As winter gives way to spring, our thoughts turn from the mountains to the rivers. We watch the remaining snow melt and listen to the early burbles of the rivers as they awaken. As skis are waxed and stored, and rafts unrolled onto trailers, the anticipation and speculation of what the melting snow will bring in the months ahead begins. It seems that everyone, from rafters to ranchers and bartenders to gardeners, are considering the odds like bookmakers at a horse race. When will the runoff peak, and how high will it be? When will the sediment-laden runoff become clear enough to fish again? How long will the Fork be raftable? Can we sneak a kayak down the Crystal this spring? Around the River Center, the staff often discusses these questions over morning coffee, but inevitably, our questions start circling the swift and sticky eddy of what the transition of seasons means for our watershed. Will this year’s runoff sustain all water users and aquatic life if it’s another hot and dry summer? What about the water that is absorbed into the soil that never reaches the stream because it has been desiccated from the dry autumn? Or the snow that evaporated before the melt due to a blustery April? And the biggest question we can’t seem to avoid, “Was it always like this, or have things changed?”

Each year it becomes increasingly clear: things have most definitely changed and continue to change. We worry that this change is not for the better.

The Roaring Fork Watershed, with its mountains and valleys, lakes and streams, plants and animals, is so much more than the sum of its parts. Maintaining the delicate balance of snow and water, and the factors determining when, where, and how precipitation falls and moves through the ecosystem becomes a much more complex calculation. In recent years, the traditional equation of average snowfall equaling average runoff has not held true. Contrary to the term “runoff,” which elicits the image of snow melting and flowing on the surface of the ground to a nearby stream, much of the water that feeds local rivers melts and seeps into the soils, percolating through the ground, saturating soils and recharging groundwater. Any excess water once those needs are met is what is available for streamflow. So when we endure an exceptionally dry autumn, the effect ripples into the spring. If the spring is exceptionally warm, or conversely, exceptionally wet (consider the “Miracle May” of 2015) the runoff timing and peak can change significantly. Are you ready to place your bet on peak flows and timing yet?? Me neither!

The conversations and wagers around peak flows remind us how much of our community revolves around water. We check the weather forecast daily in the winter for the next snowstorm — whether it’s to chart out the next powder day or plan for our morning commute. We watch the rivers as they flow through each town in the valley — whether to plan for irrigation, scout where the trout will be, or just to enjoy the nearby sights and sounds. The presence of persistent drought amplifies our awareness, reminding us of what was once predictable — a snowy March or summer monsoons — have now joined the ranks of uncertainty. As we optimistically place our bets on a high and slow runoff, we know the real wager is on the watershed. So, we will continue to work to build a community that understands the value of water. A community that creatively adapts to the changing climate while striving to use less and protect more so that when the payout comes, we have done all that we can to ensure the river wins.
Crystal River Restoration Project at Riverfront Park

by Heather Lewin, Director of Science & Policy

The best things come to those who wait... and the wait is finally coming to an end! After almost two years of fundraising and stakeholder building, The Crystal River Restoration Project at Riverfront Park will break ground this summer. Planned in partnership with the Town of Carbondale and Carbondale-based consultants River Restoration and DHM Design, this project is a direct outcome of the recommendations of the 2016 Crystal River Management Plan. In the Crystal River, the project will create a stable, low maintenance diversion structure for the Town’s Weaver Ditch and re-establish a self-sustaining low flow channel through the project reach. In Riverfront Park, the project intends to preserve, enhance, and create riparian and wetland areas; create designated angler access and riparian trails; upgrade interpretive signage; and establish an accessible access point and rustic classroom area near the River Valley Ranch South Bridge. This multi-benefit project will not only improve the project reach, but also serve as a demonstration project for other publicly and privately owned diversions and riparian corridors along the Crystal River with similar concerns.

Low water condition March 2022:
Channel in lower portion of the project reach is narrows widened with significant bank erosion due to sediment deposition and lack of vegetation on the banks. A combination of re-establishment of a low flow channel (thakerg), instream habitat features, and planting of banks with native vegetation will enhance river and riparian habitat and reduce bank erosion and sediment deposition potential. In addition, designated angler access points will be strategically placed to discourage social trails and maintain longevity of both preserved and newly planted riparian vegetation.

Extreme low water August 2018:
Looking downstream through the project reach, the modified push up dam used to divert water into the Weaver Ditch is clearly visible. The push up dam is re-established annually using large machinery in the river. During high water the material is transported downstream and deposits just upstream of the bridge (see photo below). The construction of a permanent, stable diversion structure will reduce channel disturbing maintenance activities and allow for a wide window for fish and boat passage.

