

THREATENED AND ENDANGERED SPECIES STUDY REPORT

R.L. HARRIS HYDROELECTRIC PROJECT

FERC No. 2628



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1.0 INTRODUCTION

Alabama Power Company (Alabama Power) owns and operates the R.L. Harris Project (FERC Project No. 2628) (Harris Project), licensed by the Federal Energy Regulatory Commission (FERC or Commission). Alabama Power is relicensing 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 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 as cited in Alabama Power 2018).

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”

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).

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 2018).

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

1.1 Study Background

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

During preparation of the Harris Pre-Application Document (PAD), research identified several federally protected species that are present in the counties where the Harris Project is located (Table 1-1). On November 13, 2018, Alabama Power filed ten proposed study plans, including a study plan for threatened and endangered (T&E) species at the Harris Project. FERC issued a Study Plan Determination on April 12, 2019, which included FERC staff recommendations. Alabama Power incorporated FERC's recommendations and filed the Final Study Plans with FERC on May 13, 2019.

Alabama Power formed the Harris Action Team (HAT) 3 to specifically address fish and wildlife issues, including T&E species, at the Harris Project. Alabama Power held a HAT 3 meeting on August 27, 2019 to discuss the T&E Species Study Plan. Alabama Power noted that the first phase of the T&E Species Study would be a desktop analysis that involved developing Geographic Information System (GIS) overlays of habitat information and maps to determine possible areas in the FERC-approved geographic scope where T&E species may occur.

Alabama Power prepared and filed a Draft T&E Species Desktop Assessment with FERC on April 10, 2020. Concurrently, Alabama Power distributed the draft report to the Harris Action Team (HAT) 3 participants. Stakeholders provided comments on the Draft T&E Species Desktop Assessment. This Final T&E Species Study Report incorporates information provided within and comments received on the Draft T&E Species Desktop Assessment.

The goals of the desktop assessment were to determine the probability of populations of currently listed T&E species and/or their critical habitat occurring within the Harris Project Boundary or Project Area. Alabama Power developed GIS overlays of habitat information and maps for this assessment and used this information to determine if further evaluation (i.e. field surveys) of any identified species and their habitat was warranted.

The USFWS's Information for Planning and Consultation (IPaC) was used to identify listed species occurring in counties that intersect the Project Boundary. The USFWS's Environmental Conservation Online System (ECOS) was used to more specifically determine the location of species' ranges and areas of critical habitat relative to the Project Boundary and to gather background information on life history and habitat.

Consultation with the USFWS determined the necessity for field surveys to determine presence or absence of certain listed species. In fall 2019 and summer 2020, field surveys were conducted for target mussel species (Finelined Pocketbook (*Hamiota altilis*)). Surveys for four other species (Red-cockaded Woodpecker (*Picoides borealis*), Palezone Shiner (*Notropis albizonatus*), White Fringeless Orchid (*Platanthera integrilabia*), and Price's Potato-bean (*Apios priceana*)) or their habitat continued through 2020. On December 11, 2019 and November 5, 2020, Alabama Power held HAT 3 meetings to discuss the T&E Species Study progress to-date.

For the purpose of this study, "Documented Historic Range" refers to the geographic area a species was known or believed to occupy in the past, and "Current Range" refers to the geographic range the species is known or believed to currently occupy.

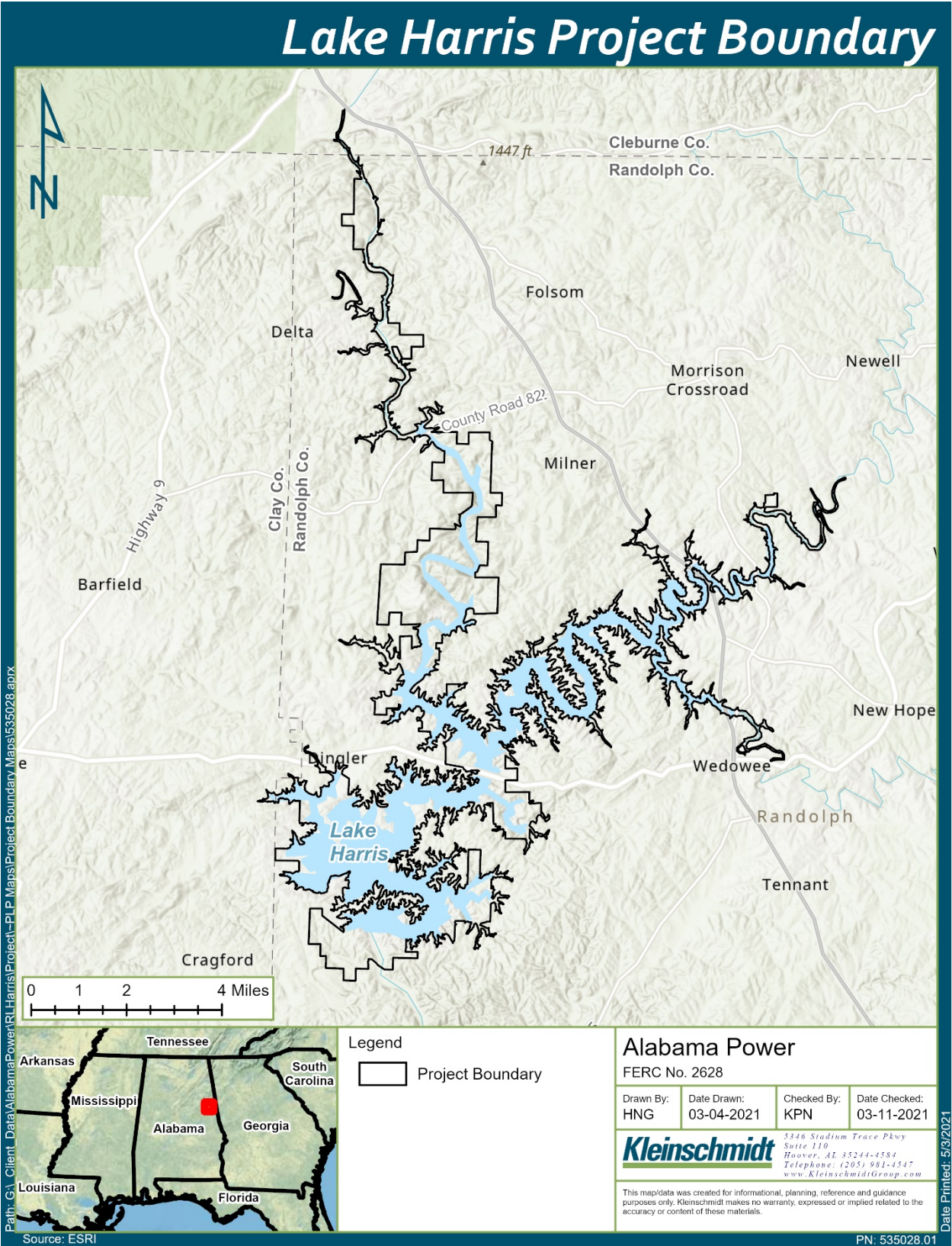


Figure 1-1 Lake Harris Project Boundary

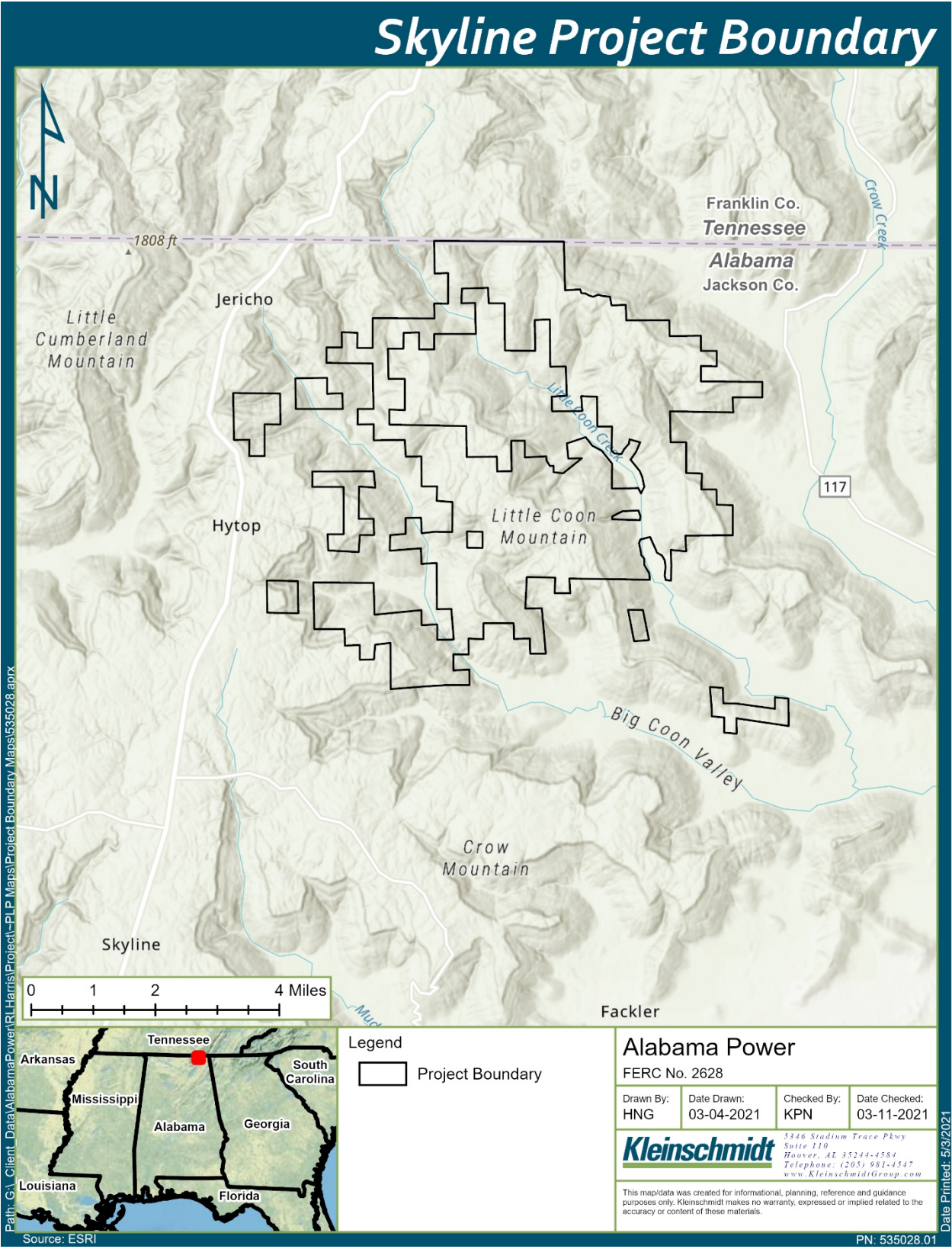


Figure 1-2 Skyline Project Boundary

**Table 1-1 Federally Threatened and Endangered Species Potentially Occurring in Alabama Counties
in the R.L. Harris Project Vicinity**

SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS ¹	STATE PROTECTED	COUNTY(IES) OF OCCURRENCE	RECENT DOCUMENTED OCCURRENCE (1995- 2020) IN PROJECT BOUNDARY	DOCUMENTED HISTORIC RANGE IN AL
<i>Picoides borealis</i>	Red-cockaded Woodpecker	E	Yes	Clay & Randolph	No	Statewide in appropriate habitat
<i>Notropis albizonatus</i>	Palezone Shiner	E	Yes	Jackson	No	Tennessee River system
<i>Erimonax monachus</i>	Spotfin Chub	T	Yes	Jackson	No	Tennessee River system
<i>Hamiota altilis</i>	Finelined Pocketbook	T	Yes	Cleburne	No	Coosa, Tallapoosa, Cahaba River systems
<i>Lampsilis virescens</i>	Alabama Lampmussel	E	Yes	Jackson	No	Tennessee River system
<i>Venustaconcha trabalis</i>	Cumberland Bean	E	Yes	Jackson	No	Tennessee River system
<i>Fusconaia cuneolus</i>	Fine-rayed Pigtoe	E	Yes	Jackson	No	Tennessee River system
<i>Toxolasma cylindrellus</i>	Pale Lilliput	E	Yes	Jackson	No	Tennessee River system
<i>Theliderma cylindrica</i>	Rabbitsfoot	T	Yes	Jackson	No	Tennessee River system
<i>Fusconaia cor</i>	Shiny Pigtoe	E	Yes	Jackson	No	Tennessee River system
<i>Epioblasma triquetra</i>	Snuffbox	E	Yes	Jackson	No	Tennessee River system

SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS ¹	STATE PROTECTED	COUNTY(IES) OF OCCURRENCE	RECENT DOCUMENTED OCCURRENCE (1995-2020) IN PROJECT BOUNDARY	DOCUMENTED HISTORIC RANGE IN AL
<i>Pleurobema georgianum</i>	Southern Pigtoe	E	Yes	Clay & Cleburne	No	Coosa River system
<i>Pleurobema dolabelloides</i>	Slabside Pearlymussel	E	Yes	Jackson	No	Tennessee River system
<i>Myotis sodalis</i>	Indiana Bat	E	Yes	Clay, Cleburne, Randolph, Chambers, Tallapoosa, & Jackson	Yes	Statewide in appropriate habitat
<i>Myotis septentrionalis</i>	Northern eared Bat	Long-T	Yes	Clay, Cleburne, Randolph, Chambers, Tallapoosa, & Jackson	Yes	Piedmont and Cumberland regions
<i>Myotis grisescens</i>	Gray Bat	E	Yes	Jackson	Yes	Statewide in appropriate habitat
<i>Gratiola amphantha</i>	Little Amphianthus	T	No	Randolph, Chambers, & Tallapoosa	Yes	Piedmont region (Bridges 1988)
<i>Platanthera integrilabia</i>	White Fringeless Orchid	T	No	Clay, Cleburne, Jackson, Chambers, & Tallapoosa	No	Talladega National Forest
<i>Apios priceana</i>	Price's Potato-bean	T	No	Jackson	Yes	Statewide in appropriate habitat

SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS ¹	STATE PROTECTED	COUNTY(IES) OF OCCURRENCE	RECENT DOCUMENTED OCCURRENCE (1995-2020) IN PROJECT BOUNDARY	DOCUMENTED HISTORIC RANGE IN AL
<i>Clematis morefieldii</i>	Morefield's Leather Flower	E	No	Jackson	No	Northern regions of state (USFWS 2007)

Source: Mirarchi et.al. 2004, USFWS 2016a, USFWS 2016b, Williams et.al. 2008, FERC 2018; 1 E = Federally listed as Endangered, T = Federally listed as Threatened

2.0 METHODS

Information presented in the Section 3.0 below was obtained and summarized from a variety of sources, including scientific literature, gray literature, and resource agency websites and databases.

The IPaC and Federal Register Listings were used to identify listed species occurring in counties that intersect the Project Boundary. The ECOS, USFWS Recovery Plans, and Five-Year Reviews were used to more specifically determine the location of species' ranges and areas of critical habitat relative to the Project Boundary and to gather background information on life history and habitat. Maps depicting current species ranges and critical habitats (Appendix B) were developed using GIS data available on the USFWS' ECOS online system. Information from the Draft Threatened and Endangered Species Desktop Assessment was revised and updated based on comments received from stakeholders and agencies.

The revised Threatened and Endangered Species Desktop Assessment in conjunction with consultation with the USFWS was used to determine if further evaluation (i.e., field surveys) of any listed species and potential habitat was warranted. If field surveys were conducted, a report was completed outlining survey methods and results.

Information presented in the Section 3.0 below incorporates the revised Threatened and Endangered Species Desktop Assessment and summaries of consultation with agencies and subsequent field surveys.

3.0 DISCUSSION AND CONCLUSIONS

The species described within this section potentially occur or may have designated habitat in the Lake Harris Project Vicinity and the Skyline Project Vicinity, which includes Clay, Randolph, Cleburne, Tallapoosa, and Chambers counties, and Jackson county, respectively. These species may also occur in other counties in Alabama; however, this assessment focuses on those counties where the Harris Project is located.

The Alabama counties in which the Harris Project Vicinity is located (i.e., Tallapoosa, Chambers, Randolph, Clay, Cleburne, and Jackson) overlap with the habitat range, critical habitat, and extant populations of 20 federally listed T&E species of which 16 are state protected (Table 1-1).

The desktop assessment determined that, of these 20 species that potentially occur or may have designated habitat in the Project Vicinity, nine of these species have habitat ranges intersecting the Project Boundary, five of which have a range occurring in the Project Boundary at Skyline, and seven of which have a range occurring in the Project Boundary at Lake Harris (Table 3-1).

Additionally, the USFWS has designated critical habitats for six of the 20 total species identified (Finelined Pocketbook, Indiana Bat (*Myotis sodalis*), Rabbitsfoot (*Theliderma cylindrica*), Slabside Pearlymussel (*Pleuroaia dolabelloides*), Southern Pigtoe (*Pleurobema georgianum*), and Spotfin Chub (*Erimonax monachus*)). However, only one of these, Finelined Pocketbook, has areas of critical habitat that occur within or adjacent to the Project Boundary.

In addition to critical habitat ranges, specific extant populations were identified for ten species. Seven of the ten listed mussels (Alabama Lampmussel (*Lampsilis virescens*), Finerayed Pigtoe (*Fusconaia cuneolus*), Pale Lilliput (*Toxolasma cylindrellus*), Rabbitsfoot, Snuffbox (*Epioblasma triquetra*), Shiny Pigtoe (*Fusconaia cor*), and Slabside Pearlymussel) and one of the two listed fish (Palezone Shiner)) have extant populations in the Paint Rock River, which is located 3.9 linear-miles from the closest Project Boundary at Skyline.

Surveys were conducted for five species (Red-cockaded Woodpecker, Palezone Shiner, Finelined Pocketbook, White Fringeless Orchid, and Price's Potato-bean) due to potential

suitable habitat, known critical habitat, or known extant populations within or in close proximity to the Project Boundary.

Table 3-1 Habitat Ranges of Listed Threatened and Endangered Species that Intersect the R.L. Harris Project Boundary

SPECIES	HABITAT OCCURRENCE	
	<i>Skyline</i>	<i>Lake Harris</i>
Finelined Pocketbook		✓
Southern Pigtoe		✓
Gray Bat	✓	
Indiana Bat	✓	✓
Northern Long-eared Bat	✓	✓
Little Amphianthus		✓
Price's Potato-bean	✓	
Red-cockaded Woodpecker		✓
White Fringeless Orchid	✓	✓

3.1 Red-cockaded Woodpecker



Source: US Fish and Wildlife Service. 2019. Red-cockaded Woodpecker. [Online] URL: <https://www.fws.gov/rcwrecovery/rcw.html>

The Red-cockaded Woodpecker (RCW) is a federally listed endangered species that potentially occurs in Clay and Randolph counties (USFWS 2016e) (Appendix B, Figures 3.1-1 and 3.1-2). This woodpecker requires open pine woodlands and savannahs with large old pines for nesting and roosting habitat. Large old pines, preferably longleaf pine, are required as cavity trees. The excavated cavities within inactive heartwood are free of resin, which can entrap the birds (USFWS 2016e). The resin that comes out of the tree (from outer vascular tissue) after excavation may provide protection for woodpeckers against climbing snakes or other predators. The cavity trees are located in open stands with little or no hardwood mid-story and few or no over-story hardwoods. The woodpeckers require abundant native bunchgrass and groundcovers suitable for foraging within their habitat (USFWS 2016e). The two primary factors threatening the Red-cockaded Woodpecker are habitat loss and habitat degradation (USFWS 2006).

The USFWS has both a Recovery Plan (USFWS 2003) and a Five-Year Review (USFWS 2006) for the Red-cockaded Woodpecker.

3.1.1 Potential Occurrence and Habitat Range

There are no published reports of RCW occurring within the Project Boundary at Lake Harris; however, the species range does overlap with the Project Boundary at Lake Harris and includes a few areas of coniferous forests. Coniferous forest within the Project Boundary were identified using GIS and aerial imagery.

The IPaC and Federal Register Listings do not list the RCW as occurring in the county where the Project Boundary at Skyline is located.

3.1.2 Field Surveys

Consultation with USFWS² and ADCNR³ determined the need to conduct field surveys for RCW habitat due to the potential for suitable habitat in mature pine stands within the Project Boundary at Lake Harris.

Alabama Power performed surveys to assess habitat suitability and to determine if potential habitat was occupied or had signs of use by RCW. Methods and results of surveys for the RCW and its habitat are described in the Red-cockaded Woodpecker (*Picoides borealis*) Habitat Survey Report (Appendix C). Mature pines, where present, were viewed from all angles to detect potential signs of use by RCW.

Coniferous forests within the Project Boundary were identified using GIS and aerial imagery. The Project Boundary at Lake Harris contains 3,068 acres of coniferous forest; however, the land use data is not specific enough to determine if these forests contain the more specific habitat characteristics to be suitable for RCW (Appendix B, Figure 3.1-1 and 3.1-2). A total of six coniferous forest sites were assessed for RCW habitat suitability.

Although stand data used for site identification indicated areas that met habitat survey guideline criteria, foraging habitat was of marginal quality at best and very few standing snags were observed. Additionally, the thick understory would make utilization of the larger pines for foraging unlikely. Furthermore, excavation of starter cavities or resin wells were not observed in any of the mature pine evaluated during this survey. Surveyors determined that the Project Boundary at Lake Harris is not likely to contain populations of RCW (Appendix C).

² Reference email dated August 7, 2020 between USFWS and Alabama Power as included in the T&E Study Consultation record filed concurrently within this report.

³ Reference email dated August 7, 2020 between ADCNR and Alabama Power as included in the T&E Study Consultation record filed concurrently within this report.

3.2 Palezone Shiner

The Palezone Shiner was listed as endangered in 1993. The Palezone Shiner is a small, slender minnow species with a pointed snout and large eyes. It has a small, dark, wedge-shaped spot at the base of the caudal fin and may exhibit a light yellow color at the base of its pectoral fins during breeding. Historically, this species was found in the Tennessee and Cumberland River systems; however, the only known extant populations occur in the Paint Rock River (Tennessee River tributary), and the Little South Fork of the Cumberland River both of which are outside of the Project Boundary at Skyline (Appendix B, Figure 3.2-1). The Palezone Shiner is found in runs and pools of large creeks and small rivers with clean bedrock, cobble, gravel, and sand. Spawning likely occurs between May and July, peaking in June. Limited distribution make this species vulnerable to extinction.



Source: Wikipedia. 2018. Palezone Shiner. [Online]
URL:
https://en.wikipedia.org/wiki/Palezone_shiner

The USFWS has both a Recovery Plan (USFWS 1997a) and Five-Year Review (USFWS 2014) for the Palezone Shiner.

3.2.1 Potential Occurrence and Habitat Range

The IPaC and Federal Register Listings do not list the Palezone Shiner as occurring in the counties where the Project Boundary at Lake Harris is located.

Habitat range for this species is located immediately to the west of the Project Boundary at Skyline (Appendix B, Figure 3.2-1). The Palezone Shiner occurs in tributaries of the Tennessee River in Jackson County, Alabama, specifically in Paint Rock River, which is near the Project Boundary at Skyline; however, there is no documentation of the species occurring within the Project Boundary at Skyline.

3.2.2 Field Surveys

The USFWS recommended surveys for this species⁴ due to the close proximity of the extant population in the Paint Rock River to the Project Boundary at Skyline and the possibility of a population in Little Coon Creek.

Surveyors from Alabama Power and the Alabama Department of Environmental Management (ADEM) performed fish Index of Biotic Integrity (IBI) sampling according to methods in O'Neil and Shephard (2010) at four locations on Little Coon Creek. No specimens were found, and surveyors determined that the species was not likely to be present in the Project Boundary at Skyline due to the absence of historical records for Palezone Shiner in Little Coon Creek, degraded substrate conditions throughout much of the stream, and the failure to detect the species during the collection effort (Palezone Shiner (*Notropis albizonatus*) Survey Report (Appendix D). Methods and results of surveys for the Palezone Shiner are described in the Palezone Shiner (*Notropis albizonatus*) Survey Report (Appendix D).

3.3 Spotfin Chub



Source: National Park Service. 2015. Threatened and Endangered Species of Abrams Creek. Gatlinburg, TN. [Online] URL:<https://www.nps.gov/grsm/learn/nature/threatened-species-abrams.htm>

The Spotfin Chub was listed as threatened in 1977. The Spotfin Chub is an elongate minnow species with dusky green coloration above the lateral line and silver below. Breeding males develop a metallic blue coloration and white fin margins. Historically, this species was endemic to upland habitats in the Tennessee River drainage including parts of Alabama (Appendix B, Figure 3.3-1); however, it is presumed to be extirpated in Alabama and Georgia. The Spotfin Chub is found in clear, large creeks and medium-sized rivers with moderate current over bedrock and gravel substrates. Spawning probably occurs between May and August. Threats to this species include habitat loss and degradation.

⁴ Reference meeting summary from HAT 3 meeting held on August 27, 2019 as included in the T&E Study Consultation record filed concurrently within this report.

The USFWS has both a Recovery Plan (USFWS 1983) and Five-Year Review (USFWS 2019a) for the Spotfin Chub.

3.3.1 Potential Occurrence and Habitat Range

The IPaC and Federal Register Listings do not list the Spotfin Chub as occurring in the counties where the Project Boundary at Lake Harris is located.

Habitat range for this species is located immediately to the west of Skyline (Appendix B, Figure 3.3-1).

3.3.2 Field Surveys

USFWS did not recommend field surveys for this species because they are presumed to be extirpated from the state. Additionally, there are no historical records of the species occurring near the Project Boundary at Skyline and no areas of critical habitat occur within or adjacent to the Project Boundary.

3.4 Finelined Pocketbook Mussel

The Finelined Pocketbook mussel is a threatened mussel with a range that occurs within the Project Boundary at Lake Harris (Appendix B, Figure 3.4-1). The Finelined Pocketbook is a suboval shaped mussel that has a maximum length of approximately 3 $\frac{3}{8}$ inches (Mirarchi et al. 2004). This mussel lives in large to small streams, primarily above the fall line, with stable sand/gravel/cobble substrates and moderate to swift currents. Historically, this mussel was found in the Alabama, Tombigbee, Black Warrior, Cahaba, Tallapoosa, and Coosa Rivers, and their tributaries (USFWS 2004) (Appendix B, Figure 3.4-1). The ADCNR and USFWS are currently reintroducing the Finelined Pocketbook into suitable historical habitats within the state (USFWS 2019b). Regarding reproduction, the Finelined Pocketbook mussel releases glochidia as a super-conglutinate from March through June, and confirmed host species include Blackspotted Topminnow (*Fundulus olivaceus*), Redeye Bass (*Micropterus coosae*),



Source: International Union for Conservation of Nature and Natural Resources. 2019. Finelined Pocketbook. [Online] URL: <https://www.iucnredlist.org/species/11250/502085>

Spotted Bass (*Micropterus punctulatus*), Largemouth Bass (*Micropterus salmoides*), and Green Sunfish (*Lepomis cyanellus*) (Mirarchi et al. 2004)⁵.

The historic construction of dams and impoundments along large reaches of river channels is the primary cause of the decline in Finelined Pocketbook's distribution and population size and continues to be a major threat to this species' persistence (USFWS 2019b). This species continues to be imperiled due to water withdrawals, water quality degradation including sedimentation released from dams and agricultural runoff, downstream flow alterations caused by hydropeaking dams, and climate change (USFWS 2019b).

The USFWS has both a Recovery Plan (USFWS 2000) and a Five-Year Review (USFWS 2019b) for the Finelined Pocketbook. Critical habitat was designated for this species in 2004 (USFWS 2004). The Lake Harris Project Area does not encompass critical habitat designated by the USFWS; however, critical habitat for this species is located immediately upstream of Lake Harris (USFWS 2004) (Appendix B, Figure 3.4-1). To date, no populations have been identified within the Project Boundary at Lake Harris.

3.4.1 Potential Occurrence and Habitat Range

The Lake Harris Project Area does not encompass critical habitat designated by the USFWS; however, critical habitat for this species abuts the Project Boundary at Lake Harris at Hwy 431 (USFWS 2004) (Appendix B, Figure 3.4-1). The Documented Historic Range for Finelined Pocketbook includes the Tallapoosa River. However, to date no populations have been identified within the Project Boundary at Lake Harris.

The IPaC and Federal Register Listings do not list the Finelined Pocketbook as occurring in the county where the Project Boundary at Skyline is located.

⁵ Tallapoosa Bass (*Micropterus tallapoosae*) and Alabama Bass (*Micropterus henshalli*) were formerly known as Redeye Bass and Spotted Bass in the Tallapoosa River Basin at the time of the Mirarchi et al. (2004) publication.

3.4.2 Field Surveys

USFWS recommended surveys for Finelined Pocketbook⁶ due to the proximity of critical habitat to the Project Boundary at Lake Harris. Surveys were subsequently conducted in 2019 and 2020 in areas of critical habitat, in the Little Tallapoosa River, and in nearby tributaries of both the Tallapoosa River and Little Tallapoosa River. If Finelined Pocketbook were present in areas of critical habitat, surveys would continue downstream toward and potentially into the Project Boundary. Much of the designated critical habitat surveyed in the Tallapoosa River had been degraded by siltation, and secondary tributaries lacked suitable habitat. No Finelined Pocketbook specimens were found during surveys. Methods and results of surveys for the Finelined Pocketbook are described in Finelined Pocketbook (*Hamiota altilis*) Survey Report (Appendix E).

3.5 Alabama Lampmussel



Source: Alabama Department of Conservation and Natural Resources. 2019. Outdoor Alabama. Montgomery, AL. [Online] URL: <https://www.outdooralabama.com/lampsilis/alabama-lampmussel>

The Alabama Lampmussel was listed as endangered in 1976 (Mirarchi et al. 2004) and is found in shoals in small to medium rivers (Parmalee and Bogan 1998). The Alabama Lampmussel is endemic to the Tennessee River system and historically occurred from its headwaters downstream to Muscle Shoals (Ortmann 1925, Parmalee and Bogan 1998). Now, it is only known to occur in upper reaches of the Paint Rock River system, Jackson County, Alabama (Ahlstedt 1995) (Appendix B, Figure 3.5-1). The ADCNR and USFWS is currently reintroducing the Alabama Lampmussel into suitable historical habitats within the state (USFWS 2012). The Alabama

Lampmussel has a moderately thin shell with a maximum length of 2 ¾ inches, elliptical to long ovate in outline, and somewhat inflated. Although unknown, this species is thought to be a long-term brooder (Mirarchi et al. 2004). In laboratory trials Alabama Lampmussel glochidia have been found to utilize Rock Bass (*Ambloplites rupestris*), Green Sunfish, Bluegill (*Lepomis macrochirus*), Smallmouth Bass (*Micropterus dolomieu*), Spotted

⁶ Reference meeting notes from HAT 3 meeting held on August 27, 2019 as included in the T&E Study Consultation record filed concurrently within this report.

Bass, Largemouth Bass, and Redeye Bass as host fish and that Banded Sculpin (*Cottus carolinae*) appear to be marginal hosts (Williams et. al. 2008).

This species is imperiled due to water quality degradation primarily caused by agricultural runoff, severely restricted distribution, rarity, and vulnerability to habitat degradation (USFWS 2012). Habitat degradation is the leading cause of the decline for this species (USFWS 2012). Unauthorized removal of gravel from the Paint Rock River drainage basin results in degradation of Alabama Lampmussel habitat (USFWS 2012). Factors that have the potential to affect this species' persistence include droughts, toxic spills, and fish barriers which restrict freshwater mussel distribution (USFWS 2012).

The USFWS has both a Recovery Plan (USFWS 1985) and Five-Year Review (USFWS 2012) for the Alabama Lampmussel.

3.5.1 Potential Occurrence and Habitat Range

The IPaC and Federal Register Listings do not list the Alabama Lampmussel as occurring in the counties where the Project Boundary at Lake Harris is located.

There are no published reports of Alabama Lampmussel occurrences within the Project Boundary at Skyline.

3.5.2 Field Surveys

The current habitat range does not intersect the Project Boundary. The USFWS did not recommend field surveys for this species.

3.6 Cumberland Bean

The USFWS listed the Cumberland Bean (*Venustaconcha trabalis*) as endangered in 1976 (USFWS 2016c). This species can be found in swift riffles of small rivers and streams with gravel or mixture of sand and gravel substrate (Parmalee and Bogan 1998). This species is endemic to the upper Cumberland River system in Kentucky and the Tennessee River system from headwaters downstream to Muscle Shoals, Alabama (Appendix B, Figure 3.6-1). The Cumberland Bean has not been reported in Alabama since



Source: US Fish and Wildlife Service. 2017. Raleigh Ecological Services Field Office. [Online] URL: https://www.fws.gov/raleigh/species/es_cumberland_bean.html

impoundment of the Tennessee River and is considered extirpated (Parmalee and Bogan 1998, Mirarchi et al. 2004). The ADCNR and USFWS is currently reintroducing the Cumberland Bean into suitable historical habitats within the state (USFWS 2020). This species has a solid, elongated shell with a maximum length of 2 1/8 inches. Females grow slightly larger than males (Mirarchi et al. 2004). Host fish for the Cumberland Bean glochidia include Barcheek (*Etheostoma obeyense*), Fantail (*Etheostoma flabellare*), Johnny (*Etheostoma nigrum*), Rainbow (*Etheostoma caeruleum*), Snubnose (*Etheostoma simotermum*), Dirty (*Etheostoma olivaceum*), Striped (*Etheostoma virgatum*), and Stripetail (*Etheostoma kennicotti*) Darters (Parmalee and Bogan 1998). Factors contributing to the decline of this species includes impoundments, siltation, and pollution (USFWS 2020). Limited distribution and rarity make it vulnerable to extinction (USFWS 2020). Factors that have the potential to affect this species' persistence include changes in land use, pollution, contaminant spills, resource extraction, and siltation (USFWS 2020).

The USFWS has both a Recovery Plan (USFWS 1984a) and Five-Year Review (USFWS 2010) for the Cumberland Bean.

3.6.1 Potential Occurrence and Habitat Range

The IPaC and Federal Register Listings do not list the Cumberland Bean as occurring in the counties where the Project Boundary at Lake Harris is located.

There are no published reports of Cumberland Bean occurrences within the Project Boundary at Skyline.

3.6.2 Field Surveys

The current habitat range does not intersect the Project Boundary. The USFWS did not recommend field surveys for this species.

3.7 Fine-rayed Pigtoe Mussel



Source: IUCN Red List. iNaturalist. [Online]
URL:
<https://www.inaturalist.org/taxa/101102-Fusconaia-cuneolus>

The USFWS listed the Fine-rayed Pigtoe mussel as endangered in 1976. This species occurs in shoal habitat of medium to large rivers. Typically, the Fine-rayed Pigtoe lives in stable, mixed substrate, with particle sizes ranging from sand to cobble (Neves 1991). Endemic to the Tennessee River system, this species historically occurred from the Virginia headwaters, downstream to Muscle Shoals, Alabama, and in some tributaries (Parmalee and Bogan 1998) (Appendix B, Figure 3.7-1). This species was extirpated from Tennessee River proper (Garner and McGregor 2001). A population in Paint Rock River, Jackson County, Alabama (Ahlstedt 1995), appears to be the only extant population in Alabama. The Fine-rayed Pigtoe mussel shell is solid, somewhat inflated, with a maximum length of 3 1/8 inches, subtriangular to rhomboidal in outline (Mirarchi 2004). This species is a short-term brooder, spawning in May, with females gravid until late July (Ortmann 1925, Bruenderman and Neves 1993). This mussel distributes glochidia; hosts include River Chub (*Nocomis micropogon*), Central Stoneroller (*Campostoma anomalum*), Fathead Minnow (*Pimephales promelas*), Mottled Sculpin (*Cottus bairdii*), and Whitetail (*Cyprinella galactura*), White (*Luxilus albeolus*), Telescope (*Notropis telescopus*), and Tennessee (*Notropis leuciodus*) Shiners (Bruenderman and Neves 1993).

Factors contributing to the decline of this species includes impoundment, siltation, and pollution (USFWS 2013a). The Fine-rayed Pigtoe's small population size and limited geographic distribution make it vulnerable to stochastic disturbances and decreased fitness from reduced genetic diversity (USFWS 2013a). Factors that have the potential to affect this species' persistence include accidental chemical releases and spills and other human-induced changes (USFWS 2013a).

The USFWS has both a Recovery Plan (USFWS 1984b) and Five-Year Review (USFWS 2013a) for the Fine-rayed Pigtoe.

3.7.1 Potential Occurrence and Habitat Range

The IPaC and Federal Register Listings do not list the Fine-rayed Pigtoe as occurring in the counties where the Project Boundary at Lake Harris is located.

There are no published reports of Fine-rayed Pigtoe occurrences within the Project Boundary at Skyline.

3.7.2 Field Surveys

The current habitat range does not intersect the Project Boundary. The USFWS did not recommend field surveys for this species.

3.8 Pale Lilliput Mussel

The USFWS listed the Pale Lilliput mussel as endangered in 1976. This species is found in large creeks and small rivers, typically in gravel and in moderate current (Parmalee and Bogan 1998). This species was thought to be eliminated, except in the Paint Rock River system, Jackson County, Alabama, where it is rare (Ahlstedt 1995) (Appendix B, Figure 3.8-1). The ADCNR and USFWS is currently



Source: Alabama Department of Conservation and Natural Resources. 2019. Outdoor Alabama. Montgomery, AL. [Online] URL: <https://www.outdooralabama.com/toxolasma/pale-lilliput>

reintroducing the Pale Lilliput Mussel into suitable historical habitats within the state (USFWS 2011). The shell is moderately solid with a maximum length of 1 $\frac{3}{8}$ inches, elongate and elliptical in outline, and inflated in some older species (Mirarchi et al. 2004). It is thought to be a long-term brooder. In laboratory trials by ADCNR, Pale Lilliput glochidia have been found to utilize Northern Studfish (*Fundulus catenatus*), Blackspotted Topminnow and Blackstripe Topminnow (*Fundulus notatus*) as primary hosts (Fobian et al. 2015). The Paint Rock River system, where the only extant population of the Pale Lilliput persists, is strained from human-related activities and development (USFWS 2011).

The Pale Lilliput mussel is vulnerable to extinction due to extremely limited distribution, rarity, and susceptibility to habitat degradation (USFWS 2011). Unauthorized removal of gravel from the Paint Rock River drainage basin results in degradation of Pale Lilliput habitat (USFWS 2011). Factors that have the potential to affect this species' persistence include droughts, toxic spills, and fish barriers which restrict freshwater mussel distribution (USFWS 2011).

The USFWS has both a Recovery Plan (USFWS 1984c) and a Five-Year Review for the Pale Lilliput (USFWS 2011).

3.8.1 Potential Occurrence and Habitat Range

The IPaC and Federal Register Listings do not list the Pale Lilliput as occurring in the counties where the Project Boundary at Lake Harris is located.

There are no published reports of Pale Lilliput occurrences within the Project Boundary at Skyline.

3.8.2 Field Surveys

The current habitat range does not intersect the Project Boundary. The USFWS did not recommend field surveys for this species.

3.9 Rabbitsfoot Mussel



Source: US Fish and Wildlife Service. 2019. US Fish and Wildlife Service Midwest Region. Bloomington, MN. [Online] URL: <https://www.fws.gov/midwest/endangered/clams/Rabbitsfoot/index.html>

The USFWS listed the Rabbitsfoot mussel as threatened in 2013 (USFWS 2015). The Rabbitsfoot mussel is found in creeks and small rivers along margins of riffles and runs. In lotic reaches of larger rivers, this species may be found at depths greater than 19 $\frac{3}{4}$ feet, as well as upon marginal shelves in shallower waters (Mirarchi et al. 2004). In Alabama, extant populations are known to exist only in the Paint Rock River system, Jackson County, Alabama (Ahlstedt 1995), and a short reach of Bear Creek, Colbert County (Mirarchi et al. 2004) (Appendix B, Figure 3.9-1). The ADCNR and USFWS is currently reintroducing the Rabbitsfoot into suitable historical habitats statewide (ADCNR 2020). This species has a

solid shell with a maximum length of 4 $\frac{3}{4}$ inches, elongated and rhomboidal to rectangular in outline. The Rabbitsfoot mussel is a short-term brooder. Suitable fish hosts for Rabbitsfoot populations west of the Mississippi River include Blacktail Shiner (*Cyprinella venusta*) from the Black and Little Rivers and Cardinal Shiner (*Luxilus cardinalis*), Red Shiner (*Cyprinella lutrensis*), Spotfin Shiner (*Cyprinella spiloptera*), and Bluntnose Shiner (*Cyprinella camura*) from the Spring River, but host suitability information

is lacking for most of the eastern range (Fobian 2007). A host study conducted by ADCNR in 2011, found Scarlet Shiner (*Lythrurus fasciolaris*), Whitetail Shiner and Striped Shiner (*Luxilus chrysocephalus*) to be sympatric hosts with Rabbitsfoot from Paint Rock River, AL. Marginal minnow hosts from studies have included Central Stoneroller, Emerald Shiner (*Notropis atherinoides*), Rosyface Shiner (*Notropis rubellus*), Bullhead Minnow (*Pimephales vigilax*) and Rainbow Darter, but not in all stream populations tested (Fobian 2007, Watters et al. 2009). Widespread distribution reductions, rarity, and declining population trends make it vulnerable to extirpation (Mirarchi et al. 2004).

The USFWS designated critical habitat for the Rabbitsfoot in 2015 (USFWS 2015). In April 2019, the USFWS initiated the Five-Year Review of the Rabbitsfoot.

3.9.1 Potential Occurrence and Habitat Range

The IPaC and Federal Register Listings do not list the Rabbitsfoot as occurring in the counties where the Project Boundary at Lake Harris is located.

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

3.9.2 Field Surveys

The current habitat range does not intersect the Project Boundary, and no areas of critical habitat occur within or adjacent to the Project Boundary. The USFWS did not recommend field surveys for this species.

3.10 Snuffbox Mussel

The USFWS listed the Snuffbox mussel as endangered in 2012. It is found in large creeks to large rivers, generally in gravel and sand substrate in shoal and riffle habitats. Individual mussels often are completely buried or with only their posterior slopes exposed (Parmalee and Bogan 1998). In Alabama, the Snuffbox mussel once occurred in the Tennessee River and several of its tributaries. However, the Snuffbox mussel is assumed to persist only in the Paint Rock River system, Jackson County (Mirarchi et al. 2004) (Appendix B, Figure 3.10-1). The Snuffbox



Source: US Fish and Wildlife Service. 2019. US Fish and Wildlife Service Midwest Region. Bloomington, MN. [Online] URL: <https://www.fws.gov/midwest/endangered/clams/Snuffbox/index.html>

mussel is a long-term brooder with gravid females observed from September to May, with glochidial discharge in late May (Ortmann 1919). Hosts include Common Logperch (*Percina caprodes*), Roanoke Darter (*Percina roanoka*), and Banded and Black Sculpins (*Cottus baileyi*) (Yeager and Saylor 1995). This species' initial and current imperilment is caused by adverse effects from construction impoundments, including destruction, modification, and curtailment of habitat range (USFWS 2018a). Since its listing, five dams have been removed on streams inhabited by Snuffbox mussel, but status improvements have not been documented in restored reaches of inhabited streams (USFWS 2018a). Other factors that continue to effect Snuffbox populations are water quality degradation caused by agricultural runoff, municipal effluents, industrial sources, and spills (USFWS 2018a). Reduction in Snuffbox range include dredging and channelization, oil and gas production, and development (USFWS 2018a).

The USFWS has a Five-Year Review for the Snuffbox mussel (USFWS 2018a). The Snuffbox mussel does not have a Recovery Plan or designated critical habitat at this time.

3.10.1 Potential Occurrence and Habitat Range

The IPaC and Federal Register Listings do not list the Snuffbox mussel as occurring in the counties where the Project Boundary at Lake Harris is located.

There are no published reports of Snuffbox mussel occurrences within the Project Boundary at Skyline.

3.10.2 Field Surveys

The current habitat range does not intersect the Project Boundary. The USFWS did not recommend field surveys for this species.

3.11 Shiny Pigtoe Mussel



Source: US Fish and Wildlife Service. 2019. US Fish and Environmental Conservation Online System. [Online] URL: <https://ecos.fws.gov/ecp0/profile/speciesProfile?spcode=F00Q>

The USFWS listed the Shiny Pigtoe mussel as endangered in 1976 (Mirarchi et al. 2004). The Shiny Pigtoe mussel lives in shoal and riffle habitat of medium to large rivers. Endemic to the Tennessee River system, this mussel historically occurred from the headwaters downstream to Muscle Shoals, Alabama, and in some of its large tributaries (Parmalee and Bogan 1998). Although this mussel was extirpated from the Tennessee River proper (Garner and McGregor 2001), it still occurs in several tributaries, including Paint Rock River,

Jackson County, Alabama (Ahlstedt 1995) (Appendix B, Figure 3.11-1). The Shiny Pigtoe mussel has a solid and somewhat inflated shell with a maximum length of 3 1/8 inches, subtriangular in outline, with anterior margin broadly rounded and somewhat obliquely truncate above, and posterior margin nearly straight but obliquely angled; dorsal and ventral margins nearly straight (Mirarchi et al. 2004). This species is a short-term brooder, spawning from late May to early June and gravid from mid-May to mid-July (Ortmann 1921; Kitchel 1985). Glochidia use fish in the shiner family (Cyprinidae), including Telescope Shiner, Warpaint Shiner (*Luxilus coccogenis*), and Common Shiner (*Luxilus cornutus*) as hosts (Kitchel 1985). This species is imperiled due to impoundments, siltation, and pollution caused by coal mining, urbanization, agriculture, and toxic chemical spills (USFWS 2013b). The Shiny Pigtoe's small population size and limited geographic distribution make it vulnerable to stochastic disturbances and decreased fitness from reduced genetic diversity (USFWS 2013b).

The USFWS has both a 1984 Recovery Plan (USFWS 1984b) and a Five-Year Review (USFWS 2013b) for the Shiny Pigtoe.

3.11.1 Potential Occurrence and Habitat Range

The IPaC and Federal Register Listings do not list the Shiny Pigtoe as occurring in the counties where the Project Boundary at Lake Harris is located.

There are no published reports of Shiny Pigtoe occurrences within the Project Boundary at Skyline.

3.11.2 Field Surveys

The current habitat range does not intersect the Project Boundary. The USFWS did not recommend field surveys for this species.

