

## **MEETING NOTES**

### ***SOUTH CAROLINA ELECTRIC & GAS COMPANY Rare, Threatened and Endangered Species TWC Meeting***

***October 22, 2013***

Final KDM 11-13-13

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#### ***ATTENDEES:***

Bill Argentieri (SCE&G)  
David Eargle (SCDHEC)  
Steve Summer (SCANA)  
Shane Boring (Kleinschmidt)  
Kelly Miller (Kleinschmidt)  
Gerrit Jobsis (American Rivers)  
Vivianne Vejdani (SCDNR)

Henry Mealing (Kleinschmidt)  
Milton Quattlebaum (SCANA)  
Alison Jakupca (Kleinschmidt)  
Randy Mahan (SCANA)  
Bill Stangler (Congaree Riverkeeper)  
Byron Hamstead (USFWS)

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*These notes serve to be a summary of the major points presented during the meeting and are not intended to be a transcript or analysis of the meeting.*

Henry opened the meeting by reviewing the agenda. The group then began to discuss the RT&E Literature Based Study Plan. The group reviewed the USFWS list of RT&E species for Newberry and Fairfield counties. Henry told the group that we plan to begin the research for this study in 2014, and if any other species are added to the list in 2015, they will be included in the final report. The group agreed to this timeline. Byron brought maps to show the locations of the active bald eagle nests near the Project. Steve said that SCE&G also keeps track of the nests. The two groups agreed to work together to make sure that all of this information is shared. Byron agreed to send the Bald Eagle nesting location information to Kelly electronically.

The group then discussed Tom McCoy's comment regarding the Carolina darter. Byron explained that there was a historical record of the species occurring in the Project Area, and that the Project Area provides the correct habitat for this species. However, it is unknown if the record is pre-impoundment. While this species is not currently federally listed (it is a federal species of concern and a state threatened species). Shane will do some research on this species to determine its status in the Project Area. Shane reminded the group that any species the agencies want to be included in the study will be added to the list.

Vivianne commented that since this is a desktop study, she isn't sure if the objectives listed in the study plan can be met, including the identification of appropriate habitat for specific species and the verification of the presence or absence of specific species in the study area. She also suggested that the other RT&E studies that will be conducted are referenced in the literature-based study. The study plan was edited to reflect Vivianne's comments.

Byron mentioned that the Newberry burrowing crayfish, a federal at-risk species, needs to be included in the RT&E literature based study plan. Shane said he would make sure this species is captured in the study.

Bill S. asked why the study area specified in the RT&E Literature Based Study Plan only extends a ½ mile below the Parr Shoals Dam. The group agreed that the study needs to extend down to, and include, Frost Shoals. All study plans will be adjusted to be consistent with this geographic scope.

The group then discussed the Rocky Shoals Spider Lily (RSSL) Study Plan and the comments submitted by the USFWS. The USFWS questioned whether the GPS locations of the RSSL should be public knowledge. The group agreed that many locations are already public knowledge and this hasn't been a problem in the past.

Wording is added to Section 7 of the study plan to explain that information collected during the studies will be used in the development of potential PM&E measures. This wording will be added to all of the study plans.

Gerrit requested that elevation information for the RSSL be documented during the study. Bill S. added that the big concern for the species is how long the plants are completely inundated. Too long of an inundation period and they may die, but not long enough leaves the plants susceptible to predation. The group agreed that elevations of some lily populations will be collected during the IFIM study. The RSSL location data will be compared to the proposed IFIM transects, and the IFIM transects could be slightly shifted so that IFIM study data could apply directly to populations of RSSL. The IFIM study plan and the RSSL study plan will be edited to reflect this.

The group then discussed the Spiny Crayfish Study Plan. The USFWS provided comments on the study plan including the concern of how the crayfish will be correctly identified. Alison explained that only the Form I males will be collected in the field, and then sent to Arnie Eversole, or another qualified astacologist for further identification.

USFWS was also concerned about how frequently the traps will be monitored. Alison explained that the traps will be checked weekly, unless cannibalism or predation seems to be an issue. The traps will then be checked more frequently. The USFWS suggested changing the bait to canned cat food, and everyone agreed that this is an appropriate and effective bait. The study plan was edited to reflect this change. David then asked if the timing of the study is most appropriate for catching crayfish. Alison will contact Arnie Eversole to confirm that this is the correct time for the study, and that the traps are being checked at the appropriate frequency.

The group discussed the proposed monitoring sites for the crayfish study. Byron would like to see the traps set near woody debris, at a variety of depths in the river. Bill S. says that no monitoring location is currently set for downstream of the Parr Shoals Dam, and that maybe another site should be added in that area. The group decided that the best option would be to include general areas for monitoring in the study plan and then go on a reconnaissance trip to determine exact locations closer to the time the study will be conducted. USFWS, SCE&G and Kleinschmidt will work together to determine the best locations for the traps, with consideration to habitat, likely hood of success, and accessibility. Byron also suggested the possibility of having more than one trap at each monitoring location. This was also included in the study plan edits and will be determined during the reconnaissance trip.

Byron also suggested collecting water quality data at the sampling stations. Henry said that a YSI meter can be taken when the traps are checked and temperature, dissolved oxygen and conductivity will be recorded.

