# FINAL Pre-Dam Removal Shoal Bass Abundance and Tracking Study Report

LANGDALE PROJECT (FERC NO. 2341)
AND
RIVERVIEW PROJECT (FERC NO. 2350)

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# 1.0 INTRODUCTION

Georgia Power Company (Georgia Power) is the Federal Energy Regulatory Commission (FERC) licensee for the Langdale Project (FERC No. 2341) and the Riverview Project (FERC No. 2350) (collectively, the "Projects"). On December 18, 2018[1], Georgia Power filed applications for license surrender for the Projects with FERC in accordance with Regulations 18 Code of Federal Regulations (C.F.R.) § 6.1 and 6.2. The licenses for the Projects expire on December 31, 2023. The location of the Projects is provided in Figure 1-1.

## 1.1 Project Background

Langdale Project

The Langdale Project is located on the Chattahoochee River, adjacent to Valley, Alabama and in Harris County, Georgia at river mile (RM) 191.9. The Langdale Project is located approximately 9.5 RMs downstream of the U.S. Army Corps of Engineers (USACE) West Point Dam (RM 201.4), which began operation in 1976 and regulates the flow through the Middle Chattahoochee River region (Figure 1-1).

The Langdale Project was constructed between 1904 and 1908 and purchased by Georgia Power from West Point Manufacturing Company in 1930. The Project operated as a run-of-river hydroelectric plant. Over time, the four horizontal generating units developed maintenance problems, and eventually were no longer operable. Generation records suggest that Georgia Power ceased operation of operating the horizontal units in approximately 1954. The horizontal units were officially retired in 1960, leaving only the two 520 kilowatt (kW) vertical units operating at the Langdale Project; these two units remain in place in the powerhouse but have not operated since 2009.

Riverview Project

The Riverview Project is located at RM 191.0 (Crow Hop Diversion Dam) and RM 190.6 (Riverview Dam) on the Chattahoochee River, downstream of Valley, Alabama and in Harris County, Georgia. The Project is located approximately 10.5 RMs downstream of USACE West Point Project and 0.9 RMs downstream of the Langdale Project (Figure 1-2).

[1] Accession Numbers 20181218-5451 and 20181218-5452

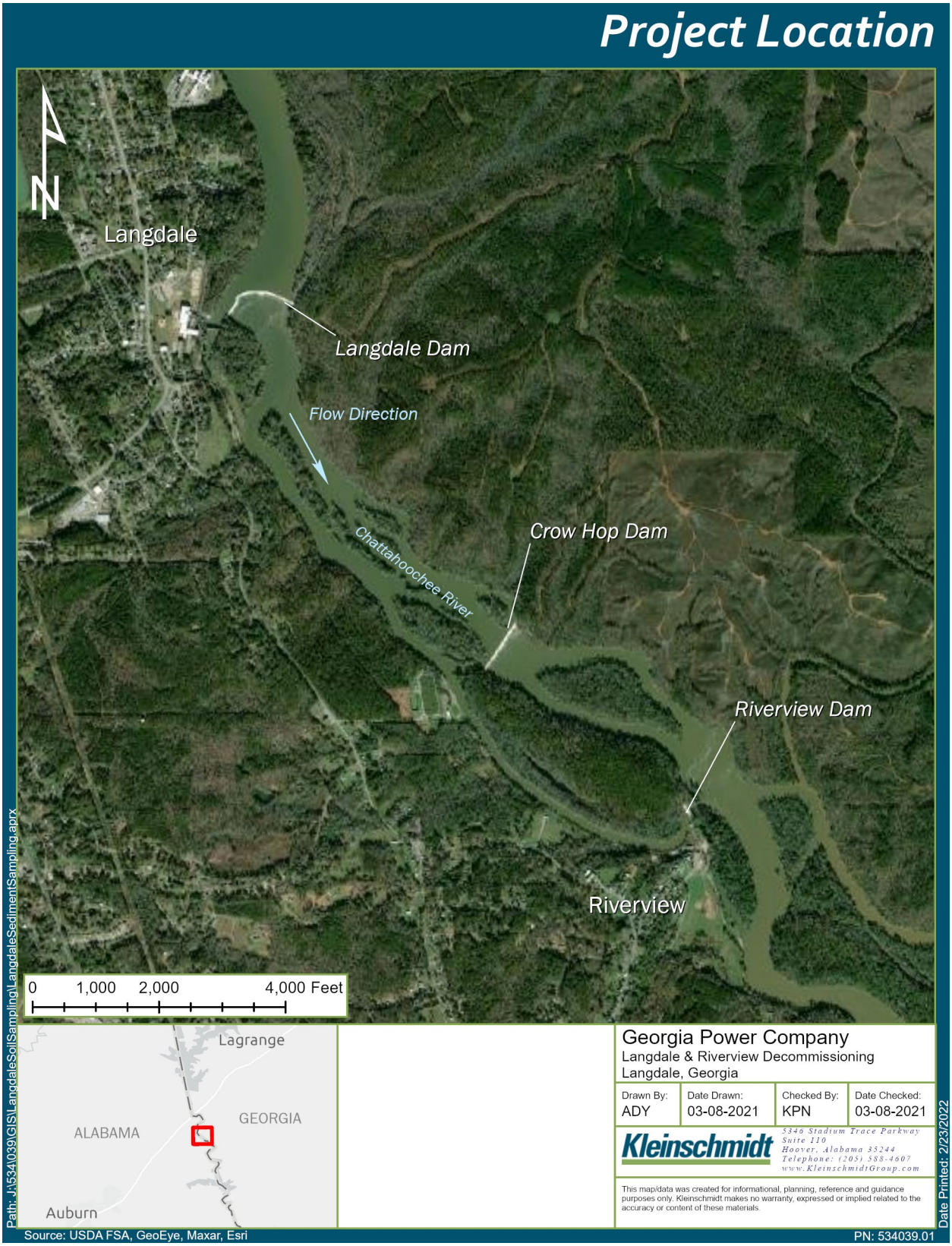


**Figure 1-1 Project Locations**

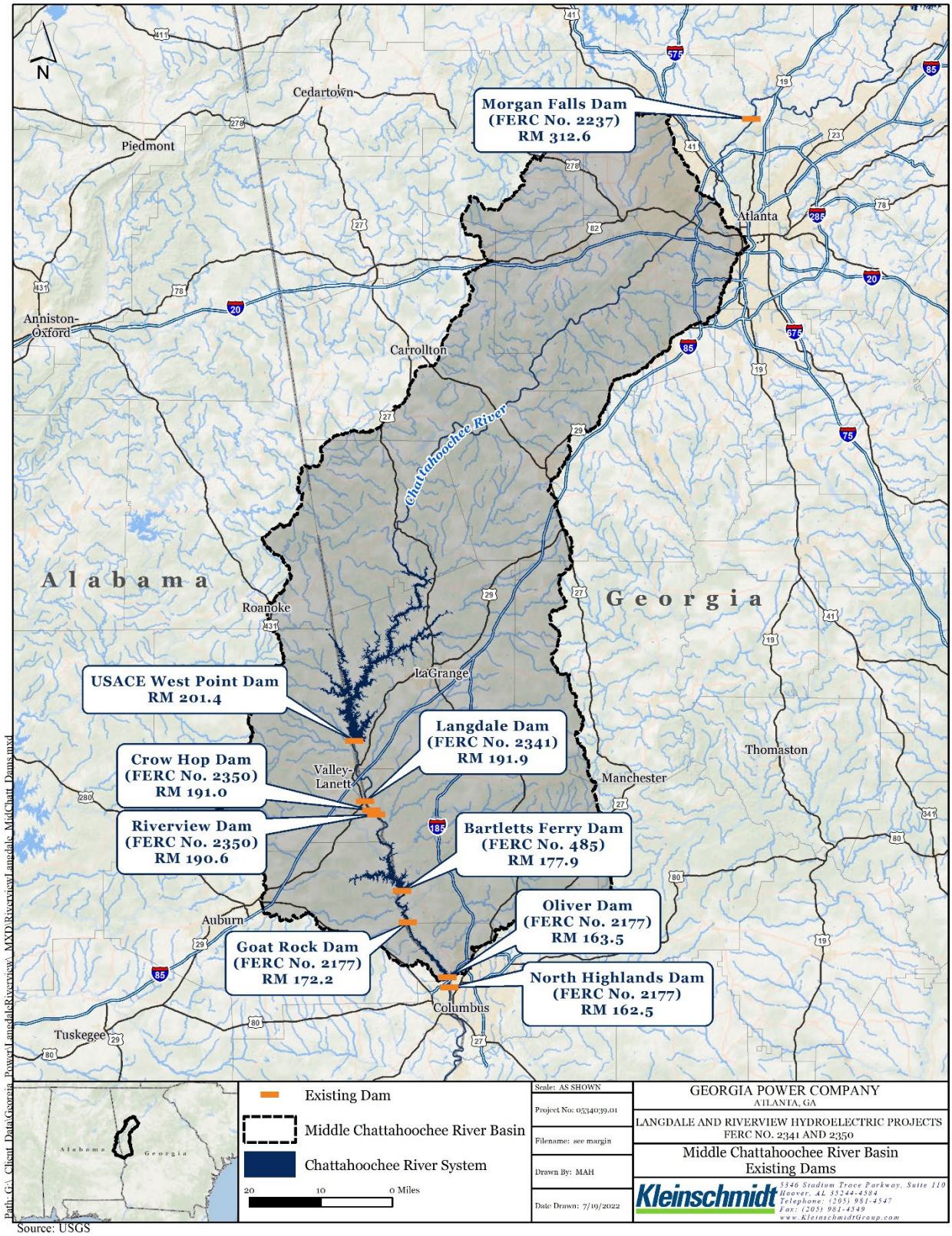


**Figure 1-2 Middle Chattahoochee River Basin Existing Dams**

The Riverview Project consists of two separate dams, Riverview Dam and Crow Hop Diversion Dam (Crow Hop Dam), and a powerhouse with generating equipment located on the western abutment of Riverview Dam. Crow Hop Dam is the upstream dam and is situated across the main river, diverting flow into a headrace channel between an island and the western bank. The headrace channel is approximately 1-mile-long. Riverview Dam and the powerhouse are located at the lower end of this headrace channel. The smaller downstream dam was constructed in 1906 for West Point Manufacturing Company. Originally, the dam diverted water into the adjacent mill building to provide power for mill operation. The existing powerhouse was built in 1918 and houses two 240 kW generating units. Crow Hop Dam was constructed in 1920. Georgia Power purchased the Riverview Project from West Point Manufacturing Company in 1930 and began operating the two generating units. Over time, the units developed maintenance problems, and eventually were no longer operable or repairable. Georgia Power stopped operating the units in 2009. The Riverview Project previously operated as a run-of-river project.

## 1.2 Study Background

On April 11, 2019, FERC issued an additional information request (AIR)[2] regarding decommissioning studies proposed by Georgia Power. As part of its response, Georgia Power filed the Proposed Study Plan (PSP) on May 24, 2019[3] to provide additional information on the proposed studies to support its surrender applications for the Project. Georgia Power filed the Final Study Plan (FSP) on July 24, 2019[4]. The FSP included a study plan addressing Potential Effects of Dam Removal on Shoal Bass. Georgia Power conducted the desktop assessment and provided a Draft Study Report on September 21, 2020[5]. On October 5, 2020, Georgia Power held a public meeting to present the study results to stakeholders. The meeting consisted of an afternoon and evening session held virtually due to concerns with Coronavirus Disease 2019 (COVID-19). Georgia Power requested that stakeholders submit comments on all draft study reports by November 5, 2020. Georgia Power received seven comment letters on the draft study reports (Appendix A).

On November 18, 2020[6], FERC responded to the draft study reports and asked that Georgia Power provide additional supporting evidence (methods, data, maps) to support

[2] Accession Number 20190411-3007
[3] Accession Number 20190524-5217
[4] Accession Number 20190724-5110
[5] Accession Number 20200921-5036
[6] Accession Number 20201118-3015

Georgia Power's conclusions in the *Potential Effects of Dam Removal on Shoal Bass Draft Study Report*. Georgia Power determined that a pre-dam removal physical assessment of the abundance of shoal bass (*Micropterus cataractae*) in the Project Area would provide additional documentation of baseline conditions of shoal bass to compare to one season of field collection post removal. The Draft Pre-and Post Removal Shoal Bass Abundance and Tracking Study Plan, filed with FERC on April 28, 2021, was designed to address the study objectives, methods, reporting, and schedule. Georgia Power requested that stakeholders submit comments on the Draft Pre-and Post Removal Shoal Bass Abundance and Tracking Study Plan by May 28, 2021. Georgia Power received two comment letters on the draft study plan (Appendix A).

In August 2022, Georgia Power filed the *Draft Pre-Dam Removal Shoal Bass Tracking and Abundance Study Report* with FERC. No comments were filed on the draft report. Therefore, this *Final Pre-Dam Removal Shoal Bass Tracking and Abundance Study Report* is being filed with FERC.

In accordance with the Pre-and Post Removal Shoal Bass Tracking and Abundance Study Plan, the purpose of this *Final Pre-Dam Removal Shoal Bass Tracking and Abundance Study Report* is to describe the baseline (pre-removal) conditions in the study area by:

- Estimating current abundance of shoal bass in the mainstem Chattahoochee River and Flat Shoal Creek
- Characterizing fish community assemblage pre-removal
- Assess habitat prior to dam removal

# 2.0 METHODS

## 2.1 Study Area and Fish Sampling Design

The study area consists of four reaches, with three reaches of the Chattahoochee River and one reach within Flat Shoal Creek (Figure 2-1). The reaches are as follows:

- Reach 1: Chattahoochee River from West Point Dam downstream to Langdale Dam (9.4 miles)
- Reach 2: Chattahoochee River from Langdale Dam to Crow Hop Dam, including the Riverview headrace channel (1.3 miles)
- Reach 3: Chattahoochee River from Crow Hop and Riverview Dams to the upper reaches of Lake Harding (3.7 miles)
- Reach 4: Flat Shoal Creek upstream of Hwy 103 (1 mile)

The pre-removal fisheries study consisted of two distinct sampling events. For each sampling event, Reaches 1-3 on the Chattahoochee River were sampled with a boat-mounted electrofishing unit. Three randomly selected transects within each reach were sampled with a standardized electrofishing effort of 20 minutes each, totaling a minimum effort of 60 minutes per reach. However, if the randomly selected transects were located in poor shoal bass habitat and few individuals were captured, additional transect(s) within suitable shoal bass habitat could be selectively sampled, and effort could be extended from 60 minutes to a maximum effort of 120 minutes per reach. Electrofishing was limited to areas accessible by boat. In general, electrofishing was performed in a downstream direction, sampling at near run-of-river speeds. Immobilized fish were netted and placed in an aerated live well for processing.

Conversely, Reach 4 on Flat Shoal Creek was sampled with two backpack electrofishing units, where sampling began at a randomly selected start location within the one mile reach upstream of Highway 103. Fish were sampled in an upstream direction, immobilized fish were netted and held in buckets for processing. This second sampling event for the pre-removal study took place approximately three weeks after the first.

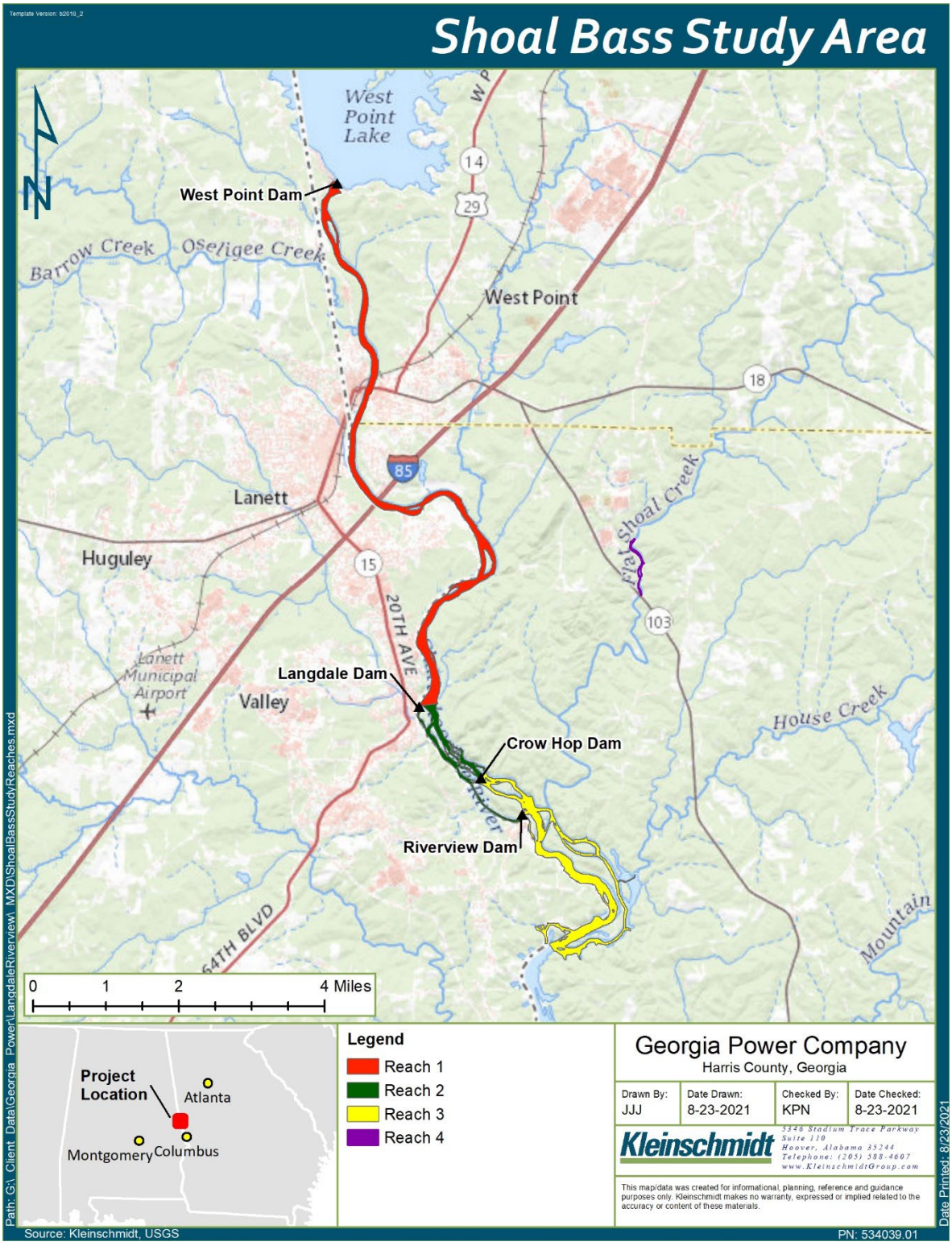


**Figure 2-1 Shoal Bass Study Area**

## 2.2 Fish Collection

Immobilized fish were identified to species, enumerated, and measured for total length and mass. Abnormalities such as parasites, disease, eroded fins, lesions, tumors (PDELTs) were recorded. In addition to being weighed and measured, captured shoal bass were scanned for the presence of a passive integrated transponder (PIT) tag, and tagged with a food-safe polymer PIT tag on the right-side dorsum. In addition, fin clips (right pectoral fin) were collected and fixed in 95 percent non-denatured alcohol. Collections were completed following the United States Fish and Wildlife Service (USFWS) Standard Operating Procedure (USFWS 2017) for collecting tissues for genetic analysis, with fin clips placed in clearly marked vials and stored until later processing.

