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EDITOR'S PICK TOPICAL ALERT

## Bighorn River Alliance launches research initiative to better understand popular trout fishery

Brett French  
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Anne Marie Emery, director of the Bighorn River Alliance, was hired in 2015. Since then the group has transitioned from advocating for river flows to funding baseline scientific research of the river ecosystem.

RYAN BERRY, Billings Gazette

Brett French

**A** group formed in 1995 by guides and anglers to advocate for the Bighorn River fishery is transitioning to a science-based watershed group.

The Alliance started out urging the Bureau of Reclamation to modify its operating plan to provide adequate water flows from Yellowtail Dam to sustain the multi-million dollar trout fishery in south-central Montana. Now the group is moving beyond that singular focus.

“We’re taking a broader approach to the ecosystem, with the understanding that it is a famous wild trout fishery and also important to agriculture and the Crow Tribe,” said Anne Marie Emery, executive director of the Bighorn River Alliance. “We’re trying to take a holistic approach to the river.”

The change was prompted in part by reports of “snaky” brown trout that anglers were catching in 2017, said Jim Chalmers, research chair for the Alliance. Utilizing a grant, Warren Kellogg, founder of Stream and Watershed Consulting in Clancy, was hired to outline a research program for the Bighorn River. Kellogg has set up similar programs on Montana’s Stillwater, Yellowstone and Sun rivers.

“The Bighorn is definitely unique,” Kellogg said, noting that when Yellowtail Dam was built it went from a warmwater to a coldwater stream. “Since it was caused by humans ... it’s a whole different freshwater ecosystem than you would see normally.”



Part of the Alliance's work includes water sampling in the river and on Bighorn Reservoir.

Courtesy Bighorn River Alliance

## Research

Under Kellogg’s guidance the Alliance has launched a research initiative, hiring outside experts to do the work. By conducting baseline studies the group is attempting to understand a variety of factors affecting the dam-controlled river. These include studying aquatic insect populations and densities, looking at turbidity and its causes, extensive river mapping, examining aquatic vegetation growth and water sampling in the river and Bighorn Reservoir to understand what’s causing changes to water quality.



In addition to scientific work, the group has developed a cell phone app to gather data from guides on the fish they catch and published an angler's river atlas.

"It's definitely stuff that needed to be done," said Ken Frazer, a retired fisheries biologist who worked on the Bighorn River for much of his career with the Montana Department of Fish, Wildlife & Parks. "It's some of the more in-depth research that we never had the money to do."

Emery said the studies cost about \$75,000 to \$100,000 a year.

The Alliance is also conducting outreach to landowners and the Crow Tribe, which owns much of the property surrounding the upper portion of the river in Montana.

"We're trying to find cooperative projects that are mutually beneficial," she said.

Projects could include fencing to ensure cattle aren't adding sediment to the river by breaking down the stream bank or adding off-river water troughs. The Alliance is bringing science projects to Crow students, such as understanding how different soils affect water filtration.

"One of the goals in the long run would be for the tribe to have a larger economic benefit from the river," Chalmers said. "We're very sensitive to looking for opportunities to partner."



This is one of the side channels on the Bighorn River scheduled to be excavated to ensure it has water at lower river flows.