After lunch, the group discussed the Monticello Mussel Study Plan. The USFWS requested that water quality data be collected at the sampling sites. Shane spoke with John Alderman prior to the meeting and asked his opinion on this. John said he didn't think it was necessary, since it just provides a snapshot of the water quality in a specific location. However the group decided that when the study is performed, water quality data, including temperature, dissolved oxygen and conductivity, will be collected using a YSI meter at some of the sampling sites. USFWS was also interested in learning the qualifications of the malacologist that will be performing the study, to ensure that he or she has the correct permits to handle RT&E species in the event one is discovered. Shane said that John Alderman or a similarly qualified group will likely be leading the study, and all are qualified and permitted to handle any sensitive species. David asked if the Carolina heelsplitter needs to be specifically mentioned in the study plan. Shane told David that all mussels found will be identified, and if the Carolina heelsplitter is found in Monticello Reservoir that it will be documented.

Henry told the group that if anyone is interested in participating in a particular study, to let SCE&G or Kleinschmidt know. They are welcome to participate in the field studies if we can accommodate them.

The four study plans discussed during this meeting are included at the end of these notes, with all edits shown in track changes. Revised and finalized copies of the documents will be emailed to the TWC. Action items stemming from this meeting are listed below.

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*ACTION ITEMS:*

- Byron will email the Bald Eagle nesting information to Kelly.
- Shane will research the Carolina darter to determine if the species is located in the Project Area.
- Bill S. will send Kelly the Davenport study and reference for the Rocky Shoals Spider Lily.
- Alison will talk to Arnie Eversole verifying the correct time and frequency to sample crayfish.
- Kleinschmidt will update the geographic scope of all study plans to extend downstream of Parr Shoals Dam to include Frost Shoals. The study plans will also be updated to mention that all information collected during the studies will be considered in the development of potential PM&E measures.

- Kleinschmidt will revise the RSSL and IFIM Study Plans to include documenting elevation of the RSSL populations.

# **PARR HYDROELECTRIC PROJECT**

**(FERC No. 1894)**

## **DRAFT RARE, THREATENED AND ENDANGERED SPECIES STUDY PLAN**

*Prepared for:*

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

*Prepared by:*

**Kleinschmidt**

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

September 2013

PARR HYDROELECTRIC PROJECT  
(FERC No. 1894)

DRAFT  
RARE, THREATENED AND ENDANGERED SPECIES  
STUDY PLAN

*Prepared for:*

South Carolina Electric & Gas Company  
Cayce, South Carolina

*Prepared by:*



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

September 2013

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

**DRAFT RARE, THREATENED AND ENDANGERED SPECIES STUDY PLAN**

**SOUTH CAROLINA ELECTRIC & GAS COMPANY**

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

**DRAFT RARE, THREATENED AND ENDANGERED SPECIES STUDY PLAN**

**SOUTH CAROLINA ELECTRIC & GAS COMPANY**

## **1.0 INTRODUCTION**

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South Carolina Electric & Gas Company (SCE&G) is the Licensee of the Parr Fairfield Hydroelectric Project (FERC No. 1894) (Project). The Project consists of the Parr Hydro Development and the Fairfield Pumped Storage Development. Both developments are located along the Broad River in Fairfield and Newberry Counties, South Carolina (Figure 1).

The Project is currently involved in a relicensing process which involves cooperation and collaboration between SCE&G as the licensee and a variety of stakeholders including state and federal resource agencies, state and local government, non-governmental organizations (NGOs), and interested individuals. Collaboration and cooperation of stakeholders is essential to the identification of and treatment of operational, economic, and environmental issues associated with a new operating license for the Project. SCE&G has established several Technical Working Committees (TWCs), including members from among the interested stakeholders, with the objective of achieving consensus regarding the identification and proper treatment of these resource issues in the context of a new license.

In preparation for relicensing, SCE&G formed a Rare, Threatened and Endangered Species Technical Working Committee (“RT&E TWC” or “TWC”), which is comprised of interested stakeholders who are working with SCE&G to identify potential issues, make biological study recommendations, and provide technical and experience-based input related to rare, threatened and endangered (RT&E) species potentially residing in the Project area. SCE&G is planning to conduct a literature-based study to compile existing information on federally and state listed RT&E species in the immediate project area. SCE&G will use this information in developing their license application for Federal Energy Regulatory Commission (FERC).