## 2.3 Fish Data Processing

Electrofishing data were used to characterize the fish community in each reach. In addition, common descriptive metrics such as catch per unit effort (CPUE), relative abundance, biomass, diversity, and evenness were calculated. These data would be used for comparison for the post-removal study, which would be conducted after the removal of the Project dams. Shoal bass data such as length and mass were used to characterize the population and size class structure of shoal bass within the study area.

## 2.4 Habitat Data

Aquatic habitat assessments within Reaches 1-3 were performed using side-scan sonar in a method like that described by Kaeser et al. (2012). Areas too shallow to scan with sonar were visually assessed. Recorded sonar imagery was imported into ArcGIS Pro, where substrates were categorized as bedrock, rocky coarse (i.e., boulders and cobbles), rocky fine (i.e., pebbles and gravels), and soft sediments (i.e., sand, silt, and clay). In areas inaccessible by boat, areas with poor image resolution, or areas within the sonar shadow, substrate categories were extrapolated based on visual observations, field truthing efforts, or surrounding areas. Field truthing included the comparison of sonar imagery with visual assessments or aerial photography of river substrates.

# 3.0 RESULTS

## 3.1 Fish Survey

The first fisheries sampling event along Reaches 1-3 occurred June 8-10, 2021, and the second sampling occurred June 31-July 2, 2021. The first sampling event within Reach 4 occurred June 17, 2021, and the second sampling event occurred June 30, 2021. During the pre-removal study, a total of 1,173 individual fish were captured within the Chattahoochee River and Flat Shoal Creek, representing 34 species across the study area (Table 3-1). Sampling effort and total number of fish captured were similar between the first and second sampling efforts (Table 3-2).

## Table 3-1 Summary of Total Fish Collected during the Pre-Removal Study

| Species | Total | | Reach 1 | | Reach 2 | | Reach 3 | | Reach 4 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **Count** | **RA (%)** | **Count** | **RA (%)** | **Count** | **RA (%)** | **Count** | **RA (%)** | **Count** | **RA (%)** |
| **Longnose Gar** *Lepisosteus osseus* | **12** | **1.0** | - | - | - | - | 12 | 2.6 | - | - |
| **Bowfin** *Amia calva* | **2** | **0.2** | - | - | - | - | 2 | 0.4 | - | - |
| **Gizzard Shad** *Dorosoma cepedianum* | **9** | **0.8** | 1 | 0.3 | 1 | 0.3 | 7 | 1.5 | - | - |
| **Threadfin Shad** *Dorosoma petenense* | **2** | **0.2** | - | - | - | - | 2 | 0.4 | - | - |
| **Bluefin Stoneroller** *Campostoma pauciradii* | **1** | **0.1** | - | - | - | - | - | - | 1 | 0.9 |
| **Bluestripe Shiner** *Cyprinella callitaenia* | **17** | **1.4** | - | - | - | - | 17 | 3.6 | - | - |
| **Blacktail Shiner** *Cyprinella venusta* | **41** | **3.5** | 10 | 3.4 | 11 | 3.6 | 10 | 2.1 | 10 | 8.8 |
| **Common Carp** *Cyprinus carpio* | **3** | **0.3** | - | - | 3 | 1.0 | - | - | - | - |
| **Weed Shiner** *Notropis texanus* | **6** | **0.5** | - | - | - | - | 6 | 1.3 | - | - |
| **Northern Hogsucker** *Hypentelium nigricans* | **4** | **0.3** | - | - | - | - | - | - | 4 | 3.5 |
| **Spotted Sucker** *Minytrema melanops* | **22** | **1.9** | 12 | 4.1 | 7 | 2.3 | 3 | 0.6 | - | - |
| **Greater Jumprock** *Moxostoma lachneri* | **18** | **1.5** | - | - | - | - | 1 | 0.2 | 17 | 15.0 |
| **Apalachicola Redhorse** *Moxostoma sp.* | **70** | **6.0** | 4 | 1.4 | - | - | 66 | 14.1 | - | - |
| | | | | | | | | | | |

| Species | Total | | Reach 1 | | Reach 2 | | Reach 3 | | Reach 4 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Count | RA (%) | Count | RA (%) | Count | RA (%) | Count | RA (%) | Count | RA (%) |
| | | | | | | | | | | |
| **Snail Bullhead** *Ameiurus brunneus* | **35** | **3.0** | 17 | 5.8 | 8 | 2.6 | - | - | 10 | 8.8 |
| **Yellow Bullhead** *Ameiurus natalis* | **3** | **0.3** | 2 | 0.7 | - | - | 1 | 0.2 | - | - |
| **Blue Catfish** *Ictalurus furcatus* | **7** | **0.6** | - | - | - | - | 7 | 1.5 | - | - |
| **Channel Catfish** *Ictalurus punctatus* | **16** | **1.4** | 8 | 2.7 | - | - | 6 | 1.3 | 2 | 1.8 |
| **Flathead Catfish** *Pylodictus olivaris* | **10** | **0.9** | - | - | - | - | 9 | 1.9 | 1 | 0.9 |
| **Brook Silverside** *Labidesthes sicculus* | **18** | **1.5** | 6 | 2.1 | 5 | 1.7 | 7 | 1.5 | - | - |
| **Striped Bass** *Morone saxatilis* | **19** | **1.6** | - | - | 1 | 0.3 | 18 | 3.9 | - | - |
| **Redbreast Sunfish** *Lepomis auritus* | **379** | **32.3** | 159 | 54.6 | 140 | 46.4 | 67 | 14.3 | 13 | 11.5 |
| **Green Sunfish** *Lepomis cyanellus* | **3** | **0.3** | - | - | 3 | 1.0 | - | - | - | - |
| **Bluegill** *Lepomis macrochirus* | **141** | **12.0** | 11 | 3.8 | 15 | 5.0 | 107 | 22.9 | 8 | 7.1 |
| **Dollar Sunfish** *Lepomis marginatus* | **1** | **0.1** | - | - | - | - | 1 | 0.2 | - | - |
| **Redear Sunfish** *Lepomis microlophus* | **95** | **8.1** | 3 | 1.0 | 10 | 3.3 | 80 | 17.1 | 2 | 1.8 |
| **Spotted Sunfish intergrade** *Lepomis punctatus/marginatus* | **5** | **0.4** | - | - | 2 | 0.7 | 2 | 0.4 | 1 | 0.9 |
| **Warmouth** *Lepomis gulosus* | **1** | **0.1** | - | - | 1 | 0.3 | - | - | - | - |

| Species | Total | | Reach 1 | | Reach 2 | | Reach 3 | | Reach 4 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **Count** | **RA (%)** | **Count** | **RA (%)** | **Count** | **RA (%)** | **Count** | **RA (%)** | **Count** | **RA (%)** |
| **Shoal Bass** *Micropterus cataractae* | **56** | **4.8** | - | - | 28 | 9.3 | 5 | 1.1 | 23 | 20.4 |
| **Spotted Bass** *Micropterus punctulatus* | **71** | **6.1** | 26 | 8.9 | 29 | 9.6 | 16 | 3.4 | - | - |
| **Largemouth Bass** *Micropterus salmoides* | **54** | **4.6** | 17 | 5.8 | 26 | 8.6 | 11 | 2.4 | - | - |
| **Black Crappie** *Pomoxis nigromaculatus* | **1** | **0.1** | - | - | - | - | 1 | 0.2 | - | - |
| **Swamp Darter** *Etheostoma fusiforme* | **1** | **0.1** | - | - | 1 | 0.3 | - | - | - | - |
| **Yellow Perch** *Perca flavescens* | **2** | **0.2** | 1 | 0.3 | - | - | 1 | 0.2 | - | - |
| **Blackbanded Darter** *Percina nigrofasciata* | **48** | **4.1** | 14 | 4.8 | 11 | 3.6 | 2 | 0.4 | 21 | 18.6 |
| **Total** | **1,173** | **100** | 291 | 100 | 302 | 100 | 467 | 100 | 113 | 100 |
| **Number of Species** | **34** | | 15 | | 18 | | 27 | | 13 | |
| **Shannon-Weiner Diversity Index** | **2.56** | | 1.75 | | 1.96 | | 2.43 | | 2.21 | |
| **Evenness** | **72.67** | | 64.74 | | 68.09 | | 73.73 | | 86.08 | |

## Table 3-2 Total Species Sampled Pre-Dam Removal

| Species | Grand Total | | | | Effort 1 | | | | Effort 2 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Count | RA (%) | CPUE (fish/hr) | Mass (g) | Count | RA (%) | CPUE (fish/hr) | Mass (g) | Count | RA (%) | CPUE (fish/hr) | Mass (g) |
| **Longnose Gar** *Lepisosteus osseus* | **12** | **1.0** | **1.1** | **9,208** | 8 | 1.5 | 1.5 | 5,510 | 4 | 0.6 | 0.7 | 3,698 |
| **Bowfin** *Amia calva* | **2** | **0.2** | **0.2** | **2,606** | 2 | 0.4 | 0.4 | 2,606 | - | - | - | - |
| **Gizzard Shad** *Dorosoma cepedianum* | **9** | **0.8** | **0.8** | **3,111** | 8 | 1.5 | 1.5 | 2,421 | 1 | 0.2 | 0.2 | 690 |
| **Threadfin Shad** *Dorosoma petenense* | **2** | **0.2** | **0.2** | **30** | - | - | - | - | 2 | 0.3 | 0.4 | 30 |
| **Bluefin Stoneroller** *Campostoma pauciradii* | **1** | **0.1** | **0.1** | **-** | - | - | - | - | 1 | 0.2 | 0.2 | - |
| **Bluestripe Shiner** *Cyprinella callitaenia* | **17** | **1.4** | **1.6** | **61** | 5 | 0.9 | 1.0 | 25 | 12 | 1.9 | 2.2 | 36 |
| **Blacktail Shiner** *Cyprinella venusta* | **41** | **3.5** | **3.8** | **390** | 13 | 2.4 | 2.5 | 151 | 28 | 4.5 | 5.1 | 239 |
| **Common Carp** *Cyprinus carpio* | **3** | **0.3** | **0.3** | **2,962** | 3 | 0.5 | 0.6 | 2,962 | - | - | - | - |
| **Weed Shiner** *Notropis texanus* | **6** | **0.5** | **0.6** | **19** | 6 | 1.1 | 1.1 | 19 | - | - | - | - |
| **Northern Hogsucker** *Hypentelium nigricans* | **4** | **0.3** | **0.4** | **-** | - | - | - | - | 4 | 0.6 | 0.7 | - |
| **Spotted Sucker** *Minytrema melanops* | **22** | **1.9** | **2.0** | **22,603** | 10 | 1.8 | 1.9 | 7,163 | 12 | 1.9 | 2.2 | 15,440 |
| **Greater Jumprock** *Moxostoma lachneri* | **18** | **1.5** | **1.7** | **9** | 1 | 0.2 | 0.2 | 9 | 17 | 2.7 | 3.1 | - |
| **Apalachicola Redhorse** *Moxostoma sp.* | **70** | **6.0** | **6.5** | **53,918** | 24 | 4.4 | 4.6 | 16,264 | 46 | 7.4 | 8.4 | 37,654 |
| **Snail Bullhead** *Ameiurus brunneus* | **35** | **3.0** | **3.3** | **2,396** | 12 | 2.2 | 2.3 | 955 | 23 | 3.7 | 4.2 | 1,441 |
| | | | | | | | | | | | | |

| Species | Grand Total | | | | Effort 1 | | | | Effort 2 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Count | RA (%) | CPUE (fish/hr) | Mass (g) | Count | RA (%) | CPUE (fish/hr) | Mass (g) | Count | RA (%) | CPUE (fish/hr) | Mass (g) |
| | | | | | | | | | | | | |
| **Yellow Bullhead** *Ameiurus natalis* | **3** | **0.3** | **0.3** | **46** | 3 | 0.5 | 0.6 | 46 | - | - | - | - |
| **Blue Catfish** *Ictalurus furcatus* | **7** | **0.6** | **0.7** | **5,391** | 3 | 0.5 | 0.6 | 2,019 | 4 | 0.6 | 0.7 | 3,372 |
| **Channel Catfish** *Ictalurus punctatus* | **16** | **1.4** | **1.5** | **18,868** | 6 | 1.1 | 1.1 | 1,194 | 10 | 1.6 | 1.8 | 17,674 |
| **Flathead Catfish** *Pylodictus olivaris* | **10** | **0.9** | **0.9** | **5,097** | - | - | - | - | 10 | 1.6 | 1.8 | 5,097 |
| **Brook Silverside** *Labidesthes sicculus* | **18** | **1.5** | **1.7** | **51** | 9 | 1.6 | 1.7 | 19 | 9 | 1.4 | 1.6 | 32 |
| **Striped Bass** *Morone saxatilis* | **19** | **1.6** | **1.8** | **19,772** | 10 | 1.8 | 1.9 | 7,301 | 9 | 1.4 | 1.6 | 12,471 |
| **Redbreast Sunfish** *Lepomis auritus* | **379** | **32.3** | **35.3** | **17,238** | 214 | 39.1 | 40.8 | 8,907 | 165 | 26.4 | 30.0 | 8,331 |
| **Green Sunfish** *Lepomis cyanellus* | **3** | **0.3** | **0.3** | **69** | 2 | 0.4 | 0.4 | 52 | 1 | 0.2 | 0.2 | 17 |
| **Bluegill** *Lepomis macrochirus* | **141** | **12.0** | **13.1** | **4,357** | 65 | 11.9 | 12.4 | 2,025 | 76 | 12.2 | 13.8 | 2,332 |
| **Dollar Sunfish** *Lepomis marginatus* | **1** | **0.1** | **0.1** | **6** | 1 | 0.2 | 0.2 | 6 | - | - | - | - |
| **Redear Sunfish** *Lepomis microlophus* | **95** | **8.1** | **8.8** | **10,408** | 29 | 5.3 | 5.5 | 2,747 | 66 | 10.6 | 12.0 | 7,661 |
| **Spotted Sunfish intergrade** *Lepomis punctatus/marginatus* | **5** | **0.4** | **0.5** | **83** | 3 | 0.5 | 0.6 | 59 | 2 | 0.3 | 0.4 | 24 |
| **Warmouth** *Lepomis gulosus* | **1** | **0.1** | **0.1** | **16** | - | - | - | - | 1 | 0.2 | 0.2 | 16 |
| | | | | | | | | | | | | |

| Species | Grand Total | | | | Effort 1 | | | | Effort 2 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Count | RA (%) | CPUE (fish/hr) | Mass (g) | Count | RA (%) | CPUE (fish/hr) | Mass (g) | Count | RA (%) | CPUE (fish/hr) | Mass (g) |
| | | | | | | | | | | | | |
| **Shoal Bass** *Micropterus cataractae* | **56** | **4.8** | **5.2** | **23,552** | 28 | 5.1 | 5.3 | 7,704 | 28 | 4.5 | 5.1 | 15,848 |
| **Spotted Bass** *Micropterus punctulatus* | **71** | **6.1** | **6.6** | **11,692** | 35 | 6.4 | 6.7 | 6,849 | 36 | 5.8 | 6.6 | 4,843 |
| **Largemouth Bass** *Micropterus salmoides* | **54** | **4.6** | **5.0** | **14,879** | 31 | 5.7 | 5.9 | 7,755 | 23 | 3.7 | 4.2 | 7,124 |
| **Black Crappie** *Pomoxis nigromaculatus* | **1** | **0.1** | **0.1** | **81** | - | - | - | - | 1 | 0.2 | 0.2 | 81 |
| **Swamp Darter** *Etheostoma fusiforme* | **1** | **0.1** | **0.1** | **2** | 1 | 0.2 | 0.2 | 2 | - | - | - | - |
| **Yellow Perch** *Perca flavescens* | **2** | **0.2** | **0.2** | **7** | 1 | 0.2 | 0.2 | 1 | 1 | 0.2 | 0.2 | 6 |
| **Blackbanded Darter** *Percina nigrofasciata* | **48** | **4.1** | **4.5** | **118** | 15 | 2.7 | 2.9 | 64 | 33 | 5.3 | 6.0 | 54 |
| **Total** | **1,173** | **100** | **109.3** | **229,046** | 548 | 100 | 104.5 | 84,835 | 625 | 100 | 113.8 | 144,211 |
| **Number of Species** | **34** | | | | 28 | | | | 28 | | | |
| **Effort** | **644.2** | | | | 314.6 | | | | 329.6 | | | |
| **Shannon-Weiner Diversity Index** | **2.56** | | | | | | | | | | | |
| **Evenness** | **72.67** | | | | | | | | | | | |

In general, the fisheries community was relatively similar between the three reaches on the Chattahoochee River, with variation in species composition and relative abundance depending on location and habitat type within those locations (Table 3-1). Of the reaches along the Chattahoochee River, Reach 1 had the fewest fish captures, lowest species richness, lowest total biomass, and lowest CPUE (Table 3-3). Reach 2 had the second-most captures, species richness, biomass, and CPUE (Table 3-4). Reach 3 had the greatest number of individuals, highest species richness, greatest biomass, and highest CPUE than any other reach (Table 3-5). Conversely, Reach 4 within Flat Shoal Creek exhibited differences in species composition and community structure as compared to the reaches with the Chattahoochee River, which was expected. A total of 113 individuals were captured in Reach 4, representing 13 species (Table 3-6).

