

## Back-to-back with our backs against the wall

*By Rick Lofaro, Executive Director*

I originally moved to the Roaring Fork Valley in 1992. Having grown up in the Denver area, I was drawn to the rural mountains and streams - or more accurately, their resident trout. In 1994, I left Colorado for a four-year hiatus spent getting acquainted with the inhabitants of northern Montana's rivers, before my tenure at Roaring Fork Conservancy (RFC) began in 1997. Shortly after I left, I remember hearing of the tragic Storm King Fire and was struck not only by the expanse of the fire, but the loss of 14 brave firefighters. I also remember hearing my friends rave about the tremendous winter of 1995, and my surprise when I heard that the huge extended runoff was so powerful, it washed out a section of Two Rivers Road in Basalt (see photos below). As evident in these memories, these contrasting events certainly registered with me, however, in retrospect, I do not believe their impacts truly resonated with me. Looking back, I am not sure I really grasped the impact - or necessity - of a big water year following a severe drought year, the same way feast often follows famine and abundance relieves scarcity.

In recent years, these large swings have become a familiar occurrence, seemingly using extremes to meet the average. In the past 20 years, Colorado experienced 4 of the driest years on record, beginning with 2002. This, and two of the three subsequent drought years (2012, 2018), were all chased by average or above average snowpack years. And as the runoff tumbled downstream, the stresses, impacts and worries of each dry year flowed with it. Everything seemed back to normal, all the water-dependent human and natural systems functioned sufficiently, and the river flowed on.

As we watched the water levels in Lake Powell and Lake Mead dwindle, whisperings of concern for back-to-back dry years crept into conversations. No one wants to be Chicken Little, crying that the sky is falling or in this case that maybe there is not enough water in the west to continue with the status quo. As we sit today, with the 2020 dry year

behind us, we were all hopeful for the proverbial "feast" in 2021. However, amidst the one of the worst long-term droughts on record, we check the SNOTEL sites, we look to the hydrographs, we check the drought monitors and see little to no relief in sight. The snowpack peaked early, and subsequently is melting early. A snowy March, while met with open arms, was not enough to make up for the dismal lack of early season snowpack. And as sunny days are upon us, we celebrate the buds on the trees and greening of the hillsides with an err of caution. While the feeling of helplessness begins to creep in, we are not powerless. Now is the time to actively conserve water as individuals and communities and to make water-wise choices with every turn of the faucet. In times of water scarcity, it is too often the river who finishes last, but this

summer, let's make the river our first consideration.

Throughout the summer, RFC will share a series of water-saving tips and highlight community members who go the extra mile to conserve water and protect the rivers. Have a great tip to share or water savings to celebrate? Send an email to [christina@roaringfork.org](mailto:christina@roaringfork.org) to be featured!

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*"...as sunny days  
are upon us, we  
celebrate the buds  
on the trees and  
greening of the  
hillsides with an  
err of caution."*

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### Basalt 1995 high water year



*A section of Two Rivers Road was washed out.*



*The confluence of Fryingpan and Roaring Fork Rivers.*

# A Brief Introduction to Water Allocation in the Colorado River Basin

By Andy Mueller, General Manager at Colorado River District



Andy Mueller

Our legal mechanisms for allocating water in the Colorado River Basin are being tested by declining flows largely attributable to climate change. To understand why this is so, it is important to delve into the history of interstate and international water allocation in the Colorado River Basin.

As many have read or heard before, water allocation within Colorado and other western states is governed by the doctrine of prior appropriation, however, since 1922 as between the seven states of the Colorado River and the country of Mexico, the waters of Colorado river are governed by the principal of equitable apportionment. This article focuses on “equitable apportionment” as expressed in the 1922 Colorado River Compact.

