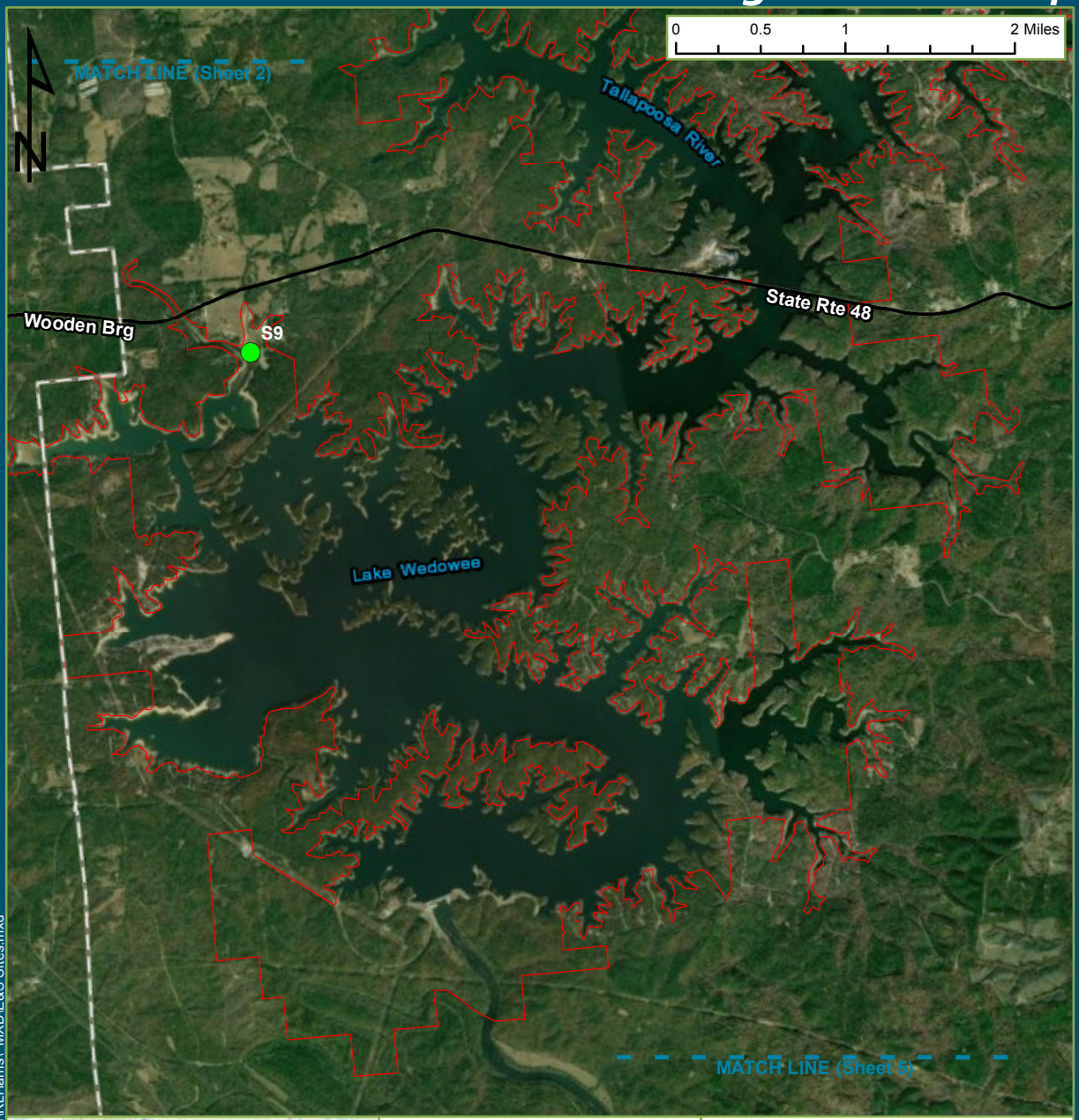

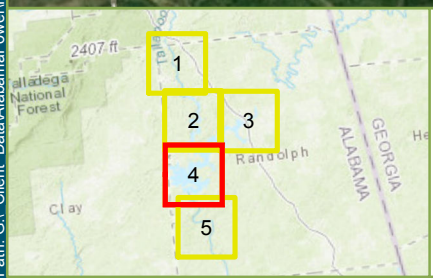

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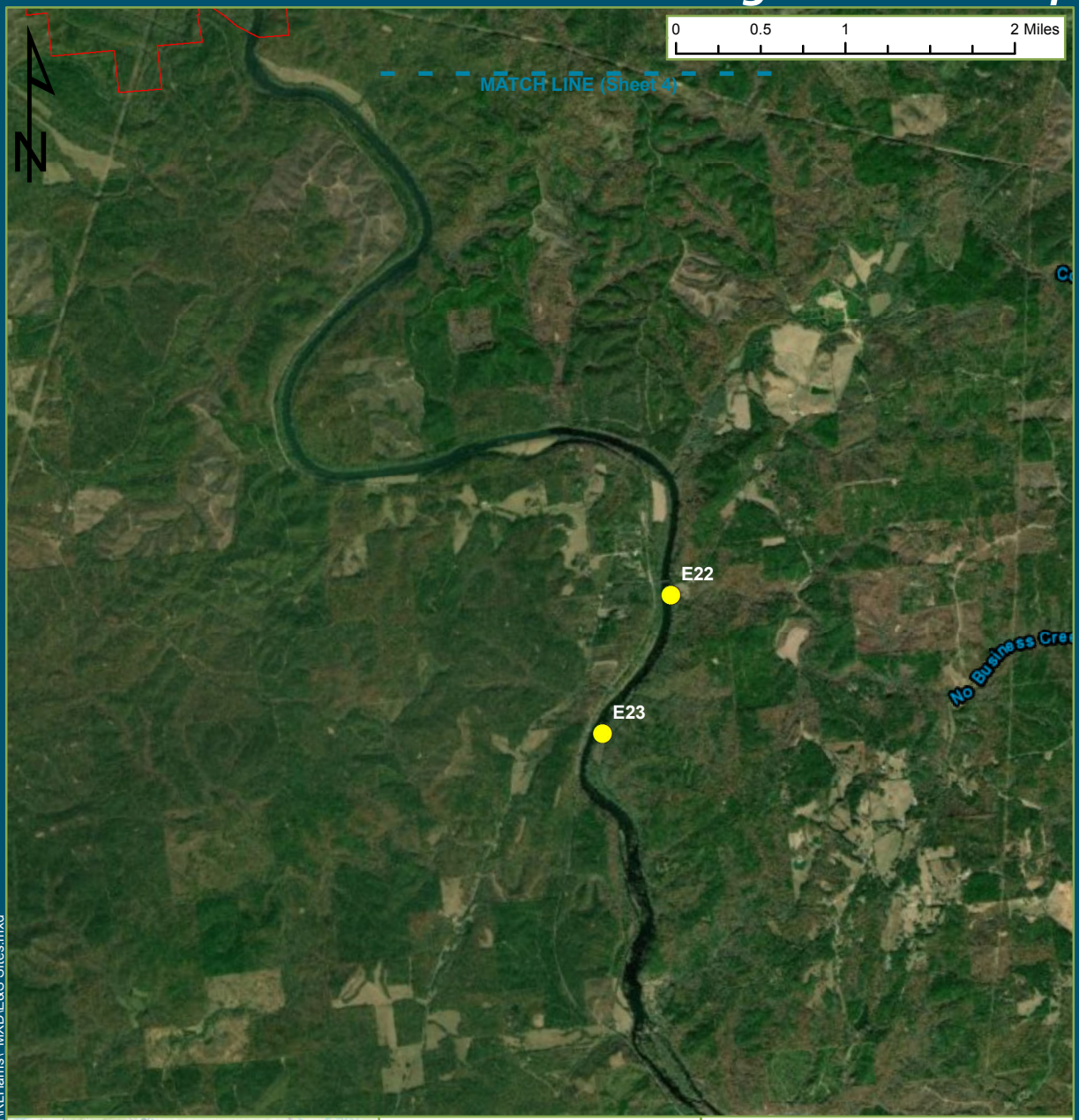

