

COASTAL CONSERVATION LEAGUE AND AMERICAN RIVERS

August 10, 2005

Mr. James M. Landreth
Fossil and Hydro Operations
South Carolina Electric and Gas Company
111 Research Drive
Columbia, South Carolina 29203

Subject: Comments on Initial Consultation Document for Saluda Hydroelectric Project,
FERC Project No. 516

Dear Mr. Landreth,

The Coastal Conservation League and American Rivers (the Conservation Groups) have reviewed the *Initial Consultation Document* (ICD) as prepared by South Carolina Electric and Gas Company (SCE&G) for the relicensing of the Saluda Hydroelectric Project, FERC No. 516, and we offer the following comments and recommendations. Although a traditional licensing process will be utilized, we are encouraged by the collaborative process SCE&G has indicated it will use throughout the relicensing process. We appreciate the efforts of SCE&G to create an atmosphere of cooperation and constructive communication.

The Coastal Conservation League and American Rivers have taken an active role in relicensing the Saluda Hydro Project since the beginning of the process. Both organizations sponsored a workshop for interested parties and citizens to learn more about the relicensing process and have attended the relicensing scoping workshops and public meetings. The Conservation Groups have entered a cooperative agreement to participate in hydroelectric and river conservation activities affecting South Carolina, North Carolina and Georgia. These efforts stem from the recognition that hydropower operations have a significant impact on riverine ecosystems and that responsible operation of these facilities can greatly enhance water quality while increasing wildlife abundance and enhancing recreational opportunities.

The Conservation League is a non-profit conservation organization with offices in Charleston, Georgetown, Beaufort and Columbia. Our mission is to protect South Carolina's threatened resources - its natural landscapes, abundant wildlife, clean water, and traditional communities. We have approximately 4,000 members, many of whom live in the affected project area. American Rivers is a non-profit conservation organization with offices in Washington, D.C., Columbia, South Carolina and throughout the nation.

We are dedicated to the protection and restoration of the nation's streams. With over 35,000 members across the country, including those that live in the project vicinity, American Rivers is one of the nation's leading river conservation groups.

The Conservation Groups would like to take this opportunity to communicate clearly to SCE&G what we hope to achieve in this relicensing proceeding. Our resource objectives will guide our participation in this proceeding, including development of the comprehensive study plan. The resource objectives of primary concern include:

- Improvement to the stream flow regimen necessary for natural flow values and ecological processes essential to river health, including riparian, wetland and floodplain functions,
- protection and restoration of fish and wildlife habitat and mitigation for project-related habitat losses,
- analysis of diadromous fish, existing and potential, in the project area – upstream and downstream of the Saluda Dam,
- protection and enhancement of water quality standards including existing and classified uses,
- protection and enhancement of rare, threatened and endangered plant and animal species,
- prudent management of the project for the Lake Murray reservoir, the Lower Saluda River, portions of the Broad and Congaree rivers, and Congaree National Park which are affected by project operations,
- enhancement of recreational opportunities including identifying future recreation areas and access points,
- coordination of water releases in a manner that fully protects the human health and safety of all resource users.

It is with a view toward these objectives that we offer comments on the ICD.

I. The Legal and Regulatory Context

Under the Federal Power Act (FPA), the Federal Energy Regulatory Commission (FERC) may issue a new license for an existing hydroelectric project only if to do so would be in the public interest. 16 U.S.C. § 803(a). In making its public interest inquiry, FERC is required to provide “equal consideration” to a range of public purposes, including the protection of fish, wildlife, recreation, and environmental quality. The FPA makes clear that relicensing is not a continuation of the status quo, but a reconsideration of the past commitment of the river resource based on present day values and “then existing laws and regulations.” 16 U.S.C. § 808(a).

The Federal Power Act further requires that any new license contain conditions that adequately and equitably protect, mitigate, and enhance fish and wildlife resources. 16 U.S.C. § 803(j). Thus, FERC is required to assure that during any new license term fish and wildlife and their habitats are protected and restored, and that unavoidable, ongoing project impacts are mitigated.

Independent of the FPA, the National Environmental Policy Act (NEPA), 42 U.S.C. § 4321 *et seq.*, requires that FERC assess the past, present, and reasonably foreseeable environmental impacts of the hydroelectric project licensing and evaluate alternatives that would avoid these impacts. This requirement applies to applications for new licenses for existing projects because relicensing constitutes a new, irreversible, and irretrievable commitment of a public resource.¹

Today, the protection and restoration of the ecosystem integrity of our rivers and public recreation opportunities is widely recognized by citizens of South Carolina as one of the highest public priorities. Accordingly, substantial emphasis should be placed on opportunities to further these priorities during the relicensing process. While we understand SCE&G's interest in maintaining the Saluda Hydroelectric Project as a power producing operation, it is critical that the company develop a complete factual record on which the Commission can give equal consideration to power and non power values, including restoration and enhancement of the downstream river ecosystem and its recreational values. Also, there must be biologically and scientifically sound information upon which agencies can base their terms, conditions, and recommendations. This requires that SCE&G evaluate a range of protection, mitigation, and enhancement (PM&E) measures and operational alternatives to current operations, including removal of parts of or all of the Project, and run-of-river operations.

Santee River Basin Model

We are developing a hydrologic/operations model for the Santee River basin which includes the Saluda River and the Saluda Project. The model includes inflow, lake levels, project operation and downstream flow information. The first two phases of the model, (1) the Santee and Cooper rivers and (2) the Catawba and Wateree rivers are complete. The final phase, which is nearing completion, is for the Congaree River basin and includes operations of the Saluda Project and hydrologic considerations for the Congaree National Park. The model is able to evaluate flows, lake levels and operations under baseline conditions and operational alternatives. We developed the model to be an effective, transparent tool to assess how alternatives can balance public benefits of FERC projects, including Saluda, during the new license terms. The model and related documentation are available at www.n-h-i.org/srm.html. We offer the Santee River Basin Model at no charge to SCE&G and other stakeholders as a tool for the Saluda relicensing.