3.12 Southern Pigtoe

The Southern Pigtoe is an endangered mussel found in Clay and Cleburne Counties. The Southern Pigtoe is an elliptical to oval shaped mussel that has a maximum length of approximately 2.5 inches (USFWS 2019c). This mussel lives in medium streams to large rivers in habitats having sand/gravel substrates and moderate to swift currents. Historically, this mussel was found in Alabama, Georgia, and Tennessee and is endemic to the Coosa River system (USFWS 2019c, Mirarchi 2004) (Appendix B, Figure 3.12-1). Regarding reproduction, the Southern Pigtoe releases glochidia during spring and early summer, and confirmed host species include Alabama Shiner (*Cyprinella callistia*), Blacktail Shiner, and Tricolor Shiner (*Cyprinella trichroistia*) (USFWS 2019c).



Source: US Fish and Wildlife Service. 2015. Georgia Ecological Services Field Offices. [Online] URL: <https://www.fws.gov/athens/endangered/teinverts.html>

The historic construction of dams and impoundments along large reaches of river channels is the primary cause of the decline in Southern Pigtoe's distribution and population size and continues to be a major threat to this species' persistence (USFWS 2019b). This species continues to be imperiled due to water withdrawals, water quality degradation including sedimentation released from dams and agricultural runoff, downstream flow alterations caused by hydropeaking dams, and climate change (USFWS 2019b).

The USFWS has a Five-Year Review (USFWS 2019c) for the Southern Pigtoe. Critical habitat was designated for this species in 2004, which includes 973 miles of stream channel in Alabama, Mississippi, Tennessee, and Virginia. The Lake Harris Project Area does not

encompass critical habitat areas identified by the USFWS (USFWS 2004); no populations were identified within the Project Boundary at Lake Harris (Appendix B, Figure 3.12-1).

3.12.1 Potential Occurrence and Habitat Range

The Lake Harris Project Area does not encompass critical habitat areas identified by the USFWS (USFWS 2004); no populations were identified within the Project Boundary at Lake Harris (Appendix B, Figure 3.12-1). Southern Pigtoe does not likely occur within the Project Boundary at Lake Harris, because the Documented Historic Range in Cleburne County exists exclusively in the Coosa River Basin.

The IPaC and Federal Register Listings do not list the Southern Pigtoe as occurring in the county where the Project Boundary at Skyline is located.

3.12.2 Field Surveys

There are no published reports of any specimens, and no areas of critical habitat occur within or adjacent to the Project Boundary. The USFWS did not recommend surveys for Southern Pigtoe; however, two sites where the Southern Pigtoe's current habitat range intersects the Project Boundary at Lake Harris in Ketchepedrakee Creek were included in Finelined Pocketbook surveys. No Southern Pigtoe specimens were found during surveys (Finelined Pocketbook [*Hamiota altilis*] Survey Report [Appendix E]).

3.13 Slabside Pearlymussel



Source: Wikipedia. 2019. *Pleuronaia dolabelloides*. [Online] URL: https://en.wikipedia.org/wiki/Pleuronaia_dolabelloides

The USFWS listed the Slabside Pearlymussel as endangered with critical habitat designated in 2013 (USFWS 2016d). The Slabside Pearlymussel historically occurred in Alabama in the Tennessee River and several of its tributaries. This species is subtriangular in shape, reaches an average length of 3.5 inches, and has dense, moderately inflated valves and a white nacre. This species typically inhabits large creeks and rivers in shallow riffles comprised of sand, gravel, and cobble substrates with moderate current. The Slabside Pearlymussel is a short-term, summer brooder that is known to use several species

in the family Cyprinidae as glochidial hosts (USFWS 2013c). The U.S. Department of Interior designated 13 critical habitat units encompassing approximately 970 miles of stream channel in Alabama, Mississippi, Tennessee, and Virginia for the Slabside Pearlymussel. In Jackson County, the designated critical habitat includes the Paint Rock River, Larkin Fork, Estill Fork, and Hurricane Creek (Appendix B, Figure 3.13-1). Decline of this species is attributed primarily to habitat loss and degradation associated with impoundments, gravel and coal mining, sedimentation, water pollution, and stream channel alterations (USFWS 2013c).

The USFWS designated critical habitat for the Slabside Pearlymussel in 2013 (USFWS 2013c). There is no Recovery Plan or Five-Year Review for the Slabside Pearlymussel.

3.13.1 Potential Occurrence and Habitat Range

The IPaC and Federal Register Listings do not list the Slabside Pearlymussel as occurring in the counties where the Project Boundary at Lake Harris is located.

Designated critical habitat for the Slabside Pearlymussel exists to the west of the Project Boundary at Skyline in the Paint Rock River and Hurricane Creek. There are no published reports of Slabside Pearlymussel occurrences within the Project Boundary at Skyline.

3.13.2 Field Surveys

The current habitat range does not intersect the Project Boundary, and no areas of critical habitat occur within or adjacent to the Project Boundary. The USFWS did not recommend field surveys for this species.

3.14 Indiana Bat

The USFWS listed the Indiana Bat as an endangered species in 1976. Habitat conducive to the Indiana Bat is located in the central to north and eastern portions of Alabama (Appendix B, Figures 3.14-1 to 3.14-3). This species hibernates in caves, mostly in tight clusters. In the summer, females form small maternity colonies in tree hollows and behind loose bark. A single pup is born in June or early July and weaned in 25-35 days. The diet of this species includes small, soft-bodied insects, including moths, flies, and beetles (Mirarchi et al.



Source: US Fish and Wildlife Service. 2019. US Fish and Wildlife Service Midwest Region. Bloomington, MN. [Online] URL: <https://www.fws.gov/midwest/endangered/permits/hcp/FowlerRidge/>

2004). The Indiana Bat is vulnerable to extinction due to habitat loss and White Nose Syndrome, a fungal disease.

The USFWS has a 2007 Draft Recovery Plan (USFWS 2007b) for the Indiana Bat, as well as a 1977 final correction and augmentation of critical habitat (USFWS 1977). Designated critical habitat does not occur within the Project Boundary.

3.14.1 Potential Occurrence and Habitat Range

While the Lake Harris and Skyline Project Boundaries fall within the range of the Indiana Bat, there have been no reports of overwintering or summer roosting occurrences at either location. A large portion (66.5 percent) of the Harris Project is comprised of forested cover that likely provides some suitable summer roosting habitat for the Indiana Bat (Appendix B, Figures 3.14-1 and 3.14-3). In addition, Skyline has 10,782 acres of karst geology conducive to cave formation; however, no known hibernacula have been reported (Appendix B, Figure 3.14-2).

The Indiana Bat could potentially use the forests within the Project Boundaries at Lake Harris and Skyline for roosting during the summer months and could potentially use the Skyline WMA year-round because of the presence of potentially suitable habitat (i.e., karst geology).

3.14.2 Field Surveys

The USFWS did not recommend surveys for any bat species because Alabama Power uses best management practices (BMPs) for timber harvest that are protective of these bats. Furthermore, no areas of critical habitat occur within or adjacent to the Project Boundary. Information on timber management within the Project Boundary at Lake Harris can be found in the Wildlife Management Plan that will be filed as part of the license application.

3.15 Northern Long-eared Bat



Source: US Fish and Wildlife Service. 2019. US Fish and Wildlife Service Midwest Region. Bloomington, MN. [Online] URL: <https://www.fws.gov/Midwest/endangered/mammals/nleb/nlebFactSheet.html>

The USFWS listed the Northern Long-eared Bat (*Myotis septentrionalis*) as threatened on April 2, 2015, with a final rule published in the Federal Register on January 14, 2016. On April 27, 2016, the USFWS determined that the designation of critical habitat for the species was not prudent; therefore, critical habitat has not been established for the Northern Long-eared Bat (USFWS 2016f). The Northern Long-eared Bat was historically distributed statewide; however, there is only low occurrence, if at all, in the southwestern region of Alabama (Mirarchi et al. 2004). The Northern Long-eared Bat feeds on invertebrates and is known to glean prey from vegetation and water surfaces. The Northern Long-eared Bat winters in groups in underground caves and cave-like structures but in the summers, it roosts singularly or in small colonies in cavities, under bark, or in hollows of live and dead trees typically greater than 3 inches in diameter. Suitable roosting trees possess exfoliating bark, cavities, or cracks (USFWS 2016f). The Northern Long-eared Bat has a single pup born in late spring or early summer with the offspring weaned approximately one month after birth (Mirarchi et al. 2004). The primary threat to the Northern Long-eared Bat is White Nose Syndrome, a fungal disease (USFWS 2016f).

The USFWS does not have a Recovery Plan, Five-Year Review, or designated critical habitat for the Northern Long-eared Bat.

3.15.1 Potential Occurrence and Habitat Range

While the Project Boundaries at Lake Harris and Skyline fall within the range of the Northern Long-eared Bat, there have been no reports of overwintering or summer roosting occurrences at either location. A large portion (66.5 percent) of the Harris Project is comprised of forested cover that likely provides some suitable summer roosting habitat for the Northern Long-eared Bat (Appendix B, Figures 3.15-1 and 3.15-3). In addition, Skyline has 10,782 acres of karst geology conducive to cave formation; however, no

known hibernacula or maternity roost trees have been reported in or within 0.25 miles and 150 feet⁷ of the Project Boundary, respectively (Appendix B, Figure 3.15-2).

The Northern Long-eared Bat could potentially use the forests within the Project Boundaries at Lake Harris and Skyline for roosting during the summer months and could potentially use the Skyline WMA year-round because of the presence of potentially suitable habitat (i.e., karst geology).

3.15.2 Field Surveys

The USFWS did not recommend surveys for any bat species because Alabama Power uses BMPs for timber harvest that are protective of these bats. Information on timber management within the Project Boundary at Lake Harris can be found in the Wildlife Management Plan that will be filed as part of the license application.

3.16 Gray Bat

The Gray Bat (*Myotis grisescens*) was listed as endangered on April 28, 1976. The Gray Bat is distinguished from other bats by the uni-colored fur on its back. This species molts in the summer, when its dark gray fur turns to a chestnut brown (USFWS 1997b). This species can be found in caves year-round, using them both in the summer roosting and winter hibernating periods (Appendix B, Figures 3.16-1 and 3.16-2). Typically, these caves are scattered along rivers or lakes where the Gray Bat feeds on flying aquatic and terrestrial insects (USFWS 1997b). Breeding takes place in the fall, with a single pup born in late May or early June (Mirarchi et al. 2004, USFWS 1997b). According to its Five-Year Review, the



Source: US Fish and Wildlife Service. 2019. US Fish and Wildlife Service Midwest Region. Bloomington, MN. [Online] URL: https://www.fws.gov/midwest/endangered/mammals/grbat_fc.html

⁷ The USFWS's Northern Long-eared Bat 4(d) rule prohibits incidental take that may occur from tree removal activities within 0.25 miles of hibernacula at any time or within 150 feet of roost trees during the months of June and July.

main threat to Gray Bat populations is human disturbance in unprotected caves (USFWS 2009).

The USFWS has both a Recovery Plan (USFWS 1982) and Five-Year Review (USFWS 2009) for the Gray Bat.

3.16.1 Potential Occurrence and Habitat Range

The IPaC and Federal Register Listings do not list the Gray Bat as occurring in the counties where the Project Boundary at Lake Harris is located.

Skyline falls within the current habitat range of the Gray Bat and has approximately 10,782 acres of karst geology (Appendix B, Figure 3.16-1). Although the Gray Bat uses caves for both winter hibernaculum and summer roosting, there have been no reports of overwintering or summer roosting occurrences within the Project Boundary at Skyline (Appendix B, Figure 3.16-1).

3.16.2 Field Surveys

The USFWS did not recommend surveys for any bat species because Alabama Power uses BMPs for timber harvest that are protective of these bats. Information on timber management within the Project Boundary at Lake Harris can be found in the Wildlife Management Plan that will be filed as part of the license application.

3.17 Little Amphianthus



Source: US Fish and Wildlife Service. 2015. Georgia Ecological Services Field Offices. Athens, GA; Townsend, GA, Ft. Benning, GA. [Online] URL: <https://www.fws.gov/athens/endangered/teplants.html>

The Little Amphianthus (*Gratiola amphiantha*) was listed as threatened in 1988 under the Endangered Species Act (ESA). Historically, this species is known to inhabit 57 sites in Georgia, Alabama, and South Carolina. In Alabama, limited populations occur in Randolph (two sites) and Chambers (one site) counties (Appendix B, Figure 3.17-1). This species is a small, aquatic annual herb with floating and submerged leaves. The tiny white to pale purple flowers are found among both the floating and

submerged leaves. An ephemeral species, the entire life cycle of this plant may be completed within three to four weeks in the spring. This species has a very specific habitat that is restricted to vernal pools on granite outcrops in the southeastern Piedmont. Optimal habitat has been described as a shallow, flat-bottomed pool with a rock rim (NatureServe 2015). In 1993, the USFWS prepared a recovery plan (USFWS 1993a) which identified threats to the species including: quarrying activities; conversion of habitat to pasture for farm animals; dumping of waste material; vehicular traffic including off-road vehicles, motorbikes, automobiles, and logging equipment; recreation impacts including foot traffic, littering, or vandalism; and insufficient regulations. Little Amphianthus will be considered for delisting when 20 viable, geographically separate populations (at least two in Alabama) have been permanently protected. A population is considered viable when it has the reproductive fitness to maintain itself.

A Five-Year Review conducted in 2007 by the USFWS concluded that the population of Little Amphianthus is declining (USFWS 2007a). Surveys found that 44 of the 65 original populations are still known to be intact. Since the recovery plan has been implemented, sixteen (25 percent) of the populations have been extirpated, and four populations have become tremendously degraded, and are at risk of being extirpated (USFWS 2007a).

3.17.1 Potential Occurrence and Habitat Range

One occurrence was reported within the Project Boundary at Lake Harris, specifically in Flat Rock Park on March 17, 1995 (ALNHP 2019), but subsequent surveys in Fall 2018, Spring 2019, and Fall 2019 did not detect the plant⁸, and it is assumed extirpated from the site. There are 138.4 acres of granite rock geology occurring within the western edge of the Project Boundary at Lake Harris that could contain outcroppings for Little Amphianthus (Appendix B, Figure 3.17-1). Desktop resources like the National Wetland Inventory do not provide accurate enough detail to identify the specific habitat characteristics of Little Amphianthus, such as the presence of vernal pools; however, vernal pools were identified during the 2019 surveys at Flat Rock Park.

⁸ Surveys were conducted for the Flat Rock Botanical Inventory Report, Appendix D of the Final Project Lands Report filed with FERC on October 2, 2020 (Accession No. 20201002-5139).

The IPaC and Federal Register Listings do not list Little Amphianthus as occurring in the county where the Project Boundary at Skyline is located.

3.17.2 Field Surveys

Consultation with the Alabama Natural Heritage Program (ALNHP) determined that the only suitable habitat for Little Amphianthus occurs at Flat Rock Park⁹; however, Little Amphianthus was not found during the botanical inventory of Flat Rock Park in 2018 and 2019. The USFWS did not recommend additional field surveys for this species.

3.18 White Fringeless Orchid

The White Fringeless Orchid was listed as threatened under the ESA in September of 2016 (USFWS 2016a). Two extant populations have been identified in Clay and Cleburne in Talladega National Forest (Appendix B, Figures 3.18-1 and 3.18-2). This species is a slender, erect, perennial herb that grows in colonies. The fragrant, white flowers grow in loose, round to elongated, terminal clusters with 6 to 15 flowers in each cluster. The stem is light green, smooth, and can grow up to 3.6 inches. The orchid blooms from late July to early September with fruits maturing in October. White Fringeless Orchid typically occurs in wet, flat, or boggy areas with acidic muck or sand. This plant prefers partially shaded areas at the head of streams or seepage slopes. The primary threat to this species is the destruction and alteration of its habitat including excessive shading, soil disturbance, altered hydrology, and the spread of invasive species. Other threats include unauthorized collection for recreational or commercial purposes, herbivory, and small population sizes (Federal Register 2016). A recovery plan has not been completed for this species.



White fringeless orchid. Credit - USFWS

Source: US Fish and Wildlife Service. 2016. Tennessee Ecological Services Field Office. [Online] URL: <https://www.fws.gov/cookeville/Whitefringelessorchid.html>

⁹ Reference email dated August 15, 2020 between the ALNHP and Alabama Power as included in the T&E Study Consultation record filed concurrently within this report.

3.18.1 Potential Occurrence and Habitat Range

The habitat range of the White Fringeless Orchid overlaps the Project Boundaries at Lake Harris and Skyline; however, there are no published reports of White Fringeless Orchid occurrences within the Project Boundaries Lake Harris and Skyline (Appendix B, Figures 3.18-1 and 3.18-2). The known extant populations in Clay and Cleburne counties are within Talladega National Forest, and the status of a third population in Jackson County outside of the Project Boundary at Skyline is uncertain (USFWS 2016a).

Although this species uses wetland habitats, the National Wetland Inventory is not detailed enough to identify wetlands containing the plant's unique habitat characteristics; however, consultation with the ALNHP determined that suitable habitat was present within the Project Boundaries at Lake Harris and Skyline¹⁰.

3.18.2 Field Surveys

Alabama Power developed survey methods for White Fringeless Orchid in consultation with the USFWS¹¹ and conducted surveys within and near the Project Boundary at Lake Harris and Skyline. Habitat at the survey sites was marginal at best. The best habitat documented was at a site in the Project Boundary at Lake Harris where Small Green Wood Orchid (*Platanthera clavellata*), a species known to occur along with White Fringeless Orchid, had previously been found (Spaulding 2020, personal communication). Surveyed habitat was typically not suitable due to excessive amounts of shade from dense canopies, disturbance, soil type, inundation, vegetation community (lack of common associates), and steep slopes. Methods and results of White Fringeless Orchid surveys are described in White Fringeless Orchid (*Platanthera integrilabia*) & Price's Potato-bean (*Apios priceana*) Survey Report (Appendix F).

¹⁰ Reference emails dated July 24, 2020 and August 4, 2020 between the ALNHP and Alabama Power as included in the T&E Study Consultation record filed concurrently within this report.

¹¹ Reference emails dated August 26, 2020 between USFWS and Alabama Power as included in the T&E Study Consultation record filed concurrently within this report.

3.19 Price's Potato-bean



Source: US Fish and Wildlife Service.
2019. US Fish and Wildlife Service
Midwest Region. Bloomington, MN.
[Online] URL:
<https://www.fws.gov/midwest/endangered/plants/pricesp.html>

Price's Potato-bean (*Apios priceana*) was listed as threatened in 1990. A member of the pea family (Fabaceae), this species' historic range included Alabama, Illinois, Kentucky, Mississippi, and Tennessee. Price's Potato-bean is a twining, herbaceous, perennial vine that grows from a tuber and has greenish-white or brownish-pink flowers. This species is found in open, bottom areas near or along the banks of streams and rivers, sometimes near the base of limestone bluffs (Appendix B, Figure 3.19-1¹²). Since publication of this species' Recovery Plan (USFWS 1993b), many new populations have been discovered. Twenty of the 25 populations included in the recovery plan are still extant and apparently stable (USFWS 2016g).

3.19.1 Potential Occurrence and Habitat Range

The IPaC and Federal Register Listings do not list Price's Potato-bean as occurring in the counties where the Project Boundary at Lake Harris is located.

According to the Five-Year Review, there are currently 16 extant populations of Price's Potato-bean in Alabama distributed among nine counties: Autauga (2), Butler (1), Dallas (2), Jackson (2), Lawrence (1), Madison (5), Marshall (1), Monroe (1), and Wilcox (1). The populations in Jackson County occur on Sauta Cave National Wildlife Refuge, and near Little Coon Creek in the Skyline WMA (Appendix B, Figure 3.19-1¹³). One of these extant populations intersects the Project Boundary at Skyline and comprises 11 percent of the

¹² A 100-foot stream buffer within limestone landscape was included in this figure to highlight low areas along or near the banks of streams and rivers, which this species seems to prefer. The buffer indicated on the figure is not regulatory. It is meant to depict areas where this species could potentially occur based on known habitat preferences.

¹³ The recent documented occurrence (1995-2020) of Price's Potato-bean in this figure is portrayed as the entirety of Little Coon Creek. More specifically, the recent documented occurrence of this species is restricted to the section of Little Coon Creek near the northern Project Boundary at Skyline and extends partially into the Project Boundary.

extant population occurring at Little Coon Creek; however, 89 percent of this single population occurs outside of the Project Boundary. According to its Five-Year Review, 7 of the 15 populations of Price's Potato-bean in Alabama face one or more of the following threats; incompatible logging, excessive shading by canopy trees, road and right-of-way interference, and competition with non-native, invasive species (USFWS 2016g).

3.19.2 Field Surveys

The USFWS did not formally recommend surveys for Price's Potato-bean, but Alabama Power conducted surveys for this species in areas of potential habitat along Little Coon Creek within the Project Boundary at Skyline as a secondary objective during the White Fringeless Orchid surveys. No specimens were found at the known population near Little Coon Creek. Alabama Power returned at a later date to conduct additional surveys in two locations near the known population with suitable habitat but did not find Price's Potato-bean. Canopy cover may have been too dense to support populations of Price's Potato-bean. Methods and results of Price's Potato-bean surveys are described in the White Fringeless Orchid (*Platanthera integrilabia*) & Price's Potato-bean (*Apios priceana*) Survey Report (Appendix F).

3.20 Morefield's Leather Flower

Morefield's Leather Flower (*Clematis morefieldii*), a perennial vine in the buttercup family (Ranunculaceae), was listed as endangered in 1992. This species has urn-shaped flowers that are pinkish in color and typically present from May to July. Morefield's Leather Flower typically occurs near seeps and springs in rocky limestone woods on south and southwest facing slopes of mountains (Appendix B, Figure 3.20-1). According to the Five-Year Review, there are currently 10 extant populations in Alabama in the counties of Madison and Jackson (USFWS 2018b) (Appendix B, Figure 3.20-1). Populations are imperiled by residential development, logging, and/or roadway interference (USFWS 2018b). There are no published reports of Morefield's Leather Flower within the Project Boundary at Skyline.



Source: The Encyclopedia of Alabama. 2019. Alabama Humanities Foundation. [Online] URL: <http://www.encyclopedi>

3.20.1 Potential Occurrence and Habitat Range

The IPaC and Federal Register Listings do not list Morefield's Leather Flower as occurring in the counties where the Project Boundary at Lake Harris is located.

Although Morefield's Leather Flower is known to occur in Jackson County, there are no published reports of specimens within the Project Boundary at Skyline.

3.20.2 Field Surveys

The Project Boundary at Skyline contains mountain slopes in wooded limestone areas, which Morefield's Leather Flower favors; however, the current habitat range of Morefield's Leather Flower does not intersect the Project Boundary at Skyline. USFWS did not recommend surveys for this species¹⁴.

¹⁴ Reference meeting notes from HAT 3 meeting held on August 27, 2019 as included in the T&E Study Consultation record filed concurrently within this report.

4.0 REFERENCES

- Ahlstedt, S, A. 1995. U.S. Fish and Wildlife Service. Status Survey for Federally Listed Endangered Freshwater Mussel Species in the Paint Rock River System, Northeastern Alabama, USA.
- Alabama Department of Conservation and Natural Resources (ADCNR). 2020. Comments on the Harris Project Initial Study Report (ISR). Letter Dated June 11, 220.
- Alabama Power Company (Alabama Power). 2018. Pre-Application Document for the Harris Hydroelectric Project (FERC No. 2628). Alabama Power Company, Birmingham, AL.
- Bridges, E.L. 1988. Stewardship Abstract for *Amphianthus pusillus*. Nature Conservancy, Chapel Hill, North Carolina.
- Bruenderman, S.A., and R.J. Neves. 1993. Life history of the endangered Fine-rayed Pigtoe (*Fusconaia cuneolus*) (Bivalvia: Unionidae) in the Clinch River, Virginia. American Malacological Bulletin 10:83-91.
- Federal Energy Regulatory Commission (FERC). 2018. List of Threatened, Endangered, Candidate, and Proposed Species Generated by ECOS-IPaC Website on July 27, 2018. Washington, D.C.
- Federal Register. 2016. Vol 81 No 177. U. S. Fish and Wildlife Service. Endangered and Threatened Wildlife and Plants; Threatened Wildlife and Plants; Species Status for *Platanthera integrilabia* (White Fringeless Orchid). September 13, 2016.
- Fobian, T.B. 2007. Reproductive biology of the rabbitsfoot mussel (*Quadrula cylindrica*) (Say, 1817) in the upper Arkansas River system. (Master's Thesis). Missouri State University, Springfield, Missouri.
- Fobian, T.B., M.L. Buntin, J.T. Holifield, T.A. Tarpley, J.T. Garner, and P.D. Johnson. 2015. Reproductive biology and reintroduction of Pale Lilliput (*Toxolasma cylindrellus*, Lea 1868) into the Duck River [Poster]. Exhibited at the Joint Meeting of the Freshwater Mollusk Conservation Society and the Upper Mississippi River Conservation Committee. March 22-26, 2015. St. Charles, Missouri

- Garner, J.T., and S.W. McGregor. 2001. Current status of freshwater mussels (*Unionidae*, *Margaritiferidae*) in the Muscle Shoals area of the Tennessee River in Alabama (Muscle Shoals revisited again). *American Malacological Bulletin* 16(1–2): 155–170.
- Kitchel, H. E. 1985. Life history of the endangered Shiny Pigtoe pearly mussel, *Fusconaia edgariana*, in the North Fork Holston River, Virginia. M.S. Thesis, Va. Polytech. Inst. State Univ., Blacksburg. 117 p.
- Mirarchi, Ralph E., ed. 2004. Alabama Wildlife, Volume One. A Checklist of Vertebrates and Selected Invertebrates: Aquatic Mollusks, Fishes, Amphibians, Reptiles, Birds and Mammals. The University of Alabama Press, Tuscaloosa, AL.
- NatureServe. 2015. *Amphianthus pusillus*. Available at: <http://explorer.natureserve.org/servlet/NatureServe?searchName=Amphianthus+pusillus>. Accessed November 11, 2016.
- Neves, R.J. 1991. Final Report: A survey for Freshwater Mussel Fauna at the Proposed Route 3 (East-West Connector) Crossing of Hazel Run, Fredericksburg, Virginia.
- O'Neil, P.E. and T.E. Shephard. 2010. Calibration of the index of biotic integrity for the Tennessee Valley ichthyoregion in Alabama: Alabama Geological Survey Open-File Report 0908, 118 p.
- Ortmann, A.E. 1919. A monograph of the Naiades of Pennsylvania. Part III: Systematic account of the genera and species. *Memoirs of the Carnegie Museum* 8(1): xvi - 385 + 21 plates.
- Ortmann, A.E. 1921. South American Naiades; a contribution to the knowledge of the freshwater mussels of South America. *Memoirs of the Carnegie Museum* 8: 451-670, pls. 34-48.
- Ortmann, A.E. 1925. The Naiad-fauna of the Tennessee River system below Walden Gorge. *American Midland Naturalist* 9: 321-372.
- Parmalee, P.W., and A.E. Bogan. 1998. The freshwater mussels of Tennessee. The University of Tennessee Press. Knoxville, TN. 328 pp.
- Spaulding, D. 2020. Personal communication. Anniston Museum of Natural History.

- U.S. Fish and Wildlife Service (USFWS). 1977. Indiana Bat (*Myotis sodalis*). Federal Register 42:47840.
- U.S. Fish and Wildlife Service (USFWS). 1982. Gray Bat Recovery Plan. USFWS Region 4, Atlanta, GA.
- U.S. Fish and Wildlife Service (USFWS). 1983. Recovery Plan for Spotfin Chub *Hybopsis monacha*. USFWS. Atlanta, Georgia.
- U.S. Fish and Wildlife Service (USFWS). 1984a. Recovery Plan for the Cumberland Bean Pearly Mussel *Villosa trabalis* (Conrad, 1834). United States Fish and Wildlife Service Endangered Species Field Office 100 Otis Street, Room 224 Asheville, North Carolina 28801.
- U.S. Fish and Wildlife Service (USFWS). 1984b. Recovery plan Fine-rayed Pigtoe Pearly Mussel *Fuscomaia cuneolus*. USFWS Region 4, Atlanta.
- U.S. Fish and Wildlife Service (USFWS). 1984c. Recovery Plan for the Pale Lilliput Pearly Mussel *Toxolasma (Carunculina) cylindrellus* (Lea, 1868). USFWS Region 4, Atlanta.
- U.S. Fish and Wildlife Service (USFWS). 1985. Recovery Plan Alabama Lamp Pearly Mussel *Lampsilis virescens*. USFWS. Atlanta, Georgia.
- U.S. Fish and Wildlife Service (USFWS). 1993a. Recovery Plan for Three Granite Outcrop Plant species. Jackson, Mississippi. 41 pp.
- U.S. Fish and Wildlife Service (USFWS). 1993b. Recovery Plan for Price's Potato-bean *Apios Priceana*. Jackson, Mississippi. 43 pp.
- U.S. Fish and Wildlife Service (USFWS). 1997a. Recovery Plan for the Palezone Shiner *Notropis albisonatus*. U.S. Fish and Wildlife Service, Atlanta, GA.
- U.S. Fish and Wildlife Service (USFWS). 1997b. Threatened and Endangered Species: Gray Bat *Myotis grisescens* Fact Sheet. USFWS, Minnesota. September 18, 1997.
- U.S. Fish and Wildlife Service (USFWS). 2000. Mobile River Basin Aquatic Ecosystem Recovery Plan. U.S. Fish and Wildlife Service, Atlanta, GA.
- U.S. Fish and Wildlife Service (USFWS). 2003. Recovery Plan for the Red-cockaded Woodpecker (*Picoides borealis*) Second Revision.

- U.S. Fish and Wildlife Service (USFWS). 2004. Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for Three Threatened Mussels and Eight Endangered Mussels in the Mobile River Basin. Federal Register 69:40083-40171.
- U.S. Fish and Wildlife Service (USFWS). 2006. Red-cockaded Woodpecker (*Picoides borealis*) 5 Year Review: Summary and Evaluation. Clemson, SC.
- U.S. Fish and Wildlife Service (USFWS). 2007a. Three Granite Outcrop Plants: Black-spored quillwort (*Isoetes melanospora*), Mat-forming quillwort (*Isoetes tegetiformans*), Little Amphianthus (*Amphianthus pusillus*). Five-Year Review: Summary and Evaluation. Athens, Georgia.
- U.S. Fish and Wildlife Service (USFWS). 2007b, Indiana Bat (*Myotis sodalist*) Draft Recovery Plan: First Revision. Great Lakes, Big Rivers Region 3, Fort Snelling, Minnesota. April 2007.
- U.S. Fish and Wildlife Service (USFWS). 2009. Gray Bat (*Myotis grisescens*) 5 Year Review: Summary and Evaluation. U.S. Fish and Wildlife Service Midwest Region Columbia, Missouri Ecological Services Field Office Columbia, Missouri.
- U.S. Fish and Wildlife Service (USFWS). 2010. Cumberland Bean (*Villosa trabalis*) 5 Year Review: Summary and Evaluation. U.S. Fish and Wildlife Service Southeast Region Kentucky Ecological Services Field Office Frankfort, Kentucky.
- U.S. Fish and Wildlife Service (USFWS). 2011. Pale Lilliput Pearly Mussel *Toxolasma cylinderellus* 5 Year Review: Summary and Evaluation. U.S. Fish and Wildlife Service Southeast Region Alabama Ecological Services Field Office Daphne, Alabama.
- U.S. Fish and Wildlife Service (USFWS). 2012. Alabama Lampmussel (*Lampsilis virescens*) 5 Year Review: Summary and Evaluation. U.S. Fish and Wildlife Service Southeast Region Alabama Ecological Services Field Office Daphne, Alabama.
- U.S. Fish and Wildlife Service (USFWS). 2013a. Finerayed Pigtoe (*Fusconaia cuneolus*). 5 Year Review: Summary and Evaluation. U.S. Fish and Wildlife Service Southeast Region Ashville Ecological Services Field Office, Ashville, NC.
- U.S. Fish and Wildlife Service (USFWS). 2013b. Shiny Pigtoe (*Fusconaia cor*). 5 Year Review: Summary and Evaluation. U.S. Fish and Wildlife Service Southeast Region Ashville Ecological Services Field Office, Ashville, NC.

- U.S. Fish and Wildlife Service (USFWS). 2013c. Designation of Critical Habitat for the Fluted Kidneyshell and Slabside Pearlymussel. Available at: <https://www.gpo.gov/fdsys/pkg/FR-2013-09-26/pdf/2013-23357.pdf>. Accessed February 21, 2017.
- U.S. Fish and Wildlife Service (USFWS). 2014. Palezone shiner *Notropis albizonatus* 5-year Review: Summary and Evaluation. Kentucky Ecological Services Field Office, Southeast Region, USFWS, Frankfort, Kentucky.
- U.S. Fish and Wildlife Service (USFWS). 2015. Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for Neosho Mucket and Rabbitsfoot. Federal Register Volume 80:24692. April 30, 2015.
- U.S. Fish and Wildlife Service (USFWS). 2016a. IPaC Trust Resources Report. R.L. Harris Project Lands Near Reservoir. Generated November 9, 2016.
- U.S. Fish and Wildlife Service (USFWS). 2016b. IPaC Trust Resources Report. R.L. Harris Skyline Wildlife Management Area. Generated November 9, 2016.
- U.S. Fish and Wildlife Service (USFWS). 2016c. ECOS Environmental Conservation. Cumberland Bean (*Villosa trabalis*). Available at: <http://ecos.fws.gov/ecp0/profile/speciesProfile?spcode=F000>. Accessed February 16, 2017.
- U.S. Fish and Wildlife Service (USFWS). 2016d. ECOS Environmental Conservation Online System. Slabside Pearlymussel Available at: <http://ecos.fws.gov/ecp0/profile/speciesProfile?spcode=F01Y>. Accessed November 2016.
- U.S. Fish and Wildlife Service (USFWS). 2016e. Red-cockaded woodpecker *Picoides borealis*. Available online at: <https://www.fws.gov/rcwrecovery/rcw.html>. Accessed November 14, 2016.
- U.S. Fish and Wildlife Service (USFWS). 2016f. Species Profile: Northern Long-eared Bat (*Myotis septentrionalis*). Available at: <http://www.fws.gov/midwest/endangered/mammals/nlba/index.html>. Accessed November 11, 2016.

- U.S. Fish and Wildlife Service (USFWS). 2016g. Price's Potato-Bean *Apios priceana* 5-year Review: Summary and Evaluation. Tennessee Ecological Services Field Office, Southeast Region, USFWS, Cookeville, Tennessee.
- U.S. Fish and Wildlife Service (USFWS). 2018a. Snuffbox (*Epioblasma triquetra*) 5-Year Review: Summary and Evaluation. Ecological Services Field Office, Midwest Region, USFWS, Columbus, Ohio.
- U.S. Fish and Wildlife Service (USFWS). 2018b. Morefield's Leather Flower *Clematis morefieldii* 5-year Review: Summary and Evaluation. Mississippi Ecological Services Field Office, Southeast Region, USFWS, Jackson, Mississippi.
- U.S. Fish and Wildlife Service (USFWS). 2019a. Spotfin Chub *Erimonax monachus* 5-year Review: Summary and Evaluation. North Carolina Field Office, USFWS, Asheville, North Carolina.
- U.S. Fish and Wildlife Service (USFWS). 2019b. Finelined Pocketbook (*Hamiota* (= *Lampsilis*) *altilis*) Orangenacre Mucket (*Hamiota* (= *Lampsilis*) *perovalis*) Alabama Moccasinshell (*Medionidus acutissimus*) Coosa Moccasinshell (*Medionidus parvulus*) Southern Clubshell (*Pleurobema decisum*) Dark Pigtoe (*Pleurobema furvum*) Southern Pigtoe (*Pleurobema georgianum*) Ovate Clubshell (*Pleurobema perovatum*) Triangular Kidneyshell (*Ptychobranhus greenii*) 5-year Review: Summary and Evaluation. Alabama Ecological Services Field Office, South Atlantic-Gulf Region, USFWS, Daphne, Alabama.
- U.S. Fish and Wildlife Service (USFWS). 2019c. Southern Pigtoe (*Pleurobema georgianum*) 5-year Review: Summary and Evaluation. Alabama Ecological Services Field Office, South Atlantic Gulf Region, SUFWS, Daphne, Alabama.
- U.S. Fish and Wildlife Service (USFWS). 2020. Cumberland Bean (*Villosa trabalis*) 5 Year Review: Summary and Evaluation. U.S. Fish and Wildlife Service Southeast Region Kentucky Ecological Services Field Office Frankfort, Kentucky.
- Watters, G.T., T. Gibson, and B. Kelly. 2009. Host identifications or confirmations. *Ellipsaria* 11(1):19.

- Williams, J.D., A.E. Bogan, and J.R. Garner. 2008. Freshwater Mussels of Alabama and the Mobile Basin in Georgia, Mississippi, and Tennessee. University of Alabama Press, Tuscaloosa, Alabama. 908 pp.
- Yeager, B. L., and C. F. Saylor. 1995. Fish Hosts for Four Species of Freshwater Mussels (*Pelecypoda: Unionidae*) in the Upper Tennessee River Drainage. Vol. 133. No. 1.

APPENDIX A

ACRONYMS AND ABBREVIATIONS



R. L. Harris Hydroelectric Project

FERC No. 2628

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 Centigrade
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 Solids
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

