

## MEMORANDUM

TO: Parr/Fairfield Hydro Relicensing Instream Flow TWC  
FROM: Shane Boring  
DATE: September 30, 2013  
RE: **Mesohabitat Assessment Study Plan**

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A mesohabitat assessment of the Broad River downstream of the Parr Shoals dam will be conducted in preparation for the upcoming Instream Flow Incremental Methodology (IFIM) Study, which will be conducted in support of the relicensing of the Parr/Fairfield Hydroelectric Project (Project). The purpose of the assessment will be to classify and determine the quantity and spatial distribution of different mesohabitat types within the study area outlined by the TWC (Figure 1).

“Mesohabitats” are generalized habitat types that are commonly used to describe stream habitat (i.e. riffle, run, pool). Acceptable mesohabitat types were determined in consultation with the Instream Flow TWC (See July 30, 2013 meeting notes), and include the following:

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|-------------|--|
| Riffle      | Shallow, with moderate velocity, turbulent, high gradient, moderate to large substrates (cobble/gravel). Typically > 1% gradient.  |
| Glide       | Moderately shallow, well-defined non-turbulent laminar flow, transition from low to moderate velocity, lacking a definite thalweg, typically flat stream geometry, typically finer substrates, transitional from pool. |
| Run         | Moderately deep, well-defined non-turbulent laminar flow, range from low to moderate velocity, well-defined thalweg, typically concave stream geometry, varying substrates, gently downstream slope (<1%).             |
| Pool        | Deep, low to no velocity, well-defined hydraulic control at outlet.  |
| Rapid/Shoal | Shallow, with moderate to high velocity, turbulent, with chutes and eddies, high gradient, large substrates or bedrock. Typically >2% gradient.  |
| Backwater   | Varying depth, no or minimal velocity, off the primary channel flow.   |

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### *Assessment Methods*

For purposes of the mesohabitat assessment, the approximately 18 mile-long study area will be broken in to the two reaches agreed upon during the June 2013 field reconnaissance: Reach One – extending from the Parr Shoals dam downstream to the Palmetto Trail trestle crossing and Reach Two – extending from the trestle to the downstream end of Bookman Island (Figure 1). The entirety of the study area will then be traversed by boat, kayak or on foot, and mesohabitats occurring in each reach will be classified into one of the six categories described above. Upstream and downstream boundaries of each mesohabitat patch will be documented with a Global Position System, and field observations regarding dominant substrate, overall cover quality<sup>1</sup>, and approximate channel width and slope recorded. Reference photos will also be taken for each mesohabitat type.

### *Reporting*

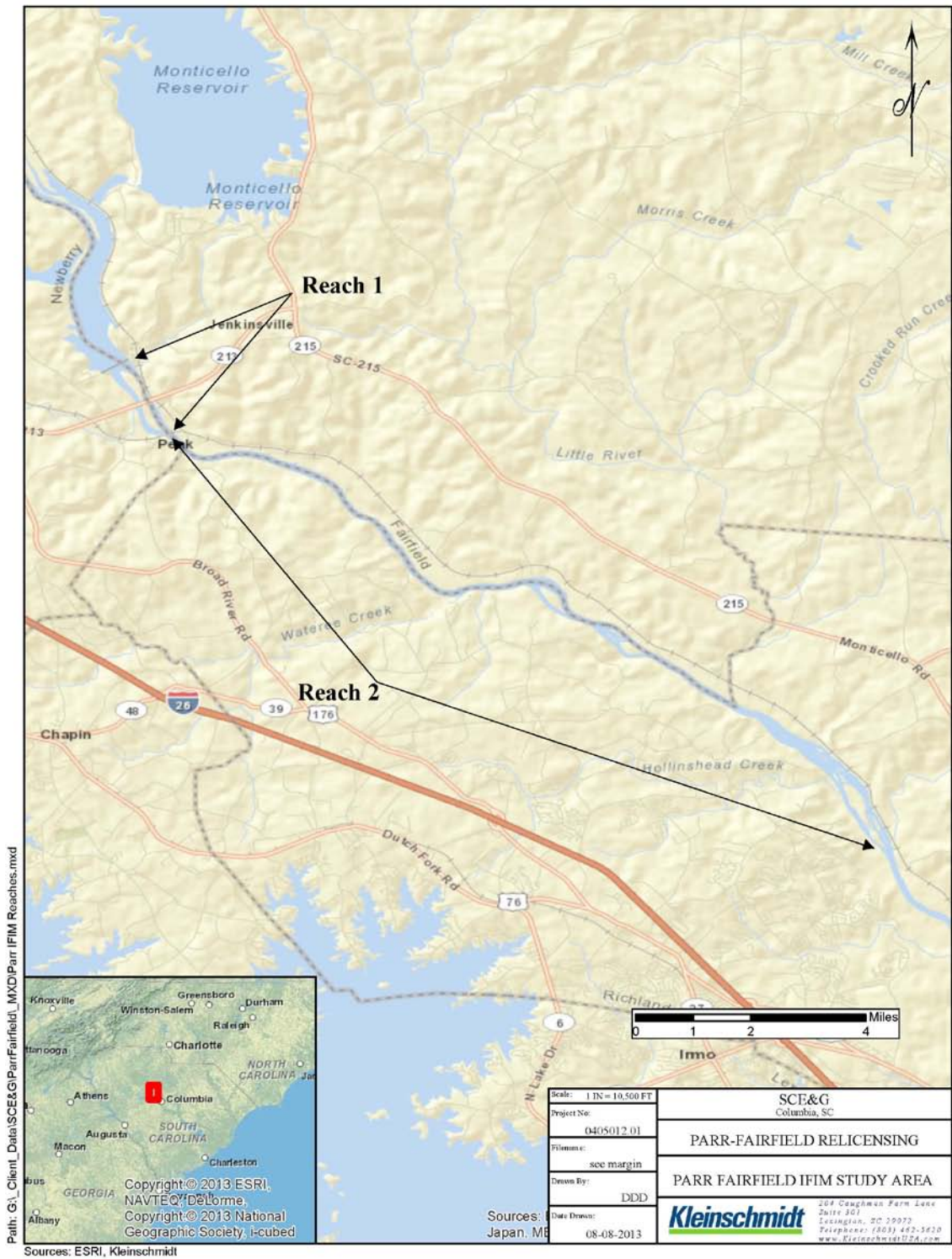
A brief report summarizing the assessment results will be prepared following completion of the field effort. The report will include appropriate Geographic Information System (GIS) maps depicting spatial distribution of mesohabitats in the study area, as well as tabular information regarding proportions of mesohabitats occurring within each study reach.

### *Schedule*

The assessment will occur during a period of relatively low-to-moderate flow so that breaks in mesohabitat, substrate, object cover and hydraulics that are representative of approximate base flow conditions can be readily observed. If river flows allow, the assessment is scheduled for the fall of 2013, with winter of 2014 as an alternate.

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<sup>1</sup> Refers to the relative density of object cover such as boulders, logs, etc.



**FIGURE 1 IFIM REACHES**