

Evaluating the Effectiveness of Stream Rehabilitation Projects: Lessons Learned From 10 Years of Monitoring

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Evaluating the outcomes of stream rehabilitation projects through monitoring is essential to determine if design objectives are being achieved. Making findings from effectiveness monitoring initiatives accessible to design practitioners and regulators is also essential for further advancing design, monitoring and management practices. While most stream rehabilitation projects receive short term post-construction monitoring (typically 3 years), few are examined over longer time periods.

In 2005 the “Natural Channel Design Monitoring Program” was initiated with a ten (10) year implementation time frame and the following objectives:

1. Develop guidance on the design of effectiveness monitoring programs for stream rehabilitation projects including what components and parameters to examine, how frequent monitoring activities should be performed, and what standard data collection protocols to use;
2. Design and implement programs for ten (10) existing Natural Channel Design project sites around the Greater Toronto Area to examine conditions and evaluate if design objectives are being achieved in the 5 to 15 years post-construction time frame; and
3. Adapt the monitoring program design guidance where warranted, based on the findings and experiences gained from program implementation.

The effectiveness monitoring program implemented included three main components: Fluvial Geomorphology (rapid assessment, long-profile, cross-sectional, and substrate surveys); Aquatic System (fish, benthic macroinvertebrates and habitat surveys); and Terrestrial System (vegetation community, flora, birds and amphibians surveys). Geomorphic survey data was used to classify sites by geomorphic state (i.e., in regime, in transition or in adjustment), and determine what channel adjustment processes were occurring. A “key indicators dashboard” approach was used to summarize conditions at each site, examine temporal trends, and compare results from each monitoring program component.

Information produced was used to determine if site design objectives are being achieved over the medium term. Combined with knowledge of catchment characteristics, it also provided insight into the dominant influences affecting channel geomorphic state and other system components.

Lessons learned about effectiveness monitoring program design, implementation and data analysis will be highlighted.