

2018

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Recommended Citation

Baker, Beau E., "Watered Down: The Challenges of Managing Water Resources in Montana" (2018). *Graduate Student Theses, Dissertations, & Professional Papers*. 11165.
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WATERED DOWN: THE CHALLENGES OF MANAGING WATER RESOURCES IN
MONTANA

By

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Professional Paper

presented in partial fulfillment of the requirements
for the degree of

Master of Arts
in Environmental Science and Natural Resource Journalism

The University of Montana
Missoula, MT

August 2018

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Watered Down: The Challenges of Managing Water Resources in Montana

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Like much of the American West, Montana sits in the cross hairs of climate change. State drought resiliency projects and cooperative watershed management are on the rise in the face of decreased snowpack, early runoff, precipitation variability and lower seasonal stream flows. Population growth, land use practices, recreation and tourism all contribute to pressures on state water supplies.

Montana is faced with the arrival of invasive species that threaten the ecological health of its lakes, rivers and streams. State budget constraints and depressed agency capacity are hurting our ability to fend off these threats. There's a lack of public education necessary to bolster our defenses and make combating invasive species a priority among state lawmakers.

Statewide water infrastructure is outdated, inefficient and in need of a massive overhaul. According to the American Society of Civil Engineers, many of the public water systems serving Montana's cities and towns have distribution and transmission piping that is 75 to 100 years old, with a majority experiencing significant losses of water. In 2014, the ASCE noted that more than 50 percent of these systems reported that their working capacity is five years or less.

Inadequate water infrastructure also contributes to increased public health risks to communities. State data shows that of the state's 700 public water systems, more than 1 in 5 are currently not in compliance with monitoring and other regulatory requirements. Small public water systems are especially prone to contamination.

Together, all of these pressing problems – climatic and ecological shifts, defunded state programs or agencies, poor infrastructure and public detachment – create a complex set of obstacles to better water management. The primary goal of my Master's Portfolio and the reporting therein is to raise awareness and effectively communicate these issues with the hope that people pay closer attention to how the state manages water resources. Another goal, in the context of each story, is to explore possible solutions and highlight the means to address, discuss and move forward with these issues. Finally, my portfolio seeks to reflect Montana voices that are directly impacted by our state's water resources, but are often neglected.

High Country News

FOR PEOPLE WHO CARE ABOUT THE WEST

'Diabolical' mussels begin their march into Montana

Divisions between state and tribal agencies could keep the door open for a most unwelcome visitor.

Beau Baker | Oct. 12, 2017

Invasive mussels haunt Georgia Smies. A soft-spoken but ebullient Southerner, Smies has spent the last year and a half working as a water-quality specialist for the Confederated Salish and Kootenai Tribes, on the clear waters of Flathead Lake in western Montana.

A prehistoric remnant of Glacial Lake Missoula, Flathead is ringed by forests of fir and larch and hemmed in by the Swan and Mission mountain ranges. On its banks are swamp meadows and sandy beaches, cherry orchards and small lakeside towns buoyed by summer traffic. Loons and geese bob on the water, eagles troll for coots, and osprey dive for suckers. Bears and mountain ungulates roam the hills, not far from vacation homes. Flathead feels like the tranquil heart of a wild and rugged landscape.

Smies has come to know this place both professionally and personally, and she clearly loves it. But she's deeply worried about its future.

Back in 2006, Smies and her family lived in Wisconsin, along the shore of Lake Michigan. It's here that Smies first encountered the genus *Dreissenidae* — zebra and quagga mussels — the tiny, malignant bivalves that have invaded the Great Lakes and Mississippi River Basin over the last 25 years. Aided by lake-hopping watercraft in the West, they reached Lake Mead in 2007 and Lake Powell in 2012.



The author scoops up a handful of mussel remains on a beach along Lake Michigan.

Beau Baker

“There’s a self-preservation element to mussels that makes them diabolical,” Smies says, “Mussels take over, they turn lakes into aquatic deserts.” Her manner betrays her history as an educator. She is attentive and disarming, her red hair pulled back into a ponytail.

Smies grimly recalls Wisconsin beaches wrecked by razor-sharp mussel shells and stinking detritus. Fish stocks shrank and businesses went bankrupt, and toxic algae blooms left the water fouled.