## 2.0 STUDY OBJECTIVES

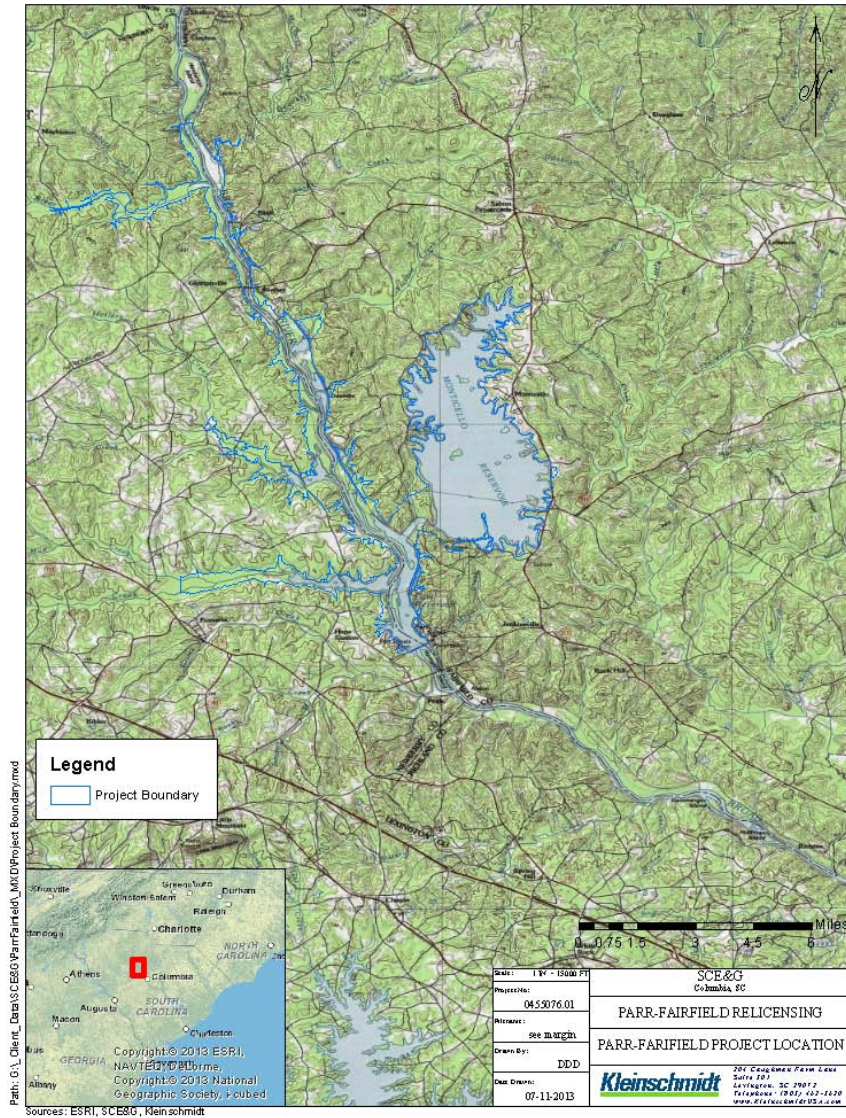
The objective of this study is to ~~accurately~~ characterize the present status of RT&E species at the Parr Fairfield Hydroelectric Project by providing information regarding the availability of RT&E habitat and ~~by verifying the presence or absence~~ characterize the known status of RT&E species within the Project boundary and Project vicinity. The presence or absence of selected species will be verified through targeted field studies.

**Comment [b1]:** Add a section listing the RT&E studies that we are doing, such as spiny crayfish, RSSL, etc.

## 3.0 GEOGRAPHIC AND TEMPORAL SCOPE

This study will focus on all areas within the FERC Project boundary, including Parr and Monticello reservoirs and the immediate vicinity of the Project in Fairfield and Newberry counties. As this study is a desktop exercise, no field reconnaissance will be implemented. RT&E species that are deemed as potentially occurring within the Project Area and from Parr Shoals Dam extending to and including Frost Shoals, near Boatwright Island ~~vicinity will be noted through this study,~~ along with the known presences of available RT&E habitat will be evaluated. The study is scheduled to commence in 2015.

**Comment [b2]:** Make the geographic scope consistent throughout all of the study plans.



**FIGURE 1 PARR-FAIRFIELD PROJECT LOCATION MAP**

## 4.0 COLLECTION METHODS AND ANALYSIS

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In order to appropriately characterize the present status of RT&E species in the Project vicinity, information will be collected from various sources, including the South Carolina Department of Natural Resources (SCDNR) and the U.S. Fish and Wildlife Service (USFWS) RT&E databases.

As an initial step, a list of RT&E species documented as occurring in the counties surrounding the Project [and downstream](#) (Newberry, ~~and~~ Fairfield [and Richland](#)) will be compiled based on the USFWS and SCDNR county level listings. Additional key species may be added at the request of TWC members, if agreed to be appropriate. The federal, state and global status of each of these species will be summarized, along with counties of occurrence. As a second step, known ranges of these species, along with occurrence data from the SCDNR Natural Heritage Program and other survey data, will then be used to eliminate species occurring in the counties but not in the Broad River Basin. Habitat requirements of each of the remaining species will then be summarized and compared to available habitat within the Project boundary and include an area ~~just~~ downstream of the Parr Shoals Dam [extending to and including Frost Shoals, near Boatwright Island for approximately 1/2 mile](#). This analysis will yield a list of species that potentially occur within the Broad River Basin, and that have suitable habitat within the Project Boundary and ~~just~~ downstream of the Parr Shoals Dam [extending to and including Frost Shoals, near Boatwright Island for approximately 1/2 mile](#).

## 5.0 SCHEDULE

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Research and data collection efforts will begin ~~in no later than~~ the spring of 2015. A final report summarizing the study findings including the compiled spreadsheets will be issued within 120 days of the completion of data collection. Study methodology and timing may be adjusted based on consultation with resource agencies and interested stakeholders.

