Assessing dam removals on a shoestring: Using Underwater Photos to Complement Bug data

Musconetcong Watershed Association

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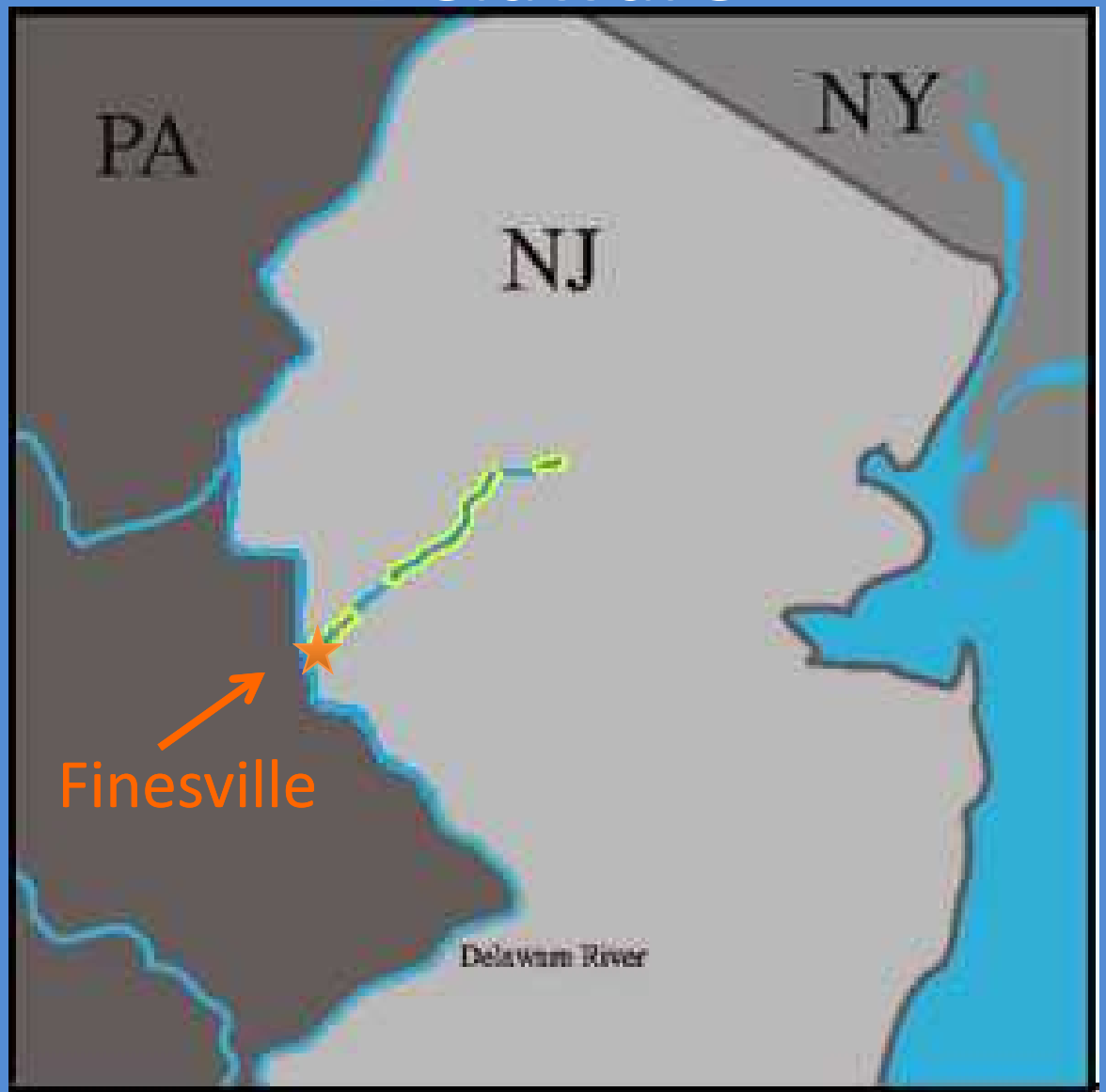
The Musconetcong is Wild & Scenic!

Finesville is one mile upstream of the Delaware

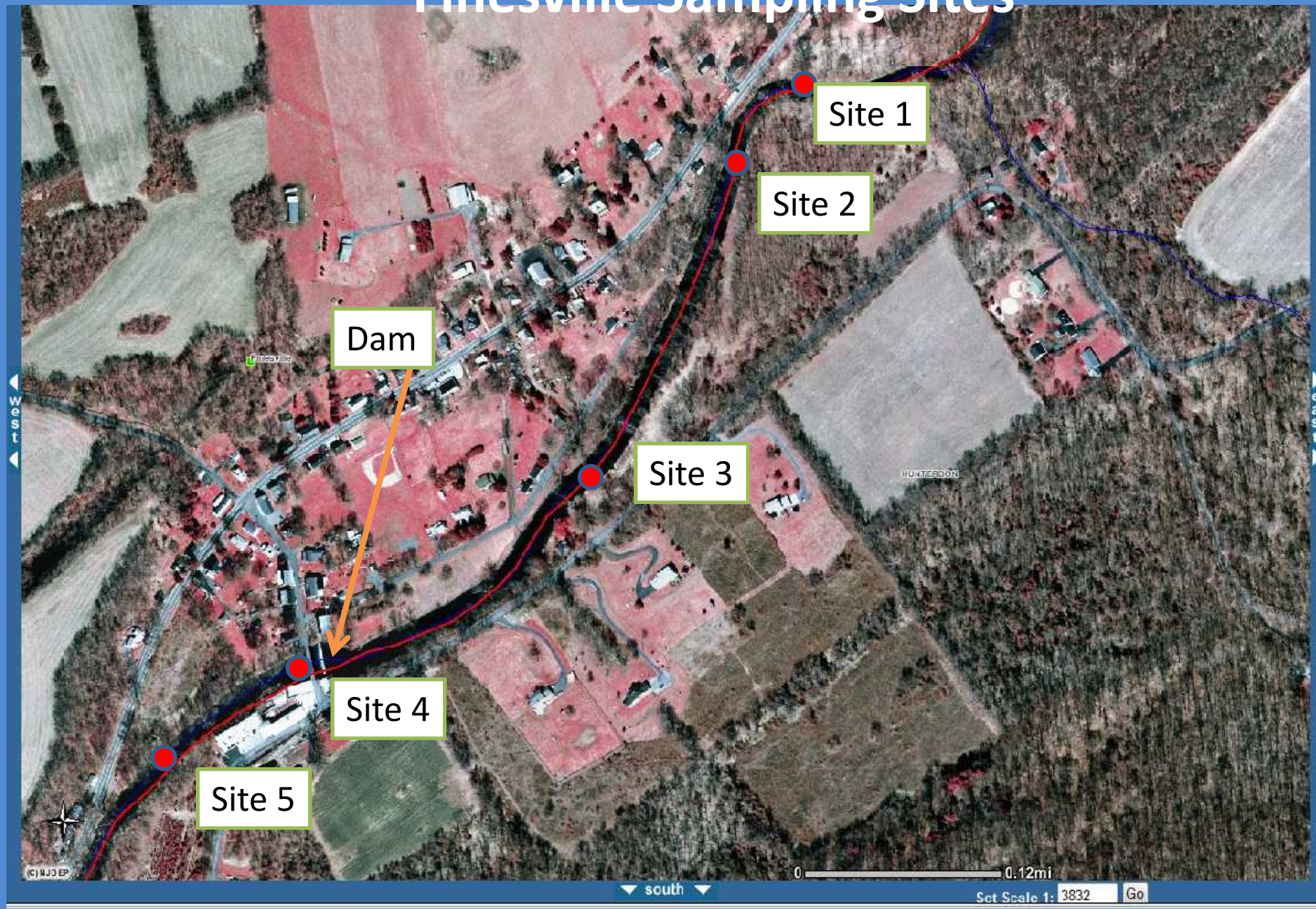


Finesville Dam

Why monitor the Finesville dam removal?

- MWA uses data to
  - track progress of project
  - Learn more about dams and restorations
  - Provide information to public
- Other uses
  - Share information with others
  - Only 5% dam removals have ecological data
- Budget is always limited!

