



Training the Next Generation of River Professionals and Scientists



Students Overcome Multiple Challenges to Conduct River Research

by John McLaughlin

Rivers are powerful teachers. Readers of this journal surely appreciate this wisdom, but its practical significance seems to escape many colleges and universities. The vast majority of undergraduate instruction is confined within classroom walls. Field programs of all kinds have been declining nationwide, a trend accelerated by the COVID-19 pandemic. Student frustration with online learning mirrored similar experiences with lecture-based instruction, leading many to reevaluate college options. Simultaneously, the need for well-trained river professionals has increased with deepening river conservation concerns, growing recreational demand, and thinly stretched agency resources. River-based field education programs provide compelling responses to these issues. This article summarizes student research and experiences in one program, which is linked to a

*Sampling aquatic macroinvertebrates in the
Elbow Creek burn zone on the Grande Ronde River.*

national network of river-based field courses.

River field courses fulfill several important needs. First, they provide essential training and experience for river scientists and other river professionals. Field training develops abilities to recognize river concepts in reality, discern river hazards, and practical skills. River variability and uncertainty provide opportunities to develop problem-solving skills, helping students become more resourceful, resilient, and self-confident. Second, students work in teams toward shared goals, which helps them develop interpersonal skills needed for effective leadership. Third, field courses help students make connections to real rivers, leading to sense of place and motivating river stewardship. For

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Executive Director's Eddy

When Paddling is Not a Hobby and Not an Assignment

This year has offered two very special learning opportunities. Thanks to the creative outreach efforts by colleagues and thoughtful invitations from generous strangers, I am coming to terms with the lightweight nature of my awareness of river tradition compared to that which far predates my discovery of the experiences I believe many RMS members share. While our collective years of enthusiasm, fun, competition, and stewardship may seem like a long time to pursue an avocation, it rounds to zero in the context of the time frame during which rivers have served as the arteries of economic, spiritual, and vocational sustainability for communities across our continent - well before a bunch of people floated over from the East to discover a new land. While we embrace the joy we have experienced and the brilliance and inspiration in people with whom we work, serve, play, and perhaps compete, this appreciation pales appreciably in comparison to the fundamental awareness of knowing rivers as a fundamental staff of life.

We offered partnership support for the June-July 2023 Big Water Salmon Jump (see more about the expedition later in this issue), with folks from a number of eastern Washington tribes. At first, volunteers seemed just like any generous group of people, offering to run shuttle or even produce new boats for the journey. As time progressed, however, I sensed more through the two-dimensionally limited sharing by zoom.

One personal revelation took place during an evening meeting as a tribal elder discussed periodic trips on his home river, the Columbia. Referencing a recent paddle from British Columbia into Washington State on his river, he shared with somber resignation that he hoped the expedition participants would not have to worry about getting 'in trouble' while crossing into the US due to the inconsistent policing of the international border.

Wow. Political authorities or borders



Risa Shimoda, RMS Executive Director

are important for dozens, maybe hundreds of reasons. The 49th Parallel that defines where Canada ends and the US begins was agreed upon in 1818 as a convenient, easily defined boundary. Yet, his comment struck me for the absurdity of defining a change in ownership of the Columbia with a latitudinal line. Recreationists might be annoyed but would comply with stopping ashore at the border to identify themselves. Among tribes for whom the river is a platform for their livelihoods, challenges crossing the border while traveling downstream would be like having your town tell you that the bottom half of your driveway belongs to someone else. Or, that you are no longer allowed to shop at your local grocery stores, or worse that your local store will no longer stock food. This was but one example of a memorable insight obtained by partnering with the Big Water Salmon Jump.

In late August, I attended the White Deer Skin Dance in Hoopa, California, as a consequence of meeting (thanks to RMS member John Newman introducing us) US Forest Service supervisor, Merv George, to explore initial program themes for the 2025 River Management Symposium. Merv is a member of one of the two sponsoring families who have been hosting this ceremony for generations. He welcomed Kai Allen, Collin Ewing and me to what seemed like a large, friendly

President's Corner

family reunion and a day-long sequence of choreographed storytelling near the banks of the Trinity River. We took no photos, as is required. [Dances](#) were accompanied by a group meal.

It's inspiring to think about how many times a ceremony identical to what we witnessed has taken place, and how many dancers have participated in the tradition.

What a crazy, special honor to be hosted with generosity and grace by the leader of this celebration of spiritual renewal, community strength, protection and prosperity ... whose work week is spent in a system framed by federal regimentation and rules.

Rivers are not playgrounds for our tribal colleagues, and they are not properties with boundaries approximated by 'high water' lines. Rivers are and represent home, work, the market, and place for nourishing and vetting one's soul. While river runners feel rivers provide many, if not all these aspects of their lives, they probably end a river day by loading up their boats and driving 'home' to a house, ranch, or apartment.

Feeling "temporary" relative to traditions practiced for hundreds, perhaps thousands of years has encouraged me to make the most of the time I have remaining. I hope you'll look up and out to see what is available to be taught or shared by those whose kin predate our existence. You'll learn more than you've planned. ❖

Risa Shimoda
Executive Director

Over the last few years, like others who may soon be able to retire, I have begun reflecting on my personal life and professional career. The ability to balance both required taking a hard look at my path, and what the next step should be, in order to find the perfect balance between the place that I now reside and the final position that I will hold within the federal government — if perfection is possible.

Having traveled from Maine to Colorado and then Alaska, my first federal job was as a Dinosaur National Monument river ranger. My first permanent job as a Visitor Information Specialist resulted from my desire to put away my traveling shoes so I could have a dog and create a home for myself. Ironically, my vagabond way of life did not cease as my career has provided me with the opportunity to live and work in some of the most beautiful places in the country including some of my favorites: Fairbanks, Alaska; Dinosaur National Monument; Vermilion Cliffs National Monument; and, northern Idaho.

Taking the best aspects of the places and jobs I have loved, my husband and I identified the communities and states we would both be willing to live in (as well as places and situations we would not consider). We wanted a place where we could hunt, fish, and boat (me). Ideally it would offer music, good food, golfing (him), and museums — and, be small enough that we could become active members of the community. The second step was harder for me — a gut-check review of jobs that I could enjoy, avoiding those positions that would not diminish my stress level.

The final results of this self analysis and reflection was quite surprising not only to me, but to those closest to me. After holding visitor services and recreation positions for over 23 years, I decided to seek out positions that were not directly responsible for the management and oversight of recreation resources, Wilderness, or Wild and Scenic Rivers. Reviewing job openings on USAJobs, I located a position in Cody, Wyoming. The 1995 memory of a fork in the road resurfaced — when I had to chose between working as a river guide in Denali National Park or a backcountry ranger in the Wind River area of Shoshone National Forest. I walked across the house to ask my husband if he would be willing to live in Cody. "I have always wanted to live in Cody" he responded, mimicking my response to Cody when I drove through it briefly in my early 20's.

For those who are unsure if you will qualify for a position, or are concerned about making a big move, take my husband's advice, "you won't know unless you try." I applied and accepted the position of Resource Staff Officer with the Shoshone National Forest in May. Deciding to manage outstandingly remarkable values that are not recreation based (such as fisheries, hydrology, geology, and wildlife) required me to leap out of my comfort zone, but the challenge has been accepted.

From the first exploratory trip to Cody in May, we realized this is the place where we can set down our roots, especially as I stumbled upon spots on the Shoshone or Big Horn National Forests that reminded me of Alaska, joined the local river community on the Monday night boating trips, or listened to music at the park after yoga. But alas, time will tell if my fingers and toes dig deep into the soil and my spirit becomes bound to the mountains, rivers, and spaces that are Wyoming. If my spirit stops mourning Alaska and Greenville, Maine, then I have found *home*. ❖



Judy Culver, RMS President

Judy Culver
RMS President

Audacious, Inclusive Team-Building and the 2023 Big Water Salmon Jump Expedition

by Risa Shimoda

Last fall, RMS was invited to support the Big Water Salmon Jump, a 350+-mile (to expand to 500 in 2024-2025) expeditionary paddle in traditional canoes down the Columbia from Revelstoke, BC to its confluence with the Snake River. During the process of attending monthly zoom planning meetings for a six week-long journey and becoming familiar with the contributing community, we helped the group obtain safety gear sponsorship from the awesome folks at NRS.

We also invited Peter “PT” Bruno, Expedition Lead and Ben-Alex Dupris, Colville Confederated Tribes, to share their inclusive leadership model and collaboration of tribal neighbors from the Pacific Coast and inland communities during the [2023 National Wilderness Skills Institute](#). Paddlers from several tribes, primarily from Eastern Washington, participated in boats or on land (providing shuttles, meals and campground entertainment) through the unimaginably engaging, inviting outreach of the expedition’s organizers.

Here is a 21-minute video of their remarks which underscore the role of this celebration of the river and its importance to their families, traditions and culture. This was certainly fun and an adventure, but paddling and reverence for the Columbia is not a hobby as paddling tends to connote outside of a tribal context. <https://youtu.be/UpIzf6mEUpg>

Here is what a morning on the river was like, an ‘en route’ social media video posted by the Spokane Riverkeepers, who were terrific supporters of the project. <https://www.facebook.com/crystal.conant/videos/254215863978569>

The Big Water Salmon Jump Expedition on the Columbia River set out mid-June in Revelstoke, BC, and concluded at the Snake River confluence in late July, a six-week expedition held to highlight the importance of the river to salmon and celebrate the refamiliarization of traditional canoes. Photo courtesy of Camille Rogers.



