

**CHRF Final Report
OE PDA 13000000053**

**Prepared by: Agnieszka Przeszlowska
March 26, 2014**

GRANTEE and FISCAL AGENT:

Grantee: Uncompahgre Watershed Partnership

Fiscal Agent: Shavano Conservation District

EIN: 84-6000225

PROJECT NAME: Community Outreach and Education

GRANT AMOUNT: \$14,000

PROJECT TERM: Oct. 25, 2012 – Mar. 31, 2014

ORIGINAL OBJECTIVES

- 1) Participate in river events and organize informational UWP events to promote UWP awareness, solicit UWP stakeholders, and enhance watershed education.
- 2) Generate a list of UWP stakeholders and identify their interests in the following target areas: water quality and quantity, mining, riparian restoration (streambank and habitat), recreation, river education.
- 3) Host general stakeholder meetings as well as focused meetings related to target areas to assess priorities and develop plans for future projects.
- 4) Provide educational activities at river, Earth Day, National Public Lands Day, and watershed stewardship events.
- 5) Conduct an educational needs assessment and watershed program development with Ouray and Ridgway school districts.
- 6) Create promotional media to promote UWP awareness: newsletters, press releases, social media, website.

TASKS

TASK 1 – Project Management

Description of Accomplishments

During this project, the UWP coordinator helped develop and assisted with the following outreach and education programs: Ridgway River Festival 2013 & 2014, Earth Day 2013, Lake Appreciation Day 2013, 2012 community outreach event (screening of the “Watershed

Movie”), 2013 community outreach event (speaker Jonathan Waterman on “Colorado River: Flowing through Conflict), 2013 stakeholder update on Red Mountain Creek project by Idarado Mining Corp., stakeholder surveys, River Watch sampling and related activities with Ridgway Elementary School, partnership development and educational needs assessment with Ridgway and Ouray School districts, partnership development at annual Sustaining Colorado Watershed Conference, Gunnison Basin Roundtable, Tamarisk Coalition and local community events, production of annual newsletter and UWP brochure.

Deliverable

Final report for grant term Oct. 25, 2012 – Mar. 31, 2014 submitted in March 2014.

TASK 2 – OSM/VISTA Volunteer

Description of Accomplishments

The UWP had two OSM/VISTA Volunteers during the term of this grant: Emily Galanto and Rhianna Williams. The VISTAs assisted the coordinator and UWP Steering Committee/Board with outreach and educational programs. They completed the following:

Goal 1: The OSM/VISTA worked to build the capacity of participating organization (UWP), enabling its long-term stability and success.

- A. Recruited volunteers for UWP’s riparian restoration project, park stewardship projects, community weed pulls, and community outreach events.
- B. Developed networks and partnerships with Ridgway State Park, water users groups/authorities, Gunnison Basin Roundtable, Selenium Task Force, Mountain Studies Institute, Colorado Watershed Assembly, county commissioners, town governments, local businesses and non-profits.
- C. Prepared three grants and two letters of inquiry to request funding for greenhouse/riparian plant nursery project.
- D. Organized several community fundraising events, set-up membership program and implemented first membership drive.

Goal 2: The OSM/VISTA assisted the UWP in enhancing community awareness and involvement through education and outreach.

- A. Education: assisted with an educational needs assessment at Ridgway and Ouray Schools, developed a partnership with Ridgway 3rd grade to conduct monthly water quality sampling and demonstrations, implemented annual service day with Ridgway 4th grade for Earth Day, organized annual macroinvertebrate sampling with Ouray and Ridgway Secondary School, organized field demonstrations on watershed topics with other local non-profits, implemented after-school programs on water topics at Ouray Public Library.
- B. Community Awareness: Assist in community outreach activities: field tour of mine remediation site, annual winter mine tour with local historical society, annual fall

community event on watershed/water issues, forum on Red Mountain Creek remediation project (update by Idarado Mining Company and CDPHE), interaction with various local organizations and influential individuals.

C. Outreach: Helped to create public outreach materials: UWP brochure, annual newsletter, monthly e-newsletters.

D. Maintained and update organization's website and social media outlets.

Goal 3: The OSM/VISTA assisted UWP with watershed research, water-quality monitoring and project development.

A. Assisted other local volunteers with monthly River Watch sampling at 9 sites. Then, helped UWP assume responsibility of long-term monitoring of 4 of those sites.

B. Assisted DRMS and WQCD staff with spring and fall water quality sampling in headwater streams of the Uncompahgre Watershed. Data will be used to inform future mine remediation and water quality improvement projects.

C. Developed plans for UWP greenhouse/riparian plant nursery project.

Deliverables

Education: 15 educational sessions conducted, 529 children educated on watershed topics

Fundraising events: 7

Outreach materials produced (see Appendix A): 2013 & 2014 UWP Annual Newsletter,

UWP Brochure, monthly e-newsletters (37% readership), UWP website

(www.uncompahgrewatershed.org), active Facebook page

(www.facebook.com/UncompahgreWatershed, 92 followers).

Projects: 4 River Watch sites, Greenhouse/Riparian Plant Nursery project development and 3 grant proposals

Stakeholders: currently 314 on UWP listserve

Volunteers: 12 volunteer days, 64 volunteers recruited, 443 volunteer hours contributed

TASK 3 – Outreach

Description of Accomplishments

Most outreach activities completed in this grant cycle are described in Task 2. Main accomplishments included:

1. Watershed Events: in June 2013, UWP worked with a local non-profit to organize the annual Ridgway River Festival which focused on celebration of community, water and learning, in July 2013, UWP assisted Ridgway State Park to organize the annual Lake Appreciation Day and facilitated a non-point source pollution activity for children, in September 2013 UWP organized a field tour to one of our future mine remediation sites, from spring through fall 2013 the VISTA Volunteer led monthly nature hikes to enhance public's understanding of watershed resources, Feb. 2013 & 2014 winter mine tour in the historic mining district to highlight mining heritage and remediation efforts.

2. Stakeholder Events and Workshops:

A. Stakeholder events included a November 2012 screening of the film “Watershed” about saving the Colorado River and exploring a new water ethic for the West which was attended by 80-100 stakeholders and a December 2013 invited speaker Jonathan Waterman who presented on “The Colorado River: Flowing through Conflict” to about 70 community members.

B. The UWP also organized two forums: in March 2013 a public update from Idarado Mining Company and CDPHE on the remediation project in Red Mountain Creek and a May 2013 forum on Water Demands in Ouray County. New stakeholders were recruited to sign up for UWP’s stakeholder database.

C. UWP collaborated with Mountain Studies Institute (MSI) and Lake Fork Valley Conservancy to produce the 2013 San Juan Mining Conference in Lake City, CO which included topics on legacy mining, community revitalization and mining futures. In late 2013, UWP, MSI and Willow Creek Reclamation Committee began planning the 2014 San Juan Mining Conference in Creede, CO which will include topics on mining heritage of Creede, micro and macro-economic impacts of mining on community economics and social services, miner remediation and water quality improvement projects. See Appendix A for conference programs.

3. Outreach Materials: The VISTA Volunteers have redesigned and regularly updated UWP’s webpage. They have also developed UWP’s Facebook page which has become an effective outreach and networking tool. The UWP has had an active presence in local press with 11 articles published during the term of this grant cycle. An annual print newsletter was produced for 2013 and 2014 while monthly e-newsletters are distributed on first of every month. Additional outreach materials supported by this grant included: graphic design of UWP logo, tri-fold and materials, t-shirts and flyers utilized at various outreach events. UWP contributed to the production of a short film on Good Samaritan legislation: <http://youtu.be/XkjFdqshv1Y>

UWP also conducted two surveys, one at the beginning of this grant cycle before major outreach and education activities took place (November 2012) and second after expanded outreach and education effort in December 2013. Same questions were used in both 2012 and 2013 surveys, survey results are summarized in Appendix B. Response rate was 23 in 2012 and in 2013 it was 35-51. This indicates at least a 65% increase in survey response rate. The range in 2013 participation is because in 2012 we used a hard-copy survey but in 2013 changed it into a questions matrix presented on 3 posters in hope of encouraging more participation. Inadvertently, in 2013 not all participants responded to questions on all 3 matrices. This complication made it difficult to normalize results by response rate for 2012 vs. 2013 comparisons. However, responses to the following questions “Have you attended UWP events in the PAST?” and “Will you attend UWP events in the FUTURE?” suggests that community participation in UWP events increased over the course of one year from 2012 to 2013, and we can expect more participation in the future. Lastly, both surveys indicate the top community priorities for issues of concern are: healthy river systems, water quality & availability, and recreation. Issues of lesser importance are education, invasive species, mining and agriculture.

Deliverable

1. Current stakeholder database comprises of 314 members and is updated regularly with contact information and topics of interest.
2. 11 published press releases during this grant's term are available in "Resources/Press Coverage" on UWP's website at: <http://www.uncompahgrewatershed.org/uwp-documents/press-coverage/>
3. Presentations and/or videos from stakeholder forums (Water Demands in Ouray County and Idarado Mining Company Update) are available in "Resources/Presentations on UWP's website at: <http://www.uncompahgrewatershed.org/uwp-documents/important-links/presentations/>
4. Social media sites: UWP website (www.uncompahgrewatershed.org), active Facebook page (www.facebook.com/UncompahgreWatershed).
5. UWP brochure and annual newsletters (Appendix A).
6. Results from stakeholder surveys evaluating UWP's outreach and education efforts (Appendix B).

TASK 4 – Education

Description of Accomplishments

Most education programs completed in this grant cycle are described in Task 2. Main accomplishments included:

1. Educational Events: UWP staff implemented educational activities related to water quality and water quantity/flow topics at several regional events: Montrose Natural Resource Festival (May 2013), Ridgway River Festival (June 2013), and Lake Appreciation Day (July 2013). These included activities from Project WET handbook, EnviroScape non-point source pollution model, and macroinvertebrate sampling. UWP organized educational service projects with 4th graders for Earth Day in April 2013. UWP staff started monthly River Watch sampling and complimentary activities in Fall 2013 with 3rd graders and macroinvertebrate sampling with secondary students. Staff also contributed to a snow science field day and wilderness appreciation day.
2. Educational Needs Assessment: UWP staff conducted an educational needs assessment with Ridgway and Ouray schools during academic year 2012-2013 to assess educational program needs related to watershed, riparian, or river topics. They met with principals and teachers to discuss needs in context of Colorado's teaching standards. They identified more experiential (or place-based) education opportunities as the primary need. Results of the assessment are included in Appendix C.

Deliverable

1. Educational Needs Assessment report (Appendix C).
2. 15 educational sessions conducted, 529 children educated on watershed topics.
3. Summary of educational programs (Appendix D).

TASK 5 – Operating Expenses and Supplies

Description of Accomplishment

With support of this grant UWP was able to acquire office resources critical to its operations: computer and software, printer, external hard-drive for backups, projector and miscellaneous office supplies (paper, ink cartridges, office and mailing supplies).

Deliverable

There were no direct deliverables under this task.

TASK 6 – Administrative

Description of Accomplishments

This grant was administered by UWP's fiscal sponsor: Shavano Conservation District at 10 % administrative fee totaling \$1,273.

Deliverable

Invoices processed per grant contract.

Appendix A. Outreach Materials

UWP Brochure

Yes! I want to join the UWP
and help protect our rivers
and streams!