Finesville Sampling Sites



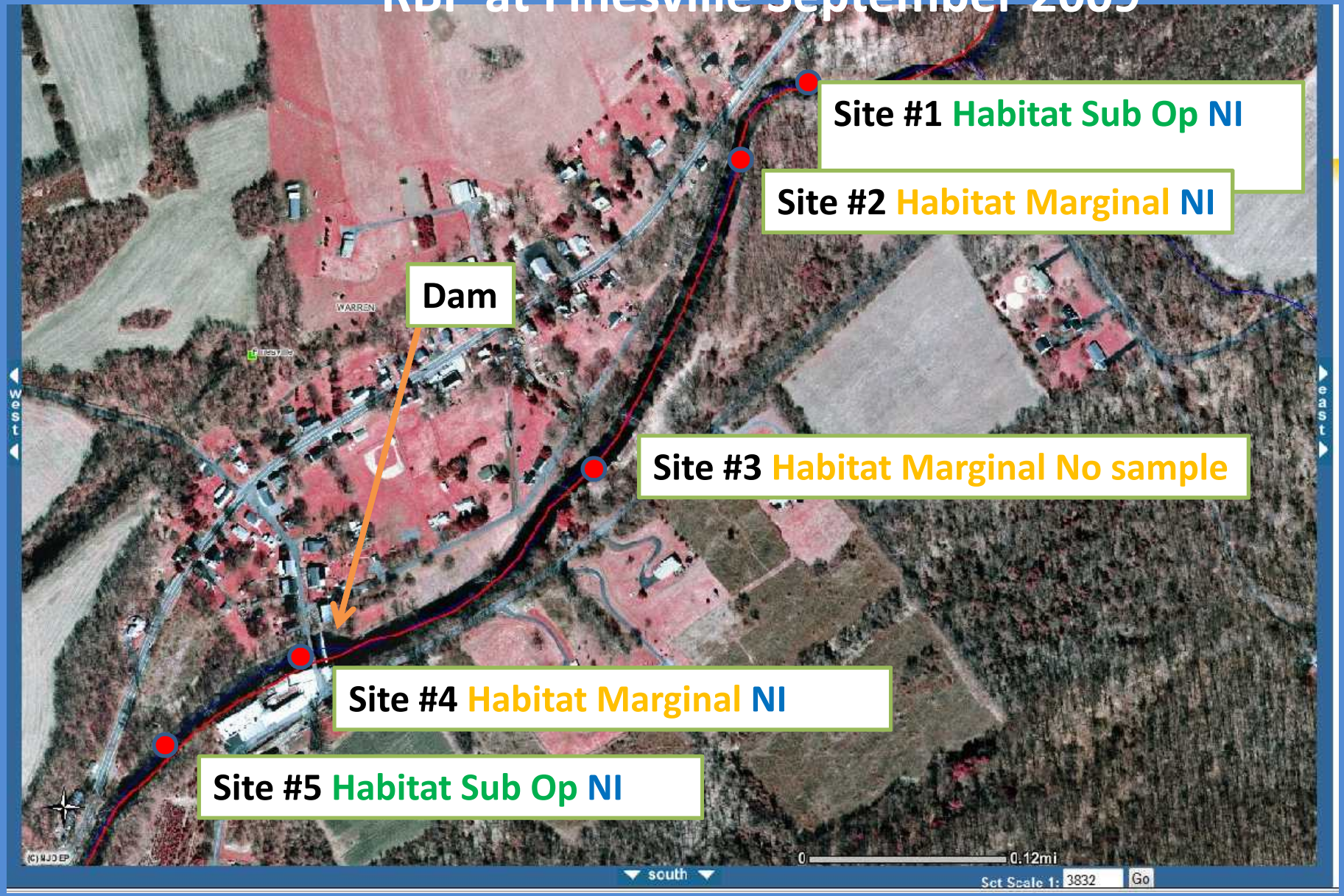
What parameters did MWA monitor?

- River Watcher Volunteers
  - Visual/Habitat assessment
  - Macroinvertebrate Assessment
  - Dissolved Oxygen (kits)
  - Temperature
  - Physical parameters
  - Turbidity
  - Photos (documentation)
- WWN partners (NJDEP VM)
  - Continuous Dissolved Oxygen, Temperature, Conductivity

Timing

- Macroinvertebrates sampling
  - September 2009
  - April 2010
  - October 2011 (VM)
  - April 2012
- Photographs of stream bottom
  - August 2011
  - November 2011 (pre-removal)
- January-April 2012 (post removal)
  - Monthly
- Dam removal November 11, 2011

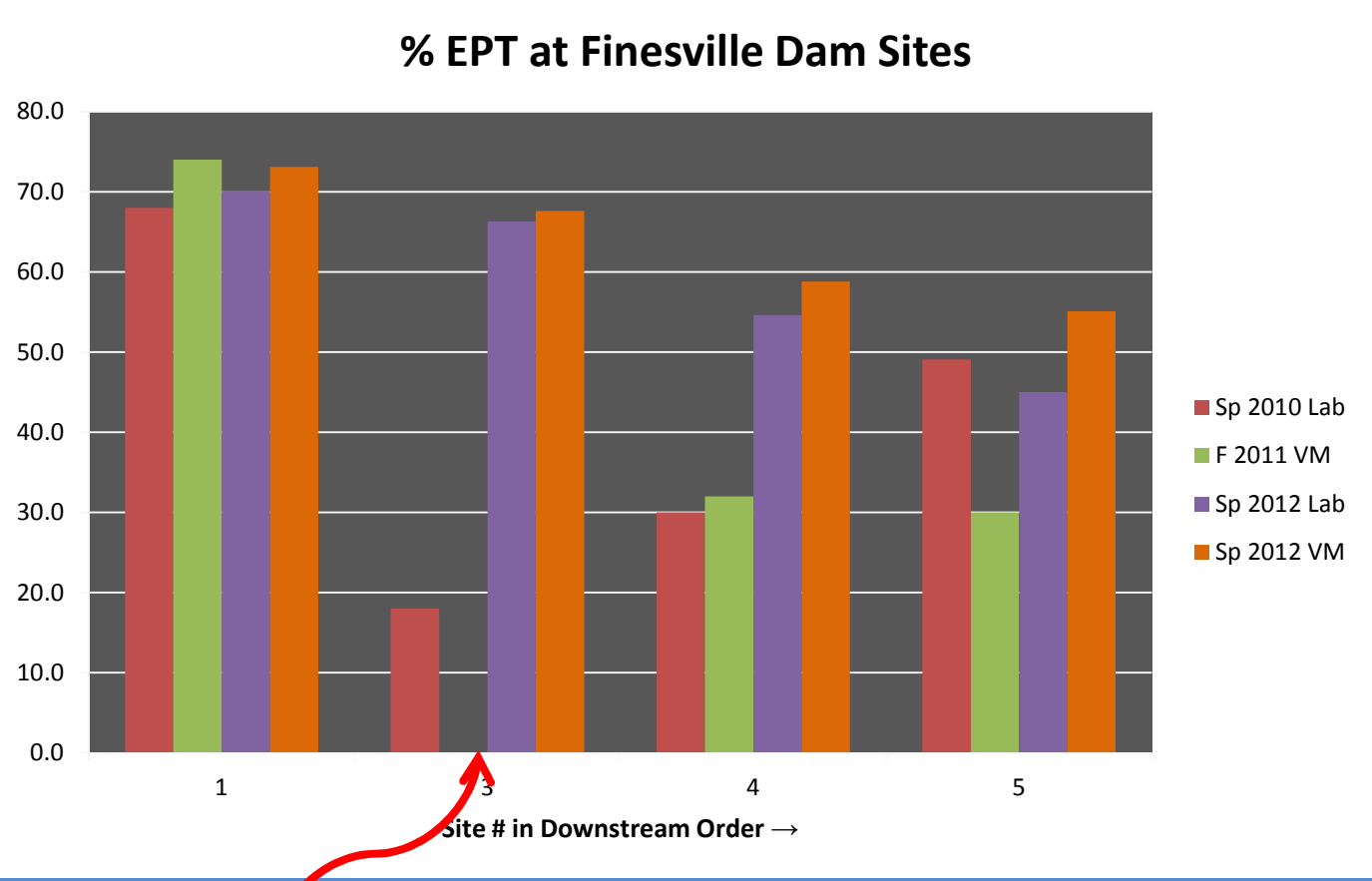
Biological Assessment using NJIS and RBP at Finesville September 2009



Biological Assessment using HGMI and supplemented with VM field collection + ID at Finesville April 2010

Biological Assessment HGMI and RBP after Finesville Post Dam Removal

%EPT Lab & VM



0% EPT in Fall 2011 VM sample!

