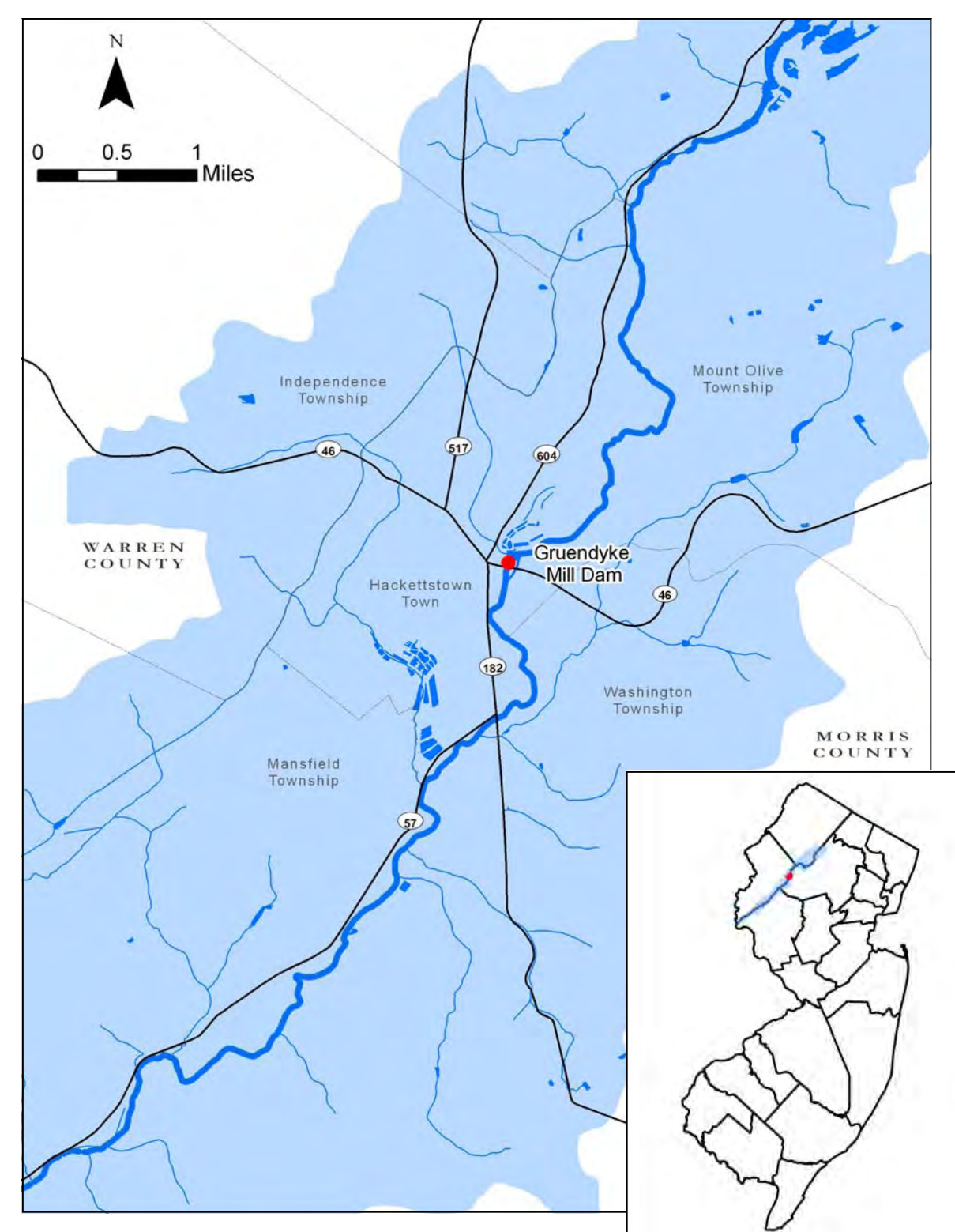




Gruendyke Dam Removal: Initial Step in Restoring the Musconetcong River



Geoff M. Goll, P.E. Jacob Helminiak, P.E. Paul M. Woodworth

Project Partners:

Rodger & Irene Cornell
Owners

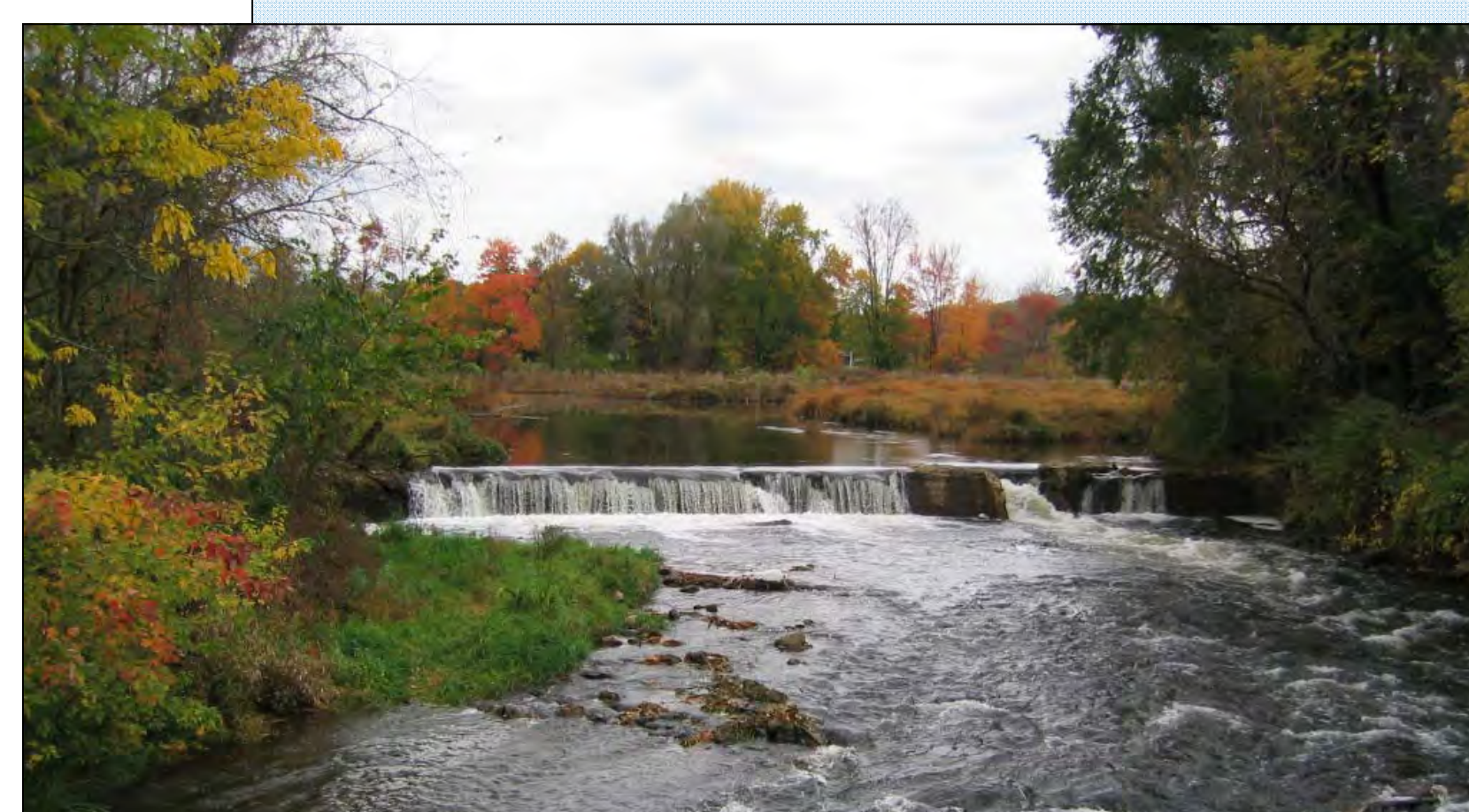


Project Highlights

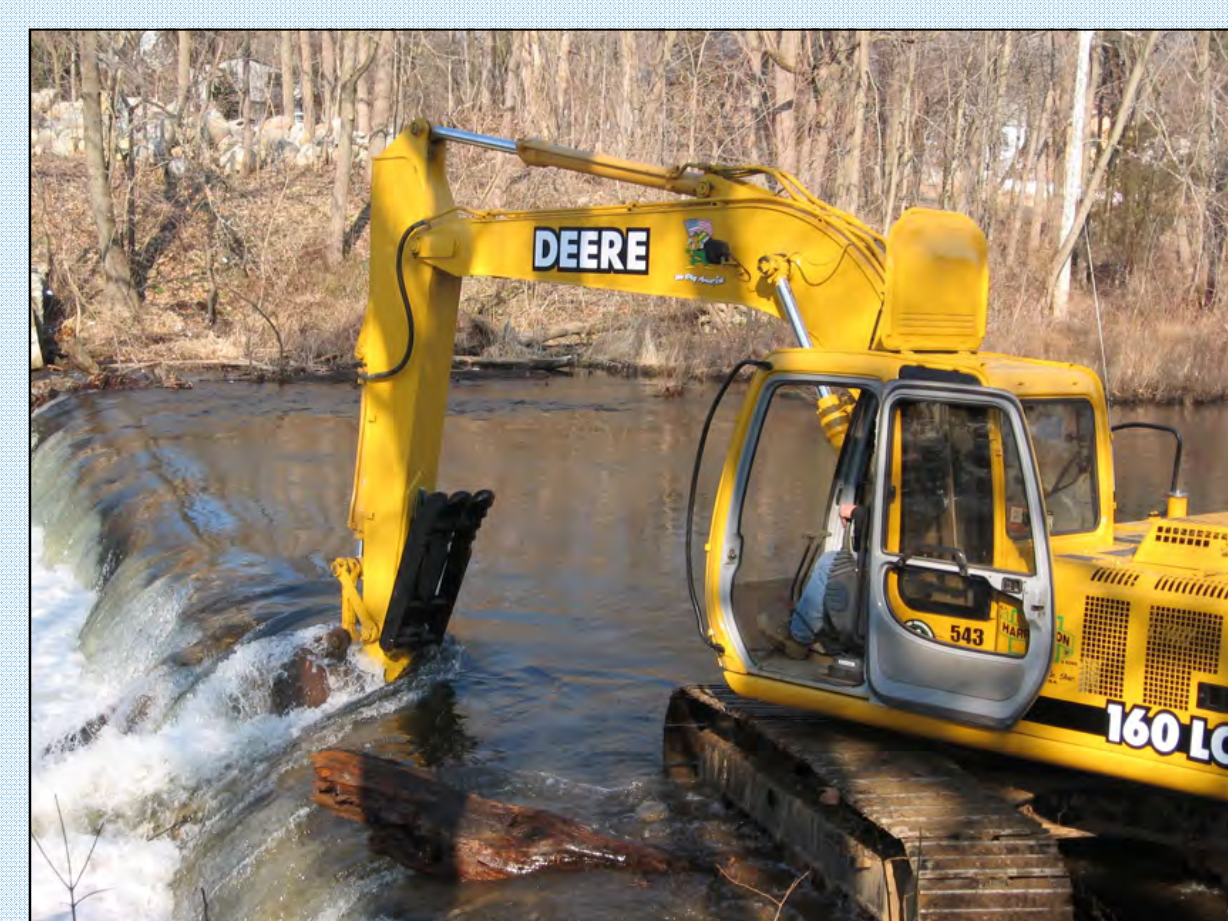
- Part of a watershed-wide effort to remove dams and other barriers to fish passage
- Lead by a local river champion - Musconetcong Watershed Association
- Regional & National Significance:
 - State Designated Trout Maintenance Area
 - Federally Designated Wild & Scenic River Segment
- Immediate upstream dam removed in February 2009
- The first blockage on River is scheduled for removal in 2010
- Next four dams targeted for subsequent breach or removal