Colorado pioneered the “prior appropriation” doctrine which set forth the principal of “first in time, first in right” within our state’s water allocation framework (a story for another time) and many states in the west adopted some version of the doctrine. As much as Coloradans love the prior appropriation system, in the early 20th century our state’s leaders saw a threat posed by the raw application of that doctrine to the entire river basin. That threat was the fast pace of population growth occurring in southern California. Government and water policy leaders in our state realized that if the prior appropriation system were applied without modification between the seven states that comprised the Colorado River Basin, it was likely that Colorado water users would be subject to being turned off during times of drought so that “senior” users in southern California could continue to consume “their” appropriated water. Given the fact that in an average year 70% of the flow of the entire Colorado River system originates in our state, this realization was particularly unsettling for Coloradans.

Our state’s leaders set about to fix this situation. Many years of negotiation involving all seven states and future President Herbert Hoover lead to an “equitable” solution. As detailed in the Colorado River Compact of 1922, the Colorado River was divided into two “basins” at a then obscure place called Lee Ferry, Arizona.<sup>1</sup> The Upper Basin consists of Colorado, Utah, Wyoming, New Mexico and

a small portion of Arizona, and the Lower Basin consists of the rest of Arizona, California and Nevada. The 1922 Compact allocates specific quantities of water for use in the two basins, 7.5 million acre feet (MAF) each to the Upper and Lower Basin, followed by another 1 MAF to the lower basin (something that arose out of discussions related to the Salt and Gila rivers which are tributaries in Arizona, although the language in the final compact fails to refer to those tributaries) and an additional undefined amount for Mexico (Defined in a 1948 treaty as 1.5 MAF). (A total paper annual allocation of 17.5 MAF) The faster growing population and political power of California meant the apportionment of these waters between the Upper Basin and Lower Basin was not, however, drafted as an equal apportionment. Agreement between the seven states required a compromise. The compromise stated in Article III(d) agreed to by the states provided that the Upper Basin shall not cause the natural flow of the river to be “depleted below an aggregate of 75 MAF” on a running ten year average. The language of this compromise is archaic and ambiguous, but it is the clause that causes the Upper Basin great concern in these times of rising temperatures and decreasing river flows. Article III(d) has been interpreted by some to mean that the Lower Basin has the right to the first 7.5 MAF each year and that water uses developed in the Upper Basin after 1922 may be curtailed if the Lower Basin does not get its 75 MAF on a running ten-year average. Others suggest that the Compact drafters never anticipated climate change and the decreased flows we are now seeing in the River and that what was once deemed an “equitable apportionment” needs to be updated to meet the 21st century reality.

The miserable hydrology over the last 21 years (an average annual flow of 12.5 MAF as opposed to the 17.5 allocated on paper) in the Colorado River basin is pushing us within sight of a time (perhaps as soon as six years) where we may see our first violation of Article III(d) of the Compact and the possibility of mandatory water use reductions throughout the Upper Basin and a simultaneous push for a new, adaptive allocation framework. The details of what a Compact call might look like on the ground, or even how an adaptive framework might function are still unclear and are at the heart of many water management discussions. What is certain is that we are using more than the river provides, and coming to a



Lake Powell was only 35% full on April 15, 2021. This photo was taken at Bullfrog Marina in Utah.

(Continued from previous page)

consensus on the solution continues to be both complex and challenging.

## Learn more about the Colorado River

Hundley, Jr., N. (2009). *Water and the West: The Colorado River Compact and the Politics of Water in the American West*. University of California Press.

Kuhn, E. and Fleck, J. (2019). *Science be Dammed: How Ignoring Inconvenient Science Drained the Colorado River*. University of Arizona Press.