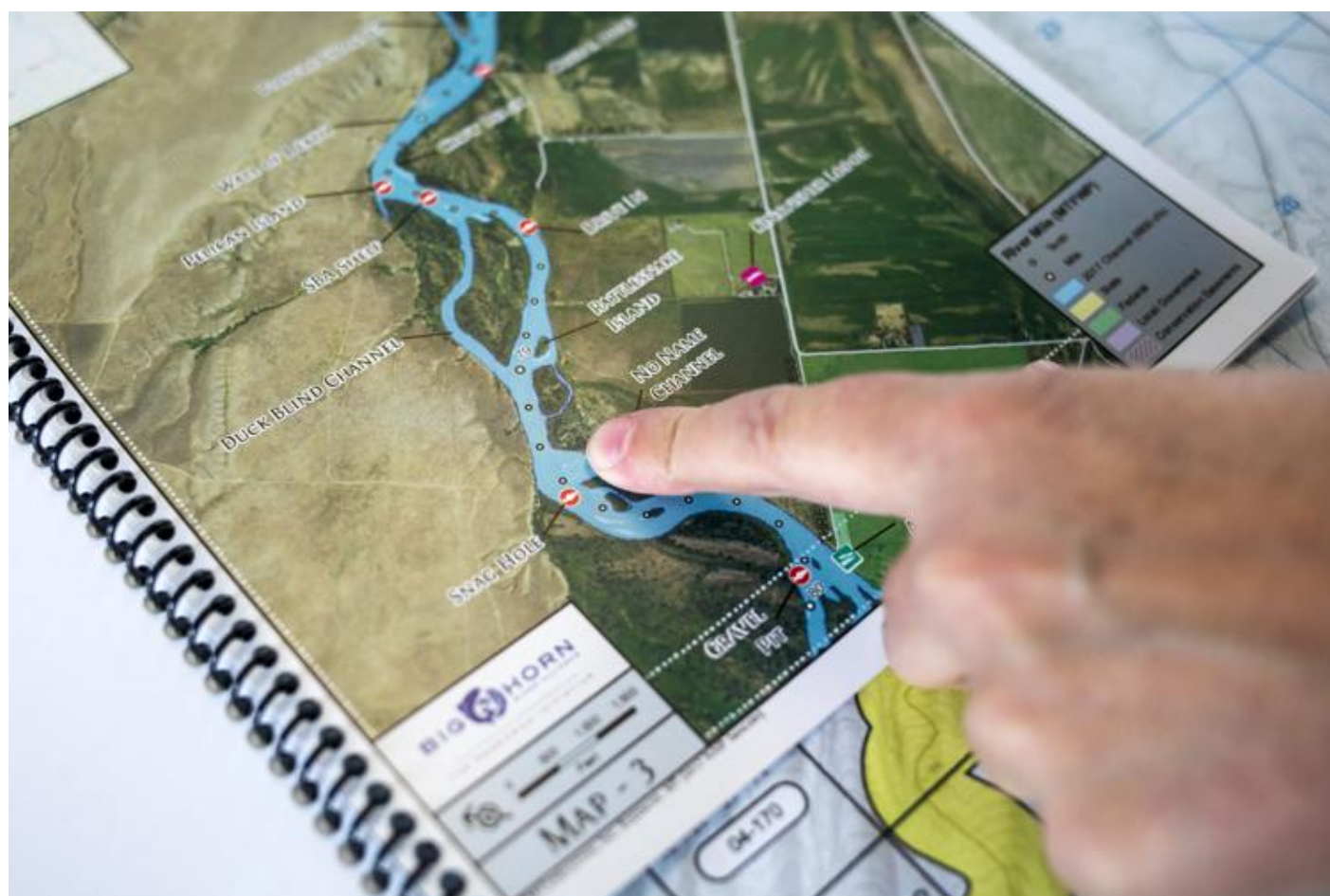
Courtesy Bighorn River Alliance

## Channels

The Alliance is also delving into side-channel restoration. To that end, the group hired a scientist to map the 83 miles of the river downstream of Afterbay Dam to its confluence with the Yellowstone River. From that research, geologist Karin Boyd identified 29 channels for possible reconnection to the river. Of these, she prioritized 13 as the easiest to relink.

“We want to unclog those arteries and open up that habitat,” Emery said. “We kind of have a big goal here.”

The side channels were cut off over time as the main channel became more deeply scoured by high water. As sediment built up at the mouths of the side channels vegetation took root.



Emery points at one of the side channels of the Bighorn River that the Alliance has scheduled to reopen this spring.

RYAN BERRY, Billings Gazette

## Unclog

To remedy the situation, and to demonstrate the feasibility of the work to acquire future grants, the Alliance identified two excavation projects for this spring. Unfortunately, last week’s snowstorm forced them to delay the digging to avoid heavy equipment damaging access routes to the river. Now the work will have to wait until after higher spring flows have dropped.



Side channels provide important rearing habitat for small fish by protecting them from larger predatory fish. With good gravels, the channels can also provide spawning habitat as long as they have water while eggs are incubating. Good gravel is in short supply in the river, Boyd reported, due to record water years that flushed the riverbed. So any finer gravels suitable for spawning that are excavated may be deposited in the river downstream.

These projects already have proof of concept. In 2012 the Alliance partnered with the Montana Department of Fish, Wildlife & Parks to restore a 1.2 mile long channel in the river. That waterway continues to hold water at flows as low as 2,000 cubic feet per second. In comparison, prior to the work it would take flows of 5,500 cfs to put water in the channel.

Follow-up surveys showed young rainbow and brown trout using the watercourse, Emery said.

“We’re trying to make the river more natural under unnatural conditions,” she said.

“Hopefully, this will build momentum.”



The front door of the Bighorn River Alliance office in Billings features its new logo.

RYAN BERRY, Billings Gazette

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Montana Untamed Editor

Montana Untamed editor for the Billings Gazette.