SPECIES HABITAT RANGE MAPS

Red-cockaded Woodpecker Current Habitat Range at Skyline

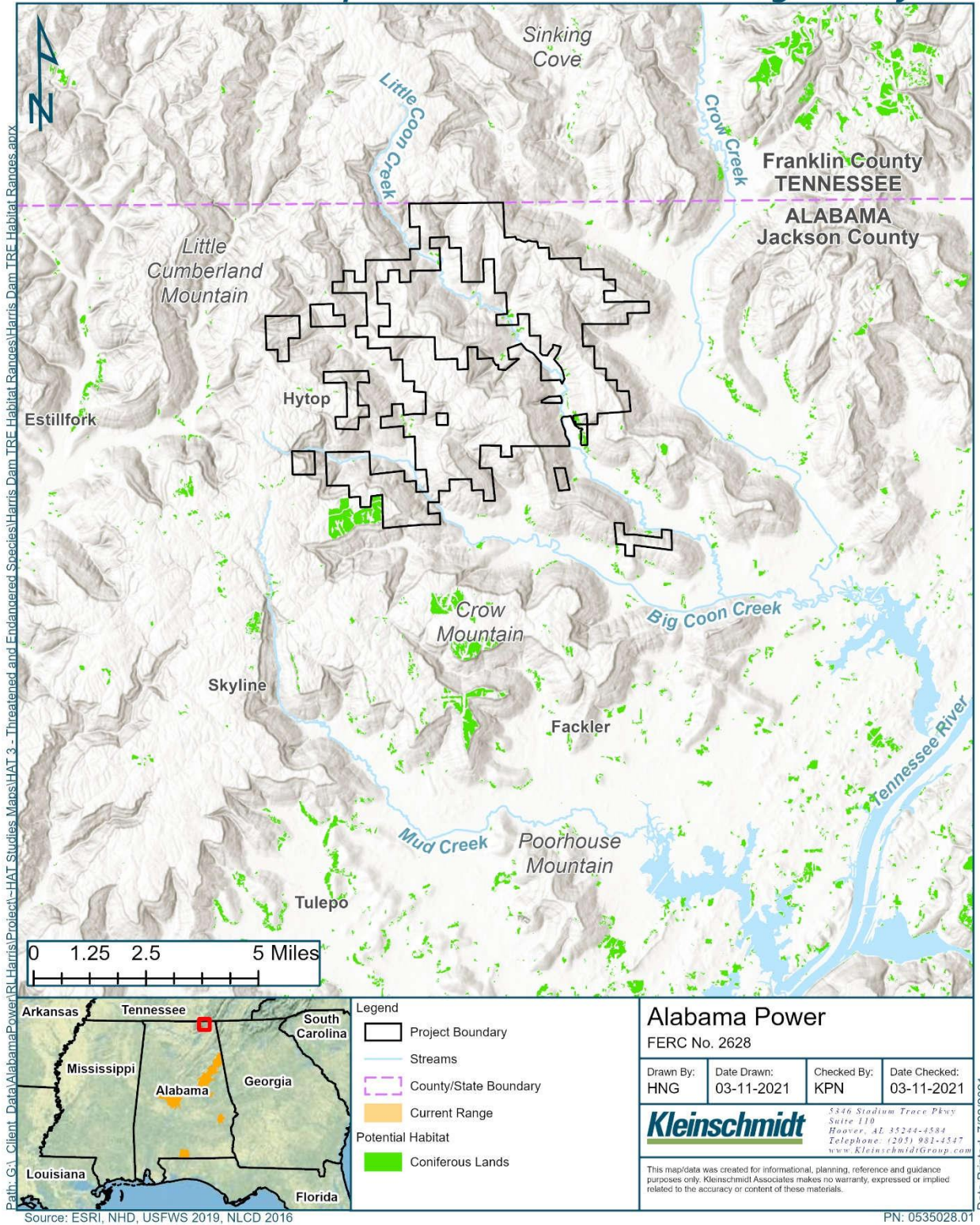


Figure 3.1-1

Red-cockaded Woodpecker Current Habitat Range at Lake Harris

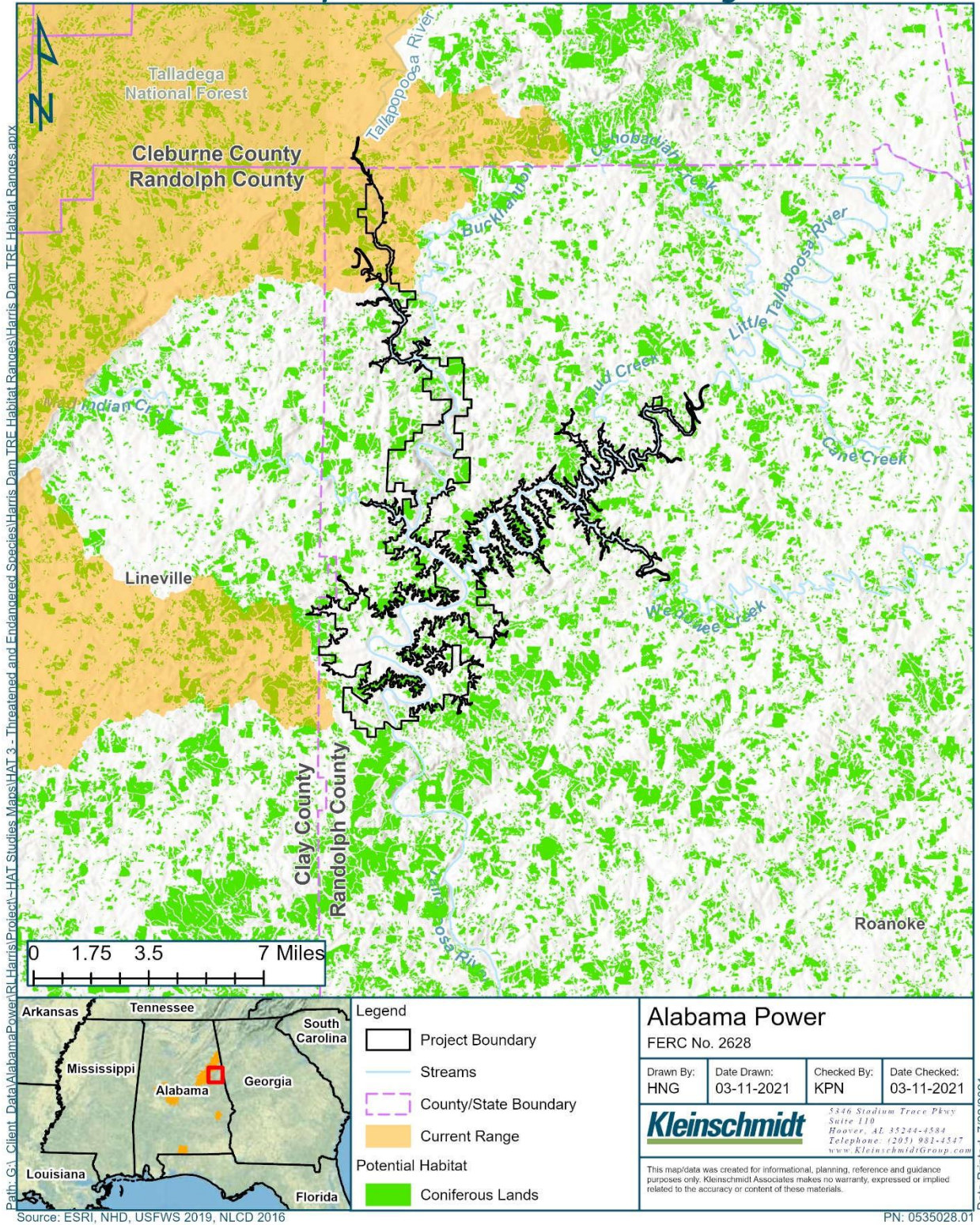


Figure 3.1-2

Palezone Shiner Current Habitat Range at Skyline

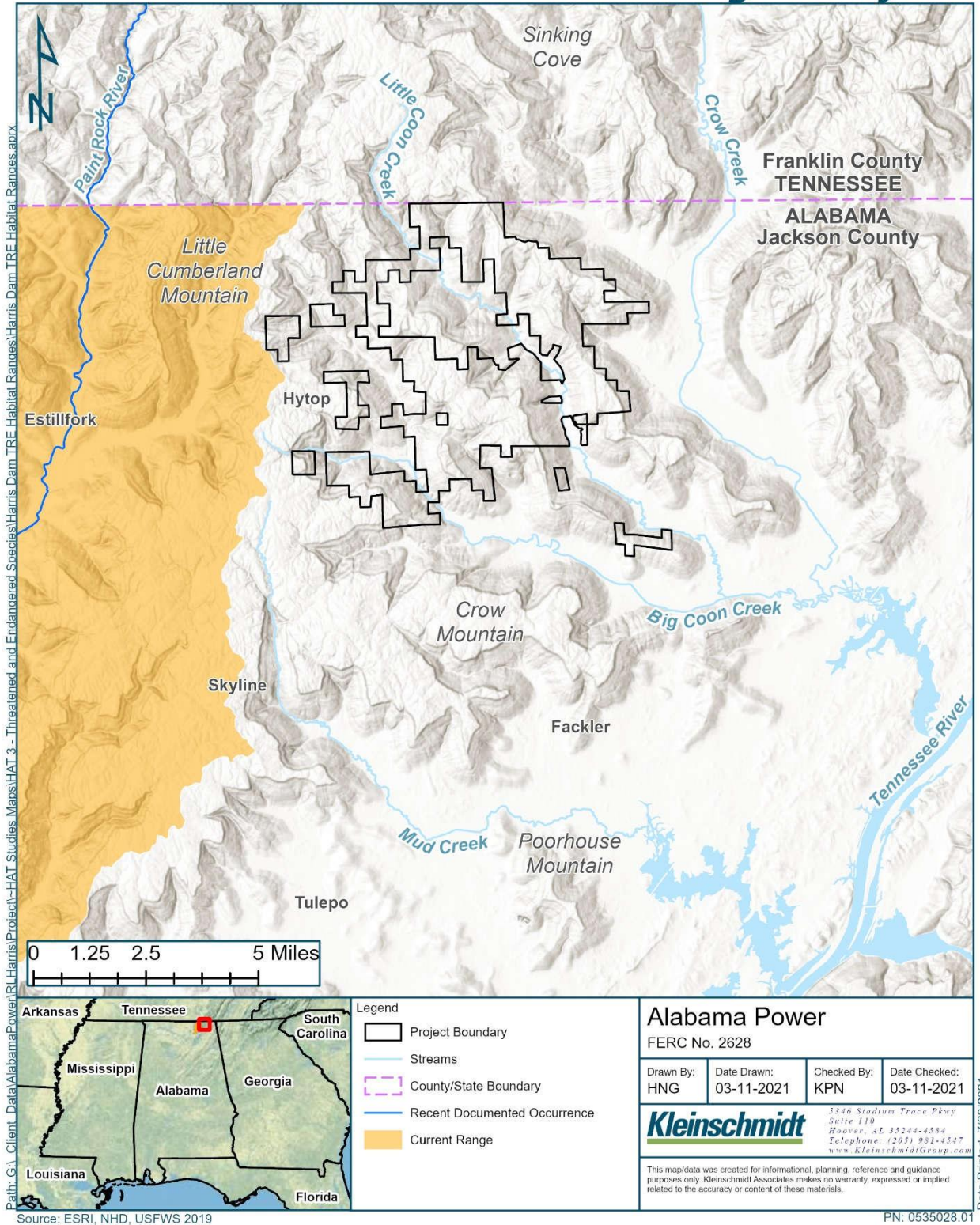


Figure 3.2-1

Spotfin Chub Current Habitat Range at Skyline

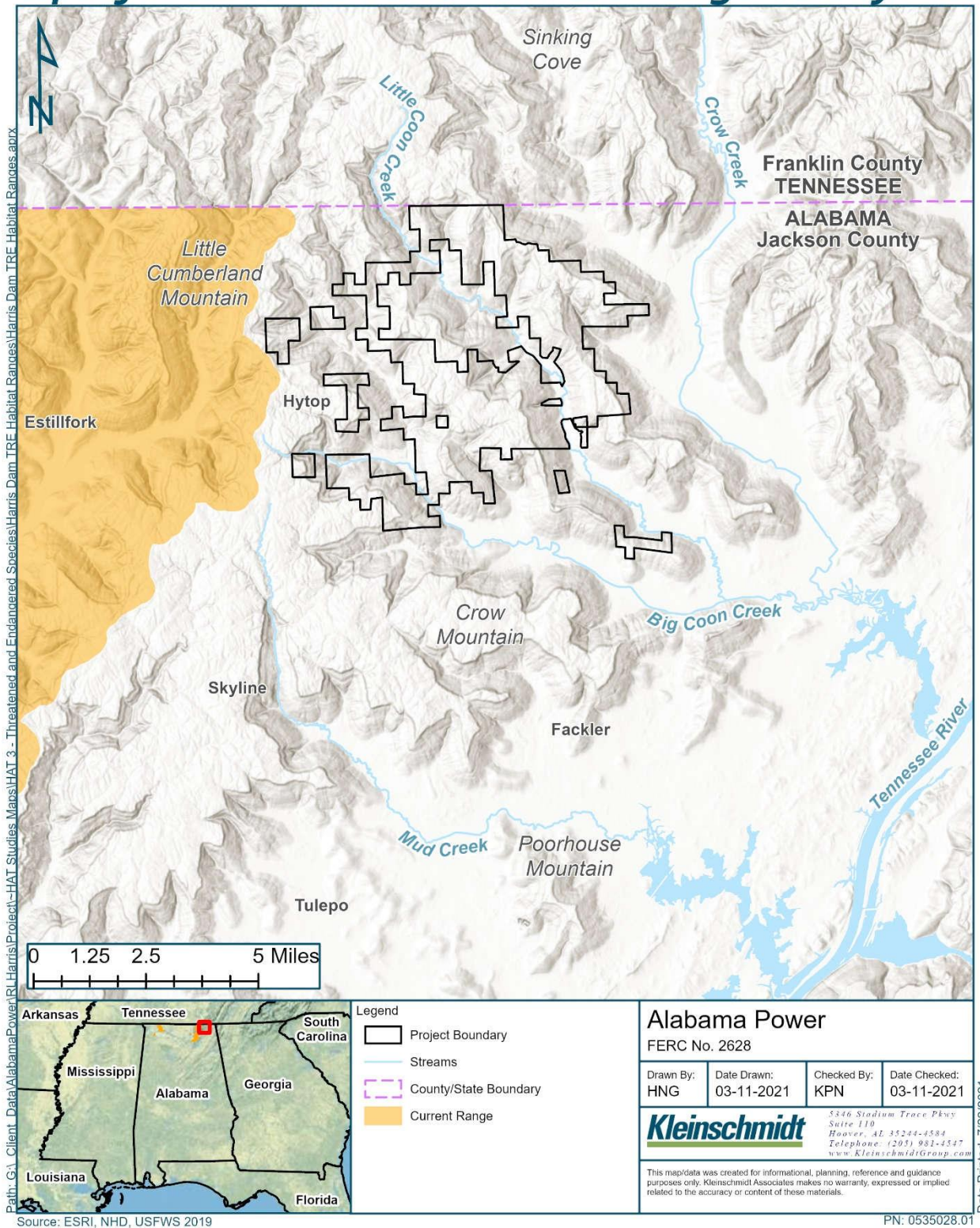


Figure 3.3.1

Finelined Pocketbook Mussel Current Habitat Range at Lake Harris

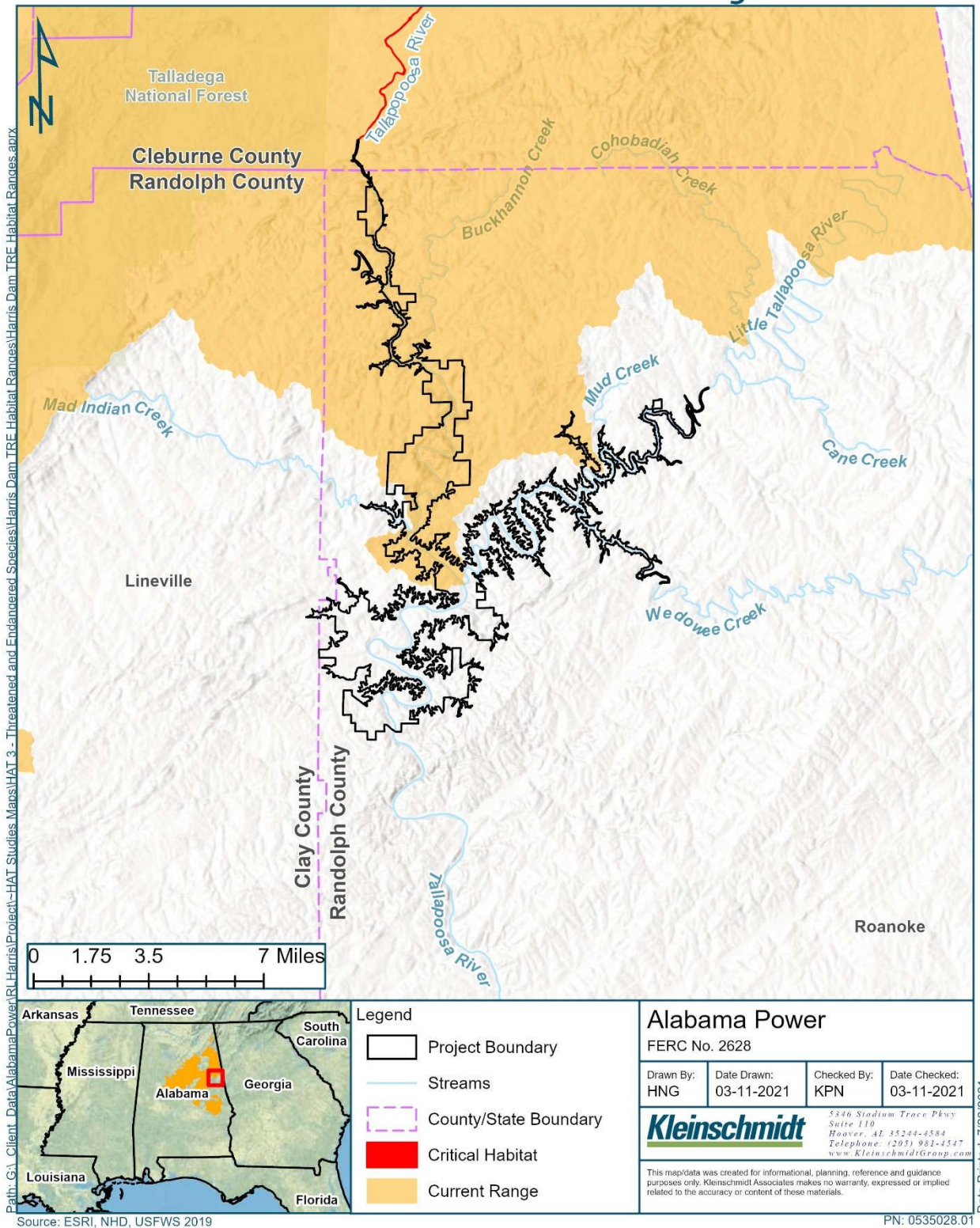


Figure 3.4-1

Alabama Lampmussel Current Habitat Range at Skyline

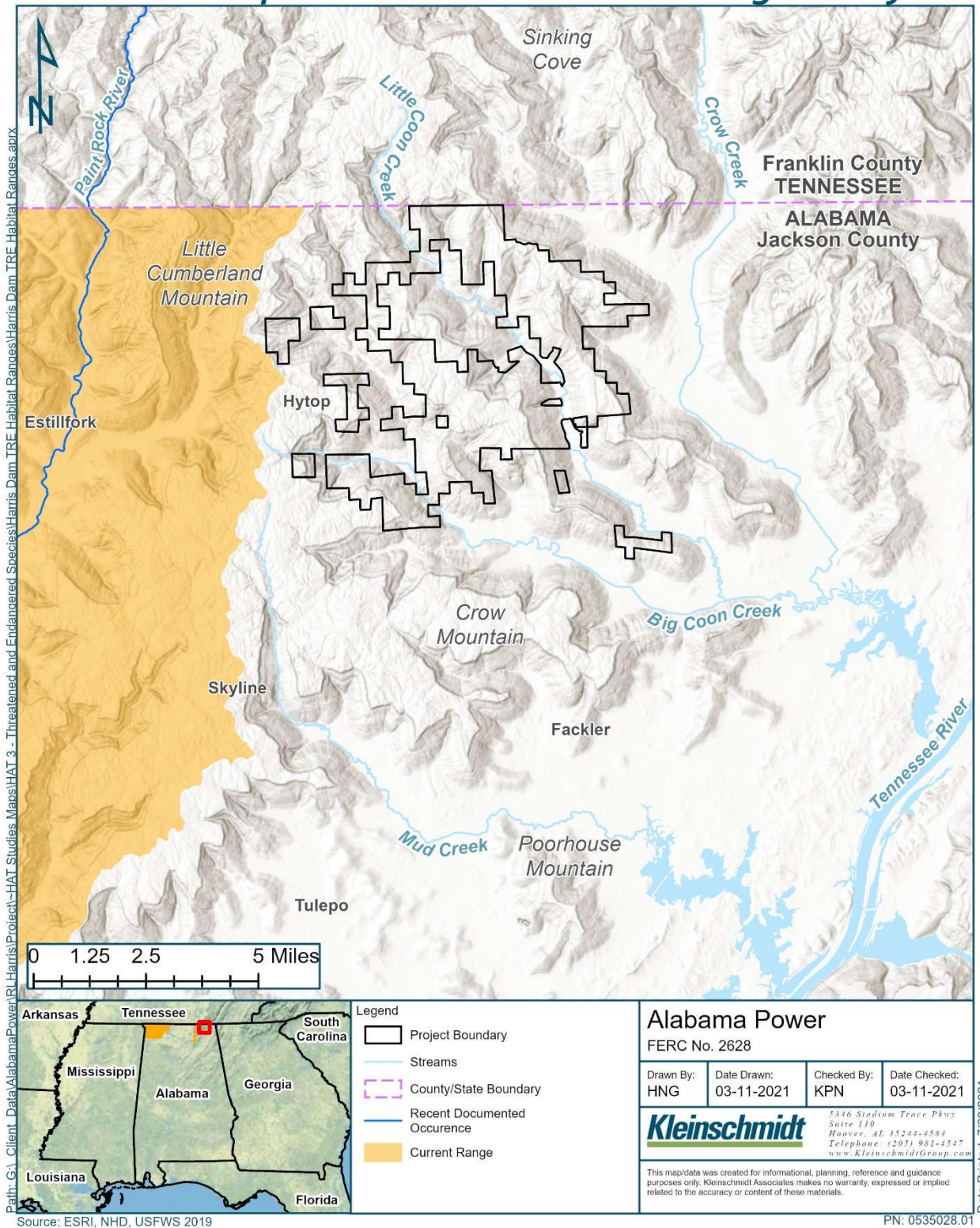


Figure 3.5-1

Cumberland Bean Current Habitat Range at Skyline

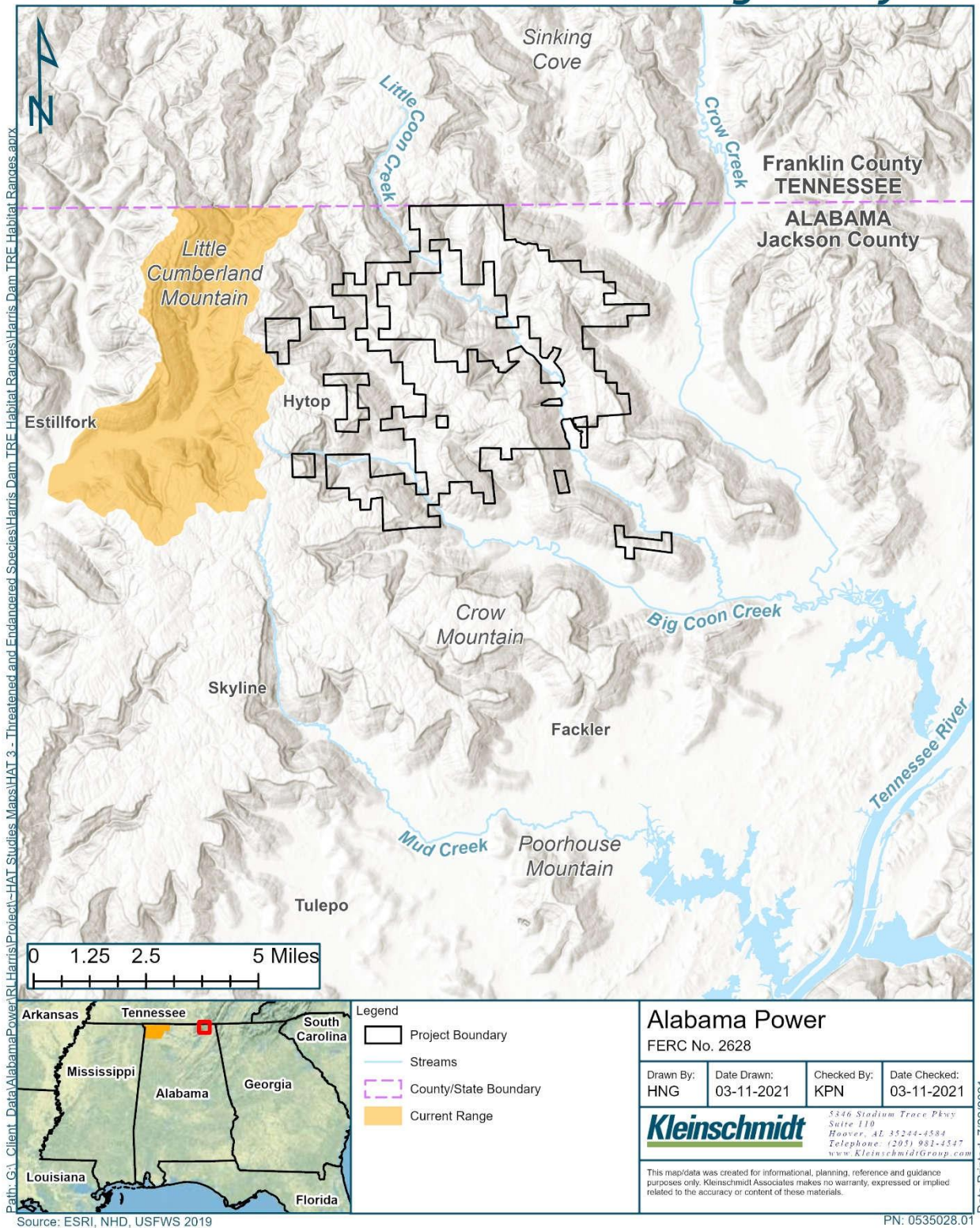


Figure 3.6-1

Fine-rayed Pigtoe Current Habitat Range at Skyline

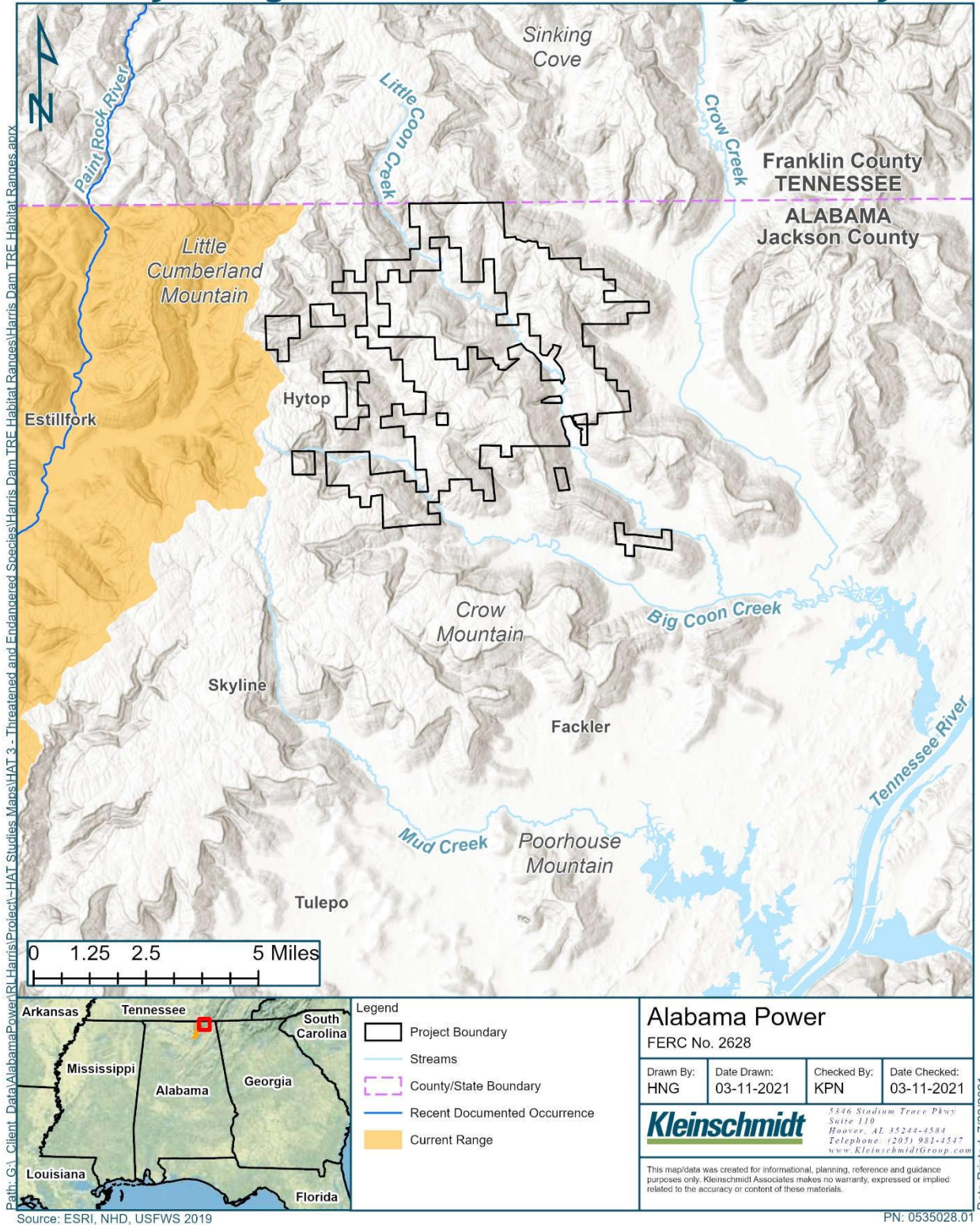


Figure 3.7-1

Pale Lilliput Current Habitat Range at Skyline

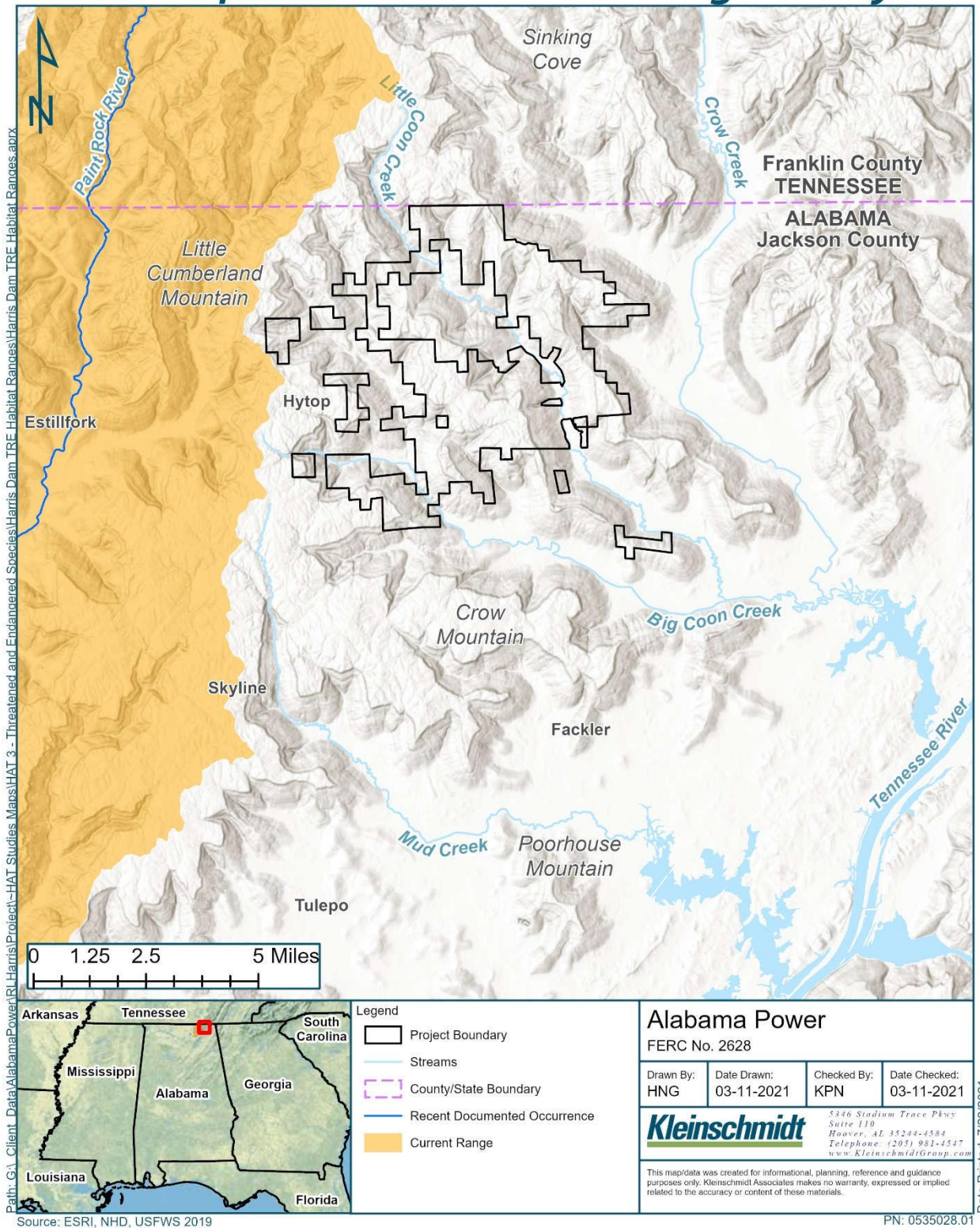


Figure 3.8-1

Rabbitsfoot Current Habitat Range at Skyline

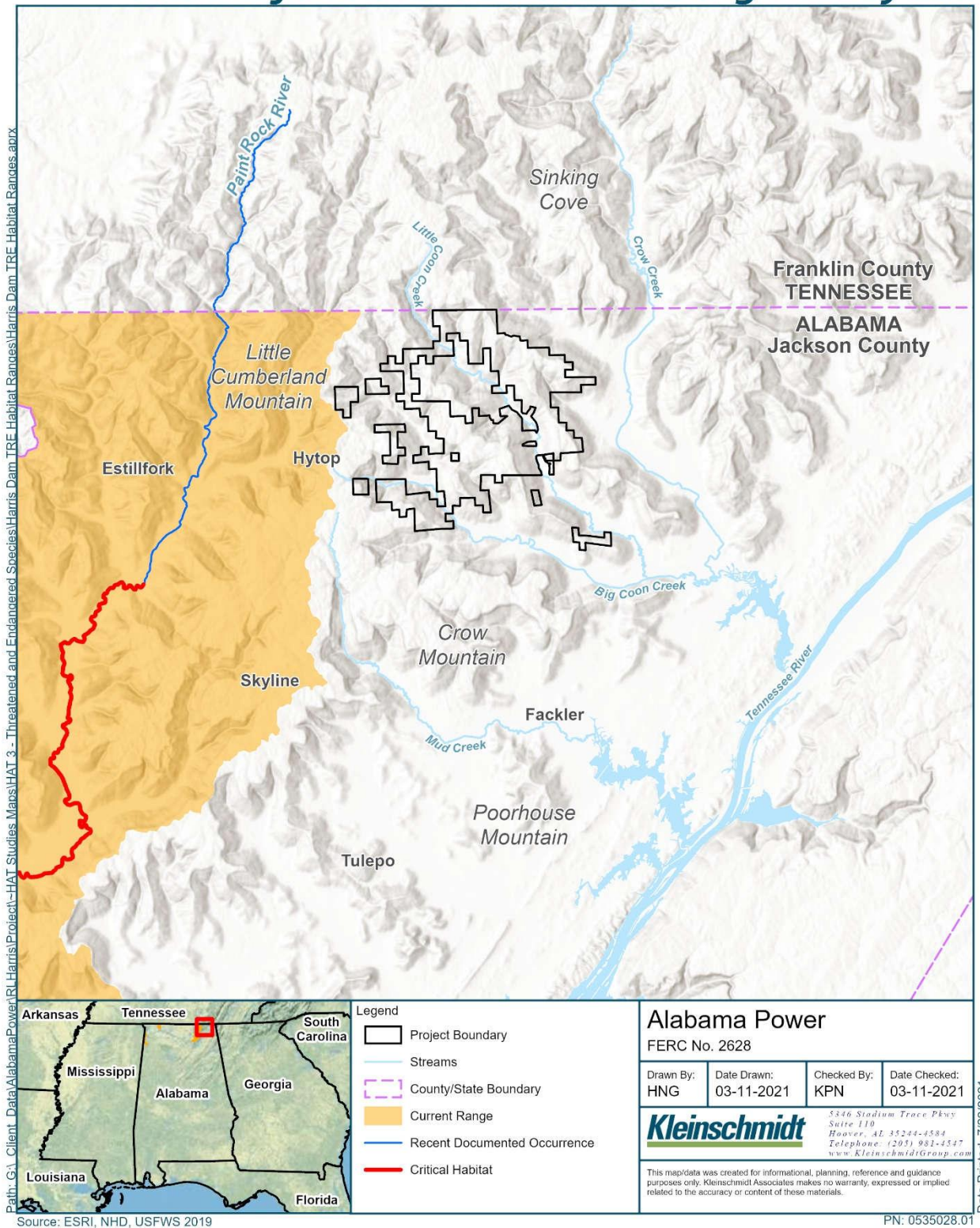


Figure 3.9-1

Snuffbox Mussel Current Habitat Range at Skyline

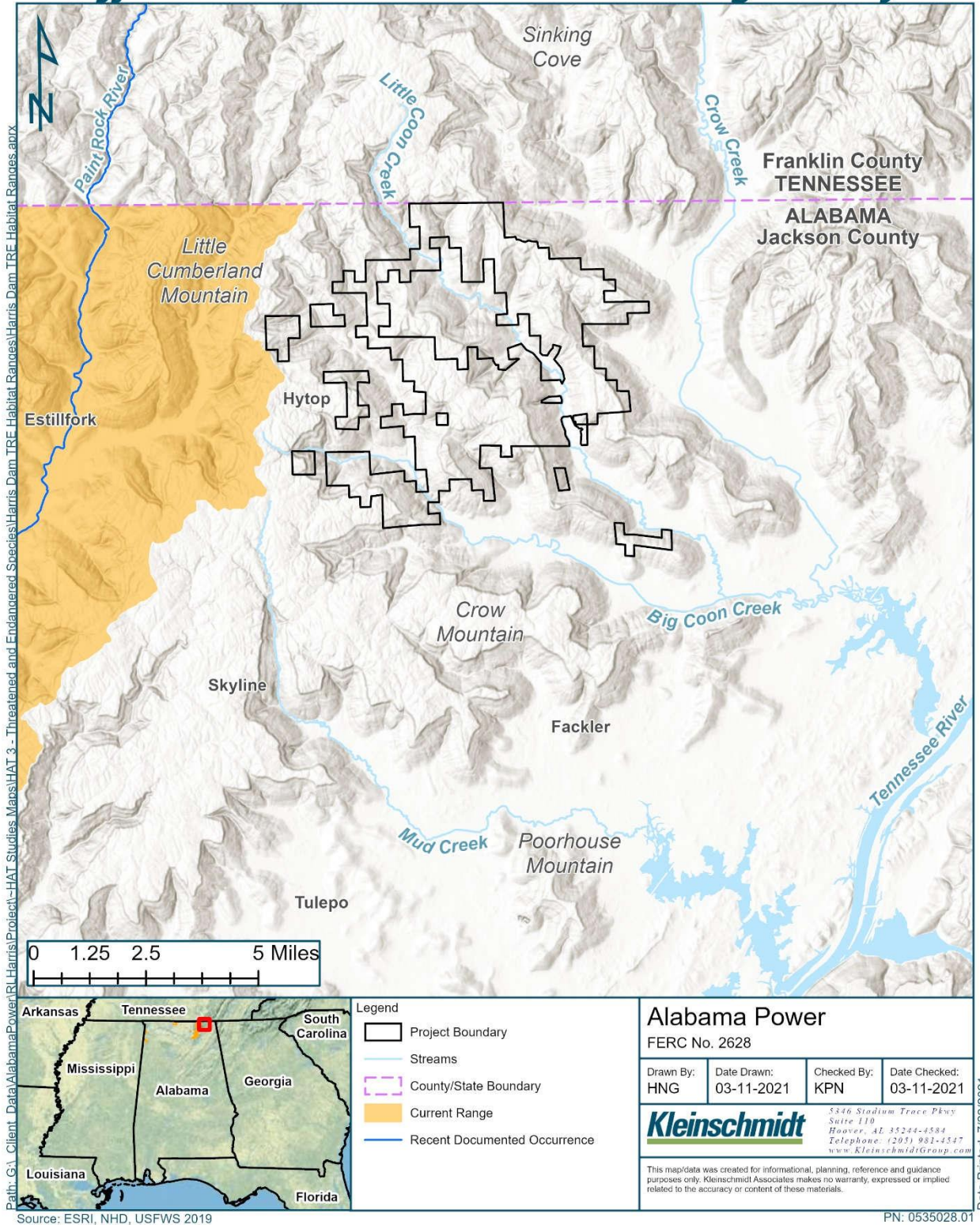


Figure 3.10-1

Shiny Pigtoe Current Habitat Range at Skyline

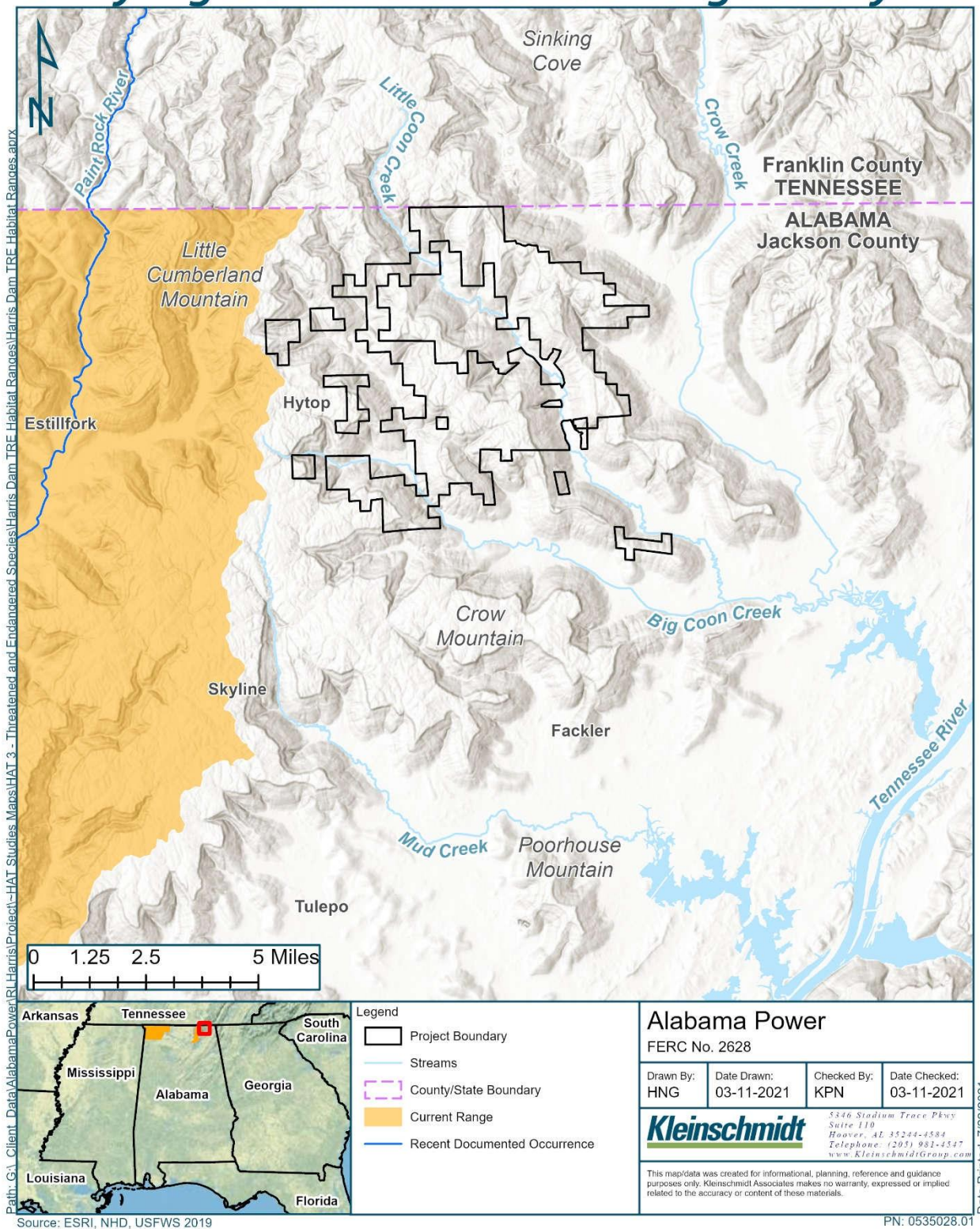


Figure 3.11-1

Southern Pigtoe Current Habitat Range at Lake Harris

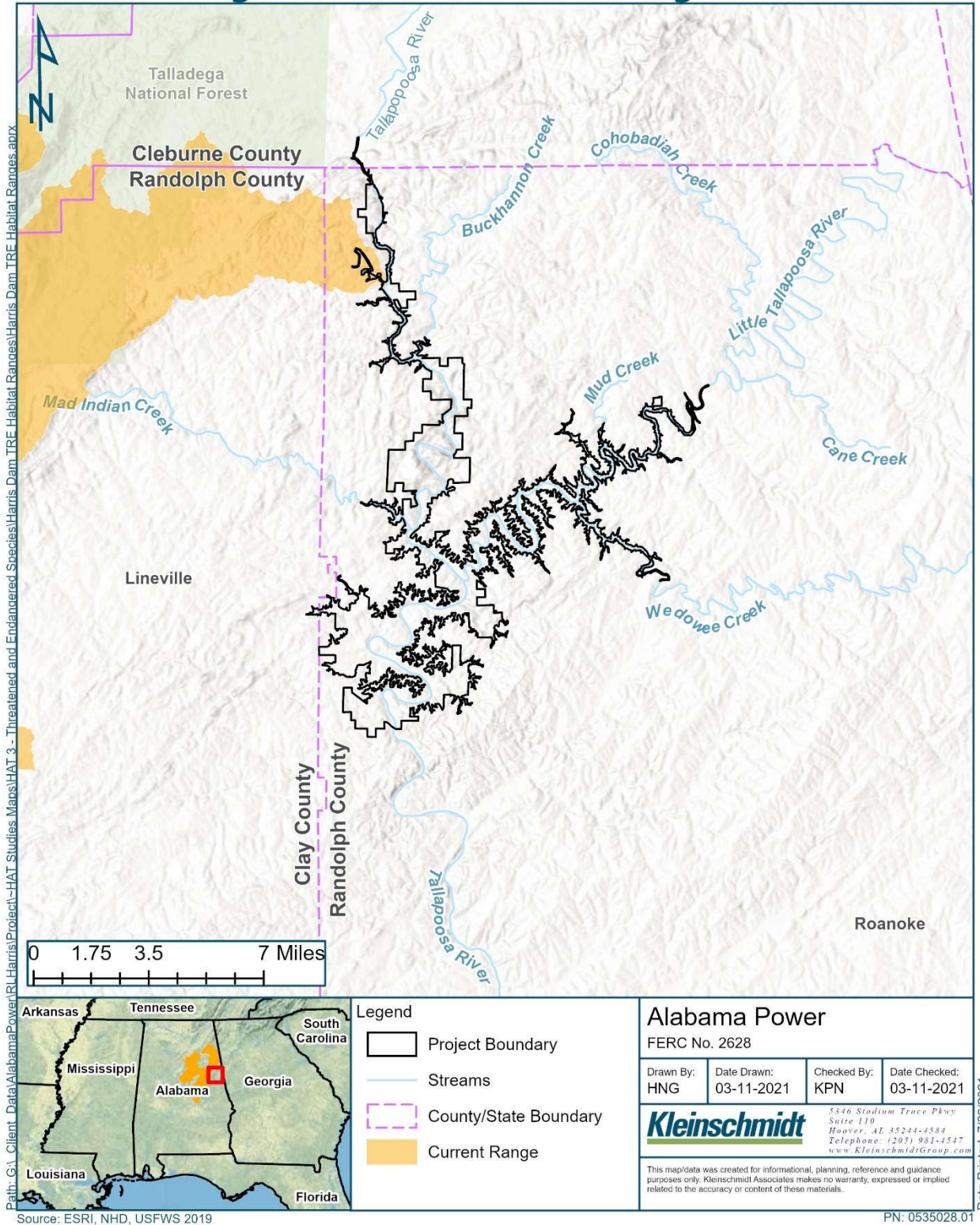


Figure 3.12-1

Slabside Pearlymussel Current Habitat Range at Skyline

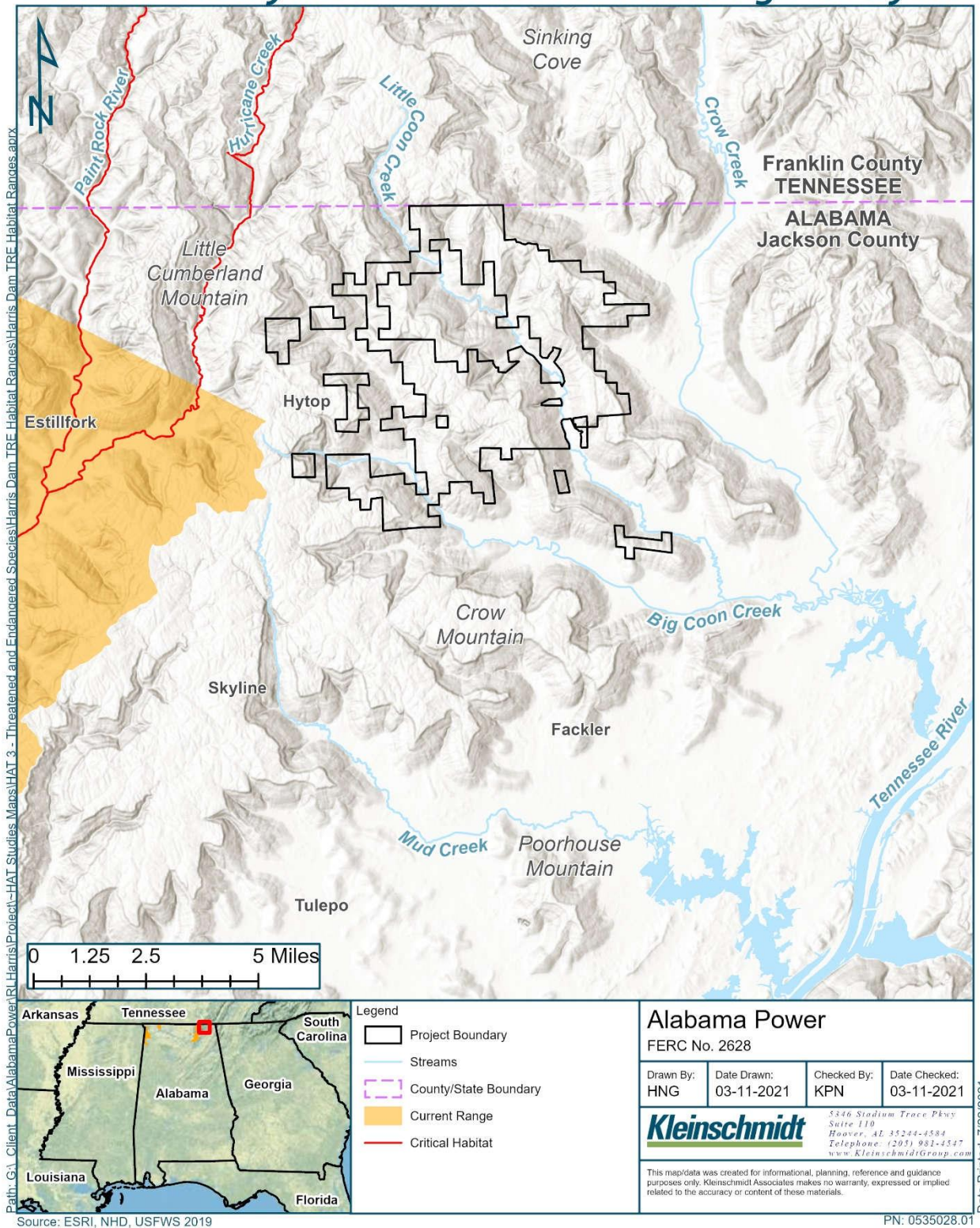


Figure 3.13-1

Indiana Bat Current Habitat Range at Skyline

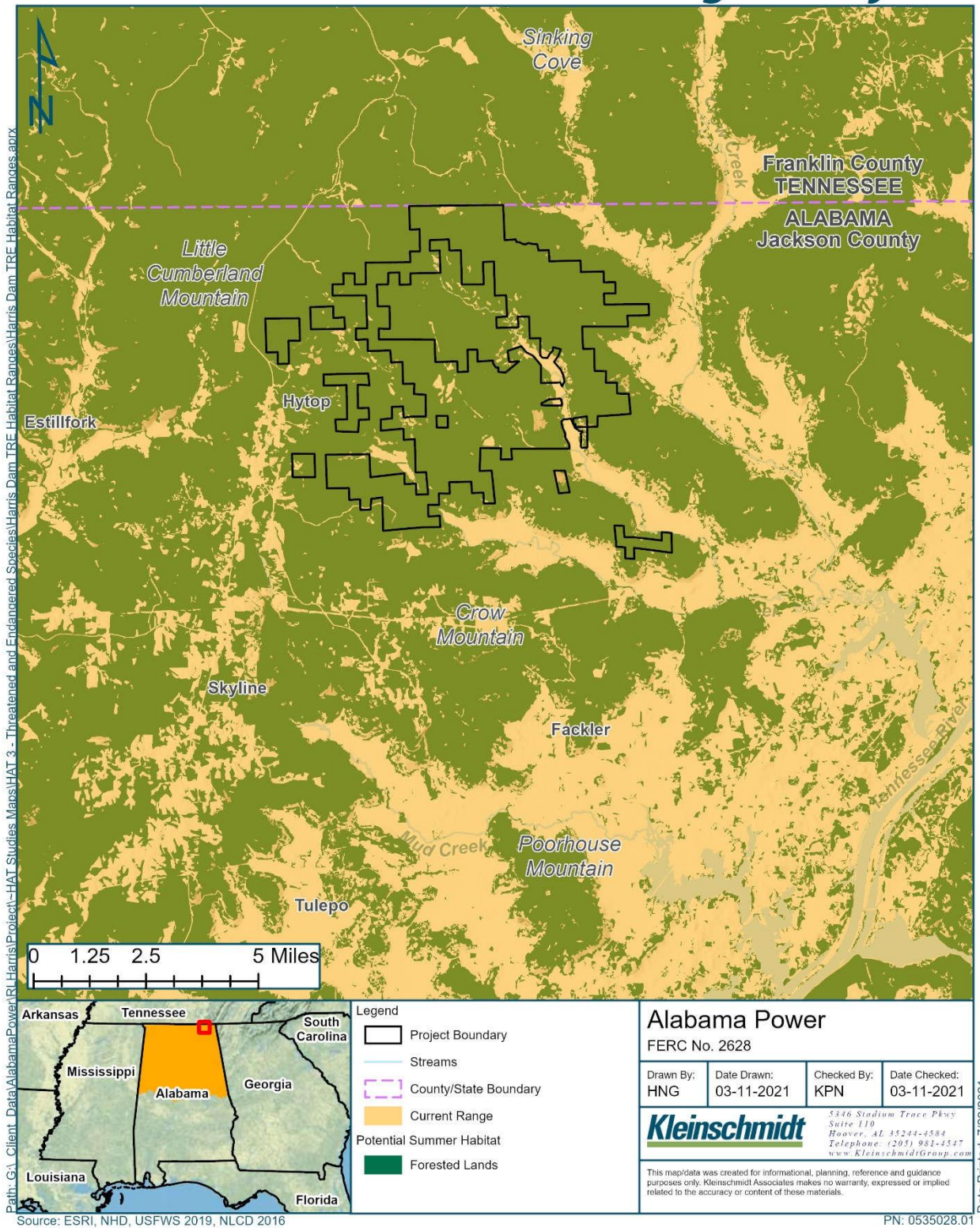


Figure 3.14-1

Indiana Bat Current Habitat Range at Skyline

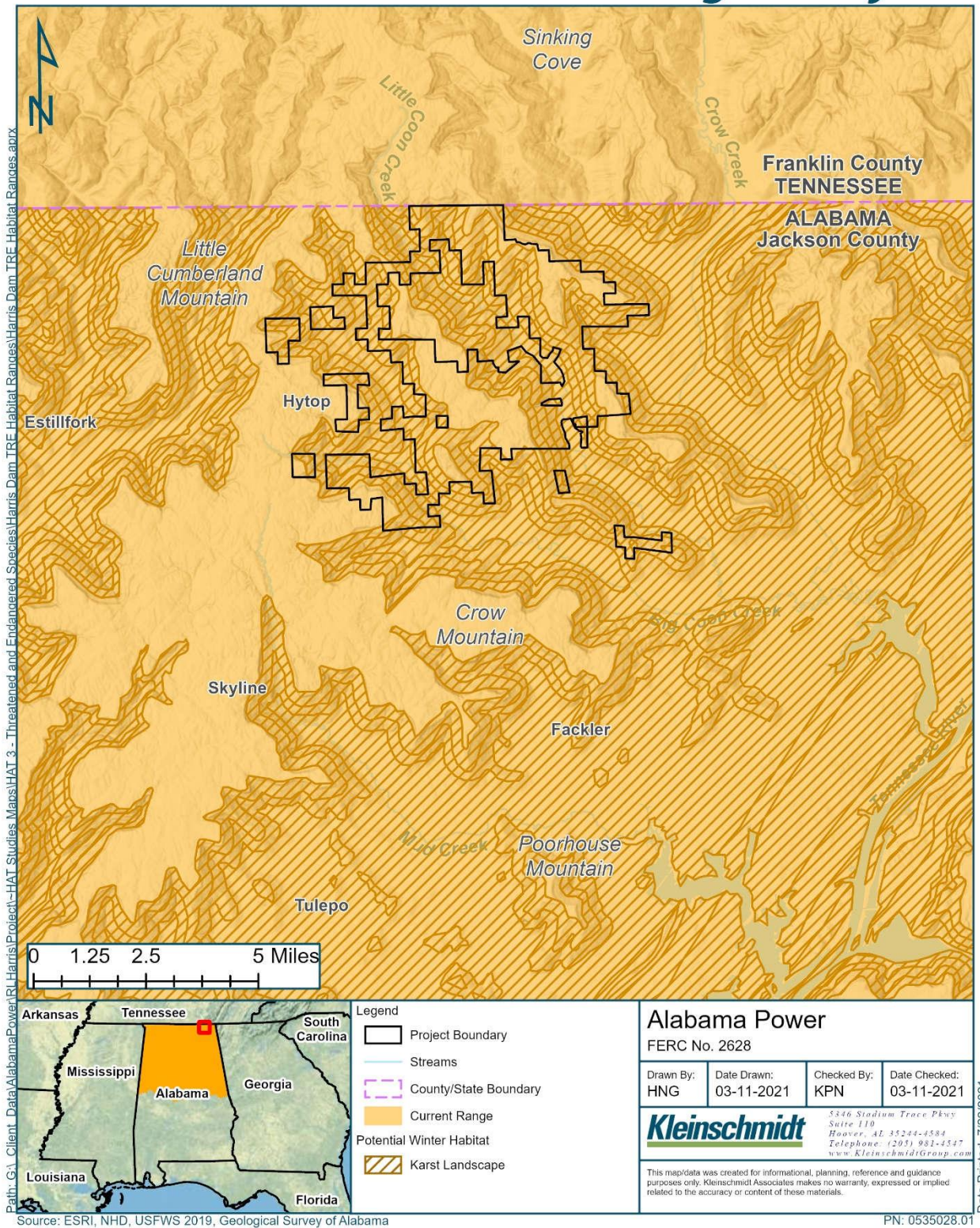


Figure 3.14-2

Indiana Bat Current Habitat Range at Lake Harris

