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The Montana Steward



Cfwep.Org



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2013

Clark Fork Watershed Education Program

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Answers to SuperFund

Remediation and Restoration
What are they?

Super Fund: 101

What does it mean to you?
What is happening now?
What's going to happen.
How you can get involved.



All You Want to Know About the Clark Fork Environmental Remedy From Butte to Missoula

Clark Fork Watershed Education Program • Cfwep.Org

Answers to SuperFund!

All You Want to Know About the Clark Fork Environmental Clean Up From Butte to Missoula

Remediation and Restoration: What are they?

What does it mean to you? What is happening now?

What's going to happen and how can you get involved.

If you are an educator please contact us for bulk issues for class study.

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The publication is also avaialble as a PDF download @ Cfwep.Org

Thanks! Thanks! Thanks! Thanks! Thanks!

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Snt'apqey; What's in a Name?

Cfwep.Org partnered with the Butte Archives, Butte High School teachers John Bercier and Chris Fisk, and the Salish Cultural Center for a School-Museum Collaborative grant through the Office of Public Instruction. The grant project titled, "What's in a Name?" was designed by the partners to archive place-name histories of the Clark Fork River watershed. The School-Museum Collaborative grant is a project of the Office of Public Instruction and the Montana Historical Society that provides support for collaborative efforts between a local museum and school district.

Tony Incashola, a Salish Cultural Leader, shared the Salish names for locations throughout the Clark Fork watershed. He is documented describing the Aboriginal Salish territory and their early travels, pre-horse as the eloquent elder would say, east up the Clark Fork watershed from the area around Missoula. His descriptions and accompanying stories were recorded by CFWEP's Frank Ponikvar and further edited by Montana Tech student, Charlie Larson. The films were transcribed by Butte High history students, who learned the archival process for oral artifacts and assisted the Butte Archives with cataloguing the films. The students also created a place-name map that marks the areas described by Mr. Incashola.

Butte High teachers, John Bercier and Chris Fisk, adapted the materials for inclusion in their curricula. John Bercier was especially struck by Mr. Incashola's description of the landscape prior to the arrival of people. As stated by Mr. Bercier:

Tony Incashola speaks of a time before the people were in this area, saying, "The animals spoke for the land," and that "when the people came to the land, these people became the speakers for the animals."

For Mr. Bercier, this conservation theme clicked an early memory of a Dr. Seuss book called The Lorax and how the Lorax spoke for the trees. "I created a lesson plan that allowed my students to view the oral interview with Tony Incashola of the Salish tribe. The students engaged in conversations of all the animals of the watershed. Environmentalism, reclamation, and conservation issues were also discussed. My students chose an animal of the Clark Fork Watershed and researched information on the animal. History of the way the land looked in the past in comparison to today and other oral stories is used as inspiration to create art. They wrote an essay

on their chosen animal. With their research, the students engaged in an art project on Ledger Art. The students were given maps of the Clark Fork watershed to create their own Ledger Art. The students were videotaped giving a short oral presentation on the research of the animal and exhibition of their work of Ledger Art. "John Bercier named the art lesson and series, I Speak for the Animals, in honor of the Salish people and their ways. An exciting outcome of the project is the fact that students

well as the rights of hunting granted to them through treaty in 1855. "There is so much more to the history of this area we call home, it wasn't all mining but so much more and now we get to learn it and live it", says Faith Setterstrom, Montana History Club President and student from Butte High School. She goes on to say, "It was an incredible thing to be a part of and experience."



now have access to Salish oral histories of animals inhabiting the watershed and the history of how the Salish people used this watershed. Chris Fisk engaged his students in learning about traditional fishing methods and tool-making. Mr. Fisk partnered with Tim Ryan who is a Salish cultural tool maker to present a lesson on early tools and cordage-making with students. The students were shown an early fish trap built from all natural materials. Mr. Fisk's students then honored the ecology and the indigenous way of life by using dogbane hemp and sand willow collected by Tim Ryan and Mr. Fisk. The students will test their fish traps on a future field trip with Tim Ryan as well as representatives from the Salish tribe, with permission granted from the Fish Wildlife and Parks. Many of the students have visited Place

Name sites important to the Salish tribe and their seasonal rounds on the Clark Fork. One example was the Warm Springs Mound or "Mo-m-o-a-o" that still stands as a religious area to Salish people as

well as the rights of hunting granted to them through treaty in 1855. "There is so much more to the history of this area we call home, it wasn't all mining but so much more and now we get to learn it and live it", says Faith Setterstrom, Montana History Club President and student from Butte High School. She goes on to say, "It was an incredible thing to be a part of and experience."

Mr. Fisk's students have completed the archival processing with Ellen Crain and her team at the Butte Archives. Fisk's History Club students also assisted with the development of the exhibit for the Butte Archives. When asked how Mr. Fisk

intends to use the artifacts in future classroom activities, he stated:

"This project is incredible. The Place Names really tied together the history and the science. I intend to continue building the fish traps and making the history of this area come alive for the kids. There are some big issues and big history for Butte and the surrounding area and it's nice to have the students be an engaged part of all of it."

Butte's Silver Bow Creek was known by the Salish as Sntapqey (Sin-tahp-kay), the word itself a reference to how the fish were so large they could be shot in the head with bow and arrow. According to the Salish, this creek held large numbers of Bull Trout and was part of the Bull Trout's spawning grounds. The Salish would stop at

the spawning grounds when traveling through this area. Shooting the bull trout in the head with a bow and arrow was a popular activity on Sin-tahp-kay, which contributed to the Place Name of this creek. Sin-tahp-kay was one of three headwaters of the Columbia River. Sin-tahp-kay as described by the Salish no longer exists.