Design Considerations

- **Protect Infrastructure:**
 - Route 46 Bridge
 - Historic mill foundation
 - The Pump House Restaurant
- Prevent significant headcutting
- Stabilize steep adjacent banks
- Restore fish passage
- Allow canoe/kayak passage



Pre-Removal - 10/11/06



Notching dam to begin draining the impoundment - 3/11/08



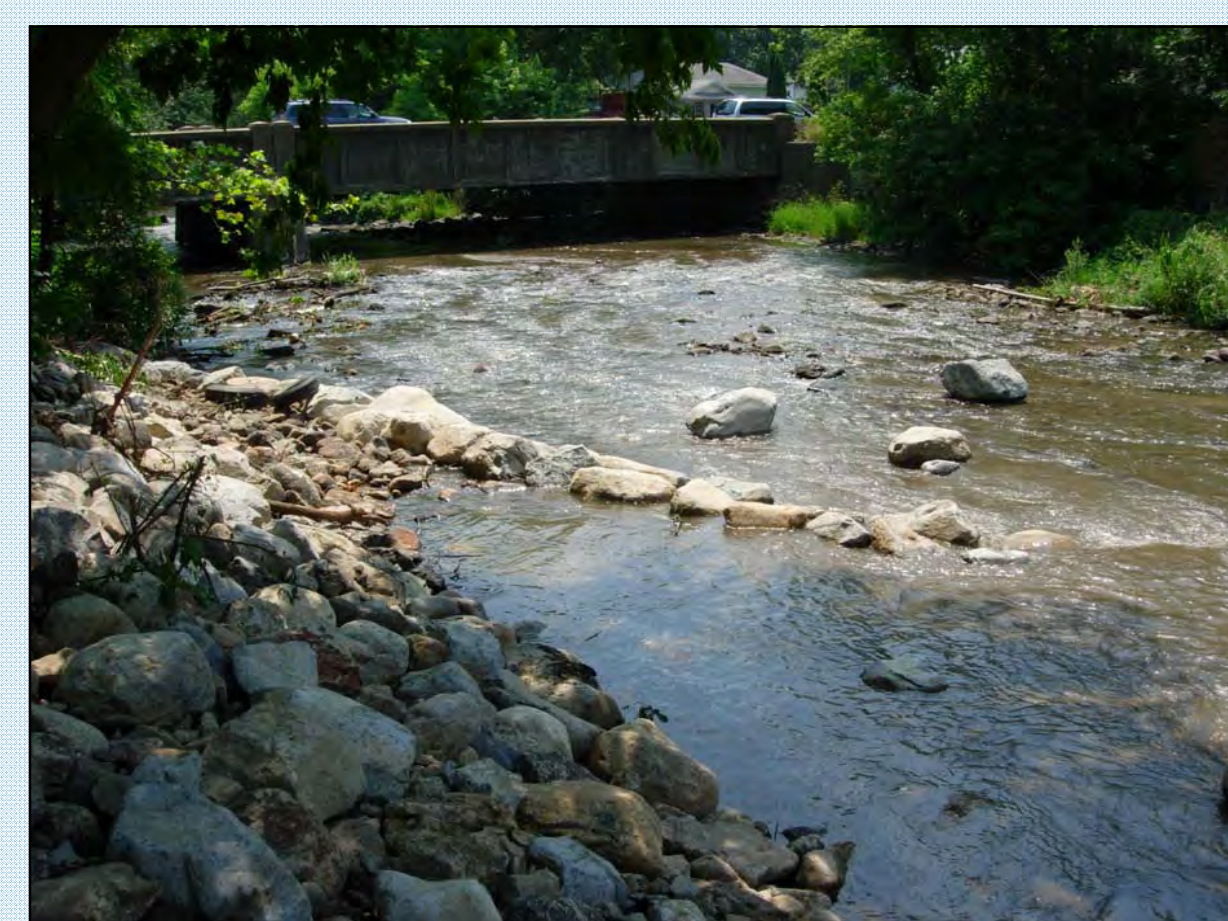
Dewatering the impoundment - 5/14/08



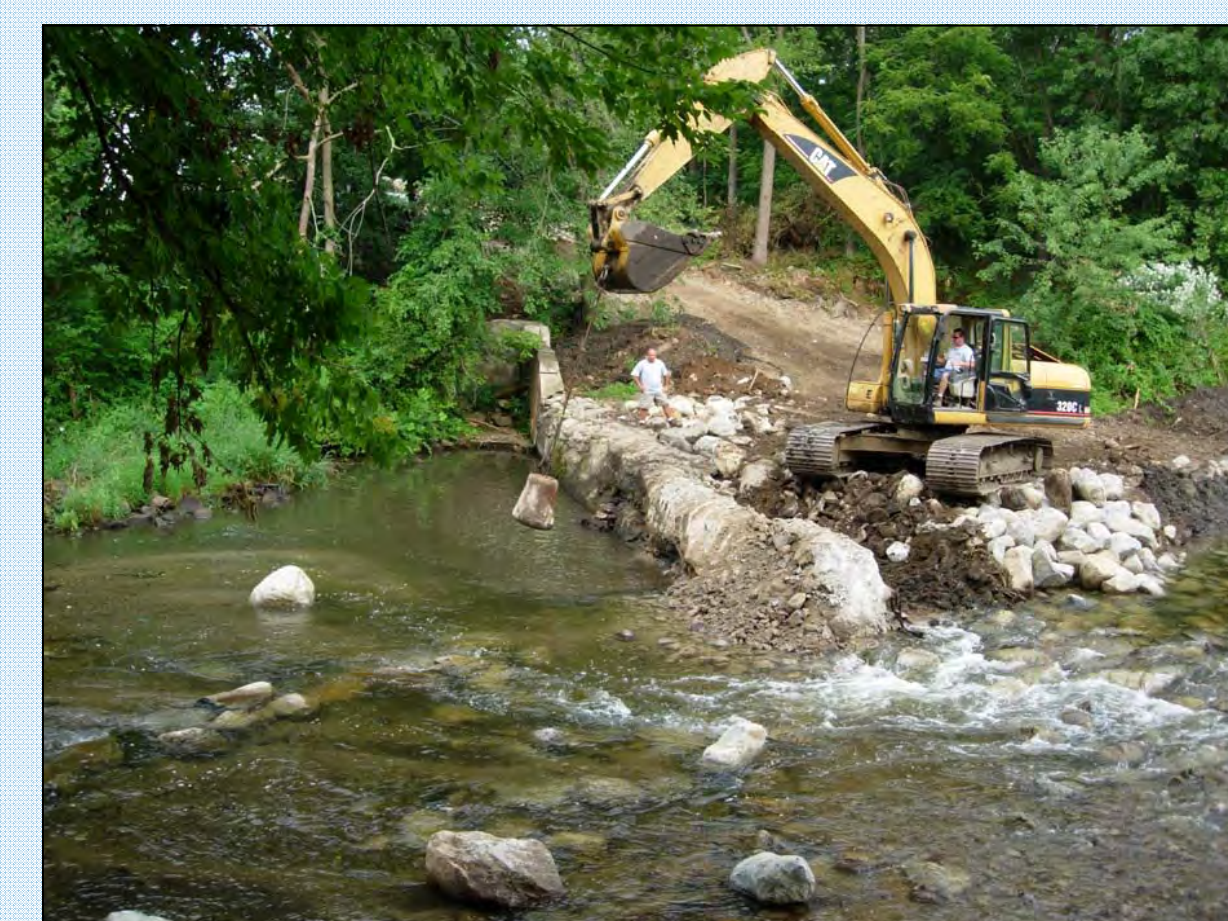
Removing river left half of dam to lower water levels and begin weir installation - 6/16/08



Installing lower weir on river left - 7/17/08



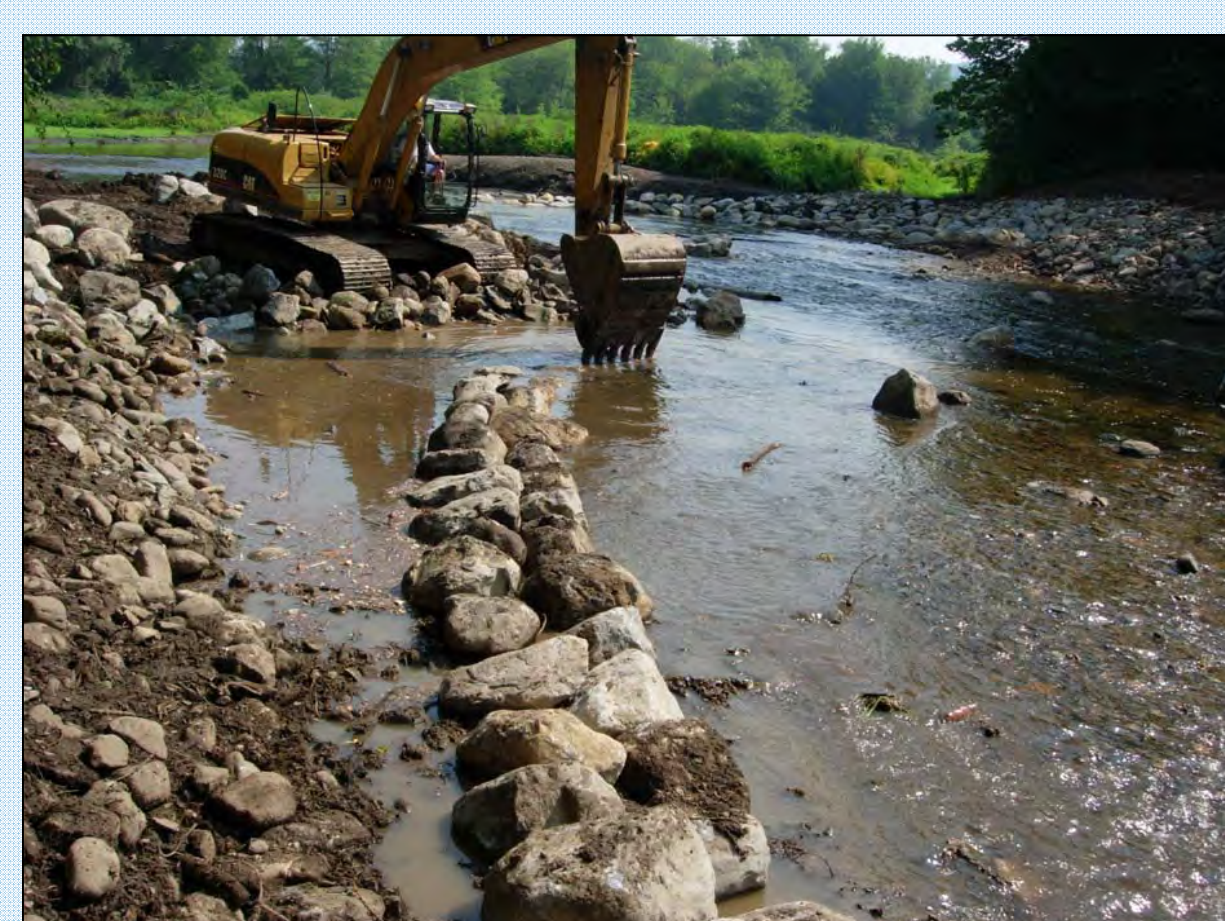
Lower weir completed on river left, looking downstream - 7/18/08