## Table 3-3 Species Sampled Pre-Dam Removal in Reach 1

| Species | Total | | | | Effort 1 | | | | Effort 2 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Count | RA (%) | CPUE (fish/hr) | Mass (g) | Count | RA (%) | CPUE (fish/hr) | Mass (g) | Count | RA (%) | CPUE (fish/hr) | Mass (g) |
| **Gizzard Shad** *Dorosoma cepedianum* | **1** | **0.3** | **0.4** | **357** | 1 | 0.5 | 0.8 | 357 | - | - | - | - |
| **Blacktail Shiner** *Cyprinella venusta* | **10** | **3.4** | **3.8** | **104** | 8 | 3.9 | 6.1 | 93 | 2 | 2.3 | 1.5 | 11 |
| **Spotted Sucker** *Minytrema melanops* | **12** | **4.1** | **4.5** | **11,510** | 5 | 2.4 | 3.8 | 3,559 | 7 | 8.1 | 5.2 | 7,951 |
| **Apalachicola Redhorse** *Moxostoma sp.* | **4** | **1.4** | **1.5** | **4,818** | - | - | - | - | 4 | 4.7 | 3.0 | 4,818 |
| **Snail Bullhead** *Ameiurus brunneus* | **17** | **5.8** | **6.4** | **1,849** | 7 | 3.4 | 5.4 | 526 | 10 | 11.6 | 7.4 | 1,323 |
| **Yellow Bullhead** *Ameiurus natalis* | **2** | **0.7** | **0.8** | **29** | 2 | 1.0 | 1.5 | 29 | - | - | - | - |
| **Channel Catfish** *Ictalurus punctatus* | **8** | **2.7** | **3.0** | **10,425** | 1 | 0.5 | 0.8 | 8 | 7 | 8.1 | 5.2 | 10,417 |
| **Brook Silverside** *Labidesthes sicculus* | **6** | **2.1** | **2.3** | **13** | 5 | 2.4 | 3.8 | 11 | 1 | 1.2 | 0.7 | 2 |
| **Redbreast Sunfish** *Lepomis auritus* | **159** | **54.6** | **59.8** | **7,511** | 136 | 66.3 | 104.2 | 6,072 | 23 | 26.7 | 17.0 | 1,439 |
| **Bluegill** *Lepomis macrochirus* | **11** | **3.8** | **4.1** | **353** | 6 | 2.9 | 4.6 | 182 | 5 | 5.8 | 3.7 | 171 |
| **Redear Sunfish** *Lepomis microlophus* | **3** | **1.0** | **1.1** | **446** | 2 | 1.0 | 1.5 | 300 | 1 | 1.2 | 0.7 | 146 |
| **Spotted Bass** *Micropterus punctulatus* | **26** | **8.9** | **9.8** | **4,375** | 9 | 4.4 | 6.9 | 2,692 | 17 | 19.8 | 12.6 | 1,683 |
| **Largemouth Bass** *Micropterus salmoides* | **17** | **5.8** | **6.4** | **2,574** | 14 | 6.8 | 10.7 | 2,227 | 3 | 3.5 | 2.2 | 347 |
| | | | | | | | | | | | | |

| Species | Total | | | | Effort 1 | | | | Effort 2 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Count | RA (%) | CPUE (fish/hr) | Mass (g) | Count | RA (%) | CPUE (fish/hr) | Mass (g) | Count | RA (%) | CPUE (fish/hr) | Mass (g) |
| | | | | | | | | | | | | |
| **Yellow Perch** *Perca flavescens* | **1** | **0.3** | **1.4** | **1** | 1 | 0.5 | 0.8 | 1 | - | - | - | - |
| **Blackbanded Darter** *Percina nigrofasciata* | **14** | **4.8** | **5.3** | **65** | 8 | 3.9 | 6.1 | 36 | 6 | 7.0 | 4.4 | 29 |
| **Total** | **291** | **100** | **109.5** | **44,430** | 205 | 100 | 157.0 | 16,093 | 86 | 100 | 63.6 | 28,337 |
| **Number of Species** | **15** | | | | 14 | | | | 12 | | | |
| **Effort** | **159.4** | | | | 78.3 | | | | 81.1 | | | |
| **Shannon-Weiner Diversity Index** | **1.75** | | | | | | | | | | | |
| **Evenness** | **64.74** | | | | | | | | | | | |

## Table 3-4 Species Sampled Pre-Dam Removal in Reach 2

| Species | Total | | | | Effort 1 | | | | Effort 2 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Count | RA (%) | CPUE (fish/hr) | Mass (g) | Count | RA (%) | CPUE (fish/hr) | Mass (g) | Count | RA (%) | CPUE (fish/hr) | Mass (g) |
| **Gizzard Shad** *Dorosoma cepedianum* | **1** | **0.3** | **0.3** | **690** | - | - | - | - | 1 | 0.6 | 0.6 | 690 |
| **Blacktail Shiner** *Cyprinella venusta* | **11** | **3.6** | **3.5** | **167** | 1 | 0.8 | 0.7 | 13 | 10 | 5.6 | 6.1 | 154 |
| **Common Carp** *Cyprinus carpio* | **3** | **1.0** | **0.9** | **2,962** | 3 | 2.4 | 2.0 | 2,962 | - | - | - | - |
| **Spotted Sucker** *Minytrema melanops* | **7** | **2.3** | **2.2** | **9,417** | 2 | 1.6 | 1.3 | 1,928 | 5 | 2.8 | 3.1 | 7,489 |
| **Snail Bullhead** *Ameiurus brunneus* | **8** | **2.6** | **2.5** | **547** | 5 | 4.1 | 3.3 | 429 | 3 | 1.7 | 1.8 | 118 |
| **Brook Silverside** *Labidesthes sicculus* | **5** | **1.7** | **1.6** | **15** | 2 | 1.6 | 1.3 | 3 | 3 | 1.7 | 1.8 | 12 |
| **Striped Bass** *Morone saxatilis* | **1** | **0.3** | **0.3** | **998** | 1 | 0.8 | 0.7 | 998 | - | - | - | - |
| **Redbreast Sunfish** *Lepomis auritus* | **140** | **46.4** | **44.3** | **7,963** | 39 | 31.7 | 25.6 | 1,710 | 101 | 56.4 | 61.9 | 6,253 |
| **Green Sunfish** *Lepomis cyanellus* | **3** | **1.0** | **0.9** | **69** | 2 | 1.6 | 1.3 | 52 | 1 | 0.6 | 0.6 | 17 |
| **Bluegill** *Lepomis macrochirus* | **15** | **5.0** | **4.7** | **410** | 12 | 9.8 | 7.9 | 277 | 3 | 1.7 | 1.8 | 133 |
| **Redear Sunfish** *Lepomis microlophus* | **10** | **3.3** | **3.2** | **3,018** | 1 | 0.8 | 0.7 | 407 | 9 | 5.0 | 5.5 | 2,611 |
| **Spotted Sunfish intergrade** *Lepomis punctatus/marginatus* | **2** | **0.7** | **0.6** | **53** | 2 | 1.6 | 1.3 | 53 | - | - | - | - |
| **Warmouth** *Lepomis gulosus* | **1** | **0.3** | **0.3** | **16** | - | - | - | - | 1 | 0.6 | 0.6 | 16 |
| **Shoal Bass** *Micropterus cataractae* | **28** | **9.3** | **8.9** | **19,930** | 16 | 13.0 | 10.5 | 5,545 | 12 | 6.7 | 7.3 | 14,385 |
| | | | | | | | | | | | | |

| Species | Total | | | | Effort 1 | | | | Effort 2 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Count** | **RA** (%) | **CPUE** (fish/hr) | **Mass** (g) | **Count** | **RA** (%) | **CPUE** (fish/hr) | **Mass** (g) | **Count** | **RA** (%) | **CPUE** (fish/hr) | **Mass** (g) |
| | | | | | | | | | | | | |
| **Spotted Bass** *Micropterus punctulatus* | **29** | **9.6** | **9.2** | **4,161** | 19 | 15.4 | 12.4 | 2,801 | 10 | 5.6 | 6.1 | 1,360 |
| **Largemouth Bass** *Micropterus salmoides* | **26** | **8.6** | **8.2** | **10,480** | 11 | 8.9 | 7.2 | 3,893 | 15 | 8.4 | 9.2 | 6,587 |
| **Swamp Darter** *Etheostoma fusiforme* | **1** | **0.3** | **0.3** | **2** | 1 | 0.8 | 0.7 | 2 | - | - | - | - |
| **Blackbanded Darter** *Percina nigrofasciata* | **11** | **3.6** | **3.5** | **49** | 6 | 4.9 | 3.9 | 25 | 5 | 2.8 | 3.1 | 24 |
| **Total** | **302** | **100** | **95.6** | **60,947** | 123 | 100 | 80.6 | 21,098 | 179 | 100 | 109.6 | 39,849 |
| **Number of Species** | **18** | | | | 16 | | | | 14 | | | |
| **Effort** | **189.5** | | | | 91.6 | | | | 98.0 | | | |
| **Shannon-Weiner Diversity Index** | **1.96** | | | | | | | | | | | |
| **Evenness** | **68.09** | | | | | | | | | | | |

## Table 3-5 Species Sampled Pre-Dam Removal in Reach 3

| Species | Total | | | | Effort 1 | | | | Effort 2 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Count | RA (%) | CPUE (fish/hr) | Mass (g) | Count | RA (%) | CPUE (fish/hr) | Mass (g) | Count | RA (%) | CPUE (fish/hr) | Mass (g) |
| **Longnose Gar** *Lepisosteus osseus* | **12** | **2.6** | **3.8** | **9,208** | 8 | 3.8 | 5.7 | 5,510 | 4 | 1.6 | 2.3 | 3,698 |
| **Bowfin** *Amia calva* | **2** | **0.4** | **0.6** | **2,606** | 2 | 0.9 | 1.4 | 2,606 | - | - | - | - |
| **Gizzard Shad** *Dorosoma cepedianum* | **7** | **1.5** | **2.2** | **2,064** | 7 | 3.3 | 5.0 | 2,064 | - | - | - | - |
| **Threadfin Shad** *Dorosoma petenense* | **2** | **0.4** | **0.6** | **30** | - | - | - | - | 2 | 0.8 | 1.2 | 30 |
| **Bluestripe Shiner** *Cyprinella callitaenia* | **17** | **3.6** | **5.4** | **61** | 5 | 2.4 | 3.5 | 25 | 12 | 4.7 | 6.9 | 36 |
| **Blacktail Shiner** *Cyprinella venusta* | **10** | **2.1** | **3.2** | **119** | 4 | 1.9 | 2.8 | 45 | 6 | 2.3 | 3.5 | 74 |
| **Weed Shiner** *Notropis texanus* | **6** | **1.3** | **1.9** | **19** | 6 | 2.8 | 4.3 | 19 | - | - | - | - |
| **Spotted Sucker** *Minytrema melanops* | **3** | **0.6** | **1.0** | **1,676** | 3 | 1.4 | 2.1 | 1,676 | - | - | - | - |
| **Greater Jumprock** *Moxostoma lachneri* | **1** | **0.2** | **0.3** | **9** | 1 | 0.5 | 0.7 | 9 | - | - | - | - |
| **Apalachicola Redhorse** *Moxostoma sp.* | **66** | **14.1** | **21.0** | **49,100** | 24 | 11.4 | 17.0 | 16,264 | 42 | 16.4 | 24.3 | 32,836 |
| **Yellow Bullhead** *Ameiurus natalis* | **1** | **0.2** | **0.3** | **17** | 1 | 0.5 | 0.7 | 17 | - | - | - | - |
| **Blue Catfish** *Ictalurus furcatus* | **7** | **1.5** | **2.2** | **5,391** | 3 | 1.4 | 2.1 | 2,019 | 4 | 1.6 | 2.3 | 3,372 |
| **Channel Catfish** *Ictalurus punctatus* | **6** | **1.3** | **1.9** | **8,443** | 5 | 2.4 | 3.5 | 1,186 | 1 | 0.4 | 0.6 | 7,257 |
| **Flathead Catfish** *Pylodictus olivaris* | **9** | **1.9** | **1.9** | **5,097** | - | - | - | - | 9 | 3.5 | 5.2 | 5,097 |
| | | | | | | | | | | | | |

| Species | Total | | | | Effort 1 | | | | Effort 2 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Count | RA (%) | CPUE (fish/hr) | Mass (g) | Count | RA (%) | CPUE (fish/hr) | Mass (g) | Count | RA (%) | CPUE (fish/hr) | Mass (g) |
| | | | | | | | | | | | | |
| **Brook Silverside** *Labidesthes sicculus* | **7** | **1.5** | **2.2** | **23** | 2 | 0.9 | 1.4 | 5 | 5 | 2.0 | 2.9 | 18 |
| **Striped Bass** *Morone saxatilis* | **18** | **3.9** | **5.7** | **18,774** | 9 | 4.3 | 6.4 | 6,303 | 9 | 3.5 | 5.2 | 12,471 |
| **Redbreast Sunfish** *Lepomis auritus* | **67** | **14.3** | **21.3** | **1,764** | 39 | 18.5 | 27.7 | 1,125 | 28 | 10.9 | 16.2 | 639 |
| **Bluegill** *Lepomis macrochirus* | **107** | **22.9** | **34.1** | **3,594** | 47 | 22.3 | 33.4 | 1,566 | 60 | 23.4 | 34.7 | 2,028 |
| **Dollar Sunfish** *Lepomis marginatus* | **1** | **0.2** | **0.3** | **6** | 1 | 0.5 | 0.7 | 6 | - | - | - | - |
| **Redear Sunfish** *Lepomis microlophus* | **80** | **17.1** | **25.5** | **6,944** | 26 | 12.3 | 18.5 | 2,040 | 54 | 21.1 | 31.2 | 4,904 |
| **Spotted Sunfish intergrade** *Lepomis punctatus/marginatus* | **2** | **0.4** | **0.6** | **30** | 1 | 0.5 | 0.7 | 6 | 1 | 0.4 | 0.6 | 24 |
| **Shoal Bass** *Micropterus cataractae* | **5** | **1.1** | **1.6** | **1,298** | 3 | 1.4 | 2.1 | 514 | 2 | 0.8 | 1.2 | 784 |
| **Spotted Bass** *Micropterus punctulatus* | **16** | **3.4** | **5.1** | **3,156** | 7 | 3.3 | 5.0 | 1,356 | 9 | 3.5 | 5.2 | 1,800 |
| **Largemouth Bass** *Micropterus salmoides* | **11** | **2.4** | **3.5** | **1,825** | 6 | 2.8 | 4.3 | 1,635 | 5 | 2.0 | 2.9 | 190 |
| **Black crappie** *Pomoxis nigromaculatus* | **1** | **0.2** | **0.3** | **81** | - | - | - | - | 1 | 0.4 | 0.6 | 81 |
| **Yellow Perch** *Perca flavescens* | **1** | **0.2** | **0.3** | **6** | - | - | - | - | 1 | 0.4 | 0.6 | 6 |
| **Blackbanded Darter** *Percina nigrofasciata* | **2** | **0.4** | **0.6** | **4** | 1 | 0.5 | 0.7 | 3 | 1 | 0.4 | 0.6 | 1 |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |

| Species | Total | | | | Effort 1 | | | | Effort 2 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Count | RA (%) | CPUE (fish/hr) | Mass (g) | Count | RA (%) | CPUE (fish/hr) | Mass (g) | Count | RA (%) | CPUE (fish/hr) | Mass (g) |
| | | | | | | | | | | | | |
| **Total** | **467** | **100** | **148.8** | **121,345** | 211 | 100 | 149.8 | 45,999 | 256 | 100 | 147.9 | 75,346 |
| **Number of Species** | **27** | | | | 23 | | | | 20 | | | |
| **Effort** | **188.4** | | | | 84.5 | | | | 103.8 | | | |
| **Shannon-Weiner Diversity Index** | **2.43** | | | | | | | | | | | |
| **Evenness** | **73.73** | | | | | | | | | | | |