At the conclusion of the expedition, a member of the organizing team thanked donors and partners and shared a few fantastic photos. RMS appreciates the opportunity to support the 2023 Big Water Salmon Jump, and is honored to play a small role in the ongoing plan to travel the Columbia again. ❖

Dear Donors,

We want to sincerely thank you from the bottom of our hearts for your donation to the Big Water Salmon Jump! Your vital donations went directly to ensuring the participants, both paddlers and shuttle drivers, had the correct supplies to stay safe, well fed, healthy and happy on the journey from Kettle Falls to Sacajawea State Park in Pasco, Washington. Over the length of the trip, approximately 35 people had the opportunity to paddle, with 13 of those paddlers participating from start to finish. We had two shuttle drivers, who dedicated their time to buying and delivering supplies to the paddlers, as well as scouting and reserving camps.

We hand selected photos that demonstrate the tenacity and joy that being on the river brings and it is thanks to you that we have these special memories!

This trip is intended to be the first of two exploratory expeditions, that will create the groundwork for a canoe journey from the Upper Columbia River to the Pacific Ocean in 2025.

So, remember, although this journey is over, the community and family continue! Keep your ears, eyes and hearts open for the next canoe gatherings. Pray for the water and the Salmon. We hope to see you on the waterways!

~ Camille Rogers
Big Water Salmon Jump

Right: “Catamaran Canoes” with Alex (right), Eneas (left), Roslyn (back), in Bridgeport, WA. Photo: Camille Rogers

Below: On-water safety was offered to participants, made possible by the Spokane Riverkeeper. Photo: Ben-Alex Dupris



Below: Final landing at Sacajawea State Park, with remaining participants (L to R): Ermilo, Louis, Camille, Annie (back), Christian (front), Alex (blocked in back), Devon (front), Crystal (front), PT (back), Roslyn (front), Louis, Basil (front), Joe (back), Janine (front), Churchill (back), Som (front). Photo: Betty Jo.





Partnering Across the Divide

Montana Western partners with Colter Pence (WSR and Trails Program Manager, U.S. Forest Service) and Sheena Pate (Executive Director, Flathead Watershed Alliance) to Engage in Wild & Scenic River Education and Enhancement

by Arica Crootof

“Instead of having a couple students for an internship, what if we brought a whole class to the Flathead?”

When Colter Pence and Sheena Pate learned about Montana Western’s partnership with RMS and RSLC they reached out to engage undergraduate students in field-based river projects. What an amazing opportunity for our students—they could explore a new watershed and apply their knowledge and skills on needed projects—I was in. The three of us met regularly to plan and Colter and Sheena traveled to Dillon, MT to present, “*Stewardship Fundamentals of Wild and Scenic Rivers in Montana.*” Not only did their talk spark interest in the class but the certificate program too.

Montana Western students regularly visit our local rivers—the Beaverhead, Big Hole and Ruby—for river-based classes or after class to catch (and release) Westslope Cutthroat and Arctic grayling. These rivers flow through native sagebrush-steppe communities and irrigated agricultural fields that highlight the semi-arid climate in Southwest Montana. A stark contrast to the

lodgepole and douglas fir forests and rugged peaks that surround the Flathead River in Northwest, MT.

On day three of class — *Applications in Watershed Management* — eighteen of us pile into three SUVs to head north, up and over the Continental Divide that separates our local Missouri headwater basin from that of the Columbia. As we drive, we watch the brown rangeland turn into green farmland and the rivers grow in size. To learn about this new watershed, we meet with our partners at the Hungry Horse Ranger Station outside of Glacier National Park.

Echo Miller-Barnes, a local river ranger, shares what it is like to work as a river ranger and Sunshine Flamer shares about her work with the Flathead Watershed Alliance and AmeriCorps. Then comes the big reveal — the five projects we are assigned to complete. There’s an air of excitement mixed with anxiety as the looming projects and our three-week timeline set in. We spend our final day of this field trip touring field sites and meeting with local experts to better understand the needs of these projects.

The class in Glacier National Park, Montana. Photo: Kim Giannone

Then back to campus for the work to begin. Over the next two weeks we work on the following five projects:

1. River Channel Mapping – The Flathead River was last mapped in 1976 using even older imagery to distinguish sections under the National Wild and Scenic Rivers Act. To update this mapping, students used NAIP satellite imagery from fall 2020 and delineated 200 miles of the main channel in ArcGIS Pro. Although the total length of the protected Wild & Scenic sections did not drastically change, we found many active sections that have a history of migration.

2. Updating Hydrographs – The U.S. Forest Service’s floating guide provides three hydrographs, one for each fork of the Flathead River at a specific USGS gauge site. The existing hydrographs show median daily streamflow using data from one (2007) to three years (2004 - 2007). The students made a compelling case to use mean daily streamflow and created 3-, 10- and 30-year averaged hydrographs for to examine historic trends and capture the variability of these rivers.

3. Mapping Goat Lick Sites – To begin, students had to first learn more about the geology of the region that creates these ‘goat lick’ sites and learn about mountain goat populations, behavior, and threats in and around Glacier National Park. Upon learning about the harmful impacts that humans can have on mountain goats, the students recommended that Glacier National Park work to remove observation decks that are adjacent to the goat’s travel corridors instead of expanding these lookouts for public access. These findings led to interesting conversations about balancing wildlife protection and the National Park’s mission.

4. Mapping Vegetation Treatment Areas – During our stay in the Flathead, we learned that a common misconception is that no thinning or forest management can occur within the *Wild and Scenic* corridor. To help counter this misconception, we were asked to create a map showing the range of vegetation treatments that have and do occur within the protected *Wild and Scenic* corridor which extends a quarter mile of each side of the river. Using ArcGIS Pro, students mapped over 600 vegetation

treatments by the U.S. Forest Service within protected corridors to be used for a future public-facing map.

5. Water Quality Assessments – A variety of water quality samples were collected by the citizen science group, Adventure Scientists. Students compared water quality results from these samples to state standards and found the water quality to largely be in compliance. A couple outliers led the students to raise questions about sampling and calibration procedures and recommend standard operating procedures moving forward.

With a few days of class left, we return to the Flathead to formally present our results and receive feedback. Working with our partners we also develop a suite of next steps. For example, we hope to have students in *Environmental Interpretation* use the student’s final reports to create [StoryMaps](#) that help connect this work with a public audience and we plan to return to this class format and build upon this collaboration for future classes! Our amazing partners organized a grand finale float. For many, this was their first rafting experience but hopefully not their last. A big *thank you!* to all who helped make this trip possible:

- ~ Sheena Pate, Sunshine Flamer and Flathead Watershed Alliance
- ~ Colter Pence, Paul Donneloon and Flathead National Forest
- ~ Hilary Hutcheson, Fly Fishing Guide
- ~ Housing donated by Glacier Guides & Montana Raft Company
- ~ River trip donated by Wild River Adventures
- ~ Montana Western Foundation X1 Learning Grant ❖

Arica Crootof is an Associate Professor of Sustainability, and River Studies and Leadership Certificate Advisor, at University of Montana Western.

Montana Western students working on a stream restoration in Centennial Valley, MT. Photos: Arica Crootof



A river trip celebration thanks to our project partners and Wild River Adventures.



Responsible River Recreation in Montana: Creating new videos for growing river use

by Cannon Colegrove

Montana State and Federal Natural Resource agencies along with river organizations in Montana recently partnered with Montana PBS to develop a series of videos that encourage responsible and safe recreation on Montana's rivers. Montana has incredibly diverse river landscapes. Western Montana rivers are often characterized by cold, clear water flowing through mountainous backdrops along forested banks, while central and eastern Montana rivers flow through cottonwood bottoms, agricultural lands, and through the Missouri River Breaks. Montana rivers have played an important role for people for hundreds of years, and these river systems include incredible wildlife, cultural resources, and a world

class wild fishery full of trout in cooler streams of central and western Montana, and warm water species such as catfish, sauger, and smallmouth bass on the east side of the state. With growing outdoor recreation on all of Montana's rivers, getting the message out about how to recreate responsibly on Montana's rivers is increasingly important to protect the experience and natural resources for generations to come.