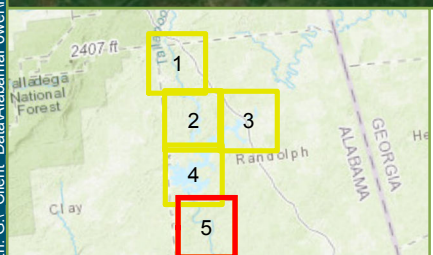

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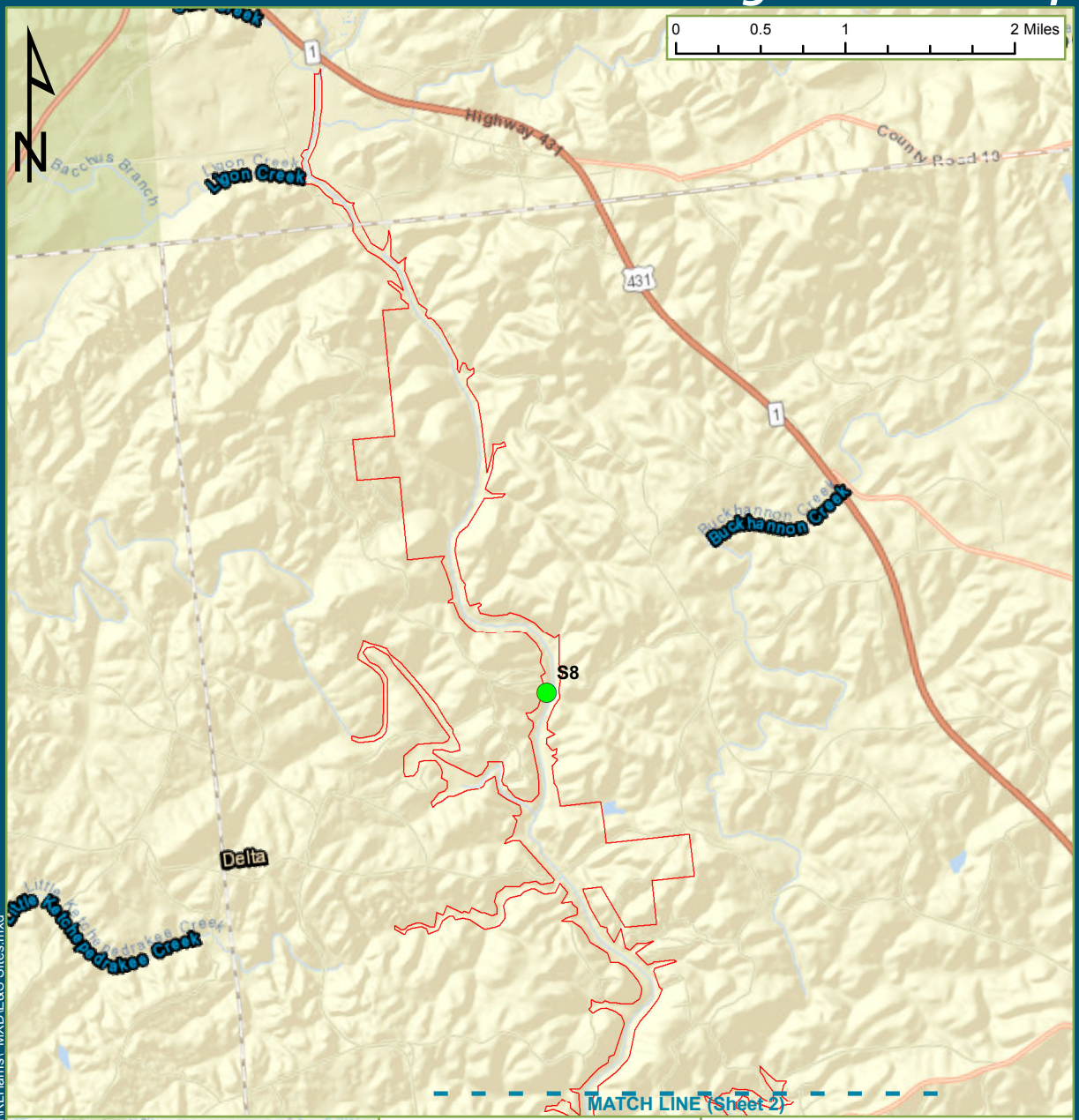

