Lessons Learned from a Collaborative Approach to Watershed Restoration

EPA Volunteer Monitoring Conference
August 10, 2013

Kevin Ryan
Outline

• Friends of the Cheat
  – History and Mission
  – Programs
    • Projects
  – Partnership Types
• Targeted Watershed Initiative
  – Project Overview
• FOC Volunteer Monitoring Program
  – Overview
• Partnership Framework
  – Lessons Learned
• Summary
• Questions/Discussion
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History and Mission

“To restore, preserve, and promote the outstanding qualities of the Cheat River watershed”
Programs

1. Restoration
Acid Mine Drainage Reconnaissance
Pre-project Planning
Construction and Project Monitoring and Maintenance
2. Recreation and River Access
Program Development

• Brownfields Revitalization
• Place-based Environmental Education
  – Doug Ferris Outdoor Classroom
• Preservation and Conservation
Diversification of programs and projects means....

More diverse partnerships!
Governmental

- West Virginia Department of Environmental Protection
- Nonpoint Source Program
- Office of Special Reclamation
- Abandoned Mine Lands and Reclamation
- West Virginia Division of Natural Resources
- US Environmental Protection Agency Region III
Private/Industry

- Landowners

- Funded $200K of FOC’s 1st AMD Treatment Project - Anker Energy

- Assisted with FOC property acquisition - Patriot Coal
Engineers
Academia

• West Virginia University
  – National Mine Land Reclamation Center
  • Water Research Institute

Stanford University

WVU - Division of Natural Resources and Forestry researchers
Volunteers
Partnership Framework

1. Communication
2. Roles and Responsibilities
3. Strategic Planning
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Lower Cheat River Remediation Plan
U.S. EPA
Targeted Watershed Grant Program

2004 – 2012
$1.5 million
Lower Cheat Remediation Plan

Objectives

1. Accelerate the restoration of 27 stream miles in the Muddy Creek watershed
2. Implement various AMD treatment technologies
3. Evaluate and compare the efficiency through a cost-benefit analysis of treatment technologies
   - $/tons of acidity removed/yr
Passive Treatment At-Source
Passive Treatment
At-Source
WV DEP
Rockville
At-Source Dosing
Fickey Run
In-stream Dosing

![Image of Fickey Run discharge into stream]

- Viking Coal Discharge
- Fickey Run Doser
- Fickey above doser
- Abandoned Mine Lands
- Fickey Run
- Fickey Mouth
- Martin Creek
Gary Conner
Average Pollutant Load Reductions
Fickey Run In-stream Dosing Average Metal Loads

![Graph showing metal load loads at different points along Fickey Run. The graph includes data for Aluminum, Iron, and Manganese.]
Effects of In-Stream Dosing
In-stream Dosing Impact Zone
Muddy Creek
In-stream Dosing Impact Zone
Muddy Creek
# Comparison of Treatment Methods

<table>
<thead>
<tr>
<th>Treatment Type</th>
<th>Total Cost</th>
<th>Capital Cost</th>
<th>O&amp;M Cost</th>
<th>Acid Treated</th>
<th>Efficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>In-stream Dosing</td>
<td></td>
<td></td>
<td>1</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>At-Source Active</td>
<td>1</td>
<td>3</td>
<td></td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>At-Source Passive Allen Conner – Mess.</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>At-Source Passive Dream Mountain</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>At-Source Passive Gary Conner</td>
<td>3</td>
<td>2</td>
<td></td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

For cost and acid treated: 1 = highest, 5 = lowest; For Efficiency: 1 = lowest/most efficient, 5 = highest/least efficient

Efficiency units: $/acid ton removed/yr
Quick Summary

• Pollutant Load Reductions/Water Quality Improvements
• In-stream dosing – not quite the answer.. (we were looking for)
• Efficiency calculations
  – Determined by individual site limitations
Next Steps

- Muddy Creek will not be remediated by any single treatment strategy or stakeholder

- Needed:
  - Innovation and collaboration between the WVDEP Office of Special Reclamation and the Office of Abandoned Mine Lands and Reclamation
  - To reduce “doh!-instances”
  - Updated Watershed Based Plan
  - Persistence!
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CAPABLE Monitoring Program Overview

- Created in response to oil and gas permits issued in the Cheat River watershed in 2010
- 15 volunteers monitor selected streams in subwatersheds potentially affected by oil and gas activity

Contributions to the CAPABLE Program 2012-2013

- Grants, $10,500, 59%
- Volunteer Time, $5,910, 33%
- Donations, $1,420, 8%
Monitoring Equipment:
- Data Observation Form
- Electric Conductivity & Temperature Pen
- pH Strips
- Grab Sample Bottles
- Extension Poles for Grab Sample Collection
- Calibration Fluid
- Gauges of Water Depth

2011-2012

Big Sandy Regional Group: Conductivity

Big Sandy Tributaries: Increasing distance from Cheat River Mainstem --->
Continuous Data Loggers
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Partnership Framework

1. Communication
2. Roles and Responsibilities
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Partnership Framework

1. Communication
   – What are the communication channels?
   – What are limitations for communication opportunities?
   – What is expected timeframe/frequency of communication?

2. Roles and Responsibilities
   – Are the deliverables and associated tasks clearly defined?
   – Are there specific actors assigned to these items?
   – Are roles and responsibilities agreed upon or assumed?

3. Strategic Planning
   – Was there a clearly defined planning phase?
     • Feasibility Study
   – At what point within the project timeline were key partners engaged?
   – Were all partners involved in negotiating important aspects of the project?
     • Roles; responsibilities; communication plans
   – Is there a expectation for partnership reassessment?
Do…

• Consider communication channels
• Set realistic expectations for frequency
• Define deliverables and tasks
• Assign specific actors
• Feasibility study (to the extent necessary)
• Engage key partners as early as possible
• Plan for reassessment
Don’t…

– Don’t avoid challenging conversations with partners
– Assume anything! (follow up)
  • Feasibility
  • Partner engagement
  • Roles and Responsibilities
  • Etc..
Thank You

Friends of the Cheat