## 6.0 USE OF STUDY RESULTS

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Study results will be used as an information resource during discussion of relicensing issues [and developing potential Protection, Mitigation and Enhancement measures](#) with the SCDNR, USFWS, RT&E TWC and other relicensing stakeholders.

**DRAFT**  
**ROCKY SHOALS SPIDER LILY**  
**(*HYMENOCALLIS CORONARIA*)**  
**STUDY PLAN**

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

*Prepared for:*

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

*Prepared by:*

***Kleinschmidt***

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October 2013

DRAFT  
ROCKY SHOALS SPIDER LILY  
(*Hymenocallis coronaria*)  
STUDY PLAN

PARR HYDROELECTRIC PROJECT  
(FERC No. 1894)

*Prepared for:*

South Carolina Electric & Gas Company  
Cayce, South Carolina

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October 2013

**DRAFT ROCKY SHOALS SPIDER LILY  
(HYMENOCALLIS CORONARIA) STUDY PLAN**

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

**SOUTH CAROLINA ELECTRIC & GAS COMPANY**

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**DRAFT ROCKY SHOALS SPIDER LILY  
(HYMENOCALLIS CORONARIA) STUDY PLAN**

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

**SOUTH CAROLINA ELECTRIC & GAS COMPANY**

## **1.0 INTRODUCTION**

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The Parr Fairfield Hydroelectric Project (FERC No. 1894) (“Parr Fairfield Project” or “Project”), owned and operated by the South Carolina Electric & Gas Company (“SCE&G” or “Licensee”), is seeking a new license from the Federal Energy Regulatory Commission (“FERC”), as their current license is set to expire on June 30, 2020. The Parr Fairfield Project consists of two developments, including the Parr Hydro Development and the Fairfield Pumped Storage Development, located in Fairfield and Newberry Counties, South Carolina.

The Project is currently involved in a relicensing process which involves cooperation and collaboration between SCE&G as licensee and a variety of stakeholders including state and federal resource agencies, state and local government, non-governmental organizations (NGO), and interested individuals. The collaboration and cooperation is essential to the identification of and treatment of operational, economic, and environmental issues associated with a new operating license for the Project. SCE&G has established several Technical Working Committees (TWCs) with members from among the interested stakeholders with the objective of achieving consensus regarding the identification and proper treatment of these issues in the context of a new license. A Rare, Threatened & Endangered Species TWC (“RT&E TWC” or “TWC”) was formed to address potential RT&E related issues associated with the Project. It is comprised of stakeholders including the U.S. Fish and Wildlife Service (“USFWS”), the National Marine Fisheries Service (“NMFS”), the South Carolina Department of Health and Environmental Control (“SCDHEC”) and the South Carolina Department of Natural Resources (“SCDNR”), among others. During issues scoping, the TWC identified a South Carolina state species of concern, the Rocky Shoals Spider Lily (*Hymenocallis coronaria*) as occurring in the Broad River, downstream of the Parr Shoals Dam (Parr Dam). TWC members requested a survey to document the presence of this species in reaches downstream of the Project Area.



## 2.0 RELEVANT LIFE HISTORY INFORMATION

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The Rocky Shoals Spider Lily (*Hymenocallis coronaria*), a recognized species of concern for South Carolina, is an aquatic, perennial flowering plant easily identified by its large white flowers. The plant develops from a bulb and grows to be approximately 3 feet tall. *H. coronaria* requires a specialized habitat of swift, shallow flowing water over rocks and direct sunlight (Davenport, 2007). The Broad River downstream of the Parr Dam contains shoal areas which provide the necessary habitat for this species. During winter months, plant bulbs and seeds stay buried in the rocky riverbed until May, when leaves begin to emerge above the water surface. During this time, flower stalks begin to develop and the short blooming season occurs from mid-May through June (Davenport, 2007).

## 3.0 STUDY OBJECTIVES

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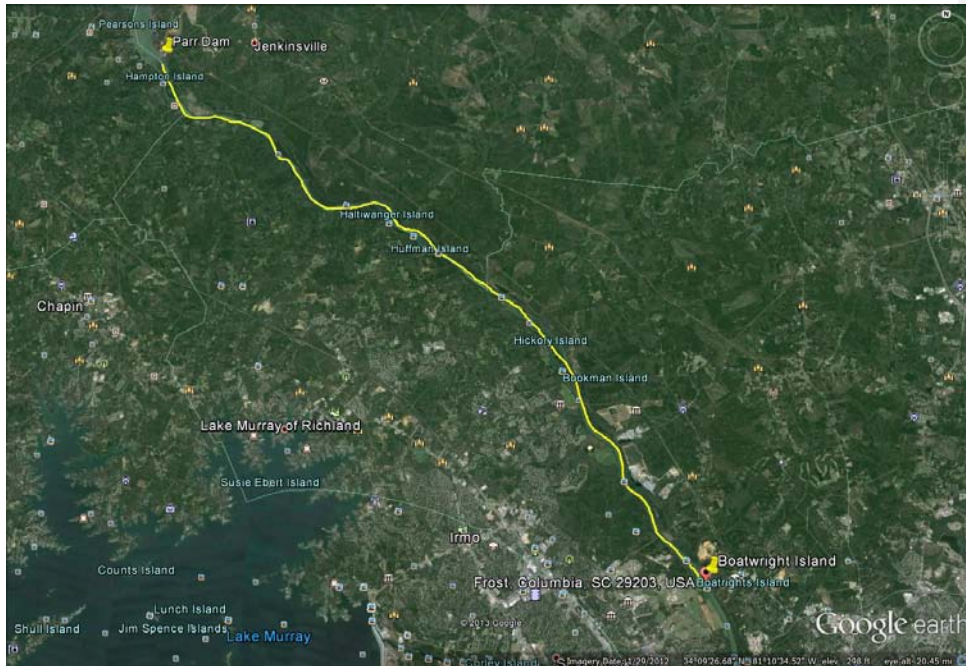
The objective of this study is to assess the status of *H. coronaria* within the area of Project influence by identifying and documenting all populations in the portion of the Broad River from Parr Dam ~~extending to and including Frost Shoals, near Boatwright Island to Boatwright Island, including Frost Shoals.~~

