

currents

clark fork coalition | fall 2013

WHERE'S THE WATER?

INSIDE:

- Low flows: Problems & fixes
- Creative solutions in the Upper Clark Fork
- Clean water watch



Jackie Corday

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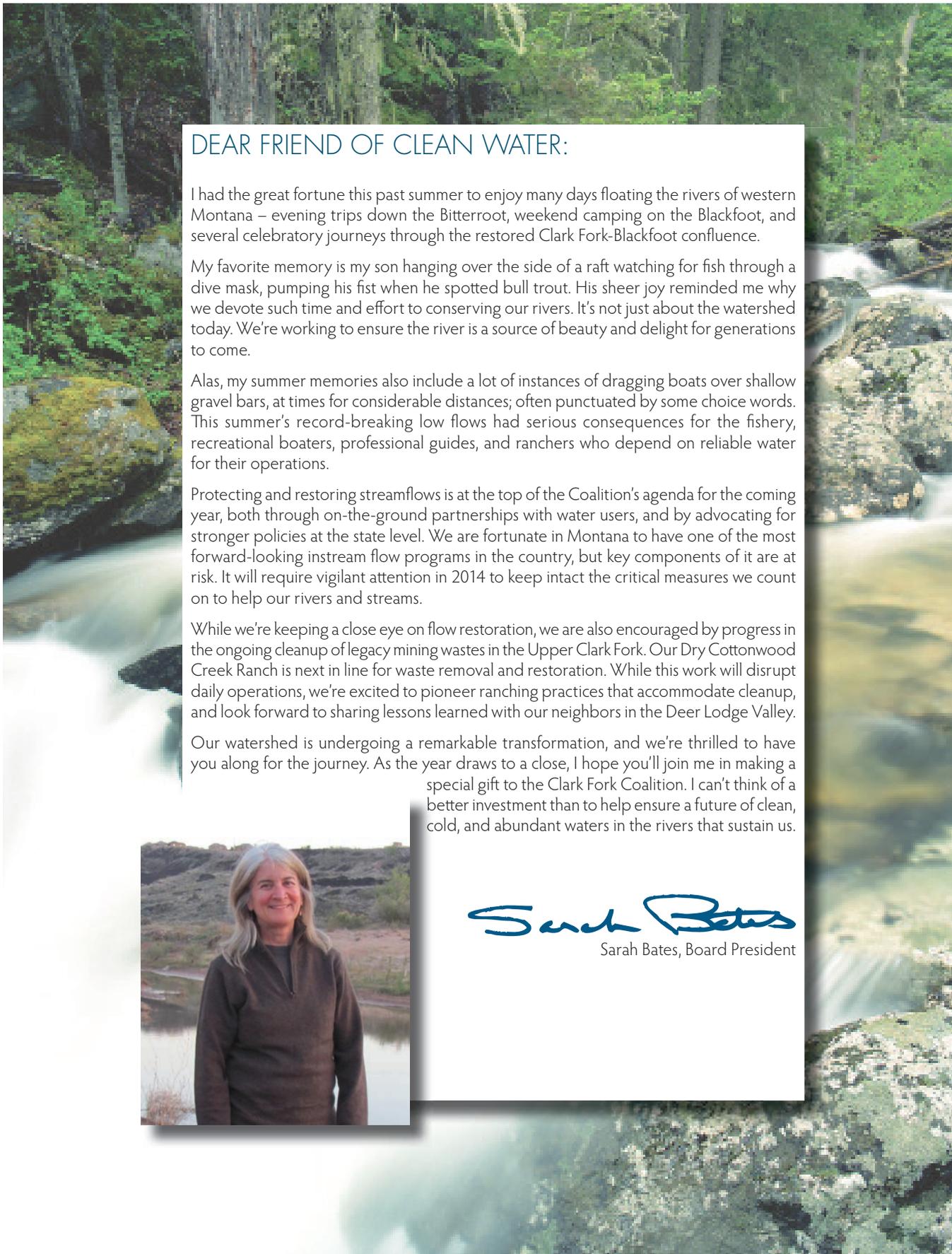
www.clarkfork.org #cleanwater



**Protecting & restoring
 the Clark Fork watershed**

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DEAR FRIEND OF CLEAN WATER:

I had the great fortune this past summer to enjoy many days floating the rivers of western Montana – evening trips down the Bitterroot, weekend camping on the Blackfoot, and several celebratory journeys through the restored Clark Fork-Blackfoot confluence.

My favorite memory is my son hanging over the side of a raft watching for fish through a dive mask, pumping his fist when he spotted bull trout. His sheer joy reminded me why we devote such time and effort to conserving our rivers. It's not just about the watershed today. We're working to ensure the river is a source of beauty and delight for generations to come.

Alas, my summer memories also include a lot of instances of dragging boats over shallow gravel bars, at times for considerable distances; often punctuated by some choice words. This summer's record-breaking low flows had serious consequences for the fishery, recreational boaters, professional guides, and ranchers who depend on reliable water for their operations.

Protecting and restoring streamflows is at the top of the Coalition's agenda for the coming year, both through on-the-ground partnerships with water users, and by advocating for stronger policies at the state level. We are fortunate in Montana to have one of the most forward-looking instream flow programs in the country, but key components of it are at risk. It will require vigilant attention in 2014 to keep intact the critical measures we count on to help our rivers and streams.

While we're keeping a close eye on flow restoration, we are also encouraged by progress in the ongoing cleanup of legacy mining wastes in the Upper Clark Fork. Our Dry Cottonwood Creek Ranch is next in line for waste removal and restoration. While this work will disrupt daily operations, we're excited to pioneer ranching practices that accommodate cleanup, and look forward to sharing lessons learned with our neighbors in the Deer Lodge Valley.

Our watershed is undergoing a remarkable transformation, and we're thrilled to have you along for the journey. As the year draws to a close, I hope you'll join me in making a special gift to the Clark Fork Coalition. I can't think of a better investment than to help ensure a future of clean, cold, and abundant waters in the rivers that sustain us.



Sarah Bates, Board President





THANKS TO YOU

we're making a difference for clean water.

Watching out for watershed health:

How low can it go? Coalition staff and field techs have been monitoring regional creeks and streams all summer and fall, putting the numbers behind a hot, dry year that's been pretty tough on the watershed. In July, our stream restoration team took to the air with reporters to document the situation and get the word out about this year's extremely low flows.

Thank you to our friends at EcoFlight for giving us a bird's-eye view of the valley. For some dramatic shots of this year's low flows see: <http://tinyurl.com/low-flows>.

Eyes on the River: Some 20 people joined us for our Streambank Assessment Float on an urban stretch of the Bitterroot River in July. Our restoration team joined the group to teach assessment techniques and explain the impacts of erosion, rip rap, weeds, and sediment. Participants are now better equipped to help keep an eye on streambank conditions. Look for more floats in 2014! Big thanks to The Trail Head in Missoula for donating a raft for the inaugural float!

Helping our community come together:

Celebrating the confluence: The dam's gone, the confluence is restored, and the river is open for business. Time to celebrate! In early August kayakers, tubers, rafters, and SUP-ers hit the river for Missoula River Fest, celebrating the newly-opened Clark Fork-Blackfoot confluence and the river's remarkable restoration story. It was a great day to kick back with friends and family, toast our community's hard work on behalf of clean water, and enjoy the many ways the river enriches our community.

Thank you to our sponsors: Montana Radio Company, First Security Bank, Good Food Store, Northwestern Energy, Boyle, Deveny & Meyer, and Western States Insurance.

