

*Presentation to the*

# Upper Midwest Stream Restoration Symposium

## Habitat Improvement on Valley Creek

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Feb. 22, 2010



# Topics

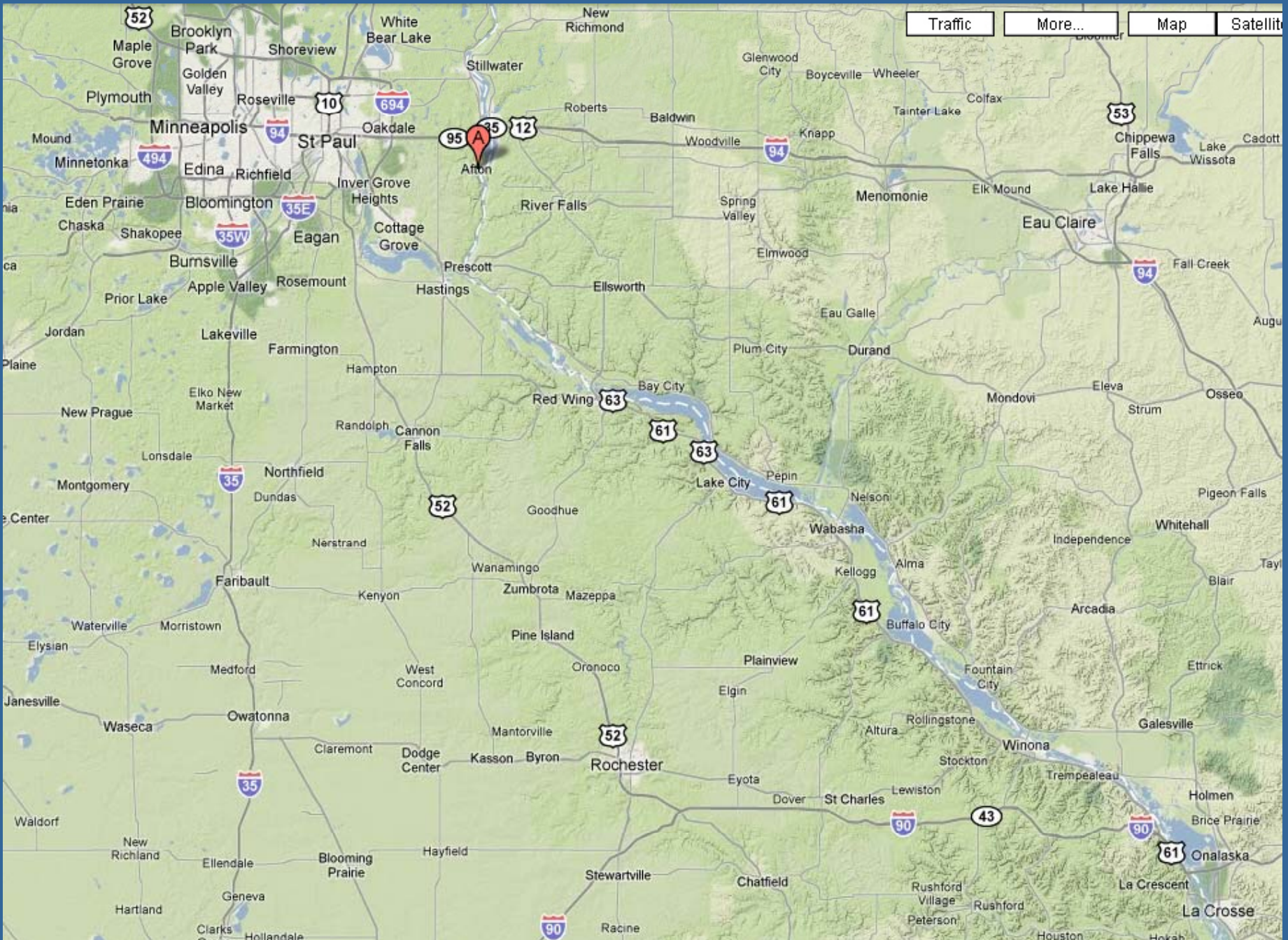
- Background
- Options Study
- Design Process
- Construction
- Post-Construction Challenges
- Monitoring
- Lessons Learned