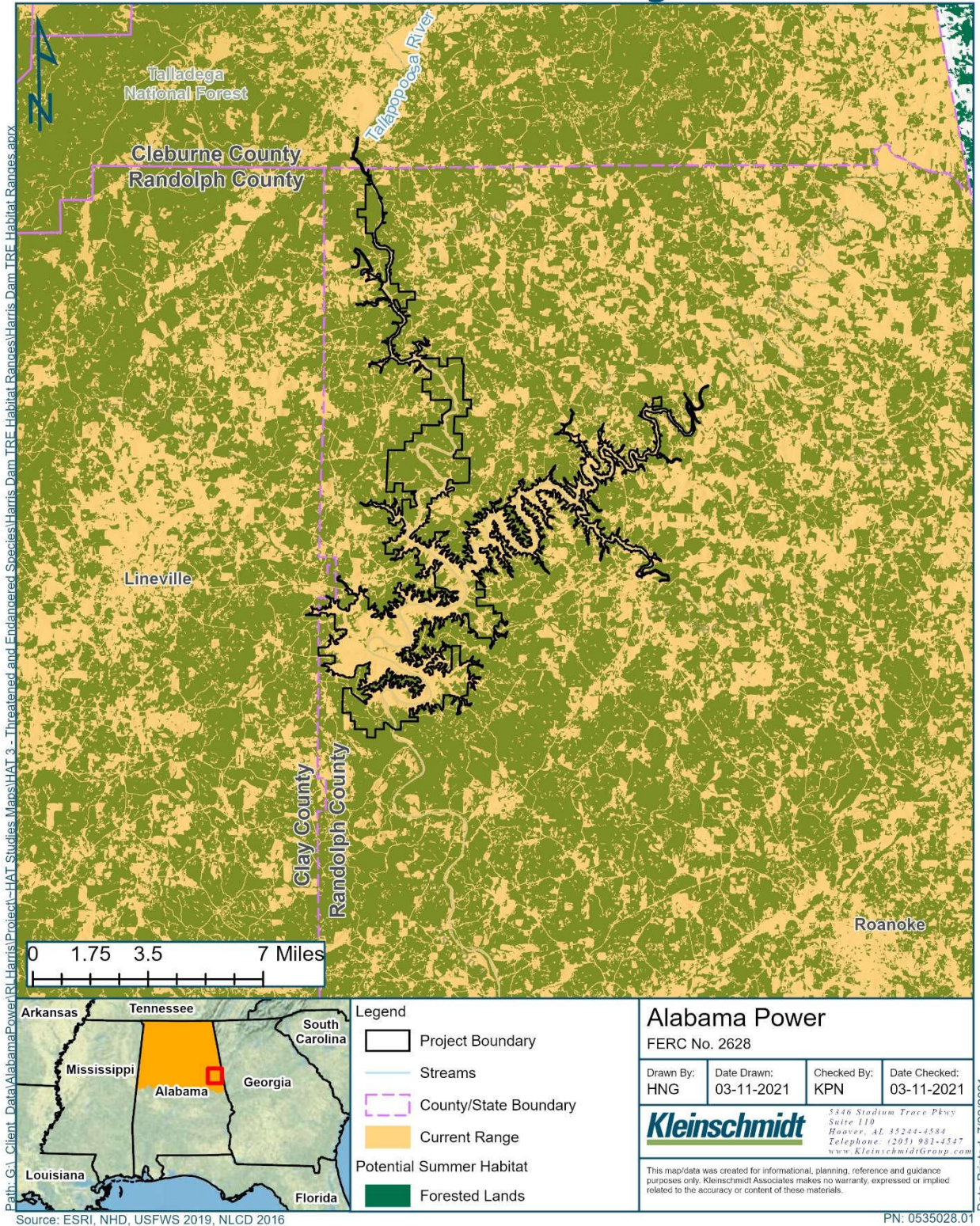


Figure 3.14-3

Northern Long-eared Bat Current Habitat Range at Skyline

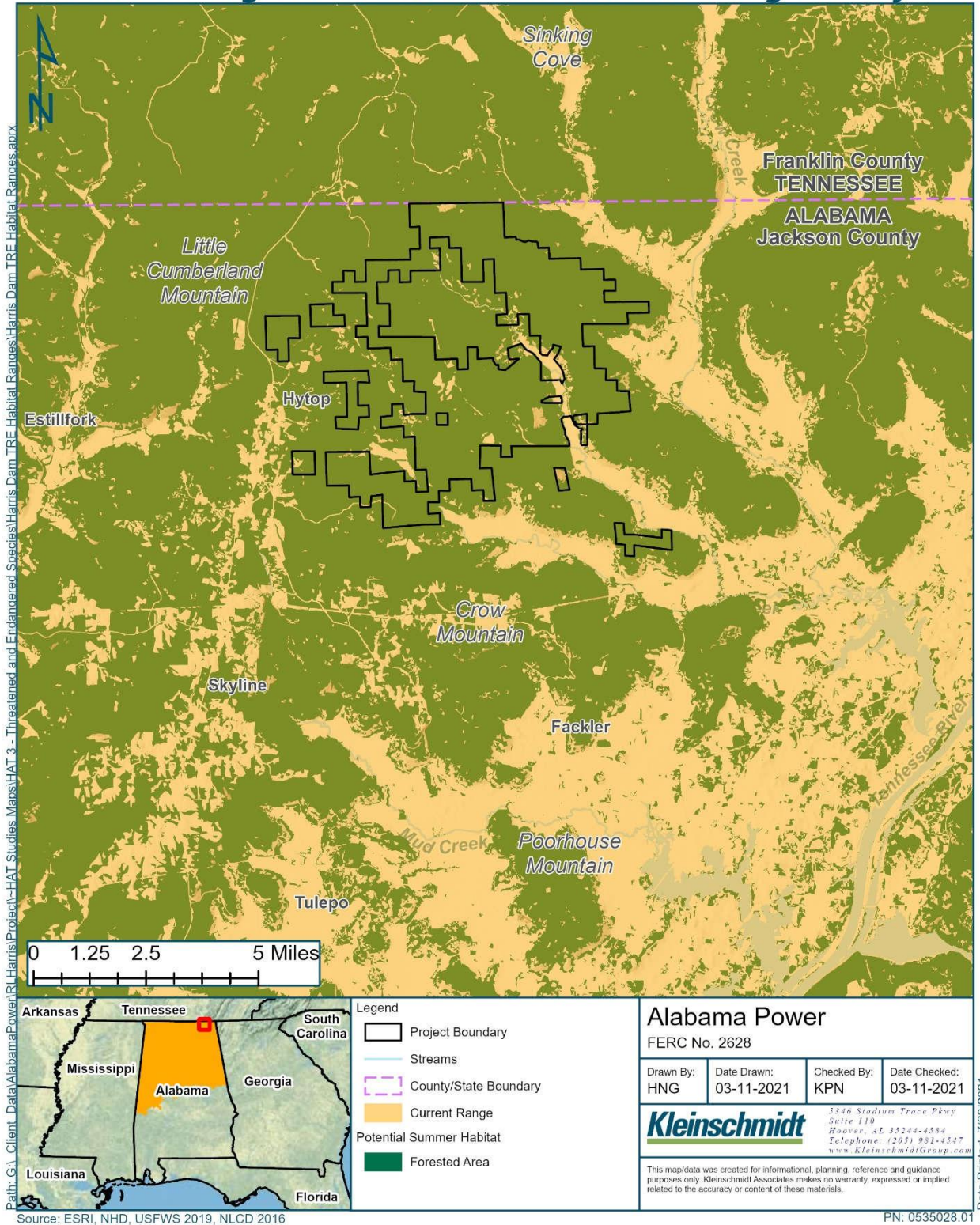


Figure 3.15-1

Northern Long-eared Bat Current Habitat Range at Skyline

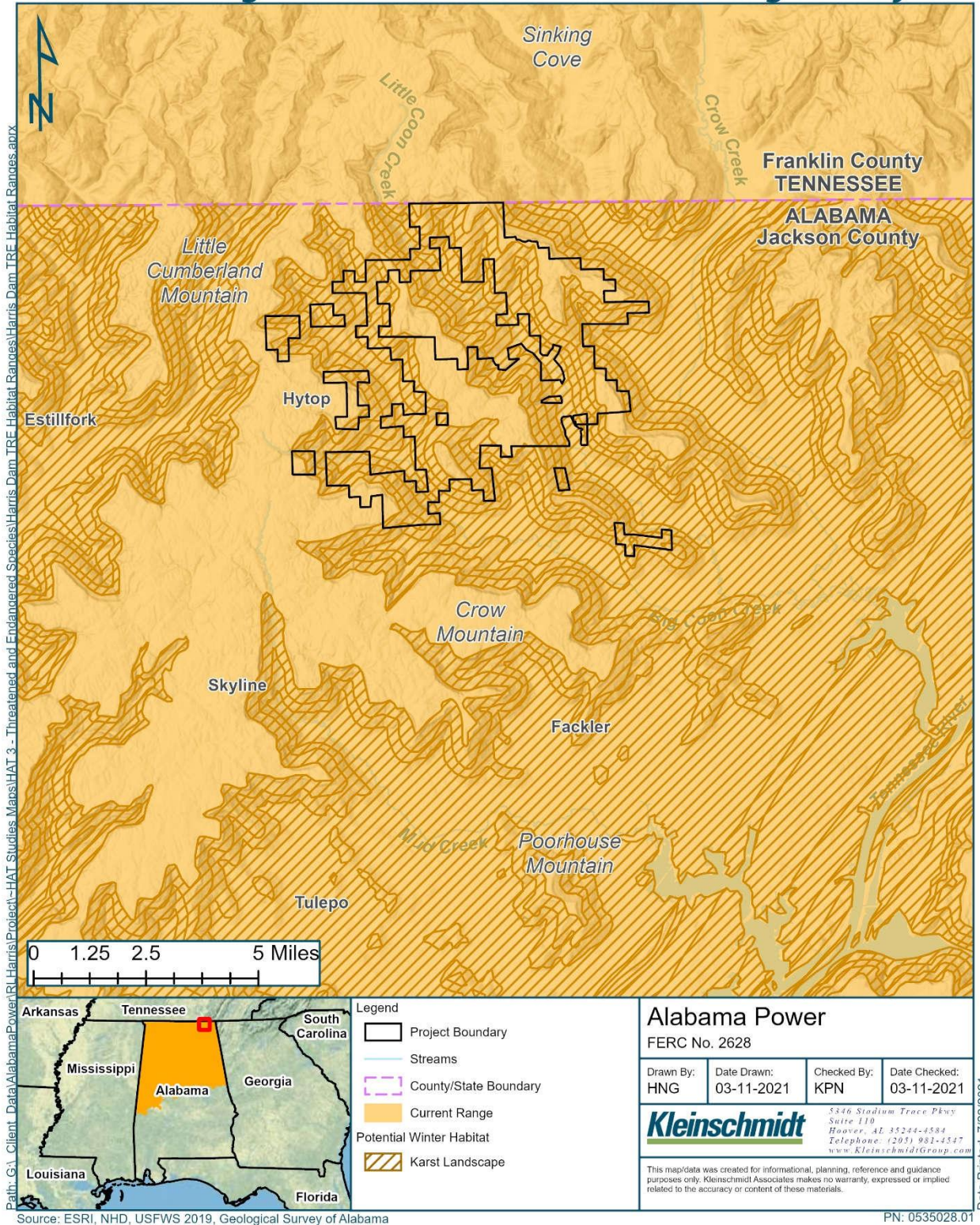


Figure 3.15-2

Northern Long-eared Bat Current Habitat Range at Lake Harris

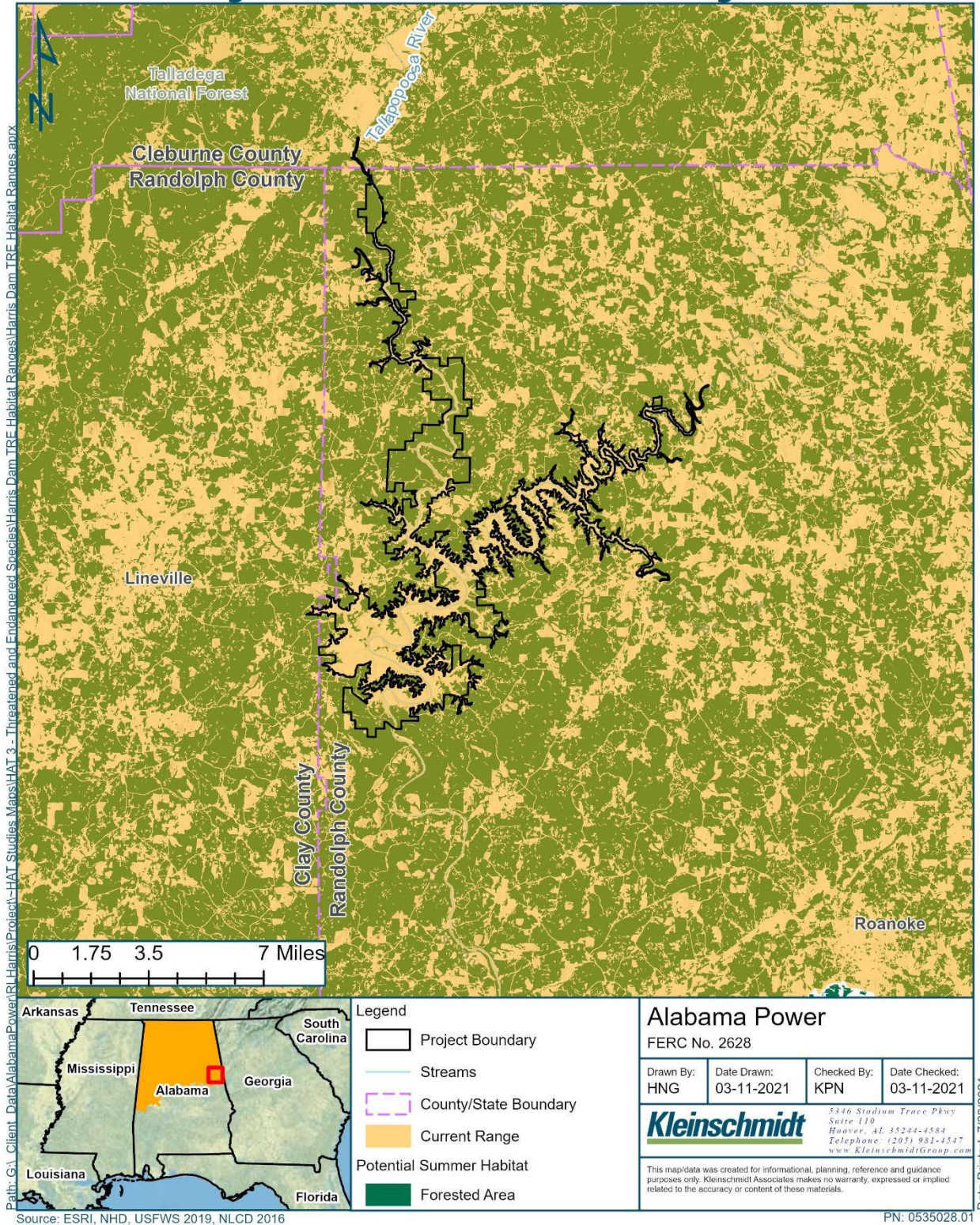


Figure 3.15-3

Gray Bat Current Habitat Range at Skyline

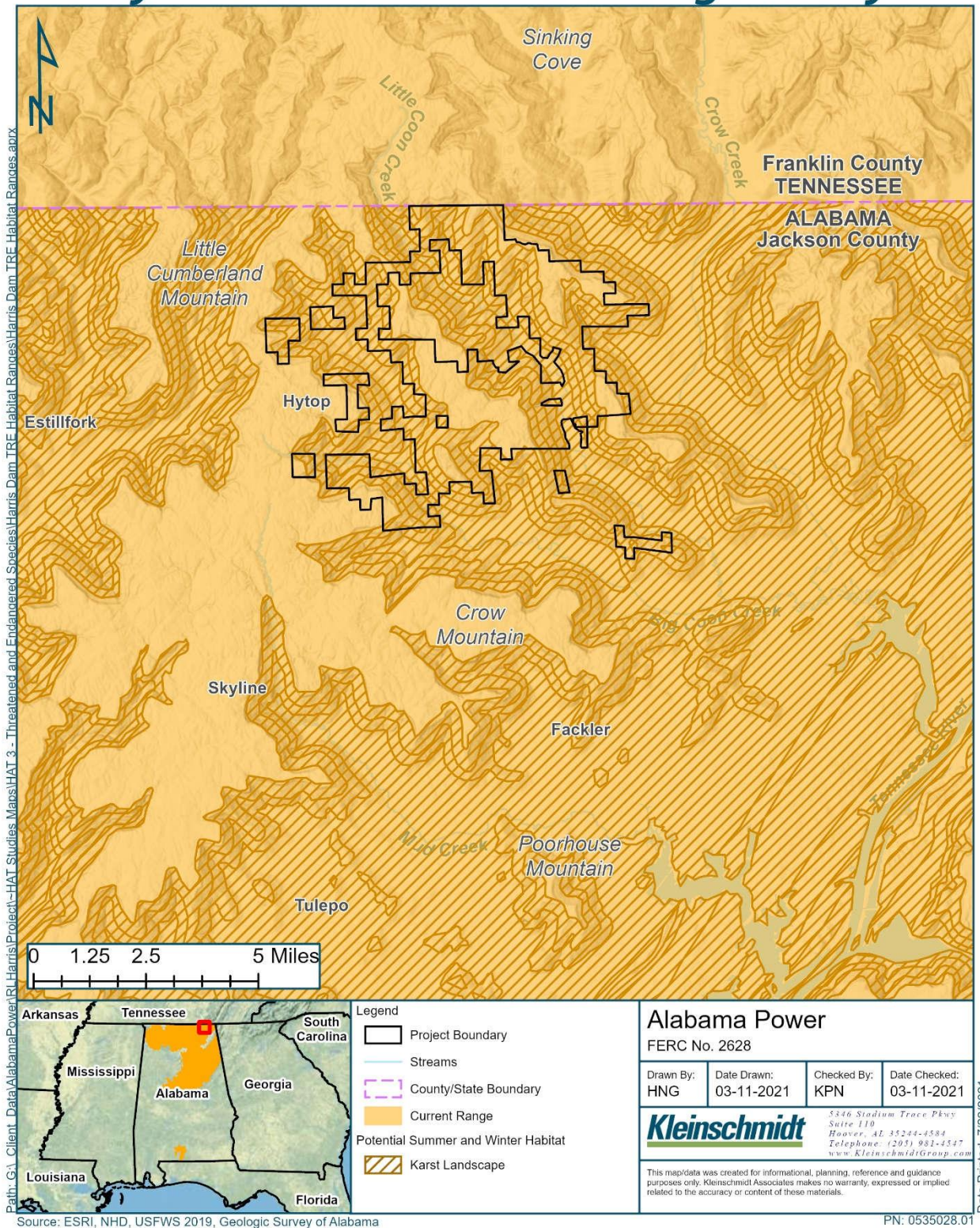


Figure 3.16-1

Gray Bat Current Habitat Range at Lake Harris

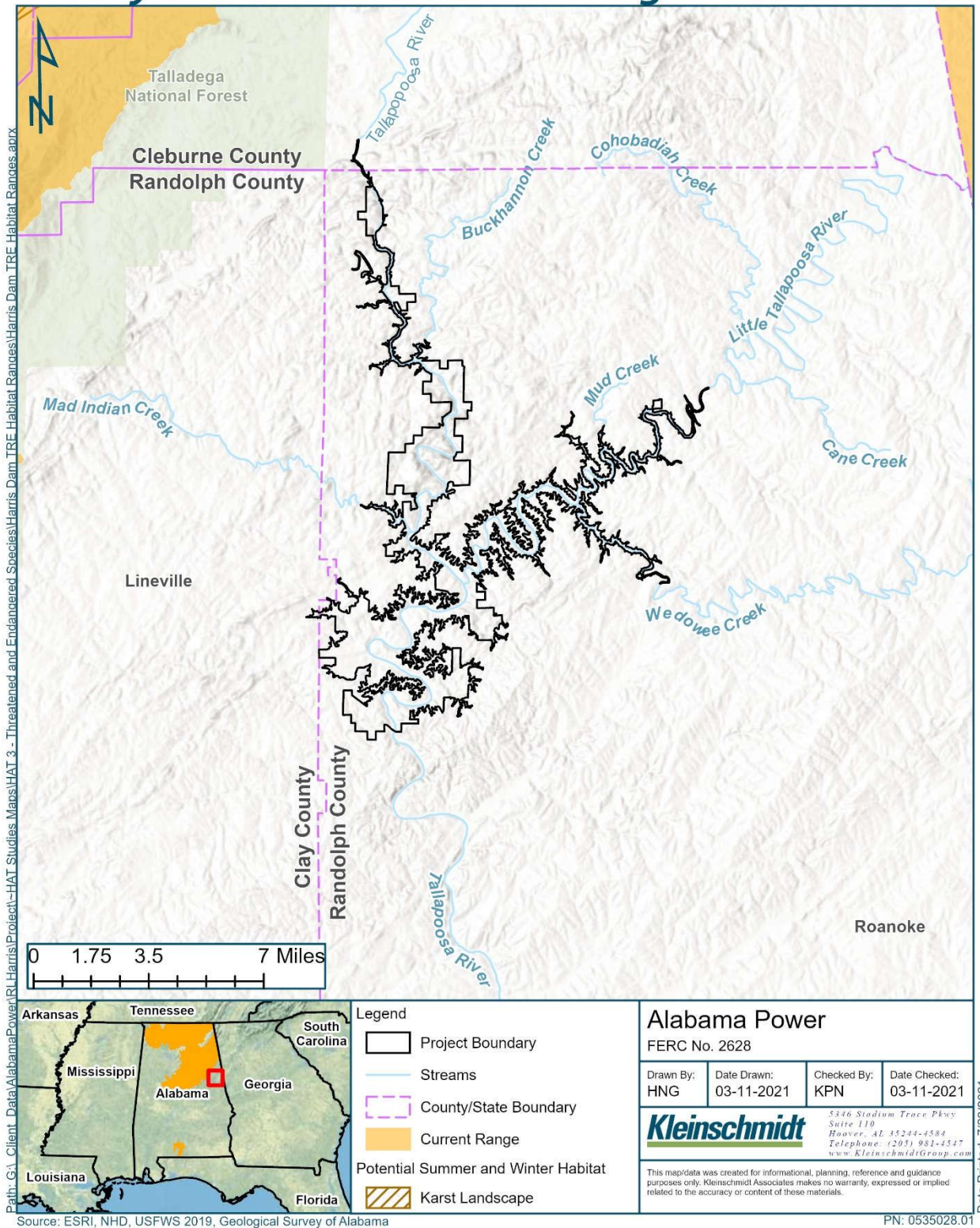


Figure 3.16-2

Little Amphianthus Current Habitat Range at Lake Harris

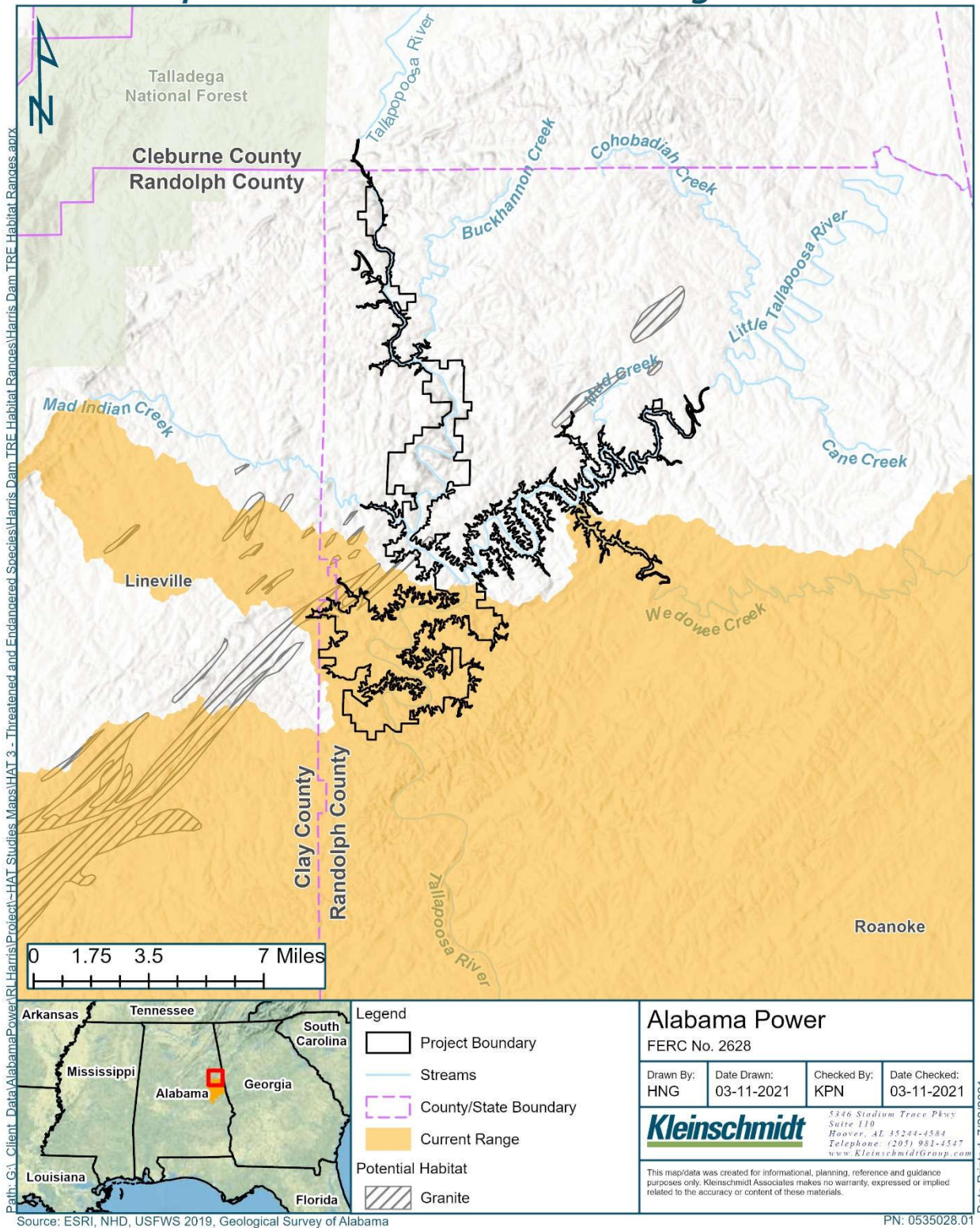


Figure 3.17-1

White Fringeless Orchid Current Habitat Range at Skyline

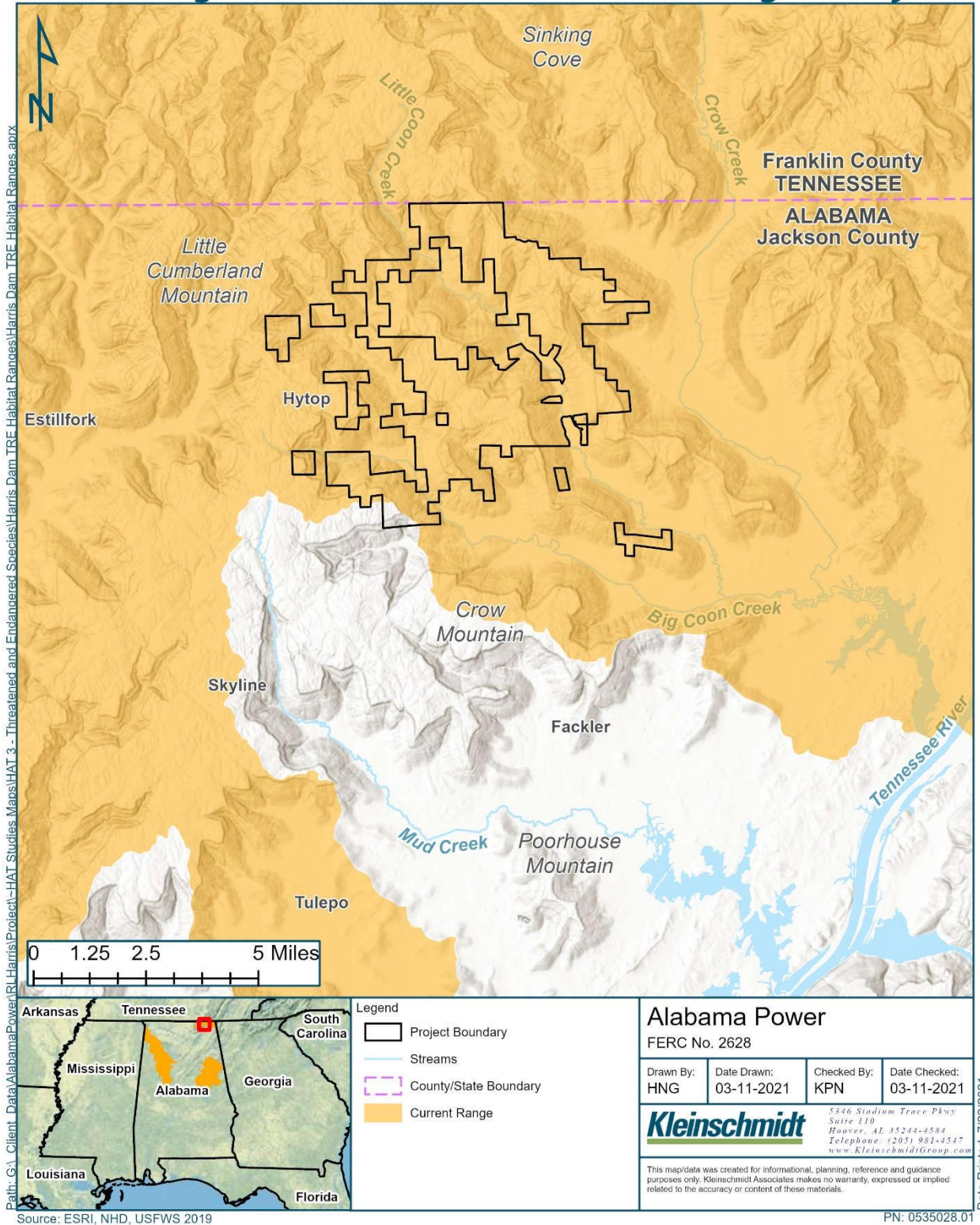


Figure 3.18-1

White Fringeless Orchid Current Habitat Range at Lake Harris

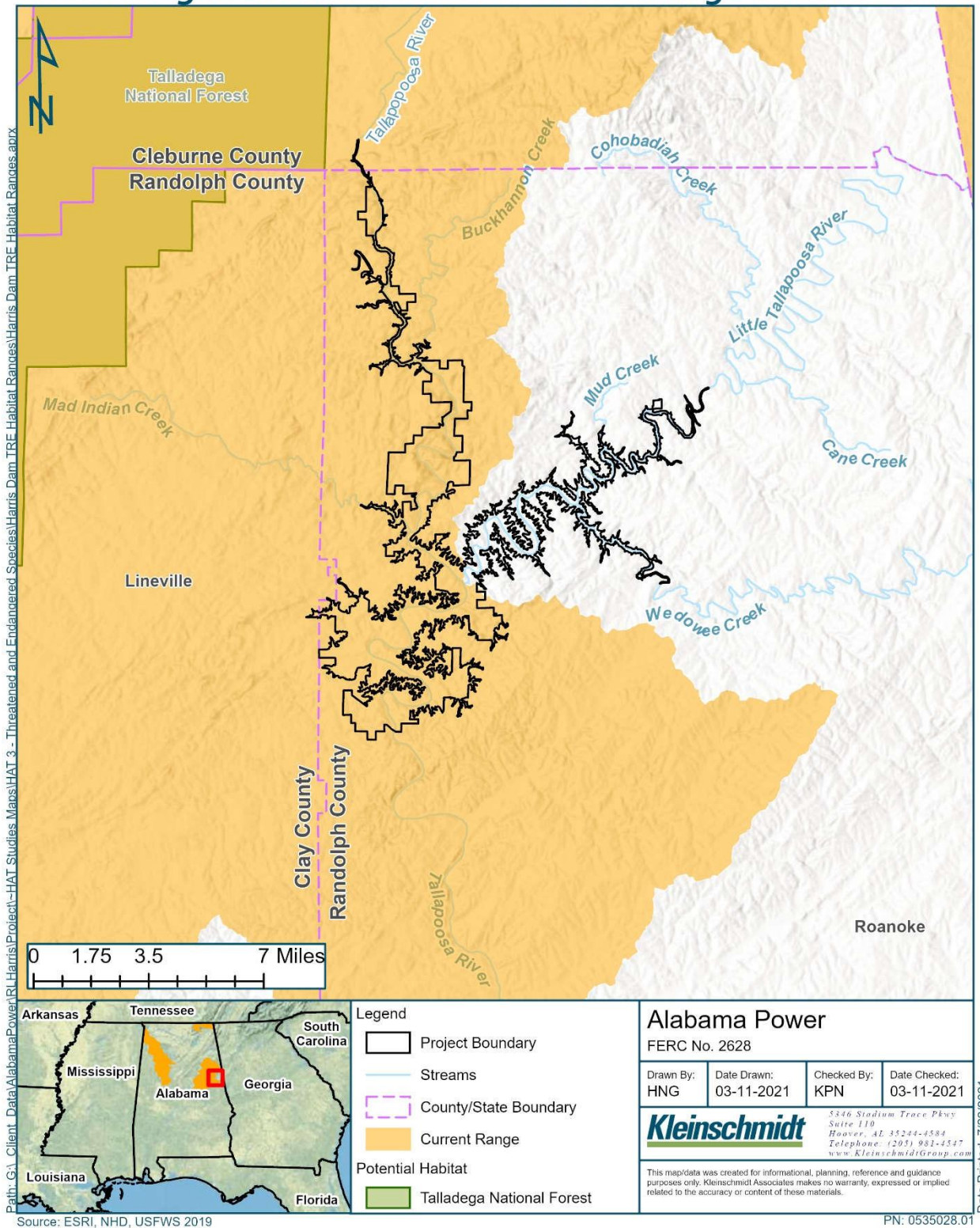


Figure 3.18-2

Price's Potato-bean Current Habitat Range at Skyline

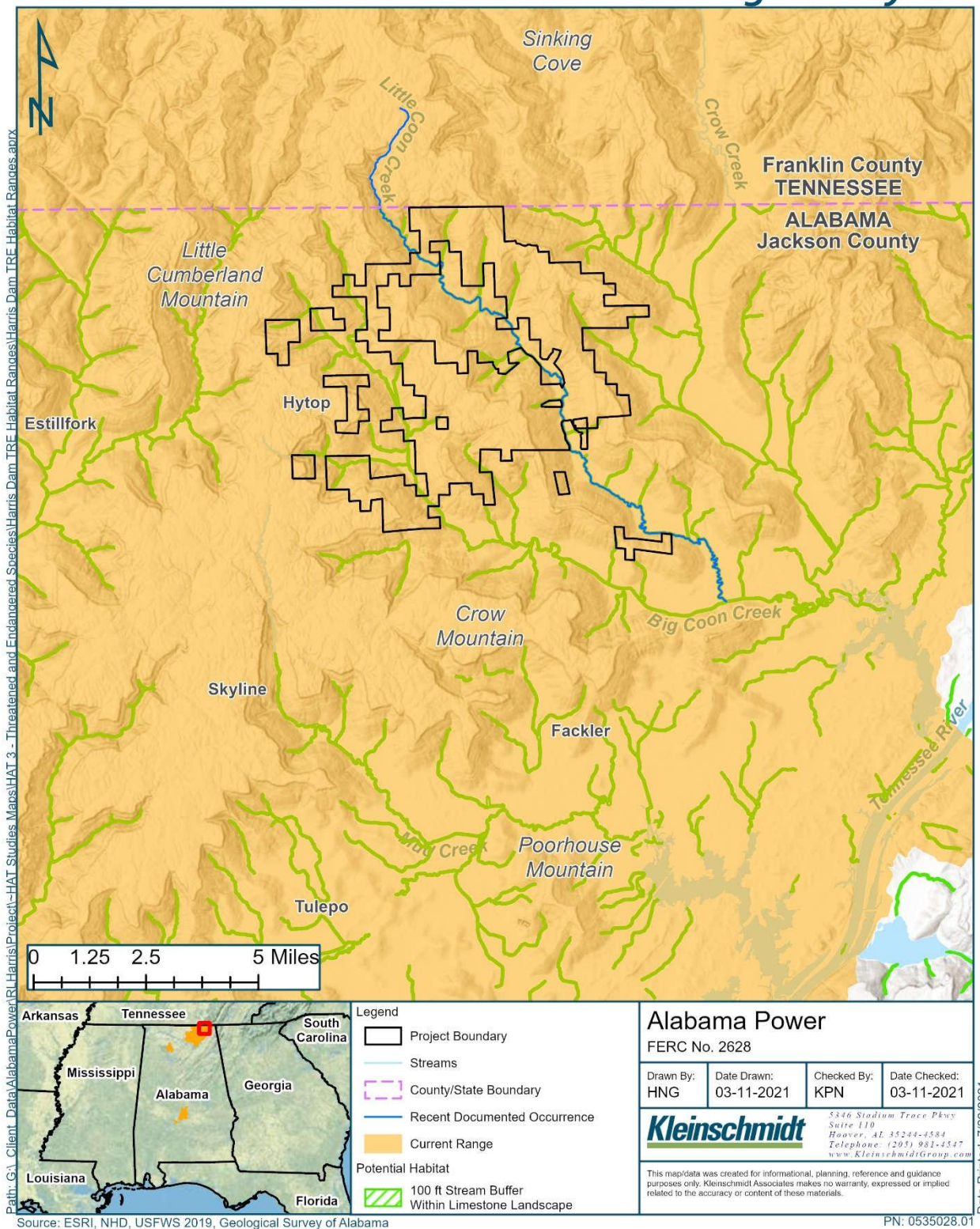


Figure 3.19-1

Morefield's Leather Flower Current Habitat Range at Skyline

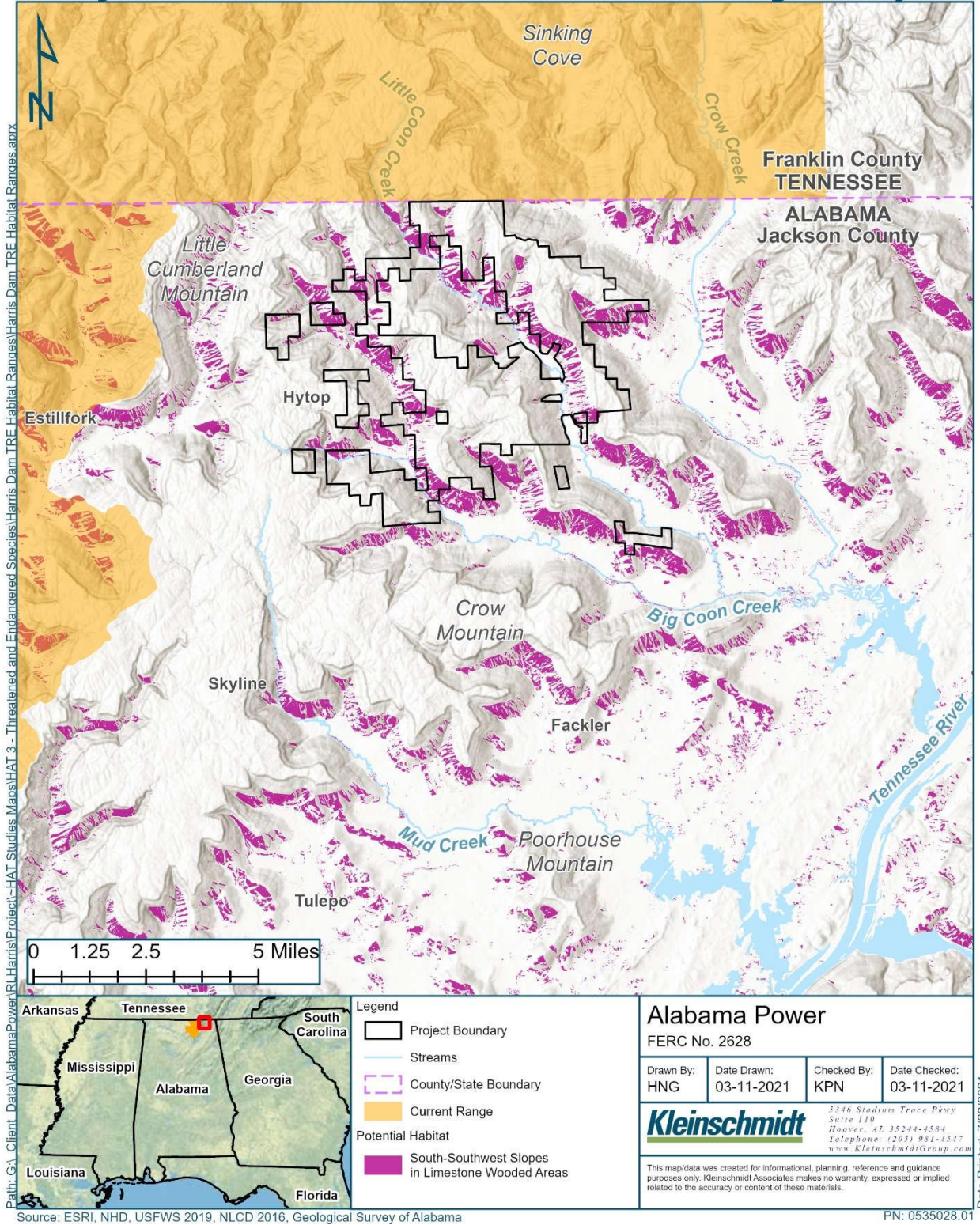


Figure 3.20-1

APPENDIX C

RED-COCKADED WOODPECKER (*PICOIDES BOREALIS*) HABITAT SURVEY REPORT

RED-COCKADED WOODPECKER (*PICOIDES BOREALIS*) HABITAT SURVEY REPORT

R.L. HARRIS HYDROELECTRIC PROJECT



Prepared by:

Alabama Power Company
and
Kleinschmidt Associates

October 2020



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1.0 INTRODUCTION

Alabama Power Company (Alabama Power) is the Federal Energy Regulatory Commission (FERC) licensee for the R.L. Harris Hydroelectric Project (Harris Project) (FERC No. 2628). On June 1, 2018, Alabama Power filed a Pre-Application Document and began the Integrated Licensing Process (ILP) for the Harris Project.