Removing river right half of dam - 7/21/08



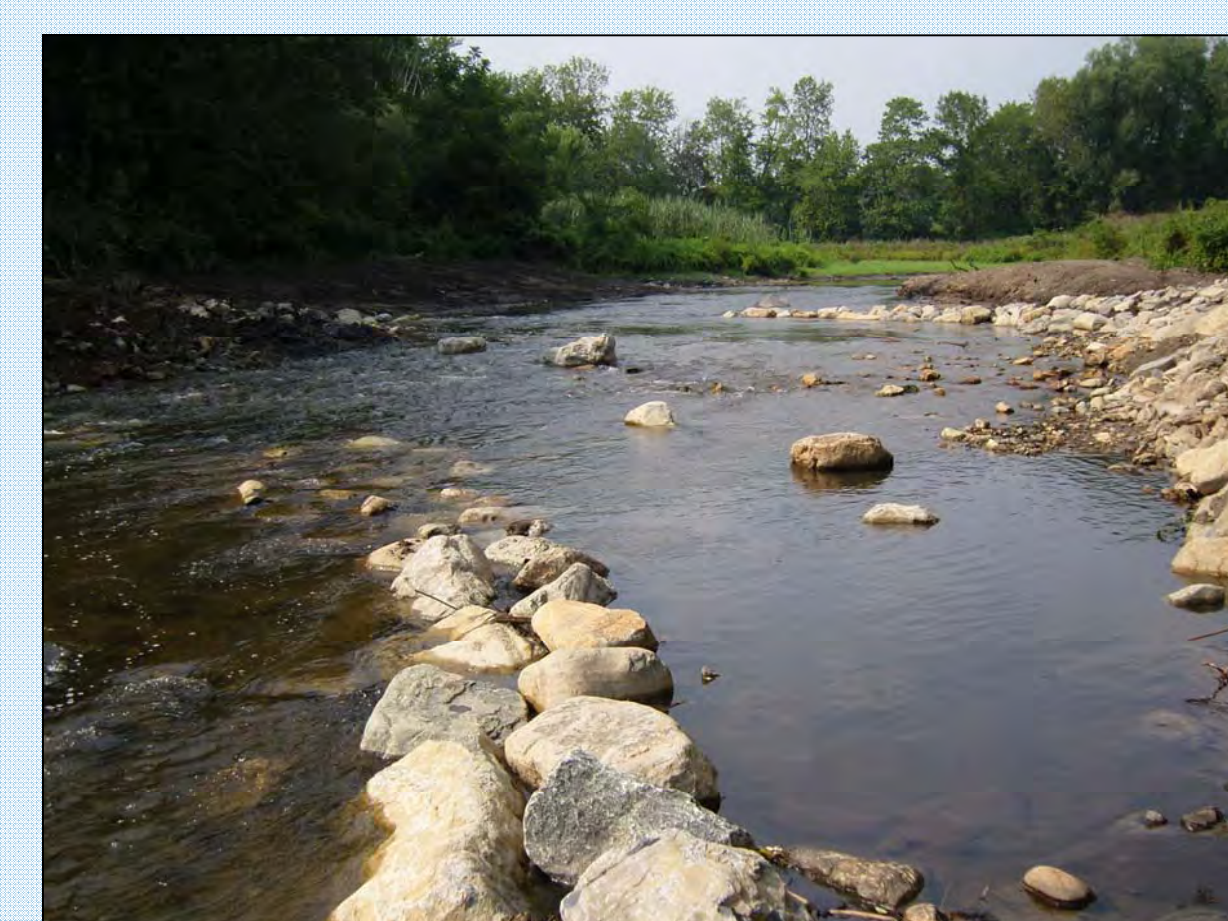
Modifying upper weir on river left - 7/25/08



Installing lower weir on river right - 7/28/08



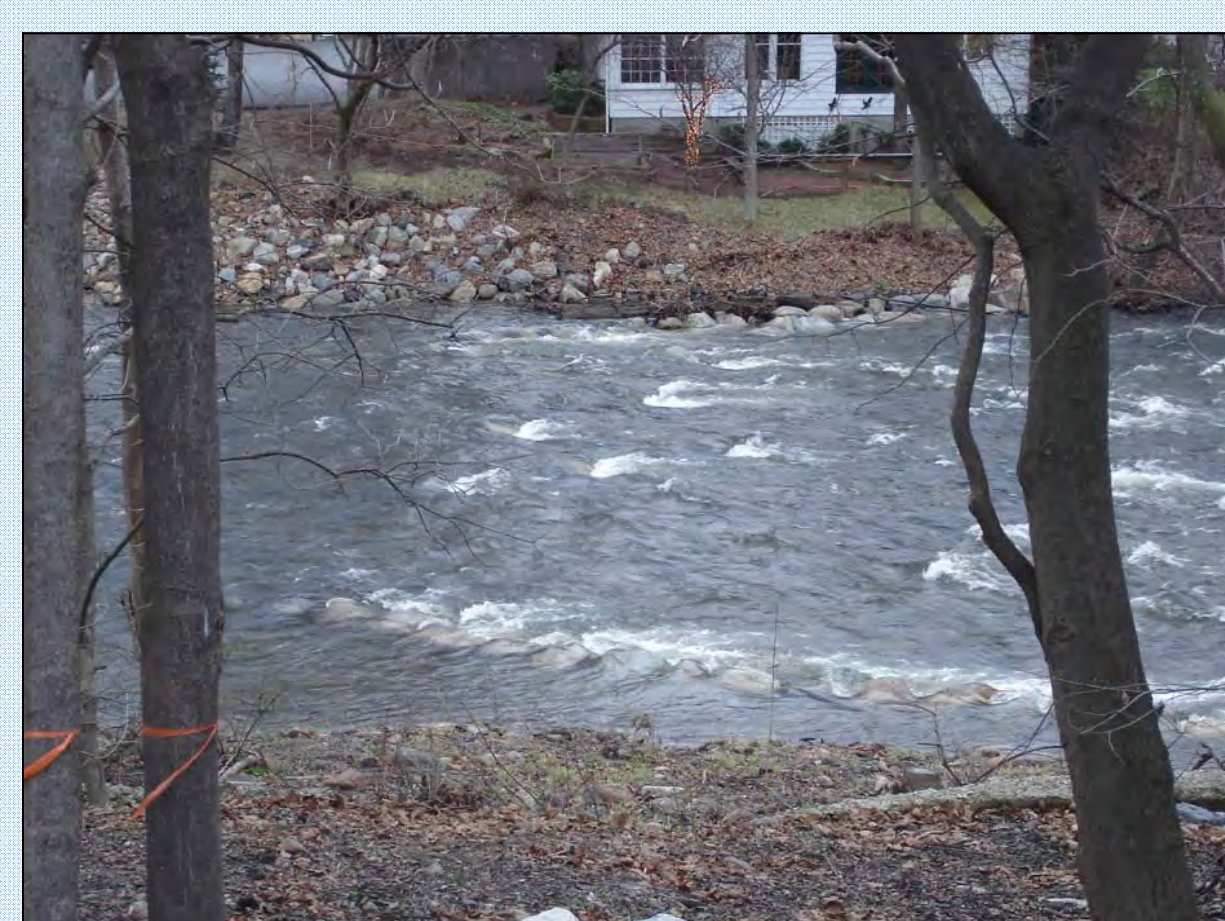
Installing upper weir on river right - 7/30/08