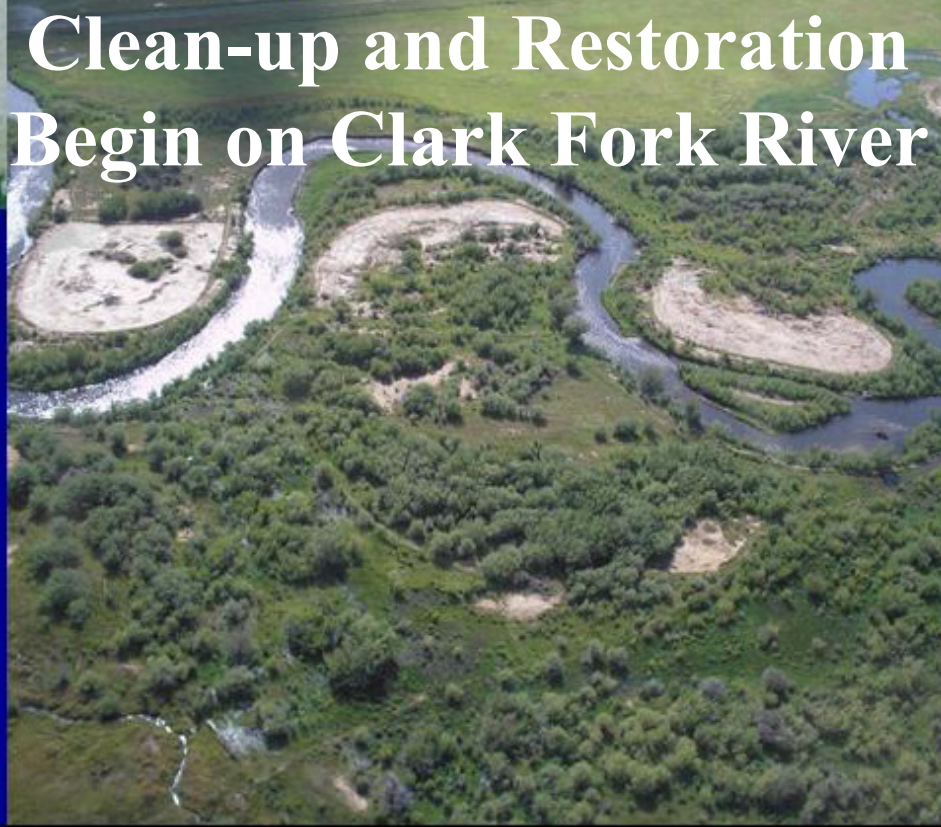
On today's map, Silver Bow Creek begins above the Yankee Doodle Tailings impoundment above the present-day mine. However, the waters of Silver Bow Creek never leave the mine property. The waters flowing through Butte's Silver Bow Creek as named and signed throughout Butte are actually from Blacktail Creek, which originates in the Highland Mountains south of town. If cartographers were naming Silver Bow Creek today, the name would be Blacktail Creek due to the tradition of continuing the name of the stream supplying the most volume of water at a confluence.

Ellen Crain of the Butte Archives was the leader for this project, pulling together the resources and people necessary to make the project come alive. When asked, why she wanted to do the project and what she learned through the process, she commented:

"I envisioned the Butte-Silver Bow Archives building resources that inform the public regarding Montana Tribes in Silver Bow County. We do not have much in the Archives regarding tribal peoples and the items we do have are more contemporary. I think that archiving the stories, legends, perspectives, and traditions of native peoples is critical. Additionally, I wish to see more young people accessing the archives and being able to see and touch artifacts personally rather than only through electronic media."

I personally learned that Chris Fisk, John Bercier and the students at Butte High School are a very talented and inspiring group of people. Additionally, I learned a great deal about the Salish in Montana and that Silver Bow Creek held the place name Sin-Tahp-Kay."

The grant has funded the professional framing of a selection of student art pieces for permanent display in the Butte Archives, cataloging the oral history of Tony Incashola and the construction of native tools, most notably the fish trap. The exhibit will be available for viewing from May 17, 2013, until July 25, 2013. The Archives is open Monday through Friday from 9:00 AM until 5:00 PM.



2013 marks the beginning of the clean-up on the mainstem of the Clark Fork River. Restoration efforts to date have focused primarily on Silver Bow Creek. The Clark Fork Operable Unit (an operable unit is the term used for each of a number of separate activities undertaken as part of a Superfund site cleanup) begins at the headwaters of the Clark Fork River at Warm Springs and continues until Milltown. The State of Montana received \$123 million dollars from the lawsuit with ARCO to clean up the Clark Fork Superfund site. The majority of the work will take place in the upper section, also known as Reach A, which is a 43-mile stretch extending from Warm Springs to Garrison. Tailings deposits, considered hazardous waste that contain cadmium, zinc, copper, lead, and arsenic, are mixed within the soils of the floodplain and stream banks in this area. Over 300,000 cubic yards of contaminated soil will be removed and streambanks will be reconstructed using bioengineering techniques and native vegetation. Not all of the contaminated soils throughout Reach A will be removed, with priority being given to the areas with deeper deposition of tailings and higher concentrations of metals. The floodplain of the river will be lowered and sediments from the streambed will be removed.

The restoration of the Clark Fork Operable Unit is a collaborative effort between multiple agencies including the Environmental Protection Agency, the Department of Environmental Quality, the Natural Resource Damage Program, and the National Park Service. The National Park Service is participating in the restoration efforts at the Grant-Kohrs Ranch in Deer Lodge. This collaboration ensures the remedy and restoration are happening concurrently throughout the clean-up process, thereby lowering costs and increasing overall suc-

cess rate of the restoration efforts. This area will have a long-term (30 year) monitoring plan that includes monitoring of the Superfund Performance Standards for surface water, groundwater, and vegetation. In addition, the success of the restoration efforts will be monitored by examining stream bed sediments and nutrient concentrations, as well as periphyton (a mixture of algae, cyanobacteria, heterotrophic microbes, and detritus), macroinvertebrate and fish populations.

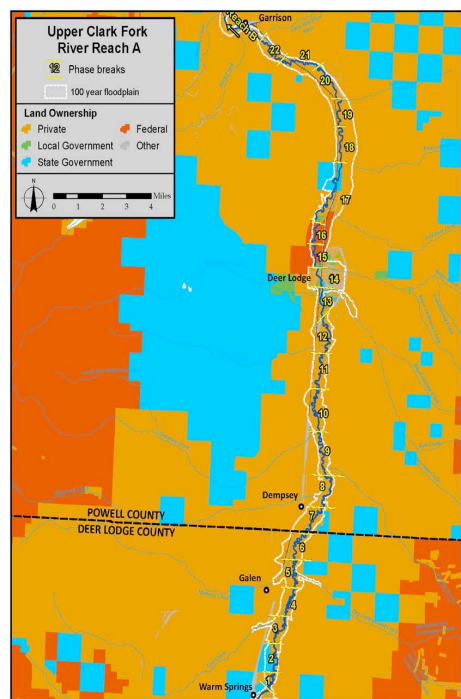
For more information regarding the clean-up of the Clark Fork River, contact:

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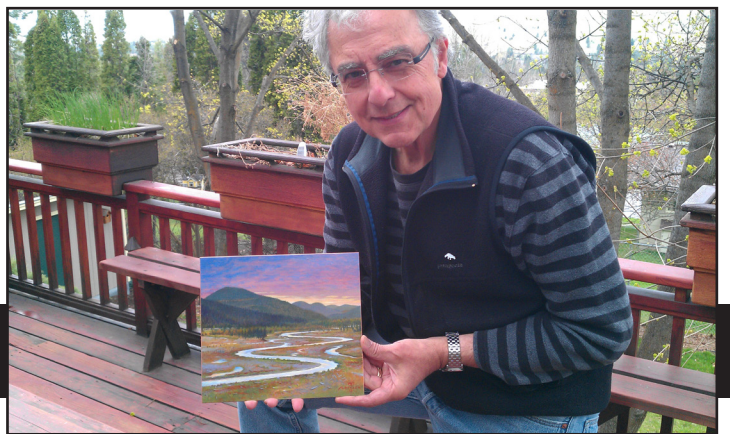


Join us in support of clean water and healthy communities. Become a Clark Fork Coalition member today. Get involved at www.clarkfork.org



Restore. Protect. Give.