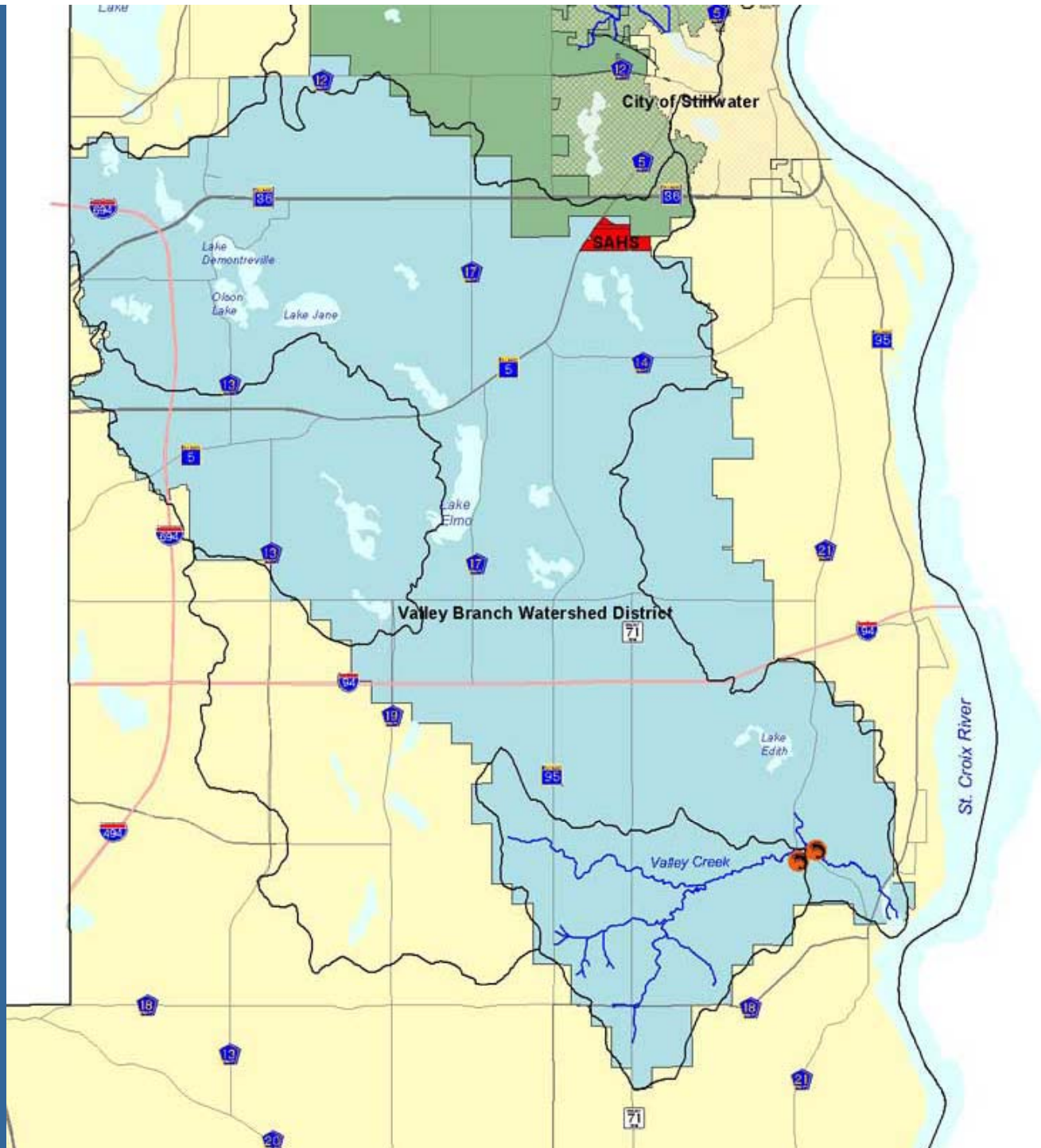


# Valley Creek

- One of 13 trout streams within the Twin Cities metropolitan area
- One of few that has a naturally reproducing population of native brook trout and brook lamprey
- Also sustains large populations of non-native brown and rainbow trout
- Believed to be in the top 10% of trout streams in the world in terms of trout production *(based on personal communication with Tom Waters and Ray Newman)*







# Valley Creek

- Flows into the St. Croix River, a federally designated Wild & Scenic River
- Lake St. Croix at Valley Creek's mouth is listed as impaired by the MPCA
- Estimated 1,400 tons of sediment per year enter Valley Creek from its watershed



St. Croix River.  
Photo: Nile Fellows

# Valley Creek Repair & Rehabilitation Program

- EPA 319 Grant
- BMP Education
- Infiltration basin
- Stabilize 2,200 feet of the Main Stem of Valley Creek on two properties