The Colorado River Water Conservation District:

<https://www.coloradoriverdistrict.org>

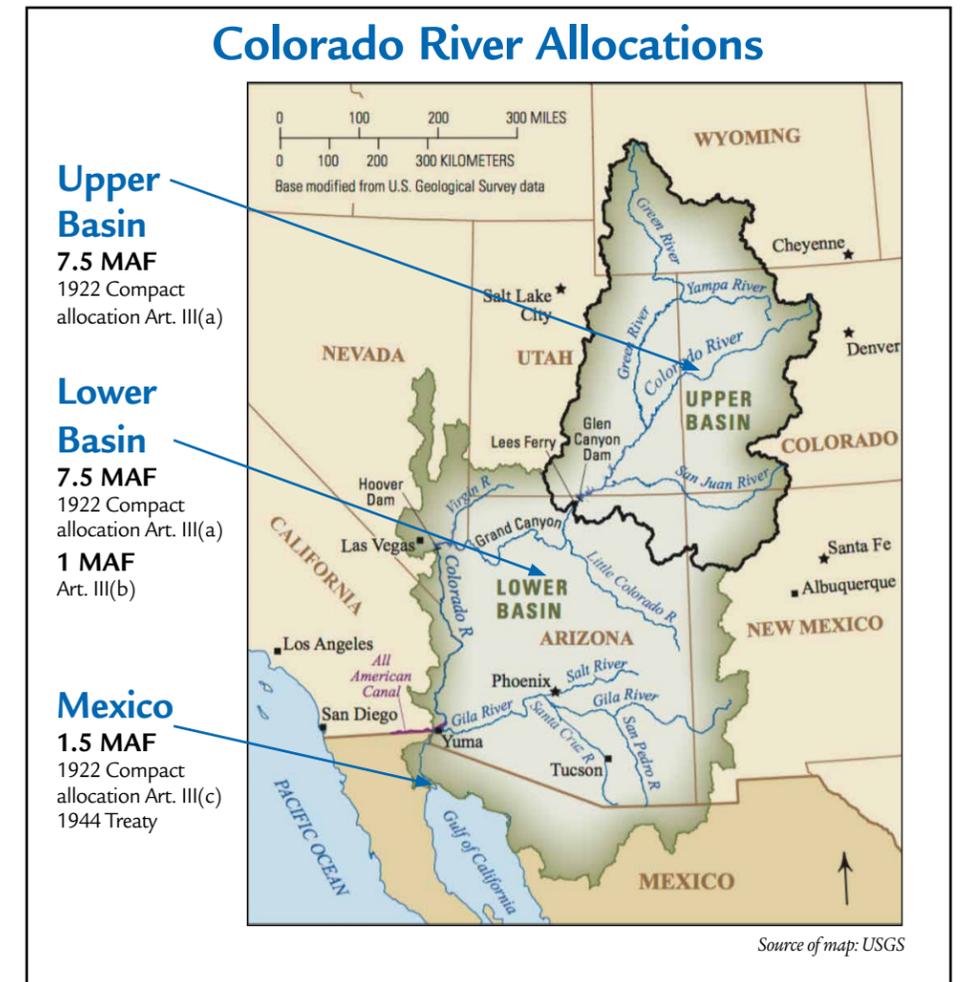
University of Utah Colorado River Center:

<https://qcnr.usu.edu/coloradoriver/futures>

Upper Colorado River Commission:

<http://www.ucrcommission.com>

<sup>1</sup> Lee Ferry is located on the Colorado River, just below the current site of the Glen Canyon dam, which forms Lake Powell (Construction of which started in 1956).



**You're Invited to continue this conversation!**

Join Andy Mueller on Wednesday, June 23rd for an outdoor, in-person conversation about Colorado River water issues. Limited to 20 participants. Register soon at [www.roaringfork.org/events](http://www.roaringfork.org/events)

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

# New Online Tools Focus on Local Impacts of Fryingpan Management

By Heather Lewin, Director of Watershed Science & Policy

Ruedi Reservoir, completed in 1968, is located on the Fryingpan River 15 miles upstream of the town of Basalt. Best known locally as a recreational amenity, popular reservoir activities include boating, camping, and fishing in the summer and ice fishing in the winter. In addition to its scenic recreational features, Ruedi Reservoir serves an important role in West Slope Water Management. Built to compensate West Slope water users for Front Range diversions, Ruedi supports a variety of local uses including the renowned Fryingpan River trout fishery and City of Aspen hydropower generation, as well as irrigated agriculture and fish habitat downstream on the Colorado River. In dry years, the primary target for water travelling from Ruedi Reservoir down the Fryingpan River is the Grand Valley, over 120 miles downstream. This demand for water can cause significant changes to the hydrologic regime of the Fryingpan River. Reservoir operations in the summer of 2018 highlighted the need for a more strategic approach to managing releases from Ruedi Reservoir. Frequent conversations between RFC, Ruedi Water and Power Authority, City of Aspen, Colorado Water Conservation Board,

