

# WATERSHED ASSESSMENT OF THE LAKE ALLATOONA/UPPER ETOWAH RIVER BASIN

James B. Stribling<sup>1</sup>, Steven R. Davie<sup>2</sup>, David M. Kubala<sup>3</sup>, and Jerry Jones<sup>4</sup>

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AUTHOR: <sup>1</sup>Director, Tetra Tech, Inc. - Center for Ecological Sciences, 400 Red Brook Blvd., Owings Mills, Maryland 21117-5159, 410-356-8993, <sup>2</sup>Director, Tetra Tech, Inc., Atlanta, Georgia, <sup>3</sup>Director, Cherokee County Water and Sewerage Authority, Canton, Georgia, and <sup>4</sup> Malcolm-Pirnie, Inc, Birmingham, Alabama.

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**Abstract** There are multiple, complex, and cumulative combinations of stressors throughout the Lake Allatoona/Upper Etowah River watershed (LAUE). Recognition of their presence and specific effects on the stream biota in isolation from effects of all other potential stressors is often difficult. An understanding can be developed of the spatial and temporal characteristics of potential stressor sources, the likelihood that stressors produced would effect biological responses, and the variable magnitude of those responses. We used ecological monitoring and assessment results, combined with water quantity, quality, and land use/land cover data, to evaluate ecological condition as the response indicator, the physical, chemical, and hydrologic stressors effecting biological conditions, and point and nonpoint sources of those stressors. The Georgia multimetric index (MMI), a biological index using benthic macroinvertebrates, provided assessments at four spatial scales: the watershed overall, nested subwatersheds at two scales (10 and 12 digit hydrologic unit code [HUC]), and individual streams. Through the first 3 years of sampling (2006-07), approximately 44% of the basin has been assessed (n=158 sites, and 23 out of fifty-three 12 digit HUC subwatersheds); of that fraction, about 38% of the stream channel miles is degraded, that is, with biological assessment results as either “poor” or “very poor”. The most complete assessments thus far are for the Upper Etowah River

(0315010401) and the Middle Etowah River (0315010403) subwatersheds at 62 and 63 percent complete, with 13.2 and 18.4% degraded stream miles, respectively. The Upper and Middle Etowah River and Amicalola Creek subwatersheds have the highest proportion of assessments falling as either “good” or “very good”; those subwatersheds having highest proportion as either “poor” or “very poor” are Lower Etowah River, Little River, and Upper and Lower Allatoona. Additional sampling and analysis in the final 3 years of this rotating basin monitoring program will ultimately result in 318 sites being assessed, and will likely necessitate modification of assessment results for some of the 10 digit HUC subwatersheds and the LAUE overall. Inventory of potential stressors and stressor sources found that there was a broad combination of point and nonpoint sources, including urban/suburban development, transportation corridors, combined animal feeding operations (CAFO), silvicultural and mining activities, and physical habitat degradation due to the reservoir impoundment itself. These sources result in potential elevated loadings of sediment (accelerated erosion), phosphorus and other nutrients, multiple aspects of physical habitat degradation to which the existing stream biota are exposed. The combined knowledge of biological degradation, most probable stressors, and the sources producing those stressors, is serving as the foundation of a watershed protection plan for the LAUE.