FROM THE HEADWATERS OF  
**VALLEY CREEK**  
TO THE  
ST. CROIX RIVER,  
**CLEAN WATER  
MAKES WAVES**

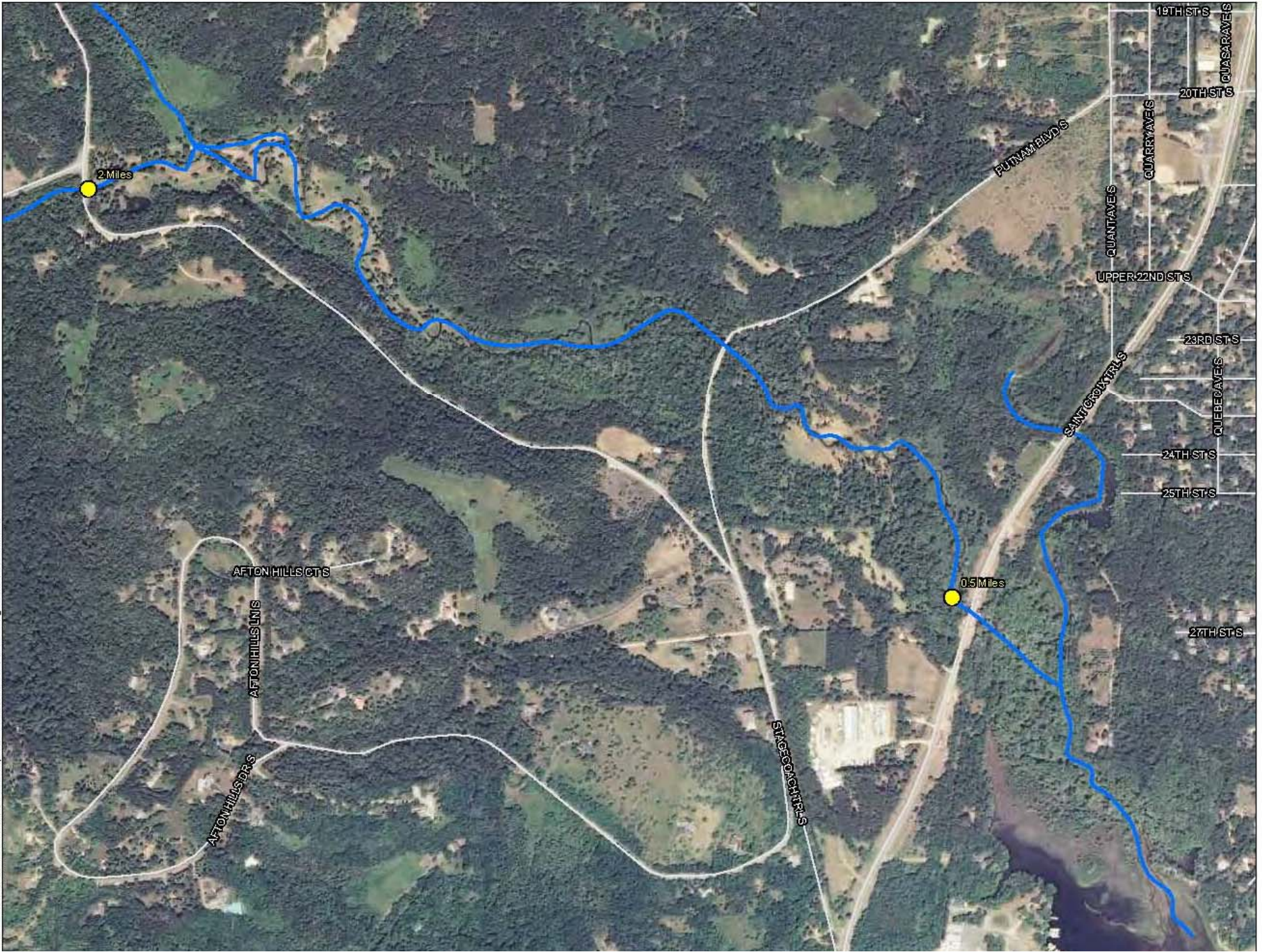
**Hooded Warbler**  
**White Wild Indigo**  
**Rainbow Trout**  
**Blanding's Turtle**

**YOUR HOME IS THEIR HABITAT**

A hooded warbler alights across the surface of Valley Creek. White wild indigo borders its banks, and trout rise in pursuit of caddis flies. Valley Creek is a special place, and as a landowner along the creek, you are a critical part of the creek's ecosystem.

As one of Minnesota's best trout-producing streams, Valley Creek is worth protecting. You can help to ensure clean water and a healthy habitat for the fish, plants, and wildlife that call Valley Creek home by participating in one of many restoration projects.

**Valley Branch Watershed District**















10-19-05



# Challenges:

- Severely incised/widened channel
- Lack of LWD
- Sand bed and banks
- Poor vegetation
- “Active” landowner



# Downstream Stabilization Project

## Options Considered:

- 1) Excavate new, lower floodplain
- 2) Construct new channel (preferred option)
- 3) Raise bed of existing channel
- 4) Combination of 1) and 3)