Colorado River Water Conservation District, and the Bureau of Reclamation resulted in a commitment from all parties to participate in ongoing cooperative dialog about optimizing water releases to support multiple uses. RFC required assistance characterizing best water management approaches for supporting aquatic life across seasons and different hydrological year types. To fulfill this need, RFC, with funding from Pitkin County Healthy Rivers, partnered with Lotic Hydrological to create two ecological tools that use historical data and studies to better understand how reservoir operations impact 1) habitat and ecological factors and 2) lower Roaring Fork River temperatures. The tools require the user to input select current conditions, then uses a conceptual model of feedback loops to determine the probability of certain ecological occurrences meeting or exceeding the set ecological parameters. Summarizing this complex system into an easy-to-use tool helps to ensure that RFC and its partners are well-positioned to advocate for river health needs on the Fryingpan River into the future. The tools can be found at [www.roaringfork.org/your-watershed/fryingpan-river](http://www.roaringfork.org/your-watershed/fryingpan-river).

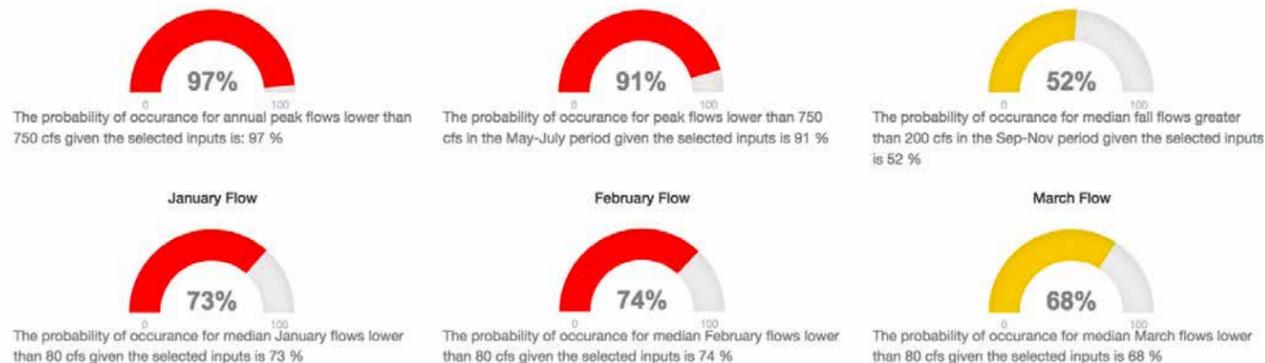
*“It is important to note that this conceptual model does not instruct stakeholders in how to best manage conditions in the Fryingpan River. Rather, it intends to support reasoned decision-making in pursuit of some stated management goal or objectives that, themselves, may change over time.”*

– Lotic Hydrological

## Streamflow Forecasting Tool for the Fryingpan River

Output probabilities for various aspects of streamflow behavior on the Fryingpan River:

Adjust streamflow thresholds of interest and hydrological/climatological forecast information at the bottom of the page and observe how the probabilities change.



