The upper stretches of the watershed have been developed more recently. Efforts are being made by the local watershed group, Paxton Creek Watershed and Education Association, to minimize the impact of new development. Unfortunately, the impacts of the development and urbanization in this watershed were evident in the severely and moderately impaired macroinvertebrate populations. The water chemistry performed may not have captured all of the impairments that exist in this watershed, but the parameters that did exceed levels of concern were nitrate-n, total nitrogen, and orthophosphate at PAXT 0.5, and sodium at both sites. Habitat was rated supporting and partially supporting at PAXT 8.4 and PAXT 0.5, respectively. Leeches and algae-covered substrate were noted at the sites, in addition to trash and litter. SRBC currently is conducting a stormwater, nutrient, and sediment study on the Paxton Creek Watershed with an emphasis on habitat remediation. This project was made possible through the support of the U.S. Environmental Protection Agency and the National Fish and Wildlife Foundation and will be implemented over the next three years.

Swatara Creek Watershed

An improvement in biological condition rating was evident at the Swatara Creek Watershed sites as the stream flowed from the headwaters to the mouth. The headwater site (SWAT 56.0) had a moderately impaired biological condition, which may have been due to the habitat, which was rated partially supporting. The area surrounding the stream was dominated by residential land use, and problems included an algae-covered bottom, low frequency of riffles, and high sediment deposition. The water chemistry analysis did not indicate that any parameters exceeded levels of concern. However, there were abandoned mine lands in the headwaters of Swatara Creek, which could have been a source of the impairment.

The biological and habitat conditions improved at the next site downstream, SWAT 39.0. Again, the water quality was rated "higher." Farther downstream (SWAT 21.7), biological and habitat conditions improved further; however, the water quality was rated "middle" due to elevated nitrate-n and total nitrogen. This increase in nitrogen may have been due to the influence of Little Swatara Creek, which enters Swatara Creek upstream of SWAT 21.7. Nitrate-n, nitrite-n, and total nitrogen were high at LSWT 0.6. The nitrite-n level (0.13 mg/l) was the highest recorded for the Lower Susquehanna Subbasin sites (Table 4).

Four tributary sites were sampled along Swatara Creek upstream of the site at the mouth. These tributaries were Quittapahilla, Manada, Spring, and Beaver Creeks. Water quality was rated "middle," and habitat was rated "supporting" on all these streams. MNDA 0.1 and BEAV 0.6 had slightly impaired biological conditions, while QUIT 0.3 and SPRG 0.0 were moderately impaired, most likely due to the high nutrient levels in each of these streams. QUIT 0.3 in particular exhibited very high nitrate-n (9.39 mg/l), total nitrogen (9.96 mg/l), orthophosphate (0.101 mg/l), and total phosphorus (0.119 mg/l) (Table 4). The site at the mouth of Swatara Creek had a nonimpaired macroinvertebrate community, although nutrient levels and sodium were elevated at the time of sampling, and habitat was rated partially supporting.

TRIASSIC LOWLANDS and TRAP ROCK and CONGLOMERATE UPLANDS ECOREGIONS

East Conewago and West Conewago Creeks Watersheds

A creek named Conewago Creek exists on both the east and west sides of the Susquehanna River south of Middletown near York Haven, Pa. Both creeks were located in agricultural areas and were impacted by nutrients. The eastern creek is much smaller and had slightly impaired biological conditions, "middle" water quality, and supporting habitat.

In this survey, West Conewago Creek contained five mainstem and four tributary sampling sites. All sites had "middle" water quality, mostly due to elevated nutrient levels. Biological conditions were either nonimpaired or slightly impaired, although the habitat ranged from excellent to partially supporting. The land use was mostly agriculture; however, most areas surrounding the stream had forested cover, and the lower section of Conewago Creek had a large percentage of natural vegetated area (Figure 3). The tributary Little Conewago Creek flowed through the northwestern part of suburban York, which may account for the five chemical parameters that exceeded levels of concern (Table 4); however, biological conditions were nonimpaired at the mouth. The other sites that had nonimpaired biological conditions were the two headwater Conewago Creek sites, the site at the mouth of Conewago Creek, and the site at the mouth of Bermudian Creek (BERM 1.2). One of the headwater sites, WCON 56.3, served as the reference site for group 64L. South Branch Conewago Creek was slightly impaired and was sampled near the Route 30 bridge in a developed area.

South Branch Codorus Creek.

S. Buda