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An Assessment of Water Quality, Physical Habitat, and Biological Integrity of an Urban Stream in Wichita, Kansas, Prior to Restoration Improvements (Phase I)

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Abstract. Urban development alters the natural hydrological conditions of many streams and rivers often resulting in the degradation of water quality, physical habitat, and biotic integrity of lotic systems. Restoration projects attempt to improve and maintain the ecological integrity of urban streams; however, few projects have quantified improvements to stream ecology following implementation of restoration measures. This paper summarizes pre-restoration data collected as part of an urban stream restoration project on Gypsum Creek in Wichita, Kansas. Water quality monitoring revealed eutrophic conditions in the stream and the presence of pesticides. Channelization has led to changes in physical habitat including bank erosion, sedimentation, loss of substrate and channel diversity, elimination of in-stream aquatic habitat, removal of riparian vegetation, and decreased base flows. Benthic macroinvertebrate communities appear degraded with more than 90% of individuals collected described as tolerant to anthropogenic stressors. Fish communities were assessed with an Index of Biotic Integrity and were rated as poor to fair, with trophic structure dominated by generalists, no sensitive species present, and one-third of the species collected considered nonnative. Overall, the data collected strongly suggest that site-specific restoration measures need to be implemented in order to improve and maintain the ecological condition of Gypsum Creek. Recommendations for improvements have been made to city managers, with implementation beginning in spring 2003 (dependent upon funding availability).