Art and the Environment an Artist's perspective

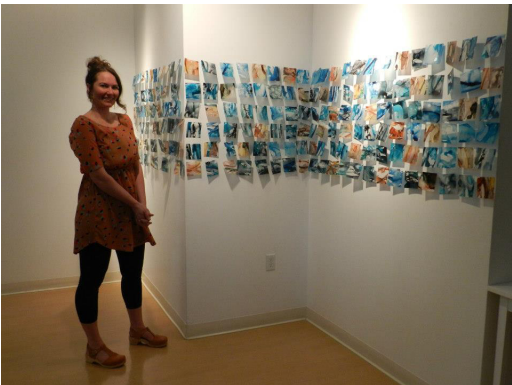


James Clayborn • Monte Dolack • Jennifer Bardsley

Jennifer Bardsley

You put on many shows and exhibitions concerning the environment; Can you give us your perspective of how Art helps create good stewardship.

Last year I had a solo exhibition concentrated solely on the Berkeley Pit. It was just unbelievable what I uncovered in my research into the lost communities of Butte



Jen with "Currents"

. Fintown, the Italian district and other neighborhoods

completely destroyed. Now we have a Superfund site that has impacted the environment beyond Butte with the Clarkfork river flowing toxins all the way down to Missoula. Thankfully there are so many folks

concerned like the Clark Fork Coalition with these issues. Taking action to clean and restore the river has really given people the power to public ownership of the Clark Fork.



James Clayborn

"We walk past, not noticing, the subtle beauty of nature every day."

Monte Dolack

As a native of Great Falls, I was reminded of the monumental smoke-stack that dominated our landscape when I was growing up in the 1950s and '60s. The Big Stack, the largest of its kind in the world when it was built in 1908, dwarfed its Cornwall cousins. My father Michael spent much of his lifetime working at the Anaconda Copper Company's smelter where I also worked during the summers while going to college.

Until it shut down in 1980, it had been my family's economic lifeline despite the annoying and sometimes very long labor strikes every three years.

Cfwep.Org Staff Serve as Ambassadors

By Dr. Arlene Alvarado

On a breezy, overcast day in July, Cfwep.Org staff members, Dr. Arlene Alvarado, Mr. Chris Doyle and Ms. Terry Biere, served as ambassadors to high school students from the Iraqi

Young Leaders Exchange Program. This amazing program is coordinated through the Montana Center for International Visitors (MCIV) located in Bozeman, MT. MCIV is an affiliate of the National Council for International Visitors (NCIV) based in Washington, D.C., and are dedicated to promoting global understanding through citizen diplomacy.



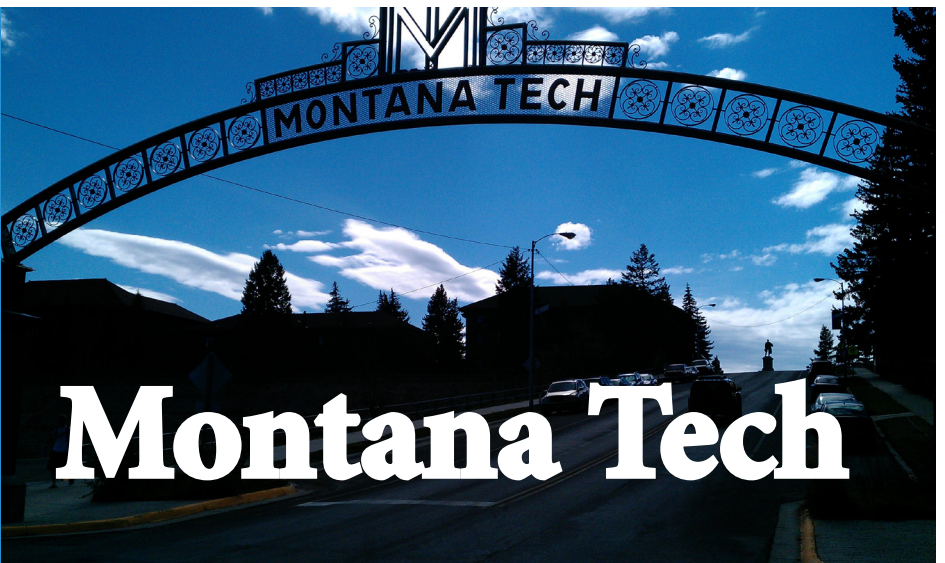
These visiting high school students were interested in learning about the environmental damages caused by historical mining practices in the Clark Fork watershed, and about the restoration work currently being conducted to repair those damages. We at Cfwep.Org were thrilled to have the opportunity to spread our message about our restoration to students from the other side of the globe.

We first took the students to a reach of Silver Bow Creek that has yet to be restored. Here we gave them a

general overview of how historical mining practices lead to environmental damages. These damages are so extensive that the Clark Fork watershed is part of the largest, contiguous Superfund site in the United States. We also explained how the unique and fascinating geology

of our area explained both its richness in heavy metals and its propensity for causing acidification of soils and water. As shown in the picture, the students were taught how to measure acid levels of soils using Hellige-Truog Soil pH Testers. They expressed how interesting it was to see first-hand how tailings cause harm to vegetation and soils.

Next we took the students to the Silver Bow Creek Greenway Trail. Here restoration has been completed and the natural habitat is recovering nicely. We were proud to show these students our restoration success and hoped that we inspired them as future leaders to keep in mind how important it is to balance the use of natural resources with the need to protect the ecosystems



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Cfwep.Org Mission Statement

The Clark Fork Watershed Education Program (CFWEP) fosters environmental stewardship and scientific decision making through place-based learning. Join one of the fastest growing education organizations and help our youth understand environmental stewardship for future generations.Cfwep.Org

Cfwep.Org's Restoration Education Program

Cfwep.org is made up of a staff of individuals whose personal values align with the core values of our organization – to help create environmental stewards through education. With our multi-disciplinary Restoration Education Program, Cfwep.Org uses an inquiry-based, place-based approach to teach watershed science to students throughout the Clark Fork watershed. Our goal is not to tell students what to think or believe, but rather to give them the tools they need to think for themselves, to think critically and to make informed decisions with regards to their environment. Cfwep.Org's Restoration Education Program (REP), also known as the Base-level curriculum, touches upon the heart and soul of our organization.

The objective of our five day REP curriculum is to teach about the restoration of the Clark Fork River – its social and cultural history; the scientific processes involved in the restoration; and the importance of restoration and the need for environmental stewards or protectors. Each year, Cfwep.Org visits with approximately 2,700 students throughout the Clark Fork watershed to present the REP curriculum. Our curriculum uses the local environment as the basis for teaching about the Upper Clark Fork River's restoration, incorporating concepts from biology, chemistry, ecology, mathematics, history, and yes, even art!