How could we track changes to the impounded area?

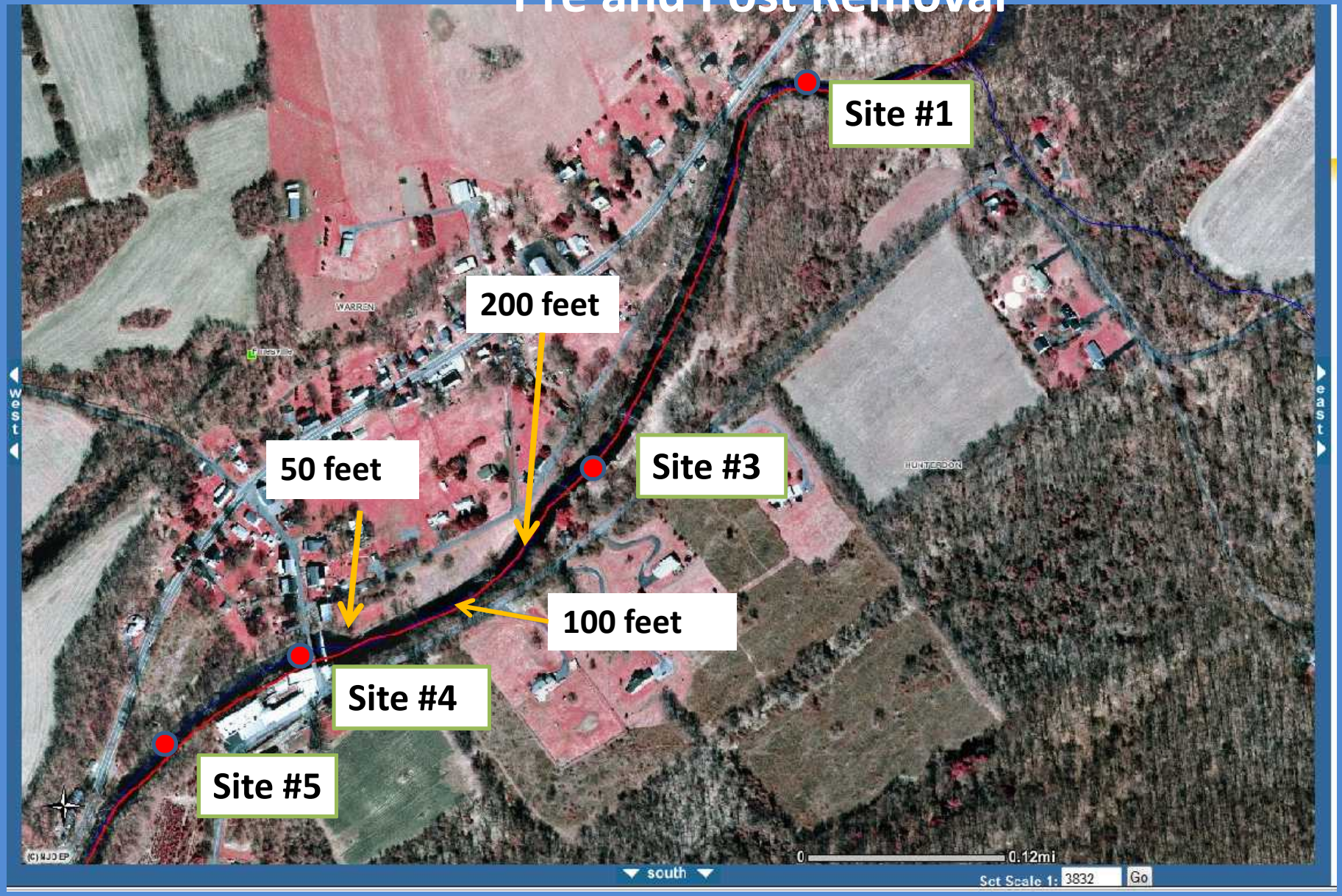
- RBP Habitat is for wadeable streams
- No biological assessment available for non-wadeable conditions in NJ
- Area hard to get into
  - Banks are vertical
  - Water 5-9 feet deep

Tracking changes by taking underwater photos with digital camera

Good quality waterproof digital cameras are now inexpensive

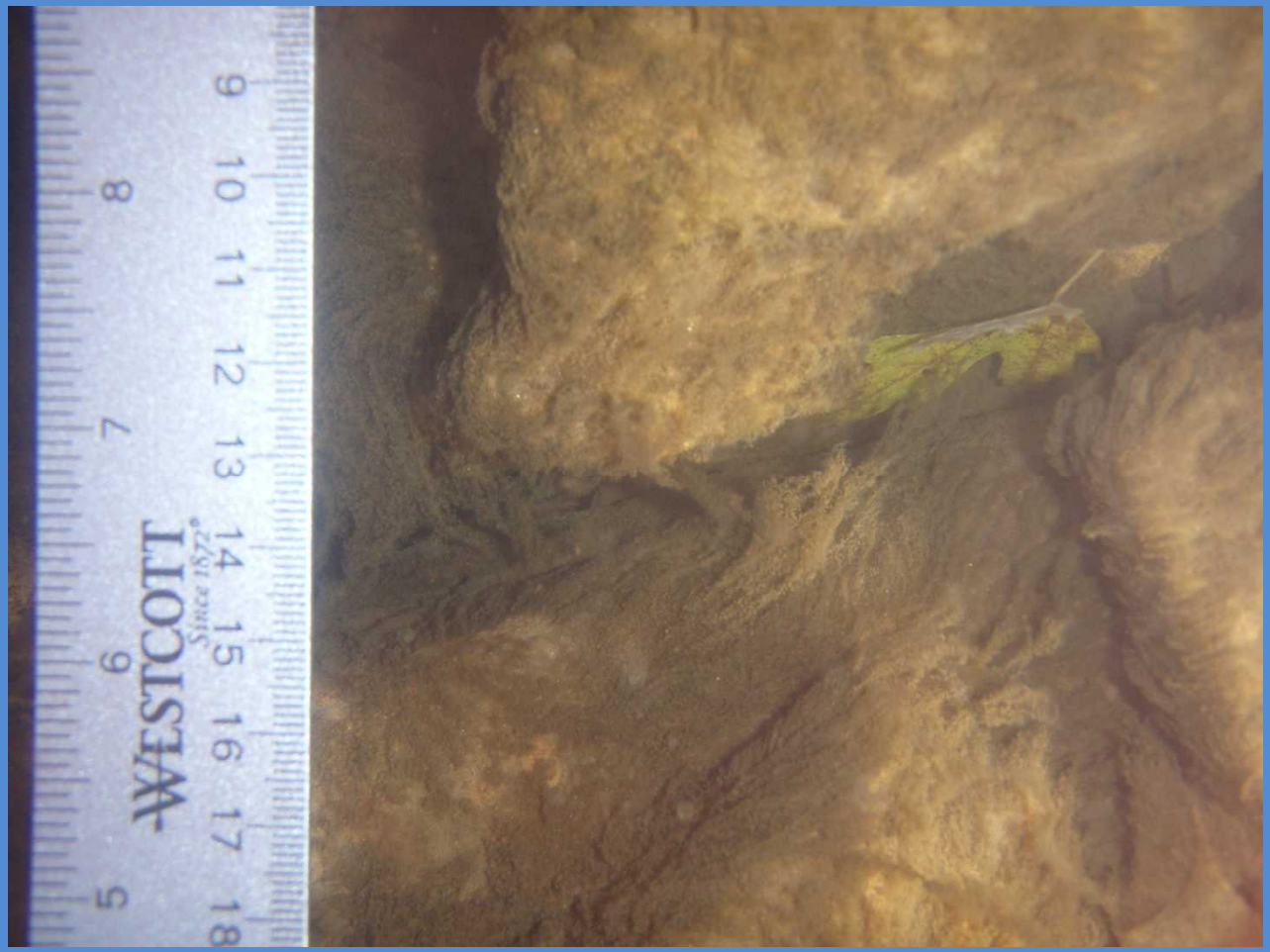
Weighted metric measuring device to standardize photographic method

