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As part of an interdisciplinary study of the Little River basin, South Carolina, we examined the relationships between fish community structure, stream nutrient chemistry, and watershed geomorphology from June to August 2003. The Little River is a fifth-order tributary of the Saluda River in the central piedmont of South Carolina. We found a significant difference ( $p < 0.05$ ) in fish diversity between the eastern and western tributaries of the Little River. While both sets of tributaries exhibited similar species richness, the eastern tributaries were characterized by lower overall fish abundance and fairly even distribution of species, resulting in higher Simpson's diversity (4.13). The western tributaries, in contrast, had greater fish abundance, primarily due to large populations of *Notropis lutipinnis* (yellowfin shiner) and *Nocomis leptocephalus* (bluehead chub). The disproportionately large numbers of these two species accounted for the lower Simpson's diversity (2.25) in the western tributaries. Of the 27 stream geophysical and geochemical parameters we measured, stream gradient, drainage area, and total stream length upstream of each sample site were the factors most highly correlated with fish distribution patterns and diversity. In particular, eastern tributaries had higher channel gradients, resulting in structurally more diverse habitats than in western tributaries. As habitat generalists, *N. lutipinnis* and *N. leptocephalus* may better be able to utilize the low gradient habitats of the western tributaries, resulting in the uneven population distribution and diversity seen in the Little River drainage.