In the Fall semester, we serve all 7th grade science students at East Middle School, as well as science students from Drummond's 7th and 10th grade classes. In the Spring semester, we work with students in Ramsay, Anaconda, Philipsburg, Butte Central, and Deer Lodge. The first four days of our program are spent in the classroom teaching the concept of a watershed; the ecological roles of riparian habitats; the history of mining copper in our region; the basic geology of our region; the processes involved in copper extraction; the Superfund designation given to our region due to mining impacts; and the current remediation and restoration efforts that are

going on in our watershed. On the fifth day of our program, we take a field trip to a mine-waste impacted site.

As the restoration has proceeded, we have been moving downstream in search of mine-waste impacted sites; for the last three years, including this current one, our field trip site has been on Silver Bow Creek at Fairmont Road. While at the site, students collect data with the aid of volunteer station leaders on water

quality, riparian habitat characteristics, and aquatic macro-invertebrates. This data is used to assess the health of the riparian habitat. We review the data in a classroom; if possible we bring the students to Montana Tech's campus so that they can experience a college classroom setting.

The theme of our current

newspaper is Art and the Environment, and we mentioned earlier that art does have a role in our science curriculum. So you may be asking yourself, "how is art incorporated into the REP curriculum?" Well, first of all, during every classroom visit, we provide colorful markers and blank sheets of paper for students to color, draw, and write about the concepts being discussed. These sheets, called RAP sheets (Rapid Assessment Program), become quite colorful and serve as an information and resource guide for the students' personal use. If we have more time in the classroom, we give students the opportunity to build models. For example, during our visit with Garrison School in Fall 2011, we brought a large bin of arts and crafts supplies that included fuzzy wire, markers, feathers, and pom poms, as well as recycled materials such as cardboard and Styrofoam. With these materials, students were asked to create a model of a healthy riparian habitat, and boy, did the students deliver! We were amazed by their talent and creativity, and were impressed by how they incorporated ecological concepts we taught through our curriculum into their models. Their riparian habitats supported an



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Butte's Park Street Community Gardens



"The Park Street Community Garden began taking shape in 2009, when community members sought to create a space for Butte residents to grow fresh, healthy, and organic food for themselves. Today, each plot is planted, maintained, and harvested by a local individual or family. The garden helps adults and children alike to understand and appreciate the importance of self-grown produce within their community."

By Julie Butler

It started from simple beginnings -- in 2009 my husband and I were renting uptown and looking for a community garden. When we found out there wasn't one, we joined forces with a few others uptown and decided to build one. Someone in the group suggested the vacant lot next to the Hummingbird (city property) and operating the non-profit Sacred Ground. A whole lot of hard

work and perseverance followed, and voia! We now have a beautiful, thriving garden. Whose beds are all full, by the way (though we have a waitlist that people are welcome to join).

Now that baseline construction is done, we are shifting our focus to education program for 2013. I'm currently applying for a few grants...

Wish us luck!

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Sara Sparks: Remedial Project Manager for the EPA

“If you look at Butte as a whole, you’d find it as clean, or cleaner than Missoula”

The Montana Steward is proud to announce our new feature series, “Voices of the Restoration”. This piece will feature interviews and perspectives of various community leaders, citizens, technical advisors, and scientists who are willing to share their perspectives and opinions about the on-going restoration efforts throughout the Clark Fork Watershed. The goal of this feature series is to include perspectives from multiple viewpoints and from various stakeholders. As always, the Cfwep.Org program remains neutral and informational in our position regarding issues related to the restoration. The opinions and perspectives presented by the interviewees are reflective of that person and not necessarily those of Cfwep.Org or its partners. Our goal is to create an active and informed citizenry who are able to make decisions based upon scientific fact. We believe that sharing multiple viewpoints regarding the restoration process is a means to achieving this goal. We hope you enjoy the series!

Sara Sparks shared with us her perspective of the remediation and restoration efforts around Butte. The following are excerpts from our conversation.

Sara Sparks shared with us her perspective of the remediation and restoration efforts around Butte. The following are excerpts from our conversation:

I grew up in Missoula Gulch, all three sides of my home was surrounded by waste dumps. The Alice Dump was right in my neighborhood and an area that was both an eyesore and our playground. When I came into this position, I brought with me my love of this community and the people. I wanted to see our landscape cleaned up. I think of myself as having tunnel vision. When I see the need for getting something cleaned up, I keep moving until it is done. Sometimes I’ve had to drag people along to get there. I admit that I don’t hear “no” very well. I try to keep focused that we need to do the next right thing. When we started looking at cleaning the Alice Dump site, it took eight years of sampling to demonstrate that the area was indeed contaminated enough to trigger a remedy. I was happy to see that area converted to a trail system and picnic area and something useable by the community rather than an ugly dump.

Superfund as laid out by the federal government was actually designed for a two-acre site that had drums on it. We’d go into the area, do the clean-up, put a fence around it and sign it “no trespassing”. This plan did not work for Butte where the superfund was five square miles and included a community in the center of it. Early on we had to make decisions about how we would turn these contaminated areas around into useable space for the community. We were fortunate that we had a PRP (Potentially Responsible Party) who was willing to spend the extra money to do re-development along with the remedy. With Superfund, we have to meet all state and federal laws that affect an area. In Butte, this includes the 1964 Historic Preservation Act. The Historic Preservation Act has allowed us to build things like the Granite Mountain Memorial and the Mountain Con site. At the Granite, the memorial itself acts as the cap for the remedy and also fulfills historic preservation requirements. Whenever possible, we’ve attempted to combine these efforts in order to give back to the community. If you look at Butte as a whole,

you’d find it as clean, or cleaner than Missoula to live in, which I think would be a surprise to many. We have clean drinking water, low exposure to heavy metals—our kids have some of the lowest blood levels of lead in the nation, and our incidences of cancer rates was the same for residents of Silver Bow County compared to the residents of the state of Montana. We’ve completed a couple of studies on cancer rates in this area. We do, however, have a higher rate of death from cancer. Why? One of the reasons may be that people don’t have health insurance. There are a lot of controversies in Butte about the various remedies, worries about health problems, and most recently the blowing mine dust. If you look at Superfund, we did air quality studies for 20 years. Based on the historic data, there is not an exposure pathway problem with heavy metals in the mine dust for human health. However, the blowing dust is clearly an ongoing problem. This is an issue for the State of Montana, as regulator of the mine site, and Montana Resources, therefore it does not involve Superfund.

Ask Dr. A



From: Chris a biology student from Montana Tech

Question: How do wildfires affect the riparian habitat?

I really like this question because it is relevant, current news - wildfires and the effects of wildfires are on many people’s minds. As of August 21, 2012, we have had 1,417 wildfires in Montana that have affected 764,275 acres (according to the Northern Rockies Coordination Center). In addition, the smoke from wildfires in the states of Idaho and Utah have covered our skies here in the Clark Fork watershed for weeks.

So how do wildfires affect the riparian habitat? As many of us know, the riparian habitat is the natural area found along the banks of a river, stream, lake or other body of water. Many of us can easily recognize the riparian habitat in Montana because it features green ribbons of vegetation bordering rivers,

streams and lakes. These habitats are ecologically diverse and different from upland habitats which appear brown in the summer months due to dried grasslands.

