MEETING NOTES

SOUTH CAROLINA ELECTRIC & GAS COMPANY
SALUDA HYDRO PROJECT RELICENSING
FISH AND WILDLIFE RESOURCE CONSERVATION GROUP

SCE&G Training Center
February 22, 2006

Final jms/csb 3-31-06

ATTENDEES:

Bill Argentieri, SCE&G
Alison Guth, Kleinschmidt Associates
Shane Boring, Kleinschmidt Associates*
Tom Eppink, SCANA Services
Randy Mahan, SCANA Services
Gerrit Jobsis, SCCCL & Am. Rivers
Dick Christie, SCDNR
Malcolm Leaphart, Trout Unlimited
Amanda Hill, USFWS
George Duke, LMHOC
Tom Bowles, SCE&G
Gina Kirkland, SCDHEC
** Facilitator*

Alan Stuart, Kleinschmidt Associates
Steve Bell, Lake Watch
Bill East, Lake Murray Assoc.
Jennifer Summerlin, Kleinschmidt Associates
Hal Beard, SCDNR
Wade Bales, SCDNR
Joe Logan, Midland Stripers
Bob Seibels, Riverbanks Zoo
Ron Ahle, SCDNR
Brandon Stutts, SCANA Services
Bill Marshall, SCDNR & LSSRAC
Steve Leach, SCDNR

ACTION ITEMS:

- Prepare a study plan on fish entrainment and submit to the Fish Entrainment TWC for review

Alan Stuart, Shane Boring

- Provide raw data and other information for the 1989 Saluda IFIM study

Ron Ahle

- Compile available studies on resident fish fauna and distribute for review

Shane Boring, Alan Stuart, Steve Summer

- Schedule next Fish & Wildlife RCG meeting

Fish and Wildlife TWCs – Shane Boring will coordinate

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MEETING NOTES:

These notes summarize the major items discussed during the meeting and are not intended to be a transcript or analysis of the meeting.

Shane Boring opened the meeting at approximately 9:00 am, and meeting attendees introduced themselves. It was noted that the primary purpose of today's meeting would be to form the Technical Working Committees (TWCs) for the Fish and Wildlife Resource Conservation Group (RCG) and assign study request to the TWCs.

Mission Statement

Shane reviewed the following mission statement for the Fish and Wildlife RCG, noting that it had been finalized and placed on the Saluda Relicensing website:

> *The mission of the Fish and Wildlife RCG is to develop a Protection, Mitigation, and Enhancement Agreement (PM&E Agreement) relative to fisheries and wildlife management for inclusion within the Saluda Hydroelectric Project license application. The objective of the PM&E Agreement shall be to assure the development and implementation of a level of integrated management best adapted to serve the public interests. To achieve this mission, the Fish and Wildlife RCG shall identify the need for, define the scope of, and manage or influence as appropriate, data collection and/or studies relative to potentially impacted fish, wildlife, and plant species and ecological communities, ecosystems and/or habitat within the Saluda Hydroelectric Project.*

Gerrit Jobsis asked that "within the Saluda Hydroelectric Project" be changed to "within the project vicinity" since some impacts can be outside of the project boundary. Alan Stuart and Alison Guth noted that it would require some work to change the mission statement as it had already been distributed to stakeholders and posted to the website as final. The group agreed that it was implicit in the mission statement that the project has potential to impact areas outside of the project boundary.

Formation and Membership of TWCs / Assignment of Study Requests

Shane reminded the group that, at the initial RCG meeting, a document was distributed that summarizes the study requests received in response to issuance of the Initial Consultation Document (ICD). He added that the primary purpose of today's meeting would be to review the fish-and-wildlife-related study requests (see attached handout from the meeting), form appropriate TWCs to handle these requests, and solicit (volunteer) membership for the TWCs. It was noted that, while all RCG members are welcome to attend the technical meetings, the TWC membership should consist of individuals with technical expertise in the resource area.

