Saluda Hydroelectric Project (FERC No. 516)

Study Plan: Macroinvertebrate Assessment of the Lower Saluda River

Freshwater Mussels/Benthic Macroinvertebrate Technical Working Committee
August 24, 2006

I. Study Objective

To assess the status of the macroinvertebrate community in the lower Saluda River (LSR) downstream of the Saluda Hydroelectric Project dam.

II. Geographic and Temporal Scope

This study will evaluate macroinvertebrate fauna in the LSR from downstream of Saluda Hydroelectric Project dam to its confluence with the Broad River. Specific sampling locations are shown in Figure 1.

Macroinvertebrate sampling will occur during late-Summer and early-Fall 2006 and 2007 when dissolved oxygen conditions downstream of the dam are at their most critical.

III. Methodology

Field Methods
If field conditions allow, macroinvertebrate fauna will be sampled at five locations consistent with previous investigation in the LSR[1]: the project tailrace (TR); the mouth of the project spillway (SPW); the "middle river" between Corley Island and the mouth of Twelvemile Creek (MR); the "lower river" between Interstates 20 & 26 (LR); and in the vicinity of Riverbanks Zoo (ZO)[2] (Figure 1). One site not previously investigated, the Ocean Boulevard shoal area (OB), will also be sampled (Figure 1).

Three replicate Hester-Dendy multi-plate samplers will be deployed at each location and allowed to colonize for approximately eight weeks. A multi-habitat assessment, following the USEPA *Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers* (Barbour et al. 1999), will also be performed at the closest wadeable habitat to each of the Hester-Dendy deployment locations (within 200 meters, if possible) at the beginning and end of the colonization period. Multihabitat sampling will involve timed, quantitative sampling of the various habitat types available with the identified reaches (i.e. cobble, sand, snags, woody debris, etc.), using kicknets and/or D-shaped dipnets, with each habitat type sampled in approximate proportion to its availability.

Laboratory Methods
Intact Hester Dendy samplers, as well as raw samples from the multihabitat assessment, will be preserved in the field with 95% ethanol and transported to a South Carolina Department of Health and Environmental Control (SCDHEC) – approved laboratory for processing. In the laboratory, macroinvertebrates will be separated from debris with the aid of a stereo microscope,

[1] Habitat is described in previous investigations at these sites (Shealy 2001; 2003; 2004; 2005).
[2] Site is in close proximity to the "old police club" (OPC) sampled in previous investigations (see Shealy 2005); sites may be used interchangeably depending on field conditions and access.

identified to the lowest possible taxonomic level, and enumerated using appropriate techniques and taxonomic keys. Specimens will be maintained in a voucher collection for five years or placed permanently in a reference collection.

Data Analysis

Differences in taxonomic composition between sampling sites will be examined using appropriate bioassessment metrics, as described in Barbour et al. (1999). These metrics will likely included taxa richness (diversity); EPT (Ephemeroptera, Plecoptera, Trichoptera) Index; Chironomidae taxa and abundance; ratio of EPT and Chironomid abundance; ratio of scraper/scraper and filtering collectors; shredder/total number of specimens collected; percent contribution of dominant taxa; and North Carolina Biotic Index (NCBI)[3]. Regression analyses may also be used to detect trends in community composition as a function of distance from the dam. Water Quality data (dissolved oxygen and temperature) will also be reported for the sampling period.

IV. Schedule and Required Conditions

Artificial substrate (Hester-Dendy) samplers will be deployed in late summer 2006 and 2007 (late August / Early September) and will be allowed to colonize for approximately eight weeks; multihabitat sampling will be conducted at the beginning and end of the colonization period during each sample year.

A final report summarizing the study findings will be issued within 90 days of completion of field work during each sampling year. Study methodology, timing, and duration may be adjusted based on consultation with the resource agencies and interested stakeholders. All data collected will be provided in electronic format to agencies and interested stakeholders.

V. Use of Study Results

Study results will be used as an information resource during discussion of relicensing issues with the SCDNR, USFWS, Wildlife and Fisheries RCG, Freshwater Mussels/Benthic Macroinvertebrate TWC, and other relicensing stakeholders.

VI. Study Participants

NAME	ORGANIZATION	PHONE	E-MAIL
Freshwater Mussels/Benthic Macroinvertebrate Technical Working Committee			
Jim Glover	SCDHEC	(803) 898-4081	gloverjb@dhec.sc.gov
Gerrit Jobsis	Am. Rivers/CCL	(803)771-7114	gjobsis@americanrivers.org
Ron Ahle	SCDNR	(803)734-2728	ahler@dnr.sc.gov
Amanda Hill	USFWS	(843)727-4707, x303	Amanda_hill@fws.gov
Shane Boring	Kleinschmidt	(803)822-3177	shane.boring@kleinschmidtusa.com
Stephen E. Summer	SCANA Services	(803)217-7357	ssummer@scana.com
Jennifer Price	SCDNR	(803)353-8232	pricej@dnr.sc.gov
Applicant Contacts			
William Argentieri	SCE&G	(803)217-9162	bargentieri@scana.com
Randy Mahan	SCANA Services	(803)217-9538	rmahan@scana.com

[3] . Bioassessment metrics are described in greater detail in Barbour et al. (1999) and in reports summarizing previous macroinvertebrate investigations at the LSR sites (Shealy 2001; 2003; 2004; 2005).

VII. List of Attachments

Figure 1: Map of Benthic Macroinvertebrate Sampling Locations in the Lower Saluda River Downstream of the Saluda Hydroelectric Project Dam

VIII. List of References

Barbour, M.T., J. Gerritsen, B.D. Snyder, and J.B. Stribling. 1999. Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates and Fish, Second Edition. EPA 841-B-99-002. U.S. Environmental Protection Agency; Office of Water; Washington, D.C.

Shealy Environmental Services, Inc. (Shealy) 2001. Macroinvertebrate Assessment of the Saluda River, Downstream of the Lake Murray Hydroelectric Dam Operated by South Carolina Electric and Gas Company, Lexington County, South Carolina. Report prepared for South Carolina Electric & Gas Company.

Shealy Environmental Services, Inc. 2003. Macroinvertebrate Assessment of the Saluda River, Downstream of the Lake Murray Hydroelectric Dam Operated by South Carolina Electric and Gas Company, Lexington County, South Carolina. Report prepared for South Carolina Electric & Gas Company.

Shealy Environmental Services, Inc. 2004. Macroinvertebrate Assessment of the Saluda River, Downstream of the Lake Murray Hydroelectric Dam Operated by South Carolina Electric and Gas Company, Lexington County, South Carolina. Report prepared for South Carolina Electric & Gas Company.

Shealy Environmental Services, Inc. 2005. Macroinvertebrate Assessment of the Saluda River, Downstream of the Lake Murray Hydroelectric Dam Operated by South Carolina Electric and Gas Company, Lexington County, South Carolina. Report prepared for South Carolina Electric & Gas Company.

Figure 1. Proposed Macroinvertebrate Sampling Locations in the Lower Saluda River Downstream of the Saluda Hydroelectric Project Dam