

**AMERICAN EEL  
(*ANGUILLA ROSTRATA*)  
ABUNDANCE MONITORING PLAN**

**PARR HYDROELECTRIC PROJECT**  
(FERC No. 1894)

*Prepared for:*

**South Carolina Electric & Gas Company  
Cayce, South Carolina**

*Prepared by:*

**Kleinschmidt**

Lexington, South Carolina  
[www.KleinschmidtGroup.com](http://www.KleinschmidtGroup.com)

September 2017

AMERICAN EEL (*ANGUILLA ROSTRATA*)  
ABUNDANCE MONITORING PLAN

PARR HYDROELECTRIC PROJECT  
(FERC No. 1894)

*Prepared for:*

South Carolina Electric & Gas Company  
Cayce, South Carolina

*Prepared by:*

**Kleinschmidt**

Lexington, South Carolina  
[www.KleinschmidtGroup.com](http://www.KleinschmidtGroup.com)

September 2017

**AMERICAN EEL (*ANGUILLA ROSTRATA*)  
ABUNDANCE MONITORING PLAN**

**TABLE OF CONTENTS**

1.0	INTRODUCTION .....	1
2.0	EXISTING INFORMATION .....	2
3.0	PROPOSED PM&E MEASURE.....	4
3.1	PRELIMINARY AMERICAN EEL MONITORING METHODS .....	4
4.0	SCHEDULE.....	6
5.0	LITERATURE CITED .....	8

**LIST OF FIGURES**

FIGURE 2-1	PARR PROJECT AMERICAN EEL SAMPLING LOCATIONS – 2015 .....	3
FIGURE 2-2	PARR PROJECT AMERICAN EEL SAMPLING LOCATIONS – 2016 .....	3
FIGURE 3-1	AMERICAN EEL MONITORING LOCATIONS.....	5

**LIST OF TABLES**

TABLE 4-1	AMERICAN EEL MONITORING PLAN SCHEDULE.....	6
-----------	--	---

**LIST OF APPENDICES**

APPENDIX A	SUMMARY OF CONSULTATION	
------------	-------------------------	--

**AMERICAN EEL (*ANGUILLA ROSTRATA*)  
ABUNDANCE MONITORING PLAN**

## **1.0 INTRODUCTION**

---

South Carolina Electric & Gas Company (SCE&G) is the Licensee for the Parr Hydroelectric Project (FERC No. 1894) (Project), which consists of the Parr Shoals Development (Parr Development) and the Fairfield Pumped Storage Development (Fairfield Development). Both developments are located along the Broad River in Fairfield and Newberry counties, South Carolina. The current license for the Project is due to expire on June 30, 2020. SCE&G will file for a new license with the Federal Energy Regulatory Commission (FERC) on or before June 30, 2018.

The Parr Development creates a blockage for upstream fish passage on the Broad River, therefore stakeholders on the Fisheries Technical Working Committee (TWC) requested an assessment of American eel (*Anguilla rostrata*) abundance downstream of Parr Shoals Dam. The study results were used to determine if upstream passage of American eel was warranted at this time or at some point during the term of the new license. SCE&G and the stakeholders reviewed the study results and agreed to develop this American Eel Monitoring Plan to assess densities of American eel downstream of the Parr Shoals Dam during the term of the new license. This plan will be included as a Protection, Mitigation and Enhancement (PM&E) measure in the Comprehensive Relicensing Settlement Agreement (CRSA).