In 2016, Smies made for Montana, a place she’d lived once before, and breathed a sigh of relief at the sight of Flathead’s pristine water: a rare jewel still untouched by the mussel catastrophe. But that fall, as Smies was settling into work with the Salish and Kootenai Natural Resources Department, the Montana Department of Fish, Wildlife and Parks announced the detection of mussel larvae in Tiber Reservoir, just two hours east of Flathead Lake.

The mussels had followed Smies home.

Since then, Smies and the Salish and Kootenai have been feverishly working to stop an invasion. A breach of Flathead Lake would bring irrevocable damage to the Crown of the Continent, a critical wilderness corridor from Canada into the U.S. It is up to state and tribal agencies — working together — to keep Flathead out of this invader’s clutches. The necessary cooperation, however, is proving difficult — leaving Georgia Smies wondering if Montana is doomed to a future of mussel-infested waters.



Formerly Kerr Dam, the Seli's Ksanka Qlispe' hydropower project operated by the Confederated Salish and Kootenai Tribes, on the Flathead River, which flows out of the south end of Flathead Lake and beyond into the Columbia River Basin. Invasive mussels pose a threat to hydropower infrastructure and would likely drive up energy costs in the region.

Beau Baker

As large freshwater lakes go, Flathead is world-renowned for its purity. The lake owes its health to geology, geography and hydrology. Fed by remote drainages and mountain snow, the lake has a rapid flushing rate; it can replace all the water it holds in just over two years' time. That's incredibly fast. Lake Tahoe, which is similar in size, takes 650 years to do the same. This hydrological cycle, along with the low surrounding population density, helps keep the water clean.

The biological history of the lake is not as clean as its waters. In the late 1800s, fisheries managers began stocking the non-native species, mostly from the Great Lakes region, that anglers generally preferred. Once-dominant natives like the westslope cutthroat trout (Montana's state fish) and bull trout gradually lost ground to introduced lake trout, lake whitefish, yellow perch and Kokanee salmon. In the 1980s, Mysis shrimp, another non-native introduced to plump up certain fish populations, began gorging on the lake's rich zooplankton, robbing the land-locked Kokanee of their primary diet. The salmon population collapsed completely in 1989. Mysis, lake trout and lake whitefish now outnumber anything else. Management's decisions, meant to "enhance" the fisheries, ultimately upended the lake's once-distinct ecology.

It's fair to say, then, that Flathead has been under siege by invasive species for a very long time. But for Smies, mussels are of another order entirely.

"It's an extinction-level event," Smies says, looking out at the lake from her back porch in Polson, Montana. "There will be no fishery in Flathead Lake."

And they're coming fast. The same year that Flathead's salmon stock hit rock-bottom, zebra mussels first turned up in Lake Erie. In a relatively short time, these Eurasian mollusks colonized the Great

Lakes and fundamentally altered that aquatic community. They traveled downstream and migrated by boat along highways and interstates. They crossed the 100th meridian, making unrelenting progress toward an open West, an invasive expeditionary force if there ever was one.

“I think my response to mussels in Montana was visceral,” Smies says ruefully, conveying the near-nausea she felt at the news of their presence near the Flathead Basin.

Flathead Lake is an essential part of Montana’s recreational economy, along with Glacier National Park to the north. But where Glacier is managed by one entity, the National Park Service, Flathead’s management is partitioned — and complicated. The Confederated Salish and Kootenai oversee the southern half of the lake on the Flathead Reservation. Montana Fish, Wildlife and Parks administers the northern half.

The Mysis shrimp debacle proved that management decisions on one end of the Flathead Basin carried reverberations throughout the area. It was a turning point in the relationship between the tribes and the state. In the aftermath, two different strategies emerged on how to manage the lake’s fishery: The tribes put more value on restorative ecology, while the state held fast to practical economics.

This conflict has been re-ignited by the arrival of mussels. Starting from an economical or ecological basis results in very different ideas about how to protect Flathead — and the rest of the West — from an advancing army of quagga and zebra mussels.

The tribes have been clear about their determination to fortify Flathead in statements they have made to the Montana Legislature. Shelly Fyant, a member of the Tribal Council of the Confederated Salish and Kootenai, told lawmakers during the spring Legislative session that, quite simply, “Water is life.”