Recommendations for Studies to Address Information Needs

7.3.4 Maintenance/Emergency Protocol Study

STUDY REQUEST: We recommend a study to develop a protocol for handling standard maintenance and emergencies on the project site that will meet the needs of SCE&G and protect public values to maximum extent possible. The study should explore how to

minimize impacts to water quality and recreation when performing routine maintenance and dealing with emergency conditions such as floods or inclement weather.

PUBLIC INTEREST: Handling routine maintenance and emergency conditions in a prompt and reliable manner furthers the goals of downstream safety and water quality and is in the public interest.

NEXUS TO PROJECT: This study relates to the project in that it deals with maintenance and equipment replacement within the dam itself and in other areas of the project. Emergency conditions refer to instances in which outside factors require that the dam be operated in a way that is out of the ordinary.

AVAILABLE INFO: To our knowledge there is little information available about maintenance and emergency protocols outside of the USGS gauge records reflecting flows in high water storm events.

BASIC METHODOLOGY: The study should identify the types of regular maintenance that occur at the Saluda project and how the performance of that maintenance has affected operations in the past. The resulting protocol should reflect SCE&G's best judgment on how to perform regular maintenance without sacrificing water quality, safety, or recreation. The emergency protocol should involve a similar analysis of past emergencies, how they affected operations and specific conclusions about how to operate during those events to protect water quality, safety, and recreation.

7.4.3 SAFETY AND WARNING SYSTEM STUDY

STUDY REQUEST: We recommend a study on the Lower Saluda River to assess and improve the rising water alert system and to implement other safety measures to account for hazardous conditions created by project operations.

PUBLIC INTEREST: It is in the public interest to be able to safely and reliably recreate upon waters of the state to the maximum extent possible. A study of existing and possible safety measures will reveal the most effective way to protect the public from the safety hazards on the Lower Saluda that have been created by the Saluda Hydro project.

NEXUS TO PROJECT: There have been numerous drownings on the Lower Saluda River associated with project operations. The proximity of the Saluda Dam to heavily used recreation areas means that project releases quickly and drastically alter the river, bringing it to unsafe recreation levels in a dangerously short period of time. The public using the Saluda River is unable to safely and quickly react to these releases without an effective warning system in place. The current warning lights and sirens have been noted as ineffective in most reaches of the river.

AVAILABLE INFORMATION: The comments of several stakeholders have demonstrated that fishermen, boaters and other river users have repeatedly been subject to sudden water level changes without warning. These instances have caused loss of property and threatened serious physical harm. SCE&G has stated that the warning system was in working order during these times, demonstrating that the current system is ineffective in at least those stretches of river.

BASIC METHODOLOGY: As a practical matter, the study should examine various types of warning systems at all sites used by the public for recreation. River reaches popular for fishing, swimming and boating - including the river immediately below the dam, Saluda Shoals Park, the shoals below I-26 and millrace rapids - should be included. The study should include the amount of time required for various volumes of release to reach the recreation sites to give an idea of exactly how much time river users have to react. The study should also examine signs, lights and other visual warnings as well as horns or sirens to meet the needs of river users of all abilities.

7.4.5 RIVER INFORMATION SYSTEM STUDY

STUDY REQUEST: We recommend a study of how to develop a public information system to communicate river conditions and project operations to river users. Potential media include signs and kiosks, the internet, and dedicated, toll-free telephone lines. Information to be communicated should include required flow releases, weekly forecasts of project operations, real-time reporting of conditions and other information useful to the public using the Saluda River.

PUBLIC INTEREST: Availability of river condition and project operation information is in the public interest because it would allow for safe and effective planning by river users. For example, whitewater boaters could plan trips for periods of high flow, while less experienced boaters and anglers could avoid the river at those times as a safety precaution. A well functioning public information system will provide safety, economic, and convenience benefits.

NEXUS TO PROJECT: The Saluda hydro project has a pervasive effect on river at all times. The way the project is operated dictates what uses the river can or cannot support at any given time and affects thousands of people every year. Taken together, these facts demonstrate a sufficient nexus between project operations and the need for an effective means of disseminating information to river users.

AVAILABLE INFORMATION: To our knowledge there is no public information system for the lower Saluda River. The existing warning system (see Section 7.4.3), while important for warning users of dam releases or other life threatening conditions, does not provide the public with information for planning. Likewise the color-coded river level poles are important for those actively using the river, but do not provide information on future river conditions.

BASIC METHODOLOGY: The study should explore the most effective means of posting the information whether by phone, internet or signage or a combination of those to reach the greatest number of river users possible. The information should include an annual schedule of minimum flow requirements, recent rainfall, weekly forecasts of expected operations, real-time operations and flow information, and other useful information. The information should include what rapids require what levels of paddling expertise at different water levels and include warnings about dangers present in varying flow scenarios. The study should examine in what languages other than English the information should be published, such as Spanish.

9.0 Water Quality Studies

STUDY REQUEST:

We recommend studies that objectively evaluate the effects of project operations (e.g. impoundment of the river and tributary streams, reservoir stratification, hypolimnetic discharges, project equipment and flow alterations, etc.) on water quality and how that affects habitat requirements of aquatic biota in the reservoir and river segments. Project operations and enhancements that would result in water quality that fully supports all aquatic life uses in the reservoir and river segments affected by the Project should be evaluated.