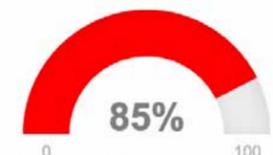
*“These new tools will help me better advocate for flows that work to benefit our rivers and our communities by providing me with targets that are based in science rather than anecdotes. The requests are harder to ignore when there are numbers to back them up. I think they will be especially helpful in this extremely dry year when temperatures in the Roaring Fork are surely going to exceed safe levels for aquatic life, reservoir releases are going to be managed on a near daily basis, and there certainly won’t be enough water to satisfy all of our desires.”*

– April Long, Executive Director of Ruedi Water and Power Authority

## Water Temperature Prediction Tool

Use this tool to assess probabilities of water temperature exceedances on the Roaring Fork River at Glenwood Springs, Colorado

Peak Flow



The probability of occurrence for exceeding a maximum weekly average temperature of 18.3 °C / 64.94 °F given the selected inputs for air temperature and streamflow is: 85 %

23rd annual Fryingpan & Beyond River Cleanup

Thank you VOLUNTEERS and SPONSORS

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- Get Busy Liv’n
- Jean Moore
- Odell Brewing
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- Town of Basalt
- Waste Management



# What to do when every drop counts...

## Tips for Conserving Water Indoors

- Become a frugal flusher or update to a new water sense toilet.
- Reduce your weekly laundry loads by at least one.
- Upgrade water fixtures, install low-flow showerheads, and use sink aerators to greatly reduce household water use.

## Tips for Conserving Water Outdoors

- Check for and fix leaks on a regular basis. (A 1/16th inch continuous leak can waste 300,000 gallons of water per year!)
- Ensure your sprinkler system is working properly and water your lawn wisely. Use a Moisture Meter (3-4" below surface!) to check soil moisture before you water.
- Use drought tolerant or native plants instead of turf.

## Hire a Qualified Water Efficient Landscaper (QWEL)

QWEL certified professionals are trained in efficient irrigation principles and sustainable landscaping practices, and can also help to:

- Use water efficiently in your landscape
- Reduce runoff and overspray
- Select and install efficient irrigation equipment
- Develop your irrigation schedule and program your irrigation controller

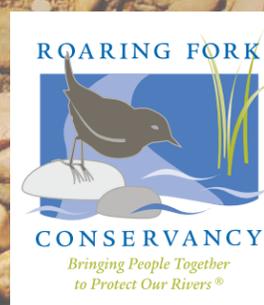
There are QWEL professionals throughout the American West, including over 20 within the Roaring Fork Valley! Find one at [www.qwel.net/hire-a-qwel-pro](http://www.qwel.net/hire-a-qwel-pro).

## Choose Low Water Native Plants

Colorado State University Extension has excellent resources to help you choose which native plants are best for your backyard.

Low-Water Native Plants for Colorado Gardens: Western Slope - Below 7,000':  
<https://extension.colostate.edu/docs/pubs/native/WestSlopeSm.pdf>

Low-Water Native Plants for Colorado Gardens: Mountains 7,500' and Above:  
<https://extension.colostate.edu/docs/pubs/native/MountainsSm.pdf>



Additional drought resources  
can be found at  
[www.roaringfork.org/drought](http://www.roaringfork.org/drought)

# A Community Rallies Around Fire Restoration

By Chad Rudow, Water Quality Program Manager

On August 10, 2020, the Grizzly Creek Fire started in Glenwood Canyon. It grew quickly, burning a total of 33,000 acres on both sides of the canyon and closing I-70 for a record two weeks. At its peak over 870 firefighters with significant air and ground equipment worked to contain the fire. The fire had a significant number of impacts, including the ecology of the Canyon, rivers and streams, local and state infrastructure, and the communities of No Name, Glenwood Springs, and others downstream.

Shortly after the fire began, the Glenwood Canyon Restoration Alliance (GCRA) was launched by Roaring Fork Outdoor Volunteers (RFOV), a local stewardship organization, to address the renewal of the Grizzly Creek burn area. This collaborative group quickly grew to include government agencies, non-profits, and business partners. Although Glenwood Canyon is not within the Roaring Fork Watershed, RFC was asked to join as a local watershed group with experience from the 2018 Lake Christine Fire. RFC quickly accepted as the impacts of this fire reverberate throughout the communities of the Roaring Fork Watershed.