“Protecting the water cuts to the core of who I am as a Salish woman,” Fyant testified. “As a Native woman, in our worldview, men are keepers of the fire, women protect the water, as we are both life-givers. From our very conception, we are carried by our mothers in sacred water, and as women we carry that responsibility throughout life. As a tribal councilwoman, as a mother to four sons and a grandmother to six, I take this responsibility very seriously.”

The state’s argument for action tends to hew to a more traditional management perspective based on economic values. Sustain the fishery, keep boaters boating. State revenue from anglers and water-based recreation is a significant part of Montana’s \$6 billion outdoor economy.



Montana Fish Wildlife & Park's Tom Woolf (center), speaks with regional stakeholders in the Flathead, including tribal agency workers, about the state's aquatic invasive species strategy at the Flathead Biological Station in August 2017.

Beau Baker

“**T**he states downstream are watching us very carefully to see what we are doing, and we in Montana do not want the blood on our hands,” Flathead Biological Station’s Assistant Director Tom Bansak says. He is speaking from an office nestled in Yellow Bay, along the east shore of Flathead Lake. The Bio Station grounds resemble a summer camp, with cabins, dormitories and a commissary. Canoes crowd at the water’s edge.

Bansak works on the threshold of tribal jurisdiction, near the invisible demarcation line spanning the lake. The Flathead Biological Station has been here since 1908, serving as a research center for scientists and students and faculty from the University of Montana. Bansak says the Bio Station began working with both the state and the tribes on aquatic invasive species in 2009. Given the urgency of the threat, though, mussels will require even more determined efforts.

“With these mussels, early detection is the only hope,” Bansak insists.

For the last five years, the Bio Station has carried out environmental DNA, or eDNA, tests on 40 lakes, including Flathead, in northwestern Montana. This detection technique can pick up an organism’s cellular traces — dead or alive — in the water column. Sampling does not require the optimum water conditions or timing reproduction cycles needed by microscopy, the other long-standing, tried-and-true method of detecting mussels.

EDNA testing, Bansak points out, extends the time period in which mussels can be found and is much more sensitive. “In addition to that, eDNA will allow you to determine which species it is, whether it’s zebra or quagga, and that can be challenging or even impossible when you’re looking

at the veligers,” Bansak notes. (Veligers are juvenile specimens that show up in the water after spawning.)

Microscopy can't do that. With microscopy, samples are collected during the warmwater breeding season (usually July to August) and subjected to light that makes mussel larvae glow under a microscope. The cruel drawback of microscopy is that a positive reaction generally shows more than just a single veliger — meaning that chances are, by the time it's detected, colonization is well underway. It is far from an early detection method.

The Bio Station and Bansak believe eDNA can find mussels early, before the shells hit the shores. Smies and the tribes agree, so the tribes have partnered with the Bio Station to conduct joint sampling on reservation waters.

The state has been less proactive about integrating eDNA into its mussel response. Following detection in Tiber Reservoir, the state brought together a panel of experts in December 2016 to make recommendations on how to proceed. This group included researchers from the Bio Station and both regional and national U.S. Geological Survey scientists. The consensus of the panel was to utilize eDNA alongside microscopy in statewide sampling — a recommendation Montana Fish, Wildlife and Parks seemed uninterested in at the time. In later meetings with the tribes, the state communicated that microscopy alone would be sufficient.

“It's like taking the wheels off the truck before getting on the road,” an exasperated Smies says. “Science is science; do it right.”

Bansak agrees: “We should be using every tool in the tool box.”

Though the state balked at eDNA for most of 2017, it eventually brought it into its detection arsenal toward the end of July. A few weeks later, Fish, Wildlife and Parks' Aquatic Invasive Species Bureau chief, Tom Woolf, sat down with stakeholders in the Flathead — the first time the state had met directly with Salish and Kootenai representatives all summer.

Woolf said the state, in coordination with the USGS, had carried out eDNA tests on Tiber and Canyon Ferry reservoirs. But he was uncertain about eDNA prospects for Flathead Lake. “The DNA thing, we're just starting to tiptoe into it. This is the first year the state has done it,” Woolf says. “I don't know that the state had planned to do eDNA sampling on Flathead.”

