Kerber Creek Restoration Project:
A Lesson in Collaborative Restoration

Up Kerber Creek, early 20th century

Up Kerber Creek, early 2000s

Presentation by: Trevor Klein (OSM/VISTA Coordinator), Steve Sanchez (Forest Manager for Soils and Hydrology, USFS), Jason Willis (Mine Restoration Field Coordinator, Trout Unlimited), Elizabeth Russell (Mine Restoration Project Manager, Trout Unlimited), Laura Archuleta (Environmental Contaminants Specialist, USFWS),
- Part of the San Luis Creek watershed, located in the Rio Grande Closed Basin
- Recharges the Rio Grande via subsurface flow
The Kerber Creek Watershed: Specifics

- Begins just northeast of Villa Grove in the northernmost area of Saguache county
- Extends north of Bonanza into the Rio Grande National Forest
The Kerber Creek Restoration Project

Mission: To sustain the health of our watershed through collaborative restoration projects and community education

PARTNERS
Collaborative Restoration: A Guide

(1) Know your site

(2) Identify needs

(3) Build partnerships

(4) Identify funding sources

(5) Implement projects

(6) Measure success

(7) Consider lessons learned
1880s – 1970s (largely ceased by 1930s)

Dozens of silver, lead, zinc, copper mines (largest: Rawley 12)

Tailings originally collected and consolidated in streams and behind dams

Dams destroyed by flood events that carried tailings downstream and deposited them along the stream bank (mid-20th century)
“The stream is a mess! Pollution...turns the water orange. No aquatic life was found.”

-Bureau of Land Management Staff
1991: USFS & CDPHE investigate for Superfund designation

1994: Bonanza Group (ASARCO, Inc., USFS, BLM, Local Landowners) approved to pursue Voluntary Cleanup

1994-1999: Restoration projects implemented (upper watershed)

2002: ASARCO, Inc. declares bankruptcy, halting restoration projects
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1998: BLM completes Proper Functioning Condition assessment on riparian area of Skunk Creek, tributary to Kerber Creek

2005: Began characterizing of parts of upper watershed; realized more was required

Question: How can federal funds be used on private lands?

Considerations: (1) Private landowner consent; (2) Legal issues
Identify Needs, II: Private Property

Notifying Landowners
- 2005-2006: Door-to-door requests for access to landowners’ properties
- 2007: Success with all but two landowners (of over 100)

Legal Issues
- Private entities reluctant to engage in restoration due to liability concerns
- Wyden Amendment: Allows BLM to use federal funds on private land if imminent threat to public health and environment and/or public lands exists
Deposition of contaminated sediment

Contribution of contaminated flow from source areas

Phytotoxicity of riparian soils and subsequent plant death

Instability of stream banks due to greater susceptibility to erosion

Contaminated surface water downstream

Poor fishery and macroinvertebrate habitat
Environmental Assessment completed on entire watershed, 2006

Alternatives suggested:
- (1) Relocation or treatment of mine waste deposits
- (2) Stream bank restoration and channel stabilization

Table 2: PROPOSED SITE TREATMENTS

<table>
<thead>
<tr>
<th>Site Number</th>
<th>Acreage</th>
<th>Average Thickness of Tailings (in.)</th>
<th>Volume of Tailings Treated (cubic yards)</th>
<th>Proposed Reclamation Treatment</th>
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<td>871</td>
<td>Relocation</td>
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<td>3872</td>
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</tbody>
</table>
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Environmental Restoration: Multi-disciplinary, Open, Rapidly changing process

Government Agencies: USFS, BLM, USFWS, NRCS
  o Funding & Land Management
  o Technical Assistance

Engaged with Trout Unlimited at relevant conferences
  o Fiscal Agent & Project Management
  o Technical Assistance
Engaged with OSM/VISTA program at relevant conferences
- Capacity Building
- Project Coordination
- Education and Outreach

Integrating environmental restoration with economic vitality, improved social opportunities

Agent of change
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Colorado Nonpoint Source Program

Federal Matching Funds
- Bureau of Land Management
- U.S. Forest Service
- U.S. Fish & Wildlife Service
- Natural Resources Conservation Service