During the summer of 2022, Montana PBS worked with staff from Montana Fish, Wildlife and Parks, the US Forest Service – Flathead National Forest, the Bureau of Land Management – Missouri River Breaks National Monument,

Flathead Rivers Alliance, and members of the River Management Society to film responsible recreation on various rivers across the Big Sky state. The video series intends to capture the beautiful and diverse landscapes and opportunities that exist for river enthusiasts while sharing and educating about best practices for responsible recreation to ensure the unique resources of Montana are protected and preserved for others to enjoy. The video project is a great way to showcase Montana's incredible rivers while sharing a positive message about responsible recreation while on the river. ❖

Cannon Colegrove is an Outdoor Recreation Manager at MT Fish, Wildlife and Parks. (cannon.colegrove@mt.gov)

Montana PBS Director of Production, Scott Sterling, films during the evening cleanup on the Blackfoot River. Photo: Cannon Colegrove



You can find the video series by searching:

“Montana River Recreation Videos”

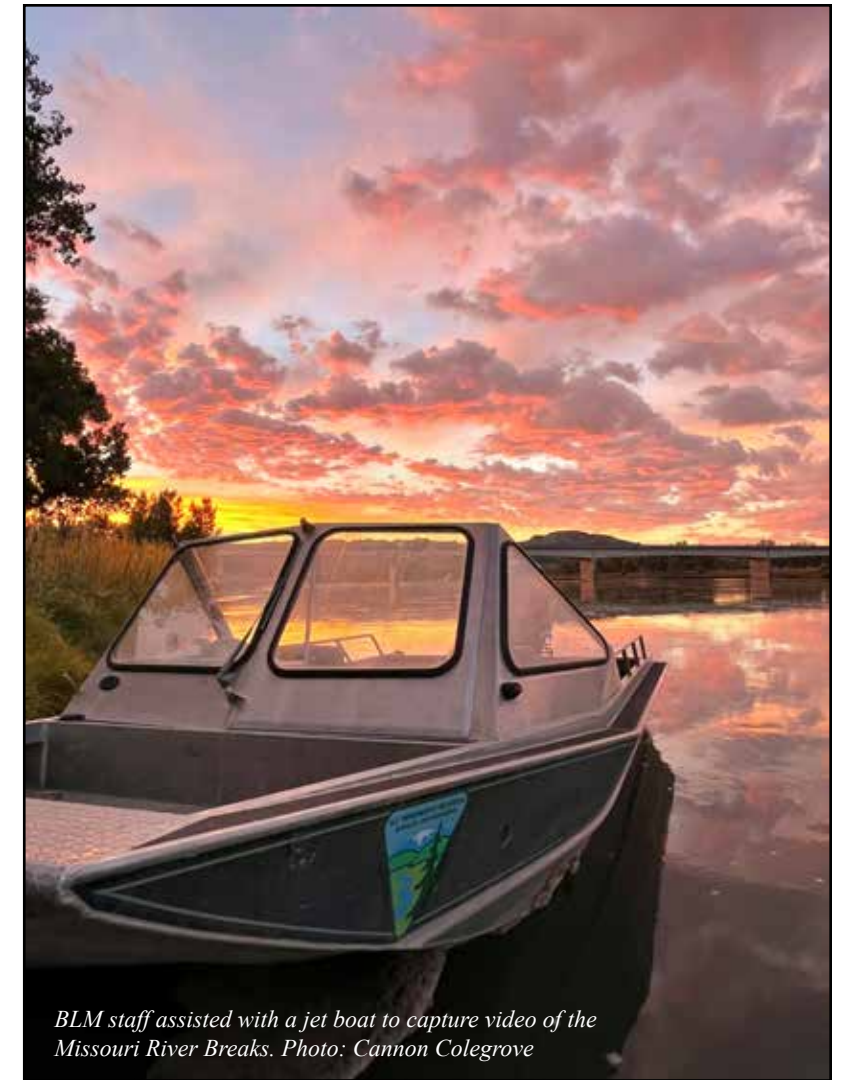
or, by following the YouTube links:

Montana River Recreation: Plan Ahead - www.youtube.com/watch?v=DEmOY42NR3g

Montana River Recreation: On River Safety - www.youtube.com/watch?v=EBCceBpkpSA

Montana River Recreation: Overnight River Camping - www.youtube.com/watch?v=jFhQk-9bK4s

Staff from Montana PBS, Flathead Rivers Alliance, the US Forest Service, Montana Fish, Wildlife and Parks, and River Management Society members join together on a memorable trip down the Blackfoot River to capture responsible recreation video content. Photo: Montana PBS



BLM staff assisted with a jet boat to capture video of the Missouri River Breaks. Photo: Cannon Colegrove



Wyoming's Wild & Scenic WildWall

Kika Macfarlane — an illustrator, designer, augmented reality creator, and animator of the Wild and Scenic Wildwall in Jackson, WY.

by David Cernicek

It first came into my fed email inbox from one of the Bridger-Teton National Forest's whitewater outfitters — Bud Chatham of Dave Hansen Whitewater (DHW). He was participating with the Snake River Fund in a Jackson Hole Public Art Mural Program called “WildWalls,” a program that combines large outdoor murals with augmented reality (AR) features to promote a greater understanding and awareness of the region's ecosystem through contemporary scientific research.

JH Public Art works with selected artists and collaborating organizations to generate educational content that brings each mural alive. Dave Hansen WW and the Snake River Fund were sponsoring a fifty-foot mural inspired by the Wild and Scenic Snake River Canyon to occupy the back wall of the rafting company office, an old brick downtown gas station. They were seeking professional opinions on which artist concept I liked best, and help with Wild and Scenic truth checking/content.

Kika Macfarlane, a very talented young illustrator, designer, augmented reality creator, and animator living in Jackson (who had worked for Patagonia and Stio) submitted a concept that was

amazing. Once selected it took very little to get great results. I explained that the outfitter worked in the Snake Canyon so it shouldn't be Grand Teton centric, and should reflect downstream Snake River Canyon outstandingly remarkable values. Her final design hit the mark beautifully, and Wyoming had its first Wild and Scenic WildWall.

WildWalls augmented reality features are hosted on the [Hoverlay](#) app, available for free on all smartphones. It Uses AI to provide more information when your camera is pointed at something like a mural.

There is a walking tour of at least sixteen walls where viewers can use the Hoverlay free app by holding it up to the mural to receive education messages. These are the links for the Wild and Scenic Wildwall's information revealed when the Hoverlay app is held up to the wall. For the left portion of the wall: <https://vimeo.com/745110423> and the right portion of the wall: <https://vimeo.com/745110754>.

More information can be found at: <https://jhpublicart.org/art/wildwalls23> ❖

2023 River Ranger Rendezvous – Three Forks of the Flathead River

by Colter Pence and Echo Miller-Barnes

River rangers from the Rogue Wild & Scenic River (BLM) and Snake River Headwaters Wild and Scenic River (USFS) joined Flathead National Forest river rangers, Flathead Rivers Alliance staff, and Glacier National Park staff for a River Ranger Rendezvous on the North Fork of the Flathead River in late July 2023. Located in NW Montana, the North Fork of the Flathead is the boundary between the Flathead National Forest and Glacier National Park; it has Class I-II rapids and meanders through a glacial valley, home to grizzly bears and amazing views of the Lewis Range.

The group met at the Hungry Horse Ranger Station to orient to the area and sort out final logistics and then traveled up to the Ford river access site. For the next three days the group patrolled down the river, camping at mid-stretch campsites and making stops at points of interest along the way. Though the water was unseasonably low, spirits and stoke were high as the group set off from Ford.

The first day on the water, the group stopped at Sondreson Meadow for lunch and a discussion on increasing recreation use, the importance of conservation easements, and to hear from our non-profit partner Flathead Rivers Alliance. Sondreson was the perfect backdrop for these talks as it's a former private parcel, now National Forest System land, that is primarily used as a dispersed camping area and has been receiving high use and pressure from visitors. If you look closely when camping there, you can see the outline of the old backcountry airstrip that was open when the land was private but has since grown over. The entire day, from putting in at Ford to stopping at Sondreson to our camp for the night, we had sweeping vistas of Glacier National Park (GNP) and the Lewis Range as our backdrop. That evening brought a good lesson in camping in grizzly country as the group learned how to set up an electric bear fence around our kitchen and made sure all attractants were stored inside the fence. No one wanted to share their tent with a bear!

The group at Polebridge Ranger Station in Glacier National Park, Montana. Photo: Colter Pence, USFS



Topic	Ties to Technical Core Competencies KSAs	Additional Materials
3 Forks of the Flathead WSR Outstandingly Remarkable Values	<u>WSRA Law/Regs/Policy</u> : Ability to describe WSR values for designated rivers in management areas.	3 Forks of the Flathead ORV Assessment document ; Provalens Wild and Scenic Rivers Course of Study , Module 7: Managing Wild and Scenic Rivers
River Recreation in Bear Country	<u>Other Relevant Laws, Policies and Tools for River Management</u> : Knowledge of federal, state, and local policies and laws which apply to rivers in management area	Interagency Grizzly Bear Committee, Be Bear Aware website; Flathead National Forest Visitor's Guide to Storing Food & Attractants in Bear Country
Authority of the Resource Technique/ Public Contacts	<u>River Management Field Skills</u> : Knowledge of non-LE techniques to educate public on rules/regs.	LNT.org , YouTube video Authority of the Resource Technique: How to Communicate Leave No Trace
Encounter Monitoring using 3 Forks Flathead River Method	<u>Visitor Use Management and Monitoring</u> : Skilled at following protocols to inventory and monitor visitor use and impacts	Interagency Visitor Use Management Council Monitoring Guidebook; Provalens Wild and Scenic Rivers Course of Study , Module 10: Monitoring
Flathead River System Awareness	<u>Natural/Cultural/Rec Resources Manage/Monitor</u> : Knowledge of the story of human occupancy of the area.	Flathead Watershed Sourcebook ; 3 Forks of the Flathead Information Toolkit
Flathead River Patrol Reporting System	<u>River Management Field Skills</u> : River information and education techniques.	Flathead River Patrol Reports website
Flathead Rivers Alliance Partnership	<u>Collaboration and Engagement Techniques</u> : Knowledge of conservation partnerships and collaborative models in use on relevant management area.	Flathead Rivers Alliance materials and website

Our second day on the river started with an easy meander downstream to our next point of interest: Polebridge Ranger Station in Glacier National Park. Here, we learned about the park's new ticketed entry system, recent recreation challenges, and the history of the Polebridge Ranger Station from the district ranger. The Polebridge Ranger Station got its name from a historic "pole-bridge," which burned in 1988 and was replaced with a more modern, concrete bridge. The replacement of that bridge crossing the North Fork was the source of litigation centering on ensuring that river managers consider how *Outstandingly Remarkable Values* need to be protected and enhanced in replacing infrastructure on and around Wild & Scenic Rivers. Once we got to camp, folks beat the heat by swimming, fishing, and hanging out in the shade before eating dinner and continuing conversations.