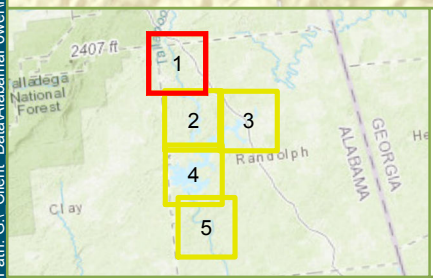

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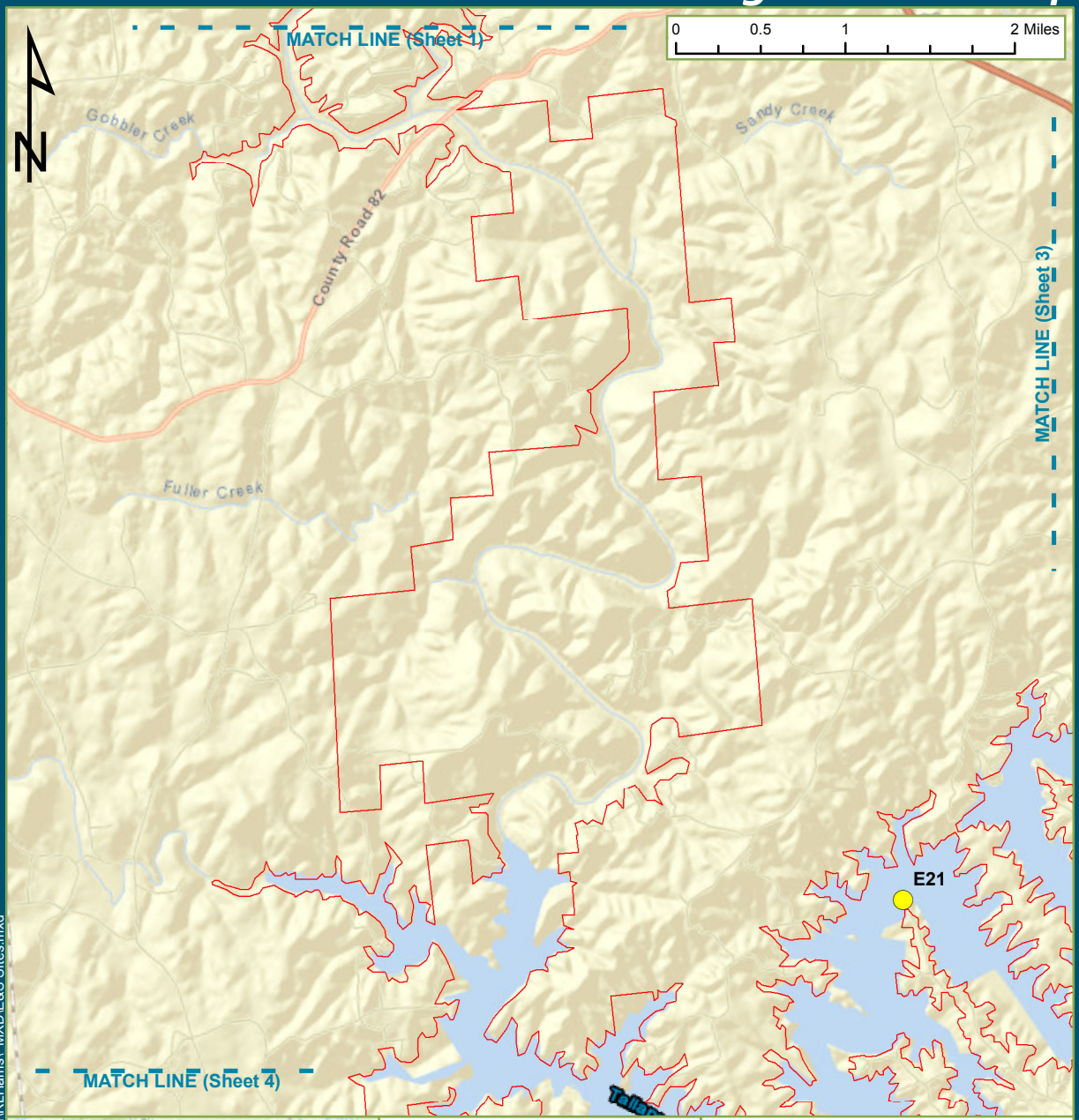