Benefits of Membership:

- * Annual newsletter mailed to your door
- * Invitations to membership events

☐ Individual Membership \$24

☐ Family Membership \$36

☐ Business Membership \$96

Name _____

Address _____

City _____

State _____ Zip _____

Email _____

☐ Send my acknowledgement letter via email

☐ I do not wish to be recognized in UWP publications.

☐ My check is enclosed.

Thank you for your tax-deductible contribution to the UWP!

uncompahgre
WATERSHED
partnership

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Uncompahgre Watershed Partnership

Who are we?

We work to help protect the economic, natural, and scenic values of the Upper Uncompahgre River Watershed. The UWP works to inform and engage water users of all ages including ranchers, miners, and recreationists.

Educate

Our environment, communities and laws are ever changing. An informed people is an investment in our community management of its resources.

The UWP works with teachers in Ouray and Ridgway to provide K-12 programs on aquatic life, the water cycle, and river chemistry.

Learning about watersheds!

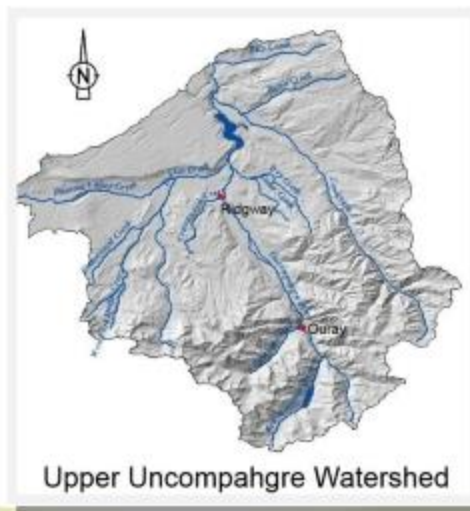


You can support the UWP and your community by attending or volunteering in our events.

We also work with local groups to sponsor discussions and talks on issues that matter to our community. Over the past year these included talks on water use, Idarado Mine cleanup, and more.

What is a watershed?

A watershed is like a bathtub which includes the area of land where all the water that is under it or drains off of it goes into the same place. It includes the people, plants, and animals also living on that land.



The UWP focuses its efforts in the upper half of the watershed, from the San Juan Mountains to Billy Creek.

Restore

The loss of plants along our river from both natural causes and human activities has led to erosion along our streams which can contribute to flooding.

By volunteering with the UWP you can help prevent erosion by planting trees and native grasses along our river banks.

Getting the weeds out!



Repair

Natural acidity and heavy metals from the Red Mountains and historic mining in the San Juan Mountains have contributed to the impaired status of the Uncompahgre Watershed's headwater streams.

The UWP is working with state and local agencies to reduce heavy metals in our headwater streams by cleaning up abandoned mines. Your donation will support these containing clean up efforts.



Sample e-newsletter

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Check out this month's monthly newsletter from your local watershed group!



UWP MONTHLY NEWSLETTER



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 [Forward to a Friend](#)



Thank you Emily Galanto!

This month we say good bye to Emily who worked as the UWP's Outreach Coordinator and then as Interim Coordinator during 2012/2013. Emily's hard work and boundless energy produced many great [programs](#) and productive partnerships with the UWP. As she goes forward we wish her well.

September 2013

www.uncompahgrewatershed.org

Read below to find out about upcoming UWP and partner events, and ways you can get involved in being a steward of your river!

Tidbits from the Uncompahgre

Many of our subscribers may be aware of the fish pond located just outside the Ouray Hot Springs in Ouray, CO. But, did you know in the 1920's it held more than fish and turtles? In 1921, local saloon keeper Ed Sullivan brought a two foot alligator from Louisiana to play in the pond. A second alligator was added after it was determined the first was lonely. They both thrived in the pool and grew to be 6 feet long. While the alligators in the pond, and the fish, were swept away in the flood of 1929, alligators are not currently found in the Uncompahgre. (From: Smith, David. (2003). *A Quick History of Ouray*. Montrose: Western Reflections, Inc.)

Upcoming UWP Events:

UWP Outing: Every 2nd Saturday of the month, the UWP invites you to hike around with our staff and board members. This September 14th, the UWP is leading a hike on the Grey Copper Trail. The trail is a pristine and scenic historic trail in the Red Mountain District. The hike will run parallel to and eventually cross Gray Copper Creek before climbing past scenic waterfalls and lovely meadows to end by the Vernon mine north of Red

Weed Pulls in Rollans Park:

Thank you to everyone who came to pull weeds in Rollans Park in Ridgway! We made room for native Colorado plants by taking out Spotted Napweed and Pig Weed.

Volunteer Day in Rollans

Park: Eight volunteers came to help us sand picnic tables, clear walking paths, adjust tree fencings, mulch, and pull weeds in Rollans Park! We had a wonderful day to work outside and got a lot of work done. So thank you to everyone who came. It's the efforts of our volunteers that make the UWP successful!

Mountain #1. It's a moderate and beautiful two-mile trail, four miles round trip. Please meet us at the Ouray Visitor's Center at 10am with your good boots and plenty of [water](#) 🍷. Check the UWP website for cancellations or postponements.

Volunteer Day at Rollans Park, Part Two!

Monday, September 9th, the UWP will stain the picnic tables we sanded in August. We had a great time in August, with just a sprinkling of rain, come join us in September to help us [finish](#) 🍷 the job. For more information contact Judi at drdjic@gmail.com.



Coffee with the UWP: Every Wednesday in September, the UWP will be available from 9am-11am at the Backstreet Bistro in Ouray for open conversation about UWP projects, issues with our watershed, or just small talk! Come grab a coffee and learn about our local waterways.

"The Colorado River: Flowing through Conflict" a Presentation by Jon Waterman. Tuesday December 3rd, 7pm at the Wright Opera House. Mr. Waterman has worked as a wilderness guide, magazine editor, park ranger, and guard dog agitator; but more than anything else, he is a writer and photographer. Supplying vital water to more than 30 million Americans living in the arid West, the Colorado River is one of the most diverted, dammed, and heavily litigated rivers in the world. To learn more about the river, and the people depending on the Colorado, Jon journeyed down the river, paddling in his kayak and hiking on foot, all 1,450 miles from the Rocky Mountains to its Mexican delta. Join us when we listen to Jon share insights gained on the river about the challenges facing the Colorado, and us.

Upcoming Partner Events

Transition OurWay September Meetings: *Time Bank* meeting, 6pm - 8pm, Sunday September 8th. *Medical Group* meeting, Noon to 1:30pm, Wednesday, September 11th. *Food Group* meeting, 6pm - 7pm, Tuesday, September 17th.

For more information visit Transition OurWay's online [calendar](#).

Top of the Pines Crowdfunding Project The goal is to complete the pavilion on our mountain retreat, build more trails, add a couple of yurts—and create an outdoor education and recreation center for our kids and the rest of us. <http://www.gofundme.com/387s90>

For more community events, visit the [UWP Calendar](#)
| [Transition OurWay Calendar](#) | [Ouray County Community Calendar](#)

[Want to be more involved in the UWP?](#)

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Uncompahgre Watershed Partnership

Annual Newsletter 2013

State of the Unc

The verdict is out: the stakeholders of the Uncompahgre River Valley want clean water! This need has been prioritized in the recently completed Uncompahgre Watershed Plan. Data collected in the recent past and during summer 2012 high and low flows indicates that abandoned mines in the upper Uncom-

pahgre watershed substantially contribute to heavy metal loading and acid mine drainage in the ore-rich Red Mountain District. The UWP will prioritize remediation of legacy mine sites to restore waters impaired by heavy metals through community and agency efforts. Our other goals as identified in the plan and stakeholder

surveys will be to improve water quantity, riverine ecosystem functions, recreational opportunities, and to create a diverse and active stakeholder group through outreach and education.

We look forward to working with you to improve the health of the Uncompahgre and our community!



Steering Committee:

REIN VAN WEST

DEBBIE COOKS

KEN LIPTON

MARSHALL PENDERGRASS

BEN TISDEL

BOB LARSON

JEFF LITTERAL

PAT WILLITS

Staff:

AGNIESZKA PRZESZŁOWSKA

EMILY GALANTO

Out with the tires, In with the seeds!

Our local community has been fundamental in the improvement of the Uncompahgre River. Back in April 2012, several volunteers helped OSM/VISTA Matt Jurjonas and Dave Hale from the Billy Creek State Wildlife Area remove over 100 tires from Burro Creek. Later in the year, Dave and his crew completely removed these tires from the floodplain, leaving a cleaner creek behind.

In August 2012, the UWP worked with Ouray County Weed Control and the Town of Ridgway to transplant 22 cottonwoods from Ridgway State Park to Rollans Park. These trees increased native vegetation and will provide habitat for wildlife in the

park. This project could not have been done without help from the community, the Southwest Conservation Corps, Town of Ridgway, Colorado Healthy Rivers Fund and the Noxious Weed Fund.

October of 2012 marked another project in Rollans Park. Volunteers from our community as well as a Humanists Doing Good from Grand Junction helped the UWP and Ron Mabry, County Weed Manager, seed over 1000 feet of stream bank with native grasses and flowers. We covered the area with biodegradable aspen fiber and straw fiber to enhance soil microclimate and facilitate seed establishment next spring.

Thank you to our star volunteers who made this project a success: Dudley Case, Dickson Pratt, Jared Coburn, Dan Murphy, Chad Jukes, Gina Kitchen, Rein and Jan van West.



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Contact us to volunteer
for future projects:
UWPvista@gmail.com

Festivals, Food and Fun: Summer 2012

As Ouray Countians know, summers are full of festivals, music and other outdoor events. In an effort to raise awareness about water conservation and the importance of healthy watersheds, the UWP participated in and helped organize several of these festivals.

The May event was the Montrose Natural Resources Festival, organized by the Shavano Conservation



District. The UWP was one of 21 agencies that engaged 540 4th graders from Delta, Ouray and Montrose

counties in various water conservation activities. The event was a hit!

In June 2012, the UWP helped organize the 5th annual Ridgway River Festival, largely put on by the MOSAIC Community Project (MCP). The UWP coordinated the Watershed Education Tent which featured representatives from local organizations and kid-friendly water education activities. The stream bugs intrigued even the parents. Additionally, the UWP helped organize the Riverfest's Silent Auction – which raised over \$2100 for MCP and the UWP. Other activities included live music, food, libations, and the renowned "Junk of the Unc" competition, where teams built buoyant structures out of "junk" and raced down the Uncompahgre. The UWP looks forward to next year's Riverfest!

The last summer festival was Lake Appreciation Day at the Ridgway

State Park. The UWP again organized the Watershed Education Tent. A special thanks to Tri-County Water Conservancy for sponsoring the food tent which included refreshing snow cones.



Fall Fundraisers and Events!

Here are few highlights of UWP's 2012 fall events:

The Buen Tiempo Restaurant in Ouray hosted UWP's first Trivia Night! Over a dozen community members came out to test their local and world knowledge while enjoying

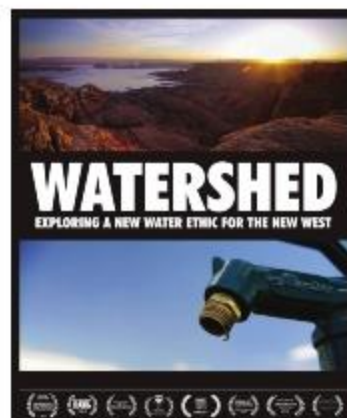


delicious beer. The trivia night was also a fun way for anyone unfamiliar with the UWP to learn about our watershed. Buen Tiempo graciously donated 50% of draft beer sales to the UWP! Congratulations to Bernie Pearce for being the night's overall winner and taking home a \$250 Gift Certificate to TeaCo Biological Supply! Our next trivia night will be held at the Trail Town Still in Ridgway on February 20, 2013.