Not all wildfires are the same; they can differ in locations (upland versus riparian habitat), intensity (how hot the fire gets) and duration (how long the fire lasts). Upland wildfires increase the amount of sediments that flow into the aquatic, or watery, portion of the riparian habitat, during rainstorms. This results in increased conductivity and turbidity of the water which is harmful to many aquatic organisms, especially trout. Even light rains can cause increased runoff because the vegetation that lived in the upland habitat prior to the fire are no longer there to absorb the water from rainstorms.

Wildfires that are located within a riparian habitat are naturally going to have greater affects, but not all the time. It depends on the intensity

and duration of the fire. Since the riparian habitat is a naturally moist habitat, it can protect itself from small, mild fires of short duration. In addition, many riparian plants can regenerate through shoots, as opposed to seeds. Shoots travel underground through the soil, coming up as young plants. Burned topsoil, therefore, is not as harmful to these plants.

Intense, uncontrolled wildfires in the riparian habitat are, of course, a different monster. Intense fires are detrimental to water quality when all the plants are destroyed. In many of these instances, soil ero-

within the soil are critical to soil health. When these organisms die from extreme heat, the soil becomes sterile and unsupportive of plant life. During fires, nutrients in the soil, such as nitrogen, can become volatile and evaporate, leaving the soil. Nitrogen is a critical nutrient that plants require for their growth and health. After fires subside, ash with significant amounts of nitrogen in the form of ammonia will cover the surface, giving a nutritive boost to plants. However, this top layer of nitrogen is short-lived, after which long-term nitrogen deficiency occurs.

When the tall trees that shade the stream are damaged, stream temperatures can increase by several degrees. These increases in temperature affect the amount of dissolved oxygen in the water. Oxygen is essential to the survival of aquatic animals, especially those that use gills to obtain oxygen.

Resources for this article include: Dennis N. (1989) The Effects of Fire on Watersheds: A Summary. USDA Forest Service Gen. Tech. Rep. PSW-109.; Dwire KA, Kauffman JB (in press) Fire and riparian ecosystems in landscapes of the western USA. Forest Ecology and Management, <http://www.forestencyclopedia.net/>.



sion increases, nutrient deficiencies occur, runoff increases, and stream and soil temperatures increase.

When soil temperatures increase this can lead to the “death” of the soil. The microorganisms living

Teacher Feature: John Bercier, Art Teacher Butte High

By Rayelynn Connoles

John Bercier has recently agreed to partner with the Cfwep.Org team and the Butte Archives for an OPI Museum & School Collaborative Grant to Integrate Indian Education for All. We are extremely pleased to have John join us in this new venture and looking forward to the amazing artwork he and his students will create for this project. I caught up with John one summer afternoon and we discussed a great many things, including his experiences growing up as an Urban Indian in Butte, MT.

Jon, tell me a little about your background and family history?

I am an Urban Indian, meaning that I have grown up here in Butte and have not lived within a reservation. I am actually not enrolled in a tribe here in Montana, rather I am enrolled at Turtle Mountain, North Dakota in the Chippewa Cree tribe. Many Montanan Chippewa Cree Indians are actually enrolled at Turtle Mountain rather than here in Montana. My family originally came to Butte to mine ores. However, my grandfather was a rancher and wanted to return to Chinook, MT, so he left his family here in Butte and returned to Chinook to ranch. My grandmother raised ten kids by herself. As one can imagine, our family was quite extended and there was not a lot of money to go around, so my grandmother had to make some difficult choices. Some of her children went to boarding schools while others put into foster homes. Needless to say, education was not a top priority in the family culture.

What was it like growing up in Butte and attending school?

As I stated, education was not the highest priority. My mom was also a single mother and I think it was hard enough for her to make ends meet, let alone make sure my sister and I were doing well in school. I was constantly in trouble in school, probably because I was bored and not engaged fully. I know I wasn't in trouble because I couldn't handle the curriculum, because when I eventually went to college, I did very well. It was tough being an Indian kid and being poor in school.



I remember that people often overlooked me, and that I was not important. I wasn't really expected to be a good student nor expected that I was going to accomplish anything in my life. I was connected to my Indian heritage through my family, but didn't have many connections within the community. I was always an outsider. In fact, my Indian name is "Two Worlds", which completely describes my experience as a youth. I did connect with Aaron Perry as a youngster. He ran the local North American Indian Alliance in Butte. His mentoring helped me have identity and feel a sense of belonging. Despite the odds, you graduated from Butte High School and eventually earned a Masters' Degree. **How is it that education became a priority for you?**

I was the first person in my family to graduate from high school, let alone attend college. I had a son very young. When he was born, I couldn't get a job earning enough money to take care of him. I knew that getting an education was my only way out of poverty and the only way that I would be able to raise him. Making the decision to attend college was hard. My mom and my grandmother were not very supportive. They thought that I would lose my faith if I went to college. They believed that education took away our spirituality and they were worried I would lose my way. I knew that college was the key to making my own way in the world and decided that I would go despite their worries.

Tell me a little about your college experience. Was college harder for you, like your other educational experiences?

I loved college! Once I started, I felt like the world opened up to me. I did very well. I maintained a 3.9 GPA overall through my entire college career. The college classes changed my life. I wanted to stay in school forever. In fact, the college finally had to require me to graduate; otherwise they would charge me out-of-state tuition for my credits. When I did graduate, I had enough credits for the masters' degree. I still like to take classes to learn new things.

How did you settle on becoming a teacher?

Well, I settled on becoming an artist first. I knew that I had something important to say and art gave me the perfect vehicle to express my message. In school, the teachers who did inspire and reach out to me were the art teachers in High School. In particular, Mike Kujawa at Butte High School was very inspirational to me. I wanted to give something back as well. With my passion for art and my desire to help students like me, it was an easy choice to become a teacher. Education reform and performance testing are in the forefront of education today.

How do you see art fitting into this new agenda, or perhaps more importantly, what do you think should happen in education going forward?

The strong "Common Core" subjects are being emphasized so much that creativity is being sidelined. When students are at benchmark or above they are neglected. All energy and focus is going to the students who aren't at benchmark. This neglect will eventually come back to bite us. We will pump out students that are proficient in "Common

Core" subjects, but lack in the ability to think creatively. Some might argue that this is already happening. Some will also argue that this is the

point! (scary)

As far as moving forward, I think colleges like Montana Tech, need to offer more liberal studies classes. Public schools should place more emphasis on the arts. We may want all our children to be engineers, doctors, and rocket scientists; but could you imagine what life would be like then?

I think we are missing many talented minds when we do not offer art classes. I also think it essential that students develop critical and creative thinking. Art coursework demands that students develop these skills. We often discuss critical thinking skills, but what is needed is creative thinking, meaning how can we problem-solve contemporary issues? Creative thinkers are able to see solutions that are inventive and allow us to move past current practices that may or may not be effective. In the future, creative problem-solving will ensure our success. How will we instill creative problem-solving without the arts?