## 2.0 EXISTING INFORMATION

---

Information on the distribution and abundance of American eel in the Broad River is not well documented. The South Carolina Department of Natural Resources (SCDNR) currently operates an eel ramp at the St. Stephen Re-diversion Dam, located approximately 135 river miles downstream of the Project. This ramp provides passage of eels into the Santee Cooper Reservoir System, which connects with the Congaree and Wateree rivers. Little is known regarding the extent of passage of American eels upstream beyond the Santee Cooper reservoirs into the Congaree and further upstream above the Columbia Hydroelectric Project into the Broad River and to the base of the Parr Shoals Dam. During relicensing, stakeholders requested a study to assess eel abundance downstream of the Parr Shoals Dam. To fulfill this request, SCE&G conducted American eel surveys during 2015 and 2016. Ramp-style elver traps, a fyke net, and electrofishing efforts were utilized during spring 2015 and fall 2015 (Figure 2-1), and only one eel was collected via backpack electrofishing. Additional backpack and boat electrofishing efforts were performed in spring 2016 (Figure 2-2), which detected two additional eels. A total of three American eels, all in the yellow eel lifestage, were collected or observed during the entire study. All the eels were observed using electrofishing methods (Kleinschmidt 2016).

The SCDNR has conducted two separate American eel abundance studies in the Broad River. During 2010 through 2012, the SCDNR collected 13 eels downstream of the Columbia Hydroelectric Project dam (located on the Broad River 23.5 miles downstream of Parr Shoals Dam) via eel ramps, electrofishing, and Fukui traps. In separate collection efforts during 2009 through 2014, the SCDNR collected a total of 21 yellow eels in the Broad River via boat electrofishing, with 12 of those eels collected immediately downstream of Parr Shoals Dam. Results of these studies suggest that while American eels are present in the Broad River downstream of Parr Shoals Dam, they are not abundant.



**FIGURE 2-1 PARR PROJECT AMERICAN EEL SAMPLING LOCATIONS – 2015**



**FIGURE 2-2 PARR PROJECT AMERICAN EEL SAMPLING LOCATIONS – 2016**

### **3.0 PROPOSED PM&E MEASURE**

---

Current distribution of American eel downstream of Parr Shoals Dam does not warrant construction of an eel ramp, but densities in the future may increase during the new FERC operating license. To address future concerns, SCE&G will conduct electrofishing sampling efforts to monitor the distribution and abundance of American eels downstream of the Parr Shoals Dam for the duration of their new license for the Project. A study plan detailing monitoring frequency, timing, and location will be developed by the American Eel Review Committee<sup>1</sup> following issuance of the new license. SCE&G will then submit this study plan to FERC for approval. Preliminary methods for American eel monitoring are included below.