Inaugural Fall Cleanup: More people in and around Missoula are getting out to enjoy the Clark Fork River than ever before via tubing, rafting, fishing, and swimming. With all the additional use (which is fantastic!) we've also noticed more trash accumulating in the river and

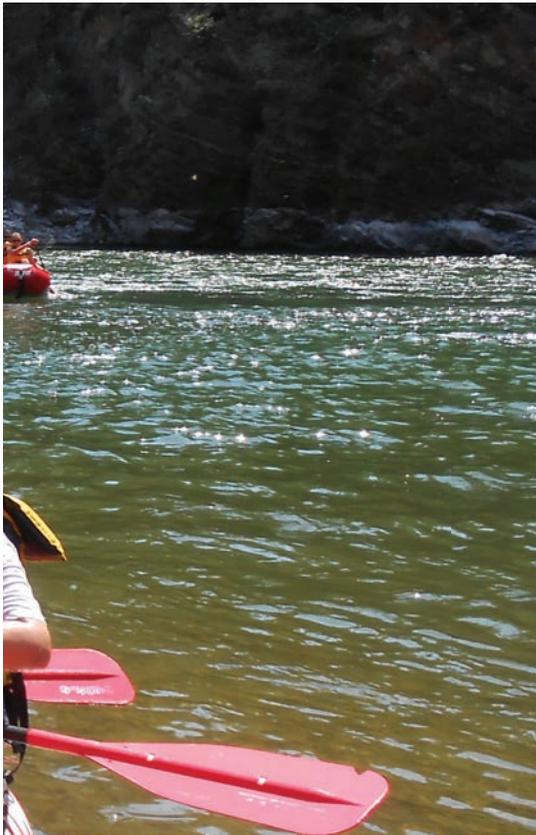
on streambanks. Our Volunteer Corps gathered on a beautiful afternoon in October to remove trash and recyclables from the Jacobs Island area in Missoula, one of the stretches of river that was hit pretty hard this summer. In all, 30 volunteers removed 20+ bags of debris from the Clark Fork in only two hours.

Big thanks to our friends at the Poverello Center for partnering on the inaugural Fall River Cleanup, and helping us to cart away all of the trash. Stay tuned to clarkfork.org for details on the spring Clark Fork Cleanup in April 2014!

Connecting kids & rivers:

Intro to the Clark Fork: Over 40 kids from area youth homes and shelters (plus some lucky adults) joined us for our 2013 Affinity Float, a great day of rafting and fun on the Alorton Gorge in July. For some of these kids it was their *first time ever* on the river, and a dream come true. Here's to the start of a lifetime of adventure on the Clark Fork!

Thank you to ROW Adventures, Community Bank, Equity Management, Inc., Hunter Bay



Coffee, Mountain States Truck Claims, Inc., Portfolio Logix, LLC, Western Montana Clinic, and generous CFC members and supporters for making this day possible.

Little Hands, Big Results: Take a dozen first-graders, add shovels, dirt, native shrubs, clean water, and blue skies and you've got a lot of smiling faces and a healthier creek to boot.

Thanks to our partners at the Montana Natural History Center, and the Missoula Water Quality District for allowing



us to plug in some kid power to help implement part of the city's riparian restoration plan in the Lower Miller Creek area.

A New Kind of Ranch Hand: Students at Powell County High School gained some serious river smarts this spring and summer through our Hands on the Ranch program. Not only did they learn how to conduct a riparian stream assessment, they also created and implemented their own restoration plans for local ranchland creeks. We also hired one HoR graduate as an intern on our ranch this summer to care for the HoR riparian plantings and monitor the restoration projects. We can't wait to see how these creeks improve in 5-10 years. Thanks PCHS!

Watershed 101: Nearly 200 sixth-graders joined us in September for a full-day immersion in riparian and river health at our 2013 Kids River Expo in Missoula. Kids learned about bull trout, macroinvertebrates, and riparian wildlife; pulled weeds and cleaned up the river; and lugged buckets in a relay to learn just how much energy it takes to provide water to our homes.

Many thanks to our generous station leaders: Westslope Chapter of Trout Unlimited, Missoula County Water Quality District, Montana Fish, Wildlife, and Parks, Montana Audubon, and Missoula County Weed District & Extension; as well as our awesome supporters: Mountain Water Company, Montana Department of Environmental Quality, and the Dennis & Phyllis Washington Foundation.

The Hidden Life of Water: Ever wonder what's really happening when you turn on the tap or flush the toilet? This year, we partnered with Montana Audubon and Mountain Water Company to produce a multimedia learning video called *The Hidden Life of Water*, showcasing Missoula's drinking water and wastewater systems. Geared toward sixth-graders, the video utilizes interviews, song, and animation to help students understand the value of clean water and conservation. Check it out at clarkfork.org. ↓

WHY I GIVE

*Peter Grubb, Founder,
ROW Adventures*

A critical part of our culture at ROW is giving back to our local communities and the resources where we operate. The Clark Fork Coalition's annual Affinity Float is the perfect marriage of both! Naturally we are committed to healthy, free-flowing rivers. We find our purpose when we share the resource with others and create advocates for its protection.

We are so pleased to see these local youth, who would not likely otherwise be able to raft the river, get out and share a day of fun, laughter and learning in their own backyard. We are very appreciative of this opportunity to give back and support the Clark Fork Coalition while also providing a life-changing experience for our young people who will be the river's future advocates.



Thanks for your support, Peter!

Find out how your business can support clean water. Contact Jill at 542-0539 x 206 or jill@clarkfork.org.

WHERE'S THE WATER?



Diminishing Returns

The summer of 2013 was a tough one for the Clark Fork watershed. And you didn't have to look hard for proof. Skinny, bony rivers. Dry, exposed creek beds. Bleached rocks. Belly-up trout. Dried up ditches. Bathtub-ringed reservoirs.

It was yet another year of low flows in western Montana, hitting the Clark Fork basin particularly hard. We've seen this trend for several decades now, but this year brought the issue home with an especially bleak clarity.

At Buckhouse Bridge near Missoula, the Bitterroot River measured in with its lowest flows on record (dating back 30 years), setting records every day for weeks on end. In response to sustained high water temperatures and low flow, state agencies put mandatory fishing restrictions in place on the Bitterroot, Clark Fork, and Blackfoot Rivers. Tributaries like Lost Horse Creek in the Bitterroot were nearly dry, and lower Lolo Creek was drained completely when the Lolo Complex Fire blew up and firefight-

ers and homeowners needed more water than the already-depleted creek could deliver. The result was a river of rock and a widespread fish kill.

The Bitterroot reached record-low flows in 2013 and lower Lolo Creek ran completely dry.

In the Upper Clark Fork conditions were only slightly better, with extremely low, though not record-setting flows. The impacts were still significant, however. In the Deer Lodge Valley, many ranches (including the Coalition-managed working ranch near Galen—see page 16), had to buy supplemental hay because the water simply wasn't there to support a healthy second season cutting — an expensive proposition when supplies

are short and prices are soaring.

Was 2013 just a bad year? Or is this the new normal?

It's likely a little of both. Several factors, both chronic and acute, combined to create a particularly low water year, especially in the Upper Clark Fork and Bitterroot valleys. The main culprits are, by now, grimly familiar: decreased snowpack, early runoff, lower-than-average precipitation, record-setting heat, and over-allocation of water supplies.