State Matching Funds
- CO State Forest Service
- CO Water Conservation Board
- Division of Reclamation Mining and Safety

Private Foundations
- Commission for Environmental Cooperation
- Xcel Energy
- Norcross Wildlife Foundation
Identify Funding Sources, II: In-Kind

- Landowners
- Volunteer Groups
- Meetings, Internships, Materials
(1) Know your site → (2) Identify needs → (3) Build partnerships

(4) Identify funding sources → (5) Implement projects → (6) Measure success

(7) Consider lessons learned
Implement Projects, I: Priority Areas

Standard Practices

✧ Implement projects up-stream to down-stream

Kerber Creek

✧ Implement projects where landowners consent

Green: 2008-2009
Light Blue: 2009-2010
Pink: 2010-2011
Dark Blue: 2012-2013
Implement Projects, II: Methods

- In-stream rock structures (limestone, metamorphosed granite), and reshaping of stream bank slopes

- In-situ treatment of mine waste deposits and revegetation (phytostabilization)

- Erosion control structures
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Watershed Health

Environmental Sampling

Water Quality

Biological Variables

Geomorphological Variables

Vegetation

Aquatic Life

Width/Depth Ratio

Sinuosity

Only about 46% of stream restoration projects in Colorado engage in even some type of monitoring activity. -Bernhardt et al., 2005
Measure Success, II: Monitoring in Action

Width/depth ratio (2012)

Sinuosity (2009)

Fish population (2011)
Measure Success, III: Land Reclamation

“Today, walking along our section of Kerber Creek is a completely different experience... There are fish for the grand-kids to catch and release because the water is deeper.”
- Brady and Jane Farrell, 2011

Rawley Mine, early 20th century

Rawley Mine, 1990s

Rawley Mine, 2013

Lower Kerber Creek, 1975

Lower Kerber Creek, 2007

Lower Kerber Creek, 2011
Public watershed tours

Environmental Education

Opportunities for youth and students to gain experience through volunteerism and internships

Recreation & appreciation

San Luis Valley Regional Science Fair, 2012

Mountain Valley School Tour, 2008

Tour with Trout Unlimited and Locals, 2012
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Consider Lessons Learned, I: Accomplishments

Statistics

Since 2007, we have...

- Treated >55 acres of mine waste
- Installed >250 rock structures
- Restored >4000 feet of stream bank
- Attracted >13,000 volunteer hours
- Secured >$2,000,000 in grants

Awards

- U.S. Forest Service – Rocky Mountain Region: Water Emphasis of the Year Honor Award (2009)
- Bureau of Land Management: Hardrock Mineral Environmental Award (2010)
- Colorado Riparian Association: Excellence in Riparian Area Management Agency Award (2010)
- U.S. Forest Service – Rocky Mountain Region: Forest and Grassland Health Partner of the Year (2010)
- American Fisheries Society – Western Division: Riparian Challenge Award (2011)
- Public Lands Foundation: Landscape Stewardship Award (2011)
Consider Lessons Learned, II: Mistakes & Successes

Successes

- Speak directly with landowners
- Work Collaboratively
- Base work on landowner participation
- Take every opportunity presented
- Recognize limitations

Mistakes

- Publicize project more widely
- Ask big, downsize later
- Work regionally & locally
- Emphasize connectivity
- Long-term management plans?
Future and Upcoming Projects

- **Saguache Community Kitchen**

- **New tour offerings:** Local schools, Geology and history of the Bonanza Mining District with Dr. James McCalpin

- **Revitalized partnerships with Northern San Luis Valley Conservation Roundtable, Rio Grande Watershed Conservation and Education Initiative, Orient Land Trust**

- **Original study of the effects of restoration on depth to water table with BLM/Adams State University Intern**

- **Wyoming Reclamation and Restoration Symposium/American Society of Mining and Reclamation Conference Presentation (Laramie, WY, June 2013)**
“Be open and receptive to the criticism of other groups and professionals. Be receptive to their interests.”

-Steve Sanchez (2013)