## 4.0 GEOGRAPHIC AND TEMPORAL SCOPE

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As the life history information indicates, *H. coronaria* populations may occur at various shoals along the Broad River downstream of the Parr Dam. For this reason, the survey area will include the stretch of the Broad River downstream of the Parr Dam extending to ~~and including~~ Frost Shoals, near Boatwright Island. The survey reach is depicted in yellow in Figure 1.

The study will occur during the flowering season over two to three days in May or June, depending on flows and weather.



**FIGURE 1 ROCKY SHOALS SPIDER LILY SURVEY REACH**

## **5.0 COLLECTION METHODS AND ANALYSIS**

The survey will take place during the flowering season of the *H. coronaria*, which occurs from late spring to early summer. A survey crew(s) will deploy in kayaks or canoes at the base of the Parr Dam and paddle downstream, observing the area for populations of *H. coronaria*. The main stem river channel, side channel areas and island complexes will be thoroughly surveyed. The crew(s) will paddle approximately halfway down the survey reach on Day 1. The group will then reconvene at the take-out location from Day 1 on Day 2 and paddle the remainder of the study area. When populations are sighted, the crew will document the exact location of the plants using GPS. The basal area of plants or clumps of plants will be measured and recorded. Elevation data for documented plants or clumps of plants will be obtained either during this survey or during the IFIM Survey. The number of individual plants within each population will also be estimated and recorded.

## 6.0 SCHEDULE

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It is anticipated that data collection will occur in the spring of 2015. Due to the variability in flows and meteorologic conditions, the exact survey dates will be determined at a later date and announced two weeks in advance to the TWC members. If 2015 has extensive high flow conditions that would not allow for an effective assessment, the study will be postponed until the spring of 2016.

Within 90 days of the close of field work, a final report summarizing the study findings will be issued. Study methodology, duration and timing may be adjusted based on consultation with resource agencies and interested stakeholders.

## 7.0 USE OF STUDY RESULTS

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Study results will be used as an information resource during the discussion of relicensing issues and developing potential Protection, Mitigation and Enhancement measures with the SCDNR, SCDHEC, USFWS, RT&E TWC, and other relicensing stakeholders.

Comment [b1]: Add reference to potential PM&E measures to all study plans

## 8.0 REFERENCES

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Davenport, L. J. (2007). "Cahaba Lily." *The Encyclopedia of Alabama*. [Online] URL: <http://www.encyclopediaofalabama.org/face/Article.jsp?id=h-967>. Accessed August 7, 2013.

**DRAFT**  
**BROAD RIVER SPINY CRAYFISH**  
*CAMBARUS SPICATUS*  
**STUDY PLAN**

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

*Prepared for:*

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

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*CAMBARUS SPICATUS*  
STUDY PLAN

PARR HYDROELECTRIC PROJECT  
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September 2013

**DRAFT BROAD RIVER SPINY CRAYFISH  
CAMBARUS SPICATUS STUDY PLAN**

**PARR HYDROELECTRIC PROJECT  
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**DRAFT BROAD RIVER SPINY CRAYFISH  
CAMBARUS SPICATUS STUDY PLAN**

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

**SOUTH CAROLINA ELECTRIC & GAS COMPANY**

## **1.0 INTRODUCTION**

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South Carolina Electric & Gas Company (SCE&G) is the Licensee of the Parr Hydroelectric Project (FERC No. 1894)(Project). The Project consists of the Parr Hydro Development and the Fairfield Pumped Storage Development. Both developments are located along the Broad River in Fairfield and Newberry Counties, South Carolina.

The Project is currently involved in a relicensing process which involves cooperation and collaboration between SCE&G, as licensee, and a variety of stakeholders including state and federal resource agencies, state and local government, non-governmental organizations (NGO), and interested individuals. The collaboration and cooperation is essential to the identification of and treatment of operational, economic, and environmental issues associated with a new operating license for the Project. SCE&G has established several Technical Working Committees (TWC's) with members from among the interested stakeholders with the objective of achieving consensus regarding the identification and proper treatment of these issues in the context of a new license.

