

PRELIMINARY SUMMARY REPORT ON THE 2012 LTLT BIOMONITORING SEASON

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During May-August, 2012 we completed monitoring of the projected 30 sites scattered throughout the upper Little Tennessee watershed, including several "Fixed Stations" (monitored annually) and others selected according to criteria related to perceived problems and opportunities, plus requests from agencies, landowners and concerned citizens. For each site, based on fish (and sometimes macroinvertebrate) samples we assign a Bioclass Rating – Excellent, Good, Fair, Poor or Very Poor. Pending possible unexpected results from the macroinvertebrate samples, we have assigned 1 Excellent, 9 Good, 11 Fair and 9 Poor ratings. (We did not visit any Very Poor sites in 2012.) These numbers probably slightly underestimate overall ecosystem health, since site selection is skewed toward analyzing problems. Comparing 2012 data with data from the same sites going back as far as 1990, 10 of the sites can be considered stable, 9 show a tendency to improve and 8 seem to be degrading. (Three of the sites were sampled for the first time this year, so for these we cannot identify a trend.)

Perhaps the most encouraging single data point is the one Excellent rating - from our Fixed Station on the Little Tennessee mainstem at Needmore, which we monitor in collaboration with TVA, and which receives this rating year after year. When one considers the quality of water passing through Franklin and over the dam at Lake Emory, this shows that a good sized river in a lightly populated area has considerable resilience and self-cleansing capacity. However, we will also note that absent LTLT's historic role in securing what today constitutes the Needmore Game Lands, and in conserving riparian lands upstream of Needmore, the river at Needmore probably would not rate Excellent today.

There is also tentative good news from the Little Tennessee mainstem between Franklin and the Georgia line. Those of you who have lived in this area for a while will have noted the change as one drives along US 441 through the Otto area. Where you used to see miles of crumbling raw river bank and sometimes cattle in the water, it is now hard to see the water thanks to the luxuriant growth of riparian vegetation. This is partly the result of hard work – by LTLT, LTWA and the Macon Soil and Water Conservation District, but also reflects demographic and land use trends. Whatever the reasons, we have noted gradual improvement in this area over the last several years, based on monitoring of a low quality site at the LTLT Tennesse Bottomland Reserve and a better one in the Norton area (located adjacent to the very first LTLT conservation easement established on the Little Tennessee River).

This optimism is partially offset by results from 2 sites on the river mainstem in Georgia. In 2007 we initiated annual monitoring at 2 sites bracketing the former Fruit of the Loom industrial waste discharge point in Dillard. The rationale was to be prepared to react intelligently to any new proposal for use of the industrial site. (In the 1990's the Stream Biomonitoring Program was instrumental in securing improvements to the treatment facility at the then Burlington Plant, with measurable positive impact on the river.) So far the plant remains in limbo but we note a slight deterioration in ecosystem health at both sites, with disappearance of at least one sensitive species, for reasons we have not yet determined.

Two other sites are of particular interest in terms of their pollution history. The lower reaches of both Tellico Creek and Wayah Creek are in very good physical condition compared to most other streams of their size in our watershed, but both have a history of pollution problems.

As of 2010, the situation in Tellico Creek could fairly be described as shocking. Lower Tellico Creek rated just Fair – with evidence of organic pollution. Our data gave weight to complaints from residents along the creek about periodic slugs of waste material from an upstream trout farm. Our biomonitoring data persuaded NCDENR to look into the situation and recommend improvements. While no violations were formally issued, there has been an improvement in management at the trout farm, and in 2012 lower Tellico Creek once again rated Good.

In Wayah Creek, the historic problem was with frequent malfunctions at a package waste water treatment plant at the LBJ Job Corps center. When the Wayah area was connected to the town sewer system in 2001, that problem should have been solved, but Bioclass Ratings on this apparently healthy stream remained only Fair, notably because of the absence of several sensitive species (all present nearby in Cartoogechaye Creek). We suspect the persistence of chlorine compounds in sediments. These species have been coming back little by little, but only in 2012 did the very pollution-intolerant gilt darter return to Wayah Creek. This and other improvements occasioned the first Good Bioclass Rating for lower Wayah Creek.

Several of the examples cited above illustrate the positive effects of selective advocacy on streams with pollution issues, and the role of biomonitoring in informing advocacy. However, this gives a skewed picture of the challenges we face here in the upper Little Tennessee watershed. While point source pollution does occur here, by far the greater portion of the biological damage done to our streams is a consequence of habitat modification and poor land use. Thus the solutions lay not so much in issue-based advocacy and regulatory activity as in restoration. We are pleased to be able to note that maintenance of Excellent conditions in the Little Tennessee at Needmore and tentative improvement along the upper mainstem seem to reflect riparian restoration effected by LTLT and our partners and predecessors. However, we can also report results more directly related to our own and others' restoration efforts.

There are presently 2 “completed” restoration efforts in our watershed in which LTLT did not have a hand, but for which we are doing follow-up biomonitoring – among other reasons in order to learn from others' experiences and guide our own future work. We hope to report on one of these sites, at Betty Creek in Rabun County in 2013. During 2011 and 2012 we did follow-up monitoring at 2 sites on Cat Creek, following completion of a major restoration project by the Ecosystem Enhancement Program and Equinox Environmental. Results show modest improvement, although neither site has risen above the Poor Bioclass Rating. Considering that Cat Creek is one of the most highly degraded streams in our watershed, this is encouraging.