The Clark Fork Watershed education Program

SIGN UP TODAY!

accepting applications from campers ages 12-17 Starting May 1st!

All Applications must be received by Noon Friday, July 19, 2013

Fly Fishing Camp

Mon, Aug 5th – Class at Montana Tech campus
Wed, Aug 7th thru Fri, Aug 9th – Fly Fishing Camp at Georgetown Lake (transportation provided)

This camp, organized by CFWEP.org and sponsored by a number of local entities and businesses is aimed at teaching young individuals the sport of fly fishing, science and history of our local waters and fisheries, and the ethics and science of stewardship and conservation. Participants will learn a comprehensive variety of skills including basic and intermediate fly fishing (equipment, casting, fly selection, knot tying, etc.), basic fly tying, stream and stillwater fishing tactics, fish ecology and identification, insect identification, riparian ecology and function, stream restoration and conservation, fisheries management, stream access issues, and sportsman etiquette and ethics. The camp includes many local and regional expert instructors and scientists.

All food, accommodations instructions and fishing gear with tackle will be provided by the camp.

Applications are available May 1st in Butte at Fran Johnson's Sport Shop, Bob Ward's and Sons, and the Stone Fly shop and downloadable on Cfwep.Org's website. In Anaconda at Ace Hardware

Sponsored By
Cfwep.Org
 The Clark Fork Watershed Education Program


 MONTANA TECH
 CLARK FORK WATERSHED EDUCATION PROGRAM

The Clark Fork Watershed education Program - Cfwep.Org - 1300 West Park st - Butte, MT 59701 Call (406) 498-8868 - email cndoyl@cmtech.edu



The Director’s Letter

Future Directions for Cfwep.Org

As the leadership mantle shifts to me, I meet this challenge with great hope for the future and joy in my heart. Many people have stopped me to ask, “What do you see for the future of Cfwep.Org?” My simple reply has been, “Greatness. We will continue our mission to create an informed citizenry who are stewards of their watershed, wherever those watersheds may be.” I joined this organization in 2007, charged with the tasks of aligning the Cfwep.Org curriculum to the national and state standards in science, and taking over an Office of Public Instruction, Math Science Partnership grant project. I quickly learned how deeply this program could impact the lives of others. I felt that sweet serendipity that comes with knowing you’ve found your life’s path and that the work you do has influence on others. My intention is to continue a great legacy set forth by our leadership

team and former directors, while building our program to reach even further and affect even more lives. Our leadership team and staff members recently met to discuss the core ideology and core values of the program. It was clear that our core ideology is the belief that people must become stewards of the environment. Our definition of stewardship does not necessarily mean that all people will hold the same values and same beliefs about how to care for the environment, rather stewards are citizens who: are scientifically literate; are capable of making informed decisions about policy and practices; understand the history of their area; are active within their area – whether on a civic level or a volunteer level; and are willing to take a stand when necessary. The leadership team of Cfwep.Org recognizes the need for the extraction industry and supports practices that

are balanced and that embrace caring for the landscape while allowing for extraction of much needed resources. Our core values are:

- We reach all students through a quality educational experience. “Creating environmental stewardship one student at a time.”
- We value an active and informed citizenry. We work to help citizens understand and appreciate their area.
- We are a fact-based organization. Scientific integrity is critical to our work and informs our educational practice and outreach efforts.
- We value cultural integrity. We honor the contributions, perspectives and history of our Native American neighbors and strive to incorporate this information within our curricula and outreach efforts.
- We are of service to our communities. We believe that community outreach is our duty and commit ourselves to reaching the widest audiences possible through our work.
- We uphold public education and value the work of professional educators. We believe that through quality professional development

outreach efforts, we will create a legacy of informed teachers who will inspire several generations.

- We value flexibility and are able to reach diverse groups of people, with diverse points of view.
- We value grassroots efforts by informed, active citizens. We strive to help groups create capacity within their communities.
- We believe that community-oriented, value-adding solutions for environmental problems are essential.
- We value restoration efforts since restorative efforts are, in the long-term, less expensive, more effective, and sustainable.

As the new director for Cfwep.Org, the core ideology and core values of the program will be the lens through which I view opportunities for growth. This organization will remain firmly rooted to its origin; however, we will grow beyond the boundaries of the Clark Fork Watershed. We view our program as a model program that can be brought to other regions with similar issues.



Rayelynn Cannole Cfwep.Org Director



On Our Cover



“Evening Light On The Middle Fork”, Acrylic, 30”W x 40”H Copyright 2010 James L. Clayborn



Next Issue:
Environmental Education
in Montana

Who We Are

The Cfwep.Org has been a leading provider of environmental and restoration education programs and services in western Montana since 2005. Cfwep.Org offers multi-disciplinary science and history programs for schools, teachers, and students in the Upper Clark Fork Basin. We also offer public education and outreach services such as tours, events, and publications that connect the public with the science and history of the amazing landscape of western Montana. Cfwep.Org is physically located in the Health Sciences building on the campus of Montana Tech in Butte, Montana. Our Mailing address is Cfwep.Org @ Montana Tech 1300 West Park Street Butte, Montana 59701. Cfwep.Org is our web address. Please direct your comments and suggestions to info@cfwep.org or Matt Vincent at MVincent@mtech.edu. The Montana Steward is a quarterly publication of the **Clark Fork Watershed Program**. The Montana Steward reserves the right to control its own publication schedule. Cfwep.Org is part of the Institute for Educational Opportunities at Montana Tech of the University of Montana, a 501c3 non-profit educational institution.

Matt Vincent - Former Director is Now Butte Silver Bow’s Chief Executive

By Matt Vincent

I’m five months into my new role as Butte-Silver Bow’s Chief Executive (that’s what they call a mayor in consolidated city-county government) and I’d be lying if I said I didn’t miss my old job at Cfwep.Org from time to time. My time spent working with the outstanding staff at Montana Tech and the thousands of teachers, citizens and amazing students were some of the greatest days of my life. Now, I am blessed with new, larger opportunities and I know there are even greater things to come. In a watershed sense of life, I have passed a confluence and am now in the main stem river, heading constantly and eventually toward a seascape sunset. The same is true for Cfwep.Org. A headwaters organization grown from just a couple dedicated employees working in a cramped of-

fice is now a dynamic, ever-growing organization that spans the Upper Clark Fork Basin from Butte to Missoula and beyond. I am confident the new leadership will keep things moving in the downstream direction and that there are greater things to come for Cfwep.Org. Every day that passes, the importance of teaching our future generations to understand and care for our environment grows larger, just like the stream that’s headed for the sea. This group is unequivocally and exceptionally dedicated to the task.

Nothing but the best to my fellow Cfwep.Org’ers...I’ll see you downstream!