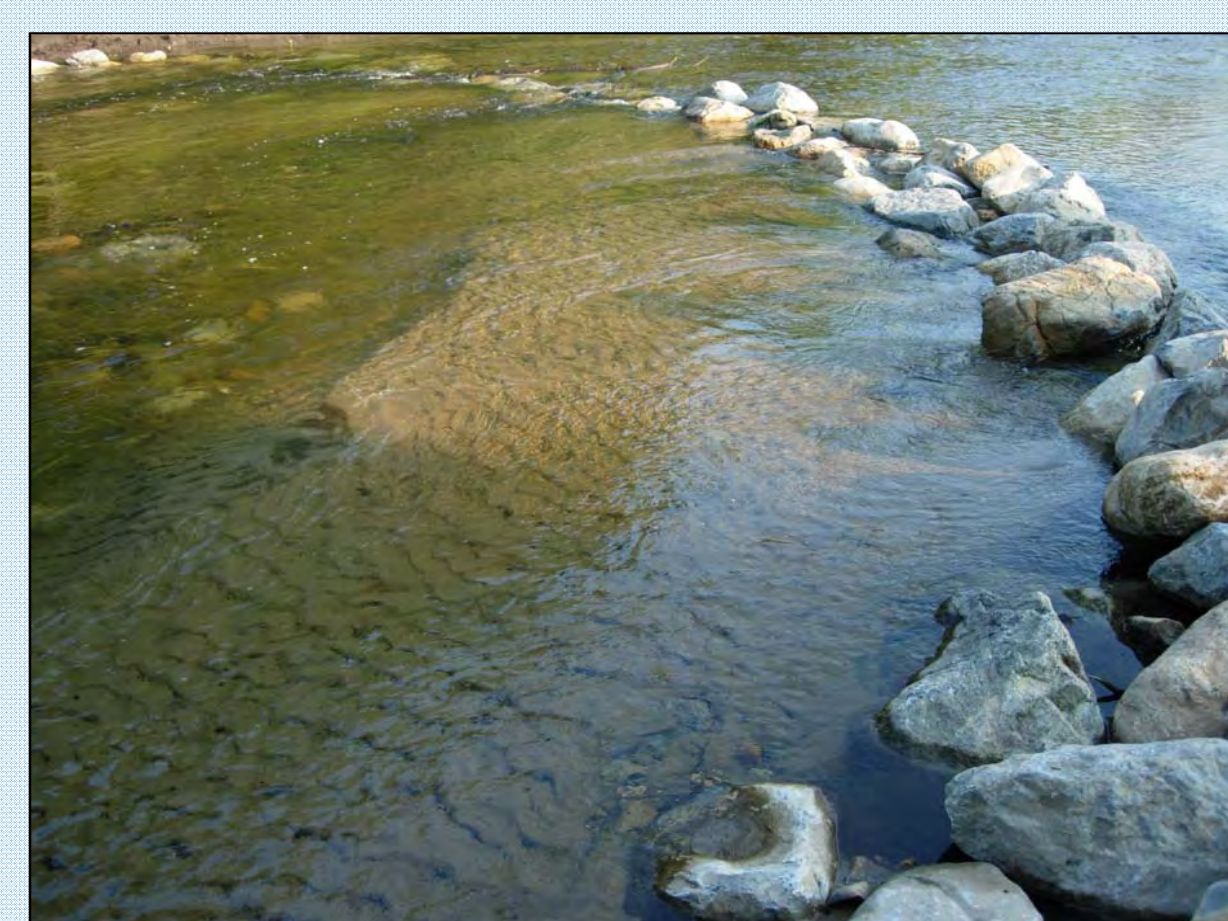
Upper and lower weirs completed on river left, looking upstream - 7/30/08



