

Montana Beaver Working Group

Connecting people and sharing resources to advance the beaver's keystone role in watershed health

Stories and News



Volunteers embrace their inner beaver while building BDAs with the Blackfoot Challenge at Chimney Creek. *Photo: Blackfoot Challenge*

Drought Resilience Through Beaver Mimicry

During one of the hottest, driest summers in recent memory, the Blackfoot Challenge Water Program teamed up again with the Garnet Mountain Property Owners Association to act like beavers and work on drought resilience. In late July, about a dozen volunteers and Challenge staff got to work to complete phase 2 of the Chimney Creek stream restoration project. Chimney is a small mountain tributary to Douglas Creek, where beavers once maintained extensive wetlands. The beavers have been gone for a decade or more, but in 2017 the homeowners approached the Blackfoot Challenge about restoring the wetland complexes (what they call “the ponds”) that long-time residents remember.

The original project began with a large volunteer work party in June 2019, installing 20 beaver dam analogs and several debris jams. To help maintain the benefits of that

work, the crews returned this summer, expanding upon the original structures. This summer's team maintained 12 previous dams and built 6 new dams plus several debris jams, all with the goal to slow runoff, help water pool and soak into the riparian zones where it can be stored and slowly released throughout the summer. In the process, the revitalized wetlands and riparian zones have expanded habitat for fish, amphibians, birds and mammals. Since this project began in 2019, staff and residents have noted increased populations of native frogs and westslope cutthroat trout. Chimney Creek is home to a pure strain of cutthroats. In addition, the Chimney Creek homeowners are hopeful that beavers will return to the area naturally or that someday beaver translocation might be possible.

To learn more about this project, contact Jennifer Schoonen (jennifer@blackfootchallenge.org)



Hilary Schultz, Shawnalee Voyles, Michelle Fillion, and Lillian Krach have been hard at work measuring the small but significant changes in beaver habitat at Teepee Creek. *Photo: Rob Rich*

New Research Explores the Impact of Beaver Mimicry on Aquatic Insects, Carbon, and Methane

Where Teepee Creek trickles through a wet meadow outside Lolo, University of Montana researchers have been exploring the effects of beaver mimicry on aquatic insects and stream biogeochemistry. The appeal of beaver dam analogues (BDA) has surged in the last decade, given their promise as a tool that incites the natural recovery of a keystone species and their habitat. Watersheds in the Intermountain West depend on healthy wetlands and riparian systems more than ever in this warming, drying climate, and the science has started to document the benefits BDAs pose for fish recovery, sediment deposition, water storage, temperature moderation, and habitat complexity. But questions remain about the tiniest impacts: How do BDAs

shape the minute invertebrates that unite the food web? And even smaller, at the molecular scale, how do BDAs shape the carbon and methane dynamics between soil, water, and air?

Working with Dr. Rachel Malison of the Flathead Lake Biological Station and technician Lillian Krach, master's degree candidate Michelle Fillion has launched the inquiry with insects. A native of Colorado with previous experience as a naturalist and aquatic consultant, Fillion has honed her attention to the interface between the aquatic and terrestrial habitat. From caddisflies and stoneflies to midges and beetles, she knows that so many insects become adults only after prolonged, successive maturation underwater as juveniles, and that these cycles have profound implications for myriad species of fish, spiders, amphibians, mammals, and birds. Fillion's methods reflect these far-reaching trophic implications, and at Howard Creek she is not only comparing how BDA presence/absence affects the abundance and diversity of benthic invertebrates (at the bottom of the stream), but also those she catches in emergence traps as they rise from water to air.

Meanwhile, with direction from Dr. Ben Colman of UM's College of Forestry and Conservation and support from technician Shawnalee Voyles, master's degree candidate Hilary Schultz is budgeting the carbon and methane dynamics alongside Fillion's insect study. While many inferences have been made about the ways wetlands sequester carbon and release methane, Shultz is conducting the first study looking directly at the detailed impacts of BDAs on these elemental tradeoffs. Using finely attuned tools designed to capture and measure carbon and methane molecules, Schultz is working to determine how these elements pool and fluctuate in systems where BDAs are present, and where BDAs are absent.