PUBLIC INTEREST: Good water quality and the maintenance/enhancement of aquatic habitats is an issue clearly in the public interest and is reflected in state and federal laws, as well as in the policies and guidance of state and federal agencies charged with protecting these resources for the public good.

NEXUS TO PROJECT: Project operations directly affect water quality and subsequently aquatic habitat by impounding streams, altering flows and releasing poor quality water.

AVAILABLE INFORMATION: Numerous watershed and water quality publications are available from SC DHEC. This agency also has guidance on the different assimilative capacities of free-flowing versus impounded waters. Effects of water quality alterations on aquatic biota are well documented in the scientific literature. Specific to the Saluda Project are effects of low oxygen on native fishes and trout populations, of temperature/dissolved oxygen “squeeze” on reservoir populations of striped bass, and of altered temperature regimens on spawning success of diadromous and riverine fishes. Effects of Saluda operations on Congaree River temperatures and striped bass spawning success are discussed in *Factors affecting recruitment of striped bass, Morone saxatilis, in the Santee-Cooper system, South Carolina* (Bulak 1994).

SCE&G has conducted extensive studies on reservoir water quality and project discharges. This information will serve as an important basis for developing new study plans.

BASIC METHODOLOGY:

- SCE&G should work with interested stakeholders to develop detailed study plans. Study methods should be tailored to meet issues specific to the reservoir, tailwater and river segments.
- The effectiveness of newly installed hub baffles and venting equipment should be assessed to determine if water quality standards can be fully met for the Saluda River or if additional enhancements are needed. If the latter is the case, then the study should be expanded to evaluate other methods for meeting water quality standards.
- The effects of project operations on summer habitat for striped bass in the reservoir forebay should be studied. Periodic fish kills have occurred in the forebay as a result of the temperature/dissolved oxygen squeeze phenomena. Striped bass are native to the Saluda River and have been stocked in the reservoir for decades. The study should also determine mitigative measures (e.g. forebay oxygenation) to reduce or avoid future striped bass fish kills.
- The effects of Project Operations on water temperature, and spawning and recruitment of diadromous and riverine fish in the Saluda and Congaree rivers should be studied. Of primary interest is if rapid temperature changes associated with project operations have an effect on spawning behavior, incubation success, fry survival and recruitment. If project effects are documented then mitigative measures (e.g. alternative flow regimens) should be evaluated so that all classified and existing uses of the Saluda and Congaree rivers can be met.
- The effects of Project Operations on water temperature and dissolved oxygen, and freshwater mussel populations in the Saluda and Congaree rivers downstream of the project. Of primary interest is if water quality changes associated with project operations have an effect on recruitment and survival of mussels. If effects are documented then mitigative measures should be evaluated so that all classified and existing uses of the Saluda and Congaree rivers can be met.

9.2.3 SEDIMENT REGIMEN AND SEDIMENT TRANSPORT STUDIES

STUDY REQUEST:

We recommend a study of the current sediment regimen throughout the Project area and of Project effects on sediment regimen of the lower Saluda River. The study should focus on 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. This study should also evaluate and develop appropriate PM&E measures to assure sediments downstream of the project fully support all lifestages of aquatic biota including habitat for fish spawning and macroinvertebrates. Alternatives should be developed to mitigate for project impacts to the sediment regimen including the addition of gravel to enhance spawning substrates.

PUBLIC INTEREST: Appropriate sediment regimens and necessary flows for geomorphological processes are recognized as essential components of a healthy river ecosystem, and for the needs of species-specific lifecycle and habitat requirements.

NEXUS TO PROJECT: Project facilities and operations directly alter the sediment regimen and sediment transport in the Saluda and Congaree rivers.

AVAILABLE INFORMATION: Numerous scientific papers have been published on the effects of hydropower operations on sediment regimens including downstream erosion and geomorphological effects. A review of study methods can be found in *Instream Flows for Riverine Resource Stewardship* (2002).

We know of no site-specific information on the river's sediment regimen or the effects of project operations thereon.

BASIC METHODOLOGY:

- SCE&G should work with interested stakeholders to develop detailed study plans.
- A comprehensive study is needed since there appears to be no information related to the sediment regimen, river geomorphology and any effects the Project may be having on such. (The ICD contains no information.)
- Identify geomorphological factors that control channel features and biological processes in the river.
- Of particular interest are Project effects on habitat requirements for spawning fishes, including shortnose sturgeon (a federally endangered species) found downstream of the Project, native fishes of the Saluda River, and trout populations.
- Mitigative measures should be evaluated as part of the study including changes in operations, supplementing gravel budgets in key reaches, protecting riparian buffers to reduce streambank erosion potential, etc.

Study Locations: The sediment regimen should be studied throughout the entire Project area.

9.2.2.7 RESERVOIR LEVEL STUDY

STUDY REQUEST: We recommend a study to objectively look at the effects of alternative reservoir operations on (1) recreational boating in reservoir headwaters and the main reservoir body, (2) near-shore aquatic habitat within the reservoir, and (3) the ability to release downstream flows to meet recreational and ecological needs of the Saluda and Congaree rivers. The study should also evaluate how current operations with fall draw downs and spring filling affect recreational and ecological values in the Saluda and Congaree rivers and the Congaree National Park.

PUBLIC INTEREST: This reservoir level study is in the public interest because public uses of the reservoir and the river are directly affected by this component of project operations.

