

Saluda Instream Flow Study

Final notes from site reconnaissance 11/28/06

Attendees:

Amanda Hill	U.S. Fish and Wildlife Service
Ron Ahle	SC Department of Natural Resources
Scott Harder	SC Department of Natural Resources
Theresa Thom	National Park Service
Milton Quattlebaum	SCANA Services
Jennifer Summerlin	Kleinschmidt Associates
Shane Boring	Kleinschmidt Associates
Brandon Kulik	Kleinschmidt Associates

The study team met at 9:30 AM at the security gate leading to the project tailwater and USGS gage area. It was agreed to start at this location and view areas of the river sequentially downstream. According to the USGS gage¹, flow was approximately 500 cfs. The overall goals of this visit were to:

- gain a common orientation to the river from an instream flow habitat perspective,
- view channel details of specific interest,
- confirm and/or refine mesohabitat definitions developed during the Nov 27 2006 scoping meeting,
- confirm and/or refine reach boundaries and definitions
- further brainstorm aspects of study implementation

USGS Gage site. This site is located in Reach 1 above the confluence with the overflow channel, It features steep vegetated banks, and laminar flow, and bank width of approximately 100 ft.. Channel bottom appeared relatively even with fines and scattered object cover. Bridge piers are evident just below the gaging station (Photo 1). Based on the mesohabitat definitions, the group agreed that this site represented a run at this flow.



Photo 1. Run habitat and USGS gage below Lake Murray outlet

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http://waterdata.usgs.gov/sc/nwis/uv?cb_00060=on&cb_00065=on&format=gif_default&period=10&site_no=02168504

Saluda Shoals. The team investigated the river channel between the Saluda Shoals Park boat ramp downstream to Corley’s Island. One part of the area is composed of runs that are fairly uniform, similar in width, bank profile, and gradient to those at the USGS gage site, but with more pronounced aquatic vegetation beds, some of which are anchored to large substrates (Photos 2 and 3).



Photos 2 and 3. Views of run mesohabitat and aquatic vegetation at Saluda Shoals.

The team also identified areas that appear to be riverine pools in this segment. There are also a few scattered riffles exposed at this flow, comprised primarily of exposed large boulders and possible tips of some bedrock surrounded by fines such as sand and small gravels (Photo 4). Rawls Creek joins the Saluda River in this segment and marks the beginning of Reach 2.

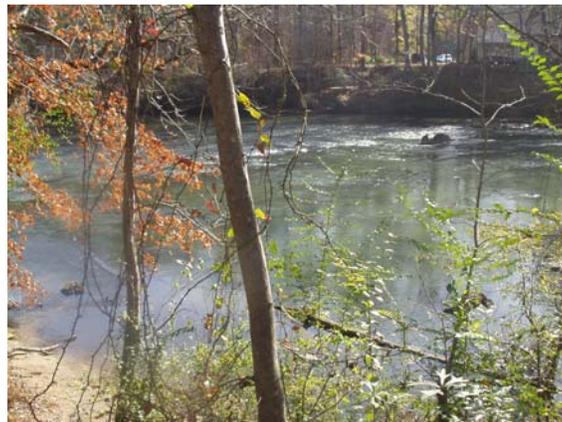


Photo 4. View of riffle in Saluda Shoals area

Corley’s Island is located below this area. The island is tied to a pronounced ledge outcrop that forms a distinct shoal in the main channel and has a stable bedrock hydraulic control directing water into the side channel. The side channel is predominantly shallow run habitat, and was originally excavated as a canal, but has aggraded with ledge/boulder/woody debris in the upper segment of the side channel (Photos 5 and 6) giving way downstream to a uniform, open sandy and shallow channel with little object cover and fine substrates (Photo 7). A cross-channel has cut across the middle section of

Corley's Island. Ron Ahle believes that this feature has been present for at least ten years.



Photos 5 and 6. Upstream tip of Corley's Island with shoal in main channel (*distant in the photo*), and object cover and substrates in upper portion of side channel.



Photo 7. Lower portion of side channel at Corley's Island.

Oh Brother Rapids/Ocean Boulevard. This site is located where the river begins to descend the fall line (upper end of Reach 3), which is the transition between Piedmont and Coastal Plain geomorphic provinces. Thus gradient and substrates are more pronounced than in the upstream sites. The group accessed the river via private property with a right of way provided by Trout Unlimited. This site is more hydraulically complex than upstream areas. An island forms two channels that descend through bedrock shoals, with the Oh Brother Rapids channel appearing to be the secondary, possibly newer channel. There is at least one cross-cutting channel traversing the main island, and braided areas below the larger main island. (Photo 8).

The Oh Brother Rapids area included well-defined examples of shoal, riffle, run and pool mesohabitats, and distinctly different (i.e. larger and more abundant larger substrates that provide object cover, eddies and holding areas for a variety of species and lifestages of interest to the TWC (Photos 9 and 10). There is also an area of active erosion along the right channel (looking downstream), suggesting that this channel is in a state of dynamic disequilibrium. The group viewed and discussed this, and recognized that this could be a

potential concern for the study if the channel is continuing to change in ways that would affect the accuracy of any modeling results obtained here. After discussion, it was agreed that input from a geomorphologist would help the team draw firmer conclusions about options and/or caveats for the modeling scope for this segment.



Photo 8. Oh Brother Rapids/Ocean Boulevard (image courtesy of Google Earth®).



Photos 9 and 10. Oh Brother Rapids: Example of riffle/shoal/substrate and braided channels.

Millrace Rapids. This marks the upstream boundary of Reach 4. The river channel width increases at this point, and there are multiple braids and interstitial flow passing between and under large boulder and broken rubble remains of a former masonry dam (Photos 11 and 12). It was noted that a plunge-pool exists at the toe of the rapids, and the team agreed that an empirical rather than PHABSIM-model approach would be preferred to characterize hydraulics at this location. Kayakers were observed navigating the rapids at this flow.



Photos 11 and 12. Millrace Rapids. Views looking upstream (Photo 11) and downstream (Photo 12).

Riverbanks Zoo. The group viewed a pool/run/rapids complex at the downstream end of the Riverbanks Zoo property. This area featured large object cover (decomposed boulder and ledge substrates dominated), and a large pool that is clearly ledge-controlled. The team viewed the upper segment of Shandon Rapids, which appears to be shoal habitat that descend to the Broad River through a braided channel with large boulder substrates (photos 13 and 14).



Photo 13. Pool and object cover area looking upstream at Riverbanks Zoo site.



Photo 14. View looking downstream from Riverbanks Zoo, across pool to the crest of Shandon Rapids. Island in center (*indicated by tall trees*) creates steep gradient braided channels.

The team ended the reconnaissance at this site. There was agreement that the reach boundaries and mesohabitat types arrived at on November 27 still appear to reasonably define conditions observed in the field, and that the reconnaissance had supplemented helpful details to the fly-over video viewed by the TWC on November 27. Brandon and Shane provided Amanda Hill with a DVD copy of the flyovers for her reference since she had joined the TWC Nov. 27 meeting by teleconference and was therefore unable to view the videos with the team.