Locations of Underwater Photographs Pre and Post Removal



Site #1 pre removal

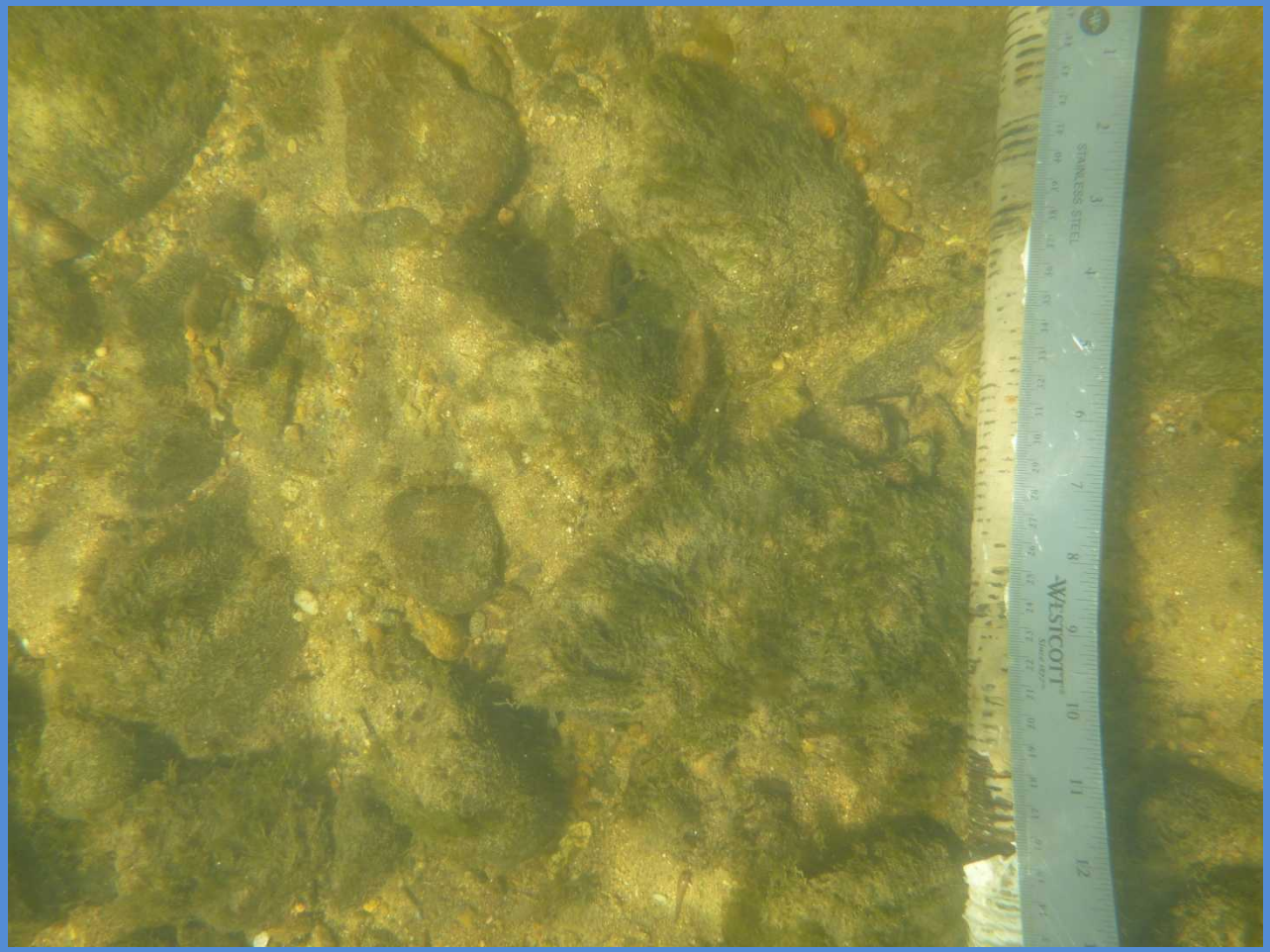
Site #1 11.04.2012
Pre removal



Site#1 Post removal- No effect

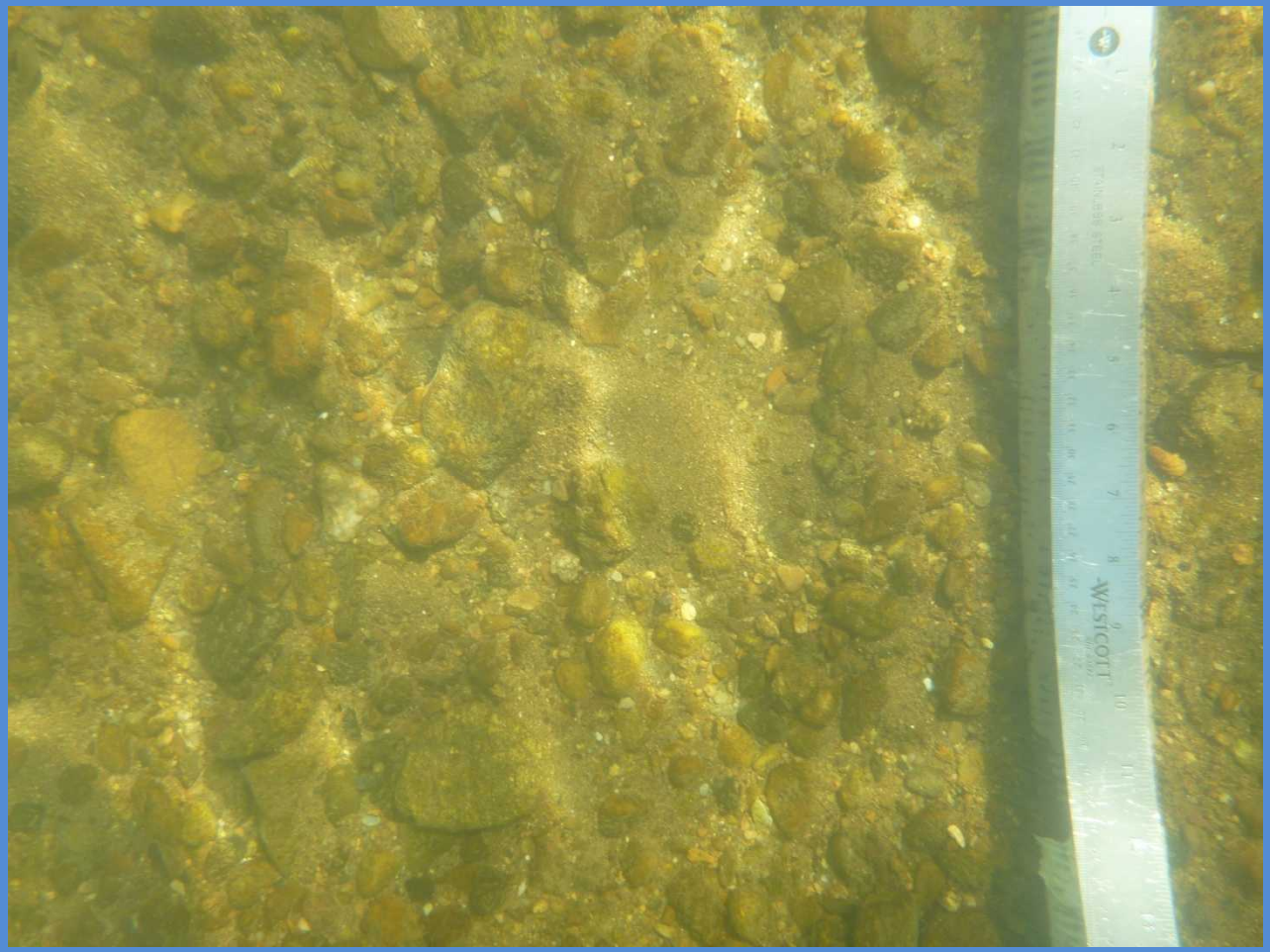