Fish, Wildlife and Parks' hesitation to support early detection efforts in the Flathead Basin was in part due to a lack of confidence in eDNA's reliability. It did, in fact, carry a “false positive” risk: A mussel confirmation could derive from dead cells years old that posed no real threat today. Another factor to the state's position, perhaps, were the bureaucratic constraints keeping the agency's mussel response behind the pace the tribes wanted for the Flathead Basin. “I understand your issue is here, but what we do here has to also encompass what's going on around the state,” Woolf says.

Montana Fish, Wildlife and Parks has been adamant that its mussel strategy is consistent statewide, even at the cost of limiting more aggressive localized efforts and alienating regional stakeholders like the Salish and Kootenai. For better or worse, Flathead's fortunes are tied up with policy emerging from the state capital, Helena, 180 miles away on the other side of the Continental Divide.

“I think one of the biggest challenges with a response is coordination with all of the stakeholders and people on the ground,” Bansak says. “(Fish, Wildlife and Parks) is based in Helena and will be running any statewide response from Helena.”



Dulaney Miller, a technician from the University of Montana’s Conservation Genetics Lab, sterilizes an eDNA sampling net in bleach to avoid contamination. Although it has become more and more embraced within the scientific community, Montana Fish Wildlife & Parks has shown hesitancy to incorporate eDNA into the state’s mussel detection arsenal.

Beau Baker

It was in Helena, on a gusty June Tuesday, that Tom Boos, the former aquatic invasive species coordinator for Montana Fish, Wildlife and Parks, guided an audience through slides detailing the progress of Montana’s mussel response. Boos spoke of the difficulties in managing large, high-traffic bodies of water. Local boater access points dotted the shores. Boos admitted that these were understaffed or not staffed at all.

“We need enforcement support,” he said.

At a local boater launch, operators are expected to have obtained proper watercraft certification through local Fish, Wildlife and Parks offices or via an online test. Vessels are marked with a sticker to show local status. This exempts local boaters from decontamination requirements when they leave certain high-risk waters. The state created the local boater program to ease the watercraft screening process for those who recreate primarily at Tiber or Canyon Ferry reservoirs, east of the Continental Divide. But according to Boos, the program was hard to police and staffing was spread thin, so the state leaned heavily on signs and the honesty of boaters.

This meant local launch sites were essentially sieves. Boaters could leave those two reservoirs without decontamination and potentially take mussels for a ride down the road (ostensibly to a place where they would eventually be inspected). Even at Canyon Ferry’s four full inspection and decontamination stations, there were loopholes. Boos talked about how the state had defined

“decontaminated” at the major high-risk reservoirs to mean, “cleaned, drained and dry.” The previously quiet audience shifted audibly in their seats. A series of questions followed.

In the West, “decontamination” is widely understood as a high-temperature, high-pressure water treatment. The Pacific States Marine Fisheries Commission specifically defines the method, saying that hot water decontamination using a pressure-washing unit is currently the only scientifically validated method that kills and removes mussels.

But “Clean. Drain. Dry.” — Fish, Wildlife and Parks’ official requirement for boaters — puts the bar at a level of routine maintenance outside consistent “decontamination” standards.

Representatives from the Flathead Basin Commission and the Salish and Kootenai Tribes were among those in the crowd who objected to the state’s definition of “decontamination.” They wanted clarification on what Boos was actually saying. In the midst of this relatively chummy and straightforward meeting, Boos’ explanation had hit a nerve. Did this mean that boats from suspect waters were getting a decontaminated pass without the proper protocol? Why was the state mixing this language? Up in the Flathead, saying that a vessel was “cleaned, drained, and dried” meant that it had passed inspection. But it wasn’t synonymous with “decontaminated.”

Boos explained that boater volume was beyond what the state could manage. He was blunt about a lack of resources. Decontaminating every boat during high season traffic, Boos maintained, “would be next to impossible.”

But if messaging was not consistent across the state, not consistent on both sides of Continental Divide, from one agency to another, the general public might get the wrong idea about how to prevent the spread of mussels. And the public is perhaps the best defense in beating back this threat.



Canoes docked at the Flathead Biological Station in Yellow Bay, north of Polson, Montana. Mussel prevention efforts in the Flathead include encouraging locals to have their non-motorized watercraft, like canoes, kayaks and paddleboards, inspected.

