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Furman University¹ and Harvard University² – Relationships between urban land cover, stream microhabitat structure, and fish assemblages in the Enoree River watershed of northwestern South Carolina.

The impacts of urbanization on stream hydrology and ecology are increasing rapidly in the southeastern US, but little is known about the more specific effects of urbanization on stream microhabitats and fish assemblages. As such, we measured fish diversity and abundance as well as stream velocity and turbidity in three microhabitats (pools, riffles, runs) at ten stream reaches (designated as primarily rural, residential, or commercial based on land use in the headwaters) in the Enoree River watershed. At each site and in each microhabitat, velocity and turbidity were measured, and fish were collected using a backpack electrofisher and seine. We hypothesized that species richness and diversity would be lowest at the commercial sites, and that the fish assemblages would be more homogeneous among the microhabitats at these sites. Additionally we hypothesized that stream velocity and turbidity would reveal the greater instability of the commercial sites. Results showed that species richness and diversity were lowest at commercial sites compared to rural and residential sites, and fish assemblages were more homogeneous among microhabitats at the commercial locations. Abundance was highest in commercial sites but assemblages were dominated by pioneer species. In addition, species richness and diversity were lowest in riffles at each location. Turbidity was greatest at rural sites, and within runs at all sites, with the least variability in velocity among microhabitats occurring in rural sites as compared to commercial and residential sites. Our results show that urbanization is negatively affecting fish assemblages and altering the composition of the various microhabitats.