## Table 3-6 Species Sampled Pre-Dam Removal in Reach 4

| Species | Total | | | | Effort 1 | | | | Effort 2 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Count | RA (%) | CPUE (fish/hr) | Mass (g) | Count | RA (%) | CPUE (fish/hr) | Mass (g) | Count | RA (%) | CPUE (fish/hr) | Mass (g) |
| **Bluefin Stoneroller** *Campostoma pauciradii* | **1** | **0.9** | **0.1** | **-** | - | - | - | - | 1 | 1.0 | 1.3 | - |
| **Blacktail Shiner** *Cyprinella venusta* | **10** | **8.8** | **0.9** | **-** | - | - | - | - | 10 | 9.6 | 12.8 | - |
| **Northern Hogsucker** *Hypentelium nigricans* | **4** | **3.5** | **0.4** | **-** | - | - | - | - | 4 | 3.8 | 5.1 | - |
| **Greater Jumprock** *Moxostoma lachneri* | **17** | **15.0** | **1.6** | **-** | - | - | - | - | 17 | 16.3 | 21.8 | - |
| **Snail Bullhead** *Ameiurus brunneus* | **10** | **8.8** | **0.9** | **-** | - | - | - | - | 10 | 9.6 | 12.8 | - |
| **Channel Catfish** *Ictalurus punctatus* | **2** | **1.8** | **0.2** | **-** | - | - | - | - | 2 | 1.9 | 2.6 | - |
| **Flathead Catfish** *Pylodictus olivaris* | **1** | **0.9** | **0.1** | **-** | - | - | - | - | 1 | 1.0 | 1.3 | - |
| **Redbreast Sunfish** *Lepomis auritus* | **13** | **11.5** | **1.2** | **-** | - | - | - | - | 13 | 12.5 | 16.7 | - |
| **Bluegill** *Lepomis macrochirus* | **8** | **7.1** | **0.7** | **-** | - | - | - | - | 8 | 7.7 | 10.3 | - |
| **Redear Sunfish** *Lepomis microlophus* | **2** | **1.8** | **0.2** | **-** | - | - | - | - | 2 | 1.9 | 2.6 | - |
| **Spotted Sunfish intergrade** *Lepomis punctatus/marginatus* | **1** | **0.9** | **0.1** | **-** | - | - | - | - | 1 | 1.0 | 1.3 | - |
| **Shoal Bass** *Micropterus cataractae* | **23** | **20.4** | **2.1** | **2,324** | 9 | 100.0 | 9.0 | 1,645 | 14 | 13.5 | 18.0 | 679 |
| **Blackbanded Darter** *Percina nigrofasciata* | **21** | **18.6** | **2.0** | **-** | - | - | - | - | 21 | 20.2 | 27.0 | - |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |

| Species | Total | | | | Effort 1 | | | | Effort 2 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Count | RA (%) | CPUE (fish/hr) | Mass (g) | Count | RA (%) | CPUE (fish/hr) | Mass (g) | Count | RA (%) | CPUE (fish/hr) | Mass (g) |
| | | | | | | | | | | | | |
| **Total** | **113** | **100** | **10.5** | **2,324** | 9 | 100 | 9.0 | 1,645 | 104 | 100 | 133.6 | 679 |
| **Number of Species** | **13** | | | | 1 | | | | 13 | | | |
| **Effort** | **106.9** | | | | 60.15 | | | | 46.7 | | | |
| **Shannon-Weiner Diversity Index** | **2.21** | | | | | | | | | | | |
| **Evenness** | **86.08** | | | | | | | | | | | |

## 3.2 Shoal Bass

Over the course of the study, a total of 56 shoal bass were collected, comprising approximately 4.8 percent of the total catch during the pre-removal fish survey (Table 3-1). Shoal bass were not observed in Reach 1 but were present in Reaches 2-4 (Table 3-7). Twenty-eight shoal bass were captured in Reach 2 and five shoal bass were collected within Reach 3. Reach 4 within Flat Shoal Creek yielded 23 total shoal bass captures.

**Table 3-7 Shoal Bass Sampled and Marked Pre-Dam Removal**

| Effort 1 | | | | | Effort 2 | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Shoal Bass ID** | **Length** (mm) | **Mass** (g) | **Mark*** | **Reach** | **Shoal Bass ID** | **Length** (mm) | **Mass** (g) | **Mark** | **Reach** |
| 910001 | 445 | 1046 | PIT + FC | 2 | 909987 | 431 | 1017 | PIT + FC | 2 |
| NT1 | 274 | 243 | FC | 2 | NT 37 | 131 | 28 | FC | 2 |
| 910009 | 356 | 538 | PIT + FC | 2 | 909996 | 332 | 458 | PIT + FC | 2 |
| 910003 | 323 | 402 | PIT + FC | 2 | 909991 | 345 | 500 | PIT + FC | 2 |
| 910010 | 327 | 429 | PIT + FC | 2 | NT 38 | 127 | 24 | FC | 2 |
| 910008 | 489 | 1208 | PIT + FC | 2 | 909982 | 411 | 1595 | PIT + FC | 2 |
| 909958 | 384 | 103 | PIT + FC | 2 | 909997 | 365 | 598 | PIT + FC | 2 |
| 909988 | 313 | 412 | PIT + FC | 2 | 909994 | 380 | 797 | PIT + FC | 2 |
| 909983 | 310 | 406 | PIT + FC | 2 | NT 39 | 114 | 29 | FC | 2 |
| 909986 | 140 | 32 | PIT + FC | 2 | 909990 | 490 | 1482 | PIT + FC | 2 |
| 910004 | 141 | 38 | PIT + FC | 2 | 909984 | 214 | 106 | PIT + FC | 2 |
| 909989 | 130 | 32 | PIT + FC | 2 | 910112 | 352 | 574 | PIT + FC | 2 |
| NT2 | 127 | 28 | FC | 2 | 910115 | 370 | 754 | PIT + FC | 3 |
| NT3 | 347 | 251 | FC | 2 | NT 40 | 135 | 30 | FC | 3 |
| NT4 | 113 | 9 | FC | 2 | NT 26 | 128 | 26 | FC | 4 |
| NT5 | 375 | 368 | FC | 2 | NT 27 | 125 | 22 | FC | 4 |
| 909992 | 298 | 254 | PIT + FC | 3 | NT 28 | 140 | 29 | FC | 4 |
| 909981 | 191 | 81 | PIT + FC | 3 | NT 29 | 115 | 19 | FC | 4 |
| 909999 | 246 | 179 | PIT + FC | 3 | NT 30 | 125 | 27 | FC | 4 |
| 910005 | 429 | 1046 | PIT + FC | 4 | NT 31 | 129 | 23 | FC | 4 |
| 909993 | 280 | 240 | PIT + FC | 4 | NT 32 | 119 | 22 | FC | 4 |
| 910006 | 213 | 106 | PIT + FC | 4 | NT 33 | 121 | 24 | FC | 4 |
| 909995 | 259 | 181 | PIT + FC | 4 | NT 34 | 133 | 29 | FC | 4 |
| NT21 | 30 | 1 | None** | 4 | NT 35 | 40 | 1 | None** | 4 |
| NT22 | 42 | 1 | None** | 4 | NT 36 | 40 | 1 | None** | 4 |
| NT23 | 119 | 23 | FC | 4 | 910129 | 205 | 93 | PIT + FC | 4 |

| Effort 1 | | | | | Effort 2 | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Shoal Bass ID** | **Length** (mm) | **Mass** (g) | **Mark*** | **Reach** | **Shoal Bass ID** | **Length** (mm) | **Mass** (g) | **Mark** | **Reach** |
| NT24 | 131 | 27 | FC | 4 | 910128 | 295 | 278 | PIT + FC | 4 |
| NT25 | 114 | 20 | FC | 4 | 910130 | 196 | 85 | PIT + FC | 4 |
| Effort 1 Captures: 28 | | | | | Effort 2 Captures: 28 | | | | |
| Effort 1 CPUE (fish/hr): 5.3 | | | | | Effort 2 CPUE (fish/hr): 5.1 | | | | |
| **Total Shoal Bass Captures: 56** | | | | | | | | | |
| **Total Shoal Bass CPUE** (fish/hr)**: 5.2** | | | | | | | | | |
| | | | | | | | | | |

* PIT = implanted with Passive Integrated Transponder tag; FC = fin clip

** Fish were deceased upon collection. Entire fish preserved in alcohol and was retained for genetic processing

Shoal bass size varied between young-of-year (YOY), sub-adults, and mature adults (Figure 3-1, Figure 3-2, Figure 3-3, and Figure 3-4). The smallest individuals collected (i.e., YOY) were found in Reach 4, within Flat Shoal Creek, which ranged between 30 and 42 millimeters (mm) (Table 3-7). Approximately 37.5 percent of the shoal bass were sub-adults between 100-150 mm and were primarily located within Reach 2 and 4. Larger individuals (200-500 mm) exhibited a normal distribution (Figure 3-1) with the longest individual reaching 490 mm in length and the heaviest individual weighing 3.5 pounds (Table 3-7).