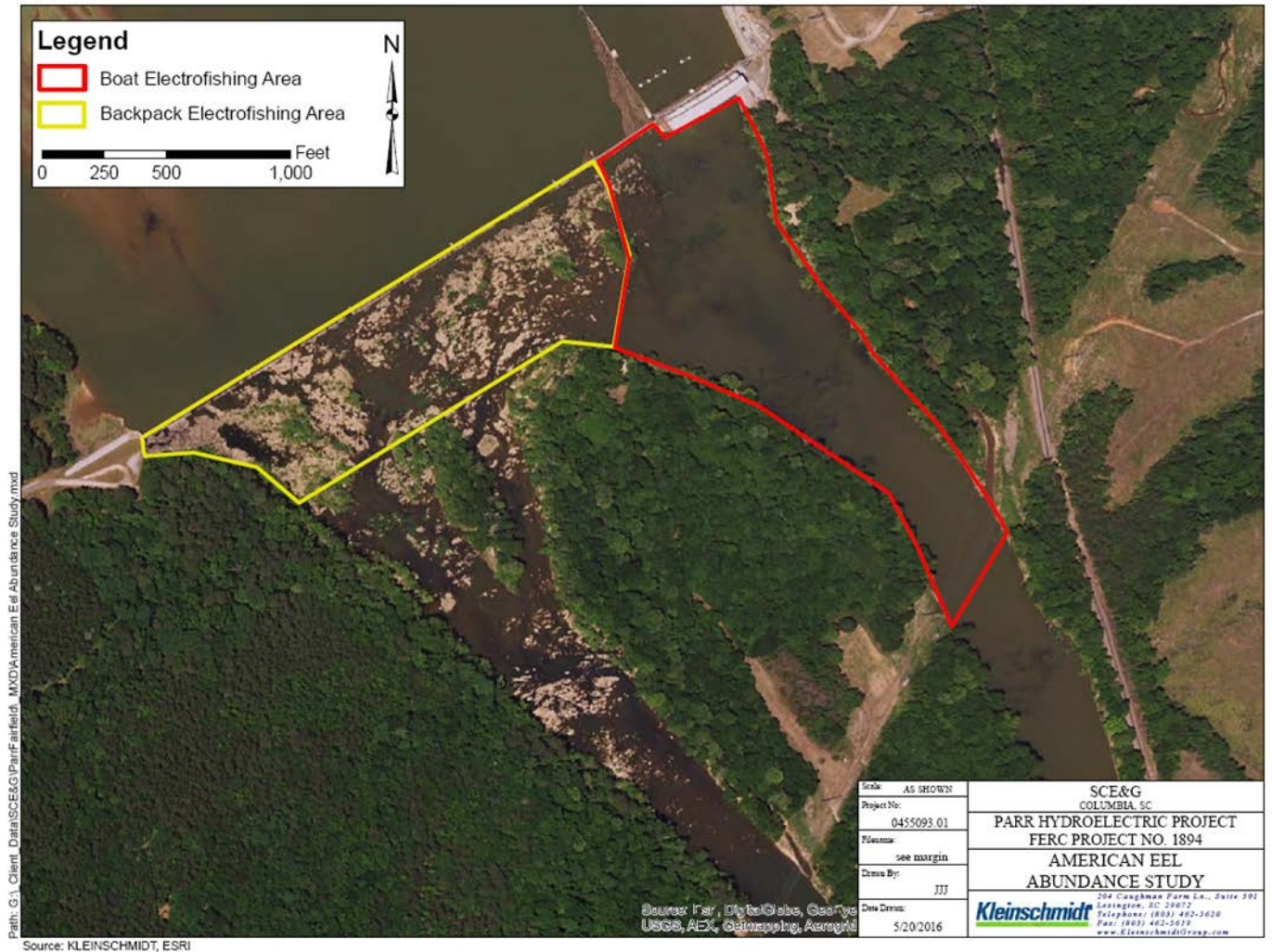
#### **3.1 PRELIMINARY AMERICAN EEL MONITORING METHODS**

Electrofishing methods will target the yellow eel lifestage and will include backpack electrofishing in pools downstream of Parr Shoals Dam along the west side of the dam and boat electrofishing in the shoal and riffle habitats downstream of the powerhouse, as well as along the face of the dam near the powerhouse. Surveys will be conducted during the first year after the license is issued and the American Eel Monitoring Study Plan has been approved by the FERC; and then every 5 years thereafter (i.e., years 6, 11, 16, etc. after license issuance) (Table 4-1). Sampling will be increased to once every 3 years upon the completion of eel passage at the Santee Cooper Project. During each sampling year, sampling efforts will be conducted over three days in April, May, and June, not necessarily with one day in each month, except during the first year of sampling. After the first year of sampling, the Review Committee will determine when the three days of sampling will occur, to potentially include other months such as October. On each sampling day, backpack electrofishing will occur for ½ hour and boat electrofishing will occur for 1 hour. Sampling locations are outlined in Figure 3-1. The monitoring results will be reported to the Review Committee within two months of the close of monitoring each collection year. Sampling results will be assessed at a Review Committee meeting the February following a monitoring year, and a report will be filed with FERC by April 30 of that year. The Review Committee will use the data collected under this monitoring plan to determine the trigger for

---

<sup>1</sup> Members of the American Eel Review Committee must be signatories to the CRSA with the exception of National Oceanic and Atmospheric Administration (NOAA) Fisheries, US Fish and Wildlife Service (USFWS) and SCDNR.

construction and implementation of an eel ramp at the Parr Shoals Dam. However, the Project currently has a plan with triggers established for implementing passage of American shad and blueback herring at the Parr Shoals Dam. SCE&G will consider inclusion of an American eel ramp as part of that fishway design and construction when triggers are met for fish passage.



**FIGURE 3-1 AMERICAN EEL MONITORING LOCATIONS**



## 4.0 SCHEDULE

---

The monitoring schedule is described in the table below in relation to the issuance of the license by FERC.