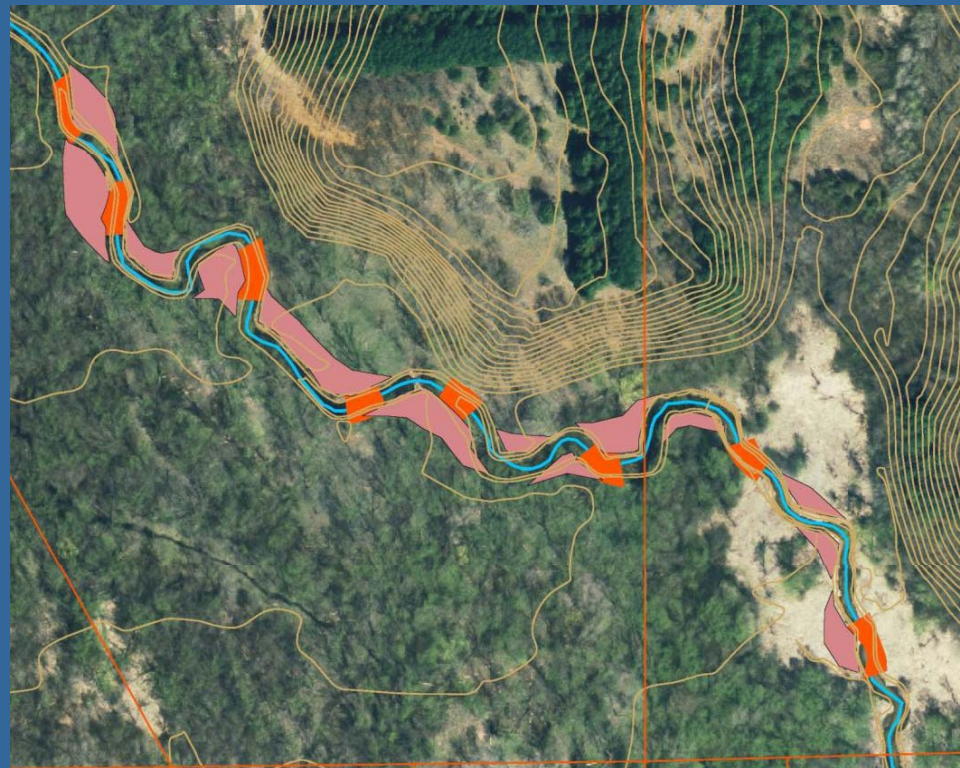




# Option 4 Selected

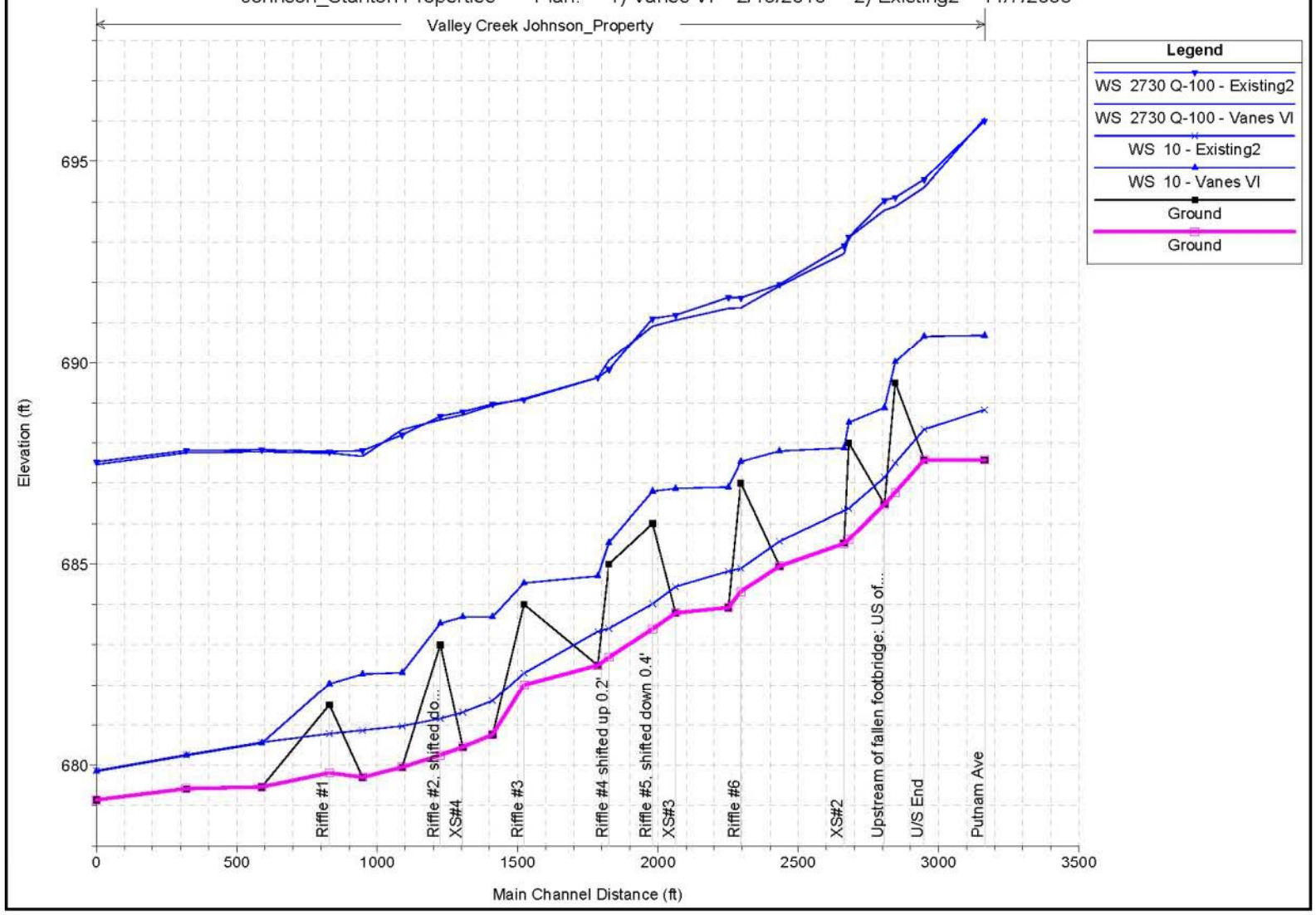
## Floodplain grading and grade