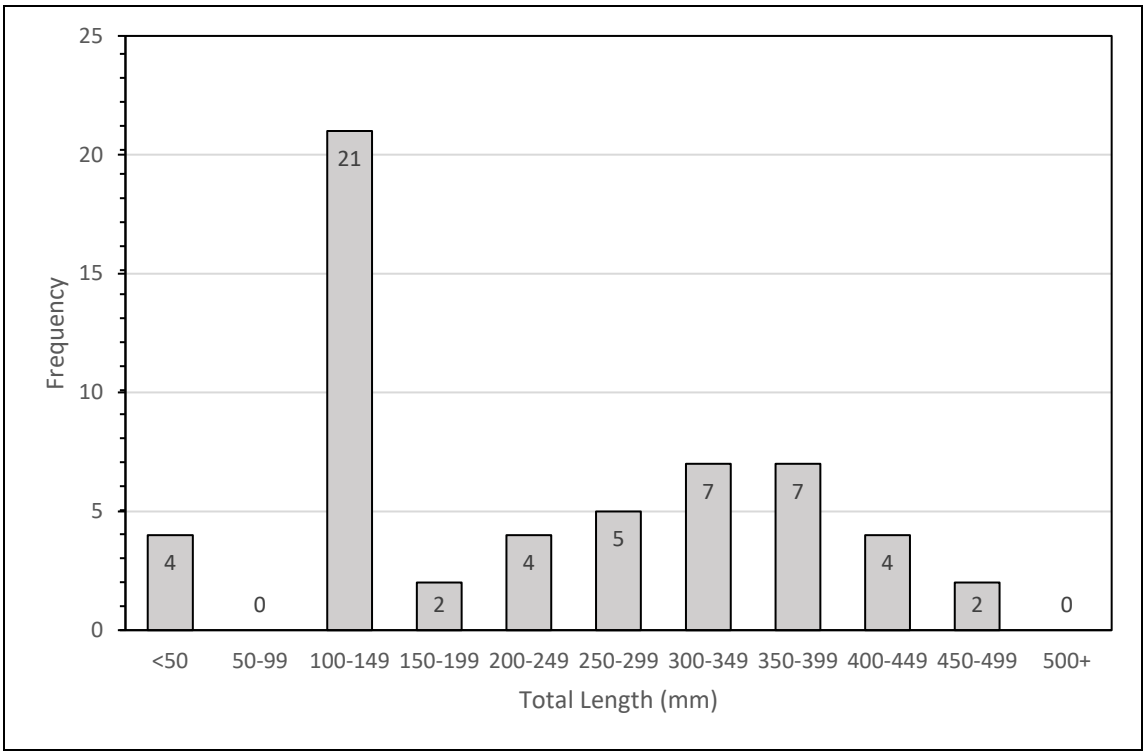


**Figure 3-1 Length-Frequency Distribution for All Reaches**

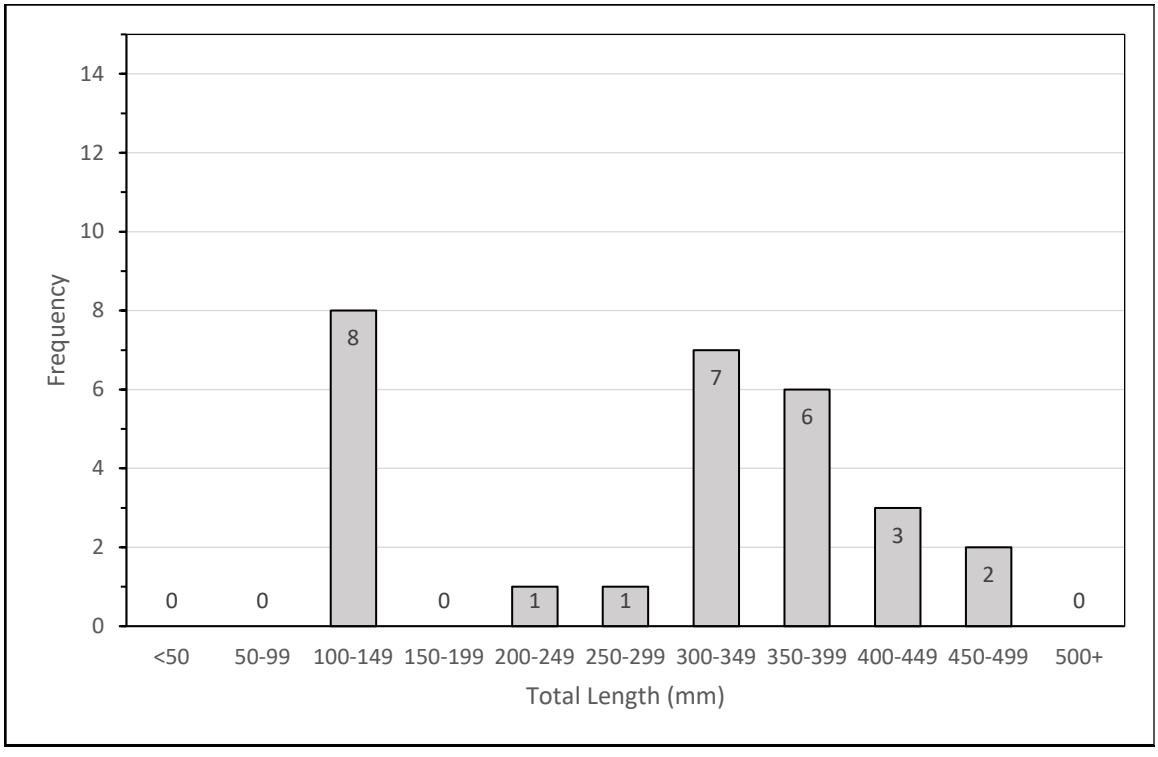


**Figure 3-2 Length-Frequency Distribution for Reach 2**

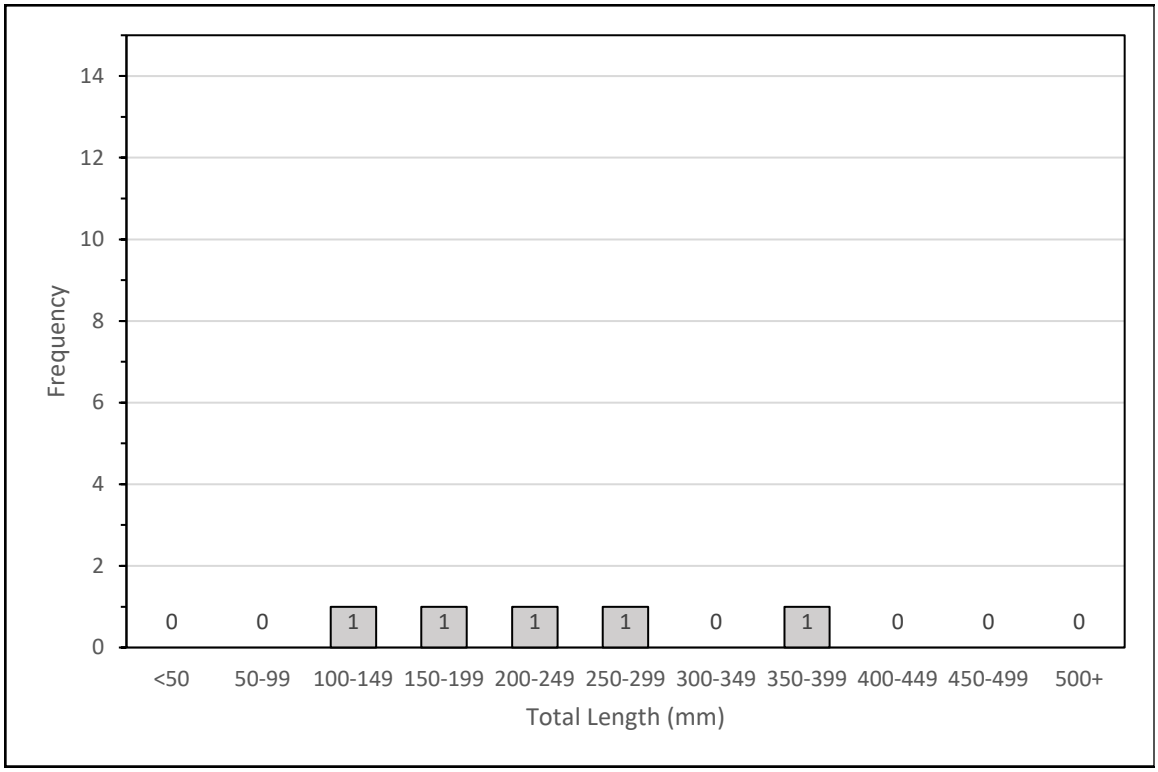


**Figure 3-3 Length-Frequency Distribution for Reach 3**

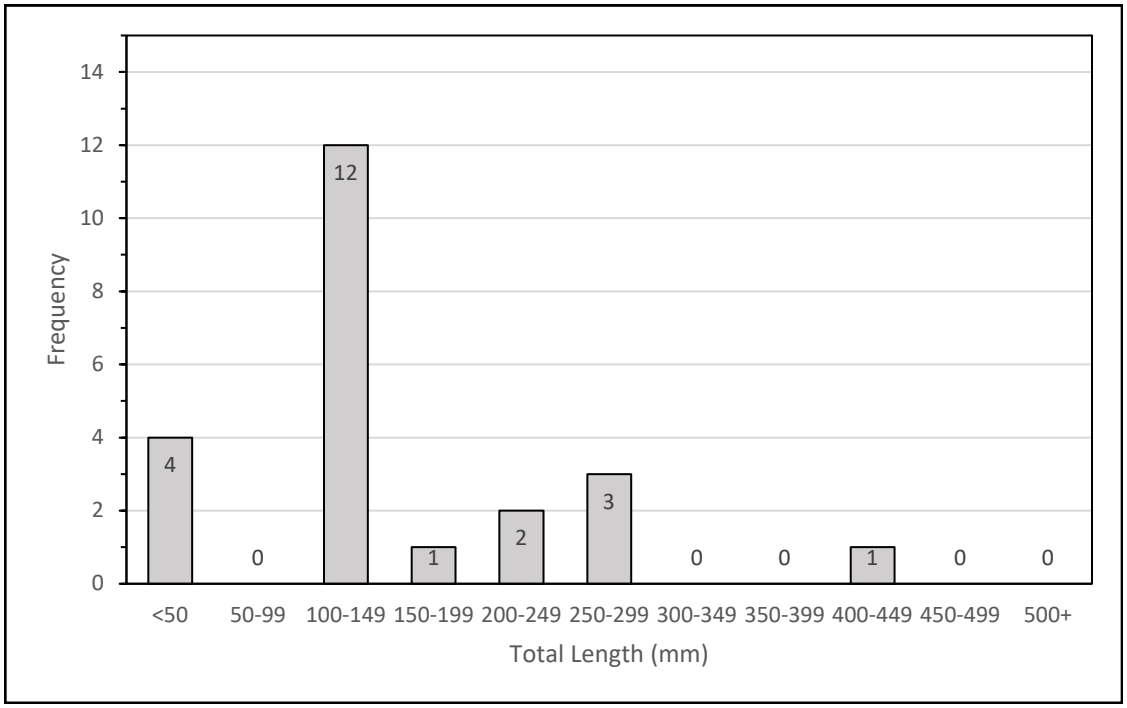


**Figure 3-4 Length-Frequency Distribution for Reach 4**

Except for the four YOY shoal bass, shoal bass were returned alive to the vicinity of capture (Figure 3-5, Figure 3-6, and Figure 3-7). The YOY shoal bass were deceased at the time of capture and were preserved in alcohol for potential future genetic analysis. All remaining

shoal bass had their right pelvic fins clipped for potential future genetic analysis. A total of 31 shoal bass were implanted with a PIT tag. Shoal bass not tagged were considered too small to be implanted without causing physical harm and risking injury or death to the individual. Although smaller individuals were not tagged, the fin clips served as a temporary mark during the pre-dam removal study. Even though some habitats were sampled repeatedly, there were no shoal bass recaptures during this study.

Shoal bass were the second-most abundant black bass (*Micropterus*) species collected during the study. Spotted bass (*Micropterus punctatus*) was the most abundant black bass species (71 captures; approximately 6.0 percent) and largemouth bass (*Micropterus salmoides*; 54 captures, approximately 4.6 percent) was the least abundant. In general, the black basses were visually distinct and there were no obvious signs of hybridization. However, detecting hybrid black basses in the field is imperfect, and the need for genetic markers to augment field surveys may more accurately detect cryptic hybridization (Lewis et al. 2021). Fin clips were collected from of all fish identified as shoal bass and will be provided to the Georgia Department of Natural Resources upon request for genetic analysis.

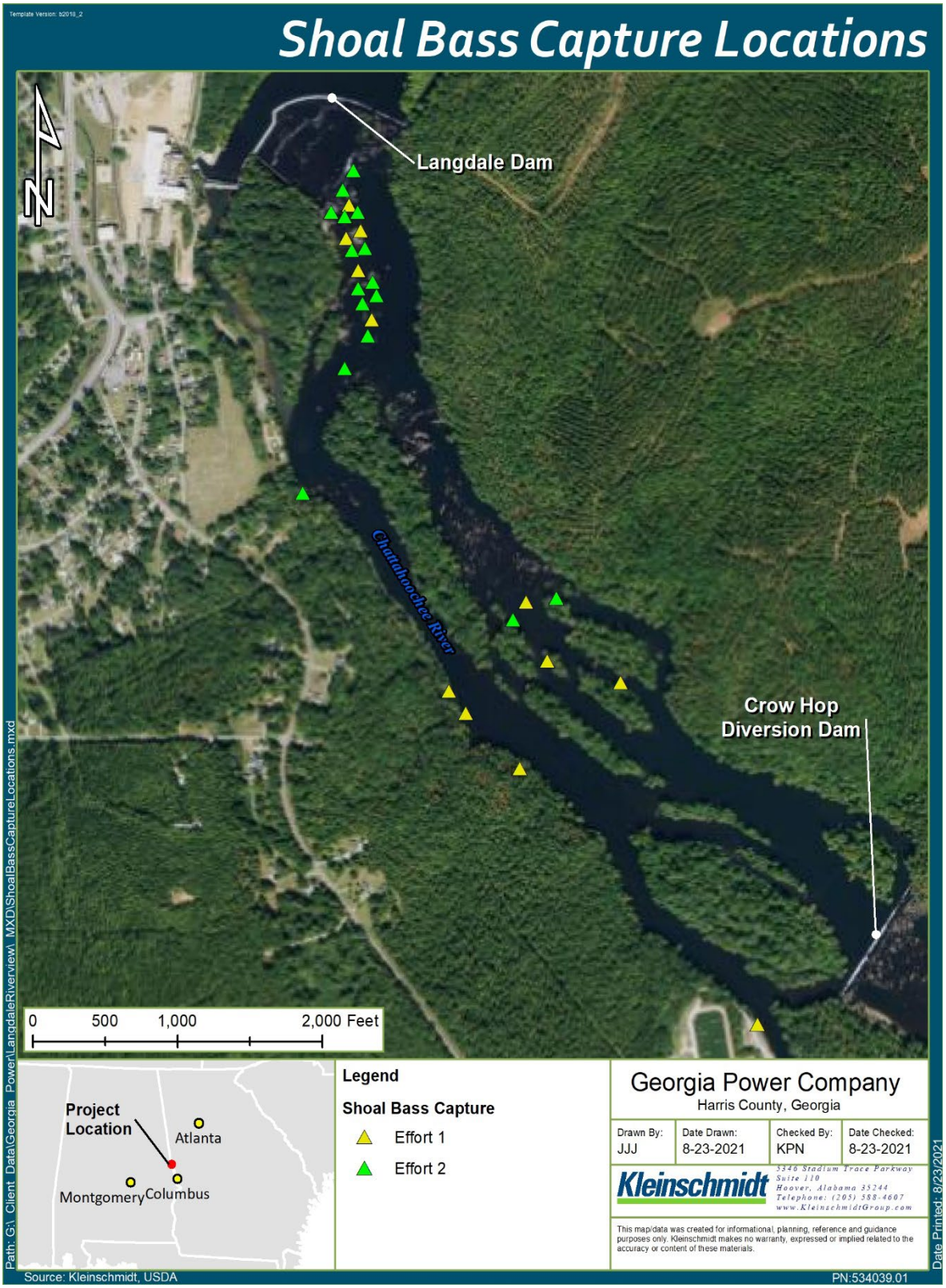


**Figure 3-5 Shoal Bass Capture Locations in the Chattahoochee River**


**Figure 3-6 Shoal Bass Capture Locations in the Chattahoochee River (continued)**

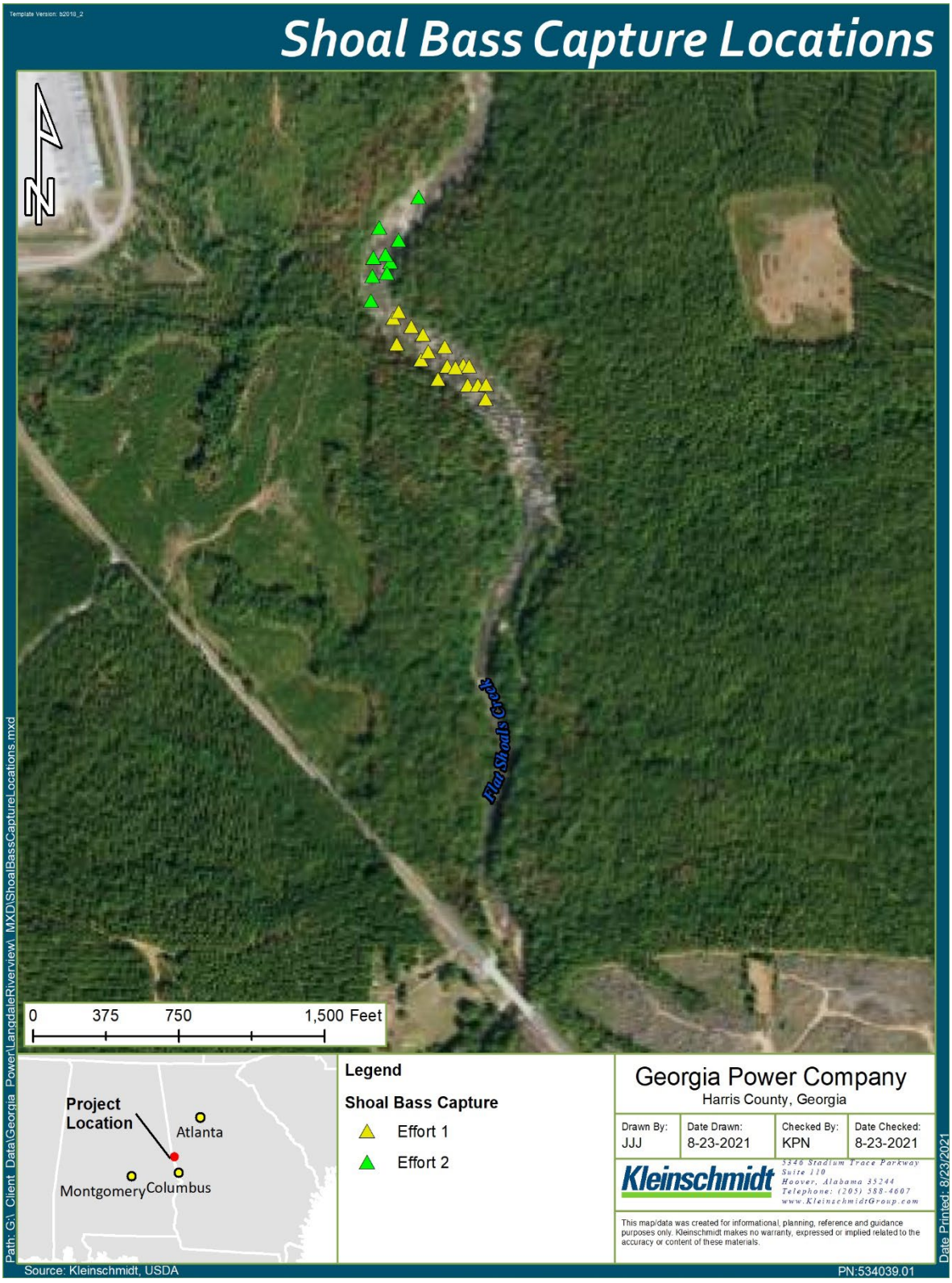


**Figure 3-7 Shoal Bass Capture Locations in Flat Shoal Creek**

## 3.3 Habitats within the Study Area

Although the three reaches on the mainstem Chattahoochee River share similarities, each reach varies in length, substrate composition, flow regimes, as well as habitat types and coverage. In general, the upstream portion of Reach 1 between West Point Dam and downtown West Point, Georgia exhibits long runs with moderate current over mixed gravel substrates, with several bedrock outcrops and shoals. These areas of bedrock shoals are separated by long runs and pools. Between downtown West Point and Interstate 85 (I-85) the river slows and transitions from gravelly substrates to sandier areas. Bedrock shoals are present, but generally less frequent, exhibit reduced flows, and have greater distances between them. Downstream of the shoals below I-85, the river flattens, flows are greatly reduced, and the river is dominated by slack-water habitats downstream to Langdale Dam. Although bedrock or other rocky substrates are scattered throughout this section, the impounded portion of Reach 1 is predominately pool habitats with sandy substrates.

Reach 2 is dominated by shoal habitats, swift runs with mixed course substrates, and occasional sandy pools. Immediately downstream of Langdale Dam, Reach 2 exhibits a broad bedrock shoal complex, with variable rocky substrates in the runs adjacent to the shoals. The western channel contains a mix of swift runs with coarse substrates, occasional bedrock and boulder habitats, and sandy pools. The mile-long bypass channel to Riverview Dam is dominated by sandy substrates, low flow, and woody structure along the riverbanks. The eastern channel contains a large shoal complex followed by several braided channels that contain a diversity of habitat types including gravelly runs, sandy banks with abundant woody structure, and a variety of flow regimes. Between the braided channels and Crow Hop Dam, Reach 2 slows into a sandy pool, although bedrock and other course substrates are evident from sonar imagery.

From Crow Hop Dam to immediately downstream of Riverview Dam, Reach 3 is predominantly bedrock shoal habitat and gravelly runs. The river transitions to mixed gravel and sand downstream of these shoals and becomes impounded immediately downstream of the Riverview Boat Ramp, which is the headwaters of Lake Harding. The impounded area is entirely pool habitat, with woody structure along the riverbanks. Substrates are predominantly sand, with occasional bedrock outcrops extending from the surrounding landscape into the river.

Reach 4 within Flat Shoal Creek is an approximately one-mile-long series of bedrock shoals. The shoals comprise a series of cascades, glides, runs, and pools within an area

dominated by bedrock, with scattered patches of gravelly runs, and occasional sand in the small and infrequent pool habitats.

# 4.0 DISCUSSION AND CONCLUSION

## 4.1 Habitat Complexity and Fisheries Community within the Study Area

This discussion focuses primarily on habitat complexity, species richness, and the evenness of the fisheries community. For purposes of this study, habitat complexity can be described as multiple habitat components represented in a three-dimensional space within the river, which includes the water column, benthos, littoral zones, and structure within those zones. Components that influence habitat complexity can include vertical or horizontal structure, substrate heterogeneity, a variety of discharge profiles within the water column, and woody structure along banks. Evenness is a measure of biodiversity which compares the observed diversity to a theoretical maximum. Evenness measures the equity of the proportion of each species in a sample, where the greater the equity, the more diverse and healthier the community. Some species, such as generalist, pollution-tolerant, or invasive species can dominate a sample, even if the observed diversity is high. In general, as the proportion of the dominant species increases, the evenness of the community decreases. Evenness values approaching 100 indicate a more diverse and even community, whereas lower values indicate a less diverse and even community.

Although Reach 1 had the greatest length of contiguous accessible habitats, the areas between West Point Dam and Langdale Dam yielded the fewest number of captures, lowest CPUE, and the least mass of the three reaches within the Chattahoochee River. The areas immediately downstream of West Point Dam to just upstream of downtown West Point exhibited mixed course substrates (cobble and gravel) with relatively swift currents. Although patches of shoals with swift currents were present, the conditions between downtown West Point and Langdale Dam were relatively uniform and lacked the habitat complexity that other reaches exhibited. As a result, the reach was dominated (54.6 percent) by redbreast sunfish (*Lepomis auritus*) and had the lowest evenness score of all reaches.

Reach 2 was generally dominated by coarse substrates throughout bedrock shoals, swift runs, and numerous braided channels. The shoals, braided channels with a variety of discharge profiles, and abundance of woody structure resulted in increased habitat complexity and provided a variety of habitats in a short reach of river. These complex and diverse habitats may explain the increase in species richness and evenness as compared to Reach 1.

Reach 3 yielded the greatest number of captures, species richness, CPUE, mass, and evenness compared to other reaches on the Chattahoochee River. This is likely attributed to the range of habitat types within the relatively short reach. The large upstream shoal complexes held species that have a high affinity for swift flows and/or coarse substrates, such as Apalachicola redhorse (*Moxostoma sp.*), striped bass (*Morone saxatilis*), and numerous catfishes. The downstream impounded areas held fish typical of large bodies of sluggish waters such as bowfin (*Amia calva*) and longnose gar (*Lepisosteus osseus*), further increasing species richness. Additionally, this reach contains the confluence, side-channel, and backwaters of Flat Shoal Creek, which provides habitat for cyprinids such as weed shiner (*Notropis texanus*) and the Georgia rare species bluestripe shiner (*Cyprinella callitaenia*). Although this reach did not necessarily contain the habitat complexity observed throughout Reach 2, Reach 3 contained the suitable habitats for lotic, lentic, and benthic-dwelling fishes, which contributed to the high species richness.

Reach 4 is located approximately 5.6 RMs upstream of the Flat Shoal Creek confluence with the Chattahoochee River. The mile-long shoal complex contained a fisheries community that is typically found in medium sized streams along the fall line, rather than a larger river system of the Chattahoochee River mainstem. Species included in Reach 4 that were not found in the Chattahoochee River included bluefin stoneroller (*Campostoma pauciradii*), and northern hogsucker (*Hypentelium nigricans*). Evenness was the highest of any reach; however, capture rates were relatively low with only 104 fish collected in the second effort which may not provide a large enough sample to produce a reliable estimate of evenness. Regardless, Reach 4 was not dominated by any species and did not contain any introduced species (e.g., spotted bass).