The third and final day brought us to our take-out at Coal Creek and all the organized chaos that comes with derigging after a

few days on the river. After loading boats and gear back into the trucks, we did a quick wrap-up and reminisced on some of the highlights of the trip. This trip was a fantastic opportunity for us here on the Three Forks of the Flathead to share the many incredible and interesting aspects of our river and work while learning about and from other river programs and rangers in the Western US.

At the 2023 Three Forks of the Flathead WSR River Ranger Rendezvous, we rooted our discussions and stopping points in the topics outlined in the adjacent table. These topics tie to various river ranger technical core competencies and are identified here for the purpose of validating the value of the River Ranger Rendezvous. "River side discussions" were had for all the topics and additional materials for follow-up learning were identified. Learn more about the [Technical Core Competencies for River Management Specialists](#). ❖

*Packing up the boats after a good lunch at Sondreson Meadow with the Lewis Range in the background. Notice the various agency markings on the boats!
Photo: Sheena Pate, Flathead Rivers Alliance.*





RIVER CAREERS

A DISCUSSION SERIES FOR STUDENTS AND EARLY CAREER PROFESSIONALS



Students and early-career professionals invited to free River Careers Discussion Series:

This 4-part webinar series is designed specifically for students and early-career professionals interested in pursuing river-related jobs. Each session will explore distinct career pathways and provide invaluable insights into the nonprofit, private sector, public agency, and policy and research professions within the river industry.

All sessions are one hour and begin at 12 p.m. PT / 3 p.m. ET.

This series is free and open to River Management Society members and non-members.

Sept 13 - "Public Agency Pathways"

Oct. 11 - "Policy and Research Pursuits"

Nov. 1 - "Navigating Nonprofit Jobs"

Nov. 29 - "Private Sector Pathways"

Register online (<https://bit.ly/44hmvsp>)

Get to know our River Studies and Leadership Certificate alumni – the next generation of river professionals

by Bekah Price

RMS launched the River Studies and Leadership Certificate program in 2015 in partnership with various universities to help students build a foundation of knowledge, skills and experience in river-based science, policy, conservation, education and recreation. Since then, 53 students have graduated with the certificate, and most have gone on to pursue careers in river management and stewardship.

In this RMS Journal column, we showcase their success so that our members can get to know them and learn more about today's pathway from student to river professional.

Katie Schmidt, she/her, Virginia Commonwealth University alumna

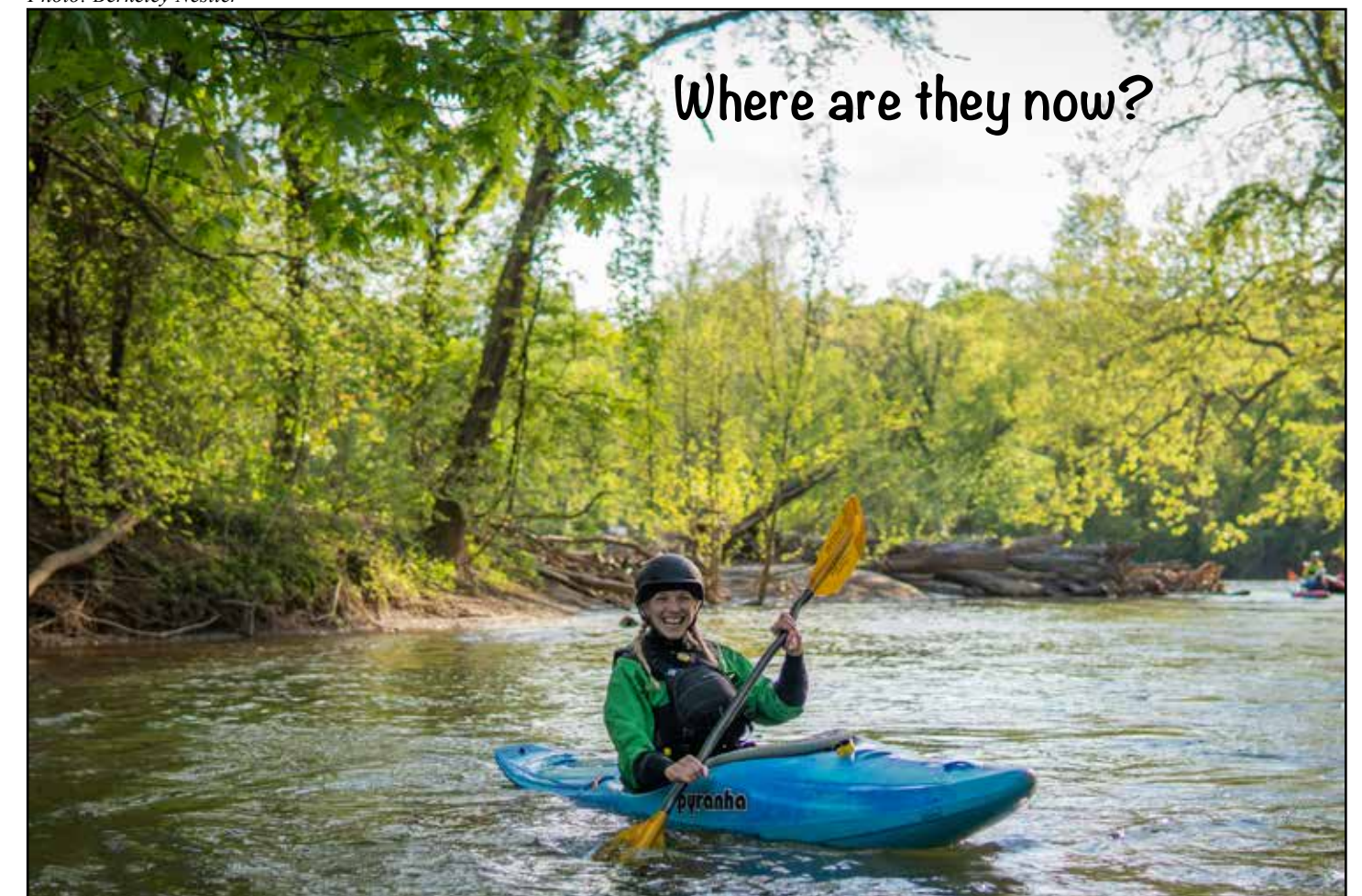
As a whitewater paddler, I have developed a deep connection to rivers and a desire to protect them. This drives my work at American Rivers, a national river conservation organization dedicated to protecting and restoring rivers. We believe that life depends on rivers, and I chose to focus on dam removal as this is the fastest, most efficient way to bring a river back to life.

During my time in the RSLC program at VCU, I did hydropower reform work with American Whitewater's National Stewardship Director, Kevin Colburn. I built off of this work as a Fellow at American Rivers when I researched and wrote a guide to removing federally regulated hydropower dams.

In July of 2023, I accepted the position of Associate Director of our National Dam Removal Program at American Rivers. In this role, I coordinate and implement our dam removal policy agenda and work with our federal agency partners. I am also expanding dam removal practice in regions without American Rivers staff and developing tools and resources for dam removal practitioners.

The RSLC program, my advisor Dr. James Vonesh, and my experience with the River Management Society have all helped me on my path. As I write this, I am sitting on Capitol Hill, about to start a meeting with another river champion in Congress. We all have a role in protecting and restoring the environment and I am grateful for the opportunity to play my part. ❖

Katie Schmidt on the James River, VA.
Photo: Berkeley Nestler



(continued from p.1)

some, these connections kindle a sense of wonder and curiosity that sustain scientific careers. Fourth, field courses often contribute to improved learning and academic performance in all contexts. Finally, river field courses provide access to experience, equipment, and skill development that are less available to some identities. In this way, river field courses can help river professions become more representative of the larger population. Each of these field course outcomes becomes more enduring when experiences are immersive, involving multiple days working and living in river environments.