Alone, each of these studies is original and essential, but together, they will provide compelling, pioneering insights to the science supporting beaver restoration practices. For balanced comparative analyses complementing the treated and untreated reaches of Teepee Creek, Fillion and Schultz are also drawing measures from Lost Prairie and Fish Creeks in the Blackfoot Watershed. As her first field season on the project wraps up, Fillion is already curious about the apparent influx of *Chronomidae* (non-biting midges) where riffles decline among BDAs, and she also has a hunch there might be more insect diversity across the entire reach with BDAs than without. And Schultz, now completing her second and final year of field work, is just starting to crunch the numbers behind the unseen changes in her carbon and methane budgeting. Their subjects may be small, but their findings will be significant, scalable, Montana-grown evidence that improves the beaver restoration movement, so stay tuned for updates as these projects evolve!

To learn more about these projects, contact Michelle Fillion (michelle.fillion@umconnect.umt.edu) or Hilary Schultz (hilary1.schultz@umconnect.umt.edu)

Upcoming Events

Colorado Beaver Summit

Zoom

October 21-22, 2021

Following successful online summits in New Mexico and California earlier this year,

Colorado is eager to be next. Details are filling out for their October 21-22 Zoom event, which is focused on “nature-based water-resource restoration, including re-establishment of beavers across their traditional range, especially in headwater regions.” The Montana Beaver Working Group is a partner supporting this effort, and we can’t wait for more from this valuable contribution to the beaver community. Learn more [here](#).

Beaver Conflict Resolution Workshop

Condon, MT

9 am, September 14-15, 2021

The Beaver Conflict Resolution Project - a partnership of the Clark Fork Coalition, Defenders of Wildlife, and the National Wildlife Federation - will be hosting a workshop for the public on September 14-15 in Condon, MT, with support from the Flathead National Forest and Swan Valley Connections. You’re invited to learn about nonlethal strategies addressing beaver conflicts while installing two culvert fences (one per day) to keep beavers from blocking water flow under USFS access roads. The workshop will last approximately 3-4 hours each day. Come for a part day, full day, or both days. The meeting place and time will be the same on both days. Waders and work gloves will be provided for those who want a more hands-on experience. If you’d just like to come and observe, that’s great too!

To learn more and RSVP, please contact Elissa Chott (elissa@clarkfork.org).



To a beaver, a road is just a dam with a hole in it. And if they successfully plug that hole (which we call a culvert), the road can become a wetland. Unfortunately, this type of wetland can crumble the road into tons of fine sediments, which is not good for people or the wildlife habitat beavers create. Culvert fences strike a balance, and they allow the beavers to work and the road to remain. The Beaver Conflict Resolution Project's fences have been successful at finding that middle ground, including this one at Council Grove State Park near Missoula. We look forward to seeing how they will help in the Flathead National Forest. *Photo: Elissa Chott*

Directions (for both days):

Approximately 3.5 miles north of the Condon Airfield on Hwy 83, turn east on Condon Loop Road 124. Drive 0.7 miles down Condon Loop Road to the small parking area on the left past the wetlands and the Old Condon Ranger Station turn-off.

Visit the Clark Fork Coalition [website](#) for more information about the Beaver Conflict Resolution Program.

Resources

Design Criteria for Process-Based Restoration of Fluvial Systems

BioScience

Damion Ciotti, et al, August 2021

Fluvial ecosystems host some of Earth’s most diverse and productive habitats. Since human alterations have also turned them into some of Earth’s most degraded habitats, restoration ecologists have often asked: How can they be fixed? They can’t be *fixed*, says [this paradigm-shifting paper](#) – at least not solely with the idealized forms that physical engineering often strives



to achieve. These authors draw from a compelling beaver-based case study to show how freeing biological processes allows for recovery that is dynamic, functional, and enduring. Give this a read to see how we can shift form-based objectives and practices towards process-based restoration with criteria that unleash spatial habitat connectivity, integrate natural fluvial energy, use native materials, and adapt management over time.

The beaver is a photogenic cover-creature for this latest issue of *BioScience*, which features the new paper. Lead author Damion Cioitti is an innovative, collaborative leader working with US Fish & Wildlife Service in Pacific Southwest Region, and he played a key role on the steering committee of the recent [California Beaver Summit](#), as well as the beaver-based restoration of [Doty-Ravine Reserve](#).