Each factor plays a role, and our watershed could probably withstand any one stressor in isolation. But in combination, and given that each has been increasing in intensity over the last decades, our rivers are facing some extremely tough times. Dry creek beds and dead fish tell a big part of the story — the data reveal the rest. What's behind this record-setting summer?

→ **Less snowpack; earlier runoff:** Data compiled by the Natural Resources and Conservation Service in early June



Bone Dry

Heat, fire, and irrigation took a toll this year on Lolo Creek in the Bitterroot. Lower stretches of the creek remained dry through September.

Photo credit: Jeff Gersh, NarrativeLab, Inc.

confirmed what many already suspected: those above-normal temps in May caused early snowmelt, loss of snowpack, and early peak flows in rivers and streams. As a result, snowpack in the Bitterroot basin, already running about 85% of normal, dropped precipitously to only 38% of normal by June 1st. The Upper Clark Fork fared better, but was still only at 72% of normal at the beginning of June. This summer's subsequent low flows were no surprise.

These conditions are not an aberration. Annual snowfall in the Clark Fork watershed has been decreasing in most drainages for decades. In Missoula, for example, annual average snowfall has dropped from nearly 52 inches in the middle of last century, to an annual average of around 40 inches over the last 22 years (see graph next page). Given that "normal" comparison ranges are often calculated for periods of 20-30 years prior to current dates, we are literally watching a "new normal" emerge in the watershed.

→ **Hotter Summers:** It's starting to

sound awfully familiar: "This year was one of the hottest on record." You can add 2013 to the list. As of the end of August, Missoula had 36 days above 90 degrees, tying it with 2006 for seventh place over the last 120 years. The summer of 2012 also made the top ten. We also set a record in 2013 for warmest temperatures in July and August: Missoula averaged nearly 72 degrees for those months, making it the second warmest summer on record - right between 2007 and 2003. In fact, the last decade is quite well represented in the weather books, with a pack of summers since 2000 crowding the list of record-setters. Whether this is a short-term trend or what we can expect for the long haul, the immediate impacts are the same, and our water resources are paying the price.

→ **Over-allocation:** From supplying taps in Missoula to irrigating crops in Deer Lodge, our rivers and streams are being asked to do more and more as our numbers increase. In fact, many drainages across the

watershed are over-allocated, meaning surface water rights actually exceed available water supply. Between 2000 and 2010, western Montana's population grew by about 10 percent overall, with some counties increasing by as much as 22 percent. It's not just drought or over-irrigation that impacts our rivers. Flow can decrease from the sheer cumulative impact of so many "straws" sipping from the same aquifer.

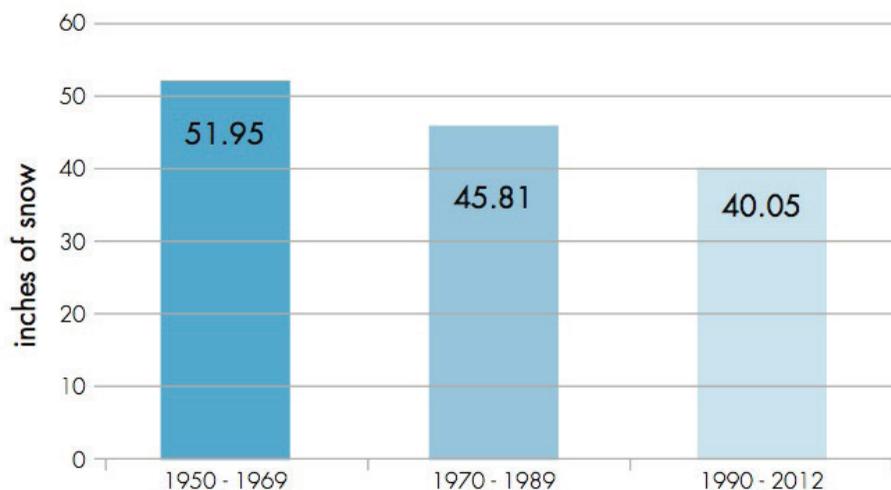
→ **Less Rainfall in 2013:** According to the National Weather Service, as of the end of August, precipitation for the 2013 calendar year was only about 60% of normal in the lower Bitterroot Valley and Missoula (based on 30-year averages). Montana is typically dry in August and September, but reduce by 35-45% and rivers surely suffer.

Implications for Natural Systems

We know it's hot and far too dry. We know a bit about why. But what's going on beneath

Low Snow = Low Flow

Missoula Average Snowfall Comparison



the surface when our rivers run low?

A tough water year like 2013 is extremely hard on fish and aquatic life, especially natives like westslope cutthroat and bull trout, which evolved in cold water environments. Lower water volume and warmer air increase creek temperatures, concentrate pollution, cause algae blooms, and lower dissolved oxygen – a lethal combination for native species. Fish can sometimes survive these conditions by retreating to smaller, cooler tributaries, but even here they face challenges. If small feeder creeks and streams are compromised, dewatered, polluted, or choked with silt, native fish can lose their refuge of last resort. Fish are also impacted when too-low streams become disconnected from mainstem rivers, or dwindle to trickles and hot stagnant pools. This not only leads to fish kills, but also prevents migration and reduces spawning success.

In the long-term such conditions threaten species survival, as non-natives, like rainbow and brown trout, are more temperature tolerant and adapt better to changing conditions. This is evident around the basin,

as some former native fish strongholds, including the famed Rock Creek, are now more heavily populated with rainbows and browns compared to just a few decades ago. The prognosis for our natives is sobering: scientists estimate that nearly 42% of trout and salmon habitat in the Rocky Mountains could be lost by the end of the century due to deteriorating conditions related to warming.

It Doesn't Just Hurt Fish

The impact of low flows goes beyond our rivers, touching everyone from irrigators and ranchers, to anglers and boaters, to guides and recreation retailers, to anyone whose livelihood depends on Montana's iconic and alluring waters.

For example, the Bitterroot, Blackfoot, and portions of the Clark Fork were all closed to fishing at various times this summer, resulting in a direct hit on guides and outfitters.

"Low flows have limited my choices of where I can fish," explains Eddie Olwell, of Fishs Eddy O. "With the combination of hoot owl restrictions and warmer temps, the fishing

was either no good or not allowed." It's hard to make a living when your "office" is either

Nearly 42% of trout and salmon habitat in the Rocky Mountains could be lost by the end of the century due to warming.

closed, compromised, or simply a place people choose not to visit.

When guides and outfitters can't work, and when rivers are closed or fishing and boating is poor, the local economy takes a hit too. Out-of-state anglers, rafters, and tourists may opt to visit different locales to fish and recreate, or alter plans, posing challenges to business planning. With tourism generating roughly one in five private sector jobs in Missoula County, chronically depleted rivers, fish kills, and a decline in the native trout fishery could



have a big impact.

"Low flows are changing the ways people book their vacations," says Olwell. He has been able to adjust to accommodate more people coming in spring and fall instead of summer, but that shift can be difficult for seasonal businesses.

The economic impact of low flows is not just a short-term problem. A survey of real estate brokers in the Colorado River basin estimated that a 20 percent decline in streamflows would cut riverfront property prices by an average of 9.5 percent, and river-view property values by 5.7 percent. Similar declines in property values in the

Clark Fork basin could affect home sales, tax revenues, and the quality of public services.