NEXUS TO PROJECT: Water levels affect the navigability of the reservoir, especially in headwater areas and are under the direct control of SCE&G. If the reservoir is not kept at a certain level the ability to release downstream flows can be limited. The dependence of downstream flow and habitat on project operations creates a sufficient nexus to merit a study. The fall drawdown and the spring filling cycle is controlled exclusively by project

operations and have extensive effects on reservoir and river habitat (Saluda and Congaree) as well as headwater and downstream recreation/navigability.

AVAILABLE INFORMATION: It is our understanding that there have been studies conducted, including the comprehensive water quality report referenced in the ICD at page 71, by SCE&G with State resource agencies contributing data. These studies have identified the types of habitat on most of the lake and more detailed information is available for areas deemed “environmentally sensitive area”. This information will be useful background for a reservoir fluctuation study. We are not aware of studies specific to lake level fluctuation as it pertains to aquatic habitat, downstream flows, and recreation.

BASIC METHODOLOGY:

(1) Effects of drawdown on recreational boating: The surface area of Project headwaters and the main reservoir meeting navigation criteria should be evaluated at one foot intervals of drawdown. Separate criteria should be evaluated for motorized and non-motorized boating to establish the feasibility of navigation and recreation at different levels.

(2) Ability to release downstream flows: A hydrologic/operations a model, such as the Santee River Basin Model, should be used to determine what effect reservoir levels and the existing drawdown cycle have on the ability to release water to meet seasonal downstream flow needs for recreational and ecological values of the Saluda and Congaree rivers. This analysis needs to include effects on inundation patterns in the Congaree National Park.

(3) Reservoir near-shore aquatic habitat: Evaluate the effects of alternative water levels on near-shore fish and wildlife habitats. Existing maps and data on near-shore habitats should be evaluated to insure accuracy and reliability. Aerial photography and GIS mapping should be used to determine the total area of near-shore habitat affected by incremental levels of draw down.

Where no reliable data exists, habitat maps should be developed for the reservoir and the Saluda River headwaters. Representative transects perpendicular to the shoreline should be selected and evaluated. The number of transects selected and their distribution within the reservoir should be determined from the total length of shoreline comprising each habitat type and its distribution throughout the reservoir. The vertical distributions of habitats from the resulting transects should be summarized by one foot depth contours from full pool. The information should then be incorporated into a GIS database that also includes bathymetric data. This data should be used to calculate changes in the surface area of near-shore of habitat at one foot increments throughout the existing drawdown zone.

10.2 INSTREAM FLOW STUDIES FOR THE AQUATIC ECOSYSTEM

STUDY REQUEST:

We recommend a study of how project operations affect stream flows and what flow regimen(s) would best meet the requirements of the aquatic ecosystem. Flow regimens

should be assessed for the Saluda River and the confluence area. Flow regimens should be identified that fully support all lifestages of aquatic biota including spawning, juvenile and adult habitat requirements, and flows for upstream and downstream fish migrations. Flows that attain aquatic habitat values over inter-annual and intra-annual periods that approximate those which would occur under the natural hydrograph should be determined.

PUBLIC INTEREST: Sufficient instream flow below project dams for aquatic biota is clearly in the public interest and is reflected in the state and federal laws, and in policies and guidance of state and federal agencies charged with protecting these resources for the public good.

NEXUS TO PROJECT: Project operations alter the hydrograph; the timing, duration, magnitude, frequency and rate of change of stream flows in the segments listed above; and thereby directly affect habitat and migration needs of aquatic biota. Project operations affect virtually all stream flow in the Saluda River and approximately one-third of the stream flow of the Congaree River.

AVAILABLE INFORMATION: An instream flow study (Isely, J.J., G. Jöbsis and S. Gilbert. 1995. *Instream flow requirements for fishes of the lower Saluda River*) was conducted at the Saluda by SCDNR and should serve as a basis from which to develop a study plan. There is also substantial information on the need for instream flows in scientific literature, state and federal agency policies, and in Comprehensive Plans filed with the FERC by the SCDNR including: Instream Flow Study, Phase I (1986), Instream Flow Study, Phase II (1988), South Carolina Instream Flow Studies: A Status Report (1989) and State Water Plan (1998).

Instream flow studies are anticipated for recreational boating, fishing and swimming, and for water quality and water supply needs. It is possible that portions of those studies could be combined with this study.

BASIC METHODOLOGY:

- SCE&G should work with interested stakeholders to develop detailed a study plan. Study methods should be tailored to meet issues specific to individual stream segments. Multiple metrics will likely be needed at each study segment. Suitable study methods may include – Tennant Method, Instream Flow Incremental Methodology (IFIM), Indicators of Hydrologic Alteration (IHA), Range of Variability Approach (RVA), MesoHABSIM, wetted perimeter, dual flow analysis, etc.
- Sufficient number of transects will be needed for IFIM studies if used. Biota that needs to be addressed includes riverine and diadromous fish, macroinvertebrates, rocky shoals spider lilies, etc.
- Assessment should include seasonal base-flow needs, flows for fish passage, and high flows needed for channel maintenance and morphometry. Flows for floodplain inundation needs will be addressed below.
- Assessment of the interaction between water quality parameters (e.g. temperature and dissolved oxygen) and instream habitat quality for target species should be addressed.

- Assessment of hourly and daily flow variations resulting from project operations (i.e. peaking) and their effect on instream habitat quality for various lifestages should also be addressed.

10.2 FLOODPLAIN FLOW EVALUATIONS

STUDY REQUEST:

We recommend a study to assess stream flows needed for incremental levels of floodplain inundation for the Congaree River including the Congaree National Park. Inventory of floodplain vegetation sufficient to represent the plant community along the affected river reaches is a central component of this study. The study should identify flow regimens and project operations that fully support the needs of floodplains, and their flora and fauna. Flow regimens that attain floodplain inundation and habitat values approximating those that would occur under the natural hydrograph over inter-annual and intra-annual periods should be determined.