## 4.2 Shoal Bass Presence and Habitat Use

As expected, shoal bass within the Project area had a high affinity for shoal habitats, areas of swift current over coarse substrates, and areas immediately adjacent to these habitats (i.e., the base of shoal complexes, eddies adjacent to swift current). Capture rates of shoal bass were highest in transects that were selectively sampled to target shoal bass habitats over the randomly selected transects that did not provide suitable habitat.

Although most shoal bass were captured in the aforementioned habitats, some individuals were observed in atypical habitats. For example, one sub-adult shoal bass was collected along the riprap bank at the deep pool approximately 200-meters downstream of the boat ramp on Cemetery Road in Reach 2. In addition, an adult shoal bass was netted in swift currents along the rip rap bank at the water treatment facility in Reach 2. Three

additional adults were located outside of shoal complexes in Reach 2 during the second sampling effort along woody structures adjacent to an area of rocky substrates and swift current.

Shoal bass habitat is inherently difficult to sample because fish may be residing in areas too deep or swift to wade, or too shallow and rocky to access by boat. As such, electrofishing in suitable shoal bass habitat within this section of the Chattahoochee River was limited to areas accessible by boat. Although some shoals were navigable, passage through some shoal complexes were limited to a single narrow run or chute that could be effectively sampled, but the entire complex could not be sampled across the width of the river. Some shoals were not navigable. For example, an approximately 500-meter-long set of shoals on the eastern channel of Reach 2 could not be sampled. Likewise, the shoals and rocky run immediately downstream of Crow Hop Dam was inaccessible for sampling because the set of shoals adjacent to Riverview Dam restricted passage. Only the base of the shoal complexes was able to be sampled. Shoal bass may be inhabiting these shoal complexes in Reaches 2 and 3 that could not be sampled.

## 4.3 Shoal Bass Population Structure and Life History within the Project Area

During this study, there were no recaptures of shoal bass which may be attributed to the ability of previously captured and marked shoal bass to freely move throughout shoal complexes and reside in inaccessible habitats. Because there were no recaptures, a population estimate could not be calculated. However, the size structure of collected individuals did allow for some inferences to be made regarding the shoal bass population within the Project area (Figure 3-1, Table 3-7).

For the purposes of this discussion, the term "subpopulation" applies to the shoal bass within an individual reach. The subpopulation in Reach 4 within Flat Shoal Creek was dominated (approximately 69.6 percent) by YOY and subadult shoal bass with only 7 of the 23 individuals in the larger size classes (Figure 3-4). The abundance of smaller shoal bass indicates that natural reproduction and recruitment is occurring within the mile-long shoal complex north of Highway 103. There is a possibility that the large proportion of younger fish being collected could be the product of gear-selectivity because backpack electrofishing units were used versus a boat. However, this is unlikely based on biologists' observations while sampling.

A previous study tracked adult shoal bass tagged below Riverview Dam (i.e., Reach 3) into the shoal complex at Reach 4 to spawn, indicating the Flat Shoals subpopulation is

connected to the subpopulation found below Riverview Dam in the Chattahoochee River (Sammons and Earley 2015). Conversely, another study did not observe movements of tagged shoal bass between Flat Shoal Creek and the Chattahoochee River and suggested the subpopulations exist independently from one another (Cottrell 2018). During the study, no subadults or YOY were observed in the shoals below Riverview Dam in Reach 3. Given this area's proximity to the confluence of Flat Shoal Creek and the supportive evidence in the Sammons and Early (2015) study, it is possible that adult fish below Riverview Dam partake in long migrations to spawn in shoals. Younger shoal bass may reside in the tributary until adulthood before migrations to the mainstem Chattahoochee River. Even if the Reach 3 and Reach 4 subpopulations persist independently, it is plausible that there is genetic mixing and Flat Shoal Creek may serve as a spawning ground, nursery, and/or refuge.

Reach 3 contained shoal bass habitat but was limited to the upstream portions of the reach between the base of Riverview Dam up to the base of Crow Hop Dam. Most of these habitats were inaccessible for sampling, but shoal bass presumably reside in these shoals, and were captured there in previous studies (Sammons and Early 2015). Riverview and Crow Hop Dams are barriers to upstream fish migration and restrict upstream movement of shoal bass into Reach 2 and beyond. However, information provided by area residents suggests that anglers are moving shoal bass from one segment of the river to another. The number of shoal bass relocated, frequency of relocation, sex and age class of those shoal bass, survival of relocated individuals, and potential effects of population, distribution, or genetics are unknown. Regardless of human-influenced movement upstream, natural downstream migration of shoal bass from Reach 2 into Reach 3 is a possibility and is discussed below.

The combination of shoal complexes, swift runs over coarse substrates, and the braided side-channels with abundant woody structure observed in Reach 2 provided ideal habitat conditions and complexity suitable for shoal bass. As such, Reach 2 yielded the highest number of shoal bass during the study. The shoal bass captures within this reach included 20 adult shoal bass of various sizes and eight subadults. This size dynamic suggests that successful reproduction is occurring within a relatively short reach of river, indicating Reach 2 has adequate habitats for all life-stages, including reproductive and foraging habitats for small and large shoal bass. Given the availability of suitable habitats, relative abundance of shoal bass, and their apparent successful reproduction, the shoal bass within Reach 2 may serve as a "source" subpopulation. It is possible that shoal bass spawned from Reach 2 may disperse and traverse over Crow Hop and Riverview Dams,

where fish may either continue to reside in Reach 3 or even eventually migrate into Flat Shoal Creek.

Although shoal bass in Reach 2 can migrate downstream into Reach 3, Langdale Dam is an upstream migration barrier and fish cannot move from Reach 2 into Reach 1. Shoal bass habitats exist in Reach 1 but are generally few and far between in the areas downstream of downtown West Point. In addition, some of these areas may have contained bedrock and other coarse substrates but flows are generally slow from the impounding effects of Langdale Dam and do not represent preferred shoal bass habitat. Suitable, higher-quality shoal bass habitats are more abundant between West Point Dam and downtown West Point. These habitats contained greater habitat complexity, swift currents over rocky substrate, and were selectively sampled during targeted efforts; however, no shoal bass were collected within Reach 1. There is a possibility that shoal bass are present within Reach 1 and potentially occupying inaccessible areas. The shoal complexes sampled within Reach 1 were more accessible than those found in Reaches 2 and 3, and biologists were able to sample large proportions of these complexes and runs at, or adjacent to, the base of the shoals. In conclusion, it is not likely that shoal bass are occupying or naturally occurring within Reach 1.

## 4.4 Anticipated Effects of Dam Removal on Shoals Bass and Their Habitats within the Project Area

Based on the habitat assessments, fisheries surveys, and existing fisheries community data collected during this study, along with the expected changes following dam removal as modeled and described in the report *Langdale and Riverview Projects Decommissioning Final Hydraulic and Hydrologic Modeling Report* (Kleinschmidt 2023a), anticipated effects of dam removal on shoal bass are discussed herein.

Short term adverse ecological effects may occur immediately following dam removal when previously trapped sediments mobilize. These effects are anticipated to be minor, and sediments are expected to stabilize over time. Additionally, these effects would be minor compared to the long-term benefits such as improved habitat quality and connectivity (Kleinschmidt 2023b). Under existing conditions, the homogeneous sandy, stagnant habitats in the impounded areas do not provide suitable habitat for shoal bass and are generally poor habitat for other fluvial specialists, intolerant, or non-generalist fish species. Following dam removal, the West Point Dam base flow, and peak generation flows would continue under their existing operations. The removal of Langdale, Crow Hop, and Riverview Dams would eliminate impounded conditions from the Project area.

Peaking flows from West Point Dam would likely mobilize large amounts of softer substrates (i.e., sand and silt) from the existing dam locations post removal. Following dam removal, habitats at the existing dam sites are anticipated to transition from sandy pools to runs with coarse substrates once river hydraulic conditions and substrates stabilize.

Following the removal of Langdale Dam, the impounded portion of the river downstream of I85 bridge within Reach 1 is expected to become shallower, with the greatest changes in depth being at the existing dam location. Based on sonar imagery, patches of bedrock, boulders, and other rocky substrates are within the existing impounded area but are generally covered or surrounded by softer substrates like sand and silt. After substrates are mobilized with increased water velocities following dam removal, this area is likely to reveal additional rocky habitats. Although sediment migration is expected to reveal new shoals, rocky areas, and coarse substrates, pockets of sediment may remain post dam removal based on the historical evidence of sediment deposition pre-dam construction (Kleinschmidt 2023b).

Similar removal of soft sediments and sand is anticipated in the currently impounded areas immediately upstream of Crow Hop Dam. Although surrounded by sandy substrates, boulder and bedrock are evident in the areas immediately upstream of Crow Hop Dam as evidenced in sonar imagery and adjacent rocky bluffs on the eastern shore. Sand and soft sediments in this area are expected to migrate downstream following dam removal, revealing additional shoals and rocky habitats. Conversely, the western channel in Reach 2 leading to Riverview Dam is a long, narrow, sandy run, and did not exhibit evidence of underlying bedrock or rocky substrates in the sonar imagery. The effect of the proposed removal of Riverview Dam on substrates in this channel is unknown. However, it is anticipated that the portion of the mainstem Chattahoochee River from the confluence of Flat Shoal Creek to just upstream of the existing Langdale Dam would be a contiguous series of shoal complexes connected by rocky runs.

In addition to revealing additional shoal habitat and eliminating impounded conditions that currently exist in the Project area, dam removal would interconnect habitats within the Chattahoochee River that have been separated since dam construction over 100 years ago. Shoal bass (and other fish species) occupying Reach 3 or Reach 4 could access the preferred optimal habitats of Reach 2 as well as the newly accessible habitats in the 9.4-mile Reach 1. Shoal bass would likely continue to occupy the shoals between the Langdale Dam and the confluence of Flat Shoal Creek; however, shoal bass colonization of the previously identified shoal habitats within Reach 1 cannot be predicted.

There is expected to be a short-term and long-term response of shoal bass to the removal of the Project dams. The short-term response is predicted to be the initial dispersal of existing juvenile and adult shoal bass and exploration into newly accessible habitats. The long-term response of shoal bass could include shifts in habitat use, potential colonization of previously inaccessible shoals, or changes in reproduction and recruitment. Following the removal of the Project dams, Georgia Power will conduct the Post Removal Shoal Bass Tracking and Abundance Study to address the short-term responses; the timing of post-removal surveys is likely to occur 1-2 years post removal. The post-removal assessment(s) would determine if changes in the fisheries community or species composition occurs following the dam removal. The post removal assessments would examine substrate composition, evaluate shoal bass habitat suitability in the Project area and at the former dam locations, and examine habitat use of shoals, including the determination if shoal bass have moved into newly accessible shoal habitats within Reach 1.

# 5.0 REFERENCES


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# APPENDIX A

# DOCUMENTATION OF CONSULTATION

| Langdale and Riverview Projects - Public Comment Matrix | |
|---|---|
| **Comment by Lanny Bledsoe (Landowner) Accession No. 20201104-0020** | **Georgia Power's Response** |
| I have a personal interest in this matter as I am the largest landowner directly affected by the destruction of the three dams at Langdale, Crow Hop, and River View. I own all of the islands in the river between Langdale and River View and they will be adversely affected if the dams are gone, as will all the shoreline.<br>•The destruction will be caused by the overwhelming flood of water turned loose each day when West Point dam generates. The water in the Langdale/River View area rises several feet quickly with great force and through the years we have seen the effect it has, even with the dams in place. It is my opinion that the dams now act as a protecting buffer and keep the water hitting the islands with full force. However, two islands have already been washed away and are gone.<br>•Some years back, the water force had washed to bank away in the bend above the River View dam and a portion of Riverdale Mill was in danger of falling into the river. I was manager of the mill at that time and a meeting was held with Corp of Engineers to review the situation. Alabama Sector Howard Heflin was in the meeting and after reviewing the evidence, Senator Heflin directed the Corp to line the bank with riprap to protect it. According to tests Georgia Power has done, they are concerned about this same area with the dams down and plan to protect it.<br>•Based on the latest Georgia Power studies just released, at minimum flow level, when West Point is not generating, only canoes and kayaks can travel on the river. These dams have been in place for a hundred years, the ponds behind the dams is a great place to boat, fish, and have recreation. The city of Valley should be greatly concerned about this, they're going to lose an asset.<br>•I've heard a lot of talk about concern for Shoal Bass as a reason to take the dams down. The state of Georgia showed little concern for any fish when they put striped bass in the river. Years ago, we could catch crappie and shad by the thousands at River View dam. Not they are gone, wiped out by the striped bass. Striped bass are not a problem above the dams now, but they will be with the dams gone.<br>•The River View powerhouse was built across an arm of the river. One side of the building was on the Alabama bank and the other side on Hodge Island. The tail race from the powerhouse flowed as it had before the powerhouse was built. Georgia Power's plans are to take the powerhouse down and block the flow of the river. Hodge Island, which I own, will not be an island but will be joined by land to the Alabama side. This will change the original flow of the river and they should not have the power to do this. They used the powerhouse for a hundred years and now want to block the river.<br>•I grew up in River View 84 years ago. The river has been a wonderful place for everyone to enjoy. It has been an asset here for all of my life. Now it will change. Georgia Power used these dams all these years for their business and the generation of electricity. They no longer have any use for the dam, and their plan would change what has been in place, for all of these years. This should not happen. | Georgia Power will evaluate potential erosion on the privately owned islands as part of removal process and post removal monitoring and would, if needed, propose to provide some protection potentially using rock from the dam removal. The Decommissioning Plan (Section 4) specifically addresses bank stabilization in the Riverview headrace channel.<br><br>The Applicant Prepared Environmental Assessment describes the change in river navigability of various vessels in Section 11. To address public access to the river, Georgia Power is proposing to extend three existing public boat ramps into the river to at least two feet of water depth at the new water surface elevation (measured at West Point minimum flow) following dam removal and river stabilization (see Section 11 of the APEA). Additionally, as discussed in the Recreation Section 11, there are nearby access points at Lake Harding and West Point that provide powered boat recreational access.<br><br>Regarding effects on Shoal Bass, Georgia Power implemented a Pre-Removal Shoal Bass Abundance and Tracking Study to provide baseline information on Shoal Bass. In addition, Georgia Power is proposing to implement a Post Removal Shoal Bass Abundance and Tracking Study to assess effects of the removal on Shoal Bass in the Project area. Section 8 of the APEA discusses effects of dam removal on Shoal Bass and other aquatic organisms.<br><br>Georgia Power performed studies to address effects of the decommissioning including: river hydraulics and hydrology (H&H) and potential impacts to aquatic organisms (including shoal bass). Study reports applicable to these comments include:<br>• Final H&H Report<br>• Final Water Quality Report<br>•Draft Sediment Quality Study Report<br>•Draft Sediment Transport Study Report<br>•Final Potential Effects on Dam Removal on Shoal Bass<br>•Pre-Dam Removal Shoal Bass Abundance and Tracking Study Report<br>•Freshwater Mussel Survey Report |
| **Comment by GADNR - WRD Accession No. 20201104-5105** | **Georgia Power's Response** |
| GA Power has completed a series of studies addressing potential changes to existing resources associated with the dam removals. These studies included modeling changes to river hydraulics and hydrology, sediment characterization, and potential impacts to aquatic wildlife, water quality, and cultural resources. Comprehensive modeling of flow distribution and velocity, shoal habitat, and potential impacts to aquatic resources such as the endemic Shoal Bass and native mussel community was also presented.<br>•Wildlife Resources Division finds the studies to be adequate, and we support Georgia Power's indication that sediment distribution will be further investigated during the decommissioning process in consultation with FERC and US Fish and Wildlife Service National Fish Passage Program. | Thank you for your comment and continued consultation. |