In November 2012, we screened a recently produced Robert Redford documentary called "Watershed" which showcases individuals who practice water conservation in the Colorado River Basin. The newly-renovated Sherbino Theater in Ridgway, CO was packed with moviegoers excited to watch this informative film and drink beer donated by the Colorado Boy Brewery! Proceeds from beer donations will help fund our 3rd annual San Juan Mining Conference in April 2013. "Watershed's" main message was to convey the importance of water conservation. The Colorado River no longer reaches its delta due to high water demands and diversions in the basin's states. With the help of communities living in contributing watersheds, we can help the river reach its delta once again by reducing our water use.

December 2012 marked the 4th annual Colorado Wine, Chocolate and Cheese Fest held in the Ouray Community Center. The UWP was selected as this event's beneficiary! The Winefest is widely attended by people from all around the state who come to enjoy local wine, chocolate,

cheese, liquor and crafts. This was a great funding and outreach opportunity for the UWP. Big Thank You to Faith Parry for organizing the event and supporting local non-profits.



Visit our website for water conservation tips:
www.uncompahgrewatershed.org

Water Education in 2012

Engaging and educating Ouray County's youth is one UWP's five core goals. The community is lucky enough to hold truly dedicated teachers that are willing to strengthen their student's knowledge through place-based education outside of the classroom. Here are examples of UWP's involvement in the local school system.



The Ridgway 4th graders celebrated Earth Day 2012 with the UWP and our Ouray County Weed Manager, Ron Mabry. The students planted native seeds, played some games, and went on a riparian scavenger hunt. They also enjoyed ice cream

donated by Suzy Ulrich from Café Ridgway. It was a beautiful day to celebrate our planet!

River Watch is a state-wide program that utilizes volunteers to sample local waterways and obtain water quality data that is used in legislation and scientific research. Starting in September 2012, The Ridgway 3rd graders became part of this larger effort. Arlene Crawford secured a new sampling site and Ethan Funk adjusted his regular sampling schedule to accommodate the students. The 3rd graders now look forward to getting outside of the classroom every month, collecting real data and learning more about their local river.

National Public Lands Day is a nation-wide, presidentially-endorsed September event to encourage all citizens to get out onto their local public lands to protect, steward, and enjoy them. This year, the UWP celebrated with the Ouray 4th graders. Thanks to the World Water Monitoring Challenge, we used a 4th-grade-friendly water quality testing kit to

measure the pH, dissolved oxygen, turbidity and temperature of the Uncompahgre River. The results were uploaded online as part of a world-wide initiative



to acquire water quality data. The students appreciated being part of this larger project to care for our public lands and waterways! And we appreciate their enthusiasm.

If you are an educator interested in strengthening your curriculum, please e-mail:
UWfvista@gmail.com

Coordinator's Note



Agnieszka Przeszlowska

Welcome to a new chapter of the Uncompahgre Watershed Partnership. FY 2012 was an exciting time of transition for us as we completed the Uncompahgre Watershed Plan (available on UWP's website) and began to transition from planning to project implementation. In FY 2013 we will develop on-the-ground projects, continue outreach and education efforts, and complete incorporation as a 501(c)3 non-profit. We are committed to protecting and restoring the upper Uncompahgre watershed through coordinated community and agency efforts and welcome your participation in all our initiatives. There are many ways you can help: provide input on

projects, serve on a committee or become a board member, participate in UWP events, volunteer, or contribute financial support. Contact us and ask what you can do.

A little about me... I'm Polish which explains all the consonants in my name, please don't be intimidated. I ventured to the Rocky Mountain West from CT in 2001 to attend graduate school at Colorado State University where I received an MS and PhD in Rangeland Ecosystem Science with a focus in riparian ecology and watershed science. My husband and I moved to Ridgway in fall 2011 and immediately fell in love with Ouray County. As the UWP watershed coordinator, I'm passionate about applying my science background to efforts that directly benefit our local community. I'm delighted to collaborate with extremely vested and energetic stakeholders that support UWP's mission.

UWP is also fortunate to work with talented and enthusiastic OSM/

VISTA Volunteers. In April 2012 we bid farewell to Matthew Jurjonas who sustained the UWP through 2011. Matt went on to pursue a Master's degree in Conservation Leadership at CSU and passed the hat to Emily Galanto. Emily joined the UWP after graduating with a BS in Environmental Biology from the University of Connecticut and completing several field tours with the Student Conservation Association in MA, CA, and FL. Emily has been coordinating UWP's outreach and education initiatives, volunteer efforts, and fundraising events.



Emily Galanto

Emily and I look forward to working with you in 2013!

-Agnieszka Przeszlowska, Coordinator

Uncompahgre Watershed Partnership

Our mission: to protect and restore the Upper Uncompahgre River Watershed through coordinated community and agency efforts and to build an informed and engaged citizenry on watershed issues. We strive for a healthy river in a thriving community!

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We're recruiting new
Directors for our
Board. Contact us be-
fore Apr. 2013 to join!

Looking Forward in 2013

The upcoming year promises to be action-packed with various projects and events. The annual **San Juan Mining Conference** will be held in Lake City on Apr. 18-19, 2013. This free, public event will feature invited presentations on mine remediation, the future of mining in the San Juan region and a half day field tour of the Ute Ulay Mine.

The summer will be filled with fun in the sun at local events including **Ridgway River Festival** (June) and **Lake Appreciation Day** (July). Summer and fall service projects will include completion of the riparian revegetation in Rollans Park in Ridgway, weed pulling events, water sampling, and construction of an ADA-compliant **fish-ing pier at Crystal Lake**. Keep your eyes peeled for

volunteer opportunities. We will also plan community stakeholder meetings, films, presentations, fundraisers and educational programs. We are currently working with local schools to increase outdoor, place-based educational activities. Expect to see more "kids in the woods" or near the river.

We will continue to work diligently toward our primary objective of improving water quality in our watershed. Our focus will be on developing **mine remediation** projects. In January 2013, we applied for a Nonpoint Source Pollution grant to conduct remediation at three abandoned mine sites: Atlas Mill, Vernon Mine and Michael Breen Mine. Pending grant approval in late March 2013, we will develop detailed remediation plans to start implementation in spring 2014. We will also

continue to monitor development of a Contingency Plan for further remediation at the **Idarado** mine sites. A community stakeholder meeting which will include updates from Idarado, DRMS and Colorado Department of Public Health and Environment (CDPHE) is tentatively planned for March 2013. Check the local papers and UWP website for announcements.

In spring and fall, we will assist Colorado Water Quality Control Division and Division of Reclamation Mining & Safety in **water quality sampling**. Throughout the year, we'll contribute to Town of Ridgway's implementation of the Source Water Protection Plan (**SWPP**) and continue to support the **River Watch** program. Contact us to contribute to these efforts.

Partner of the Year: Ron Mabry, County Weed Manager

Ron Mabry has been working for Ouray County for 8 years eradicating invasive plant species like spotted knapweed, myrtle spurge, Canadian thistle and tamarisk. This year, he partnered with the UWP to organize weekly June Weed-Pulls which helped reduce spotted knapweed in Rollans Park riparian areas. He also contributed to our Earth Day 2012 celebration during which he discussed the importance of native vegetation with Ridgway 4th graders and led them in planting native species near the 4H Event Center in Ridgway.

Most notably, Ron secured funding through the Noxious Weed Fund to sponsor a Southwest Conservation Crew and acquire equipment and materials for the Rollans Park. He thoroughly researched best practices for growing and protecting native grass seeds and cottonwood trees to ensure success of the project. Memorably, he prepared lunches for our volunteers that were both delicious and nutritious!

Ron is a jack of many trades. In addition to being a weeds warrior he is an avid fisherman, horseback rider, guitar player, aikido practitioner, a vintner and wine connoisseur, chef, advanced Master Gardner, and first responder for Ouray County. Ron's colorful personality spices up all collaborative endeavors. Thank you Ron for all your work with the UWP!



www.uncompahgrewatershed.org

Check us out on the web for updates, sign-up for monthly e-newsletters, and download the watershed plan.



Annual Newsletter 2014

Uncompahgre Watershed Partnership

State of the Unc

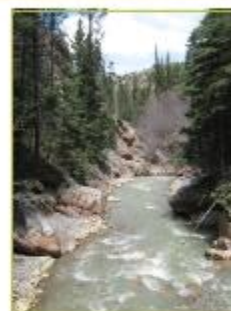
In the ore-rich, yet naturally acidic San Juan Mountains, historic hard rock mining has contributed heavy metals and acid mine drainage to natural processes in headwater streams of the Uncompahgre Watershed. Consequently, many of our streams do not meet water quality standards for metals (ex. Cadmium, Zinc, Iron, Lead) and are on Clean Water Act's section 303(d) list of impaired waters, meaning pollutants in the streams degrade beneficial uses such as recreation, aquatic life, water supply or agriculture. Although remediation work of several mines in the Red Mountain Creek drainage has

been conducted by Idarado Mining Company for several decades, there are hundreds of abandoned mine sites contributing metals and acid mine drainage to other streams in our watershed. The UWP will be working in these streams to help clean-up legacy mine sites (those without liable parties) so that over time, water quality can be improved and beneficial uses restored.

In 2014, we will be starting our biggest project to date: mine remediation at three legacy mine sites in the Upper Uncompahgre Watershed: Atlas Mill on Sneffels Creek, Michael Breen Mine on Uncompahgre River (Engineer Pass road),

and Vernon Mine in Gray Copper Gulch. This will be a precedent-setting collaborative effort which will engage an active mining company: Revenue-Virginius' Star Mine Operations, a local watershed group: the UWP, the US Forest Service, state agencies: Colorado Division of Reclamation, Mining, and Safety (DRMS) and Colorado Department of Public Health and Environment (CDPHE), and local entities: contractors and Ouray County Historical Society.

Although the project will be largely funded by a CDPHE's Nonpoint Source Program grant and funding from the Water Quality Improvement



The Uncompahgre River

Fund, all parties will contribute tremendous cash and/or in-kind services.

We will begin the multi-year project by collecting water samples at the three sites to establish a baseline data set

continued on page 4...

UWP By the Numbers

2	Business Memberships
22	Individual Memberships
13	Family Memberships
4	River Watch monitoring sites
6	Outdoor Hikes
12	Volunteer Days
64	Volunteers
443	Volunteer Hours
27	Educational Sessions
529	Children Educated on watersheds



Service in our Community

2013 was a busy year for the UWP staff and our wonderful group of volunteers! Some projects we did together include:

- Worked to rid the county of noxious weeds through weed pulls.
- Stabilized river banks by planting willows and car-

ing for last years planting projects.

- Reduced runoff by planting seedlings and grasses to reduce runoff in the hills.

Our most ambitious volunteer project this year though was to become the official adoptees of Rollins Park in Ridgway.