“May your trails be crooked, winding, lonesome, dangerous, leading to the most amazing view. May your mountains rise into and above the clouds.” Edward Abbe



Butte High School Restoration and Mining History Tour

On May 9, 2013 Cfwep.Org hosted what is hoped to be our first-annual Butte High School Restoration and Mining History Tour. Colleen Elliott, Joe Griffin and Rayelynn Connoles, members of the Cfwep.Org leadership team recruited Butte High School teachers Amanda Curtis and Chris Fiske to take on the challenge of assisting Cfwep.Org with an extensive field trip throughout Butte. Cfwep.Org partnered with members from the Citizens Technical Environmental Committee of Butte, the EPA's Sara Sparks, and ARCO to provide this incredible educational experience. Students in Amanda Curtis' math classes engaged in curriculum pro-

vided by Joe Griffin for a week prior to the field trip. Her students explored many mathematical problems related to the restoration such



Dick Gibson illustrates the Boulder Batholith at the Alice

as calculating heights and dimensions of the various headframes around Butte. Her students also calculated the estimated value of copper that could be precipitated from waters infiltrating the Parrot Tailings. In Chris Fisk's classroom, students reviewed Butte's mining history and also studied place names of

Silver Bow creek and throughout the Clark Fork Watershed, which were part of interviews conducted with Salish Elder, Tony Incashola.

On the field trip, students were able to visit with many local scientists, historians, and engineers. Students rotated through various field study sites including: the Alice Overlook, hosted by Dick Gibson and Rayelynn Connoles; the Granite Mountain Memorial, hosted by Sara Sparks; the Bell Mine, hosted by Dr. Colleen Elliot and Tom Malloy; the Parrot Tailings Well Monitoring Site, hosted by Dr. Chris Gammons, Garrett Smith, and Pat Cunneen; and the Colorado Tailings/Groundwater

Capture Treatment System hosted by, Joe Griffin, Dave Griffiths, Brad Holman, Ken Brockman, and Nikia Greene.

Without all of our volunteers and the support of our partners in this project, this field trip would not have been possible! Thanks to the following organizations who lent us your staff members for the day: Butte Silver Bow; Bureau of Mines and Geology; Environmental Protection Agency—Butte; Pioneer Technical—ARCO contractor; MT Department of Environmental Quality; Montana Tech; and the US Bureau of Reclamation.



BHS Student sampling Parrot Tailings Well

Cfwep.Org

Cfwep.Org's Outstanding Student Employees

by Jenny Miller



Chris Doyle was nominated and won the ServeMontana award from the Governor's Office of Community Service

Cfwep.Org would not be the organization that it is today without our outstanding student employees, Chris Doyle and Terry Biere. Chris is a senior majoring in Biology while Terry is a sophomore majoring in environmental engineering, both here at Montana Tech. Whether they are in the office for the day or buzzing in for an hour in between classes, tests, labs, papers, and so on, Chris and Terry are always dedicated to providing quality work for our organization and are always great company to have around. I personally greatly admire their dedication and service to the Butte community. Not only will Chris and Terry do the odd jobs we ask of them with a smile on their face, but they are also wonderful working with our students. Our 5-12th grade students love working with them because they are Butte natives who resemble an older brother or sister that students admire and look up to

as role models. Students who interact with Chris and Terry gain confidence in their abilities and are inspired to pursue undergraduate education af-

ter high school.

We here at Cfwep.Org are not ones to let good deeds go unnoticed. In winter 2013, Terry Biere was nominated for Montana Tech's Student Employee of the Year in recognition for her dedication, loyalty and quality of work. This year marked the fourth time Montana Tech cel-



Just one of the reason Chris Doyle was nominated.

brated National Student Employment week. On April 8th, Career Services hosted a Student Employee of the Year (SEOTY) recognition ceremony. The event honored Montana Tech students nominated for this distinguished award by their

on-campus employers. Although Terry did not receive the award this year, we were excited to have the opportunity to publicly recognize her for her outstanding work at Cfwep.Org.

Meanwhile, Chris Doyle was nominated and won the ServeMontana award from the Governor's Office of Community Service. On February 28, 2012, we had the privilege of accompanying Chris and his family to the 4th Annual ServeMontana Symposium in Helena where Chris received his award. The symposium was a beautiful gathering of folks coming together to celebrate and show appreciation for the incred-



Terry Nomination pictured with Chancellor Don Blacketter and Sara Raymond

ible service people are providing throughout the state for the single purpose of improving their local community. The Cfwep.Org staff nominated Chris for his invaluable service as a member of Cfwep.Org's education team. "He is instrumental in Cfwep.Org's mission to educate K-12 students about the Clark Fork watershed – its history

of environmental damage and the current, on-going restoration efforts," explained Dr. Alvarado, Cfwep.Org's Field Coordinator. "He is always at ease, whether he is teaching kindergarten children about macroinvertebrates; high-school students about proper planting techniques for Cottonwood saplings; or showing-off his animal calling techniques to people of all ages of the Montana Folk Festival. Chris motivates and engages people young and old to learn more about our watershed and its health."

And last, but certainly not least, Cfwep.Org has recently hired the talented Kori Dyer to assist us with the planning and coordination of the Folk Life and Family Life sections of the Montana Folk Festival being held July 12th through the 14th! We are so thrilled to have her as part of the Cfwep.Org crew! She is doing a wonderful job and we consider ourselves very lucky to be honored once again with an outstanding student worker.

Sign Up for Cfwep's Fly Fishing Camp

Spotlight on Partners



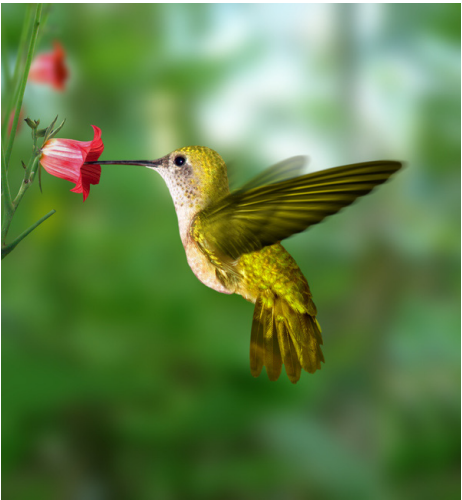
Cfwep.Org is proud to partner with the Avian Science Center at the University of Montana. Through this partnership, Cfwep.Org and the Avian Science Center have reached hundreds of area students through the Bird's Eye View programs. The partnership was a natural evolution as both programs focus on reaching children and adults, utilizing the Clark Fork clean-up and on-going research as a platform for education. The primary goal of the Avian Science Center's programs is to provide families living within the Upper Clark Fork River Basin a Bird's-Eye View of the effects of past mining activities and of current restoration projects aimed at repairing mining related damages. The partnership with the Avian Science Center enriches the Cfwep.Org core programming by illustrating the effects of the restoration within animal communities. Participants are invited to observe birds up close at the banding stations, learn about Montana's riparian birds,

and interact directly with biologists collecting scientific data on bird communities – thus it represents an opportunity for citizens to take part in the process of science. The Avian Science Center and Cfwep.Org also partner with Project Osprey at the University of Montana. Project Osprey examines blood-levels of Mercury within osprey chicks along the Clark Fork River. The researchers have published a detailed inventory of mercury and other contaminants in Ospreys in the Clark Fork River Basin and are now focusing on the long-term effects of these contaminants on ospreys and the ecosystem in general. Another focus of Project Osprey is to educate area ranchers and citizens to the dangers of bailing twine for nesting ospreys. Because the bailing twine is bright and appears to be good nesting material, the ospreys will pick up the twine scattered throughout fields. This twine becomes harmful when the chicks hatch and are beginning to fledge. Often, chicks become entangled in the twine resulting in

approximately 10% of area chicks dying. Both Project Osprey and the Bird's Eye View Program offer public education events throughout the summer. Project Osprey has live cameras on several nests throughout the Clark Fork, which can be viewed at <http://www.cas.umt.edu/geosciences/faculty/langner/Osprey/index.htm>. Additionally, Project Osprey has a Facebook page that is updated frequently by the project team.