PUBLIC INTEREST: Sufficient inundation of floodplains and enhancement of their bottomland habitats for botanical resources, and for aquatic and terrestrial fauna are clearly in the public interest; and are reflected in the policies and guidance of state and federal agencies charged with protecting these resources for the public good. The Congaree National Park is so designated because it contains North American's largest stands of virgin floodplain forest and its protection was determined to be in the public interest by Congress.

NEXUS TO PROJECT: Project operations alter the hydrograph; the timing, duration, magnitude, frequency and rate of change of stream flows and thereby the flooding regimen of bottomland habitats. Project operations affect virtually all stream flow in the Saluda River and approximately one-third of the stream flow of the Congaree River.

AVAILABLE INFORMATION: Numerous scientific and guidance publications are available regarding the effects of flow alterations on floodplains and their plant communities. Specific studies that are relevant to the Saluda Project include:

- Rikard, M. 1988. *Hydrologic and vegetative relationships of the Congaree National Swamp Monument*. Clemson University.
- Duke Power Company's Wateree River floodplain and water routing studies being conducted as part of the Catawba-Wateree relicensing.
- Rice, S.K. and Peet, R.K., 1997. *Vegetation of the lower Roanoke River floodplain*. The Nature Conservancy, Durham, North Carolina.
- Townsend, P.A. and Foster, J.R., 2002. *A synthetic aperture radar-based model to assess historical changes in lowland floodplain hydroperiod*. Water Resources Research 38 (7), pp. 20-1 to 20-10.
- Numerous floodplain assessment studies conducted by the Corps of Engineers for the St. Stephens Rediversion Project.

- Comprehensive plans filed with FERC by the SCDNR including: Instream Flow Study, Phase I (1986), Instream Flow Study, Phase II (1988), South Carolina Instream Flow Studies: A Status Report (1989) and State Water Plan (1998).

BASIC METHODOLOGY:

- SCE&G should work with interested stakeholders to develop detailed study plans. Study methods should be tailored to meet the specific floodplain characteristics of different river segments. Recommended methodology is:

A. Evaluation should be conducted using the steps outlined in the section entitled Floodplain Inundation Method in Instream Flows for Riverine Resource Stewardship (2002). This model consists of the following sequential steps:

- Determine representative floodplain cross-sectional elevations through (a) the Federal Emergency Management Agency (FEMA) and/or the U.S. Corps of Engineers (USACOE) flood risk maps; (b) topographic maps; (c) on-site surveys, including aerial photogrammetric techniques;
- Determine cross-section/stage-discharge relation by (a) measuring and surveying, (b) gage calibration rating table, or (c) gage records;
- Determine wetted perimeter versus discharge relation and inflection points for floodplain cross section;
- Tabulate phenology and inundation needs for floodplain and riparian vegetation and timing of floodplain-dependent life stages of fishes and other floodplain-dependent fauna;
- Determine historical, unmodified hydrological timing, and magnitude of high flows;
- Evaluate surface connectivity between main channel and off-channel habitats such as oxbow lakes through review of information obtained in steps 1 and 2, above;
- Evaluate timing and duration needed to address biological needs tabulated in step 4 and historical hydrology, step 5;
- Develop flow recommendations and compare alternatives based on review of information from steps 5 to 7.

B. Inventory of vegetative communities consistent with study methods included in Rice and Peet (1997) including:

- Tallies of tree species and stem densities by diameter class within 20 x 50 m plots;
- Sampling soil within 10cm of the litter layer, and performing standard analyses of nutrients, pH, base saturation, % organic matter, and bulk density;
- Derived geographic variables (floodplain elevation, distance to channel, distance to river mouth). Elevations will become available through Item C (below).

C. Remote inventory of floodplain inundation to evaluate the river discharge - floodplain inundation relationship along the affected floodplain reaches following the methods of Townsend (2002). This includes the following steps:

- Acquisition of Radarsat-1 Synthetic Aperture Radar scenes covering the area of interest, and spanning a minimum of three (3) different river discharges (high, medium, low flows);

- Using this data, a high resolution Digital Elevation Model of the floodplain is then created through interpolation of the discharge - flooded area relationship via GIS ArcInfo processing;
- Use transect information collected in (A) to calibrate and verify this model and its output.

10.2 LOW INFLOW PROTOCOL STUDY

STUDY REQUEST:

A study is needed to determine how to balance water availability, reservoir levels and downstream flow requirements for all uses during periods of low flow. Specific areas to be assessed include public water supply, reservoir and river water quality, fish and wildlife habitat needs, power generation, etc.

PUBLIC INTEREST:

The citizens of South Carolina have a direct interest in various water uses including uses for drinking water, recreation and fish and wildlife habitat. The balanced use of water resources during low flow periods is clearly in the public interest.

NEXUS TO PROJECT:

The Project was developed to store water in order to operate hydropower facilities. How this stored water is allocated for other purposes is clearly related to the Project.

AVAILABLE INFORMATION:

As detailed above the Conservation Groups are among several parties that have developed the Santee River Basin model. This is a comprehensive hydro operations and hydrologic model that can be used to assess alternative project operations under different water availability scenarios. The Saluda phase of the model is currently being developed and will soon be available. The model should prove a useful tool for developing low inflow protocol and appropriate balance of uses.

BASIC METHODOLOGY: Study the impact of low flow periods on Project operations and other water uses under existing and future scenarios. This study would then lead to the development of a low flow operations plan for Project, with involvement of the public, private and nonprofit sectors. The study should determine how to provide real time information on low flow conditions that can be used to trigger conservation measures and what flows are needed to protect water quality, aquatic habitat and water supply uses.