Paths were cleared, trees were mulched and park equipment was sanded and stained. Even the Ridgway shop class pitched in to install new fencing and stain the benches in the outdoor classroom!

We are looking forward to another year of environmental stewardship work in our community.

"In 2014 the festival torch will be passed once again as the UWP takes over management from the Mosaic Community Project."



Whitewater Rodeo 2012

Thank You to our Board:

Ken Lipton
Jerry Roberts
Judi Chamberlain
Scott Williams
Anthony Ramsey
Dennis Murphy
Bob Larson

We have two
Board openings!
If you are interested in
serving on our Board of
Directors contact us at:
uwpcoordinator@gmail.com

Thank You for Serving!
Ben Tisdell
Jack Flowers

Ridgway River Festival

Did you know that the Ridgway River Festival has been happening since 2005? At the completion of a restoration project in Rollans Park, the Town of Ridgway decided to celebrate. People gathered in the river side park for the dedication of a new footbridge and constructed wetland. The first Riverfest was a small and festive gathering where people picnicked on the shore and stood for a group photo on the bridge. It was a great start for the now annual community event!

The festival grew in its second year, with the addition of live music, food vendors, and the inaugural run of the Rubber Duck River Race! New children's activities came to the festival, which added an ongoing educational component. These stations were later expanded into the Watershed Education Tent, and Kid's Eddy where curious children and adults can learn about the water cycle, watershed ecosystems, get their face painted and munch on delicious solar oven baked cookies in the park.

In 2007, the Town put the Riverfest on hold in order to focus their energies on creating "Autumn Fest", which developed into the popular summer Ridgway Music Concert Series. However, area locals missed the Riverfest

that summer and the Mosaic Community Project offered to adopt the festival. The Town of Ridgway gladly agreed, happy in the knowledge that



Duckies for 2014!

the festival would continue. The 2008 River Festival saw the introduction of many new river races, including the infamous "Junk of the Un" race as well as the exciting "Whitewater Rodeo"!

In the years since the first River Festival took place, community members have come to look forward to this annual celebration in Rollans Park



along the banks of our Uncompahgre River. In 2011 the UWP joined the Mosaic Community Project in organizing the festival, managing the Watershed Education Tent and Kid's Eddy. In 2014 the festival torch will be passed once again as the UWP takes over management from the Mosaic Community Project.

This year Ouray County will see the continuation of the Ridgway River Festival as UWP Board members are hard at work gathering supplies, organizing volunteers and rounding up participating organizations to make 2014 a River Festival to remember!

Mark your calendar for Saturday, **June 28th, 2014** and watch our monthly newsletter to register for river races, education, and fun in Rollans Park!



The first Ridgway River Festival in 2005

Watershed Education 2013

We have remained committed to engaging and educating people of all ages in watershed education. Over the past year the UWP has worked with the wonderfully dedicated staff of both Ouray and Ridgway Schools to deliver hands on

watershed education to all ages.

Highlights of 2013 include: The Ridgway 4th Graders celebrated Earth Day this year by planting native grass seeds and pine trees in order to help an area decimated by mistletoe kill. The Ridgway 3rd Graders continue to participate with the UWP in the River Watch monitoring program and learn about the measure of river health such as pH, alkalinity, and temperature.

The Ouray Soph-

omore biology class learned how to conduct a river bug survey and what kinds of bugs indicate river health and why.

The UWP staff participated in the Montrose Natural Resource day where students from Ouray to Delta spend a day in the park visiting stations on agriculture, history and watersheds.

Through a Captain Planet Grant the UWP was able to buy water testing kits for use in both Ouray and Ridgway schools. The kits are available at the UWP Ridgway office and can be loaned out by emailing uwpvista@gmail.com.

We look forward to another great year learning about our water!



Ridgway 3rd Graders learn about the bugs/macroinvertebrates that indicate river health.

Coordinator's Note

The 2013 was a milestone year for the UWP. We incorporated as a 501(c)(3) non-profit corporation, recruited a new Board of Directors, moved to a new office in downtown Ridgway, rolled-out a membership program and secured funds for our biggest implementation project yet (see "State of the Unc"). We thank the original Steering Committee for contributing to these accomplishments: Rein van West, Jeff Litteral, Bob Larson, Debbie Cokes, Ken Lipton, Ben Tisdell, Pat Willits, and Marshall Pendergrass.

2014 promises equally fruitful with various programs and events: the annual San Juan Mining Conference on Apr. 24-25, Ridgway River Festival on June 28, our first mine remediation project this summer, Rollans Park Adopt-a-Park

service days in late summer, an invited speaker or film in late fall, monthly water sampling on the Uncompahgre River for Colorado's River Watch program, as well as various community outreach and school educational programs in between. There will be many opportunities for you to get involved. You can attend an open Board meeting, join a special committee, participate in UWP events, volunteer for our projects, become a member or support UWP's mission with a charitable contribution.

2014 will also be a year of transition for UWP as support from the AmeriCorps OSM/VISTA program comes to an end in late April 2014. The UWP has been fortunate to have five talented Volunteers In Service To America (VISTAs) serve our organiza-

tion and the Ouray Community in recent years. Our current VISTA, Rhianna Williams, joined us in April 2013 and has been coordinating UWP's outreach, education, and fundraising efforts. She has also prepared several grants, developed UWP's membership and volunteer programs, and volunteers with several local organizations. Rhianna is concurrently a Master's student at Michigan Technological University in Houghton, MI pursuing a degree in Environmental and Energy Policy. And, as part of her thesis is conducting research on water use in Ouray County. This report will be a valuable tool for informing water users in our community on the status of our local water supply.

We look forward to working with you in 2014!

*Thank you!
To all of our Members!*

BUSINESS MEMBERSHIP Sacred Water Consultants

FAMILY MEMBERSHIP
Scott & Sheelagh Williams
Jerry Roberts
Ray & Lisa Mc Janiel
Al Lowande & Roxanne Evans
Jeff Litteral
Sue Husch
Randy Gregory
Richard Godfrey
Angela Ferrelli
Michael Cassidy

INDIVIDUAL MEMBERSHIP
Pat Willits
Dee Williams
Gayle Veum
Rein van West
Tulen Van Arsdell
Tyler Van Arsdell
Rick Trujillo
Ben Tisdell
Jen Parker
Chris Landry
Kate Kellogg
John Hollrah
Peter Hackett
Michael Covington
Jack Brauer
Mike Boruta
Judith Bartlett
Bob Albrecht



Agnieszka Przeszlowska and Rhianna Williams outside the UWP Office in Ridgway.

Our Mission: The Uncompahgre Watershed Partnership exists to help protect the economic, natural, and scenic values of the Upper Uncompahgre River Watershed. The Partnership works to inform and engage all stakeholders and solicits input from diverse interests to ensure collaborative restoration efforts in the watershed.



Arlene, 2012 Lake Appreciation Day

Partner of the Year: Arlene Crawford

Arlene Crawford has been working for the Ridgway State Park for 12 years. She develops and runs the curriculum for the "Parks in Education" Program at the park. Some of Arlene's Programs include Disabled Vets Fly Fishing, and the highly successful two week long Bird Banding Project where students from Delta, Montrose, Ouray, and Delta visit the park and learn all about birds and their environment.

For the past three years, Arlene

has partnered with the UWP to organize Lake Appreciation Day as well as train UWP VIS-TAs on how to conduct sampling for the River Watch Program. In fact Arlene introduced the River Watch program to our area. Thanks to her efforts there are 10 sites being monitored from Iron-ton to below the Ridgway Reservoir.

Arlene not only enjoys teaching others about the outdoors she also likes to get outside herself by hiking, hunting, and

fly fishing. Arlene is always a pleasure to work with and we always learn something new when we do! Thank you Arlene for all of your work with the UWP!



H2O Jo

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State of the Unc continued...

to which we can compare outcomes of our remediation efforts. Work on the Atlas Mill site will include removal of tailings (fine material leftover after ore processing) from Sneffels Creek streambanks and valley bottom, re-vegetation of the area and creation of two small wetlands. Much of the earth-moving work and offsite tailings removal will be conducted by Star Mine Operations who plan to reprocess the tailings in an underground mill. Western Stream Works of Ouray, CO will lead re-vegetation and wetland work while DRMS provides technical oversight.

Work at the Michael Breen and Vernon Mines is scheduled for 2015 and will include removal

of waste rock (piles of coarse material leftover after ore processing), re-vegetation and diversion of drainage from mine adits around sensitive areas. DRMS will lead the remediation efforts at these two sites. At the Mickey Breen site, we will also work with Ouray County Historical Society to construct an interpretive sign and stabilize a mine load out structure adjacent to and visible from Engineer Pass road. This structure is one of the hallmarks of our local mining heritage.

The last phase of our project will include additional sampling of water quality and macroinvertebrates (i.e. stream bugs) after clean-up is completed at the three project sites. This

information will be compared to information gathered before implementation of projects to evaluate the impact of our restoration efforts. Additionally, in 2016 and 2017 we will collect more water and macroinvertebrate samples in other headwater streams to identify future mine remediation sites.

Please visit our website to learn more about these projects, support these clean-up efforts and learn about related field tours and informational events. You can get all the latest information by signing up for our monthly e-newsletter on the bottom of our homepage.

www.uncompahgrewatershed.org

Check us out on the web for updates, sign-up for monthly e-newsletters, and download the watershed plan.

2013 & 2014 San Juan Mining Conference programs

WELCOME TO THE THIRD ANNUAL SAN JUAN MINING CONFERENCE

April 18-19, 2013

Moseley Arts Center, Lake City, Colorado

Thank you for participating in this two-day conference highlighting lessons learned from past projects and new advances in the sciences of mine reclamation and watershed restoration in the San Juan Region.

This conference was made possible by our generous sponsors:



Colorado Department
of Public Health
and Environment

CALDERA
Mineral Resources

NEWMONT
The Gold Company



The 2013 Conference is presented by:



Lake Fork Valley Conservancy has sustained and enhanced the environmental and rural character of the Lake Fork of the Gunnison River valley through education, restoration, and stewardship for more than a decade. Our team assessed the Lake Fork watershed's water quality — particularly areas impacted by historic mining — with major synoptic sampling in 2005, 2006, 2009, and 2010. The Conservancy has cleaned up six mines to date, a feat the EPA recognized with an Achievement Award in 2008. In 2012 the Conservancy was given a Partners In Conservation award from the Department of the Interior for our role in land preservation. The Conservancy is now developing a program of educational and cultural events that promote environmental stewardship and a robust economy. More information available at www.lfvc.org.



Mountain Studies Institute (MSI) is a non-profit, non-advocacy, mountain research and education center established in 2002 in Silverton, Colorado in the heart of the San Juan Mountains. MSI has developed a highly collaborative, dynamic, and unique approach to serving our region, which has grown to encompass fourteen counties in Southwest Colorado. Our mission is to enhance understanding and sustainable use of the San Juan Mountains through research and education. This mission has positioned MSI to identify and articulate information needs, facilitate and complete research and restoration initiatives, and most importantly to ensure that pertinent scientific information is made available to decision makers and the general public. It is our vision that through science education, information is not only understood, but used to transform our communities into healthier, more sustainable places to live. More information available at www.mountainstudies.org.