| | |
|---|---|
| •We request that WRD be informed of related findings.<br>•Georgia Power maintains ongoing consultation with WRD regarding the decommission and removal of these hydropower projects, and we support the proposed actions and associated studies. The removal of these projects is expected to restore connectivity and riverine characteristics in this reach of the Chattahoochee River, which is expected to benefit fish, wildlife, and aquatic resources. The WRD will remain engaged in the decommissioning process. | |
| **Comment by Valley City Council District 5 (Kendall Andrews) Accession No. 20201105-5000** | **Georgia Power's Response** |
| I have made previous comments opposing the removal of the Langdale, Riverview, and Crow Hop dams. These dams provide the City of Valley and its citizens with an invaluable natural resource. I have many concerns about their removal that I will list below:<br>•The H&H model presented by Georgia Power predicts that both boat ramps located in the City of Valley will be dewatered post removal. Even if the boat ramps are extended, the amount navigable water with a powerboat will be so little that they will be useless. The City of Valley has a large number of older citizens that use the river on a daily basis with powerboats. Many of these people will not be able to drag a canoe or paddle a kayak through the shoals that will be present. Also, many people with disabilities will face the same barriers. Their access to the river will be gone<br>•The restoration of suitable shoal bass habitat has been mentioned as a possible benefit to the removal of the dams. I disagree with this. The only example of dam removal where shoal bass were present in the surrounding waters was in Columbus, GA with the removal of the City Mills and Eagle Phenix dams. Removal of these dams had an extremely negative effect on the shoal bass in this area. There has been no research done on the shoal bass population located in the reservoir below Langdale Dam. It is common knowledge that this is where the best population of shoal bass exists in this area. I believe that there should be some data obtained from this area, if for nothing else, to create a baseline for comparison post removal of the dams.<br>•The virtual format of the public meeting made participation very difficult for much of the community. The list of attendees submitted shows that there were few participants that were not associated with an agency or group. This is one of the only chances for members of the community to have their questions answered and to voice their opinions.<br><br>The removal of these dams has the potential to devastate the local community. The public meeting should not be rushed to meet a deadline.<br>•I would like to respectively request that the Federal Energy Regulatory Commission require Georgia Power to hold an in-person public meeting once the nation pandemic ends. This will give everyone the opportunity to participate before any decisions are finalized. | The Applicant Prepared Environmental Assessment describes the change in river navigability of various vessels in Section 11. To address public access to the river, Georgia Power is proposing to extend three existing public boat ramps into the river to at least two feet of water depth at the new water surface elevation (measured at West Point minimum flow) following dam removal and river stabilization (see Section 11 of the APEA). Additionally, as discussed in the Recreation Section 11, there are nearby access points at Lake Harding and West Point that provide powered boat recreational access.<br><br>Regarding effects on Shoal Bass, Georgia Power implemented a Pre-Removal Shoal Bass Abundance and Tracking Study to provide baseline information on Shoal Bass. In addition, Georgia Power is proposing to implement a Post Removal Shoal Bass Abundance and Tracking Study to assess effects of the removal on Shoal Bass in the Project area. Section 8 of the APEA discusses effects of dam removal on Shoal Bass and other aquatic organisms. |
| **Comment by Chattahoochee Riverkeeper (Chris Manganiello) Accession No. 20201105-5077** | **Georgia Power's Response** |
| … Our comments will focus on 3 topics: recreational access; construction process; and aquatic resources.<br>•Recreational Access:<br>-CRK supports safe, continued and enhanced access to the River in the middle of the Project area's middle (Cemetery Road) and the bottom (Lake Harding). This type of access will enable paddlers of varying skill to enter and exit the project area at multiple points. Some existing access points will require extensions and improvement when dam removal reduces pool elevations and river flows.<br>-CRK also supports a new public recreational access point to the river above the Projects. For example, a new proposed park above Langdale on river right would provide safe access above the exposed Langdale shoals. | The new Langdale Park is described in Section 11 of the Applicant Prepared Environmental Assessment and is also referenced in the Decommissioning Plan and 90 percent drawings for the Langdale Project (Appendix D). In addition, the Decommissioning Plan provides details on the construction process, schedule, and post removal monitoring.<br><br>Regarding effects on Shoal Bass, Georgia Power implemented a Pre-Removal Shoal Bass Abundance and Tracking Study to provide baseline information on Shoal Bass. In addition, Georgia Power is proposing to implement a Post Removal Shoal Bass Abundance and Tracking Study to assess effects of the removal on Shoal Bass in the Project area. Section 8 of the APEA discusses effects of dam removal on Shoal Bass and other aquatic organisms. |

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| For example, see slide 55 from the October 5, 2020 Public Meeting. CRK understands that the City of Valley, Alabama may assume local control and responsibility for recreational assets in the Project area. Foot access to the islands and the river is something that might be considered. CRK understands the managed nature of West Point Dam releases and river flows adds significant risk for people who choose to recreate in the Project area. If a single access point from Langdale to the large adjacent island was available, anglers might appreciate foot access from the west bank to the shoals.<br>•Construction Process:<br>-CRK understands that Georgia Power is developing the details of the construction plan. CRK anticipates those details in the next round of public engagement and document release. CRK is very interested to learn about Georgia Power's plans for egress and river access to conduct physical construction and removal activities.<br>-Additionally, we look forward to reviewing the dam removal schedule, that is, which dam will be removed first and by what methods, and what will Georgia Power intend to do with the dams' debris.<br>-Finally, CRK would also like to know if Georgia Power has any additional plans for pre-construction and post-construction monitoring during the construction process, and specifically for sediment movement as well as quantity and quality.<br>•Aquatic Resources:<br>-CRK is optimistic that removal of the dams in the Project area will enhance aquatic habitat and connectivity for species, including shoal bass. While CRK understands that Georgia Power cannot stock any aquatic species without coordinating with Georgia's Department of Natural Resources Wildlife Resources Division, it would be helpful to understand Georgia Power's plans for pre-construction and post-construction monitoring of aquatic species.<br>-For example, is there a base-line for the shoal bass population, and if post-construction monitoring revealed poor conditions, what might Georgia Power do to improve conditions? It is our understanding that post-construction monitoring in Columbus after the removal of Eagle & Phenix and City Mills dams has been extremely limited.<br>•In closing, CRK remains supportive and hopeful about the prospect of barrier removal in the Middle Chattahoochee River region. Given the unprecedented size, scale and scope of this proposed project, pre- and post-construction monitoring of multiple natural and aquatic resources would greatly aid in the general understanding of the impacts and consequences of barrier removal in large, regulated southeastern river systems. | Georgia Power performed studies to address effects of the decommissioning, as described in the following study reports:<br>• Final H&H Report<br>• Final Water Quality Report<br>•Draft Sediment Quality Study Report<br>•Draft Sediment Transport Study Report<br>•Final Potential Effects on Dam Removal on Shoal Bass<br>•Pre-Dam Removal Shoal Bass Abundance and Tracking Study Report<br>•Freshwater Mussel Survey Report<br>•Archaeological Testing of Two Sites On The Chattahoochee River, 9HS30 AND 9HS31, Harris County, Georgia<br>•Archaeological Survey of 20 Acre Island in the Chattahoochee River, Harris County, GA<br>•Archaeological Reconnaissance Survey of the Chattahoochee River, Harris County, GA<br>•Langdale Dam Marine Remote Sensing in the Chattahoochee River, Harris County, GA<br>•Assessment of Effects for Archaeological Sites 9HS30, 9HS525, 9HS526, 9HS527, 9HS528, 9HS529, 9HS530, 9HS531, 9HS532, and 9HS533. |
| Based on our review of the study report, we have the following comments:<br>• On Page 5 of the draft study report, GPC stated "searches for relevant contemporary USGS and ADEM data were not found." ADEM sampled Moores Creek, which is one of the main tributaries to the Riverview Project Reservoir, in 2014 and 2016. This data can be found using the Water Quality Data Portal.<br>• We request Georgia Power to continue informing the ADEM of water quality and sediment distribution findings during the decommissioning process. | These comments are addressed in the Final Water Quality Study Report. |
| **Comment by American Rivers Accession No. 20201106-5010** | **Georgia Power's Response** |
| American Rivers fully supports and encourages the removal of these projects for the reasons outline below:<br>•Public safety improvements: On 4/1/2019, one drowning and three injuries occurred at Crow Hop diversion dam as a result of a kayaking accident. Eliminating the low head dams will significantly improve public safety in this reach of river, especially for water recreation activities. | Georgia Power performed studies to address effects of the decommissioning including: river hydraulics and hydrology (H&H), sediment characterization (quality and quantity), potential impacts to aquatic organisms, water quality, and cultural resources. Georgia Power is filing an Applicant Prepared Environmental Assessment (which incorporates study results and analyzes effects on environmental, recreational, and cultural resources), Dam Decommissioning Plan, and the following study reports: |

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| •Sediment release: Based on data provided by GPC, impounded sediment volumes behind the low head dams are negligible compared to overall sediment volume in the system below West Point dam, which has become a sediment sink since its construction. Release of impounded sediments at the removed Riverview & Langdale Dams will renourish sediment-starved downstream habitat for the benefit of aquatic species.<br>•River flow: By definition, low head dams do not store water, therefore removal of the dams will not cause significant changes in flow volume or timing, as the flow of the Chattahoochee River is controlled by US Army Corps of Engineers (USACE) operations at West Point Dam. USACE may elect to hold back flow in West Point Lake during dam removal construction to provide optimal conditions for instream activities. Presence of naturally occurring bedrock shoals will act as grade control for the river once dam removal construction is completed.<br>•Flood risk: According to GPC studies, removing the dams will not increase flood risk, and in fact reduces flood risk at the 1% return, particularly upstream of the Langdale Dam. American Rivers concurs with this finding.<br>•Boat access: due to water elevation changes associated with dam removal, some areas of the river may not be navigable during low flow conditions, even for low draft paddling boats such as canoes and kayaks. However, the public safety benefits of dam removal are critical given the recent fatality and injuries at the Crow Hop dam. It may be possible to negotiate short term flow augmentation from West Point Lake to support schedule water recreation events. It is important to point out that more than adequate access to flat water boating for canoes, kayaks, jon boats, and deeper draft motorized boats exists at West Point Lake and Lake Harding in proximity to the project area.<br>•Aquatic habitat connectivity and species impacted: GA Wildlife Resources Division finds that dam removal will support aquatic habitat connectivity and access for shoal bass, a high-value, rare species identified as a priority species in the GA State Wildlife Action Plan. Chattahoochee Riverkeeper finds the potential reconnection of up to 11 miles of shoal bass habitat and encourages habitat enhancements be included in the project. American Rivers concurs with these positions and supports dam removal for aquatic habitat connectivity to benefit shoal bass.<br>•Infrastructure: American Rivers finds that GPC plan for dam removal incorporates structural adjustments to accommodate continued treated effluent discharges to the Chattahoochee River.<br>•Public engagement: Based on materials provide by GPC, American Rivers finds that public engagement was sufficient to provide critical information about the project to surrounding property owners, river interest groups, cognizant agencies, and stakeholders.<br>•Water quality: American Rivers has documented the impacts of low head dams on water quality including decreased dissolved oxygen and increased thermal profile at numerous locations around the country. We concur with GPC's finding that dam removal will not negatively impact the water quality of the Chattahoochee River. | • Final H&H Report<br>• Final Water Quality Report<br>•Draft Sediment Quality Study Report<br>•Draft Sediment Transport Study Report<br>•Final Potential Effects on Dam Removal on Shoal Bass<br>•Pre-Dam Removal Shoal Bass Abundance and Tracking Study Report<br>•Freshwater Mussel Survey Report<br>•Archaeological Testing of Two Sites On The Chattahoochee River, 9HS30 AND 9HS31, Harris County, Georgia<br>•Archaeological Survey of 20 Acre Island in the Chattahoochee River, Harris County, GA<br>•Archaeological Reconnaissance Survey of the Chattahoochee River, Harris County, GA<br>•Langdale Dam Marine Remote Sensing in the Chattahoochee River, Harris County, GA<br>•Assessment of Effects for Archaeological Sites 9HS30, 9HS525, 9HS526, 9HS527, 9HS528, 9HS529, 9HS530, 9HS531, 9HS532, and 9HS533. |
| **Comment by American Rivers Accession No. 20201106-5011 - Duplicate of above comments** | **Georgia Power's Response - see above** |
| **Comment by Chattahoochee Riverkeeper (Chris Manganiello) Accession No. 20201106-5011 - Duplicate of above comments** | **Georgia Power's Response - see above** |
| **Comments by Federal Energy Regulatory Commission Accession No. 20201118-3015** | **Georgia Power's Response** |
| **H&H** | |
| As noted in our August 15, 2019 letter, several stakeholders raised concerns regarding the composition of the sediment and the possible presence of contaminants within it. The H&H study fails to characterize the sediments found within the projects' reservoirs and instead speaks mostly to sediments elsewhere in the river | Georgia Power conducted a standalone Sediment Quality Study and is filing a Draft Sediment Quality Study Report concurrent with the Dam Decommissioning Plan and Applicant Prepared Environmental Assessment to address specific comments on sediment. The Final H&H Study Report incorporates by reference the Draft Sediment Quality Study Report. |

| Langdale and Riverview Projects - Public Comment Matrix | |
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| basin. Additionally, Appendix C only includes data for the borings within the proposed constructed channel through the island between Langdale Dam and Powerhouse.<br>•You must revise the H&H study report to characterize the sediments within the project reservoirs and include the associated data. | |
| The H&H study fails to explain why you did not perform a chemical analysis of the sediment and does not speak to the concerns related to possible contaminants in any meaningful way. You must explain the appropriateness of the comparisons in the H&H study to other sampling completed within the river basin due to the following conditions: 1) West Point Dam was more recently constructed and some of the sampling was performed in the riverine section just below the dam; and 2) the City Mills and Eagle Phenix Dams were located downstream of Lake Harding and had smaller impoundments with characteristics that made them less likely to trap sediment.<br>•You must revise the H&H study report to reassess the need for chemical analysis based on project specific circumstances. | Georgia Power conducted a standalone Sediment Quality Study and is filing a Draft Sediment Quality Study Report concurrent with the Dam Decommissioning Plan and Applicant Prepared Environmental Assessment. The Draft Sediment Quality Study Report provides a chemical analysis of the sediment and documentation of consultation. As applicable, the Final H&H Study Report incorporates by reference the Draft Sediment Quality Study Report. |
| The H&H study fails to explain how the number and locations of the sediment borings were determined, or explain their adequacy of lack thereof (e.g., see pages 31 and 52 – "borings did not provide enough information for interpolation").<br>•You must revise the H&H study report to include an explanation of the appropriateness and adequacy of the locations and number of borings completed. | Georgia Power conducted a standalone Sediment Transport Study and is filing a Draft Sediment Transport Study Report with the Dam Decommissioning Plan and Applicant Prepared Environmental Assessment. The Final H&H Study Report incorporates by reference the Draft Sediment Transport Study Report. |
| The H&H study fails to address sediment quantity (estimated to be 516-acre-feet or approximately 832,500 cubic yards), post removal sediment transport, and associated impacts in any meaningful way.<br>•Either the Decommissioning Plan or the revised H&H study report must include a thorough analysis of the post removal sediment impacts, considering specific metrics such as erosion, scouring, incision, accretion, etc., stemming from the initial and prolonged changes in flow dynamics during and following dam removals.<br>•You must also include specific analyses of these impacts to aquatic organisms, as described below. | Georgia Power has addressed the sediment quantity in the Draft Sediment Transport Study Report along with responses to each of the specific metrics described by FERC. Potential effects on aquatic organisms are described in the Applicant Prepared Environmental Assessment and in the Draft Sediment Transport Study Report. |
| •Either the Decommissioning Plan or the revised H&H study report must include a discussion of post-removal streambank erosion. | The Decommissioning Plan discusses post removal streambank erosion. |
| The H&H study indicates two boat launches will be dewatered as well as the loss of motorboat access to most of the study reach but fails to discuss the impacts or possible mitigation measures.<br>•Either the Decommissioning Plan or the revised H&H study report must include a discussion of impacts and possible mitigation measures. | The Decommissioning Plan and the Applicant Prepared Environmental Assessment discuss Georgia Power's proposed protection, mitigation, and enhancement measures to address access to existing public boat ramps. |
| The H&H study contains the following error message in several locations (e.g., pages 25, 52, 53, and 74): "Error! Reference source not found." Please correct<br>these reference errors. | Error corrected in the Final H&H Study Report. |
| **Shoal Bass & Water Quality** | |
| In the shoal bass literature review, you included a histogram displaying predicted acres of existing and post-removal optimal habitat for shoal bass. You state that the data were generated from output from the Hydrologic Engineer Center – River Analyses System (HEC-RAS) modeling and analyzed with GIS, however, you did not provide supporting evidence (methods, data, maps, etc.) to substantiate those conclusions.<br>•Either the Decommissioning Plan or a revised shoal bass literature review must include such evidence to adequately support your conclusions. | Georgia Power conducted a standalone Pre-Dam Removal Shoal Bass Abundance and Tracking study that includes methods, data, maps, and conclusions. |

| Langdale and Riverview Projects - Public Comment Matrix | |
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| Similarly, you state in the water quality study report that conclusions were made based on modeling results; however, the methods you used were not described in the report, nor were any pertinent supporting materials to substantiate the statements that:<br>-The decommissioning and removal of Crop Hop and Riverview Dams will result in a minimum flow of at least 193 cubic feet per second in the Headrace Channel [thereby not impacting the Valley Wastewater Treatment Plan permitted effluent discharge];<br>-and If the projects' dams are removed, the resulting lower water levels and higher water velocities in the affected reach of the Chattahoochee River would provide an alternative means of physical aeration as the water passes through exposed shoals.<br>•Because there are gaps in your conclusions, you must address the items above in either the Decommissioning Plan or a revised water quality study report by providing such evidence to adequately support your results. Regarding minimum flows in the headrace channel, please also include documentation of correspondence with Valley Wastewater Treatment Plant for our review. | These comments are addressed in the Final Water Quality Study Report. Note that the consultation for the Valley Wastewater Treatment Plant was conducted with the East Alabama Water, Sewer, and Fire Protection District. |
| **Aquatic Resources** | |
| The H&H study does not address the specific methods that will be used in the removal of each individual dam, nor does it address the rate of drawdowns that each pond would experience as a result of each removal.<br>•The Decommissioning Plan must include the specific means by which the dams would be removed, including the anticipated rate of drawdown (to natural river channel) that would occur under each scenario. | Specific information on the removal of each dam and the Riverview Powerhouse is provided in the Decommissioning Plan, along with the construction sequence, schedule, and drawdown information. |
| As noted above, the H&H study does not provide an adequate analysis of sediment transport during and following dam removals. Further, there is no analysis of potential effects to mussel beds or other aquatic organisms in the shoal bass or mussel studies.<br>•The Decommissioning Plan must include an analysis of the potential impacts of sediment transport to aquatic organisms (i.e., sedimentation of mussel beds, habitat loss/creation, etc.), based on the revised H&H study report as directed above. | These issues are addressed in the Applicant Prepared Environmental Assessment. |
| Regarding aquatic organisms that may become stranded in dewatered areas during and following dam removals, there is no mention of a plan for surveys and/or rescue efforts in either the mussel or shoal bass studies.<br>•The Decommissioning Plan must include a plan to survey for stranded aquatic organisms during each dam removal, including methods for rescue/relocation if stranded organisms are found. This plan must be based on your previous bathymetry models, as well as your pending analysis of anticipated rates of reservoir drawdown as directed above. | The Draft Aquatic Organism Recovery Survey and Relocation Plan is discussed in the Decommissioning Plan and the Applicant Prepared Environmental Assessment. In addition, the draft Aquatic Organism Recovery Survey and Relocation Plan is provided as an appendix to the Decommissioning Plan. |
| **Cultural Resources** | |
| On September 21, 2020, you filed archaeological surveys completed for the Langdale and Riverview Projects with the Commission. However, you did not include consultation from the Georgia and Alabama State Historic Preservation Officers (Georgia and Alabama SHPOs) regarding the review of archaeological surveys in your filing.<br>•In our review of the archaeological surveys, we expect your Decommissioning Plan filing to include a draft Memorandum of Understanding (MOA) that memorializes the mitigation of any adverse effect to historic properties that would result from your proposals.<br>•Additionally, you should include documentation of your consultation with the Georgia and Alabama SHPOs and how you addressed any of their comments in the MOA. | Consultation with the SHPOs has been ongoing during the study phase and this documentation is provided in the Consultation Summary as appendices to the concurrently filed Privileged cultural resource reports. After the study report review concluded, Georgia Power drafted an MOA that went out on July 1, 2022 to Alabama and Georgia SHPOs as well as Alabama-Coushatta Tribe of Texas, Alabama-Quassarte Tribal Town, Coushatta Tribe of Louisiana, and the Muscogee (Creek) Nation. Georgia Power did receive comments from the SHPOs and is currently addressing those comments in the MOA; a 2nd draft MOA will be sent back out to the same July 1st groups by middle to late August 2022. Georgia Power anticipates receiving any further comments and addressing them by about early October. Georgia Power will submit documentation of the MOA drafts and MOA consultation in a separate submittal to FERC in October 2022. |

| Langdale and Riverview Projects - Public Comment Matrix | |
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| **Other Issues** | |
| Several comments were filed in response to the October 5, 2020 virtual study result meetings.<br>•You are expected to respond to those comments either as part of the study report revisions requested above or in the Decommissioning Plan to be filed with the Commission. | Comments are addressed in the Draft and Final Study Reports, Decommissioning Plan, and/or Applicant Prepared Environmental Assessment. |
| We remind you that our analysis of the surrender and decommissioning is based only on information filed on the record for these proceedings.<br>•To help prevent the need for additional future studies and information requests, we again recommend that you document the detailed methods, consultation process, development, and implementation of these studies. Additionally, each study report should include each party's concurrence and/or comments, and explanations of how you addressed the comments. | The Study Reports include the associated documentation of consultation. |