Doing Something About It

Bad year? New normal? Given the on-the-ground impacts, it's time to stop asking and start acting. Read on to learn about the promising work the Coalition is doing across the basin with partners, landowners, and others to address one of the biggest challenges facing the Clark Fork watershed. ↓



WHY I GIVE

*Morgan Hollis, Owner,
Boom Swagger Salon*

We were tremendously excited to give a portion of our salon's proceeds to the Clark Fork Coalition as part of the Aveda Earth Month corporate partnership in 2013.

One of Aveda's main goals is clean water for people and wildlife across the world. The Coalition's work is extremely important to everyone at our local salon because we all love to enjoy our local rivers and the outdoors, in and around Missoula. As a small business in Missoula, we're also very aware of how important community involvement and support can be.

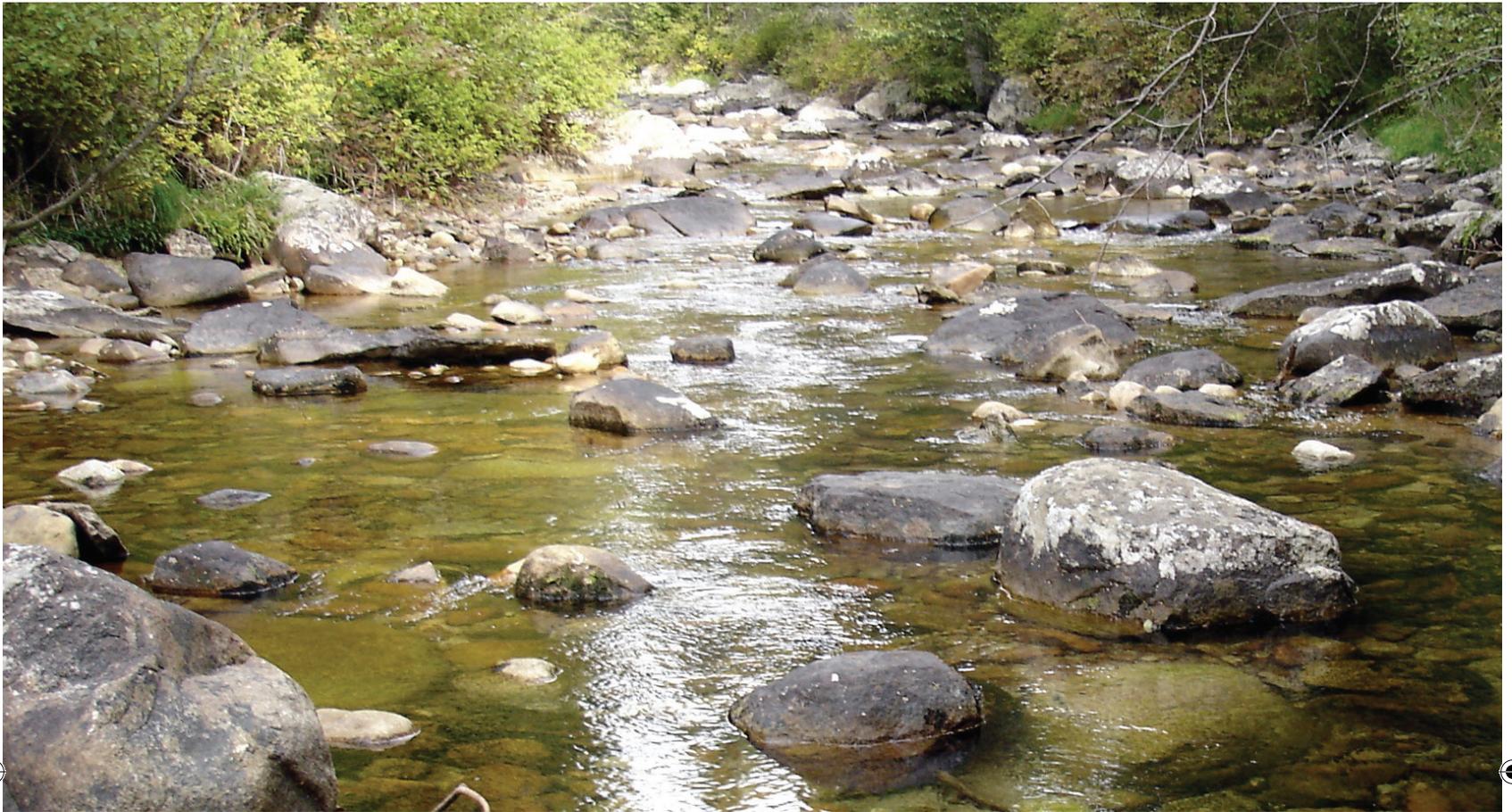


Many thanks to Morgan and all participating Aveda salons for their contributions in 2013!

← **Wanted: Restored flow**

Low flows in the Clark Fork basin this summer didn't just impact fish: irrigators, boaters, anglers, and river enthusiasts were often left high and dry as well.





Fixing the Flow Problem

It's impossible to know the exact course of climate-related changes that are coming to our watershed. But by focusing effort and resources on re-watering, rehabilitating, and reconnecting our rivers, creeks, and streams, we can create a healthy physical environment that is resilient to external shocks, such as the dry summers of recent years.

The good news is that the tools do exist. And as we're discovering through diverse project partnerships, they can be integrated in innovative ways to keep water in-stream for fish, wildlife, recreation, and aesthetics, while meeting growing demands for out-of-stream uses that enrich local economies.

An essential first step to creating these win-win solutions is to get a clear picture of the problem and identify the greatest needs and opportunities for impact. Montana Fish Wildlife and Parks (FWP) estimates that roughly 900 miles of tributaries in the Clark Fork watershed are either chronically or periodically dewatered. A dewatered stream is defined as one that is reduced

to the point that it can no longer support fish. (If it's chronic, that means the stream is dewatered in virtually all years; if it's periodic, it's dewatered only in low water or drought years.)

Using data from FWP and other state and federal agencies, the Coalition and its partners have identified high-priority tributaries and drainages in the basin where restoration investments will deliver the biggest environmental gains. It turns out that the majority of these streams run through landscapes held in private ownership. For

There are many more streams in need than there are resources currently available to help them, but we're making progress.

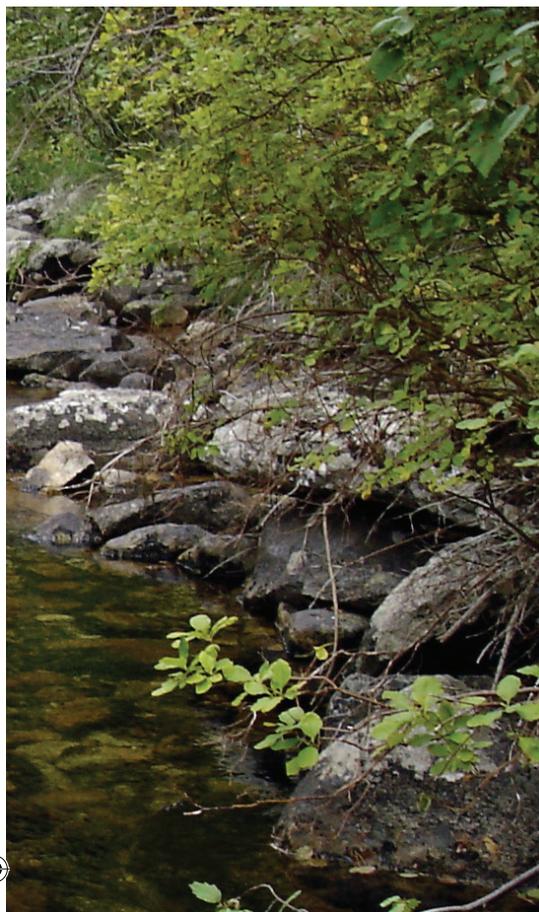
that reason we emphasize careful planning, collaboration, and smart management to ensure water is plentiful for both people and the environment. Here we spotlight some of the tools we use to maintain that critical balance.