Each spring, I teach a 15-credit block of field courses (Environmental Science Field Camp) centered around scientific field research expeditions. Students work in small groups to design research projects, which they implement during two expeditions. Prior to the program, most students have completed instructor-designed projects but few have conducted their own “authentic” research. Consequently, I mentor students closely throughout project development and implementation to facilitate their transition from student to scientist. I provide similar training and mentoring in river skills and procedures. Prior to each expedition, students identify their research interests, review the scientific literature to identify knowledge gaps, formulate research hypotheses, and design sampling protocols. After feedback and revision, they test their protocols at local field sites. Then the entire class participates in the expedition, during which each research group implements their protocol. After the expedition, we analyze the data to evaluate the hypotheses. The projects culminate in written scientific reports and presentations in a university-wide research symposium. Some students also presented their work at conferences beyond the university and we have submitted some reports for publication in scientific journals. For students, this experience is powerful and rare: few students engage in science at this level before grad school.

Student composition in the program has been more diverse than the university’s student population and most river professions. In 2021, one third of students were people of color. In 2022, 45% of students had underrepresented identities as people of color or LGBTQIA+. (In spring 2020 the university’s COVID response banned travel and required all courses to be online. In spring 2023 I was on sabbatical leave conducting river

Students measuring amphibian habitat upriver from dams and reservoirs removed on the Elwha River, Olympic National Park, WA.



research, during which I did not run the program.) The program orientation and subsequent activities emphasized an inclusive social environment, which also facilitated effective teamwork during expeditions.

In recent years, the field expeditions centered on Northwest rivers, spanning ten days each. The first expedition traveled up the Elwha River on the Olympic Peninsula, Washington, focusing on science to inform ecosystem restoration following humanity’s largest dam removal to date. We reached field sites via backpacking along a route lengthened considerably after river floods eliminated road access. The second expedition has been a 92-mile raft trip down the Grande Ronde River to its confluence with the Snake River, launching on the Wallowa River ten miles upriver from the confluence with the Grande Ronde. During the COVID-19 pandemic, I integrated infection risk into a comprehensive risk management program. That program was designed to reduce risk of infection and other incidents below that of staying home. We implemented a COVID-free “bubble” strategy for each expedition, in which students avoided pre-expedition exposure, tested negative immediately prior to the expedition, and avoided outsider contact throughout the expedition. This strategy facilitated close collaboration throughout expeditions, and provided students a welcome alternative to online instruction that prevailed during the pandemic.

Student research projects addressed diverse river components in 2021 and 2022. Along the Elwha River, some studied amphibian habitat use and responses to riparian restoration following dam removal. Other groups surveyed carnivore habitat use, factors associated with invasive plant distributions, and effects of large woody debris on floodplain sediment deposition. On the Grande Ronde River, students studied habitat selection of river-dependent birds, butterfly-plant relationships, riparian songbird-habitat relationships, invasive plant distributions and habitat suitability modeling, large woody debris distribution, and impacts of wildfire on aquatic macroinvertebrates.

Research projects before the pandemic were similarly diverse, and focused on Elwha River restoration. In 2018, student teams studied insects and spiders in vegetation restored to the Elwha’s largest reservoir bed, amphibian distributions on the former reservoir, ungulate browse impacts on trees and shrubs establishing in the reservoir, beaver browse selection, and responses of river-dependent birds to dam removal. In 2019, students studied amphibians and wetlands in the larger reservoir and another valley above the dams and reservoirs, ungulate browse in the upper valley, fungal distributions, and habitat selection by Spotted Sandpipers.

Below are some noteworthy results from several projects.

Amphibian responses to Elwha restoration have been rapid and dynamic. Initially, only one or two species were restricted to streams flowing over bare sediments on the former reservoir adjacent to pre-dam forests. During the next few years, trees and shrubs grew rapidly in damp sediments along the streams, restoring amphibian habitat. In addition, high river flows left ephemeral ponds adjacent to the active channel, which amphibians used as breeding sites. Now multiple amphibian species are found in habitats throughout the former reservoir. Students’ analyses have shown that amphibians are found most consistently in larger and more complex wetland habitats.



Students establishing a plot to measure ungulate browse on the former Mills reservoir, after removal of Glines Canyon Dam, Olympic National Park, WA. All photos: John McLaughlin

Logs support Elwha restoration by protecting plants from deer and elk. Ungulates impact riparian habitats when intense browsing limits growth of trees and shrubs. Browse impacts are particularly relevant to river restoration, where woody plants provide shade and stabilize banks. Students studied the potential for large logs to reduce browse on both the Elwha’s largest former reservoir and an upriver valley that serves as a model for restoration. They measured browse in four contexts:

open areas without wood, adjacent to single logs, between two parallel logs, and fully surrounded by wood. They found large wood can reduce browse up to four-fold, but only where wood surrounded plants. These results have important restoration applications: clusters of logs can support growth of forest islands, which could accelerate riparian forest restoration.

River-dependent birds responded rapidly to dam removal. Removing dams affects habitats and food sources used by river-dependent birds. Students measured responses to these changes by surveying birds along the Elwha River from the mouth to a valley upriver from

Students at Glines Canyon, Olympic National Park, site of the largest dam removed on the Elwha River.



the former dams and reservoirs. Then they compared their surveys with data collected before dam removal using the same method along the same reaches. Their results showed large increases in species that use early successional habitat, along reaches most changed by dam removal. Little change has yet occurred in species that depend on late successional habitat structures or fish abundances that will require decades to restore. These results suggest river-dependent birds can serve as indicators of river restoration, from early to late in the restoration process.

River-dependent birds use habitat without regard for ownership or WSR designation. Students recorded bird habitat use vs. availability while rafting down the Grande Ronde River. Then they evaluated

habitat selection using graduate-level statistical methods. Their results were clear and consistent with habitat associations known for each species. Results became stronger along arid reaches downriver where trees were sparse. The birds responded to specific habitat structures, which merit priority in river management. Students found little influence of private vs. public ownership or Wild and Scenic designation, perhaps due to consistently high river habitat quality or WSR suitability of the

undesigned lower river.

Wildfire impacts to aquatic invertebrates decline downriver. Wildfire is known to decrease aquatic macroinvertebrates in burned reaches, but it was not known how far downstream this impact extends. A student team studied this issue one year after the Elbow Creek Fire, which burned nearly 23,000 acres along 13 river miles on both sides of the Grande Ronde River. They sampled macroinvertebrate species composition and abundances above, within, and below the burn zone. They found a dramatic reduction in macroinvertebrate diversity and abundance in burned reaches, relative to baseline samples measured upriver from the burn. Macroinvertebrate diversity and abundance increased logarithmically with distance downriver from the burn, and did not approach the baseline for a considerable distance (Figure 1). These results warrant additional study on other rivers and fires, in ways that control for other factors along the Grande Ronde that may have affected the results. Regardless, the results may have important implications as wildfires become larger, more frequent, and more severe. Because macroinvertebrates are key components in aquatic food webs, the results also are relevant to salmon restoration in a changing climate.

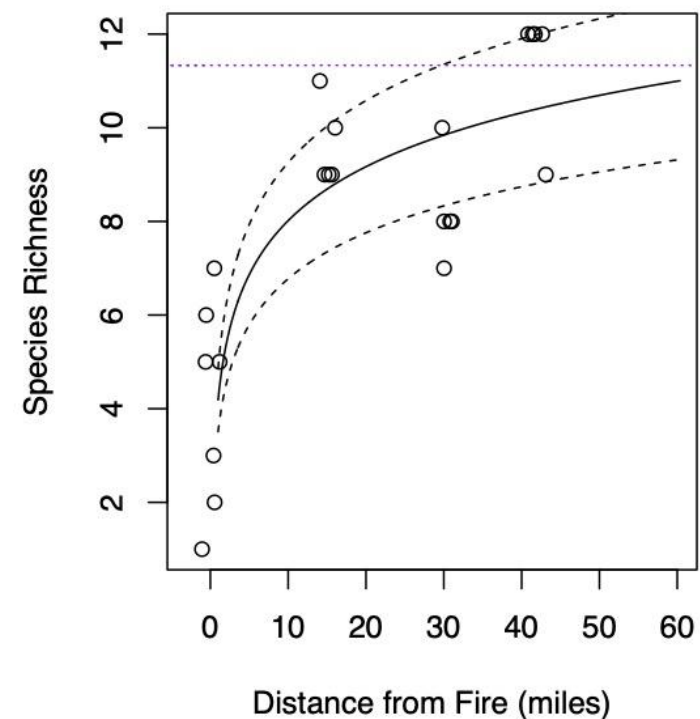


Figure 1. Relationship between aquatic macroinvertebrate species richness and distance from the Elbow Creek Fire burn zone, Grande Ronde River. Circles indicate number of macroinvertebrate species found in each sample. The solid line plots a logarithmic regression model fit to species richness data, $R^2 = 0.70$. Dashed lines plot one standard error above and below the model. The height of the horizontal dotted line near the top of the figure is the average species richness from samples collected upriver from the burn zone. Similar results were obtained for macroinvertebrate abundances. *Figure created by Brock Diehl, Fern Keely, and Adriano de Oliveira, who also designed the project and collected the data.*

Students overcame multiple challenges while achieving these

results. Field challenges included bankfull flows, snowstorms, gale-force winds, limited campsites within the burn zone, long hikes to study sites, and inquisitive cattle. Social challenges included learning to work closely with diverse peers within a tight timeline. Conceptual challenges involved climbing steep learning curves regarding both scientific research and outdoor skills. The university imposed financial obstacles: while institutional funds pay for laboratory courses, students must pay extra for field course expenses. The university also imposed myriad senseless bureaucratic requirements, but those impacted the instructor more than students. Transformative student outcomes each year suggest efforts to overcome these challenges were successful.