December 2020: The current Weaver Diversion headgate, consisting of concrete barriers and outdated gate infrastructure. Portions of the Weaver Diversion will be rebuilt with native materials and will be enhanced by the new, modern headgates, funded by the Pitkin County Healthy Rivers Board. The new headgates will increase the ability to control water entering the Weaver Ditch and will have the ability to be retrofitted with an automated system in the future.

August 2018: Degraded riparian areas in Riverfront Park from past uses. Invasive weed species dominate the northern portion of the project area. The proposed upland improvements will include a rustic footpath and minimalist outdoor classroom space on the disturbed, downstream area. Native plants will replace the invasive species throughout. Upstream mature cottonwoods and thriving understory will be preserved for avian and wildlife habitat.

The project team has raised over $1.5 million through grants, donations, and contributions from the Town. The completed Crystal River Restoration Project aims to achieve the project goals developed during the planning process:

1) *Restore* the ecological integrity of the riparian zone through streambank stabilization, reconnect the floodplain, and replace invasive weed communities and plant monocultures with healthy and diverse riparian plant regimes, while preserving healthy bird and wildlife habitat.

2) *Develop* a long-term, self-sustaining solution to improve river channel stability, fish habitat and spawning areas by promoting conditions that support and enhance in-stream biotic structure and diversity.

3) *Create* a self-sustaining diversion and headgate structure for the Weaver Ditch to function as part of the river system, while improving the water delivery for the Town of Carbondale and consistent with future ditch improvements and efficiencies.

4) *Enhance* passive user experiences of Riverfront Park through interpretive signs, trails, gathering spaces, and educational programs.

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Project Implementation Funders:
- Colorado Parks and Wildlife Fishing is Fun
- WaterSMART
- Colorado Water Conservation Board’s Water Plan Grants
- Town of Carbondale
- Pitkin County Healthy Rivers
- GOCO Resilient Communities Fund
- Colorado River Water Conservation District
- Aspen Valley Land Trust RJ3 Fund

1 For project details, see RFC Summer 2020 Newsletter found at www.roaringfork.org/about-us/river-currents.

The Pitkin County Healthy Rivers Board, with the Town of Carbondale, has taken the lead on modernizing the Weaver Ditch Headgate and Diversion. They have worked with the Town on plan, design, and purchase of a new headgate. Installation is slated for this fall, when the ditch is turned off. Thanks to the Healthy Rivers Board for funding this important demonstration of headgate efficiency!
Thank You

RFC is thrilled to announce Jean Moore as our 2022 Robert J. Billingsley River Conservator. We are honored to recognize Jean’s many years of unwavering dedication as an RFC volunteer and supporter, along with her undeniable love for the Fryingpan River and local community.

Jean moved to the Roaring Fork Valley in the 1970’s and has lived on the Fryingpan over 45 years. As a banking officer with Alpine Bank for 28 years, Jean began participating in RFC’s River Council and River Rendezvous in 2013. Jean played an instrumental role in both the River Rendezvous and Return to the River fundraisers, often the first volunteer to arrive and the last to leave, willing to help in any and every way. With her kind spirit, indefatigable work ethic, and thoughtful demeanor, Jean embodies the connection between the community, our mission, and our local partners. (Not to mention, she makes the best Bloody Mary’s west of the Mississippi!)

Please join us in congratulating Jean Moore, our beloved and loyal friend for over 10 years, as the 2022 Robert Billingsley River Conservator.

Thank you for supporting essential river research, education and conservation work!

www.roaringfork.org/baseflows
Open, RFC staff is left to internally debate at what level of detail to answer, “How are the rivers doing?” the same way one might casually answer “fine” when asked, “How’s it going?” at the grocery store, regardless of how it’s actually “going.” The truth is, both questions are equally loaded with details and the many factors and influences that make up the deeper answer are not always things people want, or have the time, to casually discuss. So, in an effort to save you 20 minutes when you see us at the grocery store, we decided to think about, “How are the river’s doing?” in a context many of us interact with regularly at this time of year: a report card.

We acknowledge there are factors that impact local rivers that are not taken into consideration here including reservoir management, increased development, and diversions (transmountain and local). Here, for the sake of simplicity, we are looking only at climatological factors.

Roaring Fork Watershed Midterm Report Card Issued May 12, 2022:

**Rainfall** According to the U.S. Drought Monitor most of the Roaring Fork Watershed is experiencing abnormally dry conditions, with a small portion faring slightly worse at moderate drought. **Grade: B**

**Snowfall** After having a slightly above average snowpack all winter, high winds and warm temperatures during the first week of May destro- mated local snowpack. In average and above average years, snowpack remains in the high country into June and early July. Snowpack is currently 60% of average, below where it was at the same time the past two years. This is equivalent to doing your homework all semester, then failing the midterm exam.