Hinsdale County has been identified as the most remote County in the lower 48-states and one of the few places you can wander more than ten miles from a road. The year-round population is about 850 residents which swells to 2,500 residents and second homeowners in the summer. With five fourteen-thousand+ foot peaks and more than 95% public lands, Hinsdale County offers unlimited outdoor recreational opportunities. The Lake City Historic District boasts more than 100 contributing historic structures. The Town of Lake City is both a Preserve America and Main Street community. More information available at hinsdalecountycolorado.us.



The Uncompahgre Watershed Partnership was founded in 2007 by a coalition of citizens, nonprofits, local and regional governments, and federal and state agencies dedicated to understanding the Uncompahgre Watershed in Ouray County, CO. Our mission is to protect and restore the Upper Uncompahgre River Watershed through coordinated community and agency efforts and to build an informed and engaged citizenry on watershed issues. We strive for a healthy river in a thriving community. If you would like more information about the UWP and information on current projects please visit www.uncompahgrewatershed.org.

2013 San Juan Mining Conference Agenda

Thursday	April 18, 2013
8:00am – 3:00pm	Registration
8:30am – 9:00am	Welcome, Introductions, and Conference Overview Town of Lake City, Hinsdale County, LFVC, MSI and UWP
SESSION I	Legacy Mines and Community Revitalization
9:00am – 9:25am	Revitalizing Colorado Mining Districts: Innovation Beyond Traditional Reclamation Bruce Stover, Colorado Division of Reclamation, Mining and Safety
9:25am – 9:50am	Nelson Tunnel Case Study Zeke Ward and Gwen Nelson, Willow Creek Reclamation Study
9:50am – 10:15am	Peanut Mine Reclamation Project Ann Johnston, Crested Butte Land Trust
10:15am – 10:45am	Break & Poster Session (refreshments)
10:45am – 11:10am	The Kerber Creek Restoration Project: A Lesson in Collaborative Restoration Trevor Klein, Kerber Creek Restoration Project
11:10am – 11:35am	Isotopic and Geochemical Characterization of Water Movement Through Abandoned Mine Workings, Nelson Tunnel Creede, Colorado Rory Cowie, University of Colorado Boulder
11:35am – 12:00pm	Good Samaritan Legislation and What It Means for Our Communities Lynn Padgett, Ouray County/Colorado Data Sharing Network
12:00pm – 12:30pm	Panel Discussion: Legacy Mine Sites & Community Revitalization
12:30pm – 1:30pm	Lunch catered by Sweet Peas Natural Food in the Anthony Gallery
SESSION II	Mining Futures
1:30pm – 1:55pm	Balancing Mineral Extraction and Environmental Protection in Colorado Robert Oswald, Division of Reclamation, Mining and Safety
1:55pm – 2:20pm	Revitalizing the Camp Bird Mine Mike Thompson and John Bryan, Caldera Mineral Resources
2:20pm – 2:45pm	Mine Revitalization and Legacy Operations in Creede Randy McClure, Rio Grande Silver, Creede
2:45pm – 3:15pm	Break & Poster Session (refreshments)
3:15pm – 3:40pm	Golden Wonder Mine: The Richest Gold Producer in North America Kye Abraham, LKA Gold Incorporated
3:40pm – 4:05pm	The Animas River Stakeholders Group - A Collaborative Partnership Steve Fearn, Animas River Stakeholders Group
4:05pm – 4:30pm	Critical and Strategic Minerals in Southwest Colorado Bob Larson, Monadnock Mineral Services
4:30pm – 5:00pm	Panel Discussion: Mining Futures
5:00pm – 5:30pm	Poster Session in the Anthony Gallery
5:30pm	Slumgullion Mixer at Restless Spirits Saloon

Friday	April 19, 2013
9:00am – 9:15am	Introduction: LFVC Moderating Kye Abraham, LKA Gold Incorporated
9:15am – 10:00am	Ute-Ulay: The Mine That Made Lake City Stan Whinnery, Hinsdale County Commissioner Mark Rudolph, CDPHE Voluntary Cleanup Program
10:00am – 12:00pm	Roadside Tour: The Ute-Ulay Townsite, Mine, Milling Complex, and Repository Tara Tafi, Division of Reclamation, Mining and Safety Stan Whinnery, Hinsdale County Commissioner Mark Rudolph, CDPHE Voluntary Cleanup Program Kristine Borchers, Hinsdale County Kye Abraham, LKA Gold Incorporated

A glimpse of the Ute-Ulay Mine

As the first patented mining claim in Hinsdale County – and with an estimated \$12 million mined between 1874 and 1903 – the Ute-Ulay mining complex spurred regional development and powered Lake City's economy for decades. Located three and a half miles from Lake City, this 12-acre site surrounding the Ute-Ulay is formerly known as the town of Henson.

This site demonstrates various eras of mining technology – from 1874 up to the 1980s. Structures that remain today include residential cabins, an assayer's office, the mill, a blacksmith shop, a boarding house, a red-cedar water tank, the main headframe, and several additional historically significant structures.

Thanks to a unique partnership of local government, a private mining company, nonprofit organizations, and state and federal agencies, this area is being reclaimed as a heritage tourism destination to showcase mining history and offer outdoor recreational opportunities.



Speaker Abstracts

Session I

Revitalizing Colorado Mining Districts: Innovation Beyond Traditional Reclamation

Bruce Stover, *Director of the Office of Active and Inactive Mines*, Colorado Division of Reclamation, Mining and Safety

Contact: bruce.stover@state.co.us

In Colorado there are many opportunities and challenges for abandoned mine land reclamation work. The opportunities are found in the coalition of partners that come together to address these legacy problems, including our elected officials, state and federal agencies, as well as Colorado's watershed communities and local governments. As I visit historic mining districts around the state I meet people who are dedicated to abandoned mine reclamation and restoration as well as those who cherish the importance and the history of the mining industry to Colorado's economic and industrial development. The challenges for traditional reclamation come in meeting the needs of the local community in terms of economic viability, land use, recreation and conservation. Restoring, revitalizing and reclaiming are all components of growing community-level initiatives in Colorado's historic mining districts. The Colorado Division of Reclamation, Mining and Safety has championed and fostered many projects that are meeting the new investments communities are making in revitalizing and in some cases, re-purposing their mining heritage.

Nelson Tunnel Case Study

Zeke Ward and Gwen Nelson, Willow Creek Reclamation Study

Contact: willowcreekrc@my.amigo.net

Peanut Mine Reclamation Project

Ann Johnston, *Executive Director*, Crested Butte Land Trust

Contact: director@cblandtrust.org

The Kerber Creek Restoration Project: A Lesson in Collaborative Restoration

Trevor Klein, *OSM/VISTA*, Kerber Creek Restoration Project

Contact: coordinator@kerbercreek.org

Kerber Creek watershed, located in Saguache County, CO, encompasses the historic Bonanza Mining District, operational from the 1880s to the 1970s. Over time, mine wastes sequestered behind dams in Kerber Creek and its tributaries were transported down-gradient and redeposited throughout the lower watershed as a result of flood events and human interference. The environmental degradation that resulted from abandoned mines in the upper watershed was first addressed by voluntary cleanup efforts in the 1990s spearheaded by the American Smelting and Refining Company (ASARCO, Inc.), the U.S. Forest Service (USFS), the Bureau of Land Management (BLM), the Colorado Department of Public Health and Environment (CDPHE), and local landowners. Although effective, these efforts were halted before addressing the effects of historic mining activities in the lower watershed, and so in 2005, BLM began investigating potential cleanup alternatives for this area. This investigation was the catalyst for the Kerber Creek Restoration Project, a collaboration among government agencies, non-profit organizations, and private landowners dedicated to the restoration of the Kerber Creek watershed. The project's approach involves the incorporation of each of seven essential aspects of restoration: (1) a solid understanding of the site, (2) identification of watershed needs, (3) development and maintenance of partnerships, (4) identification of funding sources, (5) project implementation, (6) measurement and documentation of success, and (7) post-project evaluation. The consideration of these aspects has allowed the Kerber Creek Restoration Project to successfully treat more than 60 acres of mine wastes, to restore over 4000 feet of stream, and to install more than 250 in-stream rock structures since 2007. Efforts to restore the Kerber Creek watershed have

dramatically improved the landscape, converting once toxic soils and poor aquatic habitat into land suitable for ranchers and wildlife. Moreover, the watershed now serves as a channel through which local community residents, school children, and professionals can understand the importance of natural ecological processes and can appreciate the enormous effort entailed in collaborative restoration. The lessons and rewards that have emerged throughout the course of the Kerber Creek Restoration Project form a model for cooperative restoration projects throughout the west.

Isotopic and Geochemical Characterization of Water Movement Through Abandoned Mine Workings, Nelson Tunnel Creede, Colorado

Rory Cowie, *PhD Candidate*, University of Colorado Boulder
Contact: rcowie@fortlewis.edu

Long-term acid mine drainage (AMD) discharging from the portal of the Nelson Tunnel near Creede, Colorado is currently impacting water quality in West Willow Creek and the Rio Grande River. Preliminary results indicate that waters draining the mine are well mixed and composed to some degree of old groundwater, not just meteoric inputs. The stable isotope (^{18}O) of the mine water is steady at -15 ‰ throughout the year, suggesting a well-mixed groundwater system composed of equal parts winter snow (-20 ‰) and summer monsoon rain (-10 ‰). Tritium (^3H) values within the tunnel are primarily “tritium-dead” indicating water that is at least older than the “bomb-spike” waters of nuclear weapons testing in the 1960s. Additionally, DIC, $\delta^{14}\text{C}$ testing indicates mine water on the order of hundreds to thousands of years of age. Results therefore suggest that mine waters are largely not directly connected to surface waters, or to the shallow groundwater (springs, seeps), but rather are likely entering the tunnel at intersections with a system of watershed-wide faults and associated fractures.

To build on existing information, additional sampling will occur in the fall of 2012. We propose to use established isotope and geochemical tracer techniques to quantitatively determine the origin of waters discharging from the Nelson Tunnel. Specifically, analysis of ^{18}O , ^2H , ^{87}Sr , ^{86}Sr , ^{14}C (from DIC and DOC), and ^3H will help identify the sources, ages and pathways of waters in the mine.

The results from field investigations will be used to develop a hydrogeologic conceptual model of the mine complex, which will aid in the development and feasibility analysis of targeted remediation strategies. One potential outcome of the research is to identify the feasibility of well installation to control groundwater prior to interacting with the mine complex, ultimately preventing AMD production at this location.

Good Samaritan Legislation and What It Means for Our Communities

Lynn Padgett, *County Commissioner*, Ouray County / Colorado Data Sharing Network
Contact: lynn@mtngеоgeek.com

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Session II

Balancing Mineral Extraction and Environmental Protection in Colorado

Robert Oswald, *Environmental Protection Specialist*, Division of Reclamation, Mining and Safety

Contact: Bob.Oswald@state.co.us

Lake City is one of many communities in western Colorado that can trace one of its roots to the discovery and extraction of economic mineral resources, beginning in the late 19th century and continuing to some degree nearly until the present. Mining and milling have benefited communities, though not without the downside of degradation of water and land.

In 1976 the "Colorado Mined Land Reclamation Act" was passed, which formally recognized the need for balancing mineral extraction and reclamation of land. The Division of Reclamation, Mining and Safety is charged with carrying out the Reclamation Act. Under the Act, mining operators and prospectors are required to obtain a permit and post a reclamation bond. This assures the orderly development of the state's mineral resources and the timely return of the land to beneficial use.