control

- Excavate floodplain terraces
- Boulder riffles for grade control

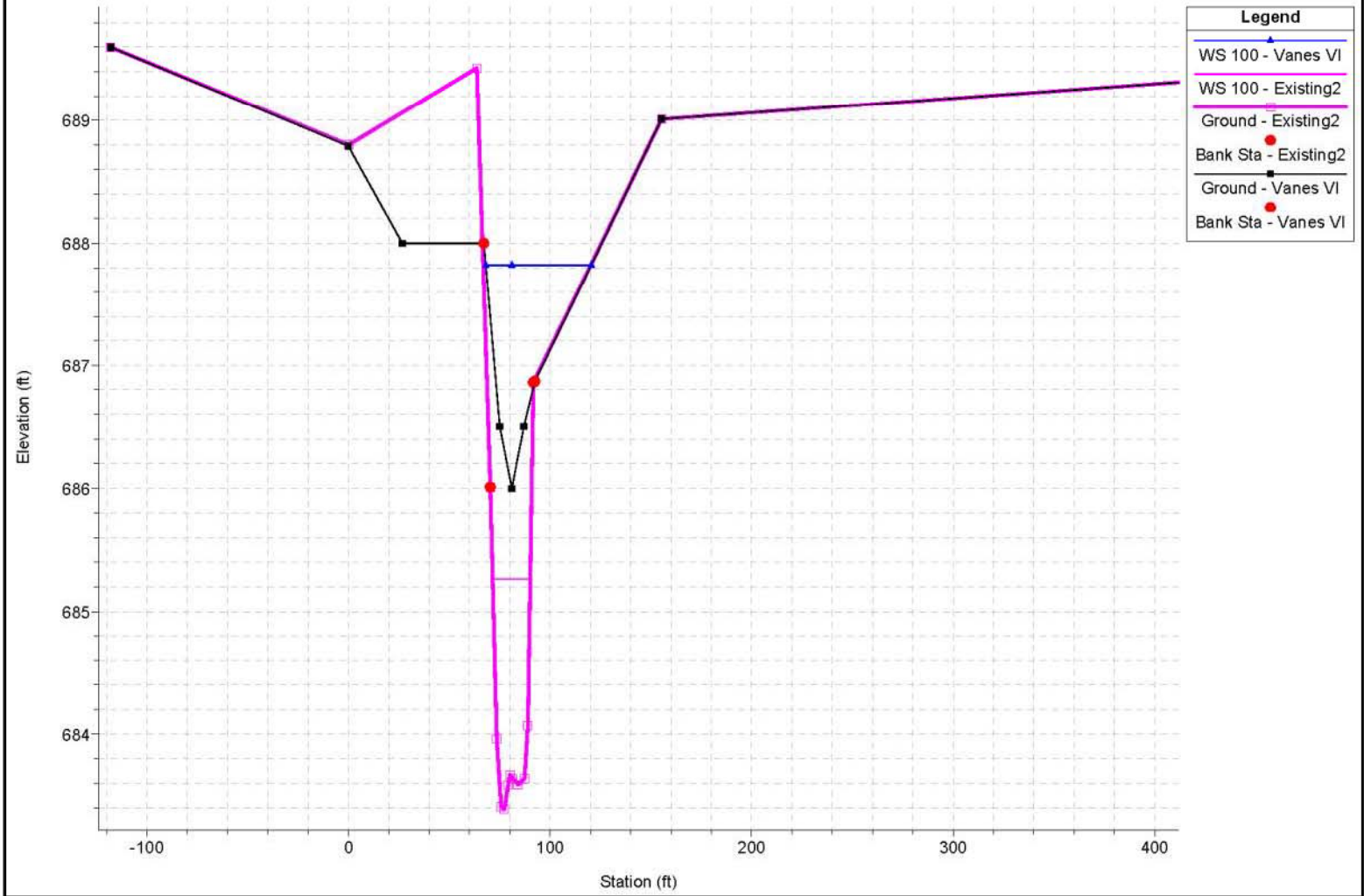


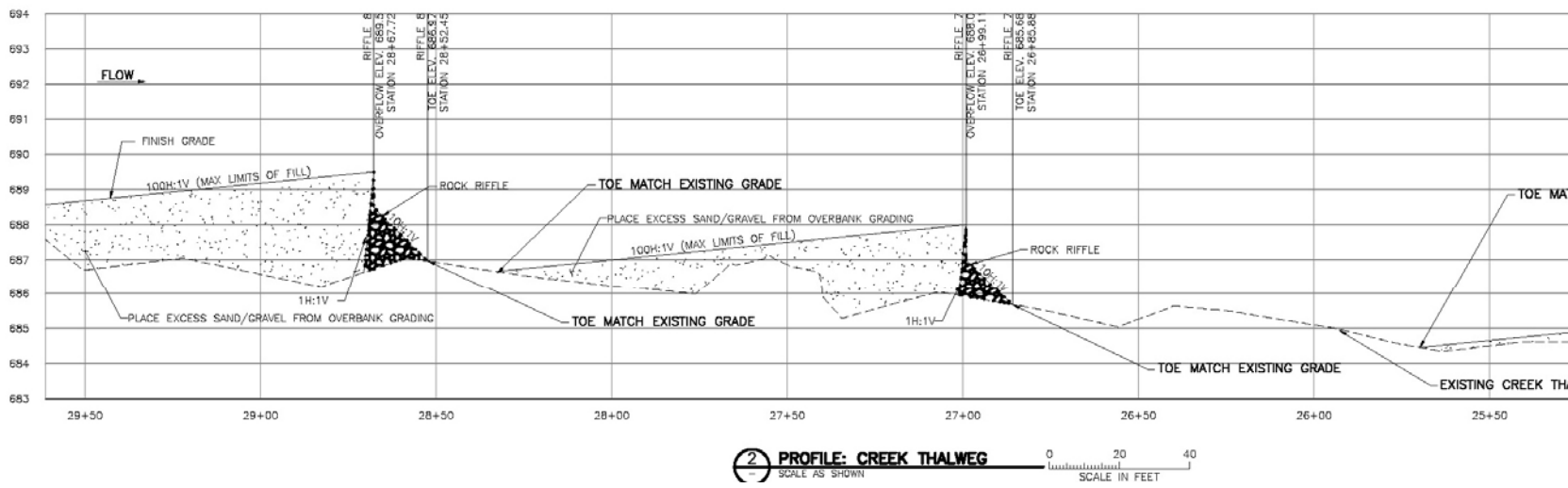