LTLT also has 2 restoration projects we inherited from the LTWA and which will be monitored indefinitely:

A project on Watauga Creek, initiated in 2008, involved replacement of a failing culvert on a farm road by a free spanning bridge, thus averting a potential catastrophic “blowout”. Along with removal of a mill dam fragment which was impeding the natural flow of the stream, this work improved upstream access for fish, allowed for flushing of accumulated sediment and led to improved habitat quality in upstream riffles. The results are apparent in an improved Bioclass Rating (Fair to Good) above the bridge. This project, although incomplete, provides a clear example of a win-win collaborative situation, with the landowner, the stream and ultimately the downstream ecosystem and the local public benefitting from the work.

A similar but smaller project on Bradley Creek also involved replacement of a potentially failing culvert with a bridge. Landowner satisfaction is equal, but while the 2012 Bioclass Rating on Bradley Creek will likely remain Fair construction had the unintended result of eliminating the only significant pool in the lower half mile of the creek. This will probably prove to be a limiting factor in use of Bradley Creek by the Threatened spotfin chub, which migrates up it (as they also do in Watauga Creek) in the fall. It is incumbent upon us to find a way to finish this project, especially since we have a more than willing landowner, and we will continue to monitor Bradley Creek until the situation is resolved.

The particular reasons for the incomplete status of the restoration projects on Bradley and Watauga Creeks are different but in both cases essentially bureaucratic. They underscore the need for the LTLT to develop its own capacity to effect small scale, low cost and even partial restoration where appropriate. This was the logic for a new monitoring site in 2012, located on the recently acquired LTLT property along Lakey Creek. Initial monitoring demonstrated that the principal factors impacting Bioclass Rating (probably a high Poor or low Fair) on this stream – also used by spotfin chubs in the fall - are lack of high quality riparian shade and scarcity and low quality of pool habitat. Both of these factors, but especially the first, are amenable to low intensity restoration approaches which the LTLT intends to apply, along with continual monitoring, in the years to come.

In 2012 we also monitored, for the first time, Porter Cove Branch (Bioclass Rating Poor) at the Mountain View School. The school proposes to restore this badly degraded stream where it passes through their campus, and we will be doing follow-up monitoring, while exploring opportunities to work with classes in grades 5-8 and their teachers.

Funding for restoration is always a challenge, and it is no secret that private consulting firms sometimes overbuild and overbudget. At the opposite end of the spectrum is the argument that left along, nature will eventually do the restoration. In 2012 we monitored two sites where nature has been left to do the work. Everyone knows about Peeks Creek where, following the 2004 flood disaster, human intervention was largely limited to cleaning up major debris and hydroseeding along Peeks Creek Rd. Less well known is Lamb Creek in Rabun County, where in 1995 a major housing development, built with next to no environmental precautions, filled the channel with sediment, raising water temperatures and dropping the Bioclass Rating from Good to Poor. As of 2012, although visible scars remain, the Peeks Creek ecosystem seems to be functioning normally, with a Good Bioclass Rating. But although Lamb Creek downstream of the development presents a healthy, attractive appearance the Bioclass Rating remains Poor. These examples illustrate the importance of the role of biomonitoring in evaluating the probable cost-effectiveness of proposed restoration efforts.

During the summer of 2012, this work involved 79 mostly local volunteers, including groups from Franklin High School, the intern program at Coweeta Hydrologic Lab and The Mountain Retreat Center. These individuals contributed 636 hours of work, for an official matching value \$13,858.44. Volunteers are of all ages, but included 29 individuals of high school age and under. These figures do not include 45 Mountain View School students who observed fish monitoring and participated in macroinvertebrate sampling on Porter Cove Branch.

We made a major leap forward this year in being able to turn over identification of the macroinvertebrate samples to LTLT intern Warren Stiles, who has trained the last several years with Dave Penrose (former NC State and NC DWQ), John Morse (Clemson and Highlands Biological Station) and John Thurman (TVA). While there is no guarantee that Warren will stay in the area after graduation

from Berry College, this is his expressed desire. Having in-house benthic taxonomy expertise would be an enormous advantage to LTLT.

With the completion of the field season, we will be beginning to try to integrate our own earlier work with the USDA SVAP (Stream Visual Assessment Protocol) habitat assessment methodology with SVAP research being carried out in our watershed by U. of Georgia doctoral student Jeremy Sullivan. By next year we hope to have SVAP methodology integrated into the biomonitoring process as well as being available for local students and volunteers to apply independently.

Our stream biomonitoring work and our emphasis on biodiversity do not exist in a vacuum; they are intrinsically connected to our educational efforts, SVAP and our work in stream restoration. All of this needs to be packaged in ways which make it increasingly attractive and available to the ordinary citizen, linked with other kinds of monitoring and assessment and put to work toward realization of on-the-ground conservation goals. If we can continue to finance the work, LTLT is in an excellent position to continue its pioneering and leadership roles in this endeavor at a regional level.