Leasing Water

Like other western states, Montana's water law has a "use it or lose it" restriction. So if ranchers and other water users do not put all their allocated water to beneficial use over time, they lose the right to it. Fortunately, a law written almost a decade ago gives landowners another option: they can now lease their agricultural water rights to a nonprofit group like the Clark Fork Coalition or Trout Unlimited, or to FWP to maintain higher flows for fisheries.

With water leases everyone comes out ahead: the rancher maintains ownership of the water right, retains seniority, and can be compensated for water not used. Plus, it's all voluntary. As for the stream, a well-timed water lease during a hot, dry summer can





make the difference between a fish-filled, wet, and connected waterway, or a creek that's degraded, dried up, and done.

Through our flow restoration program the Coalition manages more than 35 instream flow agreements with irrigators in the Bitterroot, Nine Mile, and Upper Clark Fork. Together with our project partners, we have returned nearly 25 billion gallons of water to chronically and periodically dewatered streams in the Clark Fork basin over the last decade (see graph next page). And with our current contract agreements we will add another 4.6 billion gallons next year (pending funding), bringing our total to nearly 30 billion gallons conserved since 2003. That's enough to fill almost 45,000 Olympic-sized swimming pools. Distribute those savings across the watershed and both fish and people come out winners.

Another benefit of instream flow agreements is the speed with which they can make a difference. Impacts can be immediate and dramatic, literally bringing a creek back to life when flows are dangerously low. For example, in June of this year, Cottonwood Creek in the Deer Lodge Valley was experiencing

extremely low flows and the creek was becoming a series of disconnected pools. In mid-July, a special "split season diversion reduction agreement" kicked in, and a landowner reduced the amount of water he was diverting and stopped irrigating one pasture. As a result, nearly 1,100 gallons per minute of water was returned to the stream by July, reconnecting those pools and reviving the creek.

Conserving Water

Agreements like the one on Cottonwood Creek don't just happen overnight. In that case the Deer Lodge-based Watershed Restoration Coalition, with technical support from the Coalition, had been working with the water right holders for several years to improve irrigation efficiencies on their ranch. Because of those efforts, less water was needed to water crops, making it possible for this family to reduce their diversion during hot and dry summer months. (See related story, p. 14.)

Of course, each rancher has his or her own specific circumstances and needs, so no two projects are alike, and a wide range of tools are available to help ranchers conserve water. For example, sometimes the Coalition secures funds to modernize irrigation infrastructure, so a ranch has water to spare. Other times it's a matter of pulling landowners together to share headgates, so more water stays in the stream. Additional techniques described below include lining or piping ditches, upgrading water diversions, and converting from flood irrigation to pivot systems.

→ **Lining or piping ditches:** Open irrigation ditches lose water through evaporation and seepage as they cross miles of rangeland to carry water from stream to pasture. Ditches also tend to be inefficient due to the difficulties of precisely regulating flow to ensure the amount of water diverted does not exceed how much is actually needed. Enclosing ditches or piping diverted water not only prevents evaporation and reduces water loss from seepage, it can also regulate flow so that the amount of water in the pipes does not exceed what the crops require. This ensures there's plenty of water to irrigate while also preventing waste.

→ **Upgrading water diversions:** Water diversions are exposed to sometimes extreme conditions, particularly during spring runoff when high water, carrying logs,

rocks, and other debris, can cause significant damage to in-stream structures. Upgraded diversions that include bank stabilization and engineered water features can calm or direct flow during high water events, saving time and money by preventing damage to infrastructure. They also reduce flood-related degradation of streambanks, help avoid damage to creekside roads, prevent incised channels, reduce siltation, and keep debris from clogging diversion pipes.

In the end, more water stays in the creek, ranchers save time on repairs and maintenance and gain greater control over when, where, and how much water is diverted into irrigation systems, and the creek system is healthier. A related benefit of upgraded diversions is that they help prevent fish from accidentally swimming into ditches or pipes, and provide ways for fish to bypass the diversion during spawning season, preserving critical migration pathways.

→ **Converting from flood to pivot irrigation:** Flood irrigation is the process of watering fields by diverting flow from a creek into a series of ditches running alongside and through ranchlands. By blocking flow with tarps, ranchers can specify which ditches overflow onto which fields. Experienced ranchers can be highly skilled at this process, though it is extremely labor-intensive. It can also lead to over-watering, as streamflows fluctuate and ranchers have limited tools to regulate how much water is being used. Even though too much water can actually lower crop production, often ranchers find it safer to err on the side of caution and apply all the water they can. Flood irrigation can benefit the aquifer through recharge, but in chronically de-watered creeks, fish survival and stream viability are often improved when that excess water is left instream. Converting from flood irrigation to more efficient pivot irrigation saves water, as pipes can limit the amount of water being diverted to match pivot capacity, and water can be applied more precisely. It also saves time, as it does not require maintaining miles of ditches, adjusting tarps by hand, or managing flow on a daily basis to adjust to changes in creek levels.

A good place to see these techniques in action is the Deer Lodge Valley. On the McQueary Ranch, for example, new wells and stock water tanks have largely replaced a 1.3-mile long ditch that diverted water from the creek to water cattle. Previously the



FUNDING FLOW

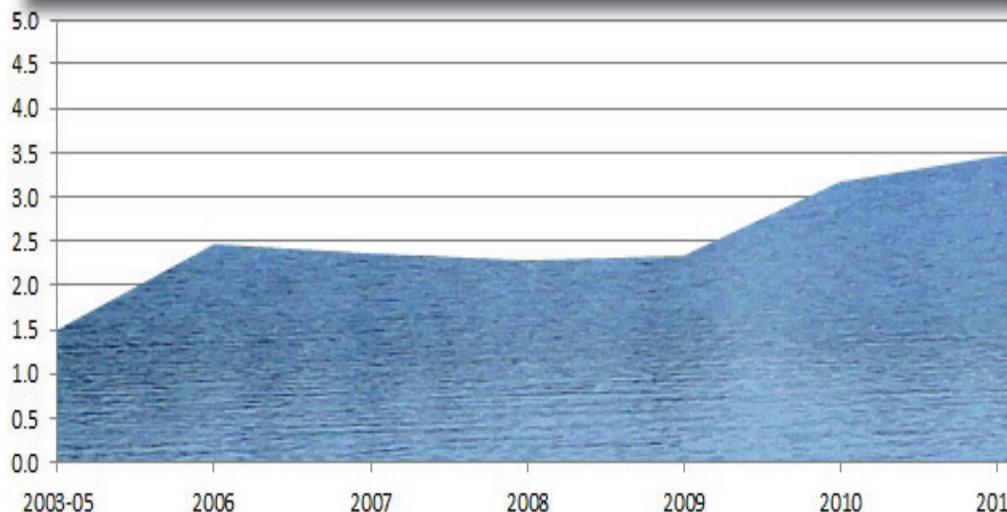
Footing the bill to restore streamflow to creeks and streams is truly a watershed-wide, collaborative effort. One key player is the Columbia Basin Water Transactions Program (CBWTP), a project of the National Fish and Wildlife Foundation that utilizes funds paid by the Bonneville Power Administration to mitigate for its dams in the Columbia basin. CBWTP funds are directed toward streams in need throughout the headwaters of the Columbia River, including in Idaho, Montana, Oregon, and Washington (the Clark Fork River is one of the largest tributaries of the Columbia). The program also provides funding for the incentives paid to water rights holders to compensate for voluntary reduction in water use.