Upper Site#3

Upper part of Site#3 post removal



Site#3

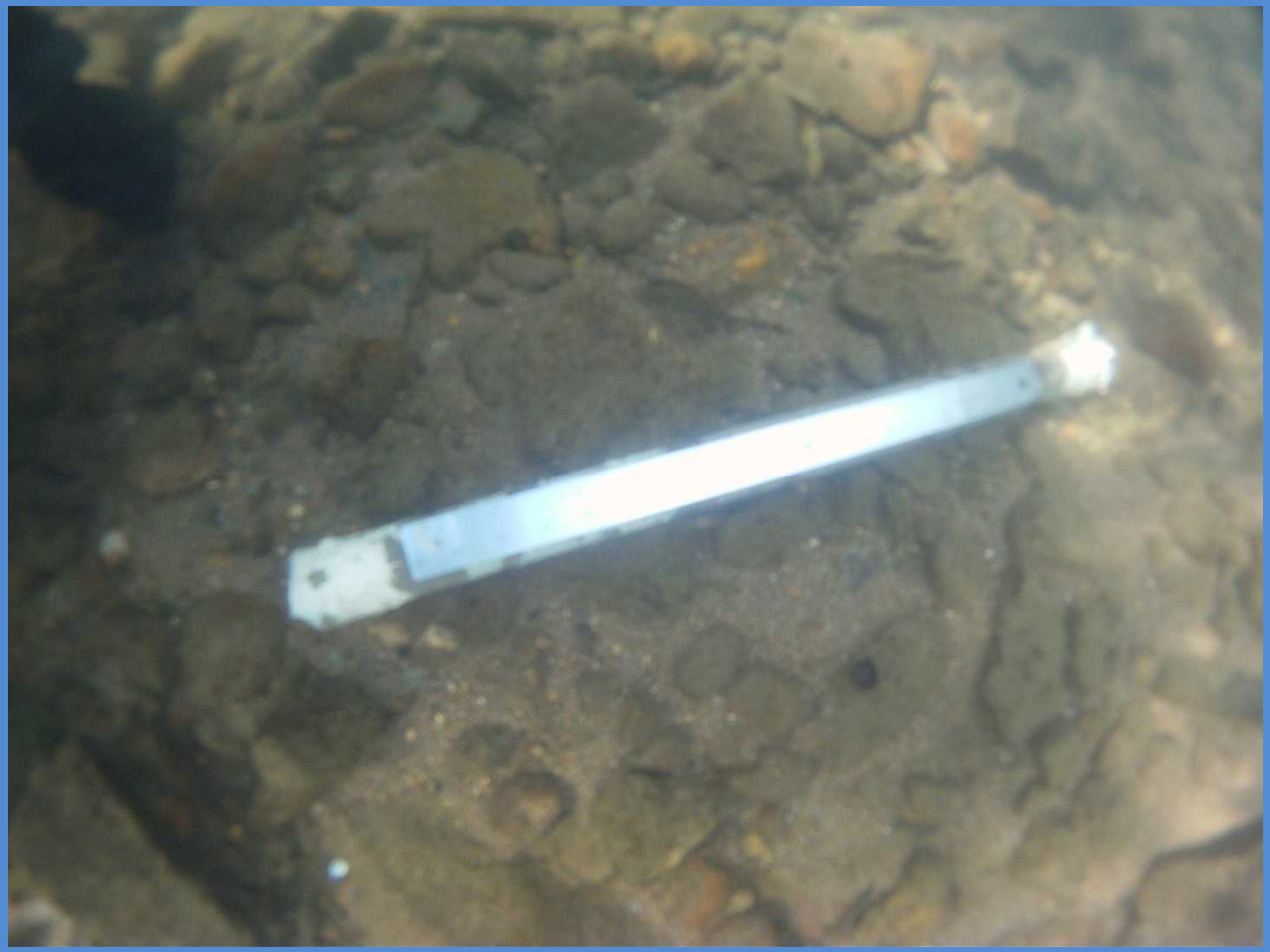
Site#3 post removal



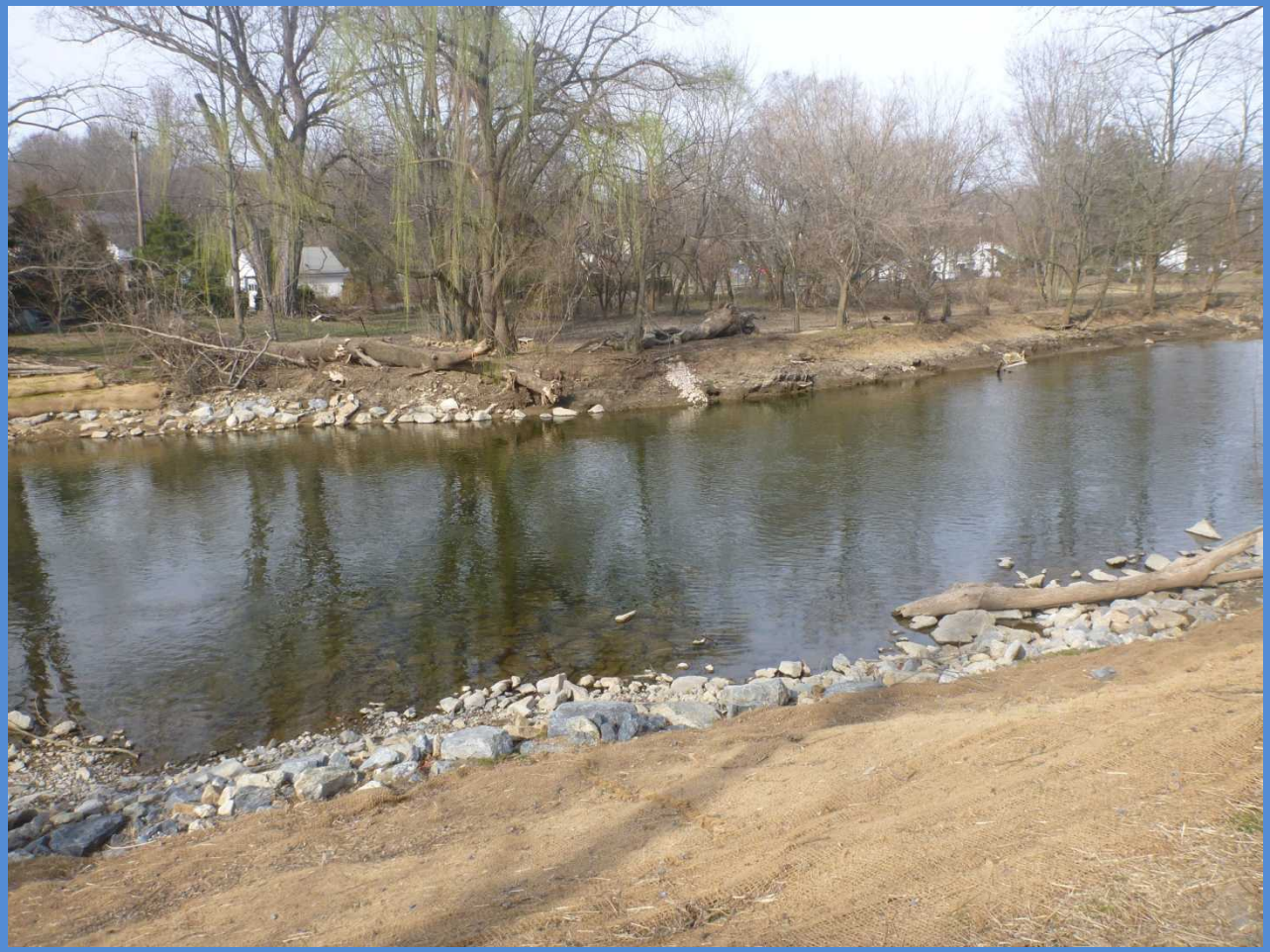
100 feet upstream post dam removal February 2012