Completed lower weir - 8/6/08



High flows directed away from banks 12/2008



Deposition on channel margins during low flows - 8/2008



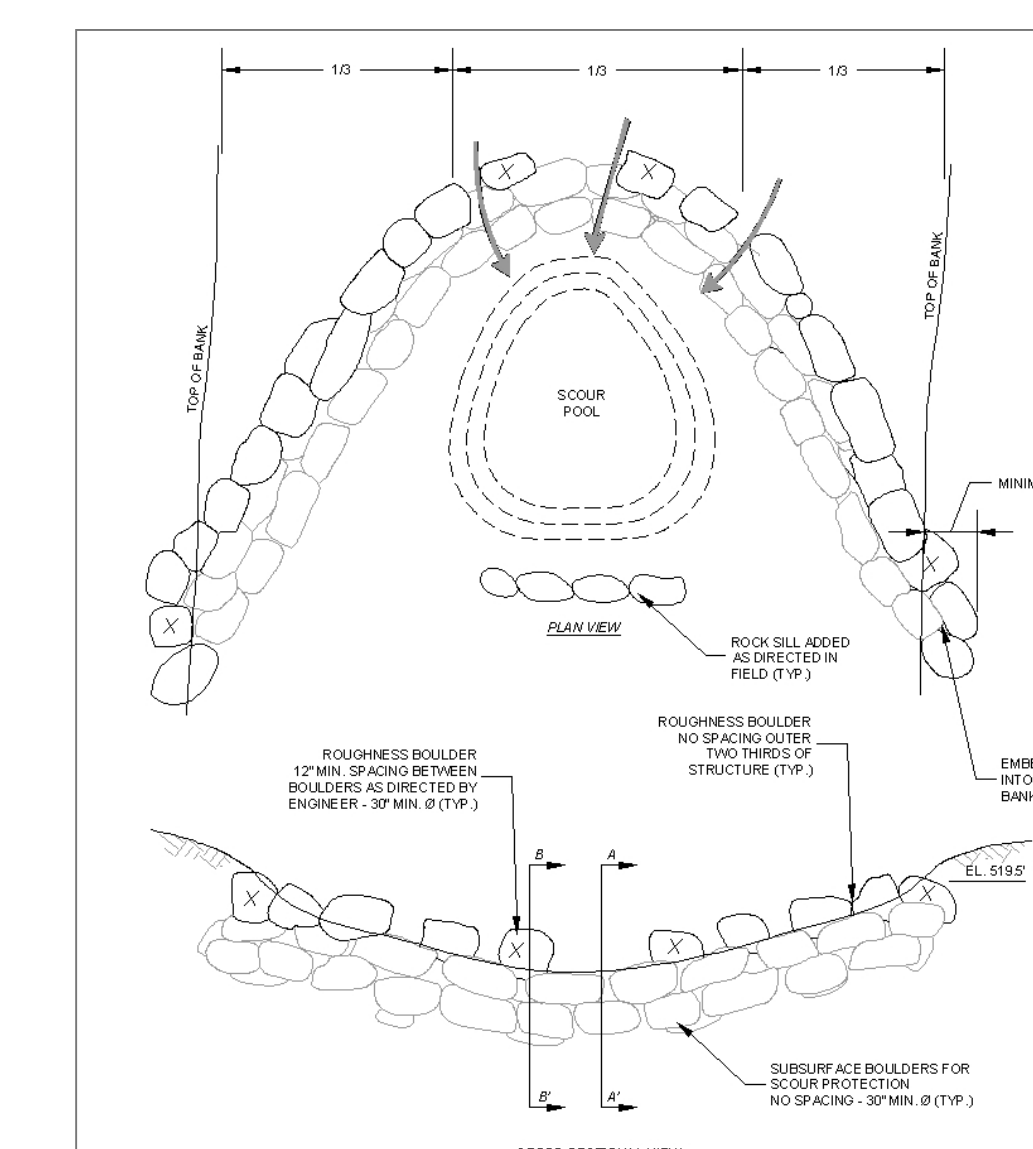
Reduction in near bank velocities - 12/2008