When you're driving in western Montana, getting to Flathead likely means passing through the tiny outpost of Ravalli, about 35 miles south of the lake.

Train tracks hug the road in this narrow corridor at the north end of the Jocko Valley. The Big Sky briefly gets pinched by the hillsides, before opening back up miles ahead to reveal the grandeur of the Mission Mountains. On the edge of town, the speed limit cools to 45 mph, but Ravalli can still slip by your window in an instant. Once, the largest buffalo herd in the country resided here under the watch of a buffalo breeder named Charlie Allard. There are no buffalo to be seen in Ravalli proper now, just a handful of homes, a bakery, a bar and the Bison Café, which hangs a banner advertising "Buffalo Meat for Sale." In the middle of this highway blip, a watercraft inspection station sits in a gravel lot. There is not much to the site — some traffic cones, a camp trailer and a wall tent to shade a few staff from the beating sun.

Drivers hauling motorized and non-motorized watercraft — including paddleboards, kayaks and canoes — are required to stop here and spend some time with the state's watercraft inspectors. Aquatic invasive species technician Russell Erickson is one of them. Erickson, a stocky, bearded guy who gives off a gruff but amiable impression, is part of an imperfect but essential firewall. He works 40 hours a week over four shifts, three of them 12-hour watches.

"They can be murder, especially if it's hot and you get 450 boats through here," he says, foreshadowing an upcoming Fourth of July weekend that is sure to test the inspection team's resiliency. Folks like Erickson are the sentinels of Montana's mussel watch. Their job involves a delicate mix of PR, soft enforcement and shrewd observation. Every inspection must be thorough, but also quick. Erickson says they handle hundreds of boaters over Fridays and Saturdays during the summer. He sees his job as "serving a greater good."

"The damage that's done if Flathead Lake is contaminated with mussels is going to be in the hundreds of millions. If that day comes, they're not going to look back and say we spent too much money inspecting boats at the Ravalli station," he says.

Montana legislators pushed House Bill 662 through the 2017 session. The bill revised general invasive species laws and set aside \$14 million of the state's budget for aquatic invasive species prevention. This included an expansion of inspection station personnel and funding for additional on-site decontamination units. By all accounts, state and tribal, this was a huge boon to the cause.

Erickson has little patience for public cynicism directed at funding the mission. He sees a future Flathead infestation as a taxpayer's nightmare. Economists have estimated that if the mussels set down roots in this region, Montana, Washington, Oregon and Idaho — as well as three Canadian provinces — will be shelling out around half a billion dollars annually to deal with the mess.

It makes sense, then, that Montana law requires all boats be inspected. But Erickson thinks about his contact with boaters, and he's not sure the message is getting to the public.

"Very often they are hearing things for the first time," he admits. "It is illegal to bring a boat into Montana or to this side of the Continental Divide and launch it without being inspected."

"Ninety-eight, 99 percent of the people who come through here want to do the right thing and they are on board with the program. There's another 2 percent that don't," Erickson says.

He recalled a ticked-off boater who pulled into the station, fuming. The crew had called the driver in to law enforcement for passing the stop. A county deputy turned the boater around to Erickson and company for inspection. And it's a good thing: The boat was contaminated with standing water and headed for Flathead Lake. "I'm not getting the sense that the public really understands that they have a greater role here," he says.



Montana Fish Wildlife and Park employees carry out a watercraft inspection in Ravalli, Montana. Each inspection begins with a series of questions to ascertain where a boater has been and where they're going. Watercraft are then examined for signs of invasive species contamination. An average inspection takes 10 minutes.

Beau Baker

Erickson is also right about the public's lack of information about the mussel threat. A recent study from the Institute of Tourism and Recreation Research at the University of Montana highlighted a lack of awareness of invasive species among the state's young people. The report showed 18- to 36-year-old Montana residents were high-use water recreationalists, but that their knowledge of mussel-related closures — and general invasive species threats — was slim to none. If these younger groups were not being reached, the report concluded state agencies should be concerned. It suggested the state ratchet up its communication and education efforts, particularly those outside of traditional media outlets like TV, radio and newspapers.

The tourism institute's findings tapped into a core component of any invasive species defense: public education. An informed base is able to translate state messaging into action and give substance to strategy. Look no further than Minnesota, a state that has fended off mussels with some success thanks in part to an aggressive education campaign. Fewer than 2 percent of Minnesota's nearly 12,000 lakes are infested.