On November 13, 2018, Alabama Power filed ten proposed study plans for the Harris Project. FERC issued a Study Plan Determination on April 12, 2019, which included FERC staff recommendations. Alabama Power incorporated FERC's recommendations and filed the Final Study Plans with FERC on May 13, 2019. As part of phase one of the FERC-approved Threatened and Endangered Species Study Plan, Alabama Power conducted a desktop assessment of threatened and endangered species ([T&E Species Desktop Assessment \[harrisrelicensing.com\]](https://www.harrisrelicensing.com)). The desktop assessment includes a description and maps of the project, reviews of existing information, and maps depicting known ranges and habitat. While preparing the desktop assessment, Alabama Power determined it was unclear if some species or their suitable habitats occur within the Harris Project Boundary. Subsequently, Alabama Power requested guidance from the U.S. Fish and Wildlife Service (USFWS), the Alabama Department of Conservation and Natural Resources (ADCNR), and the Alabama Natural Heritage Program as to whether surveys for four species or assessments of habitat suitability are advised. A habitat suitability assessment was advised for the Red-cockaded Woodpecker (RCW) (*Picoides borealis*).

The RCW is a relatively small species with black and white feathers and can be distinguished from other woodpecker species by their large white cheek patches. Males and females have similar plumage and can be difficult to distinguish when they are adults. However, as juveniles, the male can be distinguished by the presence of a red crown patch. This patch persists into adulthood but can be hard to discern. The RCW was once commonly distributed across the south-eastern United States, but due to habitat degradation it is now more limited in distribution. This species requires older living pine for nesting. It also requires open mature pine woodlands maintained by frequent fire. Habitat loss through fire suppression is one of the major threats to the species.

Survey methods for RCW habitat were based on standard survey methods. This survey report describes the methods that Alabama Power used to assess the habitat of RCW in the study area.

2.0 METHODS

Alabama Power performed habitat assessments at six locations near the R.L. Harris Reservoir (Figure 2-1). GIS and aerial imagery were used to identify coniferous forest within the Project Boundary. All contiguous stands 60 acres or greater in size were selected for the habitat suitability assessment. Stand data, habitat descriptions included in the Red-cockaded Woodpecker Recovery Plan (USFWS 2003), and the surveyors' extensive experience with the species were used to make qualitative assessments of habitat suitability. Assessments of nesting and foraging habitat; including surveying for larger older longleaf pine with little or no hardwood midstory and overstory trees, were performed using a meandering survey across the entire survey area. Mature pines, where present, were viewed from all angles to detect potential signs of use by RCW. A general habitat description of the site was recorded.

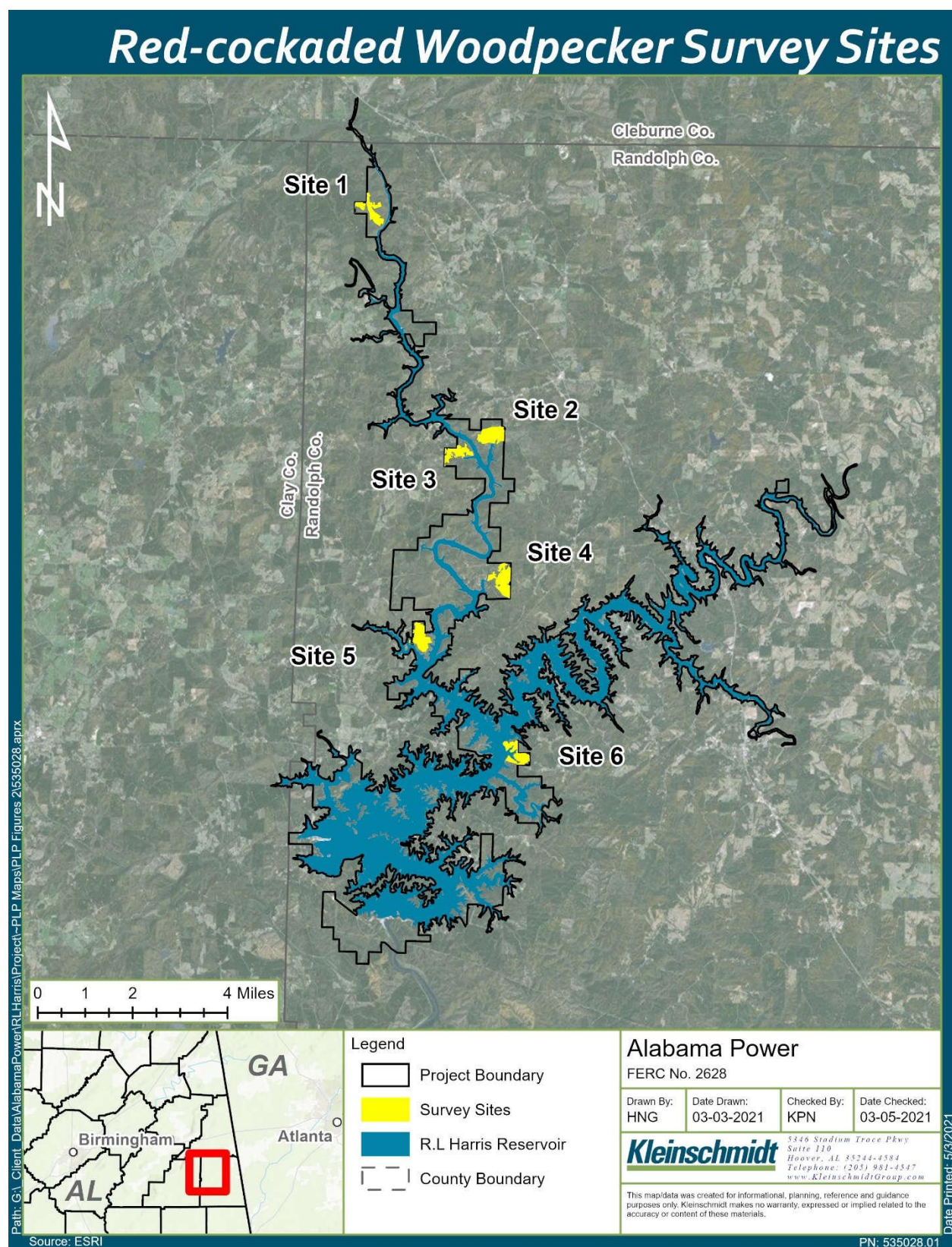


Figure 2-1 Harris RCW Habitat Survey Areas

3.0 RESULTS

Surveys were conducted on September 22, 2020. Sites 1, 3, and 6 were comprised of older pine (58-63 years) and were considered high priority search areas; however, suitable nesting habitat or foraging habitat was not identified at any of the sites. Table 3-1 shows the size and location of all sites. The following is a description of the results by site.

Table 3-1 Harris RCW Habitat Assessment Sites

Site Number	Site Size (acres)	Site Location	Habitat Suitability*
1	84	33.474752, -85.620624	U
2	105	33.407346, -85.574600	U
3	69	33.401295, -85.586397	U
4	116	33.364561, -85.574204	U
5	95	33.348224, -85.601981	U
6	85	33.307157, -85.563305	U

*Habitat Suitability: Suitable = S, marginal = M, unsuitable = U

3.1 Site 1

Site 1 was the most northerly occurring site and was a natural Loblolly Pine (*Pinus taeda*)/hardwood stand (Figure 3-1). Pine occurring on the site was approximately 63 years old with a 11" average diameter at breast height (dbh). It was identified as a priority search area based on the age of the stand. The site was characterized by a dense mix of hardwoods and Loblolly Pine. Dominant hardwoods in the tree stratum included White Oak (*Quercus alba*), hickory (*Carya* spp.), and Red Oak (*Quercus rubra*). Typical sapling species included Sourwood (*Oxydendrum arboreum*), Sweetgum (*Liquidambar styraciflua*), and Red Maple (*Acer rubrum*). Ground cover was dominated by Sparkleberry (*Vaccinium arboreum*), Highbush Blueberry (*Vaccinium corymbosum*), and Muscadine (*Vitis rotundifolia*). There was no discernible evidence of the area being maintained by fire and the dense vegetation was typical of a fire suppressed area. The habitat was not suitable for nesting or foraging by RCW.

3.2 Site 2

Site 2 was situated along the eastern side of the Tallapoosa stem of Harris Reservoir upstream of the confluence with the Little Tallapoosa river. It was a 17-year-old planted Loblolly Pine plantation with a dense stand of hardwoods mixed throughout (Figure 3-2).

Hardwoods in the tree stratum included Tulip Poplar (*Liriodendron tulipifera*), Sweetgum, and Red Maple. The sapling layer was comprised of Sweetgum, Red Maple, and Sparkleberry. Ground cover was dominated by Muscadine. There was no discernible evidence of the area being maintained by fire and the dense vegetation was typical of a fire suppressed area. The habitat was not suitable for nesting or foraging by RCW.

3.3 Site 3

Site 3 was immediately west of Site 2 and was an approximately 63-year-old natural Loblolly/Shortleaf Pine (*Pinus echinata*) stand (Figure 3-3). It was identified as a priority search area based on the age of the stand. However, there was a dense hardwood stand throughout the site. Hardwoods in the tree stratum include Southern Red Oak (*Quercus falcata*), Common Persimmon (*Diospyros virginiana*), Sourwood, and White Oak. The sapling layer was dominated by Red Maple, Water Oak (*Quercus nigra*), Southern Red Oak, and American Holly (*Ilex opaca*). The ground cover was comprised of Sparkleberry and Muscadine. There was no discernible evidence of the area being maintained by fire and the dense vegetation was typical of a fire suppressed area. The habitat was not suitable for nesting or foraging by RCW.

3.4 Site 4

Site 4 was a 29-year-old planted Loblolly Pine plantation with a dense understory of mixed hardwoods (Figure 3-4). Hardwoods included Sweetgum, Tulip Poplar, Red Maple, Common Persimmon, and Sourwood. Muscadine was common in the herb layer. There was no discernible evidence of the area being maintained by fire and the dense vegetation was typical of a fire suppressed area. The habitat was not suitable for nesting or foraging by RCW.

3.5 Site 5

Site 5 was a 28-year-old planted Loblolly Pine plantation with a dense hardwood understory predominately in the sapling stage (Figure 3-5). Hardwoods included Sweetgum, elm (*Ulmus spp.*), Chinese Privet (*Ligustrum sinense*), and Sourwood. Muscadine was the dominant ground cover. There was no discernible evidence of the area being maintained by fire and the dense vegetation was typical of a fire suppressed area. The habitat was not suitable for nesting or foraging by RCW.

3.6 Site 6

Site 6 was a natural Loblolly/Longleaf Pine (*Pinus palustris*) stand approximately 58 years old (Figure 3-6). It was identified as a priority search area based on the age of the stand. However, there was a dense hardwood stand mixed throughout the site. Hardwoods were common in both the tree and sapling layer and include Red Oak, hickory, Red Maple, and Tulip Poplar. Sparkleberry was common in the shrub layer and Muscadine was the most common ground cover. There was no discernible evidence of the area being maintained by fire and the dense vegetation is typical of a fire suppressed area. The habitat was not suitable for nesting or foraging by RCW.



Figure 3-1 Site 1: Natural Loblolly Pine Stand



Figure 3-2 Site 2: Planted Loblolly Pine Stand



Figure 3-3 Site 3: Natural Loblolly/Shortleaf Pine Stand



Figure 3-4 Site 4: Planted Loblolly Pine Stand



Figure 3-5 Site 5: Planted Loblolly Pine Stand



Figure 3-6 Site 6: Natural Loblolly/Long Leaf Pine Stand

4.0 SUMMARY AND CONCLUSIONS

A total of six sites were assessed for RCW habitat suitability. Although stand data used for site identification indicated areas that met habitat survey guideline criteria, foraging habitat was of marginal quality at best and very few standing snags were observed. Additionally, the thick understory would make utilization of the larger pines for foraging unlikely. The nearest known RCW occurrence is approximately 15 miles away, and there are no known nesting birds within the Project Boundary. It is unlikely that any of these birds would use the habitat along Harris for foraging. Furthermore, excavation of starter cavities or resin wells were not observed in any of the mature pine evaluated during this survey.

5.0 REFERENCES

U.S. Fish and Wildlife Service (USFWS). 2003. Recovery Plan for the Red-cockaded Woodpecker (*Picoides borealis*) Second Revision. U.S. Fish and Wildlife Service Southeast Region, Atlanta, GA.

APPENDIX D

PALEZONE SHINER (*NOTROPIS ALBIZONATUS*) SURVEY REPORT

PALEZONE SHINER (*NOTROPIS ALBIZONATUS*) SURVEY REPORT

R.L. HARRIS PROJECT

FERC No. 2628



Prepared by:

Alabama Power Company
and
Kleinschmidt Associates

July 2020



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1.0 INTRODUCTION

Alabama Power Company (Alabama Power) is the Federal Energy Regulatory Commission (FERC) licensee for the R.L. Harris Hydroelectric Project (Harris Project) (FERC No. 2628). On June 1, 2018, Alabama Power filed a Pre-Application Document and began the Integrated Licensing Process (ILP) for the Harris Project.

On November 13, 2018, Alabama Power filed ten proposed study plans for the Harris Project. FERC issued a Study Plan Determination on April 12, 2019, which included FERC staff recommendations. Alabama Power incorporated FERC's recommendations and filed the Final Study Plans with FERC on May 13, 2019. On August 27, 2019, the Harris Action Team (HAT) 3 met to discuss components of the Threatened and Endangered Species Study Plan. At that meeting, the U.S. Fish and Wildlife Service (USFWS) noted that Palezone Shiner (*Notropis albizonatus*), a federally endangered fish species, occurs in tributaries of the Tennessee River near the Project Boundary at Skyline in Jackson County, Alabama. The USFWS subsequently recommended that Alabama Power perform surveys to determine if Palezone Shiner occur within or near the Project Boundary in Little Coon Creek.

The Palezone Shiner is a small, slender minnow species with a pointed snout and large eyes. It has a small, dark, wedge-shaped spot at the base of the caudal fin and may exhibit a light yellow color at the base of its pectoral fins during breeding. Historically, this species was found in the Tennessee and Cumberland River systems; however, the only known extant populations occur in the Paint Rock River watershed (Tennessee River tributary), and the Little South Fork of the Cumberland River (ADCNR 2020). Palezone Shiner are found in runs and pools of large creeks and small rivers with clean bedrock, cobble, gravel, and sand. Spawning likely occurs between May and July, peaking in June.

This survey report describes the methods that Alabama Power used to assess the occurrence of Palezone Shiner in the study area.

2.0 METHODS

Alabama Power performed surveys at four locations on Little Coon Creek (Figure 2-1). Little Coon Creek flows into Big Coon Creek before entering the Tennessee River. The locations were selected based on accessibility, proximity to the Project Boundary at Skyline, and proximity to locations at which the Alabama Department of Environmental Management (ADEM) performs periodic water quality and biota assessments.

Table 2-1 Palezone Shiner Survey Locations

Site Number	Miles Upstream of Mouth	Description
1	1.8	County Road 53
2	7.0	County Road 566
3	8.6	County Road 567
4	10.8	County Road 54

Surveyors from Alabama Power and ADEM performed fish Index of Biotic Integrity (IBI) sampling according to methods in O'Neil and Shepard (2010). Sites were sampled by backpack electrofishing and seining and stratified over riffle, run, pool, and shoreline habitats. Ten sampling efforts were expended proportionally in each of the riffle, run, and pool habitat types and two efforts were expended along stream shorelines. All captured fish were identified to species and released.

Palezone Shiner Survey Locations

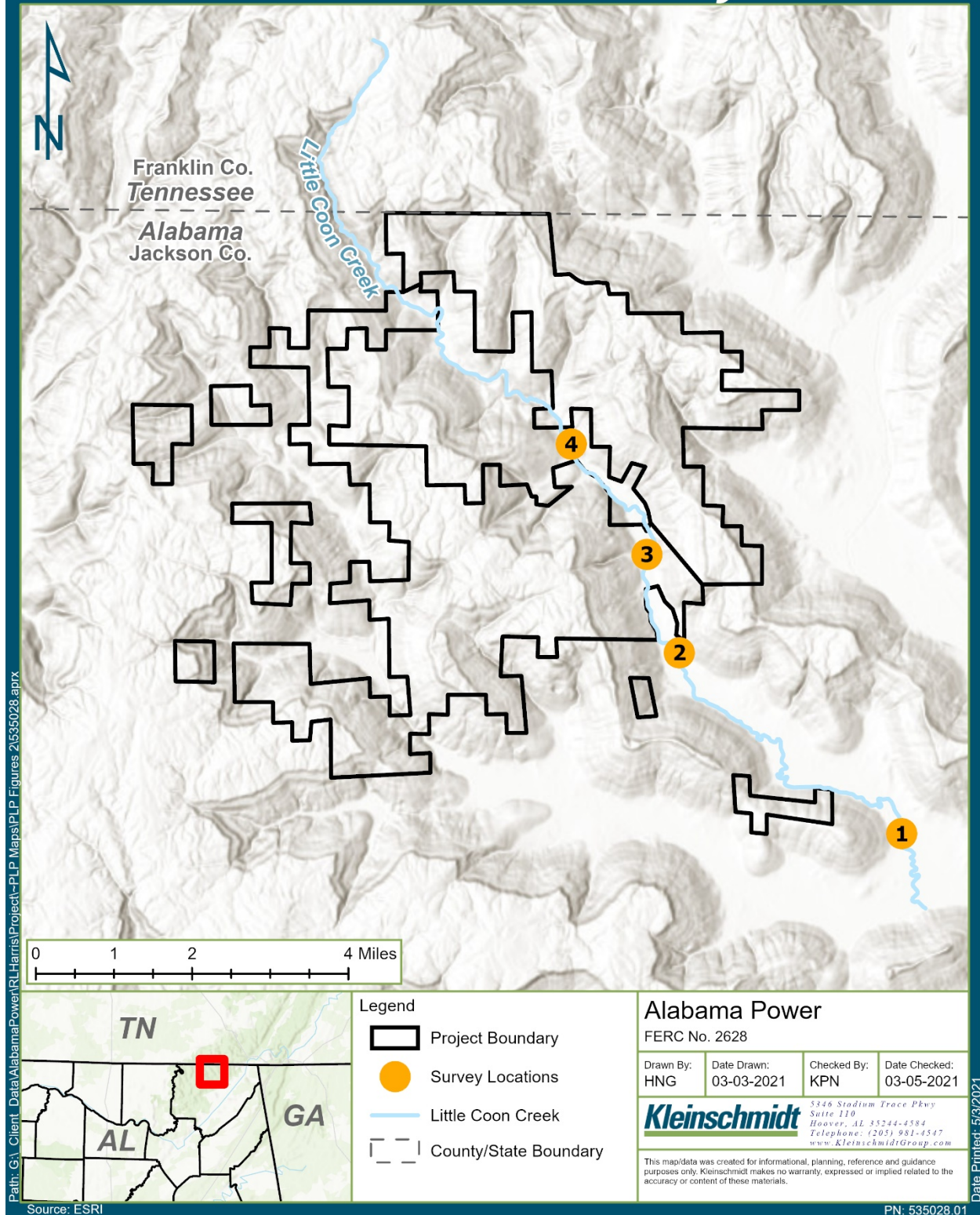


Figure 2-1 Palezone Shiner Survey Location Map

3.0 RESULTS

Surveys were conducted on June 10-11, 2020. No Palezone Shiners were collected or observed at any of the four survey sites. The following is a description of the results by site.

3.1 Site 1

Site 1, located downstream of the Skyline Management Area, has been channelized and was extremely turbid on the day of sampling. Loose, shifting, sand and silt was present across the entire channel. Sampling at this site was aborted due to extremely low catch rate and instream conditions. Furthermore, habitat is highly degraded at this site. However, Geological Survey of Alabama (GSA) does have historical sample records for this site and the Palezone Shiner has not been collected.

3.2 Site 2

Site 2 is very near the Project Boundary. Heavy siltation was observed throughout the sample reach at this site as well. The entire channel has been altered by severe siltation and sand deposits. A complete IBI sample, resulting in a “poor” score of 28, was performed but no Palezone Shiners were collected. A total of 15 species from seven families were collected. Banded Sculpin (*Cottus carolinae*) was the most commonly encountered species. Bluegill (*Lepomis macrochirus*) was the next most commonly encountered species at this site (Table 3-1). GSA also has records of historical sampling at this site, but Palezone Shiners have not been collected. Aerial imagery of the site indicated a relatively narrow riparian area between the stream and the surrounding pasture. Field observations confirmed this and the ADEM Physical Characterization Field Data Sheet indicated that the riparian zone scored in the marginal range (Appendix A).

3.3 Site 3

Site 3 was within the Project Boundary at Skyline. Substrate conditions were much improved at this site, but the fish community was similar to the degraded Site 2. A total of 16 species from six families were collected. Like Site 2, Banded Sculpin was the most commonly collected species. Other relatively common species included Striped Shiner (*Luxilus chrysocephalus*), Bluntnose Minnow (*Pimephales notatus*), and Bluegill. A complete fish IBI was performed, but Palezone Shiners were not collected. IBI scores for Site 3 resulted in a score of 26, putting it in the “very poor” range (Table 3-1). Like Site 2, aerial imagery of the site indicated a relatively narrow riparian area between the stream

and the surrounding pasture. Field observations confirmed this and the ADEM Physical Characterization Field Data Sheet indicated that the riparian zone scored in the sub-optimal range (Appendix A).

3.4 Site 4

Site 4 was narrow compared to downstream sample reaches and appeared to be more typical of a headwater stream. A complete IBI was not performed due to the low number of fish collected. Neither mollusks nor aquatic macroinvertebrates were observed at this site. This section of Little Coon Creek and sections upstream of this point may be intermittent, going seasonally dry in summer and/or fall.

Table 3-1 Adult Fishes Collected in Little Coon Creek

Scientific Name	Common Name	Site 2	Site 3	Totals
<i>Campostoma oligolepis</i>	Largescale Stoneroller	9	2	11
<i>Hemitremia flammea</i>	Flame Chub	5		5
<i>Luxilus chrysocephalus</i>	Striped Shiner	3	36	39
<i>Lythrurus fasciolaris</i>	Scarlet Shiner	1	12	13
<i>Pimephales notatus</i>	Bluntnose Minnow	4	24	28
<i>Rhinichthys atratulus</i>	Blacknose Dace	7	4	11
<i>Catostomus commersoni</i>	White Sucker		1	1
<i>Moxostoma erythrurum</i>	Golden Redhorse	1	1	2
<i>Ameiurus natalis</i>	Yellow Bullhead	1		1
<i>Fundulus olivaceus</i>	Blackspotted Topminnow	12	5	17
<i>Cottus carolinae</i>	Banded Sculpin	78	102	180
<i>Lepomis auratus</i>	Redbreast Sunfish		1	1
<i>Lepomis cyanellus</i>	Green Sunfish	2	6	8
<i>Lepomis gulosus</i>	Warmouth	1		1
<i>Lepomis macrochirus</i>	Bluegill	14	23	37
<i>Lepomis microlophus</i>	Redear Sunfish		1	1
<i>Etheostoma duryi</i>	Black Darter	2	12	14
<i>Perca flavescens</i>	Yellow Perch		1	1
<i>Percina kathae</i>	Mobile Logperch	1	3	4
Total		141	234	375
IBI Score		28	26	
IBI Range		Poor	Very Poor	

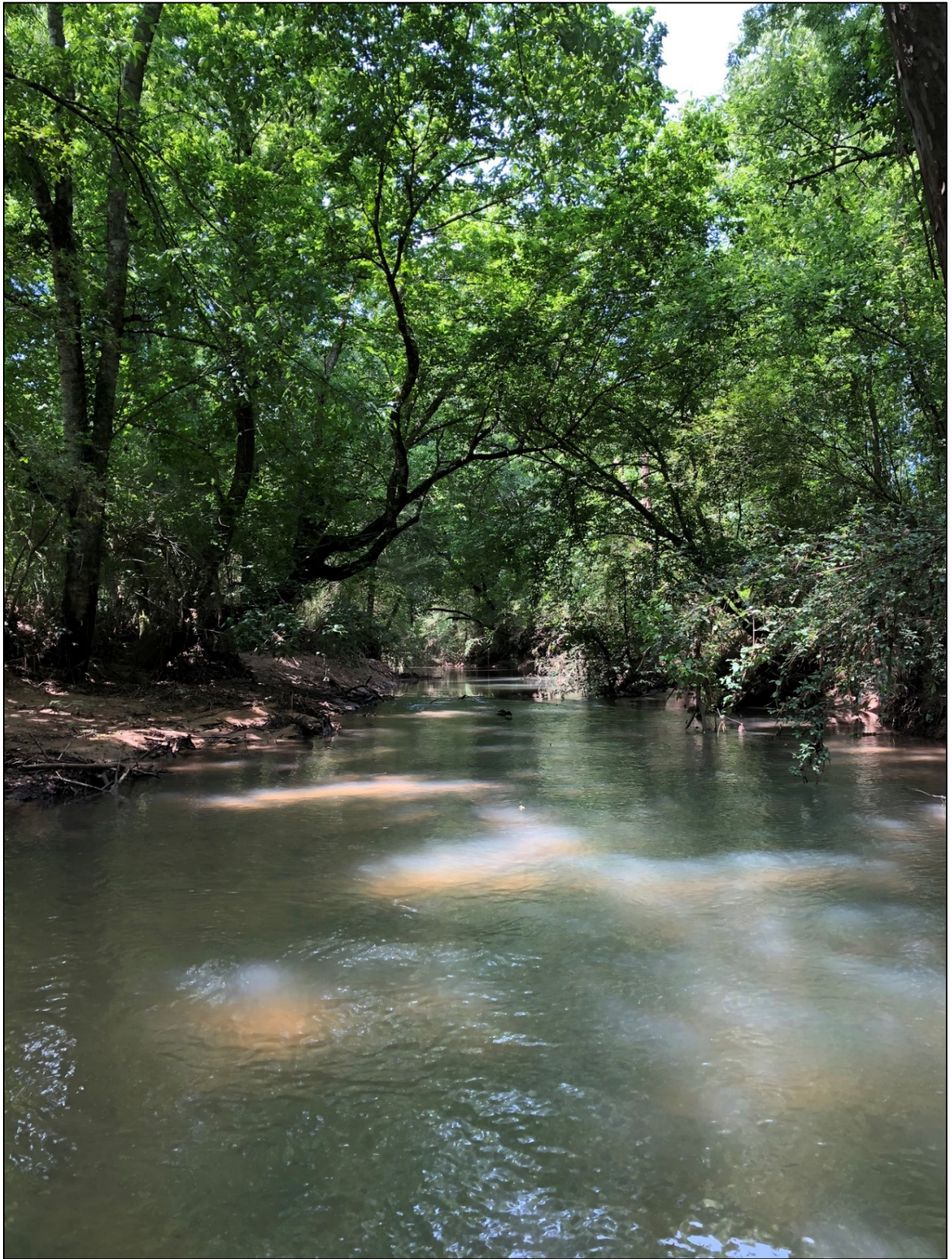


Figure 3-1 View Looking Upstream at Site 2



Figure 3-2 View Looking Downstream at Site 2



Figure 3-3 View Looking Upstream at Site 3



Figure 3-4 View Looking Downstream at Site 3



Figure 3-5 View Looking Upstream at Site 4



Figure 3-6 View Looking Downstream at Site 4

4.0 SUMMARY AND CONCLUSIONS

A total of 19 species, from seven families, were collected at sites 2 and 3. Banded Sculpin was by far the most commonly encountered species; followed by Striped Shiner, Bluegill, and Bluntnose Minnow. Much of the stream substrate in this section of Little Coon Creek is degraded. The surrounding land use and narrow riparian buffers likely contribute to the substrate conditions. Conditions improve as you move up the watershed, but the stream becomes more typical of a headwater stream and may be seasonally dry in areas. The absence of historical records for Palezone Shiner in Little Coon Creek, substrate conditions throughout much of the stream, and the failure to detect this species during this collection effort indicate that it is unlikely that the species occurs in Little Coon Creek.

5.0 REFERENCES

- Alabama Department of Conservation and Natural Resources (ADCNR). 2020. Palezone Shiner. Available at: <https://www.outdooralabama.com/shiners/palezone>. Accessed July 2, 2020.
- O'Neil, P.E. and T.E. Shepard. 2010. Calibration of the Index of Biotic Integrity for the Tennessee Valley Ichthyoregion in Alabama. Open-File Report 1004. Geological Survey of Alabama, Tuscaloosa, Alabama.

APPENDIX A

FIELD FORMS

FISH COMMUNITY IBI SURVEY FORM

Site Little Con Creek Cave Springs Rd/CR56 Date 6/10

Riffles	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Runs	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭	⑮
Pools	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭	⑮
Shorelines	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭	⑮
No fish	1	2	3	④	5	6	7	8	9	10	Time start <u>1200</u>				
				④	5	6	7	8	9	10	Time end <u>1320</u>				

Minimum of 10 run, 10 riffle, 10 pool and 2 shoreline efforts. An effort is approximately equal to one seine haul through a pool for about 25 feet with a 10 foot seine; or a riffle/run set with a 10 foot seine for about 15 to 20 feet upstream with shocker; a shoreline effort is 150 feet of shoreline sampled with shocker and dip nets. If habitat is poorly represented at a site, substitute other habitats to yield 30 efforts + minimum of two shoreline efforts.

	Species	
1	Banded Sculpin	☒ ☒ ☒ ☒ ☒ ☒ ☒ ☒ ☒
2	Large Scale Stoneworm	☒
3	Warmouth	.
4	Bluegill	☒ . .
5	Flame Chub	. .
6	Green Sunfish	. .
7	Black nosed dace	☒
8	Scarlet Shiner	.
9	Bluntnose minnow	. .
10	Striped Shiner	. .
11	Blackspotted Topminnow	☒ . .
12	Yellow Billhead	.
13	Black Darter	. .
14	Golden Redhorse	.
15	Logperch	.
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ADEM - FIELD OPERATIONS DIVISION
PHYSICAL CHARACTERIZATION FIELD DATA SHEET W/DATALOGGER IMPORT

Trip Name APCO HARBOR DAM MITIGATION PROJECT

Station # LITTLE CANOE CR 2 CAVE SPRINGS RD

Visit Date 10 Jun 2020

Visit Time 1200

Collector Names CS/APCO CREW - JB/DS/CF

Trip Comments:					
STATION VISIT COMMENTS (REACH DESCRIPTION)		(For COC Purposes: D.O =) <u>SEVERE SITUATION IMPAIRMENT - CORN COTTS AND CORN STALKS IN STREAM, NO RIFFLES PRESENT DUE TO LARGE SILT AND SAND DEPOSITS</u>			
ALAWADR/BIOWADR STATION VISIT ACTIVITIES (*ACTIVITY TIMES ONLY NEEDED IF DIFFERENT FROM STATION VISIT TIME)	Activity Time* (24hrs):		Replicate Time (24hrs):		Activity Conducted?
	<input checked="" type="checkbox"/> Field Form: Phys Char Form		<input type="checkbox"/> Rep 1		<input type="checkbox"/> Activity Not Conducted
	<input checked="" type="checkbox"/> Field Form: Substrate Composition & Habitat Assessment Form				<input type="checkbox"/> Activity Not Conducted
	<input type="checkbox"/> Datalogger Import		<input type="checkbox"/> Rep 1		<input type="checkbox"/> Activity Not Conducted
	<input type="checkbox"/> MB-I Inverts		<input type="checkbox"/> Rep 1		<input type="checkbox"/> Activity Not Conducted
	<input type="checkbox"/> Peri Chl a		<input type="checkbox"/> Rep 1		<input type="checkbox"/> Activity Not Conducted
	<input checked="" type="checkbox"/> Fish IBI		<input type="checkbox"/> Rep 1		<input type="checkbox"/> Activity Not Conducted
	If any activity is not conducted, Why? <input type="checkbox"/> No Flow <input type="checkbox"/> Intermittent Pools <input type="checkbox"/> Too Deep <input type="checkbox"/> Too Turbid <input type="checkbox"/> Dry Streambed <input type="checkbox"/> Equipment Malfunctioned <input type="checkbox"/> Inaccessible <input type="checkbox"/> Dangerous Flow <input type="checkbox"/> Dangerous Weather <input type="checkbox"/> Other: Note in Comments				
<input checked="" type="checkbox"/> Pictures Taken (Notes:)					
RIPARIAN LANDUSE & VEGETATION	Land use at Reach (Check all) <input type="checkbox"/> CAFO <input type="checkbox"/> Pasture <input type="checkbox"/> Fields <input type="checkbox"/> Industrial <input type="checkbox"/> Crops <input type="checkbox"/> Residential <input type="checkbox"/> Mixed Urban <input type="checkbox"/> Forest <input type="checkbox"/> Commercial <input type="checkbox"/> silviculture		Dominant Riparian Vegetation Present Select Only One <input checked="" type="checkbox"/> Trees <input type="checkbox"/> Herbaceous <input type="checkbox"/> Shrubs <input type="checkbox"/> Grasses		Canopy Cover: <input type="checkbox"/> Open 0-20% <input type="checkbox"/> Mostly Open 20-40% <input type="checkbox"/> Est 50/50 40-60% <input checked="" type="checkbox"/> Mostly Shaded 60-80% <input type="checkbox"/> Shaded 80-100% Type: <input checked="" type="checkbox"/> Deciduous <input type="checkbox"/> Coniferous <input type="checkbox"/> Mixed
	Stream Morphology Est. Reach Length <u>1200</u> ft Stream Width <u>35</u> ft Bank Height: High <u>6</u> ft Low <u>4</u> ft High Water Mark <u>10</u> ft Channelized? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		% of Total Reach (Must add up to 100%) Riffle Habitat <u>0</u> % Rootbank Habitat <u>5</u> % Rock/log Habitat <u>50</u> % CPOM Habitat <u>10</u> % Sand Habitat <u>30</u> % Macro Habitat <u>0</u> % Unsuitable Substrates <u>5</u> %		Stream Depth Riffle <u>0</u> ft Run <u>1.00</u> ft Pool <u>1.75</u> ft Proportion of Riffle <u>0</u> % Run <u>90</u> % Pool <u>10</u> %
AQUATIC VEGETATION	Total % of wetted reach with aquatic vegetation present <u>0</u> % For species list see plant guide of common species of AL				
	Dominant Vegetation Type: (Select only one) <input type="checkbox"/> Rooted Emergent <input type="checkbox"/> Rooted Submergent <input type="checkbox"/> Floating Algae <input type="checkbox"/> Rooted Floating <input type="checkbox"/> Attached Algae <input type="checkbox"/> Free Floating				
	(Optional) Type	% of Wetted Reach	Species	Type	% of Wetted Reach Species
	Rooted Emergent	____ %	_____	Attached Algae	____ % _____
Rooted Floating	____ %	_____	Floating Algae	____ % _____	
Rooted Submergent	____ %	_____	Free Floating	____ % _____	
SEDIMENT / SUBSTRATE	Sediment Odors (Select One) <input type="checkbox"/> None <input type="checkbox"/> Chemical <input type="checkbox"/> Sewage <input checked="" type="checkbox"/> Anaerobic <input type="checkbox"/> Petroleum <input type="checkbox"/> Fishy		Oils (Select One) <input checked="" type="checkbox"/> Absent <input type="checkbox"/> Moderate <input type="checkbox"/> Slight <input type="checkbox"/> Profuse		Deposits (Select One) <input type="checkbox"/> None <input type="checkbox"/> Paper Fiber <input checked="" type="checkbox"/> Silt <input type="checkbox"/> Sand <input type="checkbox"/> Gravel <input type="checkbox"/> Sawdust <input type="checkbox"/> Sludge <input type="checkbox"/> Coal Fines
	Looking at stones that are not deeply embedded, are the undersides black in color? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A				
WATER QUALITY INDICATORS	Water Odors (Select One) <input checked="" type="checkbox"/> Normal/None <input type="checkbox"/> Chemical <input type="checkbox"/> Raw Sewage <input type="checkbox"/> Treated Sewage <input type="checkbox"/> Fishy <input type="checkbox"/> Anaerobic <input type="checkbox"/> Petroleum		Surface Oils <input checked="" type="checkbox"/> None <input type="checkbox"/> Flecks <input type="checkbox"/> Sheen <input type="checkbox"/> Slick <input type="checkbox"/> Globbs		Water Color (Select One) <input type="checkbox"/> Clear/No Color <input type="checkbox"/> Grey <input type="checkbox"/> Green <input type="checkbox"/> Purple <input checked="" type="checkbox"/> Brown (Mud) <input type="checkbox"/> Red (Dye) <input type="checkbox"/> Chalky White <input type="checkbox"/> Blue <input type="checkbox"/> Lt. Tannic <input type="checkbox"/> Dk. Tannic
	Biological Indicators (Select all) <input type="checkbox"/> Mussels <input checked="" type="checkbox"/> Fish <input type="checkbox"/> Crayfish <input type="checkbox"/> Snails <input type="checkbox"/> Macroinvertebrates <input checked="" type="checkbox"/> Fresh Beaver Sticks				

**ADEM - FIELD OPERATIONS DIVISION
PHYSICAL CHARACTERIZATION FIELD DATA SHEET W/DATALOGGER IMPORT**

Trip Name FOD HABITAT SLM MITIGATION PROJECT Station # LETTLE CANYON 19-2 CAVE SPRINGS RJ
Visit Date 07/01/2020 Visit Time 1:00 Collector Names APCO/REU BJS/CT

Trip Comments:					
STATION VISIT COMMENTS (REACH DESCRIPTION)	(For COC Purposes: D.O =) <u>CLUGGE SITUATION INDICATOR - 20711-20735 AND 20741-20745</u>				
	<u>IN STREAM, NO REFLEES PRESENT DUE TO LARGE SILT AND SAND DEPOSITS</u>				
ALAWADR/BIOWADR STATION VISIT ACTIVITIES (*ACTIVITY TIMES ONLY NEEDED IF DIFFERENT FROM STATION VISIT TIME)	Activity Time* (24hrs):		Replicate Time (24hrs):		Activity Conducted?
	<input checked="" type="checkbox"/> Field Form: Phys Char Form		<input type="checkbox"/> Rep 1		<input type="checkbox"/> Activity Not Conducted
	<input checked="" type="checkbox"/> Field Form: Substrate Composition & Habitat Assessment Form				<input type="checkbox"/> Activity Not Conducted
	<input type="checkbox"/> Datalogger Import		<input type="checkbox"/> Rep 1		<input type="checkbox"/> Activity Not Conducted
	<input type="checkbox"/> MB-I Inverts		<input type="checkbox"/> Rep 1		<input type="checkbox"/> Activity Not Conducted
	<input type="checkbox"/> Peri Chl a		<input type="checkbox"/> Rep 1		<input type="checkbox"/> Activity Not Conducted
	<input checked="" type="checkbox"/> Fish IBI		<input type="checkbox"/> Rep 1		<input type="checkbox"/> Activity Not Conducted
	If any activity is not conducted, Why? <input type="checkbox"/> No Flow <input type="checkbox"/> Intermittent Pools <input type="checkbox"/> Too Deep <input type="checkbox"/> Too Turbid <input type="checkbox"/> Dry Streambed				
	<input type="checkbox"/> Equipment Malfunctioned <input type="checkbox"/> Inaccessible <input type="checkbox"/> Dangerous Flow <input type="checkbox"/> Dangerous Weather <input type="checkbox"/> Other: Note in Comments				
	<input checked="" type="checkbox"/> Pictures Taken (Notes:)				
RIPARIAN LANDUSE & VEGETATION	Land use at Reach (Check all)		Dominant Riparian Vegetation Present Select Only One		Canopy Cover:
	<input type="checkbox"/> Pasture <input type="checkbox"/> Fields <input type="checkbox"/> Crops <input type="checkbox"/> Residential <input type="checkbox"/> Forest <input type="checkbox"/> Commercial	<input type="checkbox"/> CAFO <input type="checkbox"/> Industrial <input type="checkbox"/> Mixed Urban <input type="checkbox"/> silviculture	<input checked="" type="checkbox"/> Trees <input type="checkbox"/> Herbaceous <input type="checkbox"/> Shrubs <input type="checkbox"/> Grasses	<input type="checkbox"/> Open 0-20% <input type="checkbox"/> Est 50/50 40-60% <input type="checkbox"/> Mostly Shaded 60-80% <input type="checkbox"/> Shaded 80-100%	Type: <input checked="" type="checkbox"/> Deciduous <input type="checkbox"/> Coniferous <input type="checkbox"/> Mixed
INSTREAM FEATURES	Stream Morphology Est.		% of Total Reach (Must add up to 100%)		Stream Depth
	Reach Length <u>200</u> ft		Riffle Habitat <u>0</u> %		Riffle <u>0</u> ft
	Stream Width <u>1.5</u> ft		Rootbank Habitat <u>5</u> %		Run <u>1.00</u> ft
	Bank Height: High <u>10</u> ft		Rock/log Habitat <u>50</u> %		Pool <u>1.75</u> ft
	Low <u>4</u> ft		CPOM Habitat <u>0</u> %		Proportion of
	High Water Mark <u>10</u> ft		Sand Habitat <u>30</u> %		Riffle <u>0</u> %
	Channelized? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Macro Habitat <u>2</u> %		Run <u>90</u> %
			Unsuitable Substrates <u>5</u> %		Pool <u>10</u> %
				Dam Present <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	Relation to Reach
				<input type="checkbox"/> Above <input type="checkbox"/> Below <input type="checkbox"/> Within	If Yes, Kind?
				Est. Gradient (Over 300ft)	<input type="checkbox"/> Beaver <input type="checkbox"/> Debris <input type="checkbox"/> Low-head <input type="checkbox"/> Mill <input type="checkbox"/> Culvert <input type="checkbox"/> Hydropower
				<input type="checkbox"/> Low <1ft <input type="checkbox"/> High >3ft <input type="checkbox"/> Moderate 1-3 ft	
AQUATIC VEGETATION	Total % of wetted reach with aquatic vegetation present <u>0</u> %		For species list see plant guide of common species of AL		
	Dominant Vegetation Type: (Select only one)		<input type="checkbox"/> Rooted Emergent <input type="checkbox"/> Rooted Submergent <input type="checkbox"/> Floating Algae		<input type="checkbox"/> Rooted Floating <input type="checkbox"/> Attached Algae <input type="checkbox"/> Free Floating
	(Optional) Type	% of Wetted Reach	Species	Type	% of Wetted Reach
	Rooted Emergent	%		Attached Algae	%
	Rooted Floating	%		Floating Algae	%
Rooted Submergent	%		Free Floating	%	
SEDIMENT / SUBSTRATE	Sediment Odors (Select One)		Oils (Select One)		Deposits (Select One)
	<input type="checkbox"/> None <input type="checkbox"/> Chemical <input type="checkbox"/> Sewage <input checked="" type="checkbox"/> Anaerobic <input type="checkbox"/> Petroleum <input type="checkbox"/> Fishy	<input checked="" type="checkbox"/> Absent <input type="checkbox"/> Moderate <input type="checkbox"/> Slight <input type="checkbox"/> Profuse	<input type="checkbox"/> None <input type="checkbox"/> Paper Fiber <input checked="" type="checkbox"/> Silt <input type="checkbox"/> Sand <input type="checkbox"/> Gravel <input type="checkbox"/> Sawdust <input type="checkbox"/> Sludge <input type="checkbox"/> Coal Fines	Looking at stones that are not deeply embedded, are the undersides black in color? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
WATER QUALITY INDICATORS	Water Odors (Select One)		Surface Oils		Water Color (Select One)
	<input checked="" type="checkbox"/> Normal/None <input type="checkbox"/> Chemical <input type="checkbox"/> Raw Sewage <input type="checkbox"/> Treated Sewage <input type="checkbox"/> Fishy <input type="checkbox"/> Anaerobic <input type="checkbox"/> Petroleum	<input checked="" type="checkbox"/> None <input type="checkbox"/> Flecks <input type="checkbox"/> Sheen <input type="checkbox"/> Slick <input type="checkbox"/> Globbs	<input type="checkbox"/> Clear/No Color <input type="checkbox"/> Grey <input type="checkbox"/> Green <input type="checkbox"/> Purple <input checked="" type="checkbox"/> Brown (Mud) <input type="checkbox"/> Red (Dye) <input type="checkbox"/> Chalky White <input type="checkbox"/> Blue <input type="checkbox"/> Lt. Tannic <input type="checkbox"/> Dk. Tannic	Biological Indicators (Select all)	
				<input type="checkbox"/> Mussels <input checked="" type="checkbox"/> Fish <input checked="" type="checkbox"/> Crayfish <input type="checkbox"/> Snails <input type="checkbox"/> Macroinvertebrates <input checked="" type="checkbox"/> Fresh Beaver Sticks	