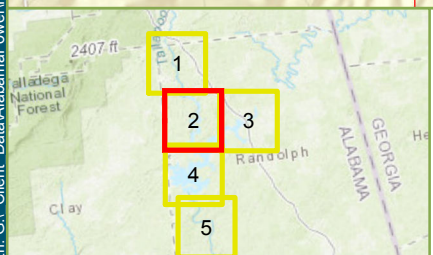

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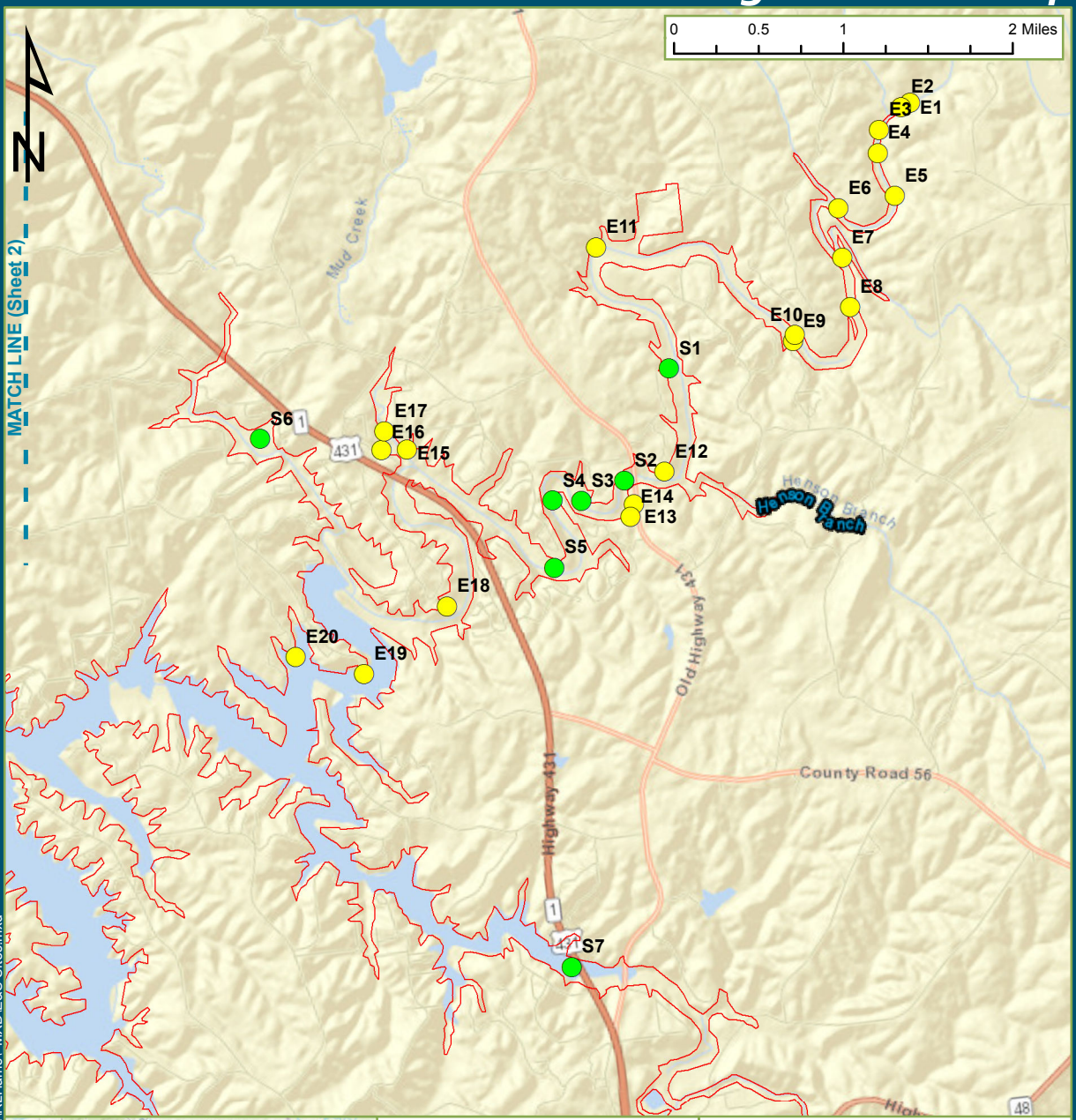