**TABLE 4-1 AMERICAN EEL MONITORING PLAN SCHEDULE**

PERIOD <sup>2</sup>	ITEM
Within 180 days of license issuance	Form Review Committee, review American Eel Monitoring Plan and submit American Eel Monitoring Study Plan to FERC
Year 1 of new license	<ul style="list-style-type: none"> <li>• Conduct 3 surveys - April-June</li> <li>• Report results to Review Committee within 2 months after end of monitoring</li> <li>• Review Committee meeting- February of following year</li> <li>• File Annual Report with FERC- April 30<sup>th</sup> of following year</li> </ul>
Year 6 of new license	<ul style="list-style-type: none"> <li>• Conduct 3 surveys - April-June or other months as determined by Review Committee</li> <li>• Report results to Review Committee within 2 months after end of monitoring</li> <li>• Review Committee meeting- February of following year</li> <li>• File Annual Report with FERC- April 30<sup>th</sup> of following year</li> </ul>
Year 11 of new license	<ul style="list-style-type: none"> <li>• Conduct 3 surveys - April-June or other months as determined by Review Committee</li> <li>• Report results to Review Committee within 2 months after end of monitoring</li> <li>• Review Committee meeting- February of following year</li> <li>• File Annual Report with FERC- April 30<sup>th</sup> of following year</li> </ul>
Year 16 of new license	<ul style="list-style-type: none"> <li>• Conduct 3 surveys - April-June or other months as determined by Review Committee</li> <li>• Report results to Review Committee within 2 months after end of monitoring</li> <li>• Review Committee meeting- February of following year</li> <li>• File Annual Report with FERC- April 30<sup>th</sup> of following year</li> </ul>

---

<sup>2</sup> Sampling will increase to once every three years upon completion of eel passage at the Santee Cooper Project.

Year 21 of new license	<ul style="list-style-type: none"> <li>• Conduct 3 surveys - April-June or other months as determined by Review Committee</li> <li>• Report results to Review Committee within 2 months after end of monitoring</li> <li>• Review Committee meeting- February of following year</li> <li>• File Annual Report with FERC- April 30<sup>th</sup> of following year</li> </ul>
Year 26 of new license	<ul style="list-style-type: none"> <li>• Conduct 3 surveys - April-June or other months as determined by Review Committee</li> <li>• Report results to Review Committee within 2 months after end of monitoring</li> <li>• Review Committee meeting- February of following year</li> <li>• File Annual Report with FERC- April 30<sup>th</sup> of following year</li> </ul>
Year 31 of new license <sup>3</sup>	<ul style="list-style-type: none"> <li>• Conduct 3 surveys - April-June or other months as determined by Review Committee</li> <li>• Report results to Review Committee within 2 months after end of monitoring</li> <li>• Review Committee meeting- February of following year</li> <li>• File Annual Report with FERC- April 30<sup>th</sup> of following year</li> </ul>

---

<sup>3</sup> Sampling will continue throughout the term of the license. This schedule will be adjusted depending on the license term issued by FERC

## 5.0 LITERATURE CITED

---

Kleinschmidt Associates. 2016. American eel (*Anguilla rostrata*) Abundance Study Report.  
June 2016.

**APPENDIX A**

**SUMMARY OF CONSULTATION**

## Appendix A

Stakeholders convened throughout the relicensing process to discuss the development of the American Eel Abundance Monitoring Plan. A list of meeting dates pertinent to the development of this monitoring plan is included below. The complete consultation record for the development of this monitoring plan, including notes from the meetings listed below, can be found in Appendix A of the Final License Application's Exhibit E.

- Rare, Threatened and Endangered Species TWC Meeting – March 1, 2016
- Joint<sup>1</sup> RCG Meeting – March 28, 2017
- Joint RCG Meeting – July 13, 2017
- Joint RCG Meeting – August 10, 2017

---

<sup>1</sup> A Joint RCG Meeting refers to a meeting where all RCGs are present, including the Water Quality, Fish and Wildlife RCG, the Lake and Land Management and Recreation RCG, and the Operations RCG.