Revitalizing the Camp Bird Mine

Mike Thompson, *Chief Geological Officer and Head of Permitting*, Caldera Mineral Resources

John Bryan, *CEO*, Caldera Mineral Resources

Mike Thompson Contact: mt@reardonsteel.us

John Bryan Contact: jbryan@watley.com

During the summer of 2012, Caldera Mineral Resources acquired Ouray County's famous Camp Bird Mine, for the express purpose of bringing the mine back into production. After revising the existing mining and reclamation permit last fall, Caldera began rebuilding the surface infrastructure of the mine in preparation for rehabilitating the 11,000 foot long 14-Level tunnel that accesses the Camp Bird Vein. In tandem with renewing activity at Camp Bird, Caldera's senior management set goals of maintaining the highest level of environmental stewardship and to provide as much support to the local and regional communities as possible. As one of the first steps towards these goals, Caldera reached out to the Uncompahgre Watershed Partnership (UWP) to lend its assistance with regional mine cleanup projects. In response, UWP was kind enough to allow Caldera to participate with its recently approved 319 Nonpoint Source Grant application, and also invited Caldera to present at the 2013 San Juan Mining Conference. On behalf of Caldera, the presentation will be given by Mike Thompson, Caldera's Chief Geological Officer who resides in Silverton. The presentation will include a brief geological discussion of the structural development and mineralization of the Camp Bird Vein system, followed by a review of the discovery and production history of the mine. The remainder of the presentation will serve as an introduction to Caldera and its short term and long term plans for the Camp Bird Mine.

Mine Revitalization and Legacy Operations in Creede

Randy McClure, *General Manager*, Rio Grande Silver, Creede, CO

Golden Wonder Mine: The Richest Gold Producer in North America

Kye Abraham, *Chairman and President*, LKA Gold Incorporated

Located near Lake City, Colorado, the Golden Wonder is an extremely high-grade telluride (epithermal) gold deposit. As one of only two commercial gold producers in Colorado from 1998-2007 the mine was one of the highest grade gold producers in North America with an average ore grade of 16.01 ounces (453.87 grams) per ton over an eight year period. Over 134,000 ounces of gold were produced at an average cost below \$100 per ounce. Efforts are currently underway to re-establish the mine's reserves and return it to commercial production. Mine operations are conducted by Coal Creek Construction and the exploration program is directed by Mr. Rauno Perttu, Project Geologist. A highly skilled team of experienced

advisors and consultants oversee all facets of the Golden Wonder operations.

With a production history of 139,415 ounces of gold at an astonishing average ore grade of 12.6 ounces (358 grams) gold per ton and an average production cost of less than \$150 per ounce, LKA has proven that, with the right properties and management team, enormous capital investment and multi-decades of development are not necessarily required to achieve profitable gold production.

The Animas River Stakeholders Group - A Collaborative Partnership

Steve Fearn, *Co-Coordinator*, Animas River Stakeholders Group
Contact: fearneng@mni.net

The Animas River Stakeholder's Group was formed in 1994 to improve water quality in the headwaters area of the Animas River around and above Silverton, Colorado through mitigating impacts of legacy mining sites. The Group represents a community-based collaborative process composed of diverse stakeholders that work by informal consensus. The Group is focused on improving water quality by completing projects directly; and, in collaboration with others, including federal land managers and mining companies. One key in the group's success is the construction of an extensive, accessible water quality data base with sampling protocols agreed upon by all parties.

Critical and Strategic Minerals in Southwest Colorado

Bob Larson, *Consultant CPG-GLV*, Monadnock Mineral Services
Contact: larsouray@qwestoffice.net

The mining and mineral potential in SW Colorado remains an important consideration for each of us; whether being part of a concern for national security, providing resources for alternative energy projects or advanced technology demands, encouraging local economic development and job creation, or providing materials to manufacture equipment and toys we like to use in the beautiful back country of the San Juan Mountains. Jim Burnell, retired geologist from the Colorado Geological Survey, has provided extensive reports and presentations on this subject, over the past several years, and has graciously allowed me to use some of his material and slides on this fascinating and important subject.

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Poster Abstracts

Western Hardrock Watershed Team

Cari Powell, *OSM/VISTA Leader*

Contact: osmvistaleader2@hardrockteam.org

A Combination of Bauxsol™ Acid B Extra™ Blend and Biochar to Reduce Metal Concentrations in Eveline Acid Mine Drainage

C.D. Peltz, C. Zillich, and K.L. Brown

Contact: cdpeltz@gmail.com

Current acid mine drainage (AMD) treatment technologies, such as lime precipitation, are expensive to operate and often generate large residual waste streams with high disposal costs. Typical passive treatment systems, such as sulfate reducing bioreactors, often have a large footprint and are generally not suitable for high alpine environments. As part of the Abandoned Mine Lands (AML) Program the Bureau of Land Management (BLM) has built and is operating the Eveline Mine Drainage Treatment Vault near Silverton, Colorado to investigate innovative passive treatment technologies for AMD in high alpine environments.

In 2012 BLM explored the potential of combining Acid B Extra™ blend, a modified form of Bauxsol™ produced by Virotec Global Solutions, with three different matrix media, Biochar, porous concrete, and pea-gravel. The objective of the trial was to create a treatment system that (1) reduces metal concentrations in effluent waters, (2) reduces operational costs, and (3) does not create a residual, toxic product needing specialized disposal.

Field trials consisted of multiple column tests on continuous-flows of AMD from the Eveline mine. Field measurements of pH and hydraulic conductivity, and laboratory measurements of aqueous chemistry were taken at weekly intervals throughout the trial. Results suggest that the combination of Bauxsol™ Acid B Extra™ blend (30%/vol.) and Biochar (70%/vol.) achieved optimal results with >95% removal of Cd, Cu, Fe, Mn, and Zn, and >60% removal of Al and Pb, while maintaining adequate hydraulic conductivity.

We conclude that the combination of a Biochar matrix media and Bauxsol™ Acid B Extra™ blend, has the potential to reduce metal concentrations in AMD in a passive treatment system while providing the added benefit of utilizing by-products and sequestering carbon in Biochar.

Colorado River Watch

Sabrina Kilman, *OSM/VISTA, River Watch, Denver, CO*

Contact: Sabrina@coloradowatershed.org

River Watch works with voluntary stewards to monitor water quality and other indicators of watershed health and utilize this high quality data to educate citizens and inform decision makers about the condition of Colorado's waters. This data is also used in the Clean Water Act decision-making process. River Watch volunteers consist primarily of Middle and High School students, but also include citizen groups, individuals, colleges, and local governments. Volunteers analyze samples for hardness, alkalinity, dissolved oxygen, pH, and temperature. Additional samples are analyzed by a professional lab for metals, nutrients, and macroinvertebrates. Quality assurance is essential in the program operation and data and quality control checks are performed regularly through the year.

Evaluation of Restoration Activities on Riparian Vegetation Condition and Stream Morphology, Kerber Creek Watershed, Colorado

Jason Willis, *Field Coordinator, Trout Unlimited, Salida, CO*

Laura Archuleta, *Environmental Contaminants Specialist, U.S. Fish and Wildlife Service, Saguache, CO*

Aarón Mohammadi, *former Coordinator, AmeriCorps OSM/VISTA, Lakewood, CO*

Karl Ford, *former Environmental Scientist*, Bureau of Land Management, Golden, CO
Elizabeth Russell, *Mine Restoration Project Manager*, Trout Unlimited, Lafayette, CO
Steve Sanchez, *Forest Manager for Soils and Hydrology*, USDA Forest Service, Pueblo, CO
Trevor Klein, *Coordinator, AmeriCorps OSM/VISTA*, Saguache, CO
Contact: coordinator@kerbercreek.org

The Kerber Creek watershed, located in Saguache County, CO, encompasses the historic Bonanza Mining District, operational from the 1890s to the 1970s. Over time, mine wastes discharged into Kerber Creek were transported down-gradient as a result of flood events and human interference and re-deposited throughout the lower watershed. To correct subsequent impacts, several techniques have been implemented, including in-situ soil treatment (phytostabilization) and subsequent revegetation, in-stream habitat enhancements, stream bank stabilization, and grazing management. These enhancements have noticeably improved stream and riparian conditions. In-situ treatment and revegetation of mine waste deposits have reduced mobility of metals in the soil and raised soil pH. NRCS rangeland management specialists and landowners have developed site-specific rotational grazing management plans that will allow livestock grazing of restored riparian areas on private land after a three- to five-year rest period during vegetative recovery. Other indications of success include a 6.3% increase in stream sinuosity and an increase in riparian vegetation visible from photographs taken before and after restoration efforts.

Remediation of Legacy Mines in the Upper Uncompahgre Watershed
Agnieszka Przeszlowska, *Watershed Coordinator*, Uncompahgre Watershed Partnership
Emily Galanto, *OSM/VISTA*, Uncompahgre Watershed Partnership
Contact: uwpvista@gmail.com

The Uncompahgre Watershed Partnership was recently awarded funds from the Colorado Nonpoint Source Program to conduct remediation projects at 3 abandoned mine sites in the headwaters of the Uncompahgre River in Northern San Juan Mountains, Colorado. All three sites contribute acid mine drainage or heavy metals to segments on the 303(d) list of impaired waters and/or Colorado's Monitoring & Evaluation (M&E) list. Best Management Practices will be implemented at the sites to reduce heavy metal loading and improve the respective waterbody's trends toward water quality improvement and standards attainment.

Slate River Watershed Plan
Crystal Edmunds, *OSM/VISTA*, Coal Creek Watershed Coalition
Contact: crystal@coalcreek.org

In 2011, the CCWC expanded its geographic reach to include the Upper Slate River watershed by securing funding from the Colorado Nonpoint Source Program, Colorado Division of Reclamation Mining and Safety (DRMS) and the Colorado Healthy Rivers Fund (CHRF) to complete a watershed plan on the Slate River. The CCWC used funding from DRMS and the CHRF to complete a historic data compilation report and a geomorphic assessment to be included in the final watershed plan. The data compilation report has identified several data and information gaps including water quality monitoring data.

Funding from the CHRF requested in 2012 would be used to address these data gaps for E. coli (14 samples) and macroinvertebrates (10 samples). Additionally, the CCWC and project partners are actively involved in restoration projects. Macroinvertebrate sampling and the multi-metric index (MMI) scores generated would be used to document ecosystem response to restoration efforts and water quality improvement. The watershed plan is a data-driven approach that will focus on water quality impairment from historic mines. More focus will be placed on pollution sources and management issues, management strategies, and plan implementation.

Mountain Studies Institute
SAN JUAN MOUNTAINS, COLORADO

HINSDALE COUNTY

Lake Fork Valley Conservancy
Lake City, Colorado

Name (optional): _____ Community Role: _____
 Check: Participant Sponsor Presenter

- 1.) How did you find out about the conference?
- 2.) How does this conference benefit you and/or your community?
- 3.) What was the most useful presentation for you? Why?
- 4.) What was the least useful presentation for you? Why?
- 5.) Are there audiences you think should participate in this conference that you didn't see this year? If so, who?
- 6.) For 2014, what suggestions for improvement or recommendations for content do you have?
- 7.) Where would you like to attend next year's San Juan Mining Conference?