Following a review of the study requests received to date, 6 TWCs were formed; these TWCs, their membership, and their study request assignments are summarized below:

1) Freshwater Mussels/Benthic Macroinvertebrates TWC

Membership: Shane Boring, Amanda Hill, Gerrit Jobsis, Steve Summer, Ron Ahle, Jennifer Price, SCDHEC Representative

Study Requests[1] *to be Addressed:* Mussel Surveys, Benthic Macroinvertebrate Study

2) Terrestrial Resources TWC

Membership: Shane Boring, Amanda Hill, Ron Ahle, Dick Christie, Buddy Baker, Brandon Stutts

Study Requests to be Addressed: Migratory Bird Study (includes wood storks, waterfowl, and bald eagles)

3) Rare Threatened and Endangered Species/Habitat Studies TWC

Membership: Shane Boring, Ron Ahle, Amanda Hill, Gerrit Jobsis, Bob Seibels, Tom Eppink

Study Requests to be Addressed: Rare, Threatened and Endangered Species/Habitat Studies

4) Diadromous Fish TWC

Membership: Alan Stuart, Gerrit Jobsis, Dick Christie, Steve Leach, Jeni Summerlin, Amanda Hill, Steve Summers, Prescott Brownell, Shane Boring

Study Requests to be Addressed: Diadromous Fish Studies

[1] Study Requests correspond to the study request summaries included in the attached meeting handout.

5) Instream Flow / Aquatic Habitat TWC

*Membershi*p:	Alan Stuart	Shane Boring
	Steve Summers	Gerrit Jobsis
	Ron Ahle	Amanda Hill
	Hal Beard	Dick Christie
	Brandon Kulik	Wade Bales
	Scott Harden	

Study Requests to be Addressed: Instream Flow Studies, Floodplain Flow Elevations, Ecologically Sustainable Water Management, Comprehensive Habitat Assessment, Sediment Regime and Sediment Transport Studies, Evaluation of Potential for Self-Sustaining Trout Population

6) Fish Entrainment TWC

Membership:	Alan Stuart	Wade Bales
	Amanda Hill	Hal Beard
	Tom Bowles	Shane Boring

Study Requests to be Addressed: Fish Entrainment Desktop Study

Discussion/Comments on Study Requests

Diadromous Fish Studies

Shane noted that the sampling of diadromous species is among the early studies that SCE&G decided to begin prior to relicensing. He added that sampling is currently being done by Dr. Jeff Isely from Clemson University and that the study plan is available on the Saluda relicensing website. Amanda Hill explained that state and federal agencies, including NMFS, USFWS, and SCDNR, have an interest in restoring diadromous species in the Santee basin, and as such, have cooperatively developed a restoration plan to guide such efforts. She added that the diadromous study was requested to help understand potential impacts operation of Saluda may have on migration and/or spawning of the diadromous species in the Saluda and Congaree.

Shane then provided the group with a brief summary of SCE&G's effort to obtain a scientific research permit from NOAA Fisheries – National Marine Fisheries Service (NMFS) to sample for

shortnose sturgeon in the Saluda and Congaree. Specifically it was noted that the application had been submitted since June of 2005 (informally since April 2005), and to date, a permit has still not been issued. Shane noted that he had spoken with Shane Guan at NMFS, and they are expecting to have the permit issued in 9 to 10 weeks.

Amanda Hill enquired as to the status of American eel sampling. Shane provided a quick review of the discussions regarding eel sampling from the January 6, 2006 conference call with the agencies (see meeting notes on the Saluda relicensing website). Specifically, it was noted that USFWS recommended use of an eel ramp to sample for elvers due to the ineffectiveness of the eel pot sampling. He added that the group had agreed to evaluate use of an eel ramp; however, due to time constraints (sampling was slated to begin February 1), it was determined that eel pot sampling should continue in the interim until potential eel ramp sites/design can be evaluated. Amanda reiterated that USFWS still strongly recommends a ramp for sampling elvers.

Freshwater Mussel Surveys

Shane noted that he had talked to Jennifer Price with SCDNR and Lora Zimmerman with USFW, and unfortunately, data on historical distributions of mussels in SC is extremely limited. He added that no mussels are known to occur in the LSR; however, no surveys have been conducted. Amanda Hill reiterated that information on mussels in SC is extremely limited and that recent FERC relicensing efforts have provided a lot of what is known. Amanda noted a similar lack of known mussel populations at the beginning of the Santee-Cooper relicensing; however, a survey by John Alderman indicated presence of several species, includes species with conservation status. The group agreed that a potential mussel survey was deserving of further discussion in the technical committee.