Evidence from diverse sources show the program has been effective. Students' presentations usually amounted to at least half of the department's contribution in the annual university-wide research symposium. Elwha research projects have filled important information gaps in the Elwha restoration program, contributing to Olympic National Park's research effort and the Park's symposium series. Grande Ronde expeditions support the local river economy: our raft rentals typically initiate the outfitter's season, providing business during a slow time. Many students described the program as life-changing, where they came to view themselves as scientists, develop close friendships, and clarify their professional directions. Many students reported their experience propelled them in directions they had not considered for themselves, including graduate school, scientific careers, or river guiding jobs. Some of these students had identities under-represented in those professions, so they will contribute to future profession diversity. Finally, the program contributes to the portfolio of river field courses promoted by the River Field Studies Network (RFSN; <https://riverfieldstudies.com/> and RMS Journal, Fall 2019, p.18), which helps instructors at other schools innovate their river courses or develop new courses.

The program can be improved with future opportunities. First, we could collaborate more closely with river management agencies. I have been sharing Grande Ronde eagle location data with BLM staff, but research results would be more useful if the projects were designed around specific management needs. Second, we could reduce student costs to make the program more accessible. We are initiating scholarships in the coming year to support students who would be excluded by course fees. We also are developing a gear lending library to support students who need outdoor gear. Third, we could link more closely with the River Studies Leadership Certificate (RSLC) program. When I become the university's RSLC faculty advisor in fall 2023, I hope to enroll more students in RSLC across the university and within Field Camp. More broadly, positive and negative program experiences can inform instructors at other institutions. The RFSN is working to increase collaboration and knowledge sharing among river instructors across the nation. We also are providing instructor training and support to develop river field courses at more institutions.

In conclusion, rivers and river management face a difficult and uncertain future, but we launch with valuable assets. Experiences described in this article and comparable successes reported by colleagues across the River Field Studies Network outline productive strategies to prepare for that future. The next generation of river professionals will have a deep understanding of river science and river stewardship. ❖



University of Northern Colorado offers new pathway to river-based careers

River Studies and Leadership Certificate now available through River Management Society partnership

by Bekah Price

Undergraduate students who are passionate about river science, recreation, and conservation at the University of Northern Colorado (UNCO) are one step closer to launching their dream river careers. Through a new partnership with the River Management Society (RMS), the school now offers the River Studies and Leadership Certificate (RSLC).

"The RSLC is designed to prepare students for diverse and rewarding river-based careers," explained Angie Fuhrmann, RMS River Training Center Coordinator. "It offers interdisciplinary coursework, hands-on professional experience, and the opportunity to learn from current industry professionals. Students will explore river systems from multiple perspectives, including life and earth sciences, policy and conservation, socio-cultural and economic factors, education, and recreation."

The certificate's coursework requirements closely align with several UNCO bachelor's programs, making it an accessible add-on for students enrolled in Earth Science, Environmental Studies and Sustainability, Geography, Ecology, and Recreation and Tourism.

Students enrolled in the RSLC program will showcase their

Students at UNCO were already participating in some river-based field work, and the certificate program will build upon those experiences with its interdisciplinary framework and focus on river careers.

Photo: Chelsie Romulo, Inset: Sharon Bywater-Reyes

work at the RMS Symposium or in the RMS Journal. They will also enjoy complimentary RMS memberships, networking opportunities with river professionals and fellow students nationwide, and invitations to workshops and river trips.

Dr. Sharon Bywater-Reyes, the school's RSLC advisor, said, "We are excited to offer this opportunity to our students as it elevates our programs with a focus on career preparedness and personalized learning. Graduates will possess a strong understanding of river science, recreation, and management, benefiting both our community and local government organizations." ❖

To enroll, students should contact Dr. Bywater-Reyes at: sharon.bywaterreyes@unco.edu

The River Management Society established the [River Studies and Leadership Certificate](#) in 2018 to underscore the holistic, interdisciplinary approach essential for students aspiring to river-related careers. For more information, contact Bekah Price at bekah@river-management.org.

Montana's Smith River offers unique environment for work or play

by Bill Sedivy

Over the years I've worked or played on most of the rivers that offer permitted, multi-day river trips in the western United States. But when I reported for duty in May at Camp Baker — that's the normal launch point for 5-day trips down Montana's Smith River — I really had no idea what to expect.

Quickly, I found that what the guide books told me is true. The Smith is beautiful, flowing through forested foothills into deep, lichen-covered and cave-pocked limestone canyons. The fishing was great — for brown trout, rainbows, and the occasional Westslope Cutthroat. Birds and wildlife were plentiful. I saw black bears, river otters, mule deer and mink. And oh, the birds — Peregrine falcons, golden eagles, bald eagles, osprey, white pelicans, kingfishers, waxwings and warblers. The Smith may be the Common Yellowthroat capital of the world.

But it also didn't take me very long to learn that the Smith, which flows 58 miles from Camp Baker to the take-out at Eden Bridge, is unique among Western Rivers. The main separating characteristics are rooted in the fact that the river corridor is actually Montana State Park. And as a result, the river is managed more like a park than other western rivers I've run.

For instance:

- There is a sign at every designated campsite on the river. It's hard to get lost on the Smith, and, while it happens, there's little reason to miss your assigned camp.
- Each campsite has a fire ring and tie-off posts for boats — amenities designed to reduce camper and floater impacts on the landscape.
- And through this season, river rangers also dug latrines for use at each campsite. (Beginning in 2024, all floaters will be required to carry out their own waste.)

Other factors contributing to the river's unique character include:

1. It is managed jointly by Montana Fish, Wildlife and Parks (FWP) and the U.S. Forest Service, which owns a spattering of land in the corridor. This management arrangement is unique in my experience, but seems to work well — at least from water level.



Bill Sedivy, River Ranger, digging a new latrine on the Smith River in Montana. Beginning in 2024, all floaters will be required to carry out all human waste.

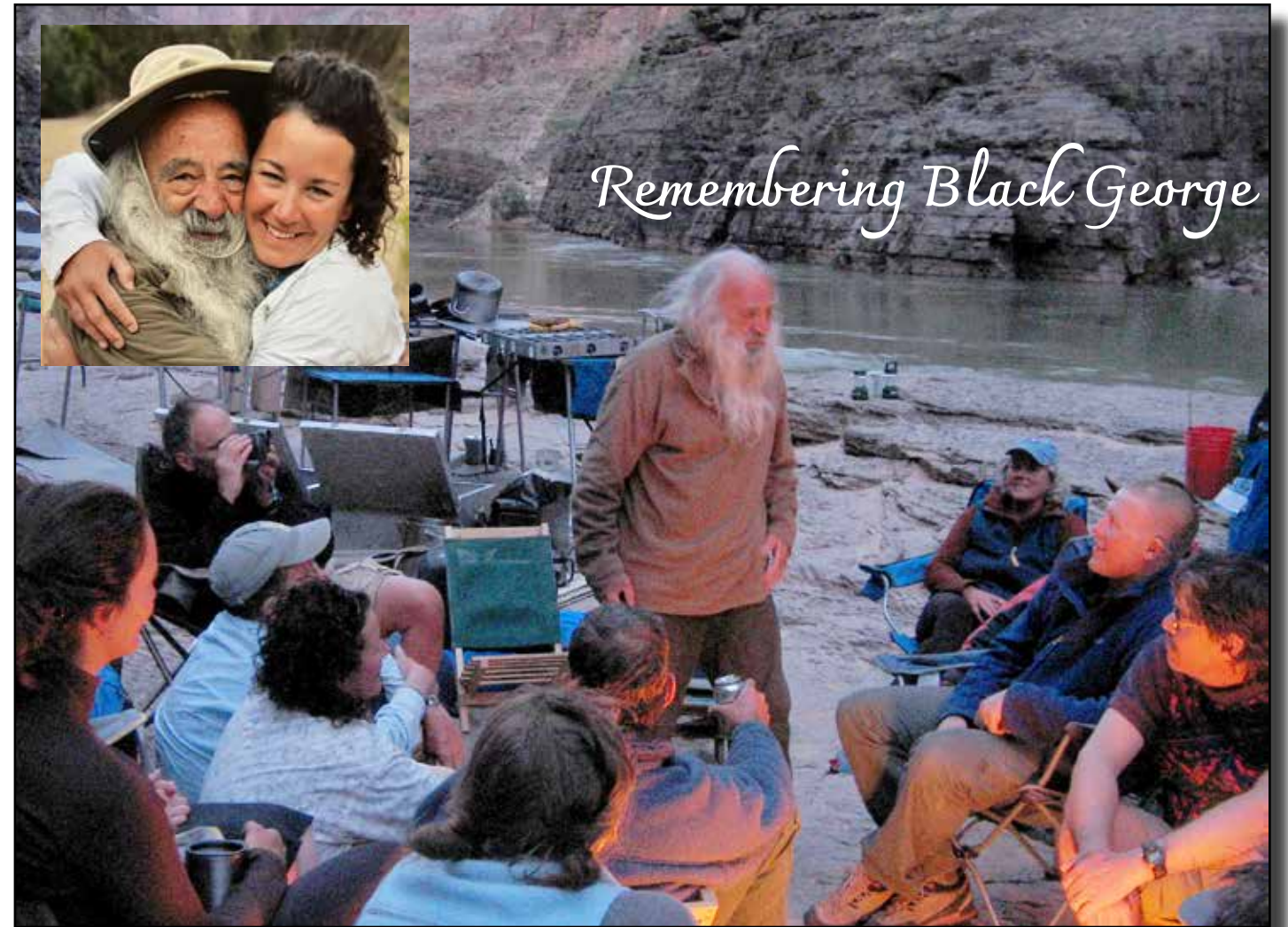


USFS joins FWP for patrols, resource inventories and special projects where that agency has in-house expertise. FWP handles most of the permitting and day-to-day management along the river, including facilities and ramp control at the put-in and take-out.