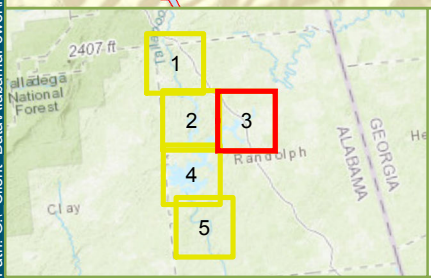

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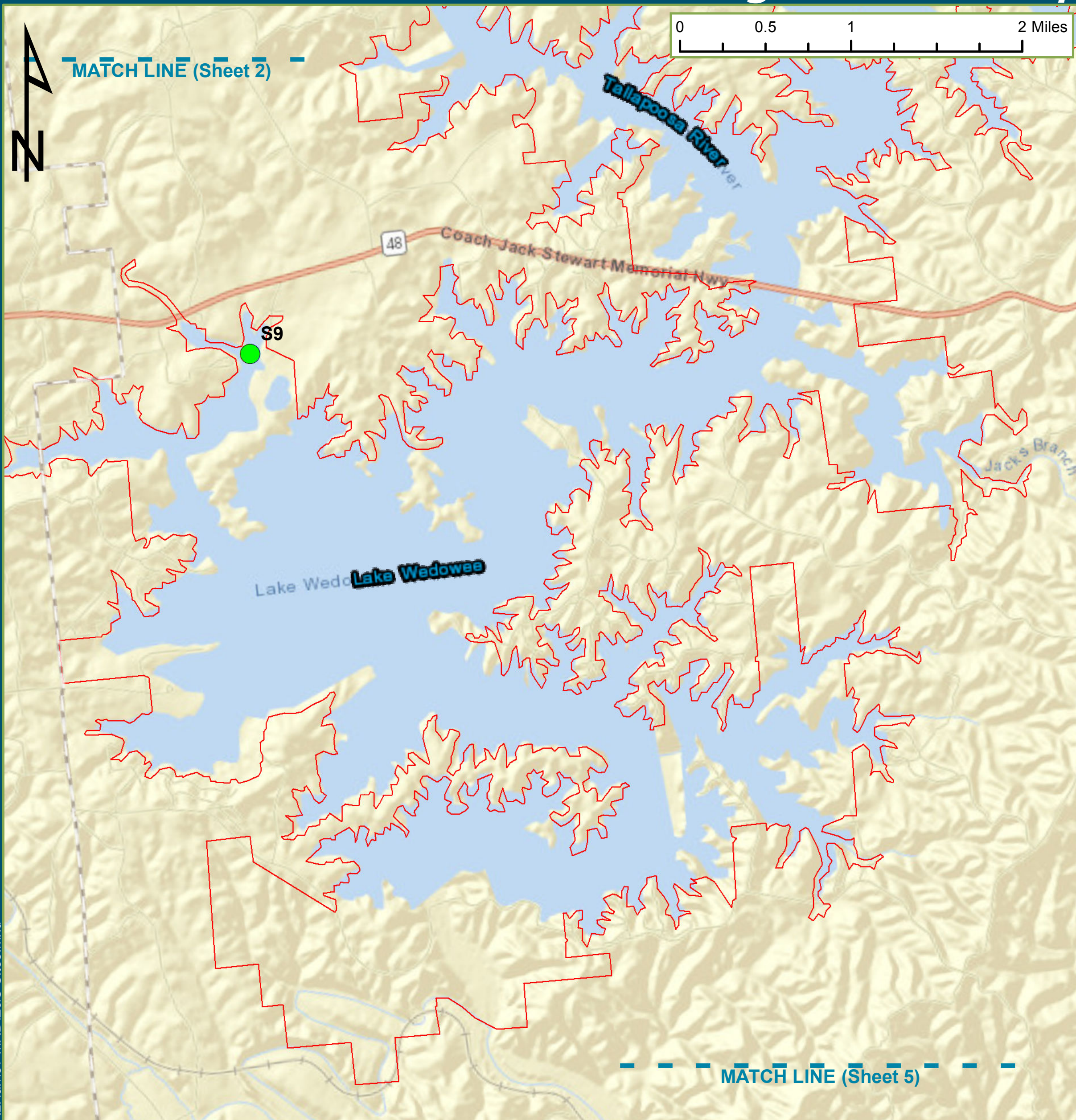

