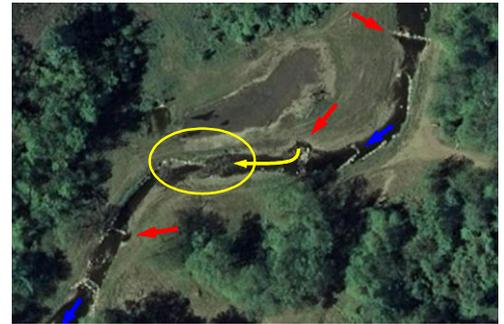


NINE MILE RUN STREAM RESTORATION

Nine Mile Run (Frick Park, Pittsburgh, PA) has undergone a major transformation following completion of a \$7.5 M restoration in July 2006 that included relocating the channel and the addition of structures to improve aquatic habitat and channel stability. The major features of the natural channel design were two channel realignments with C4 geometry and Rosgen based structures used to create a step-pool configuration throughout much of the length of Nine Mile Run. An audit of in-stream structures was conducted by Dr. Bruce Dickson on August 18, 2007 and revealed that thirty-three (33) of fifty-one (51) in-stream structures were compromised (65%) and no longer functioning as originally designed. Structure failure was primarily caused by flanking, undermining, and bedload deposition and could be observed on satellite imagery (top right). Additionally, of the fifty-one (51) structures assessed, twenty-seven (27) were identified as impassable to fish.

An emergency retrofit plan to stabilize the stream channel and address many of the documented problems was developed with Dave Derrick of USACE and saw the removal, replacement, or reconstruction of critically failing structures and enhancements to structures that were at risk of failure (completed over eight days in September 2007). Many failing structures (right photos) were replaced by Ecorestoration Inc. with engineered rock riffles (bottom left) allowing fish passage and keys were extended and planted with live poles where possible. Nine Mile Run remains in a dynamic state and is far from being geomorphically stable. The stakeholders involved in this project must recognize that they are in the very early stages of a long-term restoration project that will require constant reassessments, maintenance, and adaptive management to be sustainable. Removal of remaining fish barriers and modifications to failing structures not completed in September 2007, additional vegetative plantings, and annual geomorphically-based monitoring will continue until all structures are stable and allow fish passage.



Failures as seen in Google Earth



Dave Derrick at Cross Vane Fish Barrier



Typical Flanked Structure



Root Wads Causing Bank Failure

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