Much of Minnesota's success has to do with outreach. Keegan Lund, who works for the Minnesota Department of Natural Resources, is tasked with speaking to communities. The payoff is cultivating personal responsibility that helps shift how the public interacts with water. A "change in culture," as Lund puts it.

He admits that “success” is sometimes hard to find once your state is already infiltrated. But the fight goes on. Every year, the Land of 10,000 Lakes allocates \$10 million to aquatic invasive species work, and infestation rates have slowed. Moreover, Lund says, the public has come to grips with the reality of mussels, and life goes on.

“The ‘game over’ narrative is not the case,” Lund explains. “They don’t kill lakes, they change lakes.”

But up in the Flathead, for people like Georgia Smies, that kind of “change” carries too high a toll. She returns to Lake Michigan and the grim reality there.

“It’s a tale of woe. There’s not a mussel-free inch in substrate,” she says, referring to the invader’s total takeover of underwater surfaces. First came the zebra, then the quagga, which outstripped the former and now numbers around 950 trillion.

Smies left her position with the Salish and Kootenai in August 2017, but remains involved in education efforts to thwart invasive species. She says Montana could learn from Minnesota’s blueprint. An educated public is really the difference between no mussels and mussels in the Flathead.

Both the state and the tribes are trying to drill their messaging on mussels into the public consciousness through billboards and traditional media. It largely remains to be seen if the information is sticking. The 2018 boating season will undoubtedly tell that tale.

“We just have to do everything we can all of the time,” Germaine White, a member of the Confederated Salish and Kootenai Tribes, says of the tribes’ public information campaign. “We’re charged with protecting our natural resource, it’s all hands on deck.” Housed in a blue office in Polson, White manages tribal outreach efforts for the Salish and Kootenai Natural Resources Department. “We are one of those ecotone tribes on the backdoor to where the waters begin,” she explains. “Water is precious and we need it, and our elders remind us to care for it.”

For White, the upcoming winter months are a chance to bolster social media efforts to reach younger demographics and prepare the launch of a robust spring education plan. She says they are looking at leveraging their capacity with partnerships in the community.

A Fish, Wildlife and Parks outreach and education liaison position is still vacant. The state operates a “Montana Mussel Response” website and an associated Facebook page.

The tribes, along with the Flathead Basin Commission and regional stakeholders are pursuing more robust regulations to deal with mussels in their corner of the world. Fish Wildlife & Parks is working to expand the staffing and resources of its aquatic invasive species department.

Divisions between Montana Fish, Wildlife and Parks and the tribes are hindering progress in the Flathead, but there are signs that some hard incompatibilities may be softening.

“From my perspective, from where I’m sitting, I’m really trying to build partnerships and build capacity around the state to help protect the state and individual water bodies from invasive species,” Tom Woolf, the chief of the state agency’s Aquatic Invasive Species Bureau, says. He

expressed a desire for better communication and coordination between entities. Tribal representatives were happy to hear it. “We want to become a strong link,” responded Salish and Kootenai member Paula Webster, who is the waterquality program manager at the Natural Resources Department.

Keeping a cooperative position in this fight helps both sides of Flathead Lake fend off ecological collapse. Working together, the state and tribes might be better equipped to tackle the tall order of educating the public and instilling a collective responsibility.

Because, in the end, these agencies alone cannot hold back the mussel tide. It has to be done by the boating public, by the people who know Flathead Lake on a personal level, who derive something from its fresh waters.

That’s what gives Smies hope. “We have the good fortune here of protecting one body of water that everyone cares about in their own way,” she says.

Beau Baker practices journalism in the West, where he grew up. Originally from Idaho, he relocated to Montana in 2011 to take a farm apprenticeship in the Bitterroot Valley. He now works as a host and news reporter for Montana Public Radio. Food security and water rights are among his interests.

This story was produced as part of the Crown Reporting Project (<http://jour.umt.edu/crown/>), at the University of Montana.