GCRA was established to “renew community & landscape through collective action” by guiding multi-year community outreach and restoration efforts. Led by RFOV, the diverse set of partners and stakeholders worked diligently over the winter to plan and organize the initial season of activities with three goals: community building, community education, and community-led restoration.



*The purpose of GCRA is to renew community & landscape through collective action.*

*Together, we will work in multi-year effort to restore Glenwood Canyon and its surrounding landscape.*

This year’s activities are as diverse as the partnering organizations, including town hall meetings, interpretive hikes, educational materials and presentations, a community exhibition, data gathering projects, and a full series of community restoration projects. These community-based activities are intended to supplement professional restoration efforts, and they depend on and highlight the collaborative efforts of all stakeholders.

To learn more about the GCRA, its many partners, and how to get involved, visit the official GCRA website: [www.gcrestorationalliance.org](http://www.gcrestorationalliance.org).

## GCRA Partners:

- Aspen Center for Environmental Studies
- Colorado Department of Transportation
- City of Glenwood Springs
- Eagle River Watershed Council
- Garfield County Public Library District
- H2O Ventures
- Middle Colorado Watershed Council
- Roaring Fork Conservancy
- Roaring Fork Outdoor Volunteers
- U.S. Forest Service
- Wilderness Workshop

PHOTO: SAMI DINAR

# The Duality of Watershed Education: Low Snow, Adaptation, and Rejuvenation

By Megan Dean, Director of Education

Walking up Red Mountain Trail in Glenwood Springs, I am full of joyful anticipation for the classes that will soon be joining me. Scouting for areas that students can explore during their snow science class is a fun precursor to a day full of learning. This snow science class guides students through activities that reinforce how important snow is to winter ecology. Students learn about how animals use snow to find food and insulate their winter dens. The trail is quiet and beautiful, but I’m worried that there will not be enough snow to teach the program. As I gain elevation, I’m relieved to find enough white stuff on the ground for us to play our tracking games and create snow dens. As the students arrive, I am once again overwhelmed by their enthusiasm, engagement, and joy. After being in education for over 20 years, I am accustomed to students pushing the rules and boundaries. Consequently, I always have a few fun tricks up my sleeve for these occasions. This class, however, is completely attentive and engaged. Their teacher explains to me that they are so happy to be outside learning with their friends that even students who struggled last year are fully attentive. The students dive into the natural snowy playground and become junior ecologists for the next two hours.

One of our snow science classes at the confluence of the Roaring Fork River and Fryingpan River in February was not as lucky. That class is intended to illustrate the beauty and complexity of snow crystals and snowpack. It is also designed to teach the science behind avalanches. When RFC educator Aaron Abeyta arrived, he quickly realized that adaptation was needed. He was missing the most important material for this lesson, SNOW. Luckily, he had prepared back up photographs of snow crystals and layers in snowpack. These visual aids, along with an avalanche model consisting of layered blankets sliding at different angles, saved the day. The students had a great time creating a “Blanket-A-Lanche”. They also found some crusty snow hiding under riparian plants in the shade.

As we work to adapt to the variety of challenges with which we are presented as educators, I can’t help but compare that to the continued challenges that our rivers face. This reinforces and drives the goals that define the education programs at RFC. Positive connections and experiences with our watershed lead to positive actions, creating a community of river stewards that will also find innovative ways to protect our rivers despite the continued challenges they face.



## 2020 Annual Report

Available now at [www.roaringfork.org/about-us/annual-reports/](http://www.roaringfork.org/about-us/annual-reports/)

# 2020 Drought Conditions Anticipated to Impact Snowmelt Runoff

By Karl Wetlaufer, Hydrologist/Assistant Supervisor, USDA-NRCS Colorado Snow Survey

Following one of the warmest and driest summer and fall seasons on record in 2020 it is widely expected that the drought conditions which ushered in this past winter will have a considerable impact on the 2021 snowmelt runoff season. Over half of the mountain SNOTEL (SNOpack TELemetry) stations in the state received either the lowest or second lowest amounts of precipitation on record over the last year, primarily during summer and fall of 2020. This led to extremely dry soil moisture conditions across the state going into this past snowpack accumulation season. Much like a sponge, dry soils and vegetation need to absorb a certain amount of moisture (snowmelt) before



**“Over half of the mountain SNOTEL stations in the state received either the lowest or second lowest amounts of precipitation on record over the last year...”**

it most effectively transmits water through the system to a stream channel.