During issues scoping, the TWC identified the potential need for a crayfish survey dependent upon discussions with U.S. Fish and Wildlife Service ("USFWS"). Based upon communications with the USFWS on June 6, 2013, the Broad River Spiny Crayfish (*Cambarus spicatus*), a South Carolina species of special concern, may be located within the Project area. As such, crayfish surveys were recommended to document the presence of this species within the Project area [and downstream of the Parr Shoals Dam](#).

## 2.0 RELEVANT LIFE HISTORY INFORMATION

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As noted, the Broad River Spiny Crayfish (*Cambarus spicatus*) is a species of concern in South Carolina. Eversole (1990) identified *C. spicatus* as having a distribution limited to lotic environments in the Broad River drainage basin. *C. spicatus* collections in the vicinity of the Project occurred within the Little River, a tributary to the Broad River, in Fairfield County. Although *C. spicatus* collections are limited, individuals were primarily associated with leaf litter and other organic debris located along the banks of streams. Preferred substrates have been found to be comprised primarily of sand and tend to be unstable in nature with a lack of rooted aquatic vegetation. Current information indicates that *C. spicatus* reproduces during the summer months (Eversole, 1990). *C. spicatus* was described by Hobbs (1956) as gray-green with cream, pink, purple and brown highlights. The chelae (the "claw" or "pincer") are green with orange tips and a double row of tubercles. Individuals range from about 60 mm (2.4 inches) to 78 mm (3.1 inches) in length.

## 3.0 STUDY OBJECTIVES

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The objective of this survey is to assess the status of *C. spicatus* in the portion of the Broad River located within the Project boundary [and an accessible area downstream of the Parr Shoals Dam](#).

## 4.0 GEOGRAPHIC AND TEMPORAL SCOPE

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Based upon the life history information identified above, sampling sites will be located along the margins of the Broad River and associated tributaries, in areas of leaf litter/detritus, if possible.

[At least Three-three](#) sampling [sites-areas](#) are proposed to be included as a part of this survey. [These-General](#) locations are listed in Table 1 and in Figure 1, below. These locations are approximate and actual sampling sites will be determined [in the field in consultation with USFWS prior to start of survey](#).

**TABLE 1 BROAD RIVER CRAYFISH SAMPLING LOCATIONS**

	<del>SAMPLING LOCATIONS</del> <del>AREAS</del>
1.	<del>Cannon's Creek Boat Ramp</del> Main Reservoir
2.	<del>Heller's Creek Boat Ramp</del> Broad River <del>Downstream of Parr Shoals Dam</del>
3.	Hwy 34 Boat Ramp



The study season will extend from August 1 through October 1, 2015.

**Comment [b1]:** Verify this time frame is correct.



FIGURE 1 CRAYFISH SAMPLING LOCATIONS

Comment [b2]: Change / expand map move pins to proposed areas.

## 5.0 COLLECTION METHODS AND ANALYSIS

Passive trap methods will be utilized for this study. Traps will consist of double-entry, galvanized wire mesh minnow traps with 1" opercula. Traps will be baited with herring-canned fish and will be re-baited at weekly intervals, or as needed. A one-pound weight will be placed in the traps to ensure that they remain submerged. Traps will be deployed along river margins/shoreline, in areas of detritus and/or leaf litter, if possible. The number of traps per area will be determined during sample location reconnaissance. Traps will also be placed in locations where water depth is sufficient to ensure that they remain inundated over the full range of

[reservoir fluctuations](#). They will also be positioned such that they are not readily noticeable in an effort to decrease disturbance and vandalism. In the event of vandalism or theft, the trap will be replaced as soon as possible.

The traps will be checked on a weekly basis. Data recorded for each collection event will include: location (including site description and GPS coordinates), date, name of water body, [basic water quality parameters \(temperature, DO and conductivity\)](#), trap retrieval and deployment times, ~~the~~ the total number of crayfish collected, ~~the~~ the number of males and females. For the purposes of identification, only [Form I](#) males will be collected from the sample; other individuals will be released. Collected materials will be fixed in 5% neutral formalin, washed in tap water and preserved in 70% ethyl alcohol. Samples will be transported to a qualified astacologist for species identification.

## 6.0 SCHEDULE

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[Site location reconnaissance will be conducted in consultation with USFWS prior to start of survey](#). Crayfish traps will be deployed at the ~~three~~ sampling locations on or around [August 1](#), 2015 and will be allowed to sample for approximately eight weeks. The traps will be checked weekly during this sampling period.

**Comment [b3]:** Verify actual date for this activity.

A final report summarizing the study findings will be issued within 120 days of completion of field work. Study methodology, timing and duration may be adjusted based on consultation with resource agencies and interested stakeholders.

## 7.0 USE OF STUDY RESULTS

---

Study results will be used as an information resource during discussion of relicensing issues [and developing potential Protection, Mitigation and Enhancement measures](#) with the South Carolina Department of Natural Resources, USFWS, RT&E TWC, and other relicensing stakeholders.