[illegible]

8.) How would you rate the following facets of the conference? (5=Best 1=Worst)

The conference's ability to accomplish the following goals:

1) Educate participants on: a. the science and policy of mining b. remediation of mine lands and activities addressing water quality impairments	a. 5	4	3	2	1
	b. 5	4	3	2	1
2) Facilitate informed discussion among diverse presenters and stakeholders	5	4	3	2	1
3) Spark dialogue about the benefits legacy and operational mines can bring to communities	5	4	3	2	1
4) Expand knowledge and resources of stakeholders to actively participate in remediation/restoration of their mining communities	5	4	3	2	1

Other Forum Logistics:

Venue	5	4	3	2	1
Food	5	4	3	2	1
Presentation Topics	5	4	3	2	1
Length of Presentations	5	4	3	2	1
Quality of Panel Sessions	5	4	3	2	1
Poster Session	5	4	3	2	1

Additional Comments:

Apr. 24-25, 2014 San Juan Mining Conference Agenda DRAFT

Thursday	April 24, 2014
10:00am – 11:00am	Registration
11:00am – 2:00pm	Workshop: Colorado Data Sharing Network Lynn Padgett, CDSN Project Coordinator
11:00am – 2:00pm	Workshop: Heritage Tourism Bev Rish, San Juan County Historical Society
12:00pm – 1:00pm	Lunch catered for workshop participants
2:30pm – 4:30pm	Field Tour 1: Rio Grande Silver Inc. coreshed
2:30pm – 4:30pm	Field Tour 2: Willow Creek Reclamation Committee restoration project
TBD	Gallery Open House Wine & Cheese
TBD	Mixer & Trivia Contest at Tommyknocker Tavern
Friday	April 25, 2014
SESSION I	Mining, Economics and Community
9:00am – 9:25am	History and Geology of Creede, Mineral County Jonathon Moore/Ken Wyley, Rio Grande Silver Inc.
9:25am – 9:50am	Weighing Risks and Benefits of Mining Operations Randy McClure/?, Rio Grande Silver Inc.
9:50am - 10:15am	TBD
10:15am – 10:45am	Break & Exhibit Session (refreshments)
10:45am – 11:10am	Boom and Bust Cycles of Mining and Community Impacts Rhianna Williams, Uncompahgre Watershed Partnership
11:10am – 11:35am	Microeconomics Impacts of Mining in Creede Scott Lamb, Mineral County Commissioner
11:35am – 12:00pm	InnoCentive Challenge and Creative Problem Solving Peter Butler, Animas River Stakeholders Group
12:00pm – 12:30pm	Panel Discussion: Mining & Community Revitalization
12:30pm – 1:30pm	Lunch
SESSION II	Mining – Water Quality Nexus
1:30pm – 1:55pm	Good Samaritan Legislation Tom Schillaci, Biscuit Boy Productions & Peter Butler, Animas River Stakeholders Group
1:55pm – 2:20pm	Merry Murphy Mine Tailings Reclamation and Water Quality Improvements Bruce Stover, Colorado Division of Reclamation, Mining, and Safety
2:20pm – 2:45pm	Pennsylvania Mine Remediation and Water Quality Results Jeff Graves, Colorado Division of Reclamation, Mining, and Safety

2:45pm – 3:15pm	Break & Exhibit Session (refreshments)
3:15pm – 3:40pm	Superfund reclamation of Summitville Mine and Water Quality Results Mark Rudolph, Colorado Department of Public Health and Environment
3:40pm – 4:05pm	Remediation with In-Situ Amendments Jason Willis, Trout Unlimited
4:05pm – 4:30pm	Radionuclide Study in San Miguel County and Implications for Water Quality from Airborne Pollutants Rorie Cowie, University of Colorado
4:30pm – 5:00pm	Panel Discussion: Reclamation and Water Quality Impacts

Appendix B. Stakeholder Survey Results

Stakeholder Question	2012	2013
Response Rate*	23	35-51
Are you familiar with the UWP?		
Yes	14	42
No	9	2
Have you volunteered with the UWP in the Past?		
Yes	4	7
No	19	28
<1 month	0	2
1-6 months	3	2
6-12 months	1	1
>1 year	0	2
Have you attended UWP events in the PAST?		
Yes	7	30
No	16	21
Do you think you'll attend UWP events in the FUTURE?		
Yes	21	39
No	0	0
Maybe	2	12
What issues are important to you? May circle more than one.		
Healthy river systems	16	32
Water quality/pollution	17	28
Water availability	17	28
Recreation	13	16
Education	12	11
Weeds	10	8
Mining	10	7
Production Agriculture	13	3

** The 2013 survey was administered in a matrix format on 3 posters. 2013 Data indicates participants did not complete all poster matrices.*

Appendix C. Educational Needs Assessment



Educational Needs Assessment

Public Schools of Ouray County, Colorado

Completed by: Emily Galanto, Agnieszka Przeszlowska, and Rhianna Williams of the
Uncompahgre Watershed Partnership
August 20, 2013

BACKGROUND

The Uncompahgre Watershed Partnership (UWP) was formed in 2007 by a group of concerned citizens in Ouray County. The group acquired funds to produce the Uncompahgre Watershed Plan that was completed in 2012. Per this plan, the Watershed Coordinator of the UWP was to conduct an Educational Needs Assessment to survey the county's public schools to find opportunities where the UWP could supplement lesson plans to include more field studies, place-based education, and hands-on learning directly related to the Uncompahgre Watershed.

School information:

To view ColoradoSchoolGrades.com's overview of Ridgway Secondary School, visit:

<http://coloradoschoolgrades.com/SchoolReportCard.aspx?sid=7346H>

Overall grade: A+

Low-income families: 28%

To view ColoradoSchoolGrades.com's overview of Ridgway Elementary School, visit:

<http://coloradoschoolgrades.com/SchoolReportCard.aspx?sid=7342E>

Overall grade: B

Low-income families: 41%

To view ColoradoSchoolGrades.com's overview of Ouray Elementary School, visit:

<http://coloradoschoolgrades.com/SchoolReportCard.aspx?sid=6596E>

Overall grade: A-

Low-income families: 38%

To view ColoradoSchoolGrades.com's overview of Ouray Middle School, visit:

<http://coloradoschoolgrades.com/SchoolReportCard.aspx?sid=6598M>

Overall grade: A

Low-income families: 34%

To view ColoradoSchoolGrades.com's overview of Ouray High School, visit:

<http://coloradoschoolgrades.com/SchoolReportCard.aspx?sid=6600H>

Overall grade: B+

Low-income families: 30%

For more information as to how grades are calculated, visit:

<http://coloradoschoolgrades.com/FrequentlyAskedQuestions.aspx>

To view Teachers and Staff from Ridgway:

<http://www.ridgway.k12.co.us/>

To view Teachers and Staff from Ouray:

<http://ouray.k12.co.us/site/default.aspx?PageID=1>

PURPOSE

After completion of the Uncompahgre River Watershed Plan (largely done by Sarah Sauter), the need for an educational assessment was expressed. The goals were to examine the 1) Colorado State Curricula and Standards, 2) Discover areas of these curricula that could be enhanced with hands-on learning and field study opportunities 3) Identify ways the Uncompahgre Watershed Partnership could strengthen current educational activities or develop new programs to reinforce the standards.

METHODS

From Jan.-Apr. 2013, UWP Staff held a series of Ouray County Public School meetings with the teachers and staff to give presentations about the UWP, provoke discussion, and brainstorm ways the UWP could become involved in the schools. The schedule of meetings was as follows:

Date of meeting	Location/School	Accomplishments
Jan. 29, 2013	Ouray Public School K-12	<ul style="list-style-type: none"> Met with nearly all staff from the school Gave UWP presentation Discussed opportunities Teachers listed potential programs and their contact information for follow-up.
Jan. 31, 2013	Ridgway Elementary School K-8	<ul style="list-style-type: none"> Met with 5 teachers from the school Gave UWP Presentation Discussed opportunities Teachers listed potential programs and their contact information for follow-up.
Mar. 18, 2013	Ridgway Secondary School, 9-12	<ul style="list-style-type: none"> Met with nearly all staff from the school Gave UWP presentation Discussed opportunities Teachers listed potential programs and their contact information for follow-up.
Apr. 25, 2013	Ouray Public School	<ul style="list-style-type: none"> Met with the two high school science teachers for follow-up Discussed specific needs of the science programs in Ouray Planned a field-based lab program with the sophomore biology class.

UWP Staff received written feedback from 10 out of 28 (35%) total teachers in Ouray, 5 out of 17 (30%) teachers at the Ridgway Elementary School, and 5 out of 23 (22%) teachers at the Ridgway Secondary School (30% overall).

The written results were reviewed and assessed by UWP Staff.

RESULTS

County-wide:

Please see *Appendix A* for written responses from Ouray County School staff.

Please see *Appendix B* for Colorado State Standards involving watersheds.

Placed-Based Education

It was clear from written and verbal responses from the teachers that more placed-based education could be a useful tool in teaching environmental concepts. "Place-based education is the process of using the local community and environment as a starting point to teach concepts in language arts, mathematics, social studies, science and other subjects across the curriculum. Emphasizing hands-on, real-world learning experiences, this approach to education increases academic achievement, helps students develop stronger ties to their community, enhance students' appreciation for the natural world, and creates a heightened commitment to serving as active, contributing citizens." (Sobel, David, <http://www.antiochne.edu/wp-content/uploads/2012/08/pbexcerpt.pdf>).

Service Days

Several teachers mentioned that they would like more “service-days” with an emphasis on environmental impacts. For example, one teacher recommended taking students up to the Top of the Pines area for planting trees and native grass seeds, cleaning up trash and brush, and pulling weeds.

Field Trips/Field Studies

Several teachers expressed the need to bring students out into the field more. This ties in to place-based education, as there are countless opportunities in Ouray County to visually showcase scientific concepts. Miller Mesa, Rollins Park, Dallas Creek, and Red Mountain were a few suggestions.

Earth Day Celebration

Many teachers, particularly in Ridgway but also in Ouray, expressed a few thoughts on celebrating Earth Day with the UWP. Some teachers suggested doing a service day on Earth Day to further drive home the importance of environmental conservation.

Work with Disadvantaged Youth

A need was expressed to be sure the UWP targets disadvantaged youth in extracurricular programs.

Ouray Public Schools

Throughout the assessment there were several key points brought up during discussions. Some of these points are :

- Students are interested in water quality and mining impacts (ie: why is the water red?). One idea to bring this idea into the classroom would be to take the students out during future UWP mine remediation projects and show them what is happening (perhaps before and after), or bring them on a similar field tour.
- Incorporate mining history into field tours.
- Create interdisciplinary programs: Have the science students collect data and have the English students write a scientific paper.

Ridgway Public Schools

Throughout the assessment there were several key points brought up during discussions. Some of these points are :

- Create multi-year programs; i.e.: 5th graders can finish what the 4th graders started.
- Showcase how people affect the earth and how people rely on resources. Teach the students that they are part of this watershed and drive home they personally can affect it.
- Incorporate water safety into lessons.
- Incorporate important scientific lesson into current snowshoeing excursions (1st and 2nd grade).
- Incorporate journaling into programs.