100 feet August 2011

100 feet March 2012



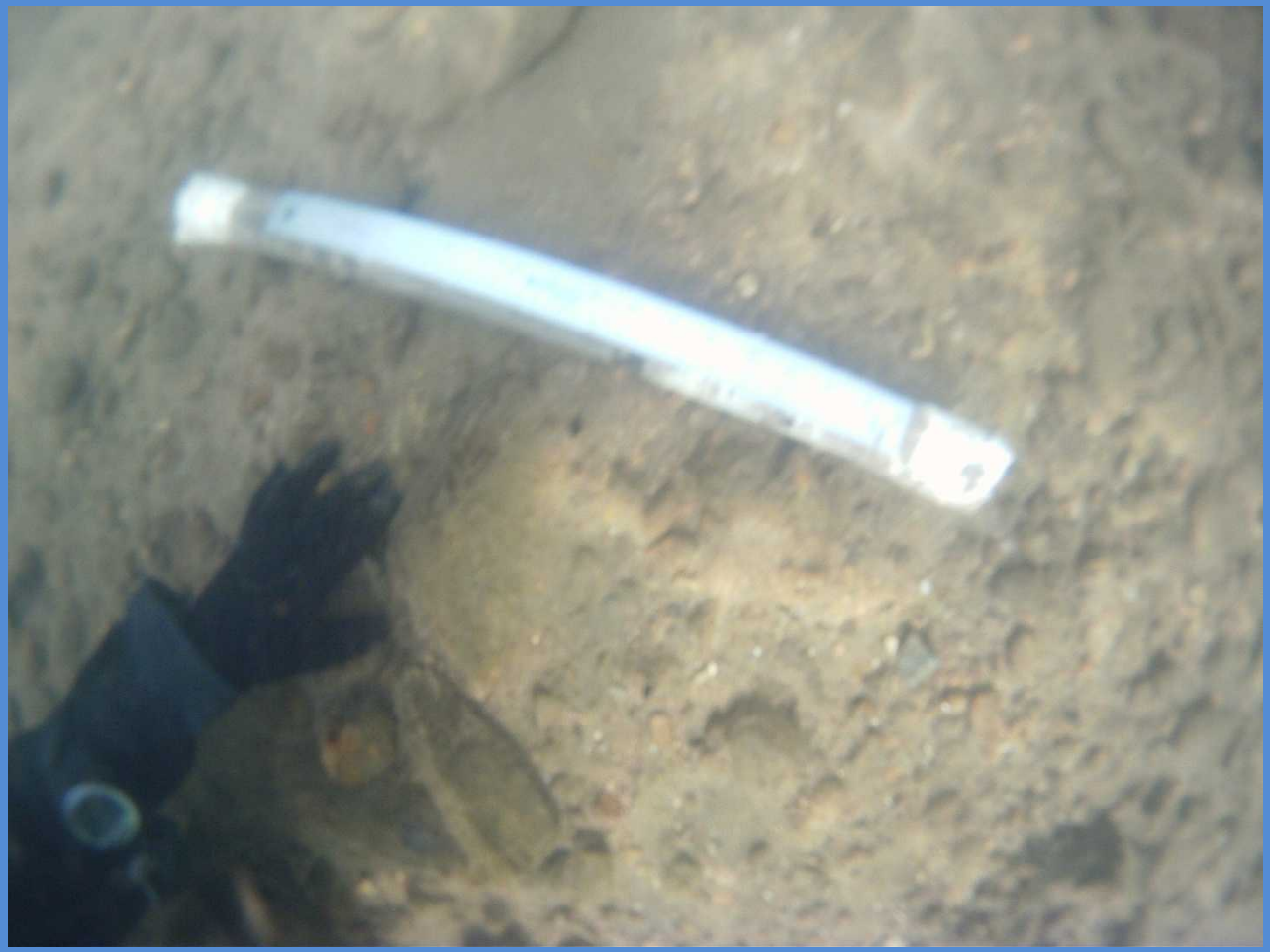
50 feet upstream of dam (post removal)