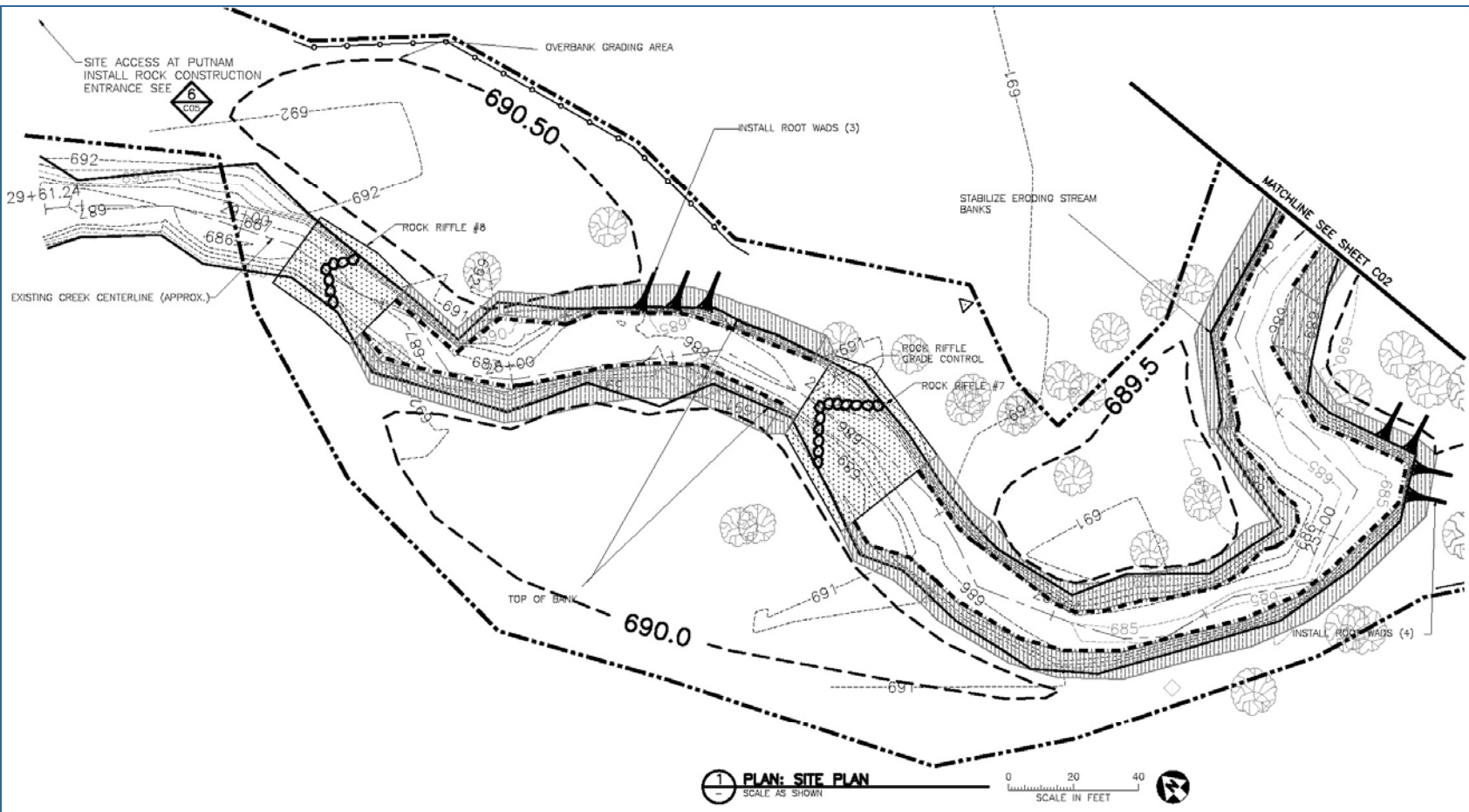
Johnson\_Stanton Properties Plan: 1) Vanes VI 2/18/2010 2) Existing2 11/7/2008