CONCLUSIONS & ACTION ITEMS

Based on our assessment, we've populated the following information to help guide future educational efforts and define UWP educational programs:

Current UWP Education Programs to continue:

- Colorado RiverWatch Sampling with the Ridgway 3rd Graders (can be expanded)
 - Can expand into involving the High School chemistry students to complete the RiverWatch titrations and analysis.
 - Can continue with in-classroom lessons on water quality parameters.
- Celebrating National Public Land's Day with the Ouray 4th Graders (can be expanded)
 - Can expand with field trips to Public Lands areas.
- Celebrating Earth Day with the Ridgway 4th Graders via service project
 - Can expand into 5th grade so the students can see their work from the year before.
- Macroinvertebrate Field Lab exercise with the Ouray 10th grade Biology class

Potential future educational programs that reflect teacher's expressed needs and UWP goals and projects:

- Annual field trip with 5th graders (Ouray and Ridgway) to Red Mountain Pass or local river area to teach erosion and how that affects acid mine drainage. This fulfills CO Educational Standards and the needs expressed by the teachers.
- Work with Arlene Crawford, Naturalist at Ridgway State Park, and other educators to develop actual curricula (ie: "Water Unit" for 2nd graders).
- Utilize newly-purchased water quality testing kits with Ouray and Ridgway High School chemistry students.
- Host a school-wide assembly that highlights important facts about the entire watershed (Presentation prepared by Rhianna Williams) to provide an all-encompassing view.
- Work with the Ridgway Shop teacher to build a watershed model.
- Work with Ouray Art teacher to incorporate a "river art" unit.
- Winter snow/watershed curricula with USFS "More Kids in the Woods" program.
- Acquire grant funds to construct a greenhouse at Ridgway Secondary School which could be used by students to propagate nursery stock for UWP restoration projects or other school curricula projects.
- Work with the Ridgway Elementary school to incorporate watershed lessons into the 1st and 2nd grade snowshoeing trips.
- See Appendix A for other potential projects.

Further action items:

- Follow up with Ridgway Science teachers.
- Follow up with Ridgway Principal to build a greenhouse nursery for UWP projects (the greenhouse could also be utilized for other projects or lesson plans).
- Follow up with all involved teachers for potential new projects.

- Determine UWP resources (as far as staff time, UWP funds, etc) to be able to execute these projects.
- Streamline UWP education initiatives to fall into the scope of UWP capacity.

Appendix A.

Grade	School	Responses
K	Ouray	Accompany field trip to Lower Cascade Falls in Ouray, CO
	Ridgway	None?
1	Ouray	None?
	Ridgway	Celebrate Earth Day Service Learning Water cycle Water Safety
2	Ouray	Help develop a "Water Unit"
	Ridgway	Water Cycle Earth Day Recycling
3	Ouray	Help develop a "Water Unit"
	Ridgway	Develop a "Tour of the Watershed" Celebrate Earth Day Service Learning at Top of the Pines Local government involvement Add in more Project WET Activities to the current water sampling project (Ongoing since Sept. 2012)
4	Ouray	Celebrate National Public Lands Day & Library Program (Completed 2012)
	Ridgway	Continue celebrating Earth Day (Ongoing since 2012)
5	Ouray	None?
	Ridgway	Continue work from 4 th grade (Standard #3) Field trip to Red Mountain to show erosion, weathering, landscape changes, and supplemental: water safety
6	Ouray	None?
	Ridgway	Add more hands-on lessons for water pollution/ecology. Give a lesson on world geography and the effects of increased population Become involved in Middle School Field Trip
7	Ouray	Add more hands-on lessons for aquatic animals and micro-organisms interactions & H2O Chemistry
	Ridgway	Add more hands-on lessons for water pollution/ecology. Give a lesson on world geography and the effects of increased population

Grade	School	Responses
8	Ouray	Add more hands-on lessons for aquatic animals and micro-organisms interactions & H2O Chemistry
	Ridgway	Add more hands-on lessons for water pollution/ecology. Give a lesson on world geography and the effects of increased population
9	Ouray	Add more hands-on lessons for weather, climate, earth science and groundwater (mining effects). & purchase water quality testing kits.
	Ridgway	Add more hands-on lessons for water pollution/ecology. Give a lesson on world geography and the effects of increased population
10	Ouray	Lab studying macroinvertebrates for Biology class (completed May 2013) & purchase water quality testing kits.
	Ridgway	Add more hands-on lessons for water pollution/ecology. Give a lesson on world geography and the effects of increased population
11	Ouray	Add more hands-on lessons for weather, climate, earth science and groundwater (mining effects). & Purchase Water Quality testing kits
	Ridgway	Add more hands-on lessons for water pollution/ecology. Give a lesson on world geography and the effects of increased population
12	Ouray	Add more hands-on lessons for weather, climate, earth science and groundwater (mining effects). & Purchase Water Quality testing kits.
	Ridgway	Add more hands-on lessons for water pollution/ecology. Give a lesson on world geography and the effects of increased population
Shop	Ridgway	Build a watershed model for younger students by older students
Art	Ouray	Teacher can incorporate rivers into an art class segment
Radio	Ouray	PSAs on local radio station, make a film for the UWP

Appendix B

Grade	Standards Involving Water
K	<ul style="list-style-type: none"> The sun provides heat and light to Earth
1	<ul style="list-style-type: none"> An organism is a living thing that has physical characteristics to help it survive Earth's materials can be compared and classified based on their properties
2	<ul style="list-style-type: none"> Organisms depend on their habitat's nonliving parts to satisfy their needs Each plant or animal has different structures or behaviors that serve different functions Weather and the changing seasons impact the environment and organisms such as humans, plants, and other animals
3	<ul style="list-style-type: none"> Earth's materials can be broken down and/or combined into different materials such as rocks, minerals, rock cycle, formation of soil, and sand – some of which are usable resources for human activity Matter exists in different states such as solids, liquids, and gases and can change from one state to another by heating and cooling
4	<ul style="list-style-type: none"> There is interaction and interdependence between and among living and nonliving components of systems
5	<ul style="list-style-type: none"> Earth and sun provide a diversity of renewable and nonrenewable resources Earth's surface changes constantly through a variety of processes and forces Weather conditions change because of the uneven heating of Earth's surface by the Sun's energy. Weather changes are measured by differences in temperature, air pressure, wind and water in the atmosphere and type of precipitation
6	<ul style="list-style-type: none"> Changes in environmental conditions can affect the survival of individual organisms, populations, and entire species Organisms interact with each other and their environment in various ways that create a flow of energy and cycling of matter in an ecosystem Complex interrelationships exist between Earth's structure and natural processes that over time are both constructive and destructive Water on Earth is distributed and circulated through oceans, glaciers, rivers, ground water, and the atmosphere Earth's natural resources provide the foundation for human society's physical needs. Many natural resources are nonrenewable on human timescales, while others can be renewed or recycled
7	<ul style="list-style-type: none"> Mixtures of substances can be separated based on their properties such as solubility, boiling points, magnetic properties, and densities Major geologic events such as earthquakes, volcanic eruptions, midocean ridges, and mountain formation are associated with plate boundaries and attributed to plate motions
8	<ul style="list-style-type: none"> Human activities can deliberately or inadvertently alter ecosystems and their resiliency
High School	<ul style="list-style-type: none"> The interaction of Earth's surface with water, air, gravity, and biological activity causes physical and chemical changes Natural hazards have local, national and global impacts such as volcanoes, earthquakes, tsunamis, hurricanes, and thunderstorms

Appendix D. Summary of Educational Programs

Program Name	Description
Earth Day	<ul style="list-style-type: none"> • Apr. 2013: 4th grade class from Ridgway planted about 20 trees, picked up trash, and planted native grass seeds at Top of the Pines, an outdoor education facility. • Apr. 2012: 4th grade class from Ridgway collected trash at town river park, participated in a riparian scavenger hunt, and planted native flowers at the local fairgrounds. • Similar projects will be planned in subsequent years.
San Juan Mining Conference	<ul style="list-style-type: none"> • Apr. 2013: UWP collaborated with Mountain Studies Institute (MSI) and Lake Fork Valley Conservancy to produce the 2013 conference in Lake City, CO which included topics on legacy mining, community revitalization and mining futures. It was free to the public and attended by industry representatives, state, federal and research entities, watershed groups and local citizens. • Apr. 2014: Planning for the 2014 conference began in Nov. 2014. It will be held in Creede and include topics on mining heritage of Creede, micro and macro-economic impacts of mining on community economics and social services, miner remediation and water quality improvement projects.
Montrose Natural Resource Festival	<ul style="list-style-type: none"> • May 2013: UWP staff presented an interactive activity highlighting river flow to about 400 students that rotated through educational stations throughout the day. • UWP will continue to provide educational water-based activities at this event which serves students from Delta, Montrose and Ouray counties.
Ridgway River Festival	<ul style="list-style-type: none"> • June 2013: UWP organized the Watershed Education Tent area which included presenters from the USFS, Shavano Conservation District, American Whitewater, Tamarisk Coalition, and UWP. The organizations provided materials and interactive stations on non-point source pollution, the water cycle, healthy streamflows, invasive plants and forest stewardship. • Future educational programs will be expanded to also include a riparian scavenger hunt, stream flow measurements, bug identification, and other Project WET activities.
Lake Appreciation Day	<ul style="list-style-type: none"> • July 2013: UWP used a watershed model to demonstrate non-point source pollution to about 50 children. • We will participate again in 2014.
Ridgway State Park Evening Program	<ul style="list-style-type: none"> • July 2013: UWP VISTA gave a presentation to park visitors on the Uncompahgre Watershed: geology, history, landuse practices, wildlife and ecology.

Program Name	Description
Ouray Public Library Program	<ul style="list-style-type: none"> • UWP VISTA organized 2 afterschool programs on “Watershed-themed Poetry” for K-6 students. The activity explored watershed topics as part of Colorado Humanities poetry and arts contest themed “Watersheds.”
Wilderness Act Field Day	<ul style="list-style-type: none"> • To celebrate the 49th anniversary of the Wilderness Act, Ridgway-Ouray Community Council in partnership with Leave No Trace, Hawk Wilderness Society and the Sheep Mountain Alliance hosted a wilderness walk for the schools of Ouray, Ridgway, and Telluride Mountain School. The students went on a 1.5 mile interactive hike, stopping at educational stations along the way. The UWP hosted a station to teach children about the importance of water for all living things.
Snow Science Field Day	<ul style="list-style-type: none"> • In late 2012, UWP contributed to a USFS grant “More Kids in the Woods” which secured funds for Nordic gear for several districts in the Gunnison Basin. The Nordic gear is used by students during a snow science field day. Seventy-five Ridgway students participated in the inaugural field trip in late Feb. 2013. UWP worked with USFS to demonstrate snow water equivalent measurements and concepts.
River Watch activities	<ul style="list-style-type: none"> • UWP has included 3rd grade students in monthly River Watch sampling since Sept. 2012. In spring 2013, UWP began to incorporate additional field educational activities to enhance student’s understanding of watershed concepts and water chemistry. Activities included conceptualizing a watershed, pH testing and concepts, dissolved oxygen demonstration. Future activities will discuss hardness, alkalinity, nutrients, erosion and sediment.
Macroinvertebrate Sampling	<ul style="list-style-type: none"> • Oct. 2013: UWP staff hosted a stream side bug activity with Ridgway 3rd graders. They demonstrated macroinvertebrate sampling with a kick net, helped the young stream ecologist identify aquatic insects and discussed their importance to streams.