Cave Spring Rd

VISIT OBSERVATIONS AND MEASUREMENTS

Was Flow Measured?	<input type="checkbox"/> Yes - ADEM: Abbrev Meter (cfs)	<input type="checkbox"/> No - Not wadeable (too deep)	<input checked="" type="checkbox"/> No - Not Required	<input type="checkbox"/> No - Meter Malfunctioned
	<input type="checkbox"/> Yes - USGS: Gauge (cfs)	<input type="checkbox"/> No - Flow conditions hazardous	<input type="checkbox"/> No - Flow not visible	<input type="checkbox"/> Data Collected but Lost or Corrupted
	<input type="checkbox"/> Yes - Facility (mgd)	<input type="checkbox"/> No - Visible but not measurable	<input type="checkbox"/> No - Braided/Swamp	
USGS Gage # or Flow--Meter #:		Flow (cfs) or (mgd):		

Now	Weather	Past 24 hrs	Flow Stage	Velocity	Parameter	Value	Replicate	Unit
<input type="checkbox"/>	Clear / Cloudless	<input type="checkbox"/>	<input type="checkbox"/> Flood (out of banks)	<input type="checkbox"/> Swift >3 ft / Sec	Datalogger Serial#		N/A	#
<input type="checkbox"/>	Partly Cloudy	<input checked="" type="checkbox"/>	<input type="checkbox"/> Above Normal	<input type="checkbox"/> Moderate 1.5 - 3 ft / Sec	Total Depth @ FM Pt			ft.
<input type="checkbox"/>	Mostly Cloudy	<input type="checkbox"/>	<input type="checkbox"/> Normal	<input type="checkbox"/> Slow <1.5 ft / Sec	Air Temp.		N/A	°C
<input type="checkbox"/>	Cloudy	<input type="checkbox"/>	<input type="checkbox"/> Low		Turbidity Meter #		N/A	#
<input type="checkbox"/>	Fog	<input type="checkbox"/>			Turbidity			NTU
<input type="checkbox"/>	Light Rain / Drizzle	<input type="checkbox"/>			Depth of Turbidity:	<input type="checkbox"/> Surface <input type="checkbox"/> Mid-Depth <input type="checkbox"/> _____ ft		
<input type="checkbox"/>	Rain	<input type="checkbox"/>	Heavy Rain in last 7 Days?					
<input type="checkbox"/>	Thunderstorms	<input type="checkbox"/>	<input type="checkbox"/> Yes <input type="checkbox"/> No					
<input type="checkbox"/>	Freezing Precipitation	<input type="checkbox"/>						

SUBSTRATE COMPOSITION & HABITAT ASSESSMENT FORM

Index To Use:
<input checked="" type="checkbox"/> High Gradient
<input type="checkbox"/> Low Gradient

Est. % Composition In Sampling Area

Type	Diameter	Percent	Stable
Bedrock		0	1/2
Hardpan Clay		0	1/2
Boulder	>10 in.	0	Yes
Cobble	2.5 - 10 in.	0	Yes
Gravel	0.1 - 2.5 in.	7	Yes
Sand	Gritty	33	
Silt		10	
Clay	Slick	5	
Detritus	Stick/Wood	35	Yes
	CPOM	10	
Muck	Fine Org.		
Total		100%	

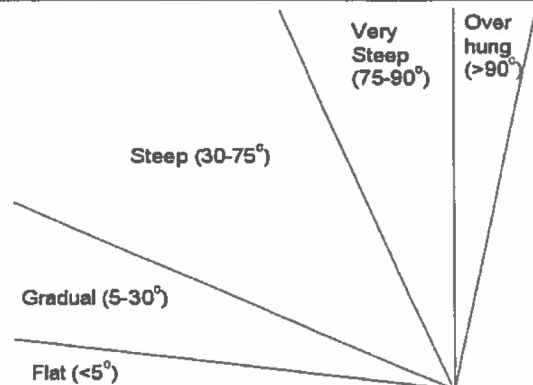
Collector 1				Collector 2			
Name of Collector		Score		Name of Collector		Score	
Riffle / Run HA		Score (LB/RB)	Score (LB/RB)	Glide / Pool HA		Score (LB/RB)	Score (LB/RB)
1	Instream Cover	12	1	1	Instream Cover		
2	Epifaunal surface	3	3	2	Pool Substrate Char.		
3	Embeddedness	5	2	3	Pool Variability		
4	Velocity/Depth	9	9	4	Channel Alteration		
5	Channel Alteration	12	13	5	Sediment Deposition		
6	Sediment Deposition	5	3	6	Channel Sinuosity		
7	Frequency of Riffles	2	2	7	Channel Flow Status		
8	Channel Flow Status	10	11	8	Condition of Banks		
9	Condition of Banks	9	7	9	Bank Veg. Protection	1	1
10	Bank Veg. Protection	7/7	7/7	10	Disruptive Pressure	1	1
11	Disruptive Pressure	2/2	2/2	11	Riparian Veg. Zone	1	1
12	Riparian Veg. zone	5/5	6/6	12	Rip Veg Zone Quality	1	1
13	Rip Veg Zone Quality	3/3	5/5				

Frequency of Riffles/ Bends (Distance between riffles/bends ÷ stream width)

Computer Measurement	<5	5	6	7	8	9	11	13	15	16	18	21	23	25	26	28	30	32	34	≥35
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Check One for each Bank:

Left Bank Angle	<input type="checkbox"/> Flat	<input type="checkbox"/> Gradual	<input type="checkbox"/> Steep	<input checked="" type="checkbox"/> Very Steep	<input type="checkbox"/> Overhung
Right Bank Angle	<input type="checkbox"/> Flat	<input type="checkbox"/> Gradual	<input type="checkbox"/> Steep	<input checked="" type="checkbox"/> Very Steep	<input type="checkbox"/> Overhung



VISIT OBSERVATIONS AND MEASUREMENTS

Was Flow Measured?	<input type="checkbox"/> Yes - ADEM: Abbrev Meter (cfs)	<input type="checkbox"/> No - Not wadeable (too deep)	<input checked="" type="checkbox"/> No - Not Required	<input type="checkbox"/> No - Meter Malfunctioned
	<input type="checkbox"/> Yes - USGS: Gauge (cfs)	<input type="checkbox"/> No - Flow conditions hazardous	<input type="checkbox"/> No - Flow not visible	<input type="checkbox"/> Data Collected but Lost or Corrupted
	<input type="checkbox"/> Yes - Facility (mgd)	<input type="checkbox"/> No - Visible but not measurable	<input type="checkbox"/> No - Braided/Swamp	
USGS Gage # or Flow--Meter #:		Flow (cfs) or (mgd):		

Now	Weather	Past 24 hrs	Flow Stage	Velocity	Parameter	Value	Replicate	Unit
<input type="checkbox"/>	Clear / Cloudless	<input type="checkbox"/>	<input type="checkbox"/> Flood (out of banks)	<input type="checkbox"/> Swift >3 ft / Sec	Datalogger Serial#		N/A	#
<input checked="" type="checkbox"/>	Partly Cloudy	<input checked="" type="checkbox"/>	<input type="checkbox"/> Above Normal	<input type="checkbox"/> Moderate 1.5 - 3 ft / Sec	Total Depth @ FM Pt			ft.
<input type="checkbox"/>	Mostly Cloudy	<input type="checkbox"/>	<input checked="" type="checkbox"/> Normal	<input checked="" type="checkbox"/> Slow <1.5 ft / Sec	Air Temp.		N/A	°C
<input type="checkbox"/>	Cloudy	<input type="checkbox"/>	<input type="checkbox"/> Low		Turbidity Meter #		N/A	#
<input type="checkbox"/>	Fog	<input type="checkbox"/>			Turbidity			NTU
<input type="checkbox"/>	Light Rain / Drizzle	<input type="checkbox"/>			Depth of Turbidity:	<input type="checkbox"/> Surface <input type="checkbox"/> Mid-Depth <input type="checkbox"/> _____ ft		
<input type="checkbox"/>	Rain	<input type="checkbox"/>	Heavy Rain in last 7 Days?					
<input type="checkbox"/>	Thunderstorms	<input type="checkbox"/>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					
<input type="checkbox"/>	Freezing Precipitation	<input type="checkbox"/>						

SUBSTRATE COMPOSITION & HABITAT ASSESSMENT FORM

Index To Use:
<input checked="" type="checkbox"/> High Gradient
<input type="checkbox"/> Low Gradient

Est. % Composition In Sampling Area

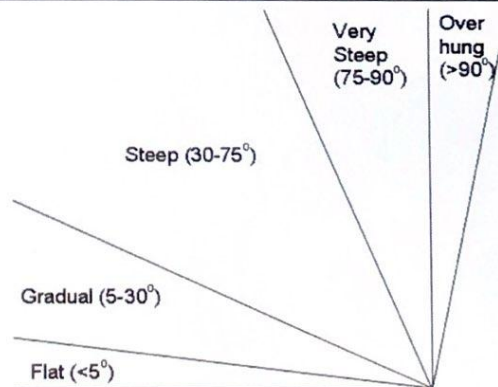
Type	Diameter	Percent	Stable
Bedrock		0	1/2
Hardpan Clay		0	1/2
Boulder	>10 in.	2	Yes
Cobble	2.5 - 10 in.	3	Yes
Gravel	0.1 - 2.5 in.	20	Yes
Sand	Gritty	30	
Silt		0	
Clay	Slick	5	
Detritus	Stick/Wood	30	Yes
	CPOM	10	
Muck	Fine Org.	0	
Total		100%	

		Collector 1		Collector 2		Collector 1		Collector 2	
Name of Collector		15		JB		Name of Collector			
Rifle / Run HA		Score (LB/RB)		Score (LB/RB)		Glide / Pool HA		Score (LB/RB)	
1	Instream Cover	17	17	17	17	1	Instream Cover		
2	Epifaunal surface	11	12	12	12	2	Pool Substrate Char.		
3	Embeddedness	16	16	16	16	3	Pool Variability		
4	Velocity/Depth	17	18	18	18	4	Channel Alteration		
5	Channel Alteration	15	15	15	15	5	Sediment Deposition		
6	Sediment Deposition	16	17	17	17	6	Channel Sinuosity		
7	Frequency of Riffles	8	7	7	7	7	Channel Flow Status		
8	Channel Flow Status	18	19	19	19	8	Condition of Banks		
9	Condition of Banks	13	14	14	14	9	Bank Veg. Protection	/	/
10	Bank Veg. Protection	8/6	9/7	9/7	9/7	10	Disruptive Pressure	/	/
11	Disruptive Pressure	9/9	9/9	9/9	9/9	11	Riparian Veg. Zone	/	/
12	Riparian Veg. zone	8/6	8/7	8/7	8/7	12	Rip Veg Zone Quality	/	/
13	Rip Veg Zone Quality	6/6	7/7	7/7	7/7				

Frequency of Riffles/ Bends (Distance between riffles/bends ÷ stream width)																				
Computer Measurement	<5	5	6	7	8	9	11	13	15	16	18	21	23	25	26	28	30	32	34	≥ 35

Check One for each Bank:

Left Bank Angle	<input type="checkbox"/> Flat	<input type="checkbox"/> Gradual	<input type="checkbox"/> Steep	<input checked="" type="checkbox"/> Very Steep	<input type="checkbox"/> Overhung
Right Bank Angle	<input type="checkbox"/> Flat	<input type="checkbox"/> Gradual	<input type="checkbox"/> Steep	<input checked="" type="checkbox"/> Very Steep	<input type="checkbox"/> Overhung



ADEM - FIELD OPERATIONS DIVISION
PHYSICAL CHARACTERIZATION FIELD DATA SHEET W/DATALOGGER IMPORT

Trip Name APCO HARRIS DAM RELENSING PROJECT

Station # LITTLE CANN CREEK 2 JACKSON CO HWY 56 ³⁶⁷

Visit Date 11 Jun 2020 Visit Time 930

Collector Names CS/APCO CREW JBS/DS/CF

Trip Comments:					
STATION VISIT COMMENTS (REACH DESCRIPTION) (For COC Purposes: D.O =) <u>BETTER HABITAT THAN DIS SAMPLE 2 CAVE SPRING</u> <u>LOW SILTATION, WORKED DIS OF BRIDGE AND FINISHED SAMPLE IN</u> <u>1 RIFFLE 0 BRIDGE</u>					
ALAWADR/ BIOWADR STATION VISIT ACTIVITIES (*ACTIVITY TIMES ONLY NEEDED IF DIFFERENT FROM STATION VISIT TIME)	Activity Time* (24hrs):		Replicate Time (24hrs):	Activity Conducted?	
	<input checked="" type="checkbox"/> Field Form: Phys Char Form		<input type="checkbox"/> Rep 1	<input type="checkbox"/> Activity Not Conducted	
	<input checked="" type="checkbox"/> Field Form: Substrate Composition & Habitat Assessment Form			<input type="checkbox"/> Activity Not Conducted	
	<input type="checkbox"/> Datalogger Import		<input type="checkbox"/> Rep 1	<input type="checkbox"/> Activity Not Conducted	
	<input type="checkbox"/> MB-I Inverts		<input type="checkbox"/> Rep 1	<input type="checkbox"/> Activity Not Conducted	
	<input type="checkbox"/> Peri Chl a		<input type="checkbox"/> Rep 1	<input type="checkbox"/> Activity Not Conducted	
	<input checked="" type="checkbox"/> Fish IBI		<input type="checkbox"/> Rep 1	<input type="checkbox"/> Activity Not Conducted	
	If any activity is not conducted, Why? <input type="checkbox"/> No Flow <input type="checkbox"/> Intermittent Pools <input type="checkbox"/> Too Deep <input type="checkbox"/> Too Turbid <input type="checkbox"/> Dry Streambed <input type="checkbox"/> Equipment Malfunctioned <input type="checkbox"/> Inaccessible <input type="checkbox"/> Dangerous Flow <input type="checkbox"/> Dangerous Weather <input type="checkbox"/> Other: Note in Comments				
<input checked="" type="checkbox"/> Pictures Taken (Notes:)					
RIPARIAN LANDUSE & VEGETATION	Land use at Reach (Check all) <input type="checkbox"/> CAFO <input type="checkbox"/> Industrial <input type="checkbox"/> Mixed Urban <input type="checkbox"/> silviculture		Dominant Riparian Vegetation Present Select Only One <input checked="" type="checkbox"/> Trees <input type="checkbox"/> Herbaceous <input type="checkbox"/> Shrubs <input type="checkbox"/> Grasses		Canopy Cover: <input type="checkbox"/> Open 0-20% <input type="checkbox"/> Est 50/50 40-60% <input type="checkbox"/> Mostly Open 20-40% <input type="checkbox"/> Shaded 80-100% <input checked="" type="checkbox"/> Mostly Shaded 60-80%
	<input checked="" type="checkbox"/> Pasture <input type="checkbox"/> Fields <input type="checkbox"/> Residential <input type="checkbox"/> Commercial				Type: <input checked="" type="checkbox"/> Deciduous <input type="checkbox"/> Coniferous <input type="checkbox"/> Mixed
	<input checked="" type="checkbox"/> Forest				
INSTREAM FEATURES	Stream Morphology Est.		% of Total Reach (Must add up to 100%)		Stream Depth
	Reach Length <u>1200</u> ft		Riffle Habitat <u>5</u> %		Riffle <u>.50</u> ft
	Stream Width <u>35</u> ft		Rootbank Habitat <u>7</u> %		Run <u>1.25</u> ft
	Bank Height: High <u>10</u> ft		Rock/log Habitat <u>53</u> %		Pool <u>1.75</u> ft
	Low <u>4</u> ft		CPOM Habitat <u>10</u> %		Proportion of
	High Water Mark <u>12</u> ft		Sand Habitat <u>20</u> %		Riffle <u>5</u> %
	Channelized? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Macro Habitat <u>3</u> %		Run <u>50</u> %
			Unsuitable Substrates <u>2</u> %		Pool <u>45</u> %
				Dam Present <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	
				Relation to Reach	
				<input type="checkbox"/> Above <input type="checkbox"/> Below <input type="checkbox"/> Within	
				Est. Gradient (Over 300ft) <input type="checkbox"/> Low <1ft <input type="checkbox"/> High >3ft <input checked="" type="checkbox"/> Moderate 1-3 ft	
				If Yes, Kind? <input type="checkbox"/> Beaver <input type="checkbox"/> Debris <input type="checkbox"/> Low-head <input type="checkbox"/> Mill <input type="checkbox"/> Culvert <input type="checkbox"/> Hydropower	
AQUATIC VEGETATION	Total % of wetted reach with aquatic vegetation present <u>3</u> %		For species list see plant guide of common species of AL		
	Dominant Vegetation Type: (Select only one) <input type="checkbox"/> Rooted Emergent <input type="checkbox"/> Rooted Submergent <input type="checkbox"/> Floating Algae <input checked="" type="checkbox"/> Rooted Floating <input type="checkbox"/> Attached Algae <input type="checkbox"/> Free Floating				
	(Optional) Type	% of Wetted Reach	Species	Type	% of Wetted Reach
	Rooted Emergent	___ %	___	Attached Algae	___ %
	Rooted Floating	___ %	___	Floating Algae	___ %
Rooted Submergent	___ %	___	Free Floating	___ %	
SEDIMENT / SUBSTRATE	Sediment Odors (Select One) <input checked="" type="checkbox"/> None <input type="checkbox"/> Chemical <input type="checkbox"/> Sewage <input type="checkbox"/> Anaerobic <input type="checkbox"/> Petroleum <input type="checkbox"/> Fishy		Oils (Select One) <input checked="" type="checkbox"/> Absent <input type="checkbox"/> Moderate <input type="checkbox"/> Slight <input type="checkbox"/> Profuse		Deposits (Select One) <input checked="" type="checkbox"/> None <input type="checkbox"/> Paper Fiber <input type="checkbox"/> Silt <input type="checkbox"/> Sand <input type="checkbox"/> Gravel <input type="checkbox"/> Sawdust <input type="checkbox"/> Sludge <input type="checkbox"/> Coal Fines
					Looking at stones that are not deeply embedded, are the undersides black in color? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
WATER QUALITY INDICATORS	Water Odors (Select One) <input checked="" type="checkbox"/> Normal/None <input type="checkbox"/> Chemical <input type="checkbox"/> Raw Sewage <input type="checkbox"/> Treated Sewage <input type="checkbox"/> Fishy <input type="checkbox"/> Anaerobic <input type="checkbox"/> Petroleum		Surface Oils <input checked="" type="checkbox"/> None <input type="checkbox"/> Flecks <input type="checkbox"/> Sheen <input type="checkbox"/> Slick <input type="checkbox"/> Globbs		Water Color (Select One) <input checked="" type="checkbox"/> Clear/No Color <input type="checkbox"/> Grey <input type="checkbox"/> Green <input type="checkbox"/> Purple <input type="checkbox"/> Brown (Mud) <input type="checkbox"/> Red (Dye) <input type="checkbox"/> Chalky White <input type="checkbox"/> Blue <input type="checkbox"/> Lt. Tannic <input type="checkbox"/> Dk. Tannic
					Biological Indicators (Select all) <input type="checkbox"/> Mussels <input checked="" type="checkbox"/> Fish <input checked="" type="checkbox"/> Crayfish <input type="checkbox"/> Snails <input checked="" type="checkbox"/> Macroinvertebrates <input type="checkbox"/> Fresh Beaver Sticks

ADEM - FIELD OPERATIONS DIVISION
PHYSICAL CHARACTERIZATION FIELD DATA SHEET W/DATALOGGER IMPORT

Trip Name APCO HARRIS DAM RELEASING PROJECT

Station # LITTLE CANN CREEK 2 JACKSON CO HARK:

Visit Date 11 Jun 2020 Visit Time 930

Collector Names CS/APCO CREW JB/MS/CF

Trip Comments:					
STATION VISIT COMMENTS (REACH DESCRIPTION)	(For COC Purposes: D.O =) <u>BETTER HABITAT THAN DIS SAMPLE @ CAVE SPRING</u>				
	<u>LOW SILTATION, WORKED DIS OF BRIDGE AND FINISHED SAMPLE IN A RIFFLE @ BRIDGE</u>				
ALAWADR/BIOWADR STATION VISIT ACTIVITIES (*ACTIVITY TIMES ONLY NEEDED IF DIFFERENT FROM STATION VISIT TIME)	Activity Time* (24hrs):		Replicate Time (24hrs):	Activity Conducted?	
	<input checked="" type="checkbox"/> Field Form: Phys Char Form		<input type="checkbox"/> Rep 1	<input type="checkbox"/> Activity Not Conducted	
	<input checked="" type="checkbox"/> Field Form: Substrate Composition & Habitat Assessment Form			<input type="checkbox"/> Activity Not Conducted	
	<input type="checkbox"/> Datalogger Import		<input type="checkbox"/> Rep 1	<input type="checkbox"/> Activity Not Conducted	
	<input type="checkbox"/> MB-I Inverts		<input type="checkbox"/> Rep 1	<input type="checkbox"/> Activity Not Conducted	
	<input type="checkbox"/> Peri Chl a		<input type="checkbox"/> Rep 1	<input type="checkbox"/> Activity Not Conducted	
	<input checked="" type="checkbox"/> Fish IBI		<input type="checkbox"/> Rep 1	<input type="checkbox"/> Activity Not Conducted	
	If any activity is not conducted, Why? <input type="checkbox"/> No Flow <input type="checkbox"/> Intermittent Pools <input type="checkbox"/> Too Deep <input type="checkbox"/> Too Turbid <input type="checkbox"/> Dry Streambed				
	<input type="checkbox"/> Equipment Malfunctioned <input type="checkbox"/> Inaccessible <input type="checkbox"/> Dangerous Flow <input type="checkbox"/> Dangerous Weather <input type="checkbox"/> Other: Note in Comments				
	<input checked="" type="checkbox"/> Pictures Taken (Notes:)				
RIPARIAN LANDUSE & VEGETATION	Land use at Reach (Check all) <input type="checkbox"/> CAFO <input type="checkbox"/> Industrial <input type="checkbox"/> Mixed Urban <input type="checkbox"/> silviculture		Dominant Riparian Vegetation Present Select Only One <input checked="" type="checkbox"/> Trees <input type="checkbox"/> Herbaceous <input type="checkbox"/> Shrubs <input type="checkbox"/> Grasses		Canopy Cover: <input type="checkbox"/> Open 0-20% <input type="checkbox"/> Est 50/50 40-60% <input type="checkbox"/> Shaded 80-100%
	<input checked="" type="checkbox"/> Pasture <input type="checkbox"/> Fields <input type="checkbox"/> Residential <input type="checkbox"/> Commercial				Type: <input checked="" type="checkbox"/> Deciduous <input type="checkbox"/> Coniferous <input type="checkbox"/> Mixed
INSTREAM FEATURES	Stream Morphology Est.		% of Total Reach (Must add up to 100%)		Stream Depth
	Reach Length <u>1200</u> ft		Riffle Habitat <u>5</u> %		Riffle <u>.50</u> ft
	Stream Width <u>35</u> ft		Roothank Habitat <u>7</u> %		Run <u>1.25</u> ft
	Bank Height: High <u>10</u> ft		Rock/log Habitat <u>53</u> %		Pool <u>1.75</u> ft
	Low <u>4</u> ft		CPOM Habitat <u>10</u> %		Proportion of
	High Water Mark <u>12</u> ft		Sand Habitat <u>20</u> %		Riffle <u>5</u> %
	Channelized? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Macro Habitat <u>3</u> %		Run <u>50</u> %
			Unsuitable Substrates <u>2</u> %		Pool <u>45</u> %
AQUATIC VEGETATION	Total % of wetted reach with aquatic vegetation present <u>3</u> %				
	For species list see plant guide of common species of AL				
	Dominant Vegetation Type: (Select only one) <input type="checkbox"/> Rooted Emergent <input type="checkbox"/> Rooted Submergent <input type="checkbox"/> Floating Algae <input checked="" type="checkbox"/> Rooted Floating <input type="checkbox"/> Attached Algae <input type="checkbox"/> Free Floating				
	(Optional) Type	% of Wetted Reach	Species	Type	% of Wetted Reach
	Rooted Emergent	%		Attached Algae	%
SEDIMENT / SUBSTRATE	Sediment Odors (Select One) <input checked="" type="checkbox"/> None <input type="checkbox"/> Chemical <input type="checkbox"/> Sewage <input type="checkbox"/> Anaerobic <input type="checkbox"/> Petroleum <input type="checkbox"/> Fishy		Oils (Select One) <input checked="" type="checkbox"/> Absent <input type="checkbox"/> Moderate <input type="checkbox"/> Slight <input type="checkbox"/> Profuse		Deposits (Select One) <input checked="" type="checkbox"/> None <input type="checkbox"/> Paper Fiber <input type="checkbox"/> Silt <input type="checkbox"/> Sand <input type="checkbox"/> Gravel <input type="checkbox"/> Sawdust <input type="checkbox"/> Sludge <input type="checkbox"/> Coal Fines
	Looking at stones that are not deeply embedded, are the undersides black in color? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A				
WATER QUALITY INDICATORS	Water Odors (Select One) <input checked="" type="checkbox"/> Normal/None <input type="checkbox"/> Chemical <input type="checkbox"/> Raw Sewage <input type="checkbox"/> Treated Sewage <input type="checkbox"/> Fishy <input type="checkbox"/> Anaerobic <input type="checkbox"/> Petroleum		Surface Oils <input checked="" type="checkbox"/> None <input type="checkbox"/> Flecks <input type="checkbox"/> Sheen <input type="checkbox"/> Slick <input type="checkbox"/> Globbs		Water Color (Select One) <input checked="" type="checkbox"/> Clear/No Color <input type="checkbox"/> Grey <input type="checkbox"/> Green <input type="checkbox"/> Purple <input type="checkbox"/> Brown (Mud) <input type="checkbox"/> Red (Dye) <input type="checkbox"/> Chalky White <input type="checkbox"/> Blue <input type="checkbox"/> Lt. Tannic <input type="checkbox"/> Dk. Tannic
	Biological Indicators (Select all) <input type="checkbox"/> Mussels <input checked="" type="checkbox"/> Fish <input checked="" type="checkbox"/> Crayfish <input type="checkbox"/> Snails <input checked="" type="checkbox"/> Macroinvertebrates <input type="checkbox"/> Fresh Beaver Sticks				

CR 567 VISIT OBSERVATIONS AND MEASUREMENTS

Was Flow Measured?	<input type="checkbox"/> Yes - ADEM: Abbrev Meter (cfs)	<input type="checkbox"/> No - Not wadeable (too deep)	<input checked="" type="checkbox"/> No - Not Required	<input type="checkbox"/> No - Meter Malfunctioned
	<input type="checkbox"/> Yes - USGS: Gauge (cfs)	<input type="checkbox"/> No - Flow conditions hazardous	<input type="checkbox"/> No - Flow not visible	<input type="checkbox"/> Data Collected but Lost or Corrupted
	<input type="checkbox"/> Yes - Facility (mgd)	<input type="checkbox"/> No - Visible but not measurable	<input type="checkbox"/> No - Braided/Swamp	
USGS Gage # or Flow-Meter #:		Flow (cfs) or (mgd):		

Now	Weather	Past 24 hrs	Flow Stage	Velocity	Parameter	Value	Replicate	Unit
<input type="checkbox"/>	Clear / Cloudless	<input type="checkbox"/>	<input type="checkbox"/> Flood (out of banks)	<input type="checkbox"/> Swift >3 ft / Sec	Datalogger Serial#		N/A	#
<input checked="" type="checkbox"/>	Partly Cloudy	<input checked="" type="checkbox"/>	<input type="checkbox"/> Above Normal	<input type="checkbox"/> Moderate 1.5 - 3 ft / Sec	Total Depth @ FM Pt			ft.
<input type="checkbox"/>	Mostly Cloudy	<input type="checkbox"/>	<input checked="" type="checkbox"/> Normal	<input checked="" type="checkbox"/> Slow <1.5 ft / Sec	Air Temp.		N/A	°C
<input type="checkbox"/>	Cloudy	<input type="checkbox"/>	<input type="checkbox"/> Low		Turbidity Meter #		N/A	#
<input type="checkbox"/>	Fog	<input type="checkbox"/>			Turbidity			NTU
<input type="checkbox"/>	Light Rain / Drizzle	<input type="checkbox"/>			Depth of Turbidity:	<input type="checkbox"/> Surface <input type="checkbox"/> Mid-Depth <input type="checkbox"/> _____ ft		
<input type="checkbox"/>	Rain	<input type="checkbox"/>	Heavy Rain in last 7 Days?					
<input type="checkbox"/>	Thunderstorms	<input type="checkbox"/>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					
<input type="checkbox"/>	Freezing Precipitation	<input type="checkbox"/>						

SUBSTRATE COMPOSITION & HABITAT ASSESSMENT FORM

Index To Use:

☒ High Gradient

☐ Low Gradient

Est. % Composition In Sampling Area

Type	Diameter	Percent	Stable
Bedrock		0	1/2
Hardpan Clay		0	1/2
Boulder	>10 in.	2	Yes
Cobble	2.5 - 10 in.	3	Yes
Gravel	0.1 - 2.5 in.	20	Yes
Sand	Gritty	30	
Silt		0	
Clay	Slick	5	
Detritus	Stick/Wood	30	Yes
	CPOM	10	
Muck	Fine Org.	0	
Total		100%	

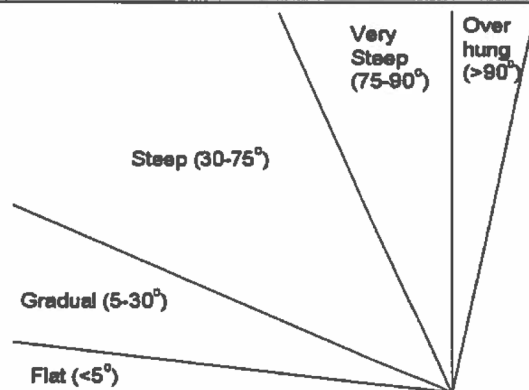
		Collector 1 Collector 2				Collector 1 Collector 2	
Name of Collector		Score (LB/RB)	Score (LB/RB)	Name of Collector		Score (LB/RB)	Score (LB/RB)
Rifle / Run HA				Glide / Pool HA			
1	Instream Cover	17	17	1	Instream Cover		
2	Epifaunal surface	11	12	2	Pool Substrate Char.		
3	Embeddedness	16	16	3	Pool Variability		
4	Velocity/Depth	17	18	4	Channel Alteration		
5	Channel Alteration	15	15	5	Sediment Deposition		
6	Sediment Deposition	16	17	6	Channel Sinuosity		
7	Frequency of Riffles	8	7	7	Channel Flow Status		
8	Channel Flow Status	18	19	8	Condition of Banks		
9	Condition of Banks	13	14	9	Bank Veg. Protection	/	/
10	Bank Veg. Protection	8/6	9/7	10	Disruptive Pressure	/	/
11	Disruptive Pressure	9/9	9/9	11	Riparian Veg. Zone	/	/
12	Riparian Veg. zone	8/6	8/7	12	Rip Veg Zone Quality	/	/
13	Rip Veg Zone Quality	6/10	7/7				

Frequency of Riffles/ Bends (Distance between riffles/bends + stream width)

Computer Measurement	<5	5	6	7	8	9	11	13	15	16	18	21	23	25	26	28	30	32	34	≥35
----------------------	----	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----	----	----	-----

Check One for each Bank:

Left Bank Angle	<input type="checkbox"/> Flat	<input type="checkbox"/> Gradual	<input type="checkbox"/> Steep	<input checked="" type="checkbox"/> Very Steep	<input type="checkbox"/> Overhung
Right Bank Angle	<input type="checkbox"/> Flat	<input type="checkbox"/> Gradual	<input type="checkbox"/> Steep	<input checked="" type="checkbox"/> Very Steep	<input type="checkbox"/> Overhung



APPENDIX E

FINELINED POCKETBOOK (*HAMIOTA ALTILIS*) SURVEY REPORT

FINELINED POCKETBOOK (*HAMIOTA ALTILIS*) SURVEY REPORT

R.L. HARRIS HYDROELECTRIC PROJECT

FERC No. 2628



Prepared by:

Alabama Power Company
and
Kleinschmidt Associates

October 2020



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1.0 INTRODUCTION

Alabama Power Company (Alabama Power) is the Federal Energy Regulatory Commission (FERC) licensee for the R.L. Harris Hydroelectric Project (Harris Project) (FERC No. 2628). On June 1, 2018, Alabama Power filed a Pre-Application Document and began the Integrated Licensing Process (ILP) for the Harris Project.

On November 13, 2018, Alabama Power filed ten proposed study plans for the Harris Project. FERC issued a Study Plan Determination on April 12, 2019, which included FERC staff recommendations. Alabama Power incorporated FERC's recommendations and filed the Final Study Plans with FERC on May 13, 2019. On August 27, 2019, the Harris Action Team (HAT) 3 met to discuss components of the Threatened and Endangered Species Study Plan. At that meeting, Alabama Rivers Alliance (ARA) asked if the June 2019 removal of the Howle and Turner Dam on the Tallapoosa River upstream of Lake Harris could affect critical habitat of the Finelined Pocketbook (*Hamiota altilis*). The U.S. Fish and Wildlife Service (USFWS) stated that some investigation could be warranted due to the proximity of Finelined Pocketbook's critical habitat to the Project Boundary, specifically noting an area near the Highway (Hwy) 431 bridge on the Tallapoosa River.

The Finelined Pocketbook mussel is a suboval shaped mussel that has a maximum length of approximately 3³/₈ inches (Mirarchi et al. 2004). This mussel lives in large to small streams in habitats above the fall line having stable sand/gravel/cobble substrates and moderate to swift currents. Historically, this mussel was found in the Alabama, Tombigbee, Black Warrior, Cahaba, Tallapoosa, and Coosa Rivers, and their tributaries (USFWS 2004). Regarding reproduction, the Finelined Pocketbook mussel releases glochidia as a super-conglutinate from March through June, and confirmed host species include Blackspotted Topminnow (*Fundulus olivaceus*), Redeye Bass (*Micropterus coosae*), Spotted Bass (*Micropterus punctulatus*), Largemouth Bass (*Micropterus salmoides*), and Green Sunfish (*Lepomis cyanellus*) (Mirarchi et al. 2004).

Survey methods for the Finelined Pocketbook were developed in consultation with USFWS. This survey report describes the methods that Alabama Power used to assess the occurrence of Finelined Pocketbook at the Harris Project.

2.0 METHODS

Suitable habitat for Finelined Pocketbook is more likely to be upstream of Lake Harris than in the reservoir itself, so Alabama Power performed surveys in the rivers and tributaries upstream of the reservoir. If specimens were found, surveys would continue downstream to determine if populations extended into the Harris Project. The rivers and tributaries surveyed were the mainstem Tallapoosa River and four of its tributaries (Carr Creek, Ketchepedrakee Creek, Little Ketchepedrakee Creek, and Mad Indian Creek) and the mainstem Little Tallapoosa River and one of its tributaries (Pineywood Creek) (Table 2-1). Little Ketchepedrakee Creek and Mad Indian Creek were selected for surveys during a reconnaissance trip on June 24, 2020. Additional tributaries accessed for suitability included Sandy Creek, Gobbler Creek, and Lost Creek, but they had either a narrow (10-15 feet) wetted channel or were heavily silted and were therefore not surveyed for mollusks.

Table 2-1 Finelined Pocketbook Survey Locations

Tributary	Site Number	Miles Upstream of Mouth*	Description
Tallapoosa River	1	4.6	Downstream of Co. Rd. 36 crossing to just downstream of Hwy 431 crossing
	2	4.4	
	3	4.2	
	4	4.0	
	5	3.3	
	6	0.7	
Carr Creek	1	0.1	Upstream of Tallapoosa River Site 6
Ketchepedrakee Creek	1	1.8	Upstream (Site 1) and downstream (Site 2) of Co. Rd. 201 crossing
	2	1.1	
Little Ketchepedrakee Creek	1	1.9	Downstream of Co. Rd. 313 crossing
Mad Indian Creek	1	3.1	Upstream of Co. Rd. 113 crossing
Little Tallapoosa River	1	3.2	Downstream of Co. Rd. 59 crossing to upstream of reservoir
	2	1.3	
	3	0.6	
	4	0.1	
Pineywood Creek	1	2.5	Co. Rd. 270 crossing (Site 1) and Hwy 431 crossing (Site 2)
	2	1.9	

*The mouths of the Tallapoosa River and Little Tallapoosa River in this table are where Lake Harris begins, at an elevation of 793 feet mean sea level.

Surveyors from Alabama Power and their representatives, Kleinschmidt Associates, the Alabama Department of Conservation and Natural Resources (ADCNR), and USFWS performed mussel surveys in areas with suitable habitat for Finelined Pocketbook. Viewing buckets and snorkeling equipment were used to search the substrate for mollusks for a minimum of one hour of qualitative effort unless site characteristics precluded this level of effort.

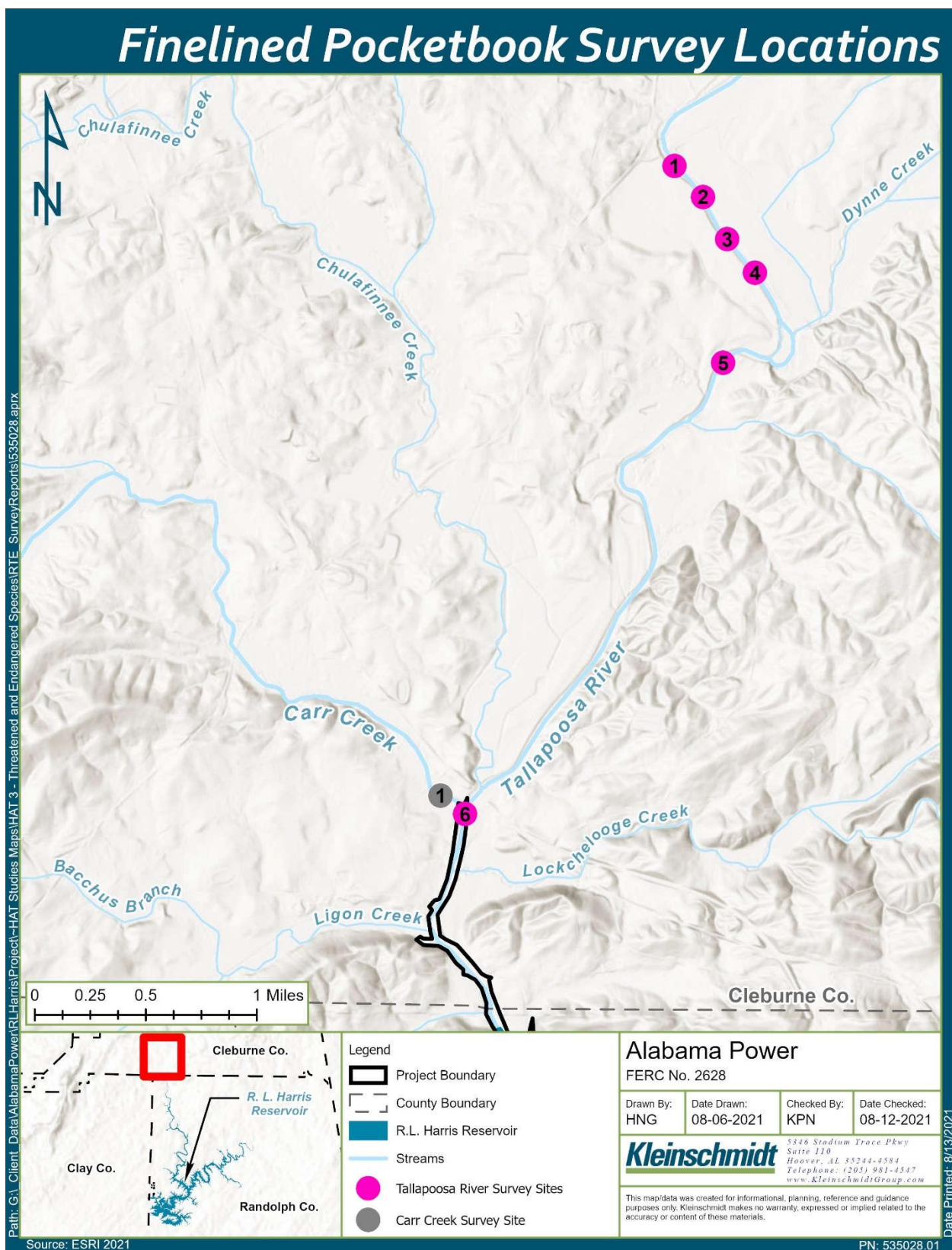


Figure 2-1 Tallapoosa River and Carr Creek Survey Sites

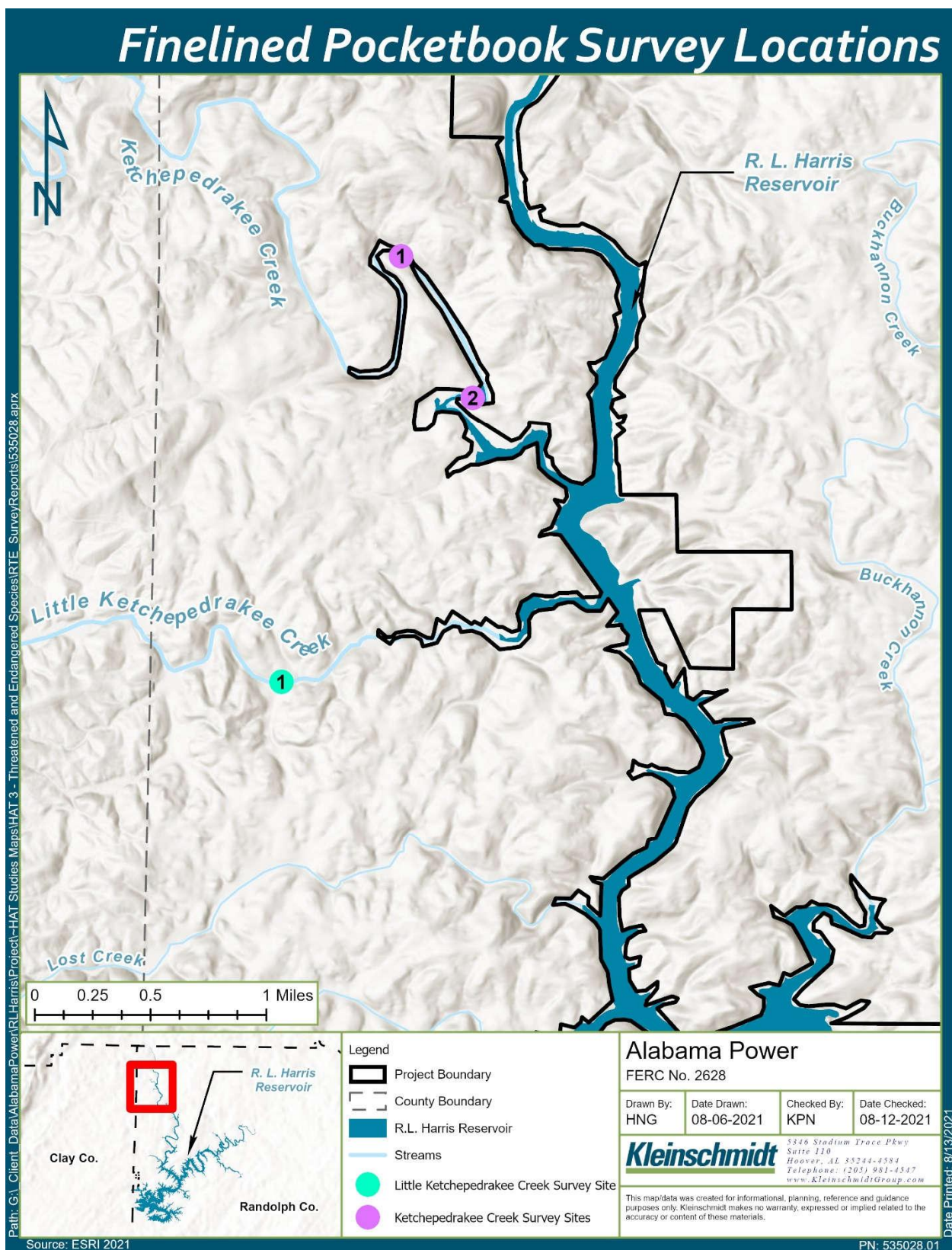


Figure 2-2 Ketchepedrakee Creek and Little Ketchepedrakee Creek Survey Sites

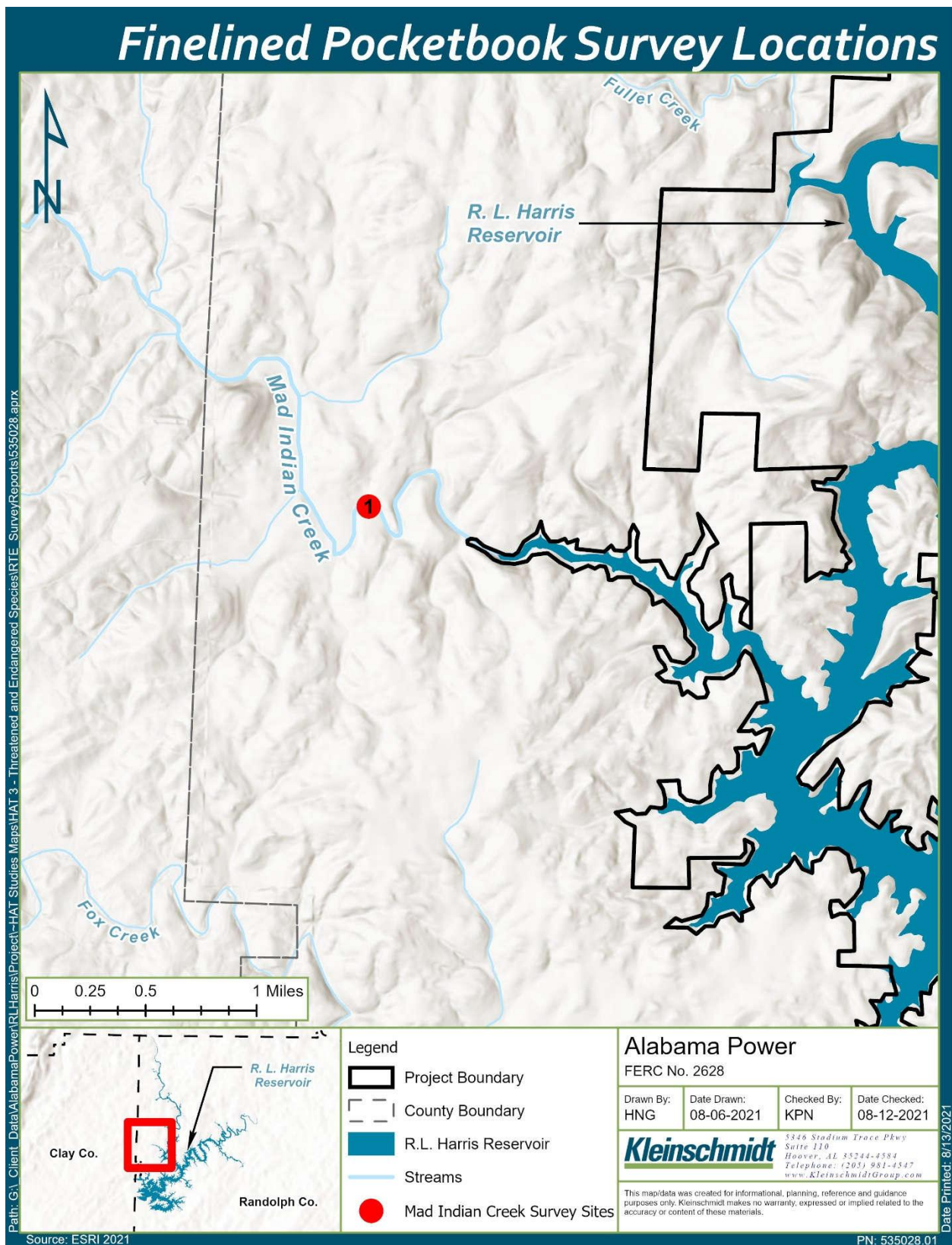


Figure 2-3 Mad Indian Creek Survey Site

Finelined Pocketbook Survey Locations

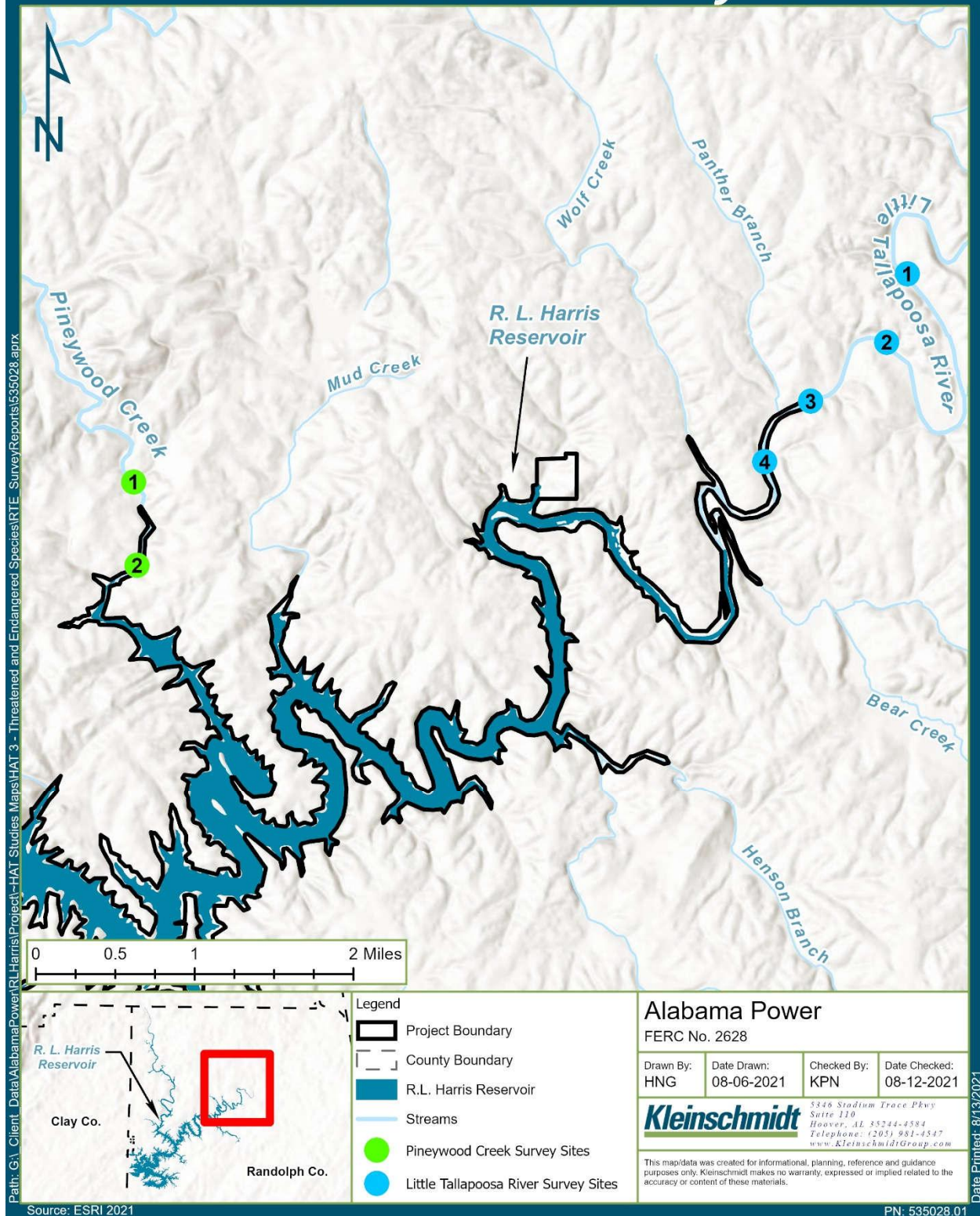


Figure 2-4 Little Tallapoosa River and Pineywood Creek Survey Sites

3.0 RESULTS

No Finelined Pocketbook specimens were collected or observed at any of the survey sites. The following is a description of the results by survey site.

