

## Evaluation of the Fish Community and Related Ecological Features of Cedar Creek, Muskegon County

Richard P. O'Neal

Michigan Department of Natural Resources, Muskegon DNR Office,  
7550 E. Messnger Road, Twin Lake, Michigan 49457

*Abstract.*—Biological and physical evaluations of Cedar Creek were conducted between 1995 and 2006 to assist in developing resource management decisions. Gradient, artificial ditching, discharge, low-flow yield, water temperature, bank stability, bank vegetation, substrate composition, instream wood cover, and fish species composition, abundance, and biomass were evaluated. The middle segment of Cedar Creek supports a self-sustaining coldwater fish community containing brook trout *Salvelinus fontinalis*, rainbow trout (steelhead) *Oncorhynchus mykiss*, and Chinook salmon *Oncorhynchus tshawytscha*. The lower segment flows through the Muskegon River floodplain and contains fish species that prefer warmer water. The headwaters have significant agricultural development that has increased bank erosion. Protection and restoration efforts will be needed to maintain coldwater fisheries as development of the watershed continues; special emphasis needs to be directed at stormwater management.

Cedar Creek, located in Muskegon County in the mid-western portion of Michigan's Lower Peninsula, is one of the principal tributaries of the Muskegon River (Figure 1). Landscape-based groundwater velocity models developed by Wiley and Seelbach (1997) indicate its catchment has the geologic and topographic characteristics that provide the relatively high groundwater velocities typical of Michigan coldwater streams. Accordingly, the entire length of Cedar Creek (24.4 miles) and all of its tributaries (51.2 miles) are trout streams designated by the Michigan Department of Natural Resources (MDNR). Management options provided in the Muskegon River Watershed Assessment (O'Neal 1997) and the Muskegon River Watershed Plan (O'Neal 2003) recommended that Cedar Creek be managed for coldwater fisheries, and that efforts be made to restore water quality in reaches that may be impaired.

The Cedar Creek watershed contains a mixture of high to moderate relief coarse end moraines, an unconfined stream channel lying over glacial-fluvial deposits, and land cover classified as a mixture of forest and light agriculture with some wetlands (Seelbach et al. 1997). The stream is classified as mesotrophic, with moderate nutrients. Stream protection and restoration efforts in Cedar Creek have been ongoing since the 1980s in conjunction with various partner organizations including the U.S. Forest Service, Muskegon-White River Chapter of Trout Unlimited, the Muskegon River Watershed Assembly, the Muskegon County Road Commission, the Michigan Department of Environmental Quality, and the Muskegon River Partnership (which includes multiple university partners). Past activities have included instream habitat improvement, sediment control, and collection of information needed for management initiatives.