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<https://www.hcn.org/articles/non-native-species-the-fight-to-keep-zebra-mussels-from-invading-montana>

State's Ability To Monitor Water Supplies Hit By Budget Cuts

By BEAU BAKER • JAN 24, 2018



A U.S. Geological Survey streamgage on Willow Creek near Harrison, MT. Because of funding reductions, the DNRC is discontinuing seven streamgages that are cooperatively managed by the state and USGS. Credit: USGS

State budget cuts mean that ranchers, recreation businesses and conservationists who rely on accurate information about water in Montana are facing new challenges.

People like David Mannix, a fourth generation rancher in Powell county who runs Mannix Family Beef with his brother.

“In this day and age when water is more and more valuable and more and more in higher demand, it’s a concern to me that that would be where we cut,” he says.

Overall, the Montana Department of Natural Resources and Conservation will see \$1.8 million in cuts to its Water Resources Division.

That division is responsible for protecting the state’s water supplies.

The cuts are part of funding reductions Montana lawmakers set in motion when they wrote the state budget, and in the special legislative session that convened in November when further spending cuts were necessary to balance the budget.

They add up to a 10 percent reduction for the division, and fall primarily on stream flow monitoring and water conservation personnel.

John Tubbs is the DNRC's Director.

"The bottom line is that we'll have fewer people trying to serve Montana's public, trying to meet those future needs and those changing priorities, DNRC will have less capacity to try to do that," Tubbs says.

He says the division depends on state general fund dollars to run operations and pay salaries. When general fund revenue is flat or declines, there's less money for that.

"I don't see this changing. The federal tax law will impact the state's general fund again. I don't expect in the 2019 session for there to be available general fund to regrow these programs. I have to be honest, that these reductions are in fact permanent," Tubbs says.

Reductions will leave 12 full-time positions open, including one state hydrologist, two state engineers, and several water conservation specialists.

Water Resources is also discontinuing seven stream gages that are cooperatively managed by the state and the U.S. Geological Survey.

Kirk Miller is with the USGS. He oversees the federal stream gaging program in Montana. Miller says when a stream gage is discontinued and data is not longer available to the public, he hears about it.

"We don't know who all the users are of those data until the site disappears from the web; and then the phone rings and the emails start coming in and we start to see how many different people in those communities are using those data, are relying on those data, sometimes for daily decisions," Miller says.

For rancher David Mannix and his brother, the data is especially important once the irrigation season begins in the spring.

The Mannix ranch is situated in the Blackfoot Valley along Nevada Creek, near one of the seven stream gages being dropped by USGS and the DNRC.

Though Mannix understands the need for the state to be fiscally conservative, less state support on monitoring means he and his brother face increasing challenges managing their water resources.

"You can't manage what you can't measure. It's important for me the irrigator, it's important for the fisheries guy, it's important for the fishing guide, you know that's part of the economic engine in the state more and more," Mannix says.

Pat Cane is an independent fly fishing guide based in Missoula.

"Being able to monitor, know the actual real-time flows and temperature data is critical for making decisions," he says.

Cane operates on the Blackfoot River and says streamflow data can dictate whether he goes out on the water, especially in the spring when runoff swells the river and in the summer when flows are low.

So-called "hoot owl restrictions" are generally put in place when low flows lead to high water temperatures that endanger fish populations.

Without the data to make good decisions, Cane worries that Montana rivers are worse off. "Making these decisions to restrict the fishing and the recreation, it's critical just to maintain the quality of these rivers; and if those types of decisions aren't made, these rivers are going to suffer just from overuse," Cane says.

Funding cuts have resulted in two USGS gages being dropped on the Blackfoot River. One is on the North Fork of the river outside of Ovando, and one's near Helmville, MT – the same gage that the Mannix brothers rely on.

Jennifer Schoonen is with the Blackfoot Challenge, a cooperative group of landowners who work with state and federal land managers to better manage shared water resources.

Schoonen says these gauges are an essential part of measuring results of the work the Blackfoot Challenge does.

"That Helmville gage is pretty important for us to demonstrate the positive side of drought response and of the various water conservation strategies and stream restoration work that's happening up in that middle Blackfoot region," she says.

Groups that rely on the stream gauges are starting to fund their operation themselves. As of late last year, two of the seven decommissioned state gages were reactivated with funding from the Confederated Salish and Kootenai Tribes.

The Blackfoot Challenge's Schoonen says her group is pursuing funding to operate the Helmville gage.