3.1 Tallapoosa River

The Tallapoosa River was surveyed by Alabama Power and their representatives, Kleinschmidt Associates, and USFWS on November 21, 2019 and by Alabama Power and ADCNR on July 7, 2020, and August 12, 2020. Six sites were sampled for a minimum of 60 minutes total qualitative effort¹ each unless unfavorable conditions or available habitat warranted less sampling effort. Sites were numbered from upstream to downstream starting near the County Road (Co. Rd.) 36 bridge crossing and ending just downstream of the Hwy 431 bridge crossing. Sites 4 and 5 were identified as having the greatest potential for Finelined Pocketbook to occur and were surveyed for 120 minutes and 180 minutes, respectively. An additional site (Site 6) with suitable habitat downstream of Hwy 431 was surveyed for 60 minutes. Sites 4 and 5 were revisited on July 7 and August 12, 2020 and were surveyed for an additional 150 and 300 minutes, respectively; however, turbid conditions on July 7, 2020 made surveying difficult.

Site 1 was a shallow shoal with gravel and sand substrate just downstream of the Co. Rd. 36 bridge crossing. Site 1 was surveyed for a total of 120 minutes *Elimia* spp. and *Corbicula fluminea* (corbicula) were collected.

Site 2 was a one to two-foot run with a mixture of cobble, gravel, and sand as substrate. Site 2 was surveyed for a total of 120 minutes. *Elimia* spp. and corbicula were collected.

Site 3 was a deep run (3 feet) that was too deep to effectively sample or evaluate substrate. Sampling time was therefore reduced to 30 minutes and no specimens were collected.

Site 4 was a shallow channel-wide run comprised of loose sand and gravel with some embedded areas. Material has been deposited over bedrock. Site 4 was surveyed for a total of 270 minutes. *Elimia* spp. and corbicula were common.

Site 5 was a shallow riffle-run complex comprised of a mixture of gravel, cobble, and sand over bedrock. Some boulders were present in the area. Site 5 was surveyed for a total of

¹ Total qualitative effort is the aggregate amount of time expended by all surveyors in which specimens are collected or observed, but not enumerated.

480 minutes. One *Elliptio* sp. relic² and one live Little Spectaclecase (*Villosa lineosa*) were collected. *Elimia* spp. and corbicula were common.

Site 6 was a 2.5-foot run with a substrate of cobble and some sand. Site 6 was surveyed for a total of 60 minutes on November 21, 2020. Only corbicula relics were collected. On July 7, 2020, Carr Creek was surveyed instead of Site 6 due to more favorable water clarity.

3.2 Carr Creek

Carr Creek was surveyed by Alabama Power and ADCNR instead of Tallapoosa River Site 6 during the July 7, 2020 survey. Carr Creek enters the Tallapoosa River on the right descending bank just upstream of Tallapoosa River Site 6 and visibility was good compared to conditions in the mainstem Tallapoosa that day. The substrate was comprised of cobble and gravel with a fine layer of silt. Carr Creek was surveyed for a total of 200 minutes and a few live *Elimia* spp. and corbicula relics were collected.

3.3 Ketchepedrakee Creek

Ketchepedrakee Creek was surveyed by Alabama Power on June 24-25, 2020 at two sites.

Site 1 was a shallow riffle-run complex approximately 50 feet wide located upstream of the Co. Rd. 201 bridge crossing. Dominant substrate at the site was comprised of cobble and boulder with some sand. Water willow was common. Site 1 was surveyed for a total of 135 minutes. *Elimia* spp. and corbicula relics were collected.

Site 2 was an area along the margins of a small island downstream of the Co. Rd. 201 bridge crossing. The substrate was comprised of sand, silt, and gravel. Site 2 was surveyed for a total of 60 minutes. Only a single corbicula relic was collected at this site.

3.4 Little Ketchepedrakee Creek

Little Ketchepedrakee Creek was surveyed by Alabama Power on June 24-25, 2020. The survey site was located just downstream of the Co. Rd. 313 bridge crossing. The substrate was comprised of bedrock and boulder overlain with sand and silt and the area was predominately exposed rock. Little Ketchepedrakee Creek was sampled for a total of 60 minutes. A few live and relic corbicula were observed.

² For the purpose of this survey, a relic is defined as the remains of a mussel or clam, characterized by an empty shell or shell material, and ranging from fresh to weathered.

3.5 Mad Indian Creek

Mad Indian Creek was surveyed by Alabama Power on June 24-25, 2020. The survey site was located upstream of the Co. Rd. 113 bridge crossing. The area was a shallow run with a substrate comprised of a mixture of moderately stable gravel, sand, and silt. Mad Indian Creek was surveyed for a total of 60 minutes. Corbicula relics and approximately 30 live corbicula were collected.

3.6 Little Tallapoosa River

The Little Tallapoosa River was sampled by Alabama Power and ADCNR on July 21, 2020. Four sites were sampled for a minimum of 60 minutes total effort each and were numbered from upstream to downstream starting near the Co. Rd. 59 bridge crossing and ending just upstream of the summer pool elevation.

Site 1 was a shallow riffle-run complex with a substrate of cobble over bedrock. Water willow was common. Site 1 was surveyed for a total of 100 minutes. *Elimia* spp. and corbicula relics were common.

Site 2 was a shallow run with a substrate of gravel and some cobble overlain with silt and sand. Site 2 was surveyed for a total of 110 minutes. *Elimia* spp., corbicula relics, and one weathered Little Spectaclecase relic was observed.

Site 3 was a shallow run. The dominant substrate was cobble, gravel, and sand over bedrock. Site 3 was surveyed for a total of 125 minutes. *Elimia* spp. and corbicula relics were common and a single live *Toxolosama* sp. was collected.

Site 4 occurred just upstream of the summer pool elevation. The substrate was comprised of cobble, gravel, and sand with some boulder. Site 4 was surveyed for a total of 150 minutes. *Elimia* spp. and corbicula relics were common.

3.7 Pineywood Creek

Pineywood Creek, a tributary of the Little Tallapoosa River, was surveyed by Alabama Power on June 24, 2020. Survey sites were located at the Co. Rd. 270 and Hwy 431 bridge crossings.

Site 1 was located just downstream of the Co. Rd. 270 bridge crossing and was a riffle-run complex. Substrate was comprised of bedrock overlain with boulder and with some sand and silt. Site 1 was surveyed for a total of 90 minutes. Only corbicula relics were collected.

Site 2 was located immediately upstream of the Hwy 431 bridge crossing and was a shallow run terminating at an upstream riffle. Substrate was comprised of a layer of sand with small areas of gravel. Site 2 was sampled for a total of 90 minutes. Only corbicula relics were observed.

Table 3-1 Effort and Mollusk Species Collected at Each Survey Site

Tributary	Site Number	Total Effort (minutes)	Species
Tallapoosa River	1	120	<i>Elimia</i> spp., corbicula
	2	120	<i>Elimia</i> spp., corbicula
	3	30	None
	4	270	<i>Elimia</i> spp., corbicula
	5	480	<i>Elimia</i> spp., corbicula, <i>Ellipto</i> sp. (relic), Little Spectaclecase (<i>Villosa lineosa</i>)
	6	60	corbicula (relics)
Carr Creek	1	200	<i>Elimia</i> spp., corbicula (relics)
Ketchepedrakee Creek	1	135	<i>Elimia</i> spp., corbicula (relics)
	2	60	corbicula (relic)
Little Ketchepedrakee Creek	1	60	corbicula (live and relics)
Mad Indian Creek	1	60	corbicula (live and relics)
Little Tallapoosa River	1	100	<i>Elimia</i> spp., corbicula (relics)
	2	110	<i>Elimia</i> spp., corbicula (relics), Little Spectaclecase (relic)
	3	125	<i>Elimia</i> spp., corbicula (relics), <i>Toxolosama</i> sp.
	4	150	<i>Elimia</i> spp., corbicula (relics)
Pinewood Creek	1	90	corbicula (relics)
	2	90	corbicula (relics)



Figure 3-1 View Looking Upstream at Tallapoosa River Site 5



Figure 3-2 View Looking Downstream Tallapoosa River Site 5



Figure 3-3 Live *Villosa lienosa* from Tallapoosa River Site 5



Figure 3-4 View Looking Upstream at Carr Creek



Figure 3-5 View Looking Downstream at Carr Creek



Figure 3-6 View Looking Downstream at Ketchepedrakee Creek



Figure 3-7 Ketchepedrakee Creek



Figure 3-8 View Looking Upstream at Little Ketchepedrakee Creek



Figure 3-9 View Looking Downstream at Little Ketchepedrakee Creek



Figure 3-10 Surveying at Little Ketchepedrakee Creek



Figure 3-11 View Looking Upstream at Mad Indian Creek



Figure 3-12 View Looking Downstream at Mad Indian Creek



Figure 3-13 Mad Indian Creek



Figure 3-14 View Looking Downstream at Little Tallapoosa River Site 1



Figure 3-15 Little Tallapoosa River Site 2



Figure 3-16 View Looking Upstream at Little Tallapoosa River Site 2



Figure 3-17 View Looking Upstream at Little Tallapoosa River Site 3



Figure 3-18 Live *Toxolosma* spp. from Little Tallapoosa River Site 3



Figure 3-19 View Looking Downstream at Little Tallapoosa River Site 4



Figure 3-20 View Looking Upstream at Pineywood Creek Site 1



Figure 3-21 Pineywood Creek Site 2



Figure 3-22 View Looking Downstream at Pineywood Creek Site 2

4.0 SUMMARY AND CONCLUSIONS

Unionid diversity and density was very low at all sites surveyed. Finelined Pocketbook was not collected at any site. Although the stretch of the Tallapoosa River surveyed during this study has been designated as critical habitat, much of it has been degraded by siltation. Secondary tributaries surveyed also lacked suitable habitat. Most areas were either exposed bedrock or had been impacted by siltation. Mad Indian Creek exhibited the most suitable habitat of all secondary tributaries surveyed and this is where the greatest number of live corbicula were collected. The best available habitat surveyed occurred in the Little Tallapoosa River. However, only one live unionid, other than corbicula, was collected in a total of 485 minutes survey effort. Similarly, only one live unionid, other than corbicula, was collected in a total of 1,080 minutes survey effort in the Tallapoosa River. No Finelined Pocketbook were reported in previous surveys of the Tallapoosa River and tributaries immediately upstream of Lake Harris (Johnson 1997).

5.0 REFERENCES

- Johnson, J.A. 1997. The mussel, snail, and crayfish species of the Tallapoosa River drainage, with an assessment of their distribution in relation to chemical and physical habitat characteristics (Master's Thesis). Retrieved from Auburn University AUETD Database.
- Mirarchi, Ralph E., ed. 2004. Alabama Wildlife, Volume One. A Checklist of Vertebrates and Selected Invertebrates: Aquatic Mollusks, Fishes, Amphibians, Reptiles, Birds and Mammals. The University of Alabama Press, Tuscaloosa, AL.
- U.S. Fish and Wildlife Service (USFWS). 2004. Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for Three Threatened Mussels and Eight Endangered Mussels in the Mobile River Basin. Federal Register 69:40083-40171.

APPENDIX F

WHITE FRINGELESS ORCHID (*PLATANThERA INTEGRILABIA*) AND PRICE'S POTATO-BEAN (*APIOS PRICEANA*) SURVEY REPORT

WHITE FRINGELESS ORCHID (*PLATANThERA INTEGRILABIA*) & PRICE'S POTATO-BEAN (*APIOS PRICEANA*) SURVEY REPORT

R.L. HARRIS HYDROELECTRIC PROJECT
FERC No. 2628



Prepared by:

Alabama Power Company
and
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1.0 INTRODUCTION

Alabama Power Company (Alabama Power) is the Federal Energy Regulatory Commission (FERC) licensee for the R.L. Harris Hydroelectric Project (Harris Project or Project) (FERC No. 2628). On June 1, 2018, Alabama Power filed a Pre-Application Document and began the Integrated Licensing Process (ILP) for the Harris Project.

On November 13, 2018, Alabama Power filed ten proposed study plans for the Harris Project. FERC issued a Study Plan Determination on April 12, 2019, which included FERC staff recommendations. Alabama Power incorporated FERC's recommendations and filed the Final Study Plans with FERC on May 13, 2019. On August 27, 2019, the Harris Action Team (HAT) 3 (Fish & Wildlife) met to discuss components of the Threatened and Endangered Species Study Plan. At that meeting, the potential use of Geographic Information System (GIS) data (National Wetland Inventory data, specifically) was discussed to determine if habitat requirements of the White Fringeless Orchid (*Platanthera integrilabia*) align with potential habitat available within the Harris Project Boundary. However, the National Wetland Inventory data was found to not be detailed enough to identify wetlands containing the plant's unique habitat characteristics, so field surveys were used to determine whether White Fringeless Orchid was present within the Harris Project Boundary.

The White Fringeless Orchid is a slender, erect, perennial herb that grows in colonies. The fragrant, white flowers grow in loose, round to elongated, terminal clusters with 6 to 15 flowers in each cluster. The stem is light green, smooth, and can grow up to 3.6 inches. The orchid blooms from late July to early September with fruits maturing in October. The White Fringeless Orchid typically occurs in wet, flat, or boggy areas with acidic muck or sand. This plant prefers partially shaded areas at the head of streams or seepage slopes. Common herbaceous associates of White Fringeless Orchid include Cinnamon Fern (*Osmunda cinnamomea*), Netted Chain Fern (*Woodwardia areolata*), New York Fern (*Thelypteris novaboracensis*), and sphagnum moss (*Sphagnum* spp.) (Zettler and Fairey 1990 as cited in Federal Register 2015; Shea 1992 as cited in Federal Register 2015; Patrick 2012, personal communication, as cited in Federal Register 2015).

Alabama Power developed survey methods for the White Fringeless Orchid in consultation with the United States Fish and Wildlife Service (USFWS). This survey report describes the methods that Alabama Power used to assess the occurrence of the White Fringeless Orchid at the Harris Project.

A secondary objective during the White Fringeless Orchid surveys was to note the presence of Price's Potato-bean (*Apios priceana*) habitat or specimens within the Project Boundary at Skyline. Price's Potato-bean is a twining, herbaceous perennial vine that grows from a tuber and has greenish-white or brownish-pink flowers. This species is found in open, bottom areas near or along the banks of streams and rivers, sometimes near the base of limestone bluffs. Since publication of this species' recovery plan (USFWS 1993), many new populations have been discovered. Twenty of the 25 populations included in the recovery plan are still extant and apparently stable (USFWS 2016). According to the five-year review, there are currently 16 extant populations of Price's Potato-bean in Alabama distributed among nine counties: Autauga (2), Butler (1), Dallas (2), Jackson (2), Lawrence (1), Madison (5), Marshall (1), Monroe (1), and Wilcox (1). The populations in Jackson County occur on Sauta Cave National Wildlife Refuge and near Little Coon Creek in the Skyline Wildlife Management Area (WMA). One extant population intersects the Project Boundary at Skyline and comprises 11 percent of the extant population in Little Coon Creek; however, 89 percent of this one population occurs outside of the Project Boundary at Skyline.

The USFWS did not request that Alabama Power survey for Price's Potato-bean; however, a field survey was completed to document absence or presence near a known population. This survey report describes the methods that Alabama Power used to assess the occurrence of Price's Potato-bean at the Harris Project.

2.0 METHODS

2.1 White Fringeless Orchid

Wetlands were identified using the National Wetland Inventory map (USFWS 2020), springs were identified using a Geological Survey of Alabama spring shapefile database (Smith (in review)), and ponds were identified using aerial imagery and the National Wetland Inventory map (USFWS 2020). Surveys were performed in areas of potentially suitable habitat within and adjacent to the Project Boundaries at Lake Harris and Skyline. Surveyors from Alabama Power surveyed 12 sites at Lake Harris containing wetlands on August 27, 2020. Surveyors from Alabama Power and Kleinschmidt Associates surveyed eight sites at Skyline containing springs, ponds, or wetlands on September 2 and 3, 2020. A ninth site at Skyline (Site 9) was attempted, but the area was blocked by private property and did not contain suitable habitat, at least within the Project Boundary, upon closer inspection in the field (Table 2-1).

Table 2-1 White Fringeless Orchid Survey Locations

Survey Location	Site Number	Survey Date	Site Description	Habitat Suitability**
Lake Harris	1	8/27	forested/shrub wetland w/ TLROW*	M
	2	8/27	emergent wetland	U
	3	8/27	emergent wetland	U
	4	8/27	forested/shrub wetland	U
	5	8/27	forested/shrub wetland	U
	6	8/27	emergent wetland	U
	7	8/27	forested/shrub wetland	U
	8	8/27	emergent wetland	U
	9	8/27	emergent wetland	U
	10	8/27	emergent wetland	U
	11	8/27	forested/shrub wetland	U
	12	8/27	forested wetland	U
Skyline	1	9/2	spring	U
	2	9/2	pond	M
	3	9/2	spring	U
	4	9/2	spring	U
	5	9/2	pond	M
	6	9/2	pond	M
	7	9/3	pond	U
	8	9/3	pond	M
	9	9/3	forested wetland	U

*Transmission line right-of-way = TLROW

**Habitat Suitability: Suitable = S, marginal = M, unsuitable = U

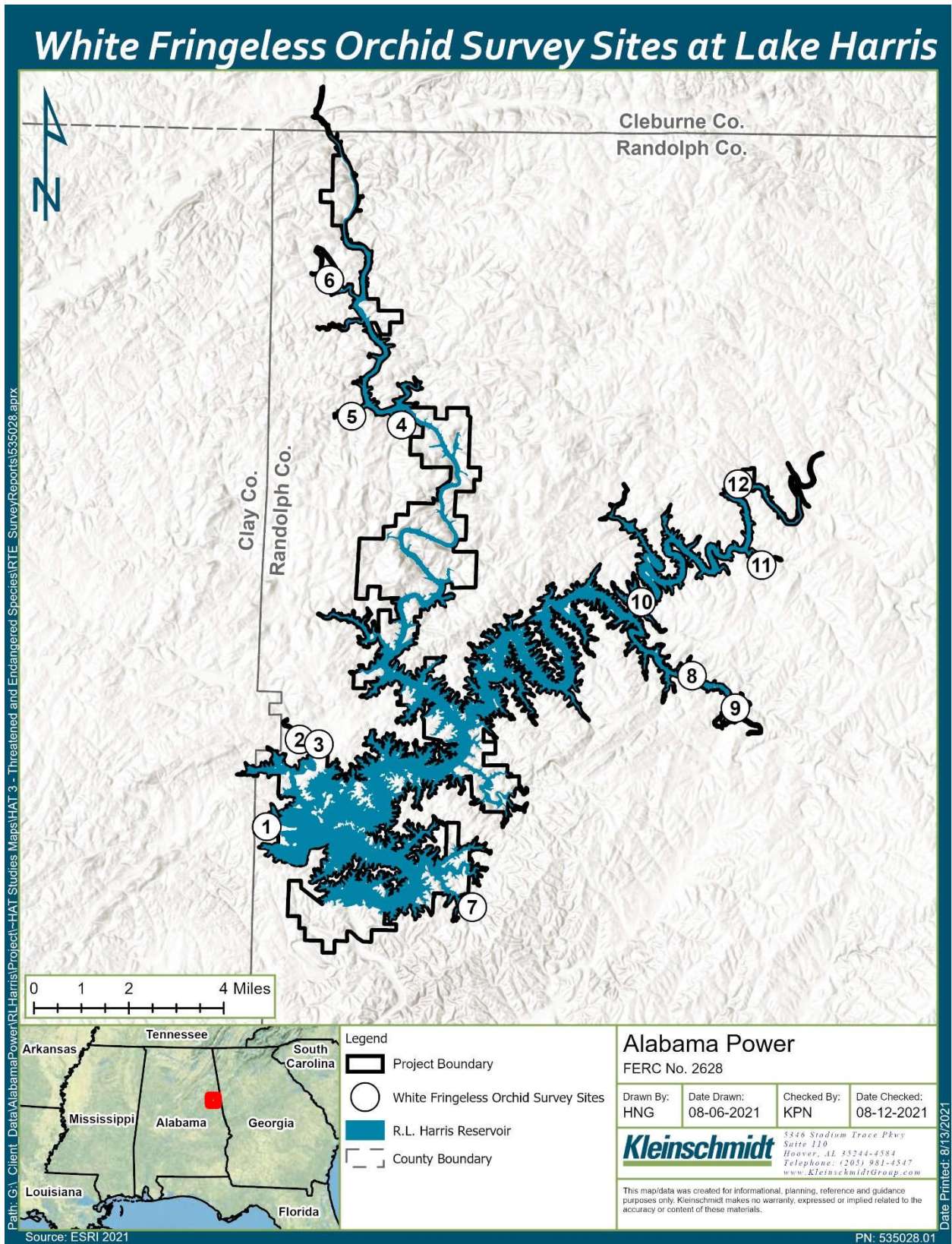


Figure 2-1 Lake Harris Survey Sites

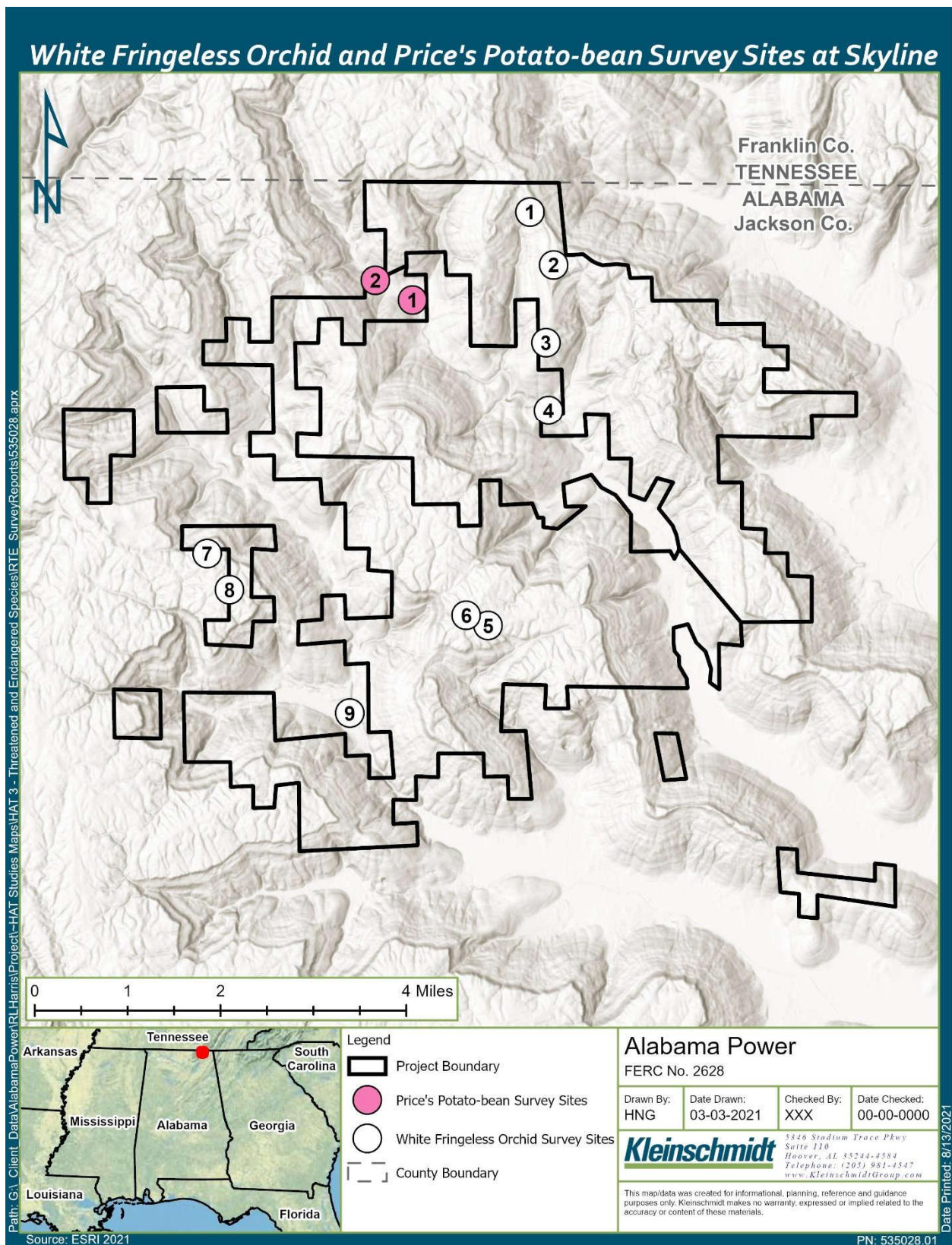


Figure 2-2 Skyline Survey Sites

2.2 Price's Potato-bean

A secondary objective during the White Fringeless Orchid surveys on September 2 and 3, 2020 was to make note of any Price's Potato-bean habitat or specimens within the Project Boundary while traveling between White Fringeless Orchid survey sites. On September 3, 2020, the four surveyors from Alabama Power and Kleinschmidt Associates searched for Price's Potato-bean for approximately 30 minutes at and in the proximity of the known population located within the Skyline WMA but outside of the Project Boundary. The plant prefers lightly disturbed areas, and the road and dry creek channel leading to the location of the known population meet this description.

On September 29, 2020, three surveyors from Alabama Power returned to Skyline to survey two sites with suitable habitat for Price's Potato-bean (Figure 2-2). Effort was expended in the best available habitat within the Project Boundary at Skyline nearest to the location of the known population.

3.0 RESULTS

3.1 White Fringeless Orchid

No White Fringeless Orchid specimens were collected or observed at any of the survey sites. The following describes the results by survey site.

3.1.1 Lake Harris

Site 1 was a freshwater forested/shrub area near a transmission line right-of-way (Figure 3-1). The southern end of the area had wetland vegetation dominated by Wingleaf Primrose-willow (*Ludwigia decurrens*), Swamp Smartweed (*Polygonum hydropiperoides*), Woolgrass (*Scirpus cyperinus*), Soft Rush (*Juncus effusus*), meadow beauty (*Rhexia* spp.), and Woolly Rosette-panicgrass (*Dichantherium scabriusculum*). Dan Spaulding (Anniston Museum of Natural History) had previously surveyed this area and found specimens of the Small Green Wood Orchid (*Platanthera clavellata*) approximately 0.25 miles from the site on July 26, 2020 (Figure 3-2) and adjacent to the transmission line right-of-way on August 23, 2020 (Figure 3-3) (D. Spaulding 2020, personal communication), but no specimens were found at the time of this survey. The Small Green Wood Orchid is known to occur along with the White Fringeless Orchid, but White Fringeless Orchid was not observed during the surveys performed by Dan Spaulding or Alabama Power. Habitat was marginal at this site, based on saturated soils observed underneath the transmission line right-of-way immediately adjacent to the reservoir. However, associates other than Small Green Wood Orchid were not observed.

Site 2 was a small freshwater emergent wetland with steep banks throughout the site. Bridge construction was underway on Hwy 48 at the time of the survey (Figure 3-4). The habitat was not suitable for White Fringeless Orchid.

Site 3 was a freshwater emergent wetland (Figure 3-5). The dominant vegetation was Soft Rush, Witchgrass (*Panicum capillare*), American Water-willow (*Justicia americana*), Buttonbush (*Cephalanthus occidentalis*), and meadow beauty. The habitat was not suitable for White Fringeless Orchid.

Site 4 was a freshwater forested/shrub wetland (Figure 3-6). Dominant trees were Water Oak (*Quercus nigra*) and Sweetgum (*Liquidambar styraciflua*). Dominant vegetation was Buttonbush, Soft Rush, American Water-willow, and Field Blackberry (*Rubus arvensis*). The habitat was not suitable for White Fringeless Orchid habitat.

Site 5 was a marginal freshwater forested/shrub wetland (Figure 3-7). Dominant trees were White Oak (*Quercus alba*), Water Oak, and Pignut Hickory (*Carya glabra*). Other dominant plants were Sparkleberry (*Vaccinium arboreum*) and Woodoats (*Chasmanthium latifolium*). The habitat was not suitable for White Fringeless Orchid.

Site 6 was a freshwater emergent wetland that was inundated at the time of the survey (Figure 3-8). Dominant trees were Smooth Alder (*Alnus serrulata*), Field Blackberry, American Hornbeam (*Carpinus caroliniana*), and American Sycamore (*Platanus occidentalis*). Other dominant plants were Giant Cane (*Arundinaria gigantea*), Woolgrass, Netted Chain Fern, and Muscadine (*Vitis rotundifolia*). The habitat was not suitable for White Fringeless Orchid.

Site 7 was a freshwater forested/shrub wetland (Figure 3-9). The habitat was mostly upland with wet depressions devoid of vegetation. The understory was dominated by azalea (*Rhododendron* spp.) with thick canopy cover overhead. There was a small drain present approximately 4 feet in width. The habitat was not suitable for White Fringeless Orchid.

Site 8 was a freshwater emergent wetland that was adjacent to residential lawns. The area was largely inundated and unsuitable for White Fringeless Orchid. No photos were taken of Site 8.

Site 9 was a freshwater emergent wetland adjacent to a corn field that was largely inundated with stagnant water (Figure 3-10). The majority of the site was typical inundated swamp habitat and was not accessible. The periphery of the inundated areas was assessed (Figure 3-11), and there were marginal fringe wetlands present. Wetland vegetation included meadow beauty, Cardinal Flower (*Lobelia cardinalis*), Giant Cane, dogwood (*Cornus* spp.), and Soft Rush. There was very little to no White Fringeless Orchid habitat.

Site 10 was a freshwater emergent wetland in a highly residential area. The lake level at full pool overlapped with upland hardwood forest (Figure 3-12). There were no wetland plants present and the habitat was not suitable for White Fringeless Orchid.

Site 11 was a freshwater forested/shrub wetland (Figure 3-13). There was a creek present with high banks and dense canopy cover throughout the area. A distribution line crossed a drain in the area near a greenfield adjacent to the site (Figure 3-14). Wetland vegetation was very limited and included meadow beauty, Woolly Rosette-panicgrass, Giant Cane,

and Giant Ironweed (*Veronia gigantea*). The habitat was not suitable for White Fringeless Orchid.

Site 12 was a freshwater forested wetland that was limited to the periphery of a large inundated area (Figures 3-15 and 3-16). The tributary creek had high banks with some wetland vegetation (Figure 3-17) but dense canopy cover throughout. The habitat was not suitable for White Fringeless Orchid.

3.1.2 Skyline

Site 1 was the headwaters of a spring-fed stream that led to a narrow flat area (Figure 3-18). The habitat was not boggy and consisted mostly of steep slopes. Vegetation was dominated by Water Hickory (*Carya aquatica*), Silver Maple (*Acer saccharinum*), White Oak, and Chestnut Oak (*Quercus montana*). The herbaceous layer was dominated by Longleaf Woodoats (*Chasmanthium sessiliflorum*). The habitat was not suitable for White Fringeless Orchid.

Site 2 was a freshwater pond that appeared to be part of a sink hole with no drains flowing into it (Figure 3-19). The canopy consisted of Sweetgum, Silver Maple, and various oaks. The shrub layer was dominated by Sassafras (*Sassafras albidum*) and Field Blackberry. The site was somewhat boggy and therefore considered marginal habitat for White Fringeless Orchid, but plants commonly associated with White Fringeless Orchid were absent.

Site 3 was a spring-fed drain with a wetland fringe (Figure 3-20). Dominant trees were Shagbark Hickory (*Carya ovata*), Water Oak, Swamp Chestnut Oak (*Quercus michauxii*), American Hornbeam, and Sweetgum. Other dominant plants were Sassafras and Longleaf Woodoats. The habitat was not suitable for White Fringeless Orchid.

Site 4 was a spring-fed tributary flowing into a high-velocity creek (Figures 3-21 and 3-22). The area was largely inundated at the time of the survey. The habitat consisted of slopes with boulders and was not boggy. Dominant trees were Tulip Poplar (*Liriodendron tulipifera*), Sweetgum, River Birch (*Betula nigra*), and persimmon (*Diospyros* spp.). The shrub layer was dominated by Christmas Fern (*Polystichum acrostichoides*) and common vine species included Poison Ivy (*Toxicodendron radicans*), Roundleaf Greenbriar (*Smilax rotundifolia*), and Virginia Creeper (*Parthenocissus quinquefolia*). The habitat was not suitable for White Fringeless Orchid.

Site 5 was a shallow (0.5-foot) freshwater pond ~0.1 of an acre in size (Figure 3-23). There was a marginal area of sphagnum moss along the periphery of the pond. Some sedges

(*Carex* spp.) were mixed in with the sphagnum moss. The dominant trees were Sweetgum, Black Gum (*Nyssa sylvatica*), and Red Maple (*Acer rubrum*). The habitat was considered marginal for White Fringeless Orchid due to the species' common association with sphagnum moss; however, other plants commonly associated with White Fringeless Orchid, such as Cinnamon Fern, Netted Chain Fern, and New York Fern, were absent. Furthermore, the habitat was likely too shady, with very little herbaceous cover present, to be considered suitable for White Fringeless Orchid.

Site 6 was a shallow (~1-foot) freshwater pond ~0.2 of an acre in size (Figure 3-24). There was a marginal area of sphagnum moss along the periphery of the pond. Longleaf Woodoats were mixed in with the sphagnum moss. The dominant trees were Sweetgum and Black Gum, and the dominant shrub was Sparkleberry. Site 6 was considered marginal due to the presence of sphagnum moss, but other species commonly associated with White Fringeless Orchid were absent. Furthermore, the habitat was likely too shady, with very little herbaceous cover present, to be considered suitable for White Fringeless Orchid.

Site 7 was a mostly dry freshwater pond that was not very boggy at the time of the survey (Figure 3-25). The dominant trees were Sweetgum, Black Gum, and White Oak. Other dominant plants were Longleaf Woodoats and Roundleaf Greenbriar. There was very little ground cover at this site. The habitat was not suitable for White Fringeless Orchid.

Site 8 was a freshwater pond (Figure 3-26). Dominant plants were Fragrant Flatsedge (*Cyperus odoratus*), smartweed (*Polygonum* spp.), and sphagnum moss. The periphery of the pond was comprised of White Oak, Sweetgum, Black Gum, and Red Maple. Habitat was considered marginal for White Fringeless Orchid due to the presence of sphagnum moss, but other plants commonly associated with White Fringeless Orchid were absent.

Site 9 was a freshwater forested area that could not be accessed due to nearby private property. Surveyors were able to get close enough to the site to field proof the unsuitability of the habitat. There was a spring and wetland north of the Project Boundary with one small corner of the Project Boundary intersecting a greenfield. The remaining Project Boundary near the mapped wetland was characterized by upland slope. No photos were taken of Site 9.



Figure 3-1 Lake Harris Site 1: Transmission Line



D. Spaulding 2020, personal communication

Figure 3-2 Lake Harris Site 1: Small Green Wood Orchid ~0.25 Mile from Site



D. Spaulding 2020, personal communication

Figure 3-3 Lake Harris Site 1: Small Green Wood Orchid Near Transmission Line



Figure 3-4 Lake Harris Site 2: Disturbed Area Adjacent to Site



Figure 3-5 Lake Harris Site 3



Figure 3-6 Lake Harris Site 4



Figure 3-7 Lake Harris Site 5



Figure 3-8 Lake Harris Site 6



Figure 3-9 Lake Harris Site 7



Figure 3-10 Lake Harris Site 9: Open Wetland



Figure 3-11 Lake Harris Site 9: Inundated Area



Figure 3-12 Lake Harris Site 10: Upland and Inundated Areas



Figure 3-13 Lake Harris Site 11



Figure 3-14 Lake Harris Site 11: Greenfield Adjacent to Site



Figure 3-15 Lake Harris Site 12: Wetland Along Inundation



Figure 3-16 Lake Harris Site 12: Upland Area Near Inundated Area



Figure 3-17 Lake Harris Site 12: Small Area with Wetland Ground Cover



Figure 3-18 Skyline Site 1



Figure 3-19 Skyline Site 2



Figure 3-20 Skyline Site 3

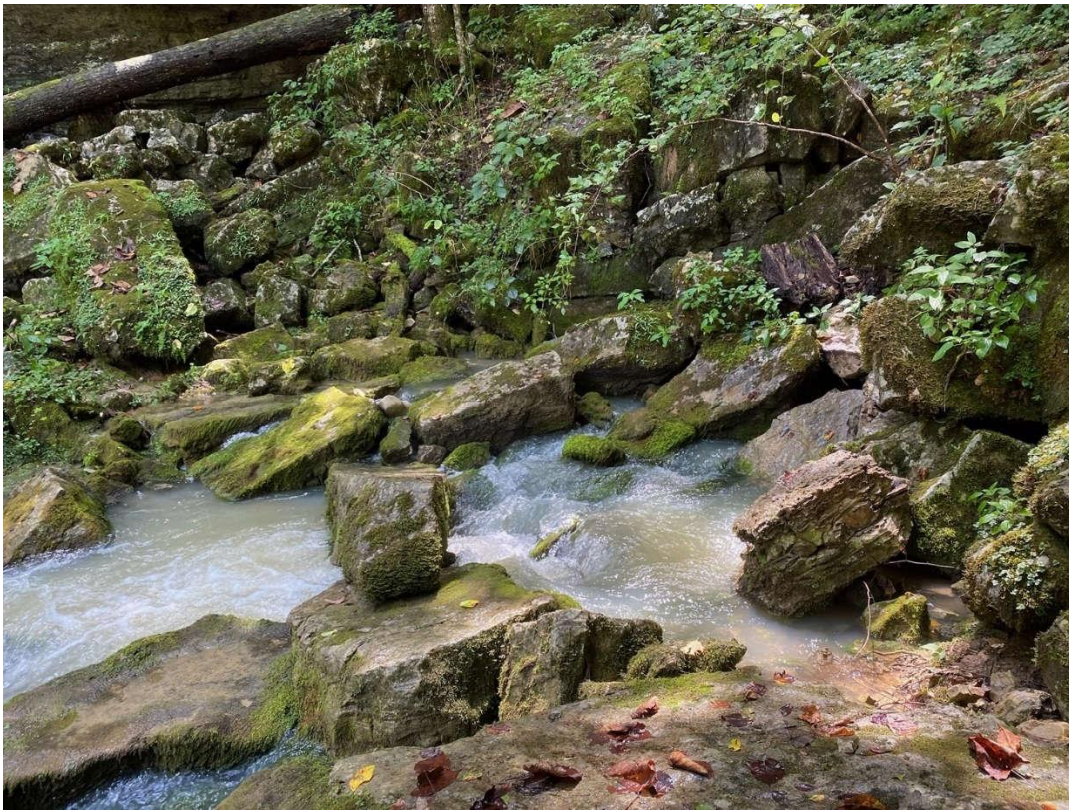


Figure 3-21 Skyline Site 4



Figure 3-22 Skyline Site 4: Spring Flowing into Tributary



Figure 3-23 Skyline Site 5



Figure 3-24 Skyline Site 6



Figure 3-25 Skyline Site 7



Figure 3-26 Skyline Site 8

3.2 Price's Potato-bean

No Price's Potato-bean specimens were observed during the White Fringeless Orchid survey at the location of the known population or as surveyors travelled through the Project Boundary at Skyline; however, some suitable habitat was observed, particularly at the portion of the Project Boundary nearest to the known Price's Potato-bean site.

Both Site 1 (Figure 3-27) and Site 2 (Figure 3-28), surveyed during a subsequent visit, were sloping areas that graded into the bottom of Little Coon Creek. Most effort was concentrated in more open areas near the creek where light filtered through to the forest floor. Approximately 0.5 acres were surveyed at Site 1 for a total qualitative effort¹ of 60 minutes, and approximately 7.7 acres were surveyed at Site 2 for a total qualitative effort of 75 minutes. Habitat for Price's Potato-bean was observed at both sites, but no specimens were found.



Figure 3-27 Price's Potato-bean Site 1

¹ Total qualitative effort is the aggregate amount of time expended by all surveyors in which specimens are collected or observed, but not enumerated.



Figure 3-28 Price's Potato-bean Site 2

4.0 SUMMARY AND CONCLUSIONS

4.1 White Fringeless Orchid

Sites were selected to be surveyed based on the presence of wetlands, springs, or ponds; however, habitat was often found to be unsuitable for White Fringeless Orchid due to excessive amounts of shade from thick canopies, disturbance, soil type, inundation, vegetation community, and steep slopes. Habitat was considered marginal if it was boggy or contained sphagnum moss, but other plants commonly associated with White Fringeless Orchid such as Cinnamon Fern, Netted Chain Fern, and New York Fern were not present at any of the sites. No suitable habitat was observed during surveys. The best habitat surveyed was a wetland at Lake Harris adjacent to a transmission line right-of-way (Lake Harris Site 1); however, it was considered only marginal because the only saturated soil observed was underneath the transmission line right-of-way immediately adjacent to the reservoir. Remaining wooded portions of the wetland lacked the saturated soils typical for this species. The Small Green Wood Orchid had previously been seen at this site (D. Spaulding 2020, personal communication) but was not seen during the survey on August 27, 2020. Furthermore, White Fringeless Orchid was not observed at this site during either survey. Results of these surveys suggest that the White Fringeless Orchid is not present within the Project Boundary.