10.3.2.7 DIADROMOUS FISH STUDY

STUDY REQUEST: We recommend a study of upstream and downstream diadromous fish passage at the project dam, the use of hatchery operations to augment existing stocks, and how to meet the stream flow and water quality requirements of these diadromous species. Alternatives should be developed to enhance diadromous fish populations by establishing access to historic spawning grounds and nursery areas, safe downstream

passage, and improving stream flow and water quality. Part of this study should include cumulative impacts analysis of the Saluda Project on the diadromous fish stocks of the Santee-Cooper Basin.

PUBLIC INTEREST: Enhancement of diadromous fish populations is clearly in the public interest and is reflected in state and federal laws, as well as the policies and guidance of state and federal agencies charged with protecting these resources for the public good.

NEXUS TO PROJECT: Project's dam and operations directly affect upstream and downstream migration of and habitat quality for diadromous fish by blocking migrations, altering instream flows, and affecting water quality including dissolved oxygen and temperature.

AVAILABLE INFORMATION: Numerous scientific publications exist regarding enhancing diadromous fish populations by establishing fishways, and enhancing instream flow and water quality. Management plans for diadromous fish species that are pertinent to the Saluda Project include: Santee-Cooper Diadromous Fish Passage Restoration Plan by USFWS, SCDNR and NMFS which has been filed with FERC as a Comprehensive Plan; ASMFC plans for diadromous species including American Shad; and NMFS recovery plan for the federally endangered shortnose sturgeon.

We know of no information that specifically addresses Project effects on diadromous species, how best to establish fish passage at the dam, use of hatcheries and trap and truck methods to supplement existing stocks, instream flow requirements for these species in river segments and floodplain areas affected by project operations, or project-related water quality effects on these fish.

BASIC METHODOLOGY:

- SCE&G should work with state and federal fisheries agencies, the Conservation Groups and other interested stakeholders to develop detailed study plans. Study methods should be tailored to meet the issues specific to individual reservoir and river segments.
- Studies should focus on answering key fish passage and adult and juvenile migration issues in order to craft a specific and scientifically defensible plan to be included in the next license.
- Studies to be conducted by SCE&G should, at a minimum, include:

A. An evaluation of the feasibility and cost of the most promising fish passage technologies for upstream and downstream migration at the Project. SCE&G should provide conceptual design drawings, including hydraulic information, an estimate of construction, operation and maintenance costs for those designs and measures at each of the three projects. Specific options that should be studied, including a cost analysis for each alternative, include:

- Upstream passage options to be evaluated should, at a minimum, include:
 - Fishways
 - Trap and haul facilities

Dam removal

- Downstream passage options to be evaluated should, at a minimum, include:

- Spill gates
- Collection and bypass facilities
- Turbine intake screens
- Reservoir operations

B. A comprehensive analysis of entrainment of diadromous species. Entrainment in project turbines can be a significant source of fish mortality and affect efforts to reintroduce diadromous fishes. An analysis of entrainment at the Project is necessary to determine the separate and cumulative impacts on fish populations.

C. A thorough analysis of historic and current fish populations, and habitat conditions in the Saluda and Congaree rivers, and their tributaries. This should include an evaluation of diadromous fish habitat lost due to inundation behind the Project dam and an assessment of potential future habitat in the river and its tributaries. Such a study would provide important background information that will assist in the development of an effective reintroduction program. Also, the study results could then be used to identify potential limiting factors and their causes, and PM&E measures could be developed accordingly to improve the opportunity for a successful reintroduction program.

D. An evaluation of habitat conditions and availability under various operational scenarios including reservoir drawdown and run of river operations. The evaluation should rely on modeling, existing information, and field studies.

E. An evaluation of the feasibility and cost of hatchery operations to augment existing diadromous fish stocks.

F. A cumulative impacts analysis of the Project on the diadromous fish stocks of the Santee-Cooper Basin.

G. Evaluation of mitigation opportunities for ongoing impacts to diadromous and migratory riverine fish. An inventory of non-project dams that could be removed both within the project vicinity and in other reaches of the Congaree basin should be compiled after coordination with the stakeholders. Elimination of these barriers would help mitigate project impacts to these fishery resources.

All of this information is critical to determine the feasibility of reintroducing diadromous fish above the Project dam and to improve connectivity of resident fish populations in the Project area. Additional information and a complete study plan should be developed with state and federal agencies, the conservation Groups and other interested relicensing parties.

Study Locations:

- Upstream and downstream fish passage facilities have been identified as a priority of state and federal resource agencies and should be thoroughly assessed.
- Instream flow and water quality effects of project operations on all lifestages of diadromous fish should be addressed in the Saluda and Congaree rivers.

10.3.2.11 FRESHWATER MUSSEL STUDY

STUDY REQUEST:

We recommend a study of freshwater mussels occurrences in the project vicinity and how project operation may affect existing and future populations. Alternatives should be developed to enhance mussel populations via project operations including the improvement of stream flow and water quality. Part of this study should include cumulative impacts analysis of the Saluda Project on mussel stocks of the Santee-Cooper Basin.

PUBLIC INTEREST: Enhancement of freshwater mussel populations is clearly in the public interest and is reflected in state and federal laws, as well as the policies and guidance of state and federal agencies charged with protecting these resources for the public good.

NEXUS TO PROJECT: Project's dam, reservoir and operations directly affect habitat quality for freshwater mussels by altering instream flows, impairing migrations of host fishes and affecting water quality including dissolved oxygen and temperature. Ongoing operation of the project will continue to have negative effects of native mussel habitat due to the impoundment of more than 30 miles of the Saluda River and additional miles of tributary streams.