## 8.0 REFERENCES

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**DRAFT**  
**LAKE MONTICELLO FRESHWATER MUSSEL**  
**RECONNAISSANCE SURVEY**  
**STUDY PLAN**

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

*Prepared for:*

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

*Prepared by:*

**Kleinschmidt**

Lexington, South Carolina  
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**LAKE MONTICELLO FRESHWATER MUSSEL RECONNAISSANCE SURVEY**

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

**SOUTH CAROLINA ELECTRIC & GAS COMPANY**

## **1.0 INTRODUCTION**

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The Parr-Fairfield Hydro Project (FERC No. 1894) (Project) is a 525 megawatt (MW) licensed hydroelectric facility owned and operated by South Carolina Electric & Gas (SCE&G). The Project consists of the Parr Hydro Development and the Fairfield Pumped Storage Development. Both developments are located along the Broad River in Fairfield and Newberry Counties, South Carolina (Figure 1).

The Parr Hydro Development forms Parr Reservoir along the Broad River. The Development consists of a 37-foot-high, 200-foot-long concrete gravity spillway dam with a powerhouse housing generating units with a combined licensed capacity of 14.9 MW. Parr Hydro operates in a modified run-of-river mode and normally operates to continuously pass Broad River flow. The 13-mile-long Parr Reservoir has a surface area of 4,400 acres at full pool and serves as the lower reservoir for pumped-storage operations.

The Fairfield Pumped Storage Development is located directly off of the Broad River and forms the 6,800-acre upper reservoir, Monticello Reservoir, with four earthen dams. As noted, Parr Reservoir serves as the lower reservoir for pumped storage operations. The Fairfield Development has a licensed capacity of 511.2 MW and is primarily used for peaking operations, reserve generation, and power usage.

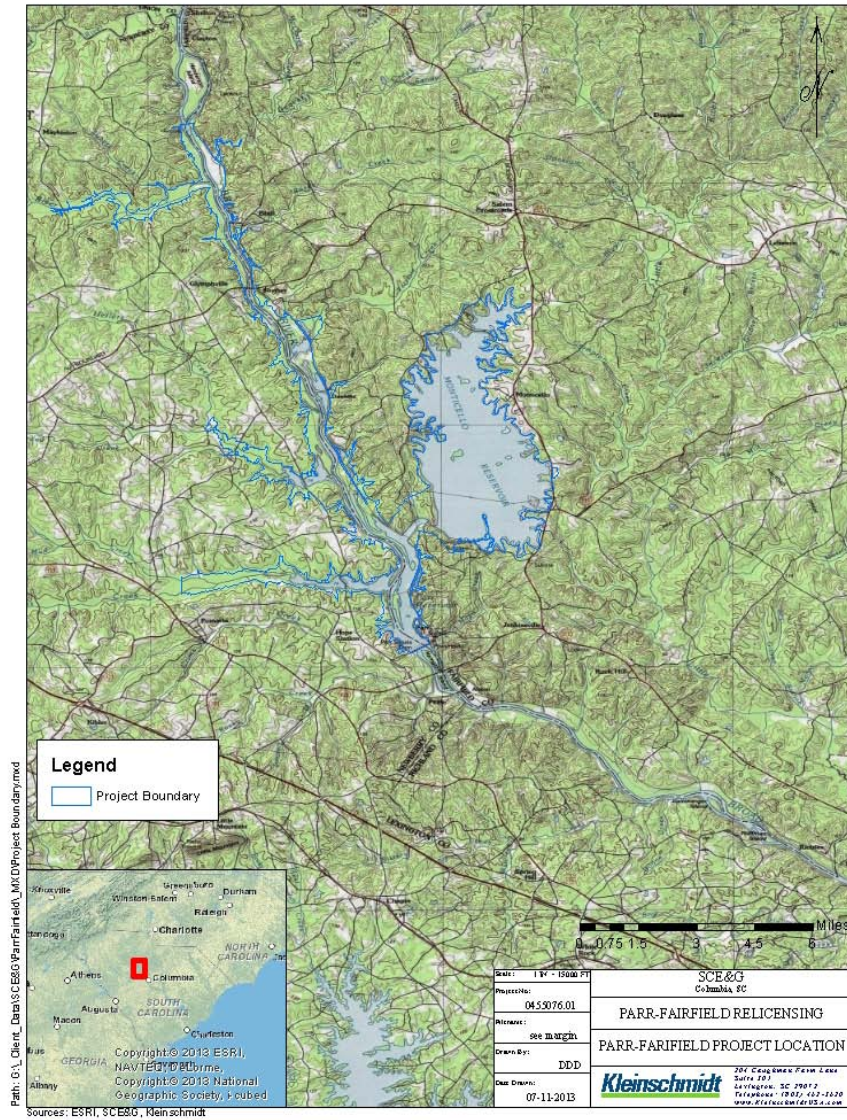
The Project is currently involved in a relicensing process which involves cooperation and collaboration between SCE&G, as licensee, and a variety of stakeholders including state and federal resource agencies, state and local government, non-governmental organizations (NGO), and interested individuals. Their collaboration and cooperation is essential to the identification of and treatment of operational, economic, and environmental issues associated with a new operating license for the Project. SCE&G has established several Technical Working



Committees (TWC's) with members from among the interested stakeholders with the objective of achieving consensus regarding the identification and proper treatment of these issues in the context of a new license.