Benthic Macroinvertebrate Studies

The group briefly discussed the status of the crayfish pilot survey that was conducted on the LSR in fall 2005. Alan noted that a significant number were captured, have been IDed, and are currently being verified by Arnie Eversol at Clemson. Hal Beard noted the crayfish populations may fluctuate over time due to the amount of vegetation available along the shoreline, which is directly related to flow regime. Gina Kirkland noted that, since she is likely not going to be on the TCW, she would like to ensure that the crayfish population is properly evaluated due to their importance as prey for trout in the LSR.

Gerrit noted that importance of considering sediment dynamics when evaluating potential impacts to the macroinvertebrate community. Shane noted that the sediment regime study request had been shifted to the Instream Flow/Aquatic Habitat TWC under the Fish and Wildlife RCG to ensure that

such factors are taken into account. The group agreed to defer further discussion to the TWC meeting.

Instream Flow Studies

Alan Stuart specifically noted that instream flow evaluations are a standard request for most relicensing efforts. Alan pointed out an important role of the Instream Flow TWC will be to provide input and alternatives to the Operations TWC. Dick Christie clarified, the purpose of this committee would be to use another model to identify flows that will protect and potentially restore habitat on the LSR. Once flows have been identified, the operations group may be able to answer what else happens to the project if these specific flows proceed downstream. Ron Ahle noted that it may be important to examine the habitat needs of specific target species, and from this information, determine which flows are necessary to provide habitat for these particular species. Ron recommended using a Physical Habitat Model (PHABSIM). Ron noted that there was a previous IFIM study done on the LSR, but that it is outdated. Several group members noted the importance of including data from the previous IFIM study into the discussions of the Instream Flow TWC. Ron noted that he has the raw data and summary information on the IFIM study and would share the information with the group. The group decided to propose a date after information has been obtained from Ron.

Fish Community Surveys

Shane noted that numerous studies have been done through the years on the resident fish fauna and that consolidating this information might satisfy the request. Shane referenced specifically Steve Summer's quarterly electrofishing in the LSR, Hal Beard's spring sampling on the LSR, and the Lake Murray Management Reports (SCDNR). Hal noted that, while the management reports provide some valuable information, they are typically species specific and would not cover the full range of potential species. He added that his boat electrofishing in the LSR likely misses some of the smaller species. Dick Christie noted that a compilation of the studies conducted over the last approximately 40 years would likely provide a fairly comprehensive species list. Amanda Hill proposed, and the group agreed, that available studies should be compiled and distributed to the group for review to determine whether any further surveys are needed.

Evaluation of Potential for Self-Sustaining Trout Population in LSR

Malcolm Leaphart noted that USGS did a study of the LSR in 1985 and found that, based on temperature and flow, the LSR has potential to be a coldwater fishery year-round. He noted that, in his opinion, the river has been impaired for decades due to operations at Saluda, and as such, has not been able to function as year-round coldwater habitat. Malcolm requested that the potential for

establishing a year-round coldwater fishery be at least considered and discussed in the relicensing and referenced the Smith River trout studies as an example of potential enhancements. Gina Kirkland noted that the LSR's designated use is as a Put-Grow-and-Take trout stream; thus the stream is not impaired for its current designated use. Dick Christie noted that there is obviously strong interest in this issue and proposed that it be discussed further in the technical committees. After some discussion, it was determined that the limiting factors for reproducing trout are primarily habitat-related; thus the study request was assigned to the Instream Flow/Aquatic Habitat TWC. Dick Christie noted that a special meeting, drawing from several TWCs, may be in order.

Rare, Threatened and Endangered (RT & E) Species

Amanda Hill noted that the Ivorybill Woodpecker had recently been rediscovered in Arkansas and that the experts felt that the most likely place for additional Ivory-bills is Congaree Swamp. She added that, since we will be evaluating impacts of project operations on Congaree Swamp, the Ivorybill should be considered in the evaluation of RT &E species. She also noted that the Saluda Crayfish, a terrestrial species known from a single location near Silversreet, SC in Newberry Co., should also be considered.

