

Emory River Watershed Biological Assessment

The overall objective of the Emory River Watershed Biological Assessment Project is to determine the current diversity and habitat condition for fish, mussels, and macroinvertebrates within the Emory River Watershed. Specific attention is being given to federally-listed endangered and threatened species, including the spotfin chub (*Erimonax monachus*) and the purple bean mussel (*Villosa perpurpurea*). To help accomplish this objective, historical water quality, fish, mussel, and macroinvertebrate data have been gathered and entered into a database that is GIS-linked to assess associated land use influences.

The entire Emory River Watershed has been visited and sampling locations have been identified after consultation with Tennessee Wildlife Resources Agency (TWRA), Tennessee Valley Authority (TVA), United States Geological Survey (USGS), Tennessee Department of Environment and Conservation (TDEC), and National Park Service (NPS) personnel. To date, 22 electrofishing sites and eight seasonal snorkeling sites have been sampled. Habitat parameters have been measured at all sites and parameters include: percent composition of habitat units (i.e., riffle, run, pool, cascade), percent composition of substrate, gradient, width, depth, water temperature, conductivity, dissolved oxygen, pH, turbidity, and flow. Additionally, at seasonal snorkel sites, lab water quality parameters (Ammonia, Total Nitrogen, Total Phosphorus, and Sediment) have been measured.

To assess seasonal habitat use by spotfin chubs, eight sample sites were snorkeled during Spring, Summer, and Fall 2004 (Table 1). The three sites within the Emory River (Nemo, Deermont, and Oakdale) contained more spotfin chubs than sites in Obed River

(Obed Junction), Daddys Creek (Devils Breakfast Table and Daddys Junction), and Clear Creek (Lilly Bridge and Jett Bridge). Adult and young-of-the-year chubs were common in Emory River sites. Digital underwater photos were obtained of fish while snorkeling. The site at Deermont had the greatest numbers of fish during summer and fall samples. The majority of spotfin chubs were found in run habitats over firm (bedrock or boulder) substrates; however, a sample from Oakdale in November 2004 found approximately 50% of fish in pools. Also, 17% of spotfin chubs observed in this sample were found over fines. These observations are the first indication that spotfin chubs in the Emory River Watershed may occupy different habitats during high flow, low water temperature conditions. To date, winter snorkel samples have not been possible due to high water/high flow conditions.

Fish communities have been sampled using electrofishing gear in Obed River and Daddys Creek (22 sample sites; 12 within Daddys Creek Watershed and 10 in the Obed River Watershed; Table 2). Some samples were collected with assistance from TVA, TWRA, TDEC, and Conservation Fisheries, Inc. All fish collected were identified, enumerated, and released. To date, only three spotfin chubs have been collected while electrofishing, all from the Daddys Junction site in the Daddys Creek Watershed. Species richness in the Daddys Creek Watershed varied from six species (Lick Creek and Upper Daddys Creek sites) to 18 species (Hebbertsburg site); the Daddys Junction site had 17 species. In the Obed River Watershed, species richness ranged from two species (Fox Creek) to 17 species (Potters Ford site). Electrofishing of Clear Creek and Emory River Watershed sites will be conducted in 2005.

Benthic macroinvertebrates have been sampled from all sample sites where electrofishing has been performed, and from the eight seasonal sites during Fall 2004. Qualitative samples were obtained using a 1.0 square meter kick screen. Processing of macroinvertebrate samples has begun. Sampling will continue during 2005, with electrofishing sites in Clear Creek and Emory River, in addition to continual seasonal sampling of the eight snorkeling sites. To date, six mussel species have been observed while snorkeling, including one freshly dead Purple Bean mussel on the Obed River.

In addition, a newsletter documenting study progress has been developed. This newsletter will hopefully be available on a monthly basis to all parties involved with this project.