

River Restoration in the Upper Mississippi River Basin

Thomas K. O'Donnell

Dr. David L. Galat, Thesis Supervisor

Abstract

River restoration has become an important management choice to address causes and effects of surface water impairment and river modification in the Upper Mississippi River Basin (UMRB). I report information on individual UMRB river restoration projects. Water quality management was the most cited project goal of UMRB projects. Collaborative efforts between agencies that implement UMRB projects may be needed to effectively address water quality concerns. The state of data sources tracking projects deters efficient integration of efforts.

Little evidence of lessons learned resulting from past river restoration projects has been documented. I conducted scripted telephone surveys with river restoration managers to determine the extent of project objective setting, monitoring, evaluation of monitoring data, and dissemination for 70 UMRB projects. Only 34% of projects incorporated a quantifiable project objective. Future restoration programs may increase knowledge gained by offering better guidance on quantifiable, impact-oriented objective setting prior to project initiation.

Implementation of best management practices (BMPs) is a U.S. strategy to reduce sediment delivery to rivers. I used deterministic equations to predict reduction of sediment delivery to rivers over a 30-year period due to BMP establishment on former cropland in the La Moine River Basin, a tributary watershed to the Illinois River. Results indicate a cost-effective strategy to reduce sediment delivery may be constrained by implementation strategies. Future field-based monitoring programs initiated to assess watershed-scale BMP effects may need to quantify channel and floodplain deposition and erosion in addition to watershed sediment yields.