**Grade: D+**

**Stream Flows** For the most part, winter stream flows registered below average. At this point, in early May, stream flows are well above average. However, this is a bit of a mixed message. Seating flows above average means local streams reap the benefits of higher flushing events like a “spring cleaning” for the rivers and a necessary component of stream health. However, runoff appears to be on schedule to peak well before normal, meaning river flows will drop sooner and run lower longer in the hoi of the summer. This puts local streams at greater risk of exceeding temperature standards and stressing aquatic life.

**Grade: C**

**Soil Moisture** Lack of precipitation dries out soils and vegetation. Thirty soils soak up snowmelt before it reaches the river, which negatively impacts both runoff and summer base flows. As of November 15, 2021, when soil moisture was last measured prior to snowfall, the Roaring Fork Watershed measured 70-90% of normal. **Grade: B**

**Air Temperature** Since January 1, observed temperatures at Aspen Airport, the one National Weather Service record- ing station in the watershed, are mostly within the historical average range. In general, temperatures above average are balanced with temperatures below average. In this case, it’s not so bad to be average.

**Grade: A**

Remarks: Based on our midterm grades, the Roaring Fork Watershed has a solid C average. We performed well in some areas (air temperature) but really dropped the ball in others (precipitation). But we all know, here in the Roaring Fork Valley, no one wants to be average. So, what can we do to bring our grades up? Any extra credit available? Where the Roaring Fork Watershed fairs well, is a component not considered here, water quality. Local rivers (with a few exceptions) score well in most water quality measures. This creates some resilience in a system that can be stressed by factors that are weather-dependent and out of our control. Protecting waterways with adequate setbacks, robust and diverse vegetation, and responsible recreation are all factors we can control that will benefit the watershed in times of stress. While high water quality and the above measures will help in the short term, addressing bigger picture issues like climate change will be key to the longevity of stream health in headwater streams like the Roaring Fork. In our final newsletter, we will assess how the summer season impacted streams and give the “final grades” for the 2022 Water Year!
Identifying, Adapting and Responding to Drought

by Chad Rudow, Water Quality Program Manager

Drought. One need not look far to find this word in recent news, particularly within the western United States. Due to its longevity, some are using the term “megadrought.” As it becomes clear that climate change is a driving force, others have started calling it “aridification” - indicating the long-term change of a region to a drier climate. Regardless of the name, the Roaring Fork Watershed has certainly experienced these conditions, with extended dry periods, reduced snowpack, hot temperatures, and wildfires all making their mark in recent years.

The term “drought” typically provokes thoughts of dry, hot summers; however, these effects can be seen year-round and can manifest and affect water resources in surprising ways. RFC works to stay abreast of changing conditions in order to adapt and respond as necessary. The following list describes various impacts from recent drought conditions and the ways RFC is working to address them.

SUMMER

Low flows and hot days can greatly increase stream temperatures, negatively affecting aquatic life which rely on cold mountain streams to thrive.

- For a 5th consecutive summer, RFC will work to monitor stream temperatures using a combination of remote sensors and volunteer-collected data. This information is shared with Colorado Parks and Wildlife (CPW) to help determine areas of concern and guide management decisions for local fisheries.
- When temperatures reach critical levels, RFC works with local outfitters and CPW to provide education and outreach on angling practices that minimize stress on fish.

FALL

As climate change intensifies and prolongs drought conditions, numerous factors can work to raise algae levels in streams, rivers, and lakes, throwing their ecosystems out of balance. Recent years have brought increasing reports of algae concerns in many local aquatic systems.

- For a 5th consecutive summer, RFC will work to monitor stream temperatures using a combination of remote sensors and volunteer-collected data. This information is shared with Colorado Parks and Wildlife (CPW) to help determine areas of concern and guide management decisions for local fisheries.
- RFC continuosly works to identify, adapt, and respond to the effects of drought and climate change. With impacts becoming more apparent, how has your life changed in response to these new conditions?

-Winter

Reduced winter flows can exacerbate the formation of anchor ice in waterways. Anchor ice builds up on the streambed, affecting habitat for aquatic life and increasing the chances for ice jams which, when they release, send floods of ice and water downstream, posing a danger to winter anglers.

- RFC implemented anchor ice monitoring on the Fryingpan River and is utilizing this data to help increase Roedl Reservoir winter flow releases aimed at reducing ice formation.
- In 2019, RFC worked with the National Weather Service, Basalt Police, and Pitkin County Emergency Management to establish a public warning system for ice jam releases along the Roaring Fork River.