State budget cuts to water monitoring come two years after the DNRC released a State Water Plan that recommended more surface water monitoring in Montana. The data they generate is also used to enforce legal agreements about water rights.

Correction 01/25/18 : Jennifer Schoonen, not Schonon works for the Blackfoot Challenge.

Aired on Montana Public Radio Jan 24, 2018.

<http://mtpr.org/post/states-ability-monitor-water-supplies-hit-budget-cuts>

A Glass Half Empty

Safe and reliable drinking water isn't a given for many low-income communities in Missoula County

By Beau Baker

Susan Villarreal of River Acres opens up the testing kit she uses every weekend to monitor her drinking water. She's making sure chlorine levels are where they should be.

"Some days it makes your eyes water," says Villarreal's husband, Martin Bellmer.

Chlorine is added to the water supply here to help safeguard supplies and kill any bacteria that might be present.

"Most of the people don't know what's going on with their water," Villarreal says.

The River Acres mobile home park is just south of the Clark Fork River. Residents get their drinking water from two independent wells, not the citywide utility Missoula Water.

Not being connected to the larger utility has its perks – the water's free – but when the Clark Fork River swells in the spring and raises the nearby water table, it puts River Acres' two wells at risk of E. coli contamination. Over the last 10 years it's shown up sporadically in the community's drinking water.

"We had one person who said he got sick," Villarreal says. "It's hard to know for sure."

Several months ago, E. coli hit the Maximum Contaminant Limit or MCL in drinking water at River Acres. By federal standards, that means the water is not safe to drink. With the help of a private contractor, Villarreal and Bellmer oversee the community's water quality and treatment.

"We were handed this whole shootin' match in a basket and anything and everything we handle on our own," Bellmer says. "It's trial and error as to make any of it work."

River Acres is just one of 64 small public water systems in Missoula County that are not hooked up to the city utility. All told, they serve about 9,000 people year round and are expected to comply with federal guidelines for safe drinking water, including regular testing and monitoring for 100 contaminants. That includes lead, arsenic, chemicals, pesticides and fecal pollution.

Low-income communities like River Acres don't have resources or staffing that Missoula Water does, making routine testing and monitoring challenging and the likelihood of contamination or service problems much higher.

State and federal records show many of these small public water systems carry high numbers of violations for failures to report monitoring data to state officials. Without up-to-date monitoring, contaminants in the water supply can go unchecked.

Linking bad water with actual cases of illness or disease is tricky, since documentation and data is near non-existent and personal health can be at the whim of many factors.

“It’s really hard to pin down, to say someone got sick from drinking water,” says Michelle Hutchins with the Missoula County Health Department.

Hutchins cautions that just because coliform or E. coli shows up in testing, it’s not necessarily pathogenic or causing disease.

“It’s no smoking gun,” she says. “It could just be an indicator.”

Indicators are expected to spur remedies, but in the case of River Acres, coliform and E. coli have been showing up in the drinking water for years.

“As far as I know, they’ve been working on the wells since Day One,” says Martin Bellmer, referring to Crisp Water Technologies, the private contractor hired to help manage the water system.

According to data from the Environmental Protection Agency’s Safe Drinking Water Information System, public water systems found to have problems cleaning their water typically took more than two years to fix contamination issues.

The EPA estimates the cost per person to keep water clean is more than twice as high in small communities as it is in large towns and cities.

“There isn’t enough money to solve these problems,” Bellmer says.

River Acre’s situation is especially precarious with its proximity to the polluted Clark Fork, but many of the county’s small public water systems - often mobile home parks, trailer courts and subdivisions - face similar challenges in ensuring safe and reliable drinking water for residents.

“The problems that these communities face is economies of scale,” says Mike Lilly, a former resident of Sunny Meadows, a rural subdivision outside East Missoula. Sunny Meadows Water and Sewer District serves 122 people.

“The first day I moved in to my house, I had no water,” Lilly says. Shortages plagued him and the rest of the community for a whole summer. “My neighbors had a newborn,” he says. “Imagine having a baby with no water?”

Perils to drinking water tend to persist among lower-income communities that operate old wells with aging infrastructure and lack the resources to upgrade or even maintain the systems.

“This isn’t a risk, it’s a reality,” says Lilly. Fed up with Sunny Meadow’s water woes, Lilly spearheaded