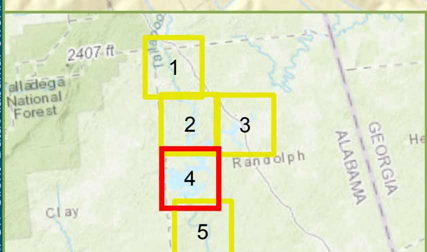

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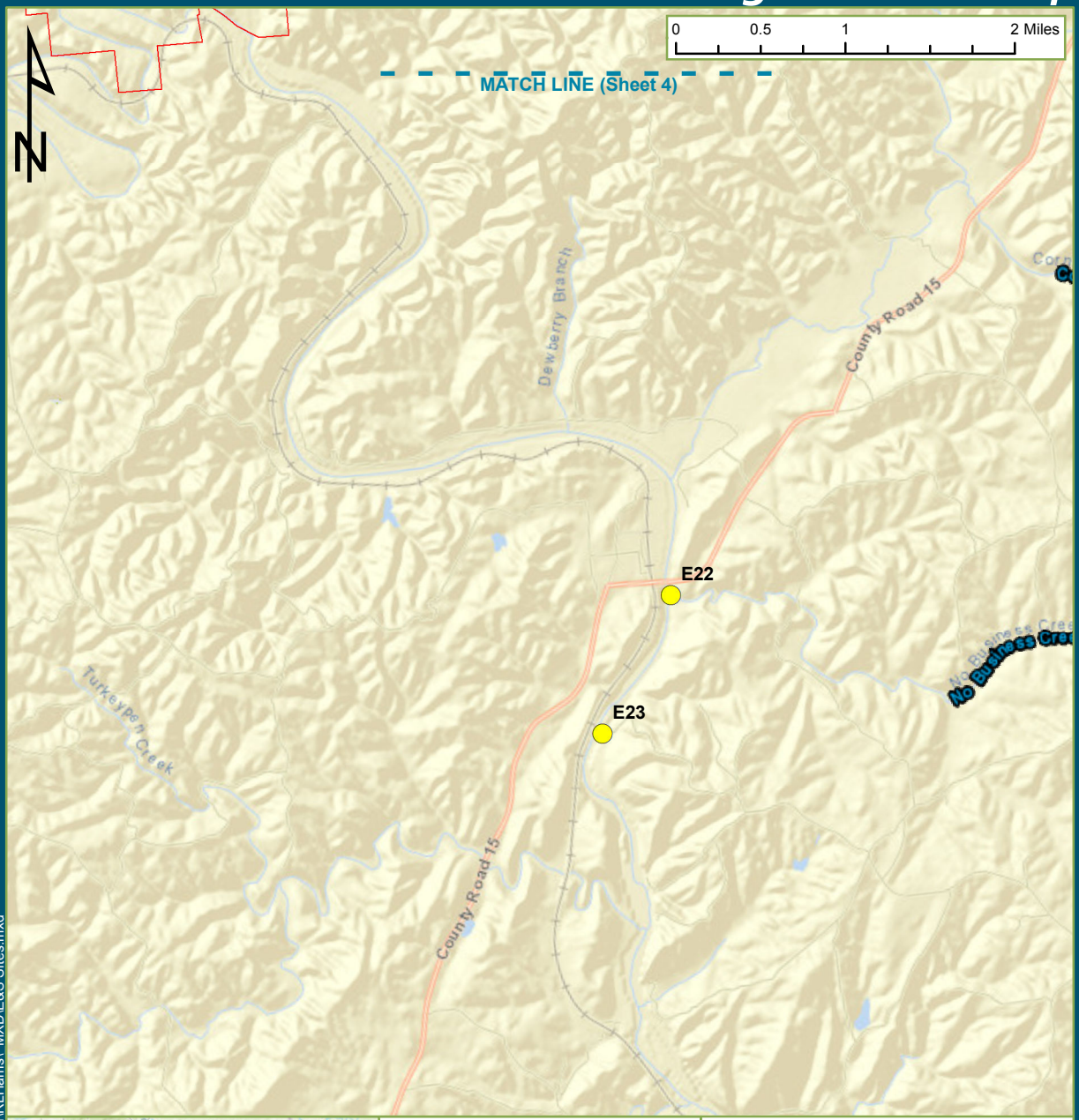

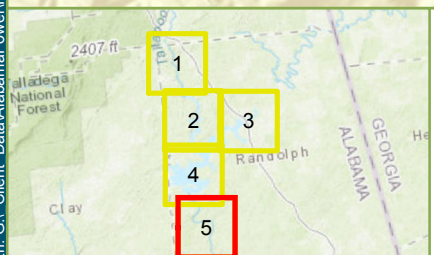

Legend

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Alabama Power Company
Birmingham, AL

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PN: 0535028.01

R.L. Harris Project
Erosion Sedimentation Study
Draft Site List
May 1, 2019

Name	Type	Latitude	Longitude
S1	Sedimentation	33.37624948	-85.47166235
S2	Sedimentation	33.36719999	-85.47747307
S3	Sedimentation	33.36590337	-85.48206374
S4	Sedimentation	33.36621704	-85.48497203
S5	Sedimentation	33.36051157	-85.48560019
S6	Sedimentation	33.37431997	-85.5138457
S7	Sedimentation	33.3264078	-85.4885445
S8	Sedimentation	33.45383479	-85.60980855
S9	Sedimentation	33.30647091	-85.62855097
E1	Erosion	33.39648716	-85.44412236
E2	Erosion	33.39618116	-85.44512448
E3	Erosion	33.39447905	-85.44762594
E4	Erosion	33.39252729	-85.44796667
E5	Erosion	33.38869558	-85.44676742
E6	Erosion	33.38816557	-85.4526412
E7	Erosion	33.38399233	-85.45284646
E8	Erosion	33.3797199	-85.45259528
E9	Erosion	33.37732425	-85.45878731
E10	Erosion	33.37784798	-85.45851087
E11	Erosion	33.38726919	-85.47760635
E12	Erosion	33.36758594	-85.47330665
E13	Erosion	33.36508776	-85.47680031
E14	Erosion	33.36406619	-85.47728423
E15	Erosion	33.37197386	-85.49913637
E16	Erosion	33.37216342	-85.50173268
E17	Erosion	33.37371456	-85.50122349
E18	Erosion	33.35832713	-85.4969299
E19	Erosion	33.3533428	-85.50610579
E20	Erosion	33.35544286	-85.51280286
E21	Erosion	33.33941479	-85.5581353
E22	Erosion	33.1960328	-85.57649228
E23	Erosion	33.18490256	-85.58503087