2. The Smith is not a wilderness river. A few roads, along with hunting cabins, RV sites, cable crossings, cattle guards, and a popular guest ranch dot the river corridor.

In fact, about 80% of the land that the Smith flows through is privately owned. That means floaters need to be reminded about respecting private property, and the agencies managing the Smith need to negotiate with landowners for campsite locations and other matters.

But at the end of the day, like other western rivers where multiple day river trips can be had, the Smith gives its visitors (and all those who work on it) all the beauty, comfort and adventure that only free-flowing rivers can provide. ❖



Remembering Black George

Inset: George and Jennifer Jones, who shares: On a RMS Grand Canyon trip in May 2010, George Simmons was 87 years old — the oldest trip participant ever; and possibly holding that distinction still. He shared stories and recited many delightful poems and tales. With dancing eyes and a heart of gold, he always said he'd live to be 100 — and kept his word. Hear an [interview](#) on NPR and learn more about George's work with USGS and the NPS [Volunteer-in-Park](#) program.

by Rip Simmons

This is not an official obituary as you'll see. In lieu of an official obituary, I'll ask Maureen to send this out like she did with the 100th birthday flyer. This is more of a tribute to his crossing over than anything else. He's told me — and probably a few of you — that when he went, he would prefer to go out as a result of a three-way love triangle gone bad. It didn't happen quite that way; he crossed over peacefully sleeping. But, feel free to tell whichever version suits your audience best. He was quite a character. For instance, the "Black" in "Black George" stems from his dark ("black") history of playing piano in a New Orleans bordello when he was a lad and from being a stripper at the Old Age Widows Club in Houston.

George leaves behind two surviving sons: Clarke Simmons and wife Diane of Arvada, Colorado, and Richard (Rip) Simmons and wife Maureen of Grapevine, Texas. He was preceded in death by his second son David Simmons several years ago. Also surviving are three grandkids and a healthy group of great grandchildren. In most instances and because of George, we're all partial to the outdoors in some capacity. Dad had us boys rafting, hiking, and fishing from very early on. We took walks after dinner on the "lone moose trail," where he could chew tobacco

and we could chew black licorice and spit like him. Traveling cross country, whenever we'd cross the continental divide, he'd stop so we could "take a leak" on the divide and have our business transported into two completely separate drainage basins. How cool is that?! Boy, was our Mom proud.

More importantly is the relationship he was able to form with all of you. From Big Bend, Bryce Canyon, Island in the Sky, Tetons, Mirror Lake, Park City, and onward. He had a great capacity for befriending people from all over the world and took pride in being able to say hello in different languages. If he didn't know the language, his universal "YEEHAA" would easily fill in the gap. This is true from Nepal to Russia to all over the west. He always wanted to try to make the visitors in whatever park he was stationed feel at home. He told me the visitors' biggest thrill was their nearly complete disbelief in the vastness of the places he volunteered and loved. Each one of your friendships gave him a great purpose in life, which he lived to the fullest. Many thanks for all the cards and letters and memories you shared. With you, he's left behind a great group of people who can carry on the mission. And, most importantly, don't forget the tequila!

R.I.P. Dad/George and YEEHAA!!! ❖



Linda Hagedorn on the Snake River, Wyoming.
Photo: Joe Smith

Snake River Headwaters Northwest Chapter Trip Report

by Joe Smith

For this new river advocate, the recent River Management Society's trip (August 31 - September 2) to the Snake River Headwaters was a truly enriching experience. Last January, I started working at the Snake River Fund, a Jackson Hole based 501c3 dedicated to promoting stewardship of and recreational access to the Snake River in Wyoming. While being a lifelong river enthusiast and long-time whitewater guide, I am fairly green in terms of professional river advocacy and management. Admittedly, I was a bit nervous to host veteran river management professionals for the NW Chapter Trip. However, this anxiety quickly dissipated upon discovering that all the trip participants, as well as agency representatives, were true ambassadors of the RMS mission; the tutelage, insight, and support available was abundant.

I especially relished conversation

regarding the region's water rights and the broader implications for water management in the western United States. With national attention squarely focused on these issues earlier this year, our conversations took on an added significance.

Beyond the enriching discussions, we experienced some high quality river time, reveling in the breathtaking scenery of the Snake River Headwaters. For those of you who haven't had a chance to make it out here, the Snake River meanders right beneath the Eastern slope of the awe-inspiring Teton Range. This time of year, waters are quite clear, and support an endemic species of cutthroat trout. Even with the low-flows of summer's end, the classic whitewater canyon stretch continues to provide excitement and scenery.

Our time on the river itself was

a thrilling adventure, punctuated by the inspiring skills of one remarkable participant – Linda Hagedorn. In her seventies, Linda's prowess on her cataraft was nothing short of extraordinary. Watching her surf wave after wave in the canyon was a testament to the enduring spirit of adventure and love for rivers that unites us all.

Our engagement may have been small in numbers, but its impact was undeniably significant, not only on those who were present but also on our organization, the Snake River Fund. I return from this trip with a shared sense of purpose and a deeper connection to the rivers we are dedicated to protecting. ❖

Joe Smith works as the Programs and Events Director of Snake River Fund.

River Management Society's Southeast Chapter hosted students and faculty for an overnight float on the French Broad Paddle Trail in Western North Carolina in mid-September. Attending schools included Virginia Commonwealth University, University of Tennessee in Chattanooga, and Western Carolina University, all of which are enrolled in RMS' River Studies and Leadership Certificate program. A story summarizing the trip will be included in the next RMS Journal.

Canoes beached at MountainTrue's Mud Creek Campsite along the French Broad Paddle Trail during a trip with students enrolled with RMS' River Studies and Leadership Certificate (RSLC).



RSLC students from Virginia Commonwealth University and University of Tennessee in Chattanooga enjoy MountainTrue's Mud Creek Campsite on the French Broad Paddle Trail.

Photos:
James Vonesh





Letter to the Editor

Opinion of Bud Hoekstra

River management and recreation management are not synonyms, and Wild & Scenic can mean more than boating or swimming on water.

Don't fall prey to the mis-thinking - ORVs - 'Outstandingly Remarkable Values' are not simply about recreation, but one of potentially several protected resources. A river, first and foremost, is water. Water here, water there - quantity and quality matter, and either profile can change. We forecast weather, we forecast climate, but seldom do we forecast the future of our rivers.

What are the hang-ups? Low water, damming for drinking water or irrigation, industrial outfalls, fish kills, toxic Annie, Fannie & Mike blooms, brain-eating amoebas, hazmat spills, levies to channelize flows (misnamed 'flood control'), nonpoint source runoff from agriculture fields, high water and flash flood events, deliberate acts of poisoning, wildfires and arson, sedimentation, thermal pollution - the purview is staggering.

Do river managers care about tomorrow, or are they really just the guardians and protectors of the paddle-sport world?

River managers do not understand their rivers. Take levies. Levies are routinely built too close to channels to exclude floodplains that are to be developed. Levies free up floodplains for development until a 100-year event comes along and ruins the development requiring FEMA's tax dollars to wage a restoration or fund an ecological correction. The reduced floodplain caused by narrow levies deprives the aquifers of recharge, and as an indirect result, overdrafts of aquifers fed by river flooding occur because of tight and narrow levies. When an aquifer doesn't recharge, we drain it by default. When wells run dry and reality sets in, users suddenly want dams and reservoirs to make up for the deficit recharge that poorly planned levies are responsible for. There goes the free-flowing river - or, to satisfy source-water or hydro needs, we convert a canoe lake into a motorized lake with a higher dam.