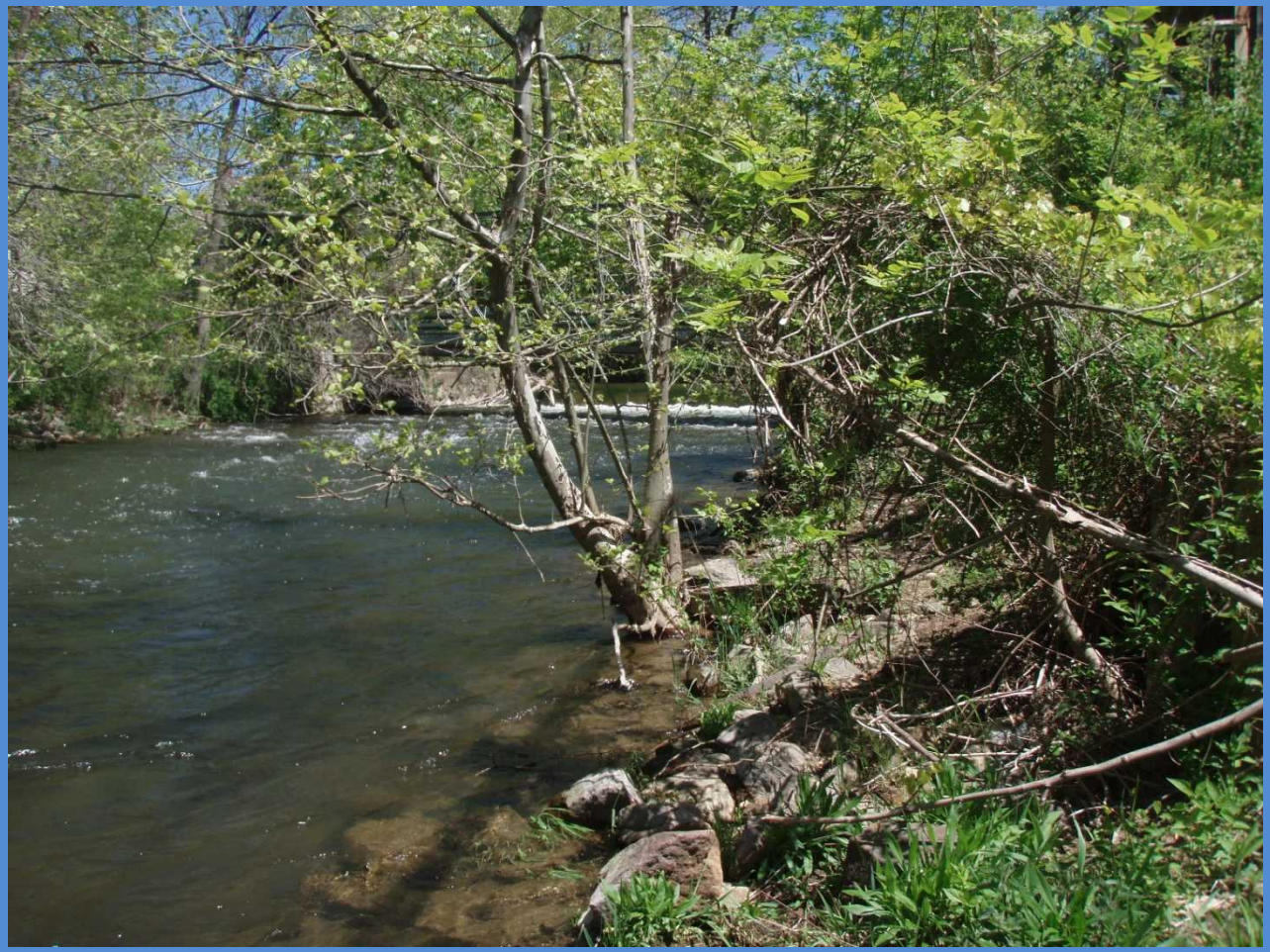
50 feet pre removal

50 feet pre removal

50 feet March 2012



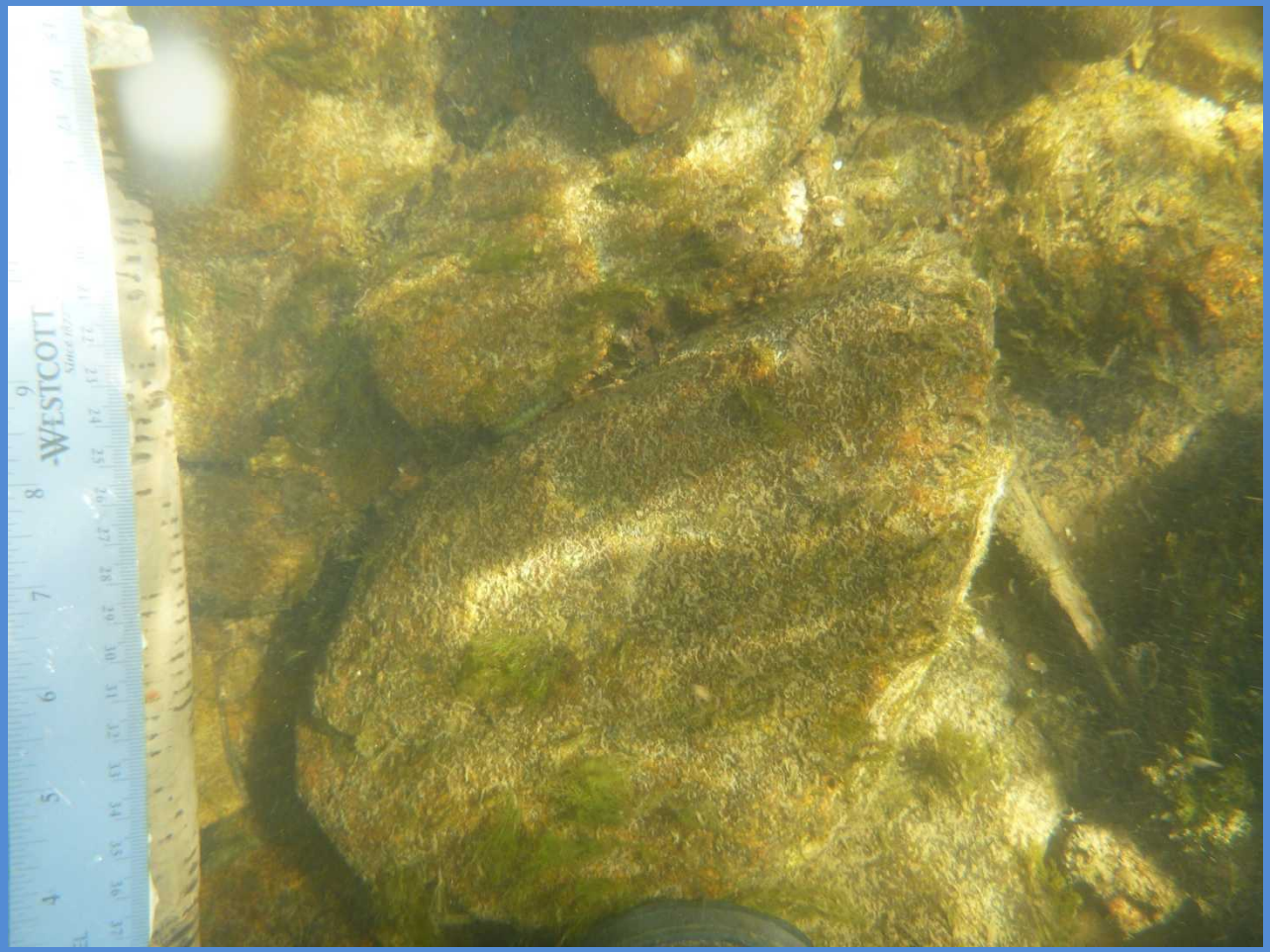
Site #4



Site#4 pre removal

Site#4 March 2012

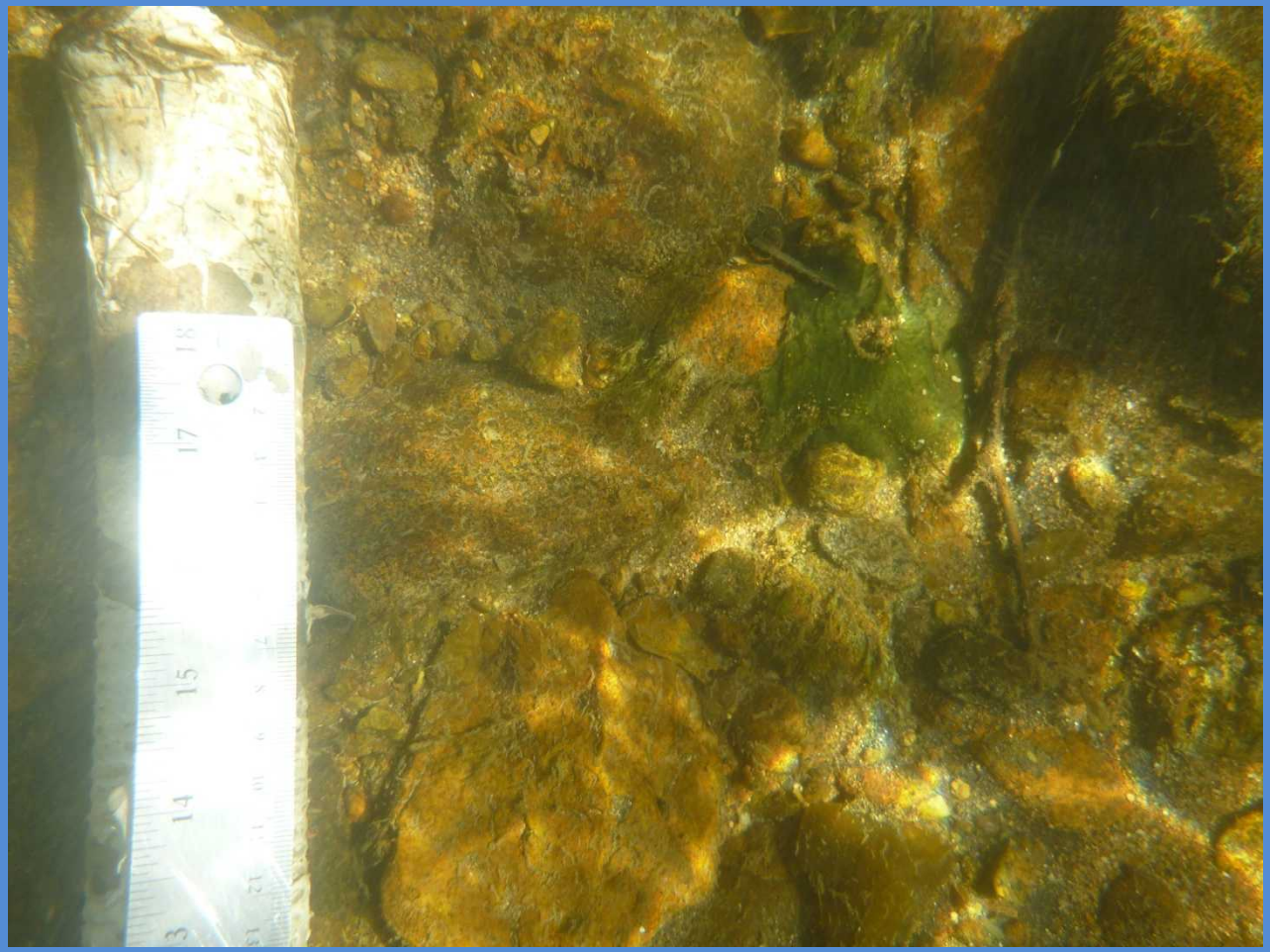
Site#4 post removal April



Site #5

Site#5 pre removal

Site#5 5 months post removal

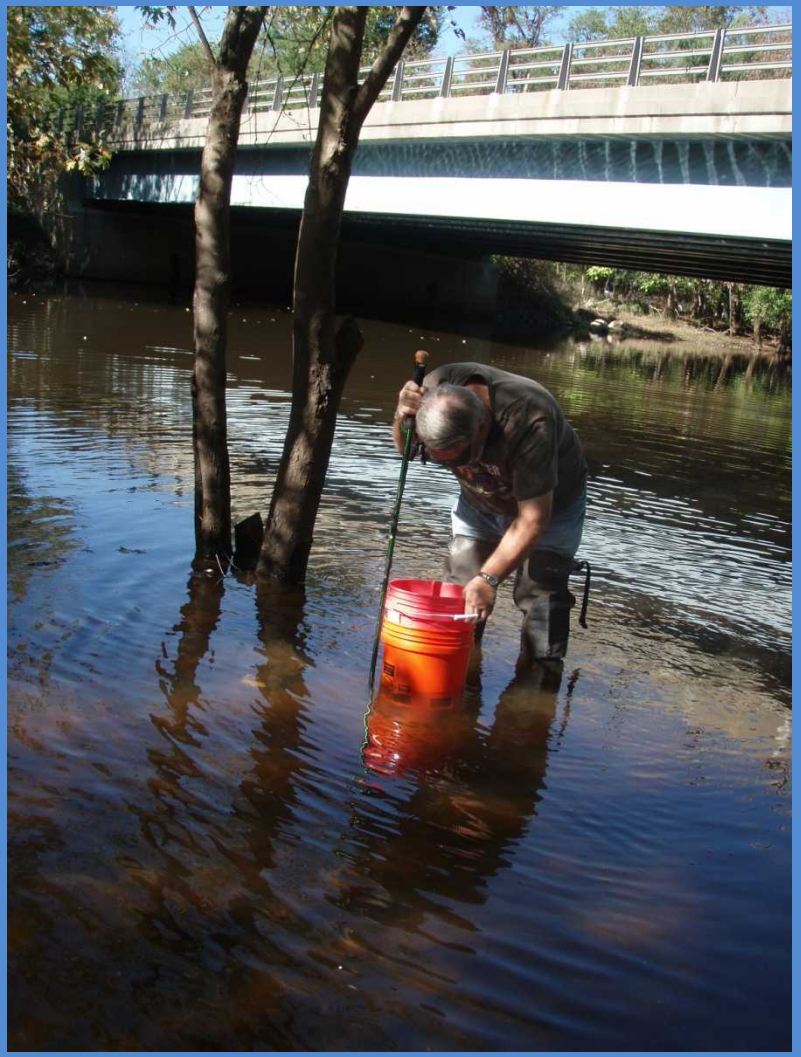


Conclusions at 5 months post removal

- **Upstream and downstream sites:**
  - No change in macroinvertebrate populations
  - Photos show no change in amount of sediment at sites
- **Impoundment:**
  - Improvement in macroinvertebrate populations in lower water areas
