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Pollution of aquatic ecosystems from industry is an increasingly common phenomenon. The Upper Enoree, a tributary watershed at the headwaters of the Enoree River basin, has a stream contaminated by a chemical spill that occurred in 1985. During summer 1999 we conducted a survey of the Upper Enoree to determine how this event influences current water chemistry and biology of this stream system. Compared to nearby streams, the impacted stream had significantly higher levels of zinc, manganese, chloride, nitrate and alkali cations, and significantly lower bacterial counts, cyprinid abundance, and aquatic insect abundance. To further characterize the anthropogenic impact on the aquatic life, a transplant experiment was then conducted. *Notropis lutipinnis* were collected from a control site in a nearby stream, placed in minnow traps, and transplanted into control and impacted sites. Survivorship was then determined 3 and 24 hours following transplantation. Survivorship at impacted headwater sites was significantly lower than at unimpacted sites at both time intervals. Microscopic examination of gill tissue revealed significant damage in fishes recovered from contaminated sites. The cause of the mortality and tissue damage is likely due to the elevated zinc levels, although other synergistic effects may also play a role.