AVAILABLE INFORMATION: We know of no information that specifically addresses distribution of mussels in the Project vicinity or Project effects on those species. The federally endangered mussel, Carolina heelsplitter, is known to occur in the counties surrounding the project.

BASIC METHODOLOGY:

- SCE&G should work with state and federal fisheries agencies, the Conservation Groups and other interested stakeholders to develop detailed study plans. Study methods should be tailored to meet the issues specific to individual reservoir and river segments. These areas include the Saluda River upstream of the dam, streams tributary to the reservoir, the Saluda River and its tributaries, and the Congaree River.
- Field surveys should be conducted in all habitats mentioned above. Shallow-water and deep-water surveying techniques should be employed
- An evaluation of habitat conditions and availability under various operational scenarios including reservoir drawdown and run of river operations. The evaluation should rely on modeling, existing information, and field studies.
- A cumulative impacts analysis of the Project on the freshwater mussels of the Santee-Cooper Basin.
- Evaluation of mitigation opportunities for ongoing impacts.

10.3.2.12 RARE, THREATENED, AND ENDANGERED SPECIES/HABITAT STUDY

STUDY REQUEST: We recommend a study that assesses the current condition of rare, threatened, and endangered species (RT&E), how project operation affects those species, and how project operations can be modified to protect, restore, or enhance those populations.

PUBLIC INTEREST: The public has a significant interest in the protection, restoration and enhancement of RT&E species. Legislative and Congressional intent to further this public interest is clearly reflected in the state and federal legislation such as the South Carolina Pollution Control Act, South Carolina Endangered Species Conservation Act and the Federal Endangered Species Act.

NEXUS TO PROJECT: The project affects RT&E species by the ongoing impoundment of the river. The project operations result in a stream flow that is significantly different from natural flow conditions and prevents species from utilizing historic habitats. These altered conditions have created documented problems with water quality and other habitat variables that affect RT&E species. Under section 7(a)(1) of the Endangered Species Act, FERC, like any other federal agency, must protect and contribute to the recovery of all threatened and endangered species affected by their actions. Under ESA section 7(a)(2), FERC must, in consultation with the Fish and Wildlife Service and the National Marine Fisheries Service, ensure that any action it authorizes, funds, or implements is not likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat. The agency is further required to use the best available data in this analysis. It should be noted that unlike FERC relicensing, the baseline for ESA analysis is the historically existing conditions, not the project as it exists at the time of relicensing.

In issuing a Section 401 water quality certification as required by the Clean Water Act, the South Carolina Department of Health and Environmental Control must not issue the certification if the proposed activity will adversely impact RT&E species. Specifically, South Carolina regulation 61-101 requires SCDHEC to evaluate project effects on rare, threatened or endangered species and section F(5)(c) of those regulations states “Certification will be denied if the proposed activity adversely impacts waters containing State or Federally recognized rare, threatened, or endangered species.”

AVAILABLE INFORMATION: Substantial information exists regarding the presence of RT&E species in the project area. Some of the species present in the area include the federally endangered shortnose sturgeon and wood stork, the American Eel which is currently being evaluated for federal listing, and the globally endangered rocky shoals spider lily. The shortnose sturgeon has been documented in the Congaree River and at the confluence of the Broad and Saluda rivers. Both areas are influenced by project

operations. The wood stork has been documented in the upper reaches of the reservoir where project operations have a direct effect on foraging habitat. The rocky shoals spider lily has been documented at the confluence of the Saluda and Broad rivers and possibly exists on the lower Saluda closer to the dam. Other species that may be present in the area are listed in the comments of the U.S. Fish and Wildlife Service. The Conservation Groups recommend that project effects on all of these species be studied and hereby incorporate that list by reference into our comments.

BASIC METHODOLOGY: The RT&E study should be conducted by comparing the habitat requirements for these species with available habitat types within the action area of the project, including downstream river reaches affected by project operations. Where habitat in the affected project area overlap with the habitat requirements of an RT&E species a well conceived study, designed in coordination with applicable state and federal agencies should be conducted. All studies should account for direct, indirect and cumulative effects of project operations.

Several RT&E species are already known to be in the action area. Our initial recommendations for studying those species as follows:

1. Shortnose sturgeon: The study should include gillnet and electrofishing sampling. Weekly sampling should occur during the months of January through June. These methods should be employed in the Saluda River, at the confluence of the Saluda and Broad rivers and in the Congaree River.
2. Rocky shoals spider lily: Plant surveys should be conducted by a qualified botanist during the flowering or fruiting periods of the species. These methods should be employed in the Saluda River, at the confluence of the Saluda and Broad rivers and in the Congaree River.
3. Wood storks: Surveys for the wood stork should occur throughout the year with an emphasis on summer and fall months when the birds have been previously observed in the project vicinity. Occurrences of the species should be documented and mapped using GPS and GIS technologies. As detailed in the (list reservoir flux study here), project effects on habitat availability should be assessed.
4. American eel: The study should include use of various eel traps and electrofishing. These methods should be employed at the dam, in the Saluda River, at the confluence of the Saluda and Broad rivers and in the Congaree River.

14.0 RECREATIONAL USES AND NEEDS STUDY

STUDY REQUEST: We recommend a study to assess the current and future recreational uses and needs of the project area over the term of the proposed license, specifically in the Saluda River below the dam and in the Saluda River at the reservoir headwaters. The study is needed to determine the best locations for additional public access points and to identify what facilities are needed at what locations such as

launching and parking, handicap access, shoreline/river fishing access for non-boat owners, and any necessary signage to inform the public and protect health and safety.