During early meetings aimed at scoping appropriate relicensing studies, the Rare, Threatened and Endangered Species (RT&E) TWC requested information describing the status of freshwater mussels in Parr and Monticello reservoirs, as well as in the downstream reach of the Broad River influenced by Project operations. A subsequent TWC review of existing mussel data for the Project vicinity determined that recent surveys conducted by the South Carolina Department of Natural Resources (SCDNR) (Price, 2010) and Alderman Environmental Services (Alderman and Alderman, 2012) were adequate for characterizing the mussel fauna of Parr Reservoir and the downstream reach of the Broad. The TWC further determined that no such data were available for Monticello Reservoir; thus a qualitative survey would be needed. This Study Plan was prepared pursuant to that determination.

**FIGURE 1 PROJECT LOCATION MAP**



## 2.0 STUDY OBJECTIVE

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The study objective will be to determine whether native freshwater mussels are present within the pool of Monticello Reservoir, and if so, gather qualitative data describing the diversity, spatial distribution and relative abundance of the mussel fauna inhabiting the lake.

## 3.0 GEOGRAPHIC AND TEMPORAL SCOPE

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The reconnaissance survey described herein will focus on selected habitats within the Monticello Reservoir pool that are likely to support populations of native freshwater mussels. Surveys will be conducted in 2015, likely during the summer to early fall months when water clarity and temperatures are sufficiently high to support wading and other in-water survey methods.

## 4.0 METHODOLOGY

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Freshwater mussel surveys in Monticello will utilize qualitative methods that allow for rapid coverage of larger survey areas and have proven more robust at determining diversity of surveyed areas (Miller and Payne, 1993). Qualitative surveys will involve timed visual and/or tactile inspections of suitable habitat for presence of live freshwater mussels and/or shell material and will be conducted by a qualified malacologist with expertise in Broad River fauna. Although the number and specific location of qualitative survey points will likely be refined in the field based on professional judgment of the lead malacologist, it is expected that a minimum of 30 representative sites will be distributed throughout the reservoir<sup>1</sup>. Particular attention will be placed upon the examination of potential Savannah lilliput (*Toxolasma pullus*) [\(federal at-risk species and State species of concern\)](#) habitat within backwater areas of the reservoir.

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Exact methods for conducting visual and tactile searches will vary depending on water depth. However, it should be noted that water levels on Monticello Reservoir typically fluctuate up to 4.5 ft daily as a result of pumping operations, and as such, mussel surveys will focus primarily on those areas below the 4.5 ft depth contour where mussels are likely to become established. Depending upon water depths, wading, batiscope, snorkeling, or SCUBA will be used to conduct timed surveys at each of the selected sites:

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<sup>1</sup> It is estimated that each site will require an average of 30 man-minutes to conduct a reconnaissance level survey.

- Wading – Where water is relatively shallow, clear, and flat (no disturbances by wind), a biologist walks over an area to [conduct a visual and/or tactile](#) survey ~~an area~~ for live mussels and shells. This method is typically focused upon examinations of exposed near-shore habitats.
- Batiscope or snorkeling – In clear to slightly turbid waters up to 2 meters deep, or in waters with wind-disturbed surfaces, a batiscope or snorkeling will be used to [conduct a visual and/or tactile](#) ~~visually~~ survey ~~an area~~ for live mussels and shells.
- SCUBA – In survey areas of Monticello Reservoir with depths from 1 to 8+ meters, a biologist will traverse the lake bottom using SCUBA to [conduct a visual and/or tactile](#) survey for mussel species that prefer deeper waters and may not be detected at near-shore sites.

Live and fresh dead mussels collected during the survey will be identified to species, enumerated and returned to their habitat, although some shell material and/or live specimens may be preserved and returned to the laboratory for taxonomic confirmation. All sampling stations, as well as any significant mussel beds found during sampling, will be documented using a Global Positioning System (GPS) receiver. Mussel habitat surveyed at each sample location, as well the species collected during the survey, will also be photo documented. [Basic water quality parameters \(temperature, DO and conductivity\) will be collected near the substrate at representative sample areas.](#)

## 5.0 REPORTING

A report will be prepared for TWC review and comment. The report will document methods and results as encountered in the field including:

- A species list documenting the diversity of mussel fauna of Monticello Reservoir.
- GIS maps depicting spatial distribution of mussel populations.
- [Tabular summaries comparing Catch per Unit Effort and relative abundance of species encountered.](#)
- [Summarize water quality data.](#)

## 6.0 SCHEDULE AND REQUIRED CONDITIONS

As previously noted, it is expected that field surveys will be conducted during the summer or fall of 2015. It is expected that this effort will require 2-3 days of field work to complete. A final

report summarizing the study findings will be issued subsequent to the completion of field work. The methodology for this survey may be revised or supplemented based on consultation with the RT&E TWC and other interested stakeholders.

## **7.0 USE OF STUDY RESULTS**

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Study findings will be used as an information resource during discussion of RT&E species issues [and developing potential Protection, Mitigation and Enhancement measures](#) with the TWC, and other relicensing stakeholders.

## **8.0 REFERENCES**

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