Fish Entrainment

Shane noted there was a request to conduct a desktop study of potential entrainment using previous studies conducted at other similar facilities. Alan pointed out that this is a typical request for relicensing. He added that there is a fairly standard study plan that is used. The group agreed that Kleinschmidt should distribute the study plan for review, after which, a conference call can be scheduled to discuss how to proceed on this issue.

Migratory Bird Survey

Shane noted that there is a considerable amount of data available for Dreher Island State Park, as well as the Lower Saluda River, from Columbia Audubon and other sources. Bob Seibels added that the zoo has access to considerable amount of data for their site. The group agrees this request should be deferred to the terrestrial TWC for further discussion of existing data and to determine whether a study is needed. It was also proposed that the study request regarding waterfowl usage, habitat, and hunting areas be deferred to the terrestrial group for discussion along with the other migratory bird request.

Striped Bass Evaluations

The group agreed that many of the issue related to impacts to striped bass are water-quality-related and thus are being handled by the Water Quality TWC. Dick Christie noted, and the group acknowledged, that there will undoubtedly be a need for the Water Quality TWC and Fish and Wildlife RCG to interface regarding this issue.

Hydrologic/Hydraulic Operations Model

After some discussion, it was noted that the scope of this request is being handled in the Operations TWC; however, several group members noted the need to ensure that information is shared between the Operations and Instream Flow/Aquatic habitat TWCs.

Low Inflow Protocol Study

The group likewise agreed that the scope of this request is being handled in the Operations TWC; group members also noted the need to ensure that information is shared between the Operations and Instream Flow/Aquatic habitat TWCs.

Other Relevant Studies in the LSR and Congaree River

Wade Bales briefly discussed two future studies that the SCDNR will be conducting downstream of Saluda Hydro. He explained the first study will be to evaluate trout mortality in the river. He noted there is very little historical information on which to base trout stocking strategies, and they would like to establish baseline data to further enhance management strategies. This study will assess estimated annual mortality based on the number of trout released. He added that, after the trout have been stocked in the river, SCDNR will sample by electrofishing methods quarterly. Hal added that they are also hoping to identify any mortality differences between brown and rainbow trout, including the potential for holdovers. He noted they recently stocked trout in the river on January 10th and would start sampling in about one week. He added sampling would also take place in June, September, and possibly December.

Wade also noted SCDNR is developing a striped bass telemetry project. The goal of this study will be to document striped bass spatial and temporal use on the river via receivers deployed as part of Steve Leach's Shortnose Sturgeon study. He noted 30 striped bass, with a size range over ten pounds, will be tagged with transmitters in the Lower Saluda, Congaree, and Wateree Rivers. He explained that SCDNR is interested in movements of mature spawning striped bass, as well as how stocked and reproducing populations intermingle.

Dates and of Upcoming RCG and TWC Meetings

The RCG meeting was closed at approximately 2:00 pm and the group agreed to use the remainder of the afternoon to convene the Diadromous Fish TWC (notes prepared separately). No date was set for the next Fish and Wildlife RCG meeting as the group determined it best that the TWC meet a few times and then propose a date to the RCG for its next meeting. The group also agreed to have the Terrestrial; Rare, Threatened and Endangered Species; and Freshwater Mussel/Benthic macroinvertebrate TWCs meet on March 8, 2006 at 9:00 am at the Lake Murray Training Center.

Fish and Wildlife

Study Requests:

- **Diadromous Fish Studies**: Study requests from the CCL/American Rivers focused on a more in depth analysis of habitat conditions, feasibility of hatchery operations for diadromous fish, impacts analysis of the Project on diad. fish stocks of the Santee-Cooper Basin, the feasibility and costs of fish passage at the Project. SCDNR requests that spawning and nursery habitat for diadromous fish species in the river and lake should be identified and quantified.