But CBWTP doesn't cover it all. Government agencies such as the USDA Natural Resource Conservation Service, U.S. Fish and Wildlife Service, Montana Fish, Wildlife and Parks, and the Montana Natural Resource Damage Program also provide funding, especially for the irrigation improvement and stream restoration projects that make flow restoration possible. Private foundations, other water conservation and watershed groups, and contributions from private donors also provide critically important funding.

Restoring streamflow requires considerable resources, but it's a wise investment that provides long-term gains for the watershed. If you'd like to contribute to CFC's flow restoration program, use the enclosed envelope or donate online at clarkfork.org.

Restoring Flow to the Clark Fork Watershed

Water conserved through instream flow agreements and acquisitions 2003-2014



creek ran dry in winter due to this diversion. But now more than 1,300 gallons per minute will be left in the creek between October and March, and the cows will still have all the water they need – and then some. On the Applegate Ranch a new diversion, fish screen, pipe, and pivot irrigation system is not only saving water, improving yields, and helping the creek, it has also reduced the need for maintenance of the diversion from once a day to only once every two weeks (see related story, page 14).

In 2014 the Coalition will begin a large water conservation project on the chronically dewatered Lost Horse Creek, south of Hamilton in the Bitterroot Valley. Working with Ward Irrigation District, we will replace a seasonal dam that the District uses to convey water from its irrigation canal alongside the Bitterroot River with a siphon to transport flow beneath the creek.

Removing the seasonal dam will eliminate a major fish barrier and improve water temperature and quality. And because the new system will be far more efficient, the District will be able to leave up to 10 cfs (nearly 4,500 gallons per minute) in the

creek below the point of the diversion. That means that instead of perennially running dry in its last half mile, Lost Horse Creek will be reconnected with the Bitterroot River. Bull trout and westslope cutthroat trout will once again be able to migrate up the creek, and water temperature and quality will improve in the Bitterroot, as more water will reach the river.

Amplifying the gains

Moving more water into the system is a critical first step in the work to return our dewatered streams to health and vitality. However, a stream suffering low flows often faces other challenges, as well, including degraded riparian habitats, disconnected floodplains, sediment loading, and channelization. These compounding problems make it difficult for flow projects to achieve their full potential.

That's why the Coalition augments its flow restoration work with a larger watershed restoration effort that includes riparian rehabilitation, fish migration improvement, and habitat management practices. It is only through this bundled, integrated approach





Since 2003 the Coalition and its partners have restored nearly 25 billion gallons of water to thirsty creeks, with 3.8 billion gallons conserved in 2013 alone. We'll add another 4.6 billion gallons in 2014, pending funding.

that the true conservation and social value of restoration can be realized.

Right now the Coalition is complementing its flow projects with a number of activities, including rebuilding and stabilizing streambanks, re-grading incised channels, restoring and planting riparian vegetation, installing riparian fencing for livestock management, removing weeds, increasing shade cover, reconnecting creeks to their floodplains, replacing culverts, improving bridges and creekside roads, and others. Along with enhancing flow, these projects lower water temperature, reduce siltation, restore connectivity, enhance fish habitat, increase spawning success, improve water quality, and prevent erosion, even in high water years.

A big plus of these techniques is that many of them can be applied virtually anywhere, and at any scale. And some, like weed removal and riparian plantings, can be implemented by anyone from young children to seniors. That's important because so many of the Clark Fork's 28,000 miles of tributaries flow through private property, and each contributes to the overall health of the

watershed. The Coalition has implemented hundreds of such projects during the last 28 years, engaging community groups, students, ranchers, and other partners across the watershed in simple, hands-on projects to improve the health of our creeks and streams.

Moving Forward

Low flows impact all of us and pose a significant threat to the health and vitality of the Clark Fork watershed. By approaching the problem in a holistic way - drainage by drainage, creek by creek, partner by partner - the results will stack up. And in concert with other complementary projects in the Clark Fork basin, such as large-scale pollution cleanup and implementation of forward-thinking water policies, together we will ensure our creeks and rivers have cool, clean, and plentiful water, and that our watershed is healthy, whole, and resilient for generations to come. ↓



CHECKING THE VITAL SIGNS

With water leases comes a legal requirement to monitor affected streams and ensure that instream flow goals are being met. Monitoring can also help detect problems as they occur, making it possible to intervene before flows are critically depleted.

Coalition staff scientists, field techs, and interns log hundreds of miles monitoring dozens of sites on streams across the basin each summer. Each site is monitored twice-monthly during the field season and entails photo documentation, as well as recording flow, temperature, and water depth at designated points in the stream. (It can also entail swarming bugs, leaky waders, some nasty bruises, and the occasional charging bull. Who says data collection is dull?)

At one monitoring site the Coalition collects data via telemetry, allowing staff to track stream health in real time, saving considerable time and resources compared to manual monitoring. The Coalition is currently seeking funding to install more telemetry monitoring stations in 2014, which will both increase efficiency, and eventually allow us to pass along up-to-the-minute stream data to the public via our website.



Mike Applegate points to healthy green pasture on his ranch in August. Using smart water management practices, he was able to turn off the diversion he usually uses to water this area, leaving much-needed water in the creek during an especially dry year.

Saving more than water on Cottonwood Creek

Mike Applegate has an excellent hay crop this year, more free time, and a lot fewer headaches now that he's not spending his summers patching a leaky ditch and irrigation diversion. Dan McQueary has stock tanks filled with plentiful, cool water and the peace of mind knowing he won't be chopping ice out of ditches this winter. And somewhere in the watershed a native westslope cutthroat trout has the opportunity to head up Cottonwood Creek to spawn this coming spring, less impeded by dams, diversions, or a dry creek that's cut off from the Clark Fork.

There are some good things happening for both ranchers and fish in the Upper Clark Fork these days, thanks to the commitment, vision, and just good, smart planning by the Deer Lodge-based Watershed Restoration Coalition (WRC). A long-time Coalition partner, the WRC is a watershed group that focuses on restoring natural resources and protecting agricultural lands in the Upper Clark Fork basin. It's a collaborative effort, run by a board made

up of landowners, conservation district supervisors, a county commissioner, and a Coalition representative.

In 2012 the WRC completed its "Watershed Restoration Plan for the Upper Clark Fork River Tributaries," focusing on 11 key tributaries. Cottonwood Creek (the upper reaches of which provide habitat for genetically pure westslope cutthroat trout), emerged as a top priority in that plan. It has also been identified as a priority for restoration by the Beaverhead-Deerlodge National Forest and Montana Fish Wildlife

There are good things happening for both ranchers and fish in the Upper Clark Fork these days.

and Parks.

To address creek conditions such as high stream temperatures, de-watering, lack of fish passage, and degradation of riparian habitat and water quality, the WRC, working with willing landowners, designed a series of projects on key private lands to improve conditions in the creek. With funding from the USDA Natural Resource Conservation Service, Montana Natural Resource Damage Program, the National Fish and Wildlife Foundation, and WRC, along with technical support from the Clark Fork Coalition, in-kind contributions from Trout Unlimited, local contractors, and landowners and families, the work is moving forward and the benefits are stacking up.