Below is the Bird's Eye View banding schedule. The public is invited to join the scientists for any of the banding dates.

- Mt. Haggin WMA near Anaconda What can you expect to see & learn by visiting our bird banding station?
- Observe birds “in the hand” and find out what a “brood patch” is.
- Learn why biologists capture and band birds & what kind of data we collect.
- Gain bird ID skills and learn a few common bird songs.
- Find out why riparian areas are



so important to birds. • Learn the history of mining activities in the Upper Clark Fork Basin and the effect those activities had on bird communities. Visitors should plan to arrive at either 7:00 am or 9:00 am in order to participate in the program. For more information about this program or to arrange a group visit, contact Megan Fylling (megan.fylling@mso.umt.edu) or Sharon Fuller (Sharon.fuller@mso.umt.edu) or call 243-2035 Please keep in mind that these programs are weather dependent Visitors should wear shoes and clothes appropriate for hiking near riparian woodlands & consider bringing snacks or a lunch, as well as water, sunscreen, a hat, and bug repellent. Bring binoculars if you have them and a camera if you'd like – this unique “bird-in-the-hand” situation creates nice photo opportunities. More information about this program at: http://avianscience.dbs.umt.edu/projects/bird_banding.php

Bird Banding Schedule 2013

| MPG Ranch | Rock Creek | Grant-Kohrs Ranch | Mt. Haggin |
|-------------|---------------|-------------------|---------------|
| | Sun, Jun 2 | Fri, May 31 | Sat, Jun 1 |
| Sat, Jun 15 | Fri, Jun 14 | Wed, Jun 12 | Thurs, Jun 13 |
| | Tues, Jun 25 | Fri, Jun 21 | Thurs, Jun 20 |
| Wed, Jul 10 | Tues, Jul 9 | Tues, Jul 2 | Mon, Jul 1 |
| | Thurs, Jul 18 | Sun, Jul 14 | Mon, Jul 15 |
| Fri, Jul 26 | Thurs, Jul 25 | Wed, Jul 24 | Tues, Jul 23 |
| | Wed, Aug 7 | Tues, Aug 6 | Mon, Aug 5 |

The Clark Fork Watershed Education Program Proudly Hosts the MEEA Conference in Butte, Montana!

March 2014

Contact Us For More Information
406-496-4790 or Cfwep.Org

Arlene Alvarado aalvarado@mtech.edu Rayelynn Connoles rconnoles@mtech.edu Jenny Miller jmiller@mtech.edu Frank Ponikvar fponikvar@mtech.edu

See the restoration of Silver Bow Creek and the Clark Fork River in Action!



Cfwep.Org Hosting MEEA in 2014

CFWEP is very proud to be hosting the Montana Environmental Education Association (MEEA) annual meeting in March, 2014, in wonderfully historic Butte America. MEEA is a non-profit organization formed in 1991 that encourages environmental education for people of all ages and backgrounds. MEEA believes that environmental literacy is critical since “the environment is where we live.” Their goals are to serve as an entry point for those seeking to be connected to and learn more about Environmental Education (EE); to unify the voices of diverse elements of EE; to connect educators with resource providers and services; to foster an awareness and understanding of the environment and local sense of place; to present accurate information about environmental problems and issues; and to assist in identifying and accessing funding resources (www.montanaeea.org). The theme for the 2014 MEEA meeting is Restoration and Environmental Education. CFWEP plans

to provide the participants with fascinating tours of our mining city, as well as engaging speakers and inspiring workshops related to the restoration of our watershed. Our aim is to attract teachers and other interested parties from around the state of Montana and demonstrate for them how easy it is to provide engaging, place-based scientific study right in their backyard. CFWEP has always attended MEEA's annual meetings, but this year, the staff attended with dual purpose: 1) to provide information to meeting attendees regarding CFWEP's work and up-to-date information on current restoration efforts in the Clark Fork watershed; and 2) to prepare for the meeting next year by meeting with the MEEA leadership and pick their brains with regards to best practices for hosting the annual gathering. Look for more information regarding MEEA 2014 on our website, www.cfwep.org. We look forward to seeing you next year!



Cfwep.Org Partnering with Folk Festival Organizers



The Clark Fork Watershed Education Program (www.Cfwep.Org) will coordinate both the Folklife Area and the Family Area this year.

George Everett and Josh Peck have contracted Cfwep.Org to organize the Family Life and Folk Life Areas for the 2013 Montana Folk Festival. The theme of this year's Folk Festival is the "Influence of Rivers". This theme speaks directly to the soul of the Cfwep.Org organization, so it is no small wonder why the Folk Festival organizers tapped Cfwep.Org for the job. The following is a sample of planned events within the Folk Life and Family Life Areas:

- Community Painting—children will help create a river confluence painting
- Build a river creature activity
- Petting Zoo
- Kid's Fishing Pool
- River Bandana
- And much more

In addition to many folk life demonstrators, Cfwep.Org has organized several discussion panels related to the folk festival theme. Here is a sampling of discussion panel topics:

- Impacts to Rivers—this discussion panel consists of researchers and outreach educators throughout the Clark Fork and Columbia River watersheds. The discussion will focus on contemporary impacts to river systems and potential solutions.
- Conservation—this discussion panel consists of leaders within conservation organizations throughout Montana including Ducks Unlim-

ited, Wild Sheep Foundation, Trout Unlimited, and the Great Bear Foundation. Speakers will discuss conservation efforts throughout Montana and how the public can get involved.

- River Education—this discussion panel consists of formal and informal educators who utilize river systems as a tool to engage students in science.

- Environmental Artists—panelists include Montana artists Monte Dolack and Jim Clayborn as well as other area artists. This panel will discuss how issues with the environment influence art and how art can be an effective tool to inspire change within a community.



- Stream Access—this discussion panel consists of representatives from various

organizations and interest groups. The panel will discuss the issues associated with stream access and how Montana's laws related to stream access affect the public.

- Native Stories and the River—Salish Elder, Tony Incashola, will share Salish stories about rivers, including place names within Montana.

Cfwep.Org

ROCKIN RUDY'S

**PROUD SUPPORTER OF THE
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