  Requested by: CCL/American Rivers, SCDNR, LSSRAC, National Marine Fisheries Service, USFWS

- **Mussel Surveys**: It was requested that the present status of mussels in the project area should be evaluated, their habitat needs assessed, and any project impacts on habitat be identified. CCL requests an evaluation of the cumulative impact analysis that the Project has on mussel stocks in the Santee Cooper Basin.

  Requested by: CCL/American Rivers, SCDNR, LSSRAC, USFWS

- **Benthic Macroinvertebrate Study**: Requested in order to determine if invertebrate fauna have increased in either number or species diversity as a result of turbine venting. As well as how far downstream they are impacted.

  Requested by: SCDNR, LSSRAC, National Marine Fisheries Service, SC Council Trout Unlimited, USFWS

- **Fish Community Surveys:** It was requested that these surveys be performed and include small non-game species in the Saluda River above and below the reservoir as well as in Lake Murray, to supplement existing fish community data and/or replace dated information. Specific sampling focused on determining presence or absence of the rare robust redhorse sucker, Carolina sucker, and the highfin carpsucker should be conducted in the lower Saluda River.

  Requested by: USFWS

- **Striped Bass Evaluations:** This study would involve an evaluation of project operations on the reservoir striped bass population, particularly regarding: (1) the effectiveness of current turbine operations, (2) potential additional enhancements in association with the summer thermocline near the powerhouse; and (3)

determine if striped bass migrate upstream of the project within the Saluda River during the spring spawning season, and if and where spawning activities occur.

Requested by: USFWS

- **Migratory Bird Surveys**: This survey would evaluate the effects of the project on migratory bird use at Lake Murray and the Saluda River and riparian ecosystems. Surveys of migratory birds and their habitats to provide baseline information on populations. Aerial surveys for potential roosting, nesting, and foraging sites for the federally endangered woodstork should also continue.

  Requested by: USFWS

- **Hydrologic/Hydraulic Operations Model**:[2] Requested development of a computer simulation model that incorporates the operating characteristics of the Saluda Hydro Project. The model would be capable of simulating the Project's operations using specific hydraulic relationships based on inflows from all drainages to Lake Murray ending downstream in the Congaree River floodplain. The model would also include water flows in the Broad River above its confluence with the Saluda to accurately model combined flow conditions at the confluence and in the Congaree River.

  Requested by: LSSRAC

- **Low Inflow Protocol Study**:[1] Requested study to evaluate the effects of periods of low flow on elements such as reservoir levels, water availability, river flora and fauna habitat, etc. Study leading to the development of a low flow operations plan for the Project. According to the City of Columbia Parks and Recreation, this study should include the development of a "Hydrologic/Hydraulic Operations Model."

  Requested by: CCL/American Rivers, City of Columbia Parks and Recreation, LSSRAC

- **Floodplain Flow Evaluations**:[1] A study was requested in order to evaluate the flows necessary for incremental levels of floodplain inundation for the Lower Saluda, Congaree River, and Congaree National Park. It is requested that it include an inventory of floodplain vegetation as well, in order to classify and characterize the vegetative species composition and structure of the floodplain areas within the zone of operational influence of the river reaches.

[2]Not included as part of meeting handout; however, this study request was discussed in the meeting and thus is included in the meeting notes.

Requested by: CCL/American Rivers *(requested floodplain inundation study as well as floodplain vegetation component)*, LSSRAC *(requested floodplain vegetation component only)* National Park Service

**In relation to this study, SCDNR requests that the hydrologic record associated with the operation of the project be compared to the unregulated hydrology that would have occurred under a natural flow regime over the life of the project. Including an estimate of the timing, duration and magnitude of flood events that occurred and that would have occurred in absence of the project*.

Requested by: SCDNR

- **Instream Flow Studies**:[1] Requested for the Saluda River and the Confluence area. An assessment on how Project operations affect stream flows, and which flow regimens would best meet the needs of the biota.