On Mike Applegate's ranch, the installation of three new pivot sprinklers, along with a new concrete diversion, a combination fish passage and debris screen, and a 1.7-mile long gravity pipeline, allows for some 2,200 gallons of water per minute to remain in the creek. These upgrades also

prevent water loss from the diversion, save energy (gravity flow reduces the need for pumps), and assure Mike has enough water to support a plentiful hay crop and green pasture – all with less effort. A 15-inch pipeline delivers exactly enough water to match pivot capacity, preventing over-irrigating. "It was well worth the time and money to do it," says Mike.

He also signed on to a split-season agreement under which he turns off his second diversion between July 15 and September 15. This means the upstream water savings make it further downstream, keeping the creek cool, and allowing water to reach and recharge the Clark Fork. Through smart water management he was able to forego using this diversion in the summer, and as of late August he could graze his cattle on still-green pasture. As Mike succinctly puts it: "In a year like this, that's pretty good."

Meanwhile on Dan McQueary's property, cattle can drink from new, trample-proof, insulated, pump-controlled, pipeline-fed, self-draining, winterized, geothermal, recycled-tire stock tanks. That list of features is brought to you by Dan himself, who designed the system to minimize maintenance, prevent freezing, withstand wear and tear, and save energy. With a new, 15-gallon/minute well, installed thanks to WRC, "you can water all the cows you want," explains Dan. And because the water is piped underground, it stays cooler in summer (he's seen cows walk a half mile to use the tank instead of the creek), and warm enough in winter to inhibit freezing. The below-ground system is also durable and cost-effective. "I never had to fence it. The cows trampled all over it and never hurt nothing."

Dan has more water to work with now, but he can also use less because of built-in design efficiencies. A simple pump and float system in each of the nine stock tanks connected to the well refills water as it's used, providing no more, and no less than what the cows need. Previously Dan used his full 3 cfs water right (about 1,350 gallons/minute) to water his cows, which often left the creek completely dry in winter. It also meant a lot of time clearing ice to keep water flowing during colder months.

Because the new system gives him a reliable and economical year-round livestock water supply, he was able to sign an agreement to forego diverting water from the creek

between October and March. That leaves plenty of water in the creek for fish, who need adequate flow and deep pools to survive the winter. "[The system] paid for itself this year," he explains, adding that

Improvements on rancher Mike Applegate's property allow for 2,200 gallons per minute to remain in the creek.

he also won't miss chopping ice when it's 20-below come next February.

In a basin with potentially limitless demand on a very limited river system, Deer Lodge Valley ranchers, with the help of the WRC, are making it work. Excellent hay production, green pasture, brim-full stock tanks, and a cooler, perennially flowing creek - all in a year of minimal snowpack, low flow and little rain - are pretty solid proof that their strategies are working. As Dan McQueary says, "it's the only way to go." ↓



Dan McQueary explains the insulated pipe system he designed as part of an upgraded stock water system on his ranch that conserves more than 1,300 gallons per minute in Cottonwood Creek.



Wild Ride at Dry Cottonwood Creek Ranch

The Coalition and its partners purchased Dry Cottonwood Creek Ranch (DCCR) in the Upper Clark Fork valley in 2005 as a learning site in one of the most important restoration areas in the watershed. Our goal is to experiment with and share information about how to pursue restoration, conservation, and mine waste cleanup on a working ranch in a way that does not compromise agricultural operations, and ideally, improves the bottom line. We've learned a lot in these eight years, encountering some tough challenges as well as exciting opportunities. The summer of 2013 provided plenty of each.

The long reach of low flows

The exceptionally dry summer of 2013 gave us a good look at the impacts of low flows on cattle operations in the Upper Clark Fork valley. By the end of July our irrigation ditch was dry, and we didn't want to pull more water out of an already-stressed river. This meant our second cutting of hay came up short. Further, this year's low snowpack meant less grass in the pastures where DCCR cattle range at the end of summer, requiring earlier supplementation with hay.

So, like many ranches in the valley, we'll face a one-two punch on the balance sheet this year: a reduced second cutting, leaving us with less hay, and the need for more hay than usual because of insufficient pasture. All in all we'll need to buy about 60 tons of hay in a year when demand is up, supplies are low, and prices are high.

Low flows also impacted operations in the upland pastures. There, a small creek we rely on to pipe water to stock tanks also ran dry by the end of July. We installed these tanks to keep cattle out of the creek, which protects riparian habitat, prevents degradation of streambanks, and helps maintain water quality. But without that water source, we had no choice but to open the gates to the upper stretches of Dry Cottonwood, giving livestock access to the creek.

Given our more frequent hot, dry summers, we'll need a more comprehensive solution on the ranch in order to keep that riparian habitat healthy and the creeks clean, while also meeting water needs for irrigation and livestock. In the years ahead we'll be pursuing both restoration and irrigation efficiency projects to improve water supply on the

ranch and will continue to share information and techniques with our Deer Lodge neighbors.

The importance of powerful partnerships

One of our goals at the ranch is to demonstrate how a successful cattle operation can be sustained while also maintaining healthy land and water resources and investing in conservation and restoration. That means finding ways to keep costs down, including pursuing affordable ways to get our grassfed beef to market.

In one of our biggest successes of the past year, we signed on as a partner in Montana's newest grassfed collaborative, Montana Meat Company, to market and sell our grassfed beef. In mid-August, ten steers from DCCR headed over to the Germann Ranch in the Madison Valley, where they'll be finished on grass right alongside steers from other Montana ranches to ensure consistency and quality of product. Montana Meat Co. will then take care of the rest of the job for us – butchering, marketing, and selling the meat to consumers.

This new partnership has been a huge positive for the ranch. In one year, we've already doubled our grassfed beef sales, and have saved time, money and resources. The savings make an especially tangible difference in tight years like this one.

The upcoming cleanup

In March 2013 Superfund cleanup began on the Upper Clark Fork, a hard-won, long-awaited project that will remove mining-related toxic sediments from the banks and floodplain of a 47-mile stretch of river, beginning with a state-owned parcel near Warm Springs. In 2014, our ranch will be the first private property to undergo cleanup – taking DCCR's role as a "learning site" to a whole new level.

The Clark Fork Superfund restoration project is unprecedented in scope or scale, and certainly unprecedented in the context of a working ranch. In preparation, we've

been negotiating with state and federal agencies on project specifics, and adjusting our watering, grazing, and livestock management strategies to ensure that the ranch reaches its monetary goals in spite of large-scale cleanup activities. Our plan is to minimize the hard knocks, learn from the ones we can't avoid, and make the whole thing as transparent as possible so our neighbors next in line will have good information and the benefit of our experience.

In 2014 we'll be ramping up our outreach to other Deer Lodge Valley ranchers and residents, hosting tours and discussions, and tracking the cleanup through pictures and data-gathering to thoroughly document the process.

Want to take a tour or learn more about Dry Cottonwood Creek Ranch? Contact us at info@clarkfork.org, or get in touch with Ranch Manager, Maggie Schmidt, at maggie@clarkfork.org. ↓



Superfund, super progress: As of early October, nearly 260,000 cubic yards of mine waste had been removed from the banks of the Clark Fork River in the Phase 1 cleanup zone near Galen (80% of total), and revegetation has begun. By this spring, 130,000 new plants will be installed, continuing the transformation of this stretch of river from contaminated slickens to a healthy, restored Clark Fork. Above, willows begin to take hold on a recently restored section of the Clark Fork River.