Valley Creek Johnson\_Property



Johnson\_Stanton Properties Plan: 1) Vanes VI 2) Existing2  
RS = 2000 Riffle #5, shifted down 0.4'





# Inclusion of Buffer

- Plant excavated terraces in native grasses
- Landowner Agreement: buy-in difficult
- 5-year exclusion



# Final Design

- Excavate floodplain terraces
- Eight Boulder riffles for grade control
- 45 root wads installed
- 7,000 feet of biolog
- Native grass, willow stakes and shrubs

















# Snowmelt Event Feb. 2009

Bank vegetation not yet established....















# CSAH 18 Bridge Replacement

- MnDNR Habitat improvement project to mitigate wetland loss
- Narrowed channel width beneath bridge using lunker structures
- Root wads provide for stable banks and fish habitat
- Boulder riffle grade control



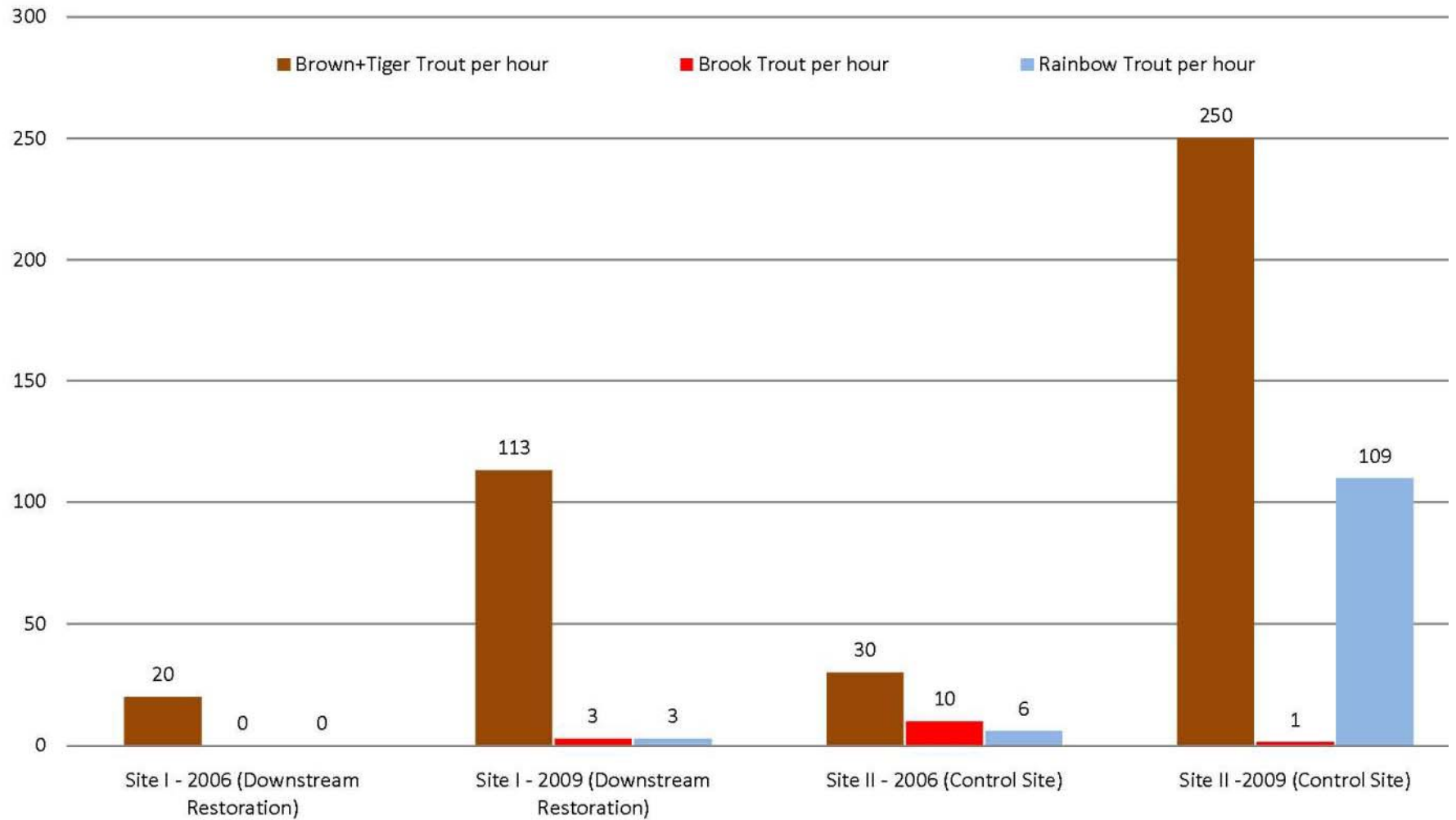


# Fish and Macroinvertebrate Sampling Performed

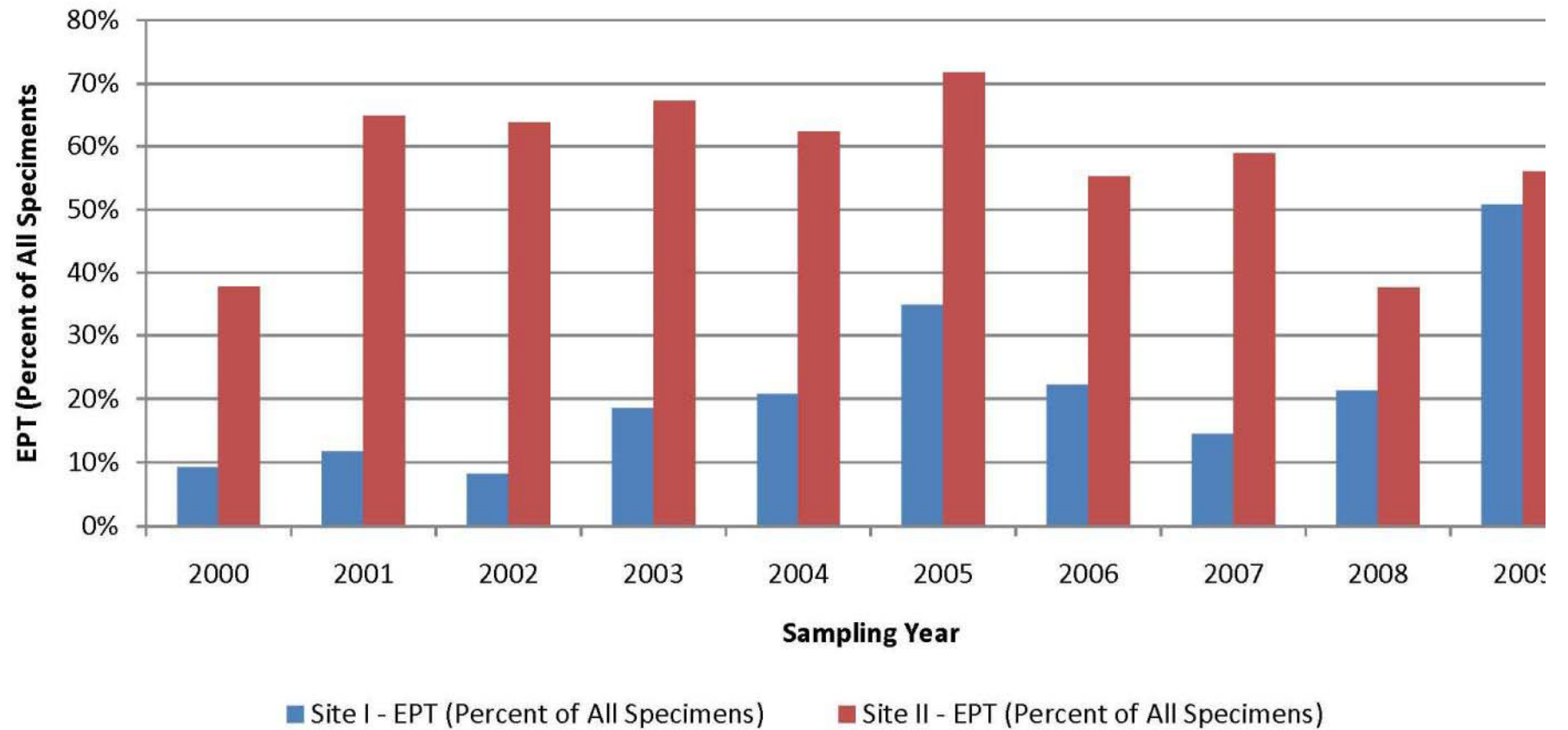


- Site I located upstream of CSAH 18 bridge, downstream of VBWD project
- Site II (control site) located upstream at Stagecoach Road
- Both sites also sampled by MnDNR in 2006

Trout Collected per Hour of Sampling  
Valley Creek 2006 and 2009



## Valley Creek Aquatic Macroinvertebrate - Percent EPT





# Lessons Learned:

- 1-D Model may be inadequate for determining design velocities
- Artificial structures poor (but hopefully temporary) substitute for large woody debris
- Projects on private property risky (obtain landowner agreement early)
- Need to manage expectations of client
- Monitoring critical to evaluate project



# Questions?