**From:** Bauer, Eric F
**To:** O"Rouke, Patrick Michael
**Cc:** Imm, Donald
**Subject:** Re: [EXTERNAL] Langdale/Riverview Shoal Bass Study
**Date:** Thursday, April 15, 2021 7:34:50 AM



Thanks Patrick. Looks good and I don't have any questions.
-Eric

Eric F. Bauer, PhD
(he/him/his)
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Georgia Ecological Services
US Fish and Wildlife Service
RG Stephens, Jr. Federal Building
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**From:** O'Rouke, Patrick Michael <PMOROUKE@southernco.com>
**Sent:** Tuesday, April 13, 2021 1:01 PM
**To:** Bauer, Eric F <eric_bauer@fws.gov>
**Cc:** Imm, Donald <donald_imm@fws.gov>
**Subject:** [EXTERNAL] Langdale/Riverview Shoal Bass Study



Eric, please find attached the draft study plan that we discussed during our March 17th call. We appreciate your and Don's comments on that call, and we have incorporated requests for study elements from GA WRD into this version, which we plan to file with FERC soon. Please let me know if you have any questions about the proposed plan.

Thank you,
Patrick

Patrick O'Rouke
Fisheries Biologist
Georgia Power

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**From:** Lovell, Graves
**To:** O"Rouke, Patrick Michael
**Subject:** RE: Langdale/Riverview Shoal Bass Study
**Date:** Monday, April 19, 2021 12:41:23 PM



Thanks for letting me know Patrick. Project looks good to me.

R. Graves Lovell
District Fisheries Biologist
Alabama Wildlife and Freshwater Fisheries
c/o Fisheries Dept. Auburn University
203 Swingle Hall
Auburn, AL 36849
334-844-8959

**From:** O'Rouke, Patrick Michael <PMOROUKE@southernco.com>
**Sent:** Tuesday, April 13, 2021 12:05 PM
**To:** Lovell, Graves <Graves.Lovell@dcnr.alabama.gov>
**Subject:** Langdale/Riverview Shoal Bass Study

Graves,

Attached is a Shoal Bass study plan that we are planning to file with FERC in response to some of the questions/comments we have received in planning for Langdale/Riverview decommissioning. This study will take place in the main stem of the Chattahoochee River and in Flat Shoals Creek on the Georgia side. This is the study plan that we expect to file with FERC soon. Please let me know if you have any questions about the proposed study.

Thank you,
Patrick

**From:** Robinson, Scott
**To:** O"Rouke, Patrick Michael
**Cc:** Hakala, Jim; Hess, Brent
**Subject:** Re: Langdale/Riverview Shoal bass (etc.) plan
**Date:** Wednesday, April 21, 2021 6:16:06 PM



Patrick,
Thanks for addressing our comments on the earlier study plan. We agree with this study plan and would like to see it move forward. We do think a telemetry study will be helpful in determining the fate of shoal bass after dam removal, and explaining to anglers and other interested parties what has changed about shoal bass habits and movements. However, we agree that it should be done at the time of the dam removal and immediately afterwards. We look forward to working with you on this project in the future and seeing the results of the study.

Thank you

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**From:** O'Rouke, Patrick Michael <PMOROUKE@southernco.com>
**Sent:** Tuesday, April 13, 2021 12:57 PM
**To:** Robinson, Scott <Scott.Robinson@dnr.ga.gov>
**Cc:** Hakala, Jim <Jim.Hakala@dnr.ga.gov>; Hess, Brent <Brent.Hess@dnr.ga.gov>
**Subject:** RE: Langdale/Riverview Shoal bass (etc.) plan



Scott, thank you for your comments as well as our follow-up call on March 15th to help clarify objectives. I've attached a revised study plan that we believe incorporates your comments. The only comment that we did not address in this particular study plan is for a radio telemetry study at this time. As we discussed, it won't make logistical sense to do any telemetry until FERC approves a removal timeline given the lifespan of telemetry tags. Additionally, since we already did one telemetry study of fish in the area of the Crow Hop tailrace, we feel it would be better to wait until closer to removal to potentially assess movement at such a fine scale. Let's continue discussing the need for movement studies as we go forward, and perhaps some of the preliminary results we get

from PIT tagging will help us better understand the research needs for this project.

Please let me know if you see anything in this version that you think stands out in need of significant change. Otherwise, we will submit this plan to FERC and move forward with studies once approved by them.

Thank you,
Patrick

Patrick O'Rouke
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Georgia Power

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**From:** Robinson, Scott <Scott.Robinson@dnr.ga.gov>
**Sent:** Tuesday, March 09, 2021 2:03 PM
**To:** O'Rouke, Patrick Michael <PMOROUKE@southernco.com>
**Cc:** Hakala, Jim <Jim.Hakala@dnr.ga.gov>; Hess, Brent <Brent.Hess@dnr.ga.gov>
**Subject:** RE: Langdale/Riverview Shoal bass (etc.) plan



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Hello Patrick,
Thank you for the opportunity to review the *Pre-and Post-Dam Removal Shoal Bass Abundance and Tracking Study Plan*. We look forward to working with you and the Georgia Power Company on the Langdale and Riverview Dam Removal Project. We have reviewed the draft study plan and have the following comments for your consideration.

The stated objectives indicate the study would include an abundance estimate for shoal bass in Flat Shoals Creek. However, the methods are unclear on how that objective will be accomplished. Flat Shoals Creek is not listed in the sampling study reaches list (Page 7) and the study map does not indicate the Flat Shoals Creek study area (Figure 2-1). Consider clarifying the methodology regarding the Flat Shoals Creek portion of the proposed study.

Comparison of modeled habitat estimates to post-dam removal habitat conditions is listed as a study objective. We believe this is an important component to the study, however, the methodology to be used was not described in the study methods. Consider providing additional explanation of how this will be conducted so the methodology can be evaluated.

Anglers expressed concern in public review that the dam removal project may negatively influence the existing Shoal Bass population. We are pleased that assessing fish movement (to include Shoal Bass) is listed as a study objective. However, the study plan lacks a Shoal Bass movement component other than general capture location collected from the mark and recapture study (Reaches 1-3). This may prove too coarse a measure of movement to fully address angler concerns. Consideration should be given to including an individual Shoal Bass tracking component to the study plan. Ideally, radio telemetry tracking would provide movements of fish immediately before and several months after dam removal.

Consider extending the Reach 1 sample boundary up to West Point Lake Dam. Tagged fish could potentially move upstream of the current Reach 1 upper boundary (above the I-85 bridge) and would not be detected under the current sample framework.

Determining the Shoal Bass genetic composition, for both the pre- and post-dam removal for the mainstem river reach and Flat Shoals Creek, should be considered. The current Study Plan lacks a genetic component.

The amount of sampling effort may not be sufficient to accurately estimate the Shoal Bass population size in either the pre or post dam removal periods. Sampling only three stations for an hour total is unlikely to result in collection/tagging of enough Shoal Bass to provide a meaningful population estimate. For example, in 2017, CPUE at Crow Hop was four Shoal Bass an hour. If similar capture rates were experienced during this study, the resultant population estimate would lack robustness. Some mark and recapture studies suggest at least 20% recapture of marked fish to generate a useable population estimate. Consideration should be given to establishing a minimum number of Shoal Bass to be tagged during the study to ensure viable population estimates are derived. We also suggest any population estimates include error, variance, and confidence intervals.

Again, thank you for giving us a chance to comment on the draft Study Plan for the Langdale and Riverview Dam Removal Project. Please, feel free to contact us if you have any questions or comments.

Scott Robinson
Chief of Fisheries

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**From:** O'Rouke, Patrick Michael <PMOROUKE@southernco.com>
**Sent:** Friday, February 26, 2021 3:20 PM
**To:** Hess, Brent <Brent.Hess@dnr.ga.gov>; Robinson, Scott <Scott.Robinson@dnr.ga.gov>
**Cc:** Hakala, Jim <Jim.Hakala@dnr.ga.gov>
**Subject:** Langdale/Riverview Shoal bass (etc.) plan



Guys, attached is the draft plan we've come up with for a shoal bass study. The plan is to get sampling started this spring. This was based on conversations I had with Brent and Thom about general research needs.

Take a look and let me know what you think. If you think anything needs to be tweaked, let me know. Feel free to give me a call.

Thanks!

Patrick

Patrick O'Rouke
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Georgia Power

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Chris Manganiello, Atlanta, GA.
May 28, 2021

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

Submitted via FERC eComment System

RE: COMMENT regarding Georgia Power Companyâ€™s and Southern Companyâ€™s Draft Pre- and Post-Dam Removal Shoal Bass Abundance and Tracking Study Plan re Langdale and Riverview Hydroelectric Project Numbers 2341-033 & 2350-025

Dear Secretary Bose,

Chattahoochee Riverkeeper appreciates the opportunity to file comments in response to the Georgia Power Companyâ€™s (Georgia Power) request for comments on the Draft Pre- and Post-Dam Removal Shoal Bass Abundance and Tracking Study Plan.

Established in 1994, Chattahoochee Riverkeeper (CRK) is an environmental advocacy and education organization with more than 9,000 members dedicated solely to making the Chattahoochee River a sustainable resource for the five million people who depend on it. Our mission is to advocate and secure the protection and stewardship of the Chattahoochee River, its lakes, tributaries, and watershed, in order to restore and preserve their ecological health for the people and wildlife that depend on the river system.

Chattahoochee Riverkeeper (CRK) appreciates Georgia Powerâ€™s development of a pre- and post-dam removal shoal bass study plan. We think this study will help answer some stakeholderâ€™s questions about the size, location, mobility, and health of shoal bass and other species in the project area.

CRK asks that Georgia Power consider additional seasons of field collection post-dam removal of the fishery. For example, one additional season of field collection could take place 3 to 5 years after the first post-dam removal of the fishery. This decommissioning process offers tremendous opportunities to document the positive benefits of barrier removal on aquatic connectivity.

CRK remains very supportive and hopeful about the prospect of the proposed barrier removal in the Middle Chattahoochee River region. Given the unprecedented size, scale and scope of this proposed project, pre- and post-construction monitoring of multiple natural and aquatic resources will greatly aid in the general understanding of the impacts and consequences of barrier removal in large, regulated southeastern river systems.

With many eyes watching, Georgia Power has a significant opportunity to demonstrate a commitment to sustainability and act as an exemplary â€œcitizen whereverâ€ they serve.

If you have any questions, please do not hesitate to contact us.

Sincerely,
/JU/
Jason Ulseth
Riverkeeper
404.352.9828
julseth@chattahoochee.org

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GEORGIA WILDLIFE FEDERATION

May 28, 2021

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

**Submitted via FERC eFiling System**

**RE: COMMENT regarding Georgia Power Company's and Southern Company's Draft Pre- and Post-Dam Removal Shoal Bass Abundance and Tracking Study Plan re: Langdale and Riverview Hydroelectric Project Numbers 2341-033 & 2350-025**

Dear Secretary Bose,

Thank you for the opportunity to comment on the proposed Draft Pre- and Post-Dam Removal Shoal Bass Abundance and Tracking Plan by Georgia Power Company and Southern Company as they move forward with the removal of the Langdale and Riverview dams.

I respectfully submit the following comments on behalf of the membership of the Georgia Wildlife Federation (GWF). Founded in 1936, the mission of GWF is to encourage the intelligent management of the life sustaining resources of the earth – its essential water resources – its protective forests and plant life – and its dependent wildlife – and to promote and encourage the knowledge and appreciation of these resources, their interrelationship and wise use, without which there can be little hope for a continuing abundant life.

Established by hunting and fishing clubs from across Georgia, Georgia Wildlife Federation has represented sportsmen and women since our beginning. Today our membership includes the broad spectrum of wildlife conservation interests, from hunting and angling to wildlife watching.

Georgia Wildlife Federation enthusiastically endorses the removal of the Langdale and Riverview dams located on the middle Chattahoochee River. This removal restores a significant stretch of the Chattahoochee River to its traditional condition, which we expect will result in the reestablishment of natural riverine habitat. We are excited, particularly, to see this stretch of the river system restored with an emphasis on the Shoal Bass, recently designated as Georgia's Official State Riverine Sportfish.

The outlined Pre- and Post-Dam removal study on Shoal Bass abundance and the physical condition assessment of the target species will provide valuable data in evaluating future opportunities for dam removal and for professional, science-based management. In combination with the proposed telemetry tracking data it will likely answer many questions associated with this species. Shoal Bass anglers, as well as fisheries management experts, will benefit greatly from this initiative.

11600 Hazelbrand Road, Covington, GA 30014 ● Phone (770)787-7887 ● Fax (770)787-9229 ● www.gwf.org

Thank you again for the opportunity to comment. More importantly, Georgia Wildlife Federation wants to thank Georgia Power for the initiative and commitment to this important restoration of one of our state's most iconic river systems.

Respectfully submitted,

Mike Worley
President and CEO
Georgia Wildlife Federation

cc: file

**From:** Hess, Brent <Brent.Hess@dnr.ga.gov>
**Sent:** Thursday, July 08, 2021 4:16 PM
**To:** O'Rouke, Patrick Michael <PMOROUKE@southernco.com>
**Cc:** Hakala, Jim <Jim.Hakala@dnr.ga.gov>; Robinson, Scott <Scott.Robinson@dnr.ga.gov>
**Subject:** RE: Langdale/Riverview SHB Sampling



Patrick,

Interesting! Good stuff. I will look over and get back to you if I have any questions.

Thank you Sir for sending.

Brent Hess
Fisheries Biologist, Fisheries Management

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GEORGIA DEPARTMENT OF NATURAL RESOURCES

**From:** O'Rouke, Patrick Michael <PMOROUKE@southernco.com>
**Sent:** Thursday, July 8, 2021 4:10 PM
**To:** Hess, Brent <Brent.Hess@dnr.ga.gov>
**Cc:** Hakala, Jim <Jim.Hakala@dnr.ga.gov>; Robinson, Scott <Scott.Robinson@dnr.ga.gov>
**Subject:** Langdale/Riverview SHB Sampling



Brent, I just wanted to give y'all an update on the SHB study on the Chattahoochee. Our team wrapped up sampling last Thursday. The second sampling event actually had to be pushed back a week due to all of the rainfall from Tropical Storm Claudette (the first round occurred the week of 6/7).

We'll have a lot more information coming with the study report, but overall we captured 33 total species, including 56 shoal bass across both sampling events, with relatively similar catch rates in both rounds. Most of the shoal bass were captured in targeted "bonus" sampling rather than in the standardized segments. Of those 56 shoal bass, 31 were tagged and 4 were deceased. No PIT-tagged shoal bass were recaptured in the second round. We do have fin clips preserved from all of these fish for future genetic analysis. Approximately 35% of the shoal bass captured were under six inches. There were no shoal bass captured in the segment from West Point Dam to Langdale Dam in either event. We did get shoal bass in all other segments (Langdale to Crow Hop/Riverview, below Crow Hop/Riverview, Flat Shoals Creek).

Let me know if you have any questions or want to discuss any of this. We're planning to conduct the side scan survey next week if flows will cooperate.

Thanks!
Patrick

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