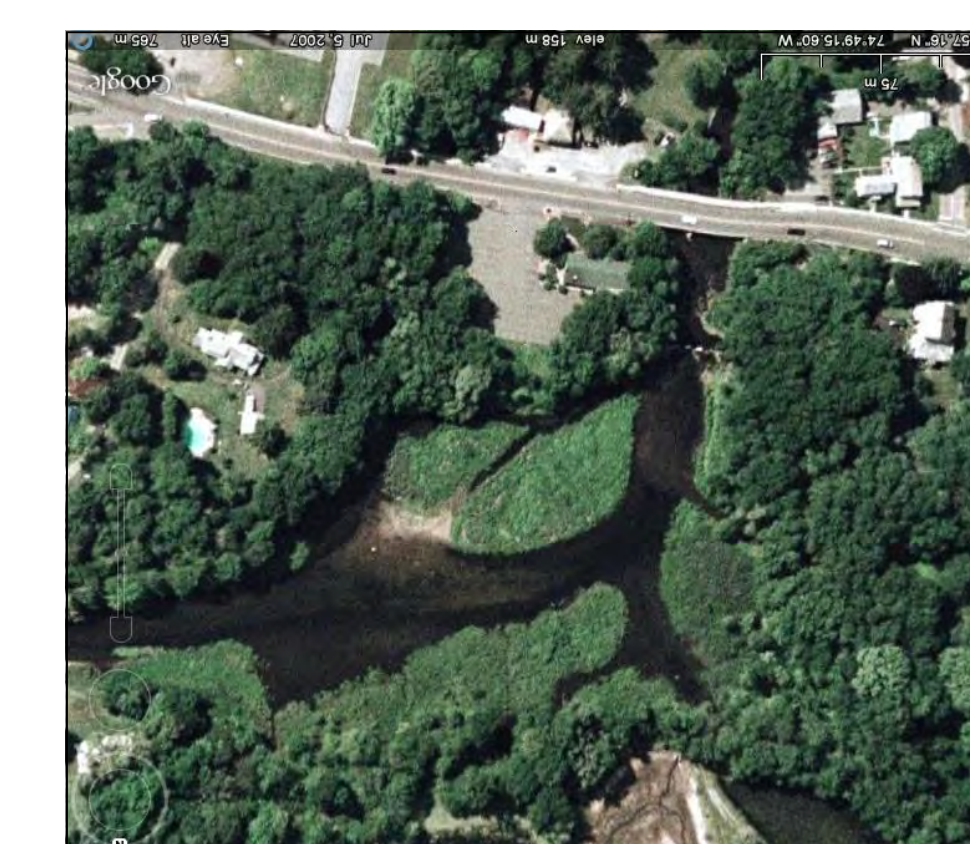
Completed Weirs - 7/30/08

Design Features

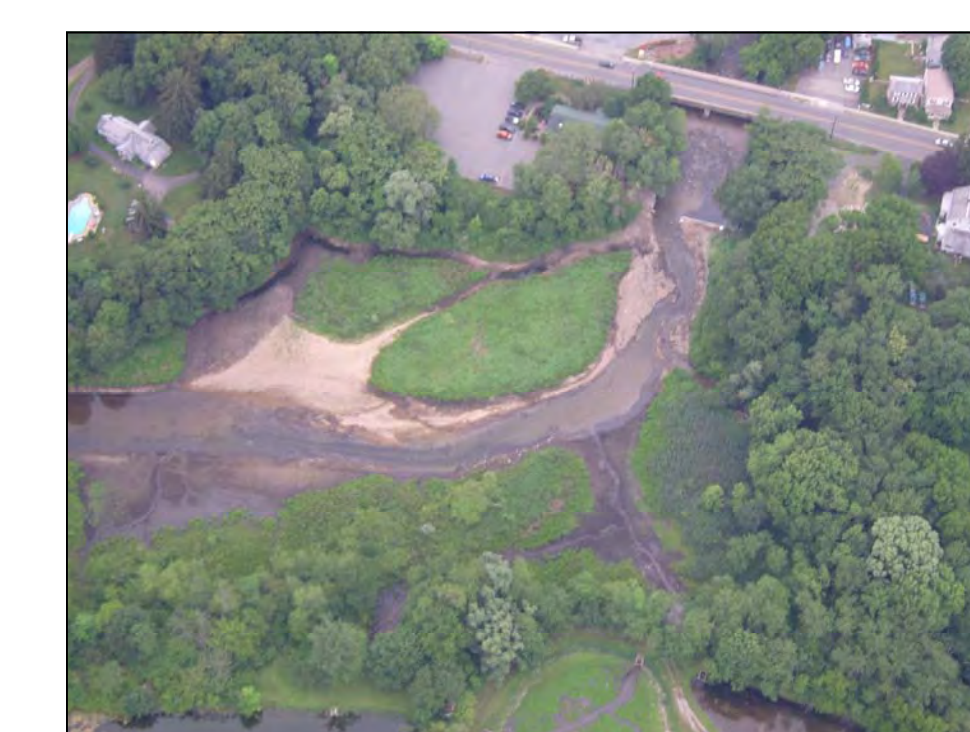
- Used native boulder vortex weirs
- Created pool/riffle habitat
- Reduced near bank shear stress
- Redirected thalweg away from bridge pier
- Maintained desired riffle sounds & Improved river aesthetics for Pump House Restaurant



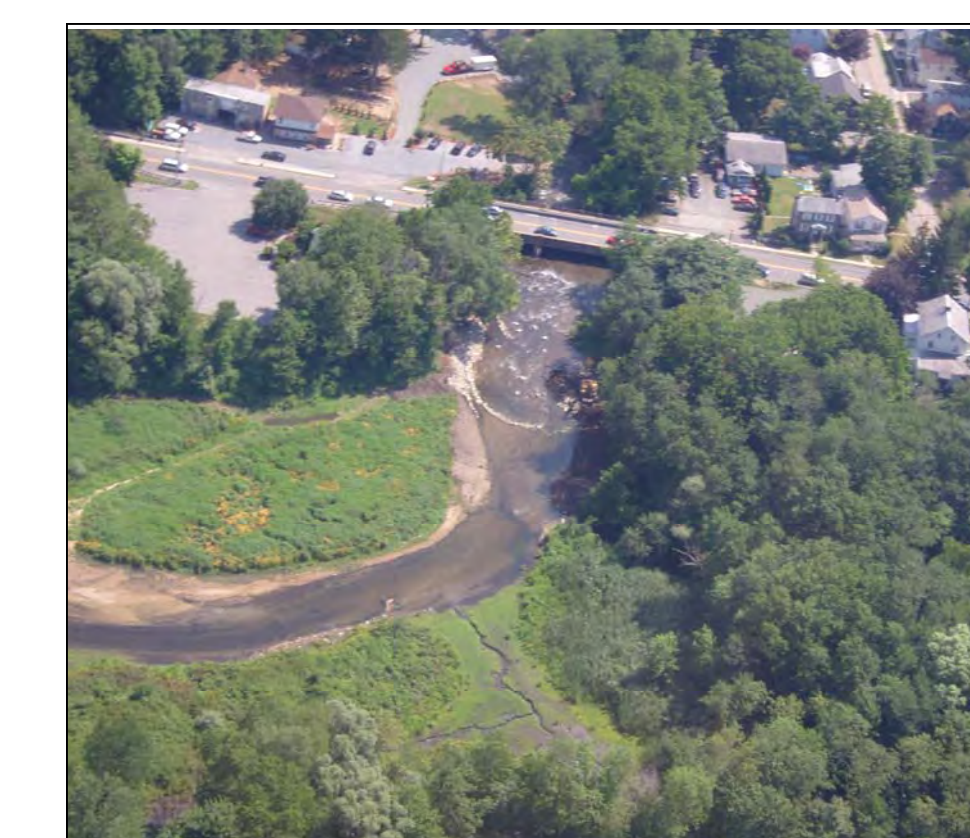
Boulder Vortex Weir



Pre-Removal (Google Earth)



Partial Removal - 6/27/08



Partially Installed Weirs - 7/25/08



Completed Weirs - 7/30/08