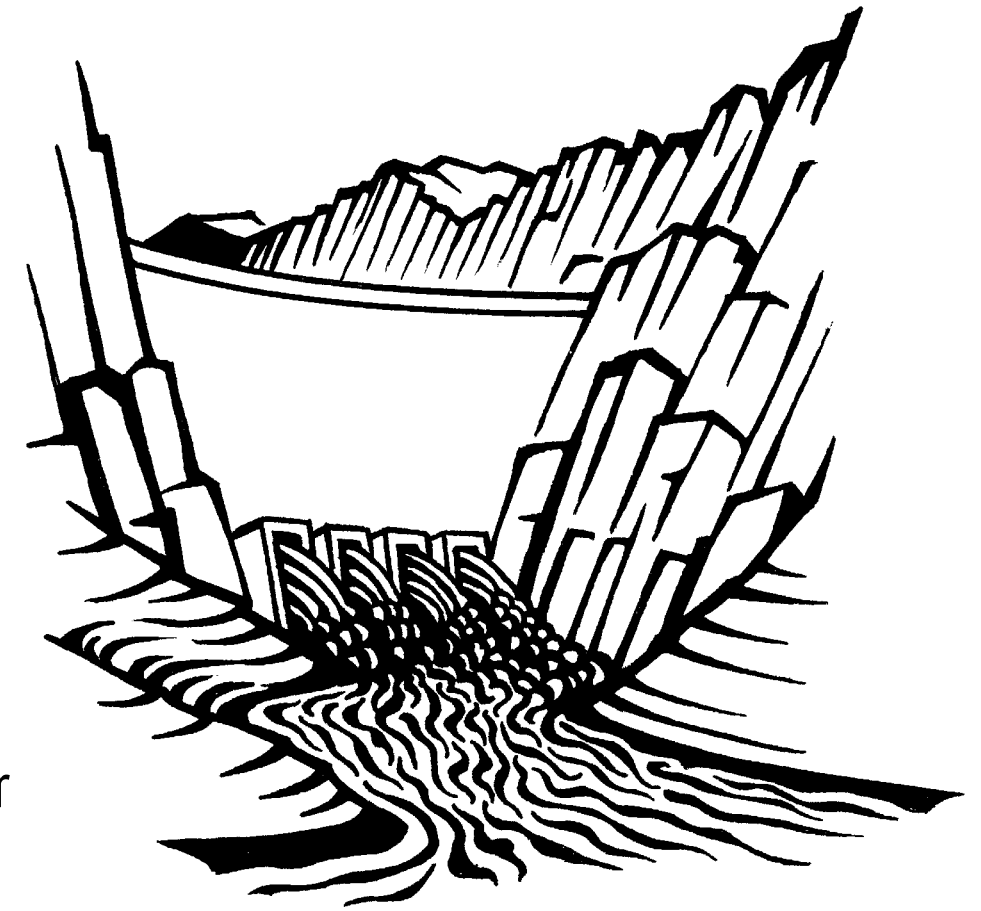
Will your river always be there for you?

"Dam it, dam it, damn it" has been our solemn solution to mend shortfalls of water availability, whether for seasonal irrigation or for source water.

Take California - California has always suffered from a seasonal scarcity of water coupled with cyclical droughts, now made worse by the warmer temperatures of climate change that trigger more transpiration and evaporation from plants. Yes - trees perspire, but we call it 'transpire,' to keep cool. Each and every tree is a bio-pump that sucks gravity water from the soil that goes to feed aquifers, subsurface flows, streams, and rivers. Connect the dots.

UC-Davis professor of forestry, Dr. Malcolm North, has estimated that an acre of forestland, given all the water and nutrients it needs, reaches a maximum density of trees, a cap on carrying capacity, and a limit to the number of trees abounding on that acre. Dr. North generalizes that forests are overstocked with these arboreal bio-pumps because of 100 years of fire suppression and his State has reached a peak density of roughly 70%. Had California relied on the ecological services of fire to thin the forests, the density of trees would hover at 35% instead of 70, he says. Unchecked tree density results in fuel overloads on the ground, and fuel overloads spawn high-intensity, high-severity mega-fires that burn off the carbon in the soil. The USDA-NRCS figures that adding 1% more organic carbon to an acre of depleted soil adds 25,000 gallons of water-holding capacity to that acre of land. More carbon means moister droughts and greater flow volumes in rivers.

In the western U.S. where 95% of the wildlife depends on the 1-2% of the land that is riverine, the high-country snow is the biggest reservoir. Snow that melts fills the rivers with water, especially in late summer when no rains come. Snowpack is a natural reservoir. What happens when snow sticks to denser canopies and doesn't fall to the ground where it melts. In the canopies, snow sublimates and bakes off without infiltrating the



We drain, drain, drain and dam, dam, dam - the binge trend of our nation's engineering.

ground. Rivers are source water for drinking and irrigation, snowpack delivers that resource in many states. Hence, it might be said that dendrology, hydrology and fire science are keys to the future volumes of river flows.

Does it make a real difference? McLaughlin, Kaplan and Cohen calculated for the southern coastal pine forests an increase in water yield - 64% increase - if forests return to longleaf pines and fire. Rivers are water, and maintaining flows is imperative. No water, no river, no management!

America's engineering and construction defies nature. We build roads to function ecologically as artificial rivers and streams, mostly filled with runoff during rains. Concrete and asphalt barriers are impermeable and they stop infiltration and recharge. Roads collect and channelize runoff with curbs, storm drains, ditches and culverts such that aquifers are not revived with water. The flow is ocean-ward, and it is the land, not the ocean that needs water. The proverbial engineering solution to less water is more dams by turning a free-flowing stream or river into a reservoir by means of an engineered dam. We drain, drain, drain

and dam, dam, dam - the binge trend of our nation's engineering.

Think of it. Infiltration and snowmelt lead to flowing rivers, we do the opposite with our engineering. Culverts and curbs channelize runoff and flush it ocean-ward, while aquifers (sic underground rivers and lakes) and rivers decline in the quantity of water. Forest roads are not crowned or out-sloped to promote surface-spreading, thus infiltration, as the USDA-NRCS recommends, bringing to an end that natural percolation that feeds rivers. Plowing creates hardpans below the surface, and hardpans deter percolation. Plowing and earth-moving cause hard crusts to form, repelling water that should infiltrate. Natural runoff is a thing of the past in agriculture with the new technology dubbed "precision leveling." Iowa's cropland is 39% tiled with 800,000 miles of pipe. The U.S. Supreme Court just threw out some of the protections for wetlands under the half-century-old Clean Water Act.

All this takes place as we paddle our way to Armageddon! Despairing? Don't allow yourself to be distraught. Mobilize your thoughts, train, learn - and mind your river. ❖



RMS members on a May 2010 Grand Canyon trip pay tribute to RMS.

Welcome New RMS Members

Individual

Thomas Catlaw

David Stibbe, Educator
Kanata Montessori

Eric Lundgren, Recreation Management Specialist
USDA Forest Service

Joshua Delaurier, Developed Recreation Intern
Forest Service

Stan Dodson, Program Manager
Central Sierra Environmental Resource Center

Cheryl Morris, Recreation Manager
MT Fish, Wildlife & Parks

Organization

Rivershed SPC
Acme, WA
Chris Elder, Principal

National Park Service
Glen Jean, WV
Douglas Manning, Biologist

Associate

Cody Anderson, River Ranger
Bureau of Land Management

Student

Tyler Yellowhair
Northern Arizona University

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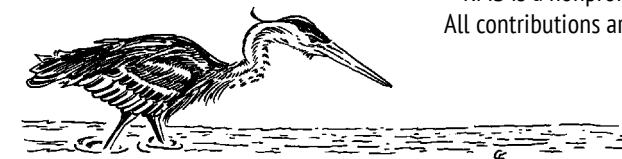
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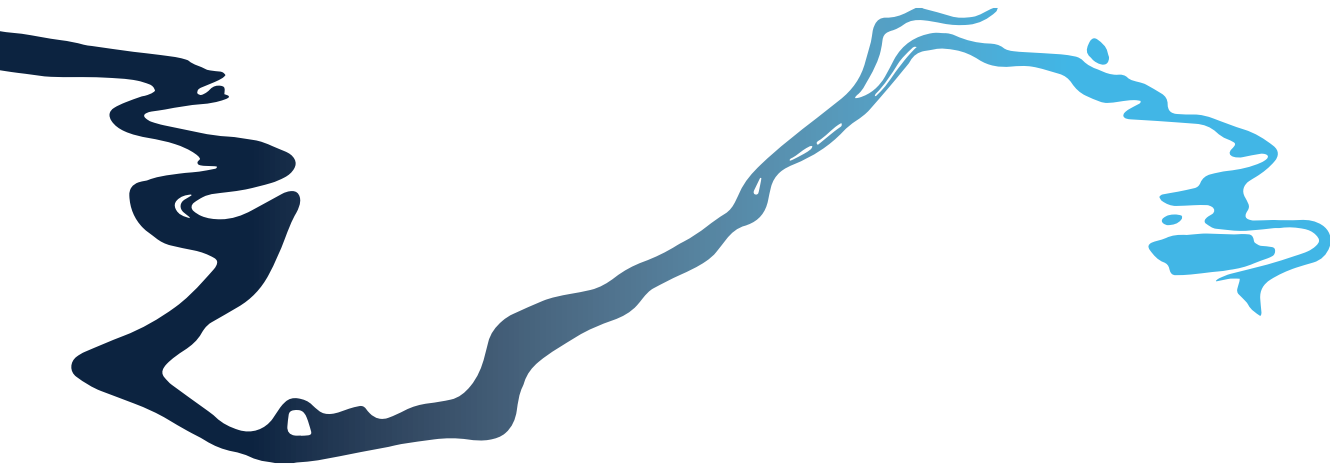


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