  - Photos show decrease in amount of sediment

Challenges

- Timing
  - Weather
  - Dam removal target date moving
- Methodology
  - Didn't do enough side by sides with VM and lab samples
  - Need better way to standardize location of photographs



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- Keira Luckhardt of Underwater Recovery
- River Watcher volunteers!

Funding

- Watershed Institute
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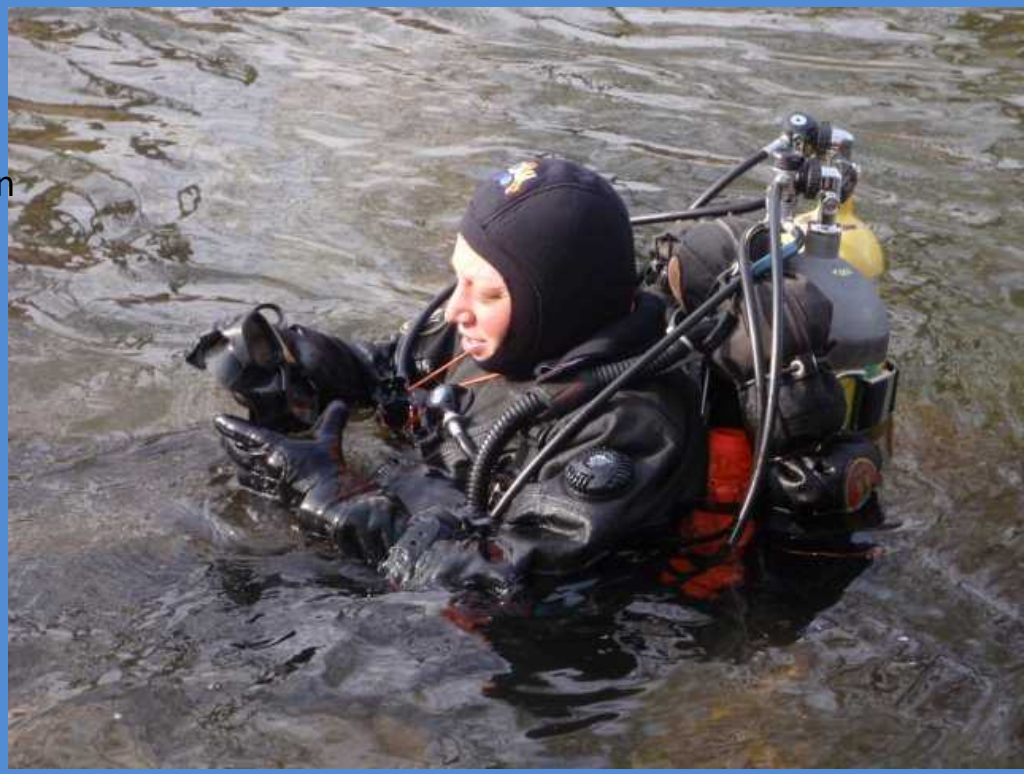
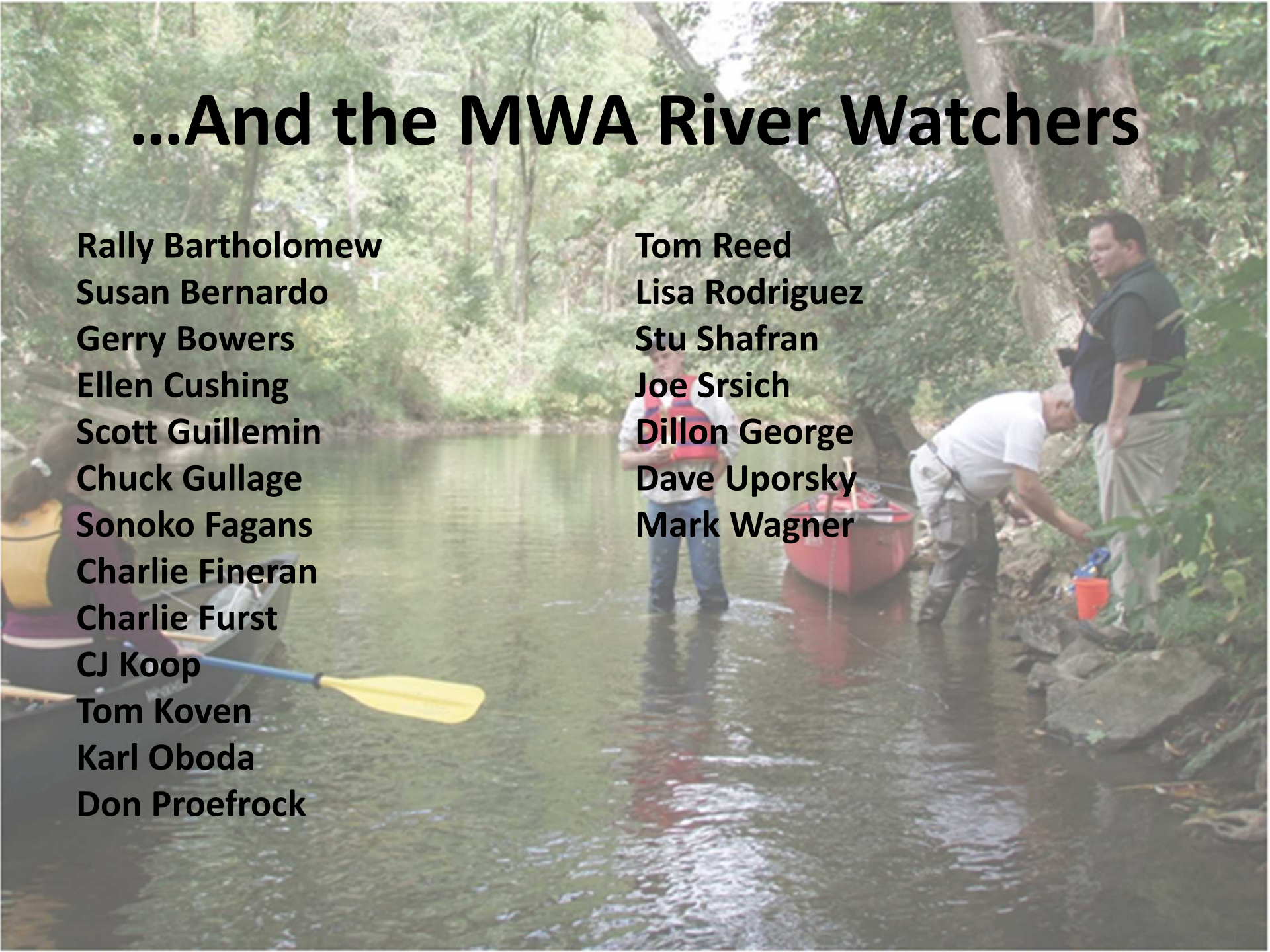
- NJDEP Watershed Watch Network



…And the MWA River Watchers



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