  Requested by: CCL/American Rivers, City of Columbia Parks and Recreation, SCDNR*, LSSRAC, National Marine Fisheries Service, SC Council Trout Unlimited, USFWS

  **[IFIM requested by SCDNR in lieu of implementing an instantaneous flow of at least 470 cfs needed to support one-way downstream navigation, and flows of 590 cfs (July – November), 1170 cfs (Jan-April), and 880 cfs (May, June and December) to provide seasonal aquatic habitat]*

- **Ecologically Sustainable Water Management (ESWM)**:[1] Described by the National Park Service as a "inclusive, collaborative, and consensus-based process to determine a scientifically based set of river flow prescriptions in order to protect downstream resources while balancing upstream benefits." The NPS notes that they believe this process can be readily adapted to the Saluda Project and have already began gathering information and developing an interactive GIS tool to provide information regarding the effect of various Saluda operational scenarios on the degree of inundation at the Congaree National Park. NPS seeks "partnership" with SCE&G as well as stakeholders in implementing this ESWM process.

  Requested by: National Park Service

[1] Not included as part of meeting handout; however, this study request was discussed in the meeting and thus is included in the meeting notes.

- **Sediment Regime and Sediment Transport Studies:**[1] A request has been made that a study be performed on the sediment regimen in the Project area as well as the Project effects on the sediment regimen of the lower Saluda River. Should include such things as sediment composition, bedload movement, gravel deposition, sediment storage behind dams, and bedload changes below the dam; and project effects on downstream geomorphometry, sediment availability and streambank erosion, and the possible addition of gravel to mitigate for project impacts. Also, the effects of the Project operations on habitat requirements for spawning fishes.

  Requested by: CCL/American Rivers, USFWS

Information Needs:

- **Comprehensive Habitat Assessment**: To provide quantitative and qualitative data in GIS format of available and potential spawning, rearing, and foraging habitats (i.e., riffles, shoals, open water, shallow coves, littoral zones) for diadromous and resident fishes in Lake Murray, the Saluda River and its major tributaries, and the Lower Saluda River below the Project.

  Requested by: National Marine Fisheries Service, USFWS

- **Fish Entrainment Desktop Study:** This study would include conducting a desktop study of potential entrainment using previous studies conducted at other similar facilities. The objectives of the study should be to (1) quantify the numbers and sizes of fish entrained, by species, (2) estimate mortality rates associated by species, and (3) provide recommendations for project design and operation that can reasonably be made to prevent or minimize fish entrainment and associated injury/mortality.

  Requested by: SCDNR, National Marine Fisheries Service, USFWS

- **A Study to Determine the Factors Needed for a Self Sustaining Trout Fishery**: The purpose of this study should be to determine the factors needed for a self sustaining trout fishery that can reproduce and thrive year round, and how the operation can be modified to meet the habitat needs. Dissolved oxygen, flows, spawning and rearing habitat, the aquatic food base, especially in the shallow, rocky foraging areas, and actual water chemistry should be key items in such an assessment.

[1] Not included as part of meeting handout; however, this study request was discussed in the meeting and thus is included in the meeting notes.

Requested by: SC Council Trout Unlimited

- **Rare Threatened and Endangered Species/Habitat Studies**: A study was requested to assess the condition of rare threatened and endangered species in the Project area, as well as how Project operations are affecting these species and how Project operations can be used to protect, restore, or enhance populations. Management plans be developed for species existing in the project area or under the influence of the project. Suggestions include Wood Stork and RSSL Surveys as well as SNS and American eel sampling.

  Requested by: CCL/American Rivers, SCDNR, LSSRAC, National Marine Fisheries Service, USFWS

- ***SCDNR*** requests a summary of emergency spill gate testing protocol to include the frequency, time of year, and any adaptive measures that are used to reduce fish mortality as a result of spill gate testing.

- Information on species composition, location, and acreage of aquatic plants in the project is needed to aide in the development of an aquatic plant management plan. ***SCDNR***

- Information be dispersed to lake users by SCE&G on aquatic weed control measures. ***County of Newberry***

- Please provide copies of the existing environmental studies conducted at the Saluda Hydroelectric Project by SCE&G contractors and the South Carolina Department of Natural Resources that are referenced in the literature cited section of the Initial Consultation Document. These may be provided as hard copies or via CD (preferable). **USFWS**

Requests for Potential Mitigation: None