APC Harris Relicensing

From: Anderegg, Angela Segars
Sent: Monday, September 23, 2019 10:58 AM
To: Barry Morris
Subject: Re: Erosion study map

Hi Barry,

We're working on getting the meeting notes put together for the September 11 meeting. Once they're ready (should be this week), we'll put those and all the meeting materials including the erosion/sedimentation map on the website and let all of the HAT know they are available.

When you take a look at the map, let me know if you need to discuss anything.

Thanks!

Angie

From: Barry Morris <rbmorris333@gmail.com>
Sent: Monday, September 23, 2019 9:27 AM
To: Anderegg, Angela Segars <ARSEGARS@southernco.com>
Subject: Erosion study map

EXTERNAL MAIL: Caution Opening Links or Files

_____

Good morning Angie. At the HAT meetings on 11 September a map of the erosion/sedimentation study sites was shown. One of our LWPOA members has a question about the sites and I can't find it on the relicensing website. Could you or a member of the relicensing team please send me the link or an email with the map attached.

In our case the question involves the point on the west side of the Little Tallapoosa channel opposite where Wedowee creek enters the river.

Thanks in advance for your help. Barry

Barry Morris
404 449 3452 (c)

HAT 2 - September 11 meeting notes

APC Harris Relicensing

Tue 10/1/2019 6:17 PM

To: 'harrisrelicensing@southernco.com' <harrisrelicensing@southernco.com>
Bcc damon.abernethy@dcnr.alabama.gov <damon.abernethy@dcnr.alabama.gov>; Steve Bryant - Alabama Department of Conservation and Natural Resources <Steve Bryant - Alabama Department of Conservation and Natural Resources>; 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>; amy.silvano@dcnr.alabama.gov <amy.silvano@dcnr.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>; jcarlee@southernco.com <jcarlee@southernco.com>; kechandl@southernco.com <kechandl@southernco.com>; mcoker@southernco.com <mcoker@southernco.com>; cggoodma@southernco.com <cggoodma@southernco.com>; gfhorn@southernco.com <gfhorn@southernco.com>; ammcvica@southernco.com <ammcvica@southernco.com>; tlmills@southernco.com <tlmills@southernco.com>; jsrasber@southernco.com <jsrasber@southernco.com>; wtanders@southernco.com <wtanders@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>; irwiner@auburn.edu <irwiner@auburn.edu>; reuteem@auburn.edu <reuteem@auburn.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>; kate.cosnahan@kleinschmidtgroup.com <kate.cosnahan@kleinschmidtgroup.com>; colin.dinken@kleinschmidtgroup.com <colin.dinken@kleinschmidtgroup.com>; amanda.fleming@kleinschmidtgroup.com <amanda.fleming@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>; sforehand@russelllands.com <sforehand@russelllands.com>; 1942jthompson420@gmail.com <1942jthompson420@gmail.com>; nancyburnes@centurylink.net <nancyburnes@centurylink.net>; lgarland68@aol.com <lgarland68@aol.com>; rbmorris333@gmail.com <rbmorris333@gmail.com>; mitchell.reid@tnc.org <mitchell.reid@tnc.org>; richardburnes3@gmail.com <richardburnes3@gmail.com>; eilandfarm@aol.com <eilandfarm@aol.com>; eveham75@gmail.com <eveham75@gmail.com>; wmcampbell218@gmail.com <wmcampbell218@gmail.com>; jec22641@aol.com <jec22641@aol.com>; chuckdenman@hotmail.com <chuckdenman@hotmail.com>; carolbuggknight@hotmail.com <carolbuggknight@hotmail.com>; donnamat@aol.com <donnamat@aol.com>; harry.merrill47@gmail.com <harry.merrill47@gmail.com>; mhpwedowee@gmail.com <mhpwedowee@gmail.com>; midwaytreasures@bellsouth.net <midwaytreasures@bellsouth.net>; inspector_003@yahoo.com <inspector_003@yahoo.com>; clark.maria@epa.gov <clark.maria@epa.gov>; decker.chris@epa.gov <decker.chris@epa.gov>; gordon.lisa-perras@epa.gov <gordon.lisa-perras@epa.gov>; holliman.daniel@epa.gov <holliman.daniel@epa.gov>; jeff_duncan@nps.gov <jeff_duncan@nps.gov>

HAT 2,

The meeting notes and materials from the September 11 HAT meeting can be found on the Harris relicensing website (www.harrisrelicensing.com) under HAT 2 – Water Quality and Use.

Thanks,

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

APC Harris Relicensing

From: Bryant, Steve <Steve.Bryant@dcnr.alabama.gov>
Sent: Wednesday, October 2, 2019 10:00 AM
To: APC Harris Relicensing
Subject: RE: HAT 2 - September 11 meeting notes

OK Thanks

From: APC Harris Relicensing <g2apchr@southernco.com>
Sent: Wednesday, October 2, 2019 9:16 AM
To: Bryant, Steve <Steve.Bryant@dcnr.alabama.gov>
Subject: FW: HAT 2 - September 11 meeting notes

Hi Steve,

I received an notice that this email didn't get to you. I wanted to make sure you saw it.