WHY I GIVE

*Dan Spencer, Assoc. Professor,
University of Montana*

As an Environmental Studies professor at the University of Montana, I work with a wide range of nonprofit groups. The Clark Fork Coalition is at the top of my list of favorite environmental organizations. In fact, the Coalition's work is so important to me that I give monthly through payroll deduction – I don't want to miss the opportunity to support their work on a regular basis.

The Clark Fork is the lifeblood of our region, and the Coalition has been critical to protecting its integrity and restoring its health. Every fall my "Ethical Issues in Ecological Restoration" graduate class partners with the Coalition on conservation projects at Dry Cottonwood Creek Ranch, and works with other ranchers across the Upper Clark Fork basin to restore the river. The Coalition's tireless and patient work is laying the foundation for a healthy river system for our children for years to come.

I am proud to play a part as a supporter and a program collaborator. I invite you to join me in supporting this vital work.



Many thanks to Dan and his students!



Water Watch:

Issues we're tracking around the watershed

Fish Advisory at Smurfit-Stone

In a disconcerting but not surprising development, state officials recently issued fish consumption advisories for northern pike and rainbow trout along a 105-mile stretch of the Clark Fork River from the Clark Fork's confluence with the Bitterroot River, near Missoula, to the confluence with the Flathead River, near Paradise. Health officials recommend a "do not eat" advisory for pike and a "four meal per month" limit for rainbow trout along this stretch of river. Highly toxic and carcinogenic dioxins, furans, and PCBs - contaminants commonly associated with the pulp and paper mill industry - were recently found in fish below the former Smurfit-Stone paper mill, triggering the advisories. Dioxins and furans have already been found in the mill's sludge ponds, groundwater, and river sediments.

The Coalition strongly supports Superfund listing for the site as the best way to ensure thorough, safe, and timely cleanup. This summer, many Coalition members sent letters to the Environmental Protection Agency (EPA) requesting such designation (thank you!), though EPA will not make a decision before next spring. In the meantime EPA is meeting with the "Potentially Responsible Parties:" paper giants Rock-Tenn and International Paper, and current owner M2Green. We're keeping a very close eye on this one -- look for updates on this critical issue on our website and in our e-blasts.



↑ **Clark Fork River near Frenchtown:** State officials issued fish consumption advisories on 105 miles of the Clark Fork River.

How would you manage Montana's water?

In western Montana we depend on our rivers for recreation, irrigation, drinking water, aesthetics, and so much more. Fortunately, the State of Montana recognizes its responsibility to protect our irreplaceable waterways, and in 2009 the Montana Legislature directed the Department of Natural Resources and Conservation (DNRC) to update Montana's State Water Plan.

As part of this process, DNRC formed Basin Advisory Councils across the state to find out what water resource issues matter most to citizens, using a series of public scoping meetings. Individuals had the opportunity to share their concerns and ideas to help shape the new version of the State Water Plan. The Clark Fork basin public meetings took place in October, but you can still weigh in using an online survey to share ideas and opinions. Visit The River Blog at clarkfork.org to learn more.

Mountain Water Company

The question of who should own Missoula's drinking water sparked to life again this fall when the City Council approved Mayor John Engen's request to negotiate the purchase of Mountain Water Company from the Carlyle Group. As Currents readers recall, two years ago the Montana Public Service Commission approved the sale of Mountain Water to the multi-national investment giant. CFC supported the sale because Carlyle agreed to protections for Rattlesnake Creek and the Missoula aquifer, and gave the City an option to purchase the company in the future.

CFC supports public ownership of the water system to eliminate the risk of a "revolving door" of buyers and to ensure local citizens determine how their water is managed and delivered. We'll keep you posted about this important issue through our website, blog, and e-blasts.

Plugging the leaks

A loophole in Montana water law allows developers to drill as many wells as they want, regardless of groundwater levels, the rights of senior water users, or dewatering risks. These "exempt wells" result in over-pumping of groundwater that is detrimental to rivers and streams. Four years ago CFC and four other senior water rights holders asked the MT Department of Natural Resources and Conservation (DNRC) to invalidate the exempt well rule – a process which it recently set in motion.

A bill in the 2013 legislature attempted to block any new rulemaking, but was fortunately vetoed by Governor Bullock, so DNRC is moving forward with the process. It's a much-needed change and we're working on multiple fronts to make sure it happens.

We will be watching this issue closely in 2014 – stay tuned.



The Compact: An Irrigator's Perspective

Harley and Sharon Coleman with extended family. (Harley: top row, 4th from right)

The Confederated Salish and Kootenai Tribes Water Rights Compact was defeated by the Montana Legislature in February, leaving hundreds of water rights both on and off the Flathead Reservation in limbo. The Coalition continues to monitor developments. In the meantime, we sat down with Harley Coleman, a third-generation Flathead Valley rancher, to get an irrigator's take on the issue. Below is an excerpt of that discussion.

Why do you support the Compact?

HC: *I wavered on it a bit, but when I looked hard and saw all the benefits, I decided to come out in support. From my own personal perspective, the Compact takes the unknown and makes it known. At our ranch, we need to know what water we have and what water we don't have so that we can operate.*

Another safety factor is that it is a three-way deal between the state, the federal government and the tribe. No one entity can change the compact. It protects all existing uses, from irrigation water to municipal water uses.

From my own personal perspective, the Compact takes the unknown and makes it known.

-Harley Coleman

How would your operation be impacted with the Compact in place vs without it?

HC: *We are definitely going to have more water with the Compact in place. And, we're going to get a lot of money for repairs and irrigation efficiency projects. Those repairs will then give us more water, [meaning] we'll lose less water to evaporation, waste, and to underground. If we don't have a Compact, the irrigators will have to put up money for [these] projects.*

The unknown is what is worrisome to me. Without the Compact, there will be a cloud hanging over our family land. What will our land be worth? What will we do with less water? How many cows will we be able to run, what crops we will be able to raise? With the Compact those questions are answered and we can continue to farm as we always have.

**See the full interview
at clarkfork.org.**

WAYS TO GIVE

Whether you're an outfitter, business owner, educator, or someone who just can't get enough of our gorgeous rivers, there are lots of ways to support clean water. Become a member, gift a membership to a friend, name the Coalition as a beneficiary in an insurance policy, make a special year-end contribution, sponsor a friend at our holiday party – the options are almost as limitless as our gratitude! Use the enclosed card or visit clarkfork.org today. Thank you!

More benefits of protecting clean water

When you donate to the Coalition you help keep our rivers and streams clean, flowing, and protected. That's a smart investment and a great feeling. Did you know you can add to that investment, plus receive additional benefits?

Here's how:

Make a planned gift to CFC's **Clean Water Endowment** and receive a tax credit of 40% of the charitable portion of your gift. Montana is one of only four states that offer this unique credit. It's easy to do – give us a call and we'll tell you how!

If you're 70 ½ or older, use the **IRA Charitable Rollover** to transfer assets to the Coalition and avoid taxes on this year's distribution, plus reduce estate taxes later. This opportunity expires December 31, so talk to your financial planner today!





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Coalition staff, friends, and board (past and present) on the Milltown overlook in August 2013, celebrating the restored confluence of the Clark Fork and Blackfoot Rivers.

The headwaters are healing, the confluence is free-flowing, and cleanup in the upper river has finally begun. Join us in writing the next chapter!

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