4.2 Price's Potato-bean

During White Fringeless Orchid surveys, Price's Potato-bean was passively searched for as a secondary objective. Some suitable habitat but no specimens were observed during the surveys; however, no specimens were observed at the location of the known population outside of the Project Boundary either, so it is possible that specimens were present but not detected. Surveyors returned to two locations near the known population with suitable habitat but did not find any specimens. Canopy cover may have been too dense in some locations to support Price's Potato-bean populations.

5.0 REFERENCES

- Federal Register. 2015. Vol 80 No 178. U. S. Fish and Wildlife Service. Endangered and Threatened Wildlife and Plants; Threatened Species Status for *Platanthera integrilabia* (White Fringeless Orchid). September 15, 2015.
- Smith, M. In review. Springs of Alabama: Geological Survey of Alabama Circular.
- Spaulding, D. 2020. Personal communication. Anniston Museum of Natural History.
- U.S. Fish and Wildlife Service (USFWS). 1993. Recovery Plan for *Apios priceana*. Jackson, Mississippi. 43 pp.
- U.S. Fish and Wildlife Service (USFWS). 2016. Price's potato-bean *Apios priceana* 5-year Review: Summary and Evaluation. Tennessee Ecological Services Field Office, Southeast Region, USFWS, Cookeville, Tennessee.
- U.S. Fish and Wildlife Service (USFWS). 2020. National Wetlands Inventory (<https://www.fws.gov/wetlands/Data/State-Downloads.html>).

APPENDIX G

STAKEHOLDER COMMENT TABLE

<u>Commenting Entity</u>	<u>Date of Comment & FERC Accession Number</u>	<u>Comment – Threatened and Endangered Species</u>	<u>Alabama Power Response</u>
Federal Energy Regulatory Commission (FERC) Note: footnotes included in the original letter have been omitted from this table	6/10/2020 20200610-3059	<p>The goals of Alabama Power’s T&E Species Study are to assess the probability of T&E species populations and/or their critical habitat occurring within the Harris Project boundary or project area and determine if there are project related impacts (i.e., lake fluctuations, downstream flows, recreation and shoreline management activities, timber management, etc.) to those species and critical habitats. According to the study schedule, Alabama Power would develop the GIS overlays and maps from April through July 2019, and conduct field verifications, if required, from October 2019 through September 2020.</p> <p>The Draft T&E Species Study Report does not provide information on the presence or absence of potentially suitable habitat within the project boundary for all of the T&E species (e.g., red cockaded woodpecker, northern long-eared bat, pool sprite, and white fringeless orchid) on the official species list for the project. Therefore, Alabama Power was unable to determine whether or not these species are likely to occur within the project boundary or identify a complete list of T&E species that require field surveys.</p> <p>As part of your response to stakeholder comments on the ISR, please provide: (1) the maps and assessment of the availability of potentially suitable habitat within the project boundary for all of the T&E species on the official species list for the project; (2) documentation of consultation with FWS regarding the species-specific criteria for determining which T&E species on the official species list will be surveyed in the field; (3) a complete list of T&E species that will be surveyed during the 2nd study season as part of the T&E Species Study; and (4) confirmation that Alabama Power will complete the field verification scheduled by September 2020.</p>	See Alabama Power’s response filed July 10, 2020 (Accession No. 20200710-5122).

FERC	Questions submitted in advance of ISR meeting	<p>Have the GIS overlays of T&E species habitat information and maps been completed (i.e., the map figures in Appendix B of the draft T&E species study report)? Or are there still steps to complete this component of the study?</p> <p>We suggest including project features, recreation areas, and other managed areas (e.g., timber harvest areas, wildlife management areas, etc.) on the T&E species maps in order to help determine the proximity of species ranges/habitats to project-related activities and identify the need for species-specific field surveys.</p>	<p>To facilitate FERC’s review of tiLoohese maps, Alabama Power is providing GIS shapefiles used for the T&E Study and of the requested information (e.g., timber harvest areas, wildlife management areas, etc.).</p> <p>Shapefiles featured in maps and used to determine survey locations for T&E species are can be found on the Harris Relicensing website. Locations of shapefiles from public sources are located below:</p> <ul style="list-style-type: none"> • Current Habitat Ranges of T&E Species featured in Species Habitat Range Maps, Appendix B (This link leads to the page for Palezone Shiner, but a shapefile containing the current habitat range for all species is available here) (USFWS, accessed October 2019) https://ecos.fws.gov/ecp0/profile/speciesProfile?spcode=E04E • Designated Critical Habitat of T&E Species featured in Species Habitat Range Maps, Appendix B (USFWS, accessed October 2019) https://ecos.fws.gov/ecp/report/table/critical-habitat.html • Streams featured in Species Habitat Range Maps, Appendix B (USGS, accessed October 2019) https://viewer.nationalmap.gov/basic/#/ • Limestone areas, granite, karst landscape featured in Species Habitat Range Maps, Appendix B (GSA, accessed October 2019) https://www.gsa.state.al.us/gsa/geologic/hazards/geospatial • Talladega National Forest featured in Species Habitat Range Maps, Appendix B (USDA, accessed October 2019) https://data.fs.usda.gov/geodata/edw/datasets.php?dsetCategory=boundaries • Forested areas and coniferous lands featured in Species Habitat Range Maps, Appendix B (MLRC, accessed October 2019) https://www.mrlc.gov/data?f%5B0%5D=category%3Aland%20cover&f%5B1%5D=region%3Aconus • Alabama wetlands used to determine survey locations for White Fringeless Orchid in the White Fringeless Orchid (<i>Platanthera integrilabia</i>) and Price’s Potato-bean (<i>Apios priceana</i>) Survey Report, Appendix F (USFWS, accessed September 2020) https://www.fws.gov/wetlands/Data/State-Downloads.html • Skyline Wildlife Management Area (ADCNR, accessed November 2020) https://www.outdooralabama.com/hunting/wildlife-management-areas
FERC		While the draft T&E species study report indicates that additional field surveys for the fine-lined pocketbook	Alabama Power consulted with USFWS, ADCNR, and ALNHP to determine which species have known historical occurrences or critical habitat intersecting the Project

<u>Commenting Entity</u>	<u>Date of Comment & FERC Accession Number</u>	<u>Comment – Threatened and Endangered Species</u>	<u>Alabama Power Response</u>
		freshwater mussel are planned for May 2020, the report does not include a description of the criteria used to determine which of the species on USFWS's official (IPaC) list of T&E species would be surveyed in the field. Please describe which species will be surveyed in the field and explain how and why they were selected. In addition, please describe any correspondence Alabama Power has had with FWS and state agencies regarding the T&E species selected for additional field surveys.	Boundary or could reasonably be found within the Project Boundary. Surveys were performed for the Palezone Shiner due to information from USFWS regarding the possibility of existence in some tributaries within Skyline (meeting summary from HAT 3 meeting held on August 27, 2019). Surveys for Finelined Pocketbook were performed due to existing critical habitat in the upper Tallapoosa River above Lake Harris (meeting summary from HAT 3 meeting held on August 27, 2019). Surveys for Red-cockaded Woodpecker were performed due to the potential for suitable habitat in mature pine stands within the Project Boundary at Lake Harris and recommendation for surveys by the USFWS and ADCNR (emails dated August 7, 2020). Surveys were conducted for White Fringeless Orchid due to the presence of suitable habitat within the Project Boundary (emails dated July 24, 2020 and August 4, 2020) and survey methods for the White Fringeless Orchid were developed in consultation with the USFWS (emails dated August 26, 2020). Surveys for Price's Potato-bean were not requested, but Alabama Power conducted surveys for this species in the Project Boundary at Skyline due to historical records of a known population at Little Coon Creek near the Project Boundary. Information on rationale for conducting field surveys for Finelined Pocketbook, Palezone Shiner, White Fringeless Orchid, Price's Potato-bean, and Red-cockaded Woodpecker, along with consultation with USFWS, ADCNR, and ALNHP are provided in the Final T&E Species Study Report. The field survey reports are attached as appendices to the Final T&E Species Study Report.
FERC		Page 7 lists the sources for the ESA species information. The sources included USFWS's Environmental Conservation Online System (ECOS) but did not include IPaC. The official list is obtained through the IPaC report. Has an IPaC report been downloaded or are you using the IPaC report filed to the record by FERC staff?	The Final T&E Species Study Report contains a reference in the Methods section to the ECOS and the IPaC. An IPaC list was used to identify species to include in the desktop assessment and potential field surveys.
FERC		Page 8 states that the existing land use data is not specific enough to determine if the 3,068 acres of coniferous forest within the Project Boundary at Lake Harris would be suitable for red-cockaded woodpecker. How do you propose to assess the suitability for red-cockaded woodpecker?	Information was added to the Red-cockaded Woodpecker (<i>Picoides borealis</i>) Habitat Survey Report, which is appended to the Final T&E Species Study Report, to explain how the surveys were completed and what components were important in determining habitat suitability for the Red-cockaded Woodpecker.

<u>Commenting Entity</u>	<u>Date of Comment & FERC Accession Number</u>	<u>Comment – Threatened and Endangered Species</u>	<u>Alabama Power Response</u>
FERC		On pages 3, 10, and 26 there is mention of additional fieldwork planned for two mussel species (i.e., fine-lined pocketbook and Southern pigtoe) for May 2020. Please elaborate on the details of the additional survey work (e.g., survey location(s), sampling protocols and methodologies employed, and clarify which species will be included in the May 2020 assessment, etc.).	<p>Explanation was provided in Alabama Power's ISR Meeting Summary (Accession No. 2020-05-12-5083).</p> <p>Results of the Finelined Pocketbook surveys are appended to the Final T&E Species Study Report. Reasons for not surveying the Southern Pigtoe are also included in Section 3.12 of the Final T&E Species Study Report; however, an area that intersects Southern Pigtoe's current habitat range (Ketchepedrakee Creek) was included in Finelined Pocketbook surveys, but no Southern Pigtoe specimens were found (Finelined Pocketbook (<i>Hamiota altilis</i>) Survey Report (Appendix E)).</p>
FERC		The descriptions of Alabama lampmussel and rabbitsfoot mussel on pages 11, 13, and 14 do not provide these species' host fish species. Are the host fish species currently unknown, or was this an inadvertent omission?	<p>Explanation was provided in Alabama Power's ISR Meeting Summary (Accession No. 2020-05-12-5083).</p> <p>This response is also included in the Final T&E Species Study Report.</p>
FERC		There appears to be a typo on page 16, in the description of Southern pigtoe mussel. The middle of the first paragraph refers to the glochidia of the finelined pocketbook mussel. Is this sentence misplaced, or does the information pertain to the southern pigtoe mussel (the subject of section 3.12)? Please clarify.	This correction is in the Final T&E Species Study Report.
FERC		The draft T&E species study report states that there are no known NLEB hibernacula or maternity roost trees within the Project Boundary. However, it does not include information on known NLEB hibernacula within 0.25 mile of the Project Boundary and known NLEB maternity roosts within 150 feet of the Project Boundary (i.e., at Harris Lake and Skyline). In addition, the report mentions a couple of best management practices (BMPs), protective of some bat species, that Alabama Power implements during timber harvest activities and states that the BMPs have been expanded but not incorporated in the existing license. However, the report does not include the locations of Alabama Power's timber harvesting and other tree removal activities, or detailed descriptions of timber harvesting protocols and BMPs currently implemented within the Project Boundary. This information is important to understanding the affected environment for Indiana bat, NLEB, and/or other T&E species. This information could also be used for the streamlined consultation option for	<p>Explanation was provided in Alabama Power's ISR Meeting Summary (Accession No. 2020-05-12-5083).</p> <p>Since filing the ISR Meeting Summary, Alabama Power consulted with the USFWS regarding the NLEB streamlined consultation (emails dated June 22 and June 23, 2020). The USFWS indicates that the streamlined consultation for NLEB isn't appropriate due to the overlap in range of the Indiana Bat and NLEB, specifically within the Project Boundary at Lake Harris. This information and information on best management practices (BMPs) for bats and timber management protocol will be provided in the Wildlife Management Report. As previously noted, Alabama Power is providing all GIS shapefiles to FERC for its analysis in lieu of updating maps.</p> <p>Shapefiles featured in maps and used to determine survey locations for T&E species are can be found on the Harris Relicensing website. Locations of shapefiles from public sources are located below:</p> <ul style="list-style-type: none"> Current Habitat Ranges of T&E Species featured in Species Habitat Range Maps, Appendix B (This link leads to the page for Palezone Shiner, but a shapefile containing the current habitat range for all species is available here)

Commenting Entity	Date of Comment & FERC Accession Number	Comment – Threatened and Endangered Species	Alabama Power Response
		<p>analyzing the potential project effects on NLEB (including within the buffer areas for hibernacula and maternity roost trees).</p> <p>Please complete the USFWS’s NLEB streamlined consultation form and include it in the final T&E species study report. This form can be found at: https://www.fws.gov/southeast/pdf/guidelines/northern-long-eared-bat-streamlinedchecklist.pdf. We recommend using FWS’s definition of “tree removal” to guide your responses on the form (i.e., “cutting down, harvesting, destroying, trimming, or 37 manipulating in any other way the trees, saplings, snags, or any other form of woody vegetation likely to be used by northern long-eared bats”).</p> <p>Also, please update figures 3.14-1, 3.14-2, 3.14-3, 3.15-1, 3.15-2, and 3.15-3 which currently show “forested area” or “karst landscape” in relation to NLEB and Indiana bat habitats, to show Alabama Power’s timber management areas within the Project Boundary, and other proposed managed areas (e.g., new/improved recreation areas, new quail management areas). This type of information is needed to meet another component of this study (i.e., “determine if [T&E species habitat at the project] are potentially impacted by Harris Project operations”, as described on slide 5 of the Aug. 27, 2019, HAT 3 meeting).</p>	<p>(USFWS, accessed October 2019) https://ecos.fws.gov/ecp0/profile/speciesProfile?spcode=E04E</p> <ul style="list-style-type: none"> • Designated Critical Habitat of T&E Species featured in Species Habitat Range Maps, Appendix B (USFWS, accessed October 2019) https://ecos.fws.gov/ecp/report/table/critical-habitat.html • Streams featured in Species Habitat Range Maps, Appendix B (USGS, accessed October 2019) https://viewer.nationalmap.gov/basic/#/ • Limestone areas, granite, karst landscape featured in Species Habitat Range Maps, Appendix B (GSA, accessed October 2019) https://www.gsa.state.al.us/gsa/geologic/hazards/geospatial • Talladega National Forest featured in Species Habitat Range Maps, Appendix B (USDA, accessed October 2019) https://data.fs.usda.gov/geodata/edw/datasets.php?dsetCategory=boundaries • Forested areas and coniferous lands featured in Species Habitat Range Maps, Appendix B (MLRC, accessed October 2019) https://www.mrlc.gov/data?f%5B0%5D=category%3Aland%20cover&f%5B1%5D=region%3Aconus • Alabama wetlands used to determine survey locations for White Fringeless Orchid in the White Fringeless Orchid (<i>Platanthera integrilabia</i>) and Price’s Potato-bean (<i>Apios priceana</i>) Survey Report, Appendix F (USFWS, accessed September 2020) https://www.fws.gov/wetlands/Data/State-Downloads.html • Skyline Wildlife Management Area (ADCNR, accessed November 2020) https://www.outdooralabama.com/hunting/wildlife-management-areas
FERC		<p>On page 21 and 22, in section 3.17, the discussion mentions an occurrence of little amphianthus within the Project Boundary at Lake Harris (Flat Rock Park) that was documented in 1995 and may be extirpated. Did the botanical surveys in that area of the project target that species? The top of page 22, states that “Vernal pools were not identified due to a lack of available data.” Did the botanical surveys identify vernal pools in this area?</p>	<p>Explanation was provided in Alabama Power’s ISR Meeting Summary (Accession No. 2020-05-12-5083).</p> <p>A footnote referencing the botanical inventory was added to the Final T&E Species Study Report.</p>

<u>Commenting Entity</u>	<u>Date of Comment & FERC Accession Number</u>	<u>Comment – Threatened and Endangered Species</u>	<u>Alabama Power Response</u>
FERC		On page 22, in section 3.18, the report states that the National Wetland Inventory data is not detailed enough to identify wetlands within the project area that contain white fringeless orchid's unique wetland habitat characteristics. Do you propose collecting more data on this subject?	Explanation was provided in Alabama Power's ISR Meeting Summary (Accession No. 2020-05-12-5083). Surveys for White Fringeless Orchid were conducted and the survey report is provided as an appendix to the Final T&E Species Study Report.
FERC		On page 23, in section 3.19, the report states that the 16 extant populations of Prices' potato bean in Jackson County, occur on Sauta Cave National Wildlife Refuge, and near Little Coon Creek in the Skyline WMA. Please clarify whether or not any of the 16 populations occur within the Project Boundary at Skyline WMA.	Explanation was provided in Alabama Power's ISR Meeting Summary (Accession No. 2020-05-12-5083). Surveys for Price's Potato-bean were conducted and the report is provided as an appendix to the Final T&E Species Study Report.
FERC		Q13 - In Appendix B, figure 3.19, showing Price's potato bean habitat range, there is a 100-foot Stream Buffer within the Limestone Landscape layer shown on the map and legend. Please explain the significance of this buffer, including any regulatory requirements associated with this buffer. Please include this information in the Final T&E Species Study Report.	Explanation was provided in Alabama Power's ISR Meeting Summary (Accession No. 2020-05-12-5083). A footnote was inserted next to the reference for the figure in section 3.19 of the Final T&E Species Study Report.
FERC		In the August 27, 2019, HAT 3 meeting summary, please clarify the following: How does Alabama Power define terms such as "sensitive time periods" in the context of timber harvesting? Evan Collins, of FWS, stated that the palezone shiner may be present in some of the lower reaches of the Tennessee River tributaries. Please clarify where these tributaries are located in relation to the Project Boundary.	Explanation was provided in Alabama Power's ISR Meeting Summary (Accession No. 2020-05-12-5083); however, the timber harvesting protocols will be filed with the Wildlife Management Plan rather than the Final T&E Species Study Report, as originally stated in the ISR Meeting Summary. "Sensitive time periods" in the context of timber harvesting refers to the summer roosting periods of the Indiana Bat and Northern Long-eared Bat. Surveys for the Palezone Shiner were completed and the Palezone Shiner Survey Report is appended to the Final T&E Species Survey Report.
FERC		Could Alabama Power could elaborate on how they decided which species to perform field surveys for. How was the list of species being surveyed narrowed down with USFWS?	Explanation was provided in Alabama Power's ISR Meeting Summary (Accession No. 2020-05-12-5083). Information was also added to the Final T&E Species Study Report.
FERC		Is IPaC being used to determine which threatened or endangered species were in the Project Boundary. If USFWS makes any changes to the inventory of listed species in the Project Boundary, that needs to be considered.	Explanation was provided in Alabama Power's ISR Meeting Summary (Accession No. 2020-05-12-5083). Information was also added to the Final T&E Species Study Report.

<u>Commenting Entity</u>	<u>Date of Comment & FERC Accession Number</u>	<u>Comment – Threatened and Endangered Species</u>	<u>Alabama Power Response</u>
FERC		Additional information is needed for a streamlined consultation on the Northern long-eared bat. The buffer zones, which are within 0.25 miles of a hibernaculum at any time or within 150 feet of a known occupied maternity roost tree from June through July, were not included in the report. The report seems to be focused on what has been reported in the Project Boundary, but the effects of tree removal need to be analyzed.	Explanation was provided in Alabama Power's ISR Meeting Summary (Accession No. 2020-05-12-5083). Since filing the ISR Meeting Summary, Alabama Power consulted with the USFWS regarding the NLEB streamlined consultation (emails dated June 22 and June 23, 2020). The USFWS indicates that the streamlined consultation for NLEB isn't appropriate due to the overlap in range of the Indiana Bat and NLEB, specifically within the Project Boundary at Lake Harris. This information and information on best management practices (BMPs) for bats and timber management protocol will be provided in the Wildlife Management Report. As previously noted, Alabama Power is providing all GIS shapefiles to FERC for its analysis in lieu of updating maps.
Alabama Department of Conservation and Natural Resources (ADCNR) Note: footnotes included in the original letter have been omitted from this table	6/11/2020 20200611-5152	Throughout the Threatened and Endangered Species Desktop Assessment, capitalize species common names. When a species is first used in the document, include the scientific name in parentheses. The common name can then be used in the remaining sections of the document.	Species common names have been capitalized throughout the document and scientific names have been provided in parenthesis after first use of common names.
ADCNR		Range Figures included in the Threatened and Endangered Species Desktop Assessment illustrating aquatic species habitat ranges, include the tributaries and streams names on the maps.	Tributary and stream names have been added to all applicable maps.
ADCNR		On page 6, Table 1-1 of the Threatened and Endangered Species Desktop Assessment in Scientific names column change " <i>Villosa trabalis</i> " to " <i>Venustaconcha trabalis</i> ", " <i>Quadrula cylindrica</i> " to " <i>Theliderma cylindrica</i> ". Correct error for scientific name of Shiny Pigtoe to " <i>Fusconaia cor</i> " (Williams <i>et al.</i> 2017).	Scientific names have been updated for the Cumberland Bean, Rabbitsfoot, and Shiny Pigtoe. The scientific name for Little Amphianthus (<i>Gratiola amphiantha</i>) has also been updated.

<u>Commenting Entity</u>	<u>Date of Comment & FERC Accession Number</u>	<u>Comment – Threatened and Endangered Species</u>	<u>Alabama Power Response</u>
ADCNR		On page 6, Table 1-1 of the Threatened and Endangered Species Desktop Assessment all of the species listed in this table are now State Protected, see Alabama Regulations relating to game, fish and furbearing animals. 2019-2020. Alabama Department of Conservation and Natural Resources, with the exception of the plant species listed, Little Amphianthus, White Fringeless Orchid, Price's Potato-bean and Morefield's Leather Flower.	All species, excluding the listed plant species, have been identified as state protected.
ADCNR		On page 6, Table 1-1 of the Threatened and Endangered Species Desktop Assessment change column heading "Occurrence" column to "Recent Documented Occurrence in Harris Project Boundary". Within the document "Recent" should be defined, for example, "In this report any documented occurrence within the past 25 years will be classified as a Recent Documented Occurrence".	The column title was changed to "Recent Documented Occurrence (1995-2020) in Project Boundary."
ADCNR		On page 6, Table 1-1 of the Threatened and Endangered Species Desktop Assessment, Williams <i>et al.</i> (2008) is cited but this resource is not utilized anywhere else in the document. Recommend including the most up to date resources in the following species descriptions.	This resource is now cited in section 3.5 – Alabama Lampmussel.
ADCNR		On Page 9, 3.2 Palezone Shiner section of the Threatened and Endangered Species Desktop Assessment if an updated survey is proposed for this species suggest including and discussing or note that it will be included in an additional Phase 2 study report.	Palezone Shiner surveys were conducted in June 2020.
ADCNR		On page 10, 3.4 Finelined Pocketbook section of the Threatened and Endangered Species Desktop Assessment, include "primarily" in the statement, "this mussel lives in large to small streams in habitats "primarily" above the fall line." See Williams <i>et al.</i> 2008 distribution map and distribution descriptions.	"Primarily" was included in this statement.
ADCNR		On page 10, 3.4 Finelined Pocketbook section of the Threatened and Endangered Species Desktop Assessment, include, if any, the last mussel survey completed in the Tallapoosa Harris Tailrace and tributaries. Include a statement indicating if a mollusk tailrace study has been considered in the study plan development process and why it was not deemed necessary for this species.	Alabama Power has no records indicating that a tailrace survey has ever been performed. The tailrace is not located within the current habitat range of this species.

<u>Commenting Entity</u>	<u>Date of Comment & FERC Accession Number</u>	<u>Comment – Threatened and Endangered Species</u>	<u>Alabama Power Response</u>
ADCNR		On page 10, 3.4 Finelined Pocketbook section of the Threatened and Endangered Species Desktop Assessment, a statement should be included notifying that ADCNR and USFWS are currently reintroducing the Finelined Pocketbook into suitable historical habitats within the state (USFWS 2019).	The following statement was added to Section 3.4: "The ADCNR and USFWS are currently reintroducing the Finelined Pocketbook into suitable historical habitats within the state (USFWS 2019b)."

ADCNR		<p>On page 10, 3.4 Finelined Pocketbook section of the Threatened and Endangered Species Desktop Assessment, the reasons for decline could be updated and improved by summarizing statements from USFWS (2019), Nine Mobile River Basin mussels (Finelined Pocketbook (<i>Hamiota</i> (= <i>Lampsilis</i>) <i>altilis</i>), Orangenacre Mucket (<i>Hamiota</i> (= <i>Lampsilis</i>) <i>perovalis</i>), Alabama Moccasinshell, (<i>Medionidus</i> <i>acutissimus</i>), Coosa Moccasinshell (<i>Medionidus</i> <i>parvulus</i>), Southern Clubshell (<i>Pleurobema</i> <i>decisum</i>), Dark Pigtoe (<i>Pleurobema</i> <i>furvum</i>), Southern Pigtoe (<i>Pleurobema</i> <i>georgianum</i>), Ovate Clubshell (<i>Pleurobema</i> <i>perovatum</i>), Triangular Kidneyshell (<i>Ptychobranhus</i> <i>greenii</i>)) 5-year review. This review states that suitable habitats and water quality, free of excessive sedimentation and other pollutants, are required for Finelined Pocketbook. The primary cause of curtailment of range and fragmentation of habitat for these mussel species has been contributed to the historic construction of dams and impoundment of large reaches of major river channels (Federal Register 58 FR 14330). Although most of these actions took place in the past, the impacted conditions and habitat continue to affect the species. In recent years, some improvements have been made to improve riverine conditions. For example, flow improvements have been made below Weiss Dam on the Coosa River that benefit existing populations of Southern Clubshell. Watershed-specific threats continue to negatively impact the species. These threats include: 1) coal mining activities 2) oil and gas exploration 3) water withdrawal 4) hypolimnetic discharges 5) poor water quality due to insufficient releases from dams 6) instream aggregate mining 7) navigation channel maintenance activities (8) agricultural practices that degrade water quality by increasing nutrients, herbicide/surfactant compounds, and hormones in surface waters; (9) hydropeaking dams that alter downstream flow conditions, water temperatures, and dissolved oxygen (10) increasing urban development that degrades water quality and stream geomorphology; and (11) climate change, which is expected to result in more frequent and extreme dry and wet years in the Southeast over the next century.</p>	<p>Citation for Finelined Pocketbook 5-year review (USFWS 2008) was removed and replaced with the reference for the 5-year review of nine mobile river basin mussels (USFWS 2019a). The following statement was added to Section 3.12: "The historic construction of dams and impoundments along large reaches of river channels is the primary cause of the declination in Finelined Pocketbook's distribution and population size and continues to be a major threat to this species' persistence (USFWS 2019b). This species continues to be imperiled due to a range of threats, including water withdrawal, water quality degradation including sedimentation released from dams and agricultural runoff, downstream flow alterations caused by hydropeaking dams, and climate change (USFWS 2019b)."</p>
ADCNR		<p>On page 10, 3.4 Finelined Pocketbook section of the Threatened and Endangered Species Desktop Assessment, change statement "No populations were identified within</p>	<p>This statement was updated. Details on the methodology of surveys for Finelined Pocketbook are included in the Finelined Pocketbook (<i>Hamiota altilis</i>) Survey Report, Appendix E.</p>

<u>Commenting Entity</u>	<u>Date of Comment & FERC Accession Number</u>	<u>Comment – Threatened and Endangered Species</u>	<u>Alabama Power Response</u>
		the Project Boundary at Lake Harris, but future surveys have been proposed by Alabama Power.” to “To date, no populations were identified within the Project Boundary at Lake Harris, but surveys focused on the 3.75 mile stretch of the Tallapoosa River where critical habitat is known to occur from the County 36 bridge to a shoal below the Highway 431 bridge are currently being conducted by Alabama Power and USFWS.”	
ADCNR		On page 11, 3.5 Alabama Lampmussel section of the Threatened and Endangered Species Desktop Assessment, a statement should be included notifying that ADCNR and USFWS is currently reintroducing the Alabama Lampmussel into suitable historical habitats within the state (USFWS 2012).	The following Statement was added to Section 3.5: "The ADCNR and USFWS is currently reintroducing the Alabama Lampmussel into suitable historical habitats within the state (USFWS 2012)."
ADCNR		On page 11, 3.5 Alabama Lampmussel section of the Threatened and Endangered Species Desktop Assessment, reasons for imperilment should be updated and improved summarizing statements from USFWS released a Five-Year Review for the species (USFWS 2012).	The following was added to Section 3.5: "This species is imperiled due to water quality degradation primarily caused by agricultural runoff, severely restricted distribution, rarity, and vulnerability to habitat degradation ((USFWS 2012). Habitat degradation is the leading cause of the decline for this species (USFWS 2012). Unauthorized removal of gravel from the Paint Rock River drainage basin results in degradation of Alabama Lampmussel habitat (USFWS 2012). Factors that have the potential to affect this species' persistence include droughts, toxic spills, and fish barriers which restrict freshwater mussel distribution (USFWS 2012)."
ADCNR		On page 11, 3.5 Alabama Lampmussel section of the Threatened and Endangered Species Desktop Assessment, include that in laboratory trials Alabama Lampmussel glochidia have been found to utilize Rock Bass (<i>Ambloplites rupestris</i>), Green Sunfish (<i>Lepomis cyanellus</i>), Bluegill (<i>Lepomis macrochirus</i>), Smallmouth Bass (<i>Micropterus dolomieu</i>), Spotted Bass (<i>Micropterus punctulatus</i>), Largemouth Bass (<i>Micropterus salmoides</i>), and Redeye Bass (<i>Micropterus coosae</i>) as host fish and that Banded Sculpin (<i>Cottus caroliniae</i>) appear to be marginal hosts (Williams et. Al. 2008).	The following was added to Section 3.5: "In laboratory trials Alabama Lampmussel glochidia have been found to utilize Rock Bass (<i>Ambloplites rupestris</i>), Green Sunfish (<i>Lepomis cyanellus</i>), Bluegill (<i>Lepomis macrochirus</i>), Smallmouth Bass (<i>Micropterus dolomieu</i>), Spotted Bass (<i>Micropterus punctulatus</i>), Largemouth Bass (<i>Micropterus salmoides</i>), and Redeye Bass (<i>Micropterus coosae</i>) as host fish and that Banded Sculpin (<i>Cottus caroliniae</i>) appear to be marginal hosts (Williams et. Al. 2008)."
ADCNR		On page 12, 3.6 Cumberland Bean section of the Threatened and Endangered Species Desktop Assessment, a statement should be included notifying that ADCNR and USFWS is currently reintroducing the Cumberland Bean into suitable historical habitats within the state (USFWS 2020).	The following statement was added to Section 3.6: "The ADCNR and USFWS is currently reintroducing the Cumberland Bean into suitable historical habitats within the state (USFWS 2020)."

<u>Commenting Entity</u>	<u>Date of Comment & FERC Accession Number</u>	<u>Comment – Threatened and Endangered Species</u>	<u>Alabama Power Response</u>
ADCNR		On page 12, 3.6 Cumberland Bean section of the Threatened and Endangered Species Desktop Assessment, reasons for imperilment should be updated and improved summarizing statements from USFWS released a Five-Year Review for the species (USFWS 2020).	The following was added to Section 3.6: "Factors contributing to the decline of this species includes impoundments, siltation, and pollution (USFWS 2020). Limited distribution and rarity make it vulnerable to extinction (USFWS 2020). Factors that have the potential to affect this species' persistence include changes in land use, pollution, contaminant spills, resource extraction, and siltation (USFWS 2020)."
ADCNR		On page 12, 3.7 Fine-Rayed Pigtoe section of the Threatened and Endangered Species Desktop Assessment, reasons for species decline should be updated and improved summarizing statements from USFWS released a Five-Year Review for the species (USFWS 2013b).	The following was added to Section 3.7: "Factors contributing to the decline of this species includes impoundment, siltation, and pollution (USFWS 2013a).The Fine-rayed Pigtoe's small population size and limited geographic distribution make it vulnerable to stochastic disturbances and decreased fitness from reduced genetic diversity (USFWS 2013a). Factors that have the potential to affect this species' persistence include accidental chemical releases and spills and other human-induced changes (USFWS 2013a)."
ADCNR		On page 13, 3.8 Pale Lilliput section of the Threatened and Endangered Species Desktop Assessment, a statement should be included notifying that ADCNR and USFWS is currently reintroducing the Pale Lilliput Mussel into suitable historical habitats within the state (USFWS 2011).	The following statement was added to Section 3.8: "The ADCNR and USFWS is currently reintroducing the Pale Lilliput Mussel into suitable historical habitats within the state (USFWS 2011)."
ADCNR		On page 13, 3.8 Pale Lilliput section of the Threatened and Endangered Species Desktop Assessment, reasons for imperilment should be updated and improved summarizing statements from USFWS released a Five- Year Review for the species (USFWS 2011).	The following was added to section 3.8: " The Pale Lilliput mussel is vulnerable to extinction due to extremely limited distribution, rarity, and susceptibility to habitat degradation (USFWS 2011). Unauthorized removal of gravel from the Paint Rock River drainage basin results in degradation of Alabama Lampmussel habitat (USFWS 2011). Factors that have the potential to affect this species' persistence include droughts, toxic spills, and fish barriers which restrict freshwater mussel distribution (USFWS 2011)."
ADCNR		On page 13, 3.8 Pale Lilliput section of the Threatened and Endangered Species Desktop Assessment, include, in laboratory trials by ADCNR, Pale Lilliput glochidia have been found to utilize Northern Studfish (<i>Fundulus catenatus</i>), Blackspotted Topminnow (<i>Fundulus olivaceus</i>) and Blackstripe Topminnow (<i>Fundulus notatus</i>) as primary hosts. (Fobian <i>et al.</i> 2015)	The following statement was added to Section 3.8: "In laboratory trials by ADCNR, Pale Lilliput glochidia have been found to utilize Northern Studfish (<i>Fundulus catenatus</i>), Blackspotted Topminnow (<i>Fundulus olivaceus</i>) and Blackstripe Topminnow (<i>Fundulus notatus</i>) as primary hosts. (Fobian <i>et al.</i> 2015)."
ADCNR		On page 13, 3.9 Rabbitsfoot section of the Threatened and Endangered Species Desktop Assessment, a statement should be included notifying that ADCNR and USFWS is currently reintroducing the Rabbitsfoot into suitable historical habitats statewide.	The following statement was added to Section 3.9: "The ADCNR and USFWS is currently reintroducing the Rabbitsfoot into suitable historical habitats statewide (ADCNR 2020)."

<u>Commenting Entity</u>	<u>Date of Comment & FERC Accession Number</u>	<u>Comment – Threatened and Endangered Species</u>	<u>Alabama Power Response</u>
ADCNR		On page 13, 3.9 Rabbitsfoot section of the Threatened and Endangered Species Desktop Assessment, include, suitable fish hosts for Rabbitsfoot populations west of the Mississippi River include Blacktail Shiner (<i>Cyprinella venusta</i>) from the Black and Little rivers and Cardinal Shiner (<i>Luxilus cardinalis</i>), Red Shiner (<i>Cyprinella lutrensis</i>), Spotfin Shiner (<i>Cyprinella spiloptera</i>), and Bluntnose Shiner (<i>Cyprinella camura</i>) from the Spring River, but host suitability information is lacking for most of the eastern range (Fobian 2007). A host study by ADCNR in 2011, found Scarlet Shiner (<i>Lythrurus fasciolaris</i>), Whitetail Shiner (<i>Cyprinella galactura</i>) and Striped Shiner (<i>Luxilus chrysocephalus</i>) to be sympatric hosts with Rabbitsfoot from Paint Rock River, AL. Marginal minnow hosts from studies have included Central Stoneroller (<i>Campestris anomalum</i>), Emerald Shiner (<i>Notropis atherinoides</i>), Rosyface Shiner (<i>Notropis rubellus</i>), Bullhead Minnow (<i>Pimephales vigilax</i>) and Rainbow Darter (<i>Etheostoma caeruleum</i>), but not in all stream populations tested (Fobian 2007, Watters <i>et al.</i> 2005).	This statement was added to Section 3.9
ADCNR		On page 14, 3.10 Snuffbox section of the Threatened and Endangered Species Desktop Assessment, update and include that in 2019, USFWS released a Five-Year Review for the species (USFWS 2019b). Reasons for imperilment could be added and improved summarizing statements from this document as well.	<p>The following statements was added to Section 3.10: "The USFWS has a Five-Year Review for the Snuffbox mussel (USFWS 2018a)."</p> <p>The following was added to Section 3.10: "This species' initial and current imperilment is caused by adverse effects from construction impoundments, including destruction, modification, and curtailment of habitat range (USFWS 2018a). Since its listing, five dams have been removed on streams inhabited by Snuffbox mussel, but status improvements have not been documented in restored reaches of inhabited streams (USFWS 2018a). Other factors that continue to effect Snuffbox populations are water quality degradation caused by agricultural runoff, municipal effluents, industrial sources, and spills (USFWS 2018a). Reduction in Snuffbox range include dredging and channelization, oil and gas production, and development (USFWS 2018a). "</p>
ADCNR		On page 15, 3.11 Shiny Pigtoe Mussel section of the Threatened and Endangered Species Desktop Assessment, reasons for imperilment should be updated and improved summarizing statements from USFWS released a Five-Year Review for the species (USFWS 2013c).	The following was added to Section 3.11: "This species is imperiled due to impoundments, siltation, and pollution caused by coal mining, urbanization, agriculture, and toxic chemical spills (USFWS 2013b). The Shiny Pigtoe's small population size and limited geographic distribution make it vulnerable to stochastic disturbances and decreased fitness from reduced genetic diversity (USFWS 2013b)."

<u>Commenting Entity</u>	<u>Date of Comment & FERC Accession Number</u>	<u>Comment – Threatened and Endangered Species</u>	<u>Alabama Power Response</u>
ADCNR		On page 16, 3.12 Southern Pigtoe section of the Threatened and Endangered Species Desktop Assessment, change “finelined pocketbook mussel” to “Southern Pigtoe”.	“finelined pocketbook mussel” was changed to “Southern Pigtoe”.

ADCNR		<p>On page 16, 3.12 Southern Pigtoe section of the Threatened and Endangered Species Desktop Assessment, the reasons for decline could be updated and improved by summarizing statements from USFWS (2019), Nine Mobile River Basin mussels (Finelined Pocketbook (<i>Hamiota</i> (= <i>Lampsilis</i>) <i>altilis</i>), Orangenacre Mucket (<i>Hamiota</i> (= <i>Lampsilis</i>) <i>perovalis</i>), Alabama Moccasinshell, (<i>Medionidus</i> <i>acutissimus</i>), Coosa Moccasinshell (<i>Medionidus</i> <i>parvulus</i>), Southern Clubshell (<i>Pleurobema</i> <i>decisum</i>), Dark Pigtoe (<i>Pleurobema</i> <i>furvum</i>), Southern Pigtoe (<i>Pleurobema</i> <i>georgianum</i>), Ovate Clubshell (<i>Pleurobema</i> <i>perovatum</i>), Triangular Kidneyshell (<i>Ptychobranhus</i> <i>greenii</i>)) 5-year review. This review states that suitable habitats and water quality, free of excessive sedimentation and other pollutants, are required for Southern Pigtoe. The primary cause of curtailment of range and fragmentation of habitat for mussel species has been contributed to the historic construction of dams and impoundment of large reaches of major river channels (Federal Register 58 FR 14330). Although most of these actions took place in the past, the impacted conditions and habitat continue to affect the species. In recent years, some improvements have been made to improve riverine conditions. For example, flow improvements have been made below Weiss Dam on the Coosa River that benefit existing populations of Southern Clubshell. Watershed-specific threats continue to negatively impact the species. These threats include: 1) coal mining activities 2) oil and gas exploration 3) water withdrawal 4) hypolimnetic discharges 5) poor water quality due to insufficient releases from dams 6) instream aggregate mining 7) navigation channel maintenance activities (8) agricultural practices that degrade water quality by increasing nutrients, herbicide/surfactant compounds, and hormones in surface waters; (9) hydropeaking dams that alter downstream flow conditions, water temperatures, and dissolved oxygen (10) increasing urban development that degrades water quality and stream geomorphology; and (11) climate change, which is expected to result in more frequent and extreme dry and wet years in the Southeast over the next century.</p>	<p>The 5-year review of nine mobile river basin mussels (USFWS 2019b) has been added to the document and cited for all information pertaining to the decline of the Southern Pigtoe. The following statement was added to Section 3.12: "The historic construction of dams and impoundments along large reaches of river channels is the primary cause of the declination The following information is provided in Section 3.12: "The historic construction of dams and impoundments along large reaches of river channels is the primary cause of the decline in Southern Pigtoe's distribution and population size and continues to be a major threat to this species' persistence (USFWS 2019b). This species continues to be imperiled due to water withdrawal, water quality degradation including sedimentation released from dams and agricultural runoff, downstream flow alterations caused by hydropeaking dams, and climate change (USFWS 2019b)."</p>
ADCNR		<p>On page 17, 3.13 Slabside Pearlymussel section of the Threatened and Endangered Species Desktop Assessment, include that in 2013, USFWS designated critical habitat for</p>	<p>The following statement was added to Section 3.13: "The USFWS designated critical habitat for the Slabside Pearlymussel in 2013 (USFWS 2013c)."</p>

<u>Commenting Entity</u>	<u>Date of Comment & FERC Accession Number</u>	<u>Comment – Threatened and Endangered Species</u>	<u>Alabama Power Response</u>
		the species (Federal Register 78:59555-59620). A statement similar to the Rabbitsfoot section could be included for consistency.	
ADCNR		On page 25, Discussion and Conclusions: section of the Threatened and Endangered Species Desktop Assessment, include a caveat statement or footnote reiterating that this is a desktop assessment and that to be certain of species occurrence, surveys should be conducted by qualified biologists to determine if a sensitive species occurs within a project area. Species not listed for a specific area does not imply that they do not occur there, only that their occurrence there is as yet unrecorded by state or federal agencies. This assessment is currently under review and reflects only our current understanding of species distributions.	The T&E Species Desktop Assessment was revised and incorporated into the Discussion and Conclusions Section of the Final T&E Species Study Report, which describes how Alabama Power and USFWS determined whether additional field surveys were needed for each species.
ADCNR		On page 25, Discussion and Conclusions: section of the Threatened and Endangered Species Desktop Assessment, change "...extant populations of 20 federal and state protected T&E species (Appendix B)." to "...extant populations of 20 federally T&E species of which 16 are state protected (Appendix B)."	"...extant populations of 20 federal and state protected T&E species (Appendix B)." was changed to "...extant populations of 20 federally T&E species of which 16 are state protected (Table 1-1)."
ADCNR		Appendix B Species Habitat Range Maps of the Threatened and Endangered Species Desktop Assessment, all figures with "extant population" shown. change to "Recent Documented Occurrence". In addition, make sure "Current Range" and "Documented Historic Range" terminology is defined in the assessment. As is, all Figure Titles in Appendix B should have "Current" inserted before Habitat Range and after the Species name.	Legend items identifying "Extant Population" have been changed to "Recent Documented Occurrence". The following statement was added: "For the purpose of this study, "Documented Historic Range" refers to the geographic area a species was known or believed to occupy in the past, and "Current Range" refers to the geographic range the species is known or believed to currently occupy."
ADCNR		Figure 3.12-1 Appendix B of the Threatened and Endangered Species Desktop Assessment, Southern Pigtoe does not occur in the Tennessee River system. It does not have critical habitat in the Paint Rock River system. This map appears to be inaccurate and should be deleted.	The Southern Pigtoe map for Skyline was removed. The Southern Pigtoe map for Lake Harris was renamed to Figure 3.12-1 in Appendix B.

<u>Commenting Entity</u>	<u>Date of Comment & FERC Accession Number</u>	<u>Comment – Threatened and Endangered Species</u>	<u>Alabama Power Response</u>
ADCNR		Figure 3.13-1 Appendix B of the Threatened and Endangered Species Desktop Assessment, The Paint Rock River has designated critical habitat for this species. See Federal Register 78:59555-59620 for critical habitat details that should be included.	The Slabside Pearlymussel has critical habitat in the Paint Rock River system, which includes Hurricane Creek (USFWS 201c). This change was made to Figure 3.13-1.
ADCNR		Threatened and Endangered Species Desktop Assessment discussion. APC stated that “No listed species have been documented in the Tallapoosa River below the Harris Dam.” Should be changed to “No listed species have recently been documented in the Tallapoosa River between Harris Dam and Lake Martin.” The Documented Historic Range for Finelined Pocketbook includes the Tallapoosa River.	A statement that the Documented Historic Range for Finelined Pocketbook includes the Tallapoosa River was added.
Alabama Rivers Alliance	Questions submitted prior to the ISR Meeting	Is the additional fieldwork to identify mussels scheduled for May being pushed back or proceeding on schedule?	Explanation was provided in Alabama Power’s ISR Meeting Summary (Accession No. 2020-05-12-5083). Fieldwork was completed and results presented in the Finelined Pocketbook (<i>Hamiota altilis</i>) Survey Report (Appendix E), appended to the Final T&E Species Study Report.
United States Fish and Wildlife Service (USFWS)	Questions submitted prior the ISR Meeting	USFWS indicated that they do not have a copy of the best management practices for consultation on bats and that information would be beneficial to mapping the buffer zone.	Explanation was provided in Alabama Power’s ISR Meeting Summary (Accession No. 2020-05-12-5083). Information on best management practices (BMPs) for bats will be provided in the Wildlife Management Report.
Ken Wills (Alabama Glade Conservation Association)	Questions submitted prior the ISR Meeting	Are the 138.4 acres of granite geology west of the Project Boundary on Alabama Power land, other private land, or public land? How much is public and private land and how much is Flat Rock?	Explanation was provided in Alabama Power’s ISR Meeting Summary (Accession No. 2020-05-12-5083).
Jimmy Traylor (Downstream Property Owner)	Questions submitted prior the ISR Meeting	Why there are no [Threatened and Endangered Species] studies below the dam and how Skyline effects water below the dam. Why are no T&E species being studied?	Explanation was provided in Alabama Power’s ISR Meeting Summary (Accession No. 2020-05-12-5083).