Because of these dry soil moisture conditions it is anticipated that spring and summer streamflows will be substantially lower than in other years that accumulated a similar snowpack. Across all of the major basins of Colorado forecasted streamflows are for 20-30 percent of normal less than the observed snowpack peak values, which occurred near April 1st. Because of these unique conditions it will be very important to closely monitor streamflow resulting from snowmelt and changing conditions throughout the spring and summer.

## Flowing Gratitude



**Ted Borchelt**, thank you for serving on RFC's board for 8 years! Ted's

passion for fishing and protecting the rivers and streams he loves was a natural fit for the board of directors. Ted worked tirelessly on the River Center Working Committee and helped to oversee the construction, completion, and grand opening in 2018. We wish him all the best and thank him for his many years of service!



**Lauren Pierce Forman**, thank you for serving on the River Stewards over the last several years! Your organization, enthusiasm and desire to learn more and more about our local rivers was awesome! We congratulate Lauren and her husband who recently welcomed their second baby.



**Shaylyn Austin** joined the RFC team in the spring of 2020 as a Science and Policy Intern. Shay's previous education and experience, including a Bachelor of Science degree from the University

of Michigan in environmental studies and turtle surveys along the Missouri River, have allowed her to excel at RFC in field work, study development and scientific reporting. Shay worked with RFC staff and regional experts to create a novel process to survey and document anchor ice on the Fryingspan River, compiled and analyzed 8 years of Didymo survey data into a formal report, assisted with field work, and took on a variety of small, but beneficial tasks. Her enthusiasm, skill and professionalism will be greatly missed when she leaves us this summer to attend the Yale University School of Environment for their Master of Forestry program. We appreciate all of Shay's valuable and functional work over the past 8 months and look forward to seeing what she will achieve in the future - we feel confident it will be something great!



**Sydney Pfeifer-Picard** spent a few weeks this spring volunteering with

RFC's water quality staff. As a senior at Colorado Rocky Mountain School in Carbon-dale, Sydney became interested in river conservation while taking an environmental science class, and wanted to learn about it while helping the community. Sydney will attend Chapman University next year to study health and environmental sciences.

## NEW Ways to Support RFC this summer!

**Become a monthly Baseflows donor!**

Learn more at [roaringfork.org/baseflows](http://roaringfork.org/baseflows)

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to win a limited edition Bates Hayes belt buckle, Trip to Costa Rica and more!

Stay tuned to our website for more details!



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Benefitting Roaring Fork Conservancy

**Wednesdays, July 7th & 14th**

Cocktail Pairing Dinners featuring:  
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**Wednesdays, July 21st & 28th**

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Learn more at [roaringfork.org/events](http://roaringfork.org/events) !

FREE RANGE  
KITCHEN & WINE BAR

32 Winds  
WINE

WOODY  
CREEK  
DISTILLERS

## RIVER CURRENTS

is published biannually by Roaring Fork Conservancy. Since 1996, Roaring Fork Conservancy has inspired people to explore, value and protect the Roaring Fork Watershed. We bring people together to protect our rivers and work to keep water in the streams, monitor water quality, and preserve riparian habitat. Roaring Fork Conservancy is an independent 501(c)(3) not-for-profit organization registered in the state of Colorado.

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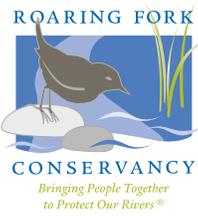
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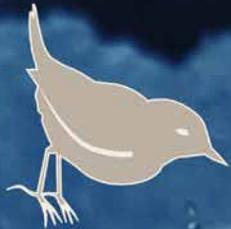


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