RFC encourages everyone to evaluate your relationship with water and what you can do on a personal level to adapt and respond to drought.
Pen Pals in the digital age? YES!

by Megan Dean, Director of Education

Ms. Vreni Neilson’s class at Basalt Elementary School and RFC teamed up to reach across the Continental Divide and connect with 5th grade students in Aurora, Colorado, through a Watershed Pen Pal Program. The partner school in Aurora is Vista Peak Exploratory. The City of Aurora and the Roaring Fork Valley both utilize water from the headwaters of the Fryingpan River. The Bousehead Transmountain Diversion Tunnel delivers water from the headwaters of the Fryingpan to the City of Aurora. The Fryingpan River flows right through Basalt where it subsequently flows into the Roaring Fork River. Through a series of shared classes, Google slides, and activities, students in both Aurora and Basalt will learn about where their water comes from and why it is important to value, conserve, and protect this life-giving resource.

Through old fashioned letter writing, students will develop a relationship by sharing information about their hobbies, interests, and personal connection to water. As part of the program, students will also get an opportunity to meet their pen pal through Google Meets. This program is an invaluable opportunity to shape and create river stewards on both sides of the Continental Divide, showing through communication and positive relationships that conservation is essential in water use. Through shared experiences students and teachers will learn water ethics together, creating a common ground for conversation and connection. Since many Aurora students do not have access to riparian areas and rivers, this project will guide them through experiences that illuminate why healthy rivers and headwaters are important. The personal relationship that students make with their pen pal will create a concrete and real-world connection to someone else that depends on the same water source.

Students at both schools are already using their writing skills to draft and mail letters to their watershed pen pals. They will also share ideas on how and why it is important to conserve water.

WELCOME NEW RIVER STEWARDS!

QUINN HARNETT is a Design Engineer with JVA Consulting Engineers and an endurance sports enthusiast. Quinn grew up in University, Ohio with the nearby Cuyahoga Valley National Park being the inspiration for his love of rivers and trails. After earning a degree in Ecological Engineering with an emphasis in stream restoration design from The Ohio State University, he moved to the Roaring Fork Valley and started his career as a civil engineer. Outside of work Quinn spends his time running far on trails that follow many of the tributary streams to the Roaring Fork River and up and down the mountains that hold the watershed’s snowpack, cycling along the Rio Grande Trail and up nearby singletrack, or skiing both up and down at Aspen and Sunlight. He is eager to share his passion for water with those around him, especially as he continues to learn more about the unique system that is water in the Western U.S.

ALEX HELLER is a river engineer with River Restoration in Carbondale, CO, where she developed a deep appreciation for the mountains through trail running, backpacking, hunting, and snowboarding. She received her B.S. in civil engineering from Colorado State University in Fort Collins and worked in Denver for several years before finally relocating back to the mountains to focus on stream restoration projects. Since moving to the Roaring Fork Valley, Alex has enjoyed being a part of a community that cares so deeply for its watershed. She is excited to bring her engineering knowledge and passion for outdoor recreation to the River Stewards.

EMERY HOLTON, an east coast transplant, has been in the valley for over a decade. She attended Trinity College and is an avid squash player. As many of us do, she came for “one” winter to ski. That winter turned into forever as she fell in love with the beauty and quality of life in Aspen. She works as a real estate broker for Douglas Elliman and takes great pleasure in helping her clients fall in love with our valley, just as she did 10 years ago. Her passion for exploring the outdoors is what keeps her interested in protecting our natural resources and landscapes. When she’s not running around the mountains with her dog Chief, you can find her in the Roaring Fork with a fly rod in hand.

JORDIE KARLINSKI grew up in Snowmass Village and is a real estate broker at Compass. Growing up in the Roaring Fork Valley allowed Jordie to experience all that the mountains have to offer at an early age. Jordie was on the professional snowboarding circuit for 16 years and was fortunate to travel all over the world with the US Snowboard Team. She narrowly missed the 2014 Olympic Team by only two points during the 2014 Winter Olympic Qualifiers. Jordie retired from professional snowboarding in 2014 and now is an avid fly angler and river enthusiast. The time Jordie has spent on the rivers, and with the mountains, has led to her develop a passion for protecting the Roaring Fork Watershed. Jordie hopes to raise awareness on the importance of protecting the wilderness and recreational areas that makes the Roaring Fork Valley so special.

PJ MURRAY grew up in Flagstaff, AZ, where rivers and water became a source of joy, adventure and a way to connect with others. Growing up appreciating water led her to attend Colorado State University for Civil Engineering with a concentration in water resource management. After graduating she moved to the Roaring Fork Valley to work for the City of Aspen Engineering Department as a project manager where she has worked on many water quality, quantity projects and educational programs. You’ll often find PJ out playing in the mountains or the rivers, hiking, biking, rafting and skiing. PJ looks forward to educating, protecting and connecting with others about the Roaring Fork River, its tributaries and the importance of this resource in our lives.

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