



Fish Dynamics in Urban Streams Near Atlanta, Georgia

A few short decades ago, much of the landscape of the upper Chatahoochee basin was rural in character, dominated by second growth forest and pasture. The basin’s close proximity to the rapidly growing Atlanta metropolitan area, however, has created intense development pressure. For example, in the last five years, the twenty county metropolitan region has added residents at a rate of 50,000 per year—roughly equivalent to the creation of a small city every year. Watershed managers are concerned about the impact of this explosive growth on 35 major warm water streams that flow through the southern Piedmont into the Chattahoochee River. To assess the impact of watershed development, Carol Couch and her colleagues at the U.S. Geological Survey (USGS) have conducted three intensive studies of the fish community in several dozen streams that drain to the Chattahoochee River (Table 1). These studies provide fresh insights on how southeastern warm water streams respond to watershed change.

The original fish community in the warm water streams of the study area was quite diverse, based on historical collections. Some 50 fish species were represented, with 42 native species and eight recent introductions (usually from bait buckets or stocking). Min-

nnows and suckers dominate the warm water fish community, although sunfish, bass, catfish and darters are also well represented. Minnows play a critical role in the food chain as prey for larger fish, reptiles and wading birds. Suckers, which feed off the bottom of streams, often account for the most fish biomass.

The First Fish Survey

In the first watershed study, researchers sampled fish populations at eight urban streams draining older Atlanta neighborhoods and a largely forested reference stream. The urban streams were of second to fourth order, and had watershed areas ranging from 15 to 85 square miles. Each urban watershed ranged from 70 to 90% developed (no measurements of impervious cover were available), and was primarily comprised of residential development. A single fish survey was taken in representative stream reaches within each of the nine watersheds in November 1993.

The survey confirmed that the abundance and diversity of fish declined sharply in urban streams, in comparison to the forest reference. Urban streams also had more non-native fish species than the forest stream (Figure 1). Nonnative species are often among the most

Table 1: Comparison of Three Recent Studies on Fish and Stream Ecology in Urban Watersheds of the Chattahoochee River Basin

Study Factors	Study No.1	Study No. 2	Study No. 3
Investigators/ Affiliation	Couch et al. 1995 USGS/NAWQA	DeVivo et al. 1997 USGS/NAWQA	Meyer et al. 1996 USGS/Univ. of GA
No. of watersheds sampled	9	21	8
Watershed size(square miles)	15 to 85	2 to 101	Unknown
Stream orders	2nd to 4th order	2nd to 4th order	2nd order
Watershed land use	Forest, Urban	Forest, Suburban, Urban	Forest, Suburban, Urban, Agricultural
Scope of study	Fish surveys Substrate assessment	Intensive fish survey, IBI calculation, water quality	Water quality, fish, macro invertebrates, stream ecosystem process rates.
Surveys per site	1	1 to 4	4 or more