Photo: Charinna Gilmore, used by permission of BioScience, Vol 71, Issue 8, August 2021, Oxford University Press

Rediscovering, Reevaluating, and Restoring Lost River-Wetland Corridors

Frontiers in Earth Science

Ellen Wohl, et al, June 2021

As a fine complement for understanding these conditions of process-based restoration, [this new paper](#) helps us to see (and seek) the “kaleidoscope rivers” of the past, present, and future. Far from being simple, these authors use this term to emphasize how river-wetland complexes have vertical, lateral, and longitudinal flows that convey biological, chemical, and physical impacts across their corridors. By nuancing the way “reference conditions” provide helpful but imperfect hints for restoration (see our February/March 2021 newsletter), this paper demonstrates what rivers need to thrive, including (for North America) the beaver.

Economic Benefits of Beaver-Created and Maintained Habitat Resulting Ecosystem Services

Ernie Niemi, et al, 2020

What is a beaver worth? What value shall we assign to the habitats beavers make? Since beaver impacts are so extensive and indirect across time and space, such questions are challenging, and they resist simple, single answers in dollars and cents. But in assigning costs to associated, tangible measures, ecosystem services can help reveal the economic wealth beavers offer to their surroundings. Drawing on rigorous analysis of practical metrics, [this report](#) is a relevant, provocative catalyst for those of us faced with articulating the wealth beavers bring to watersheds. Most importantly, it forecasts the value of keeping more live beavers on the landscape, and it shows how these benefits – which far surpass costs to people – will only grow with time.

Textural Beaver Repellent for Tree Protection - Toxicity Research Update

Miistakis Institute

August 2021

The Miistakis Institute and partners have released a [report](#) with new results from their ongoing research. Please see their full report for details, which they have summarized as follows:

"The purpose of this research was to evaluate the efficacy of a textural repellent (sand

and paint mixture) on tree damage caused by beaver and beaver tree felling in Fish Creek Provincial Park. The use of a textural repellent is a management technique that would enable coexistence in a situation where beaver may be otherwise lethally removed.

Upon further review of the ingredients in the paint used, along with all other adhesives that are available, we deemed the risk of toxic effects to beavers was too high to recommend this technique as a management technique even though it is used in other jurisdictions."

The Beavers Returning to the Desert

Future Earth / BBC

Lucy Sheriff, July 2021

There is hope in the moist, green strips where the cottonwoods grow, and this is a hope that beavers can extend. From fish recovery to fire buffering, [this comprehensive article](#) offers a strong case for the ways beavers moderate environmental extremes, with benefits for diverse species in a warming world.

Oregon's beavers – our “ecological engineers” – need our help

The Oregonian

Robert L. Beschta, July 21, 2021

Beavers are nature's firefighters. So why is California killing them?

San Francisco Chronicle

Heidi Perryman, June 26, 2021

This incredibly hot, dry, smoky summer has stoked more than a few fine Op-Eds in defense of the beaver, including one from notable beaver advocate/director with Worth-a-Dam, [Heidi Perryman](#), and another from Oregon State University professor emeritus, [Robert L. Beschta](#), whose research helped transform understanding of food web ecology in ecosystems.

Op-eds are a great way to engage your neighbors in real issues, and we'd love to share any beaver-themed pieces you write for your local newspaper here!



Robert Beschta led research on trophic cascades, revealing that the return of gray wolves to Yellowstone National Park triggered streambank recovery from elk over-browsing, which in turn helped beavers recover as well. And, given his training as a hydrologist and watershed conservationist, Beschta could see all the benefits the beavers could extend. His op-ed is a passionate homage to the importance of beaver habitats like this one in Yellowstone, or those throughout his home in the Beaver State. "One might ask, why should beavers now be afforded increased protection? Perhaps the simple answer is: 'new science.' During the last quarter-century, beavers have been increasingly studied and the results have been no less than astounding." *Photo: National Park Service / Neal Herbert*

Please send photos, stories, upcoming events, and other resources to:

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MT Beaver Working Group newsletters are posted online at:
nwf.org/WorkingWithBeavers