PUBLIC INTEREST: The public has significant interest in assuring they have sufficient access to the public waters of the Saluda River and headwater section of the reservoir.

NEXUS TO PROJECT: Project operations directly affect public access to the Saluda River. FERC regulations require that recreational interests be considered and the current and future use of public recreation sites directly impacts this analysis.

AVAILABLE INFORMATION: The ICD identifies existing public and private recreation sites and states the total number of visitors to the area. The lower Saluda state scenic river plan identifies recreation locations and other amenities needed for that river segment.

BASIC METHODOLOGY: The study should determine recreational use on a site-specific basis and identify what facilities are needed to meet needs and make these reaches more accessible. The study should determine current use numbers and develop projections for future use based on population growth statistics. Also, the study should determine the relative percentage of visitors to each site that engage in each type of recreation (e.g. 10% of people come to swim, 25% to fish, 25% to paddle). The study should assess put-in and take-out points and portages for canoes. Currently there is no take out or portage above millrace rapids, effectively requiring all boaters to run the dangerous rapid or trespass on private land. An analysis of flows for each type of recreation (fishing, power boating, paddling, swimming) should be conducted and is described in the Recreational Flow Study section.

14.2.2 RECREATION FLOW STUDY:

We recommend that SCE&G develop a plan and conduct a study to address Project effects on instream flow and recreation in the Saluda and at the Congaree River headwaters. This study is needed because dam operations alter downstream flows, and the rate at which discharge and water surface elevation changes occur. Such conditions reduce the quantity and quality of recreational opportunities downstream of Project facilities. We recommend determining flow levels in the rivers required for: 1) enhancing recreational opportunities for anglers, paddlers, and swimmers; and 2) ensuring the safety of the public as they pursue these recreational opportunities. These studies are also needed to determine the flow levels/dam operations that will allow use of canoes and kayaks from the Saluda Dam, through the confluence and into the Congaree River. An additional objective of recreation flow studies is to provide information to develop a system to timely inform the public of flow release schedules and a warning system to inform river users of changes in river flows and potentially hazardous conditions. This is addressed in a separate section 7.4.5.

PUBLIC INTEREST:

The areas listed are all used for public recreation, and would be more widely used if flow conditions made the rivers more accessible and safer for use by anglers, boaters and swimmers. Public interest in public recreational uses is explicit.

NEXUS TO PROJECT:

Operation of the Saluda Project controls virtually all flow of the Saluda River and approximately one-third of the flow at the confluence and in the Congaree River. Not only does the project control water volume, but it also controls the timing and duration of flows needed to meet recreational requirements.

AVAILABLE INFORMATION:

Some navigation flow data is available from instream flow studies conducted by SCDNR. Additional information is available through the Lower Saluda Scenic River Advisory Council and the River Alliance.

BASIC METHODOLOGY:

The quality of boating, fishing and swimming experiences should be studied at incremental levels of water flow released from the dam. The study should employ users with varying levels of expertise for each recreation type. Study participants should rate their recreational experiences at different flow levels to evaluate how future project operations can better meet public recreation needs. Safety of recreational users under the full range of Project operations should also be assessed.

15.1 SHORELINE MANAGEMENT PLAN AND ALTERNATIVES STUDY

STUDY REQUEST: We recommend a study of shoreline classifications at Lake Murray and classification of project lands along the Saluda River downstream of the dam.

PUBLIC INTEREST: Ensure adequate balance of shoreline uses is achieved in the future, and that impacts from Licensee's shoreline decisions are consistent with public values and desired public outcomes such as water quality, fisheries, erosion control, terrestrial habitat, aesthetics, and recreation. The existing SMP may be inconsistent with maximizing public benefits because extensive areas within the project boundary are slated for private development and de facto privatization of the existing 75- foot buffer.

NEXUS TO PROJECT: The Shoreline Management Plan should result in uses achieving maximum public benefit. A project approved by the FERC must be "best adapted to a comprehensive plan for improving or developing a waterway or waterways for the use or benefit of interstate or foreign commerce, for the improvement and utilization of waterpower development, for the adequate protection, mitigation, and enhancement of fish and wildlife (including related spawning grounds and habitat), and for other beneficial public uses, including irrigation, flood control, water supply, and recreational and other purposes..." and the FERC must give equal consideration to power and non-power values. (FPA Section 10(a)(1) and FPA Section 4(e).

The continued operation of the project and shoreline classification process has a tremendous impact on public accessibility and needs to be fully understood.

AVAILABLE INFORMATION: The current shoreline management plan and the studies conducted in developing that plan. Tennessee Valley Authority final environmental impact statement, *Assessment of Residential Shoreline Development Impacts in the Tennessee Valley* (1998).

BASIC METHODOLOGY:

- For Lake Murray the study should evaluate future public access needs for non-boating recreation (e.g. bank fishing, hiking, picnicking, wildlife viewing, etc.) and how project lands should be classified to meet these needs for the next license term (30 years or longer). Evaluation of how the SMP can support other uses, such as waterfowl hunting, should also be included.
- For the Saluda River downstream of the dam, the study should inventory of riparian areas and to determine feasibility of establishing permanent vegetated buffers as part of shoreline classification. These buffers will ensure high quality recreational experiences for users and abate sedimentation and non-point source pollution.
- Both reservoir and rivers studies should assess methods for habitat preservation and viewshed protection and other public benefits.

Sincerely,

Gerrit Jöbbsis, American Rivers
Director of Southeast Conservation

Patrick Moore, Coastal Conservation League
Water Quality Associate