Thanks,

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

From: APC Harris Relicensing <g2apchr@southernco.com>
Sent: Tuesday, October 1, 2019 1:18 PM
To: APC Harris Relicensing <g2apchr@southernco.com>
Subject: HAT 2 - September 11 meeting notes

HAT 2,

The meeting notes and materials from the September 11 HAT meeting can be found on the Harris relicensing website (www.harrisrelicensing.com) under HAT 2 – Water Quality and Use.

Thanks,

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

APC Harris Relicensing

From: Anderegg, Angela Segars
Sent: Tuesday, October 8, 2019 1:40 PM
To: Barry Morris
Subject: RE: HAT 2 Erosion study sites

Hi Barry,

We're in the process now of finalizing plans for the field work, so no issues at all in adding this site. Thanks for letting us know about it.

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

From: Barry Morris <rbmorris333@gmail.com>
Sent: Tuesday, October 8, 2019 11:56 AM
To: Anderegg, Angela Segars <ARSEGARS@southernco.com>
Subject: HAT 2 Erosion study sites

Angie: I'm finally getting to study the sedimentation/erosion study site map link that went out on 1 OCT. I know you said at the September 11 meeting that the study plans are set, but at an LWPOA meeting shortly after that, one of our members strongly recommends one site be added to the list.

That site is on west side of the Little Tallapoosa arm of the lake, across from where Wedowee Creek flows in. The coordinates are 33 degrees 20 '52.07" N x 85 degrees 30' 53.39" W, according to Google Earth.

That's a heavily travelled corner and there is plenty of bank erosion along with trees that have fallen into the lake from the eroding bank. It's not exactly a hazard to navigation but it does narrow that choke point.

If it's too late, I understand. Let me know what's possible. Thanks.

Barry Morris
LWPOA
404 449 3452

From:	APC Harris Relicensing
To:	"harrisrelicensing@southernco.com"
Bcc:	"damon.abernethy@dcnr.alabama.gov"; Steve Bryant - Alabama Department of Conservation and Natural Resources; todd.fobian@dcnr.alabama.gov; "chris.greene@dcnr.alabama.gov"; "keith.henderson@dcnr.alabama.gov"; "mike.holley@dcnr.alabama.gov"; "matthew.marshall@dcnr.alabama.gov"; "amy.silvano@dcnr.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"; "jcarlee@southernco.com"; "kechandl@southernco.com"; "mcoker@southernco.com"; "cggoodma@southernco.com"; "gfhorn@southernco.com"; "ammcvica@southernco.com"; "tlmills@southernco.com"; "mhunter@alabamarivers.org"; "clowry@alabamarivers.org"; "gjobsis@americanrivers.org"; "kmo0025@auburn.edu"; "irwiner@auburn.edu"; reuteem@auburn.edu; "lgallen@balch.com"; "jhancock@balch.com"; "allan.creamer@ferc.gov"; rachel.mcnamara@ferc.gov; "sarah.salazar@ferc.gov"; monte.terhaar@ferc.gov; "kate.cosnahan@kleinschmidtgroup.com"; "colin.dinken@kleinschmidtgroup.com"; "amanda.fleming@kleinschmidtgroup.com"; "henry.mealing@kleinschmidtgroup.com"; "jason.moak@kleinschmidtgroup.com"; "kelly.schaeffer@kleinschmidtgroup.com"; jessecunningham@msn.com; "sforehand@russelllands.com"; "1942jthompson420@gmail.com"; "nancyburnes@centurylink.net"; "lgarland68@aol.com"; "rbmorris333@gmail.com"; "mitchell.reid@tnc.org"; "richardburnes3@gmail.com"; eilandfarm@aol.com; "eveham75@gmail.com"; wmcampbell218@gmail.com; "jec22641@aol.com"; chuckdenman@hotmail.com; "carolbuggknight@hotmail.com"; "donnamat@aol.com"; "harry.merrill47@gmail.com"; "mhpwedowee@gmail.com"; "midwaytreasures@bellsouth.net"; "inspector_003@yahoo.com"; "clark.maria@epa.gov"; "decker.chris@epa.gov"; "gordon.lisa-perras@epa.gov"; "holliman.daniel@epa.gov"; "jeff_duncan@nps.gov"; "Jack West"; "Lydia Mayo"
Subject:	HAT 2 - Draft Erosion and Sedimentation Study Report
Date:	Wednesday, March 18, 2020 8:32:18 AM

HAT 2,

The Draft Harris Erosion and Sedimentation Study Report is available for your review on www.harrisrelicensing.com. It's a fairly large file, so it could not be attached in an email. In the study plan, Alabama Power committed to distributing this draft report to HAT 2 participants in March. As you may recall, Alabama Power will file the Initial Study Report (ISR) in April 2020, which will include reports such as this one as well as other draft study reports. At that time, Alabama Power will request official comments on the ISR and draft study reports.

If you have any questions, please contact me at 205-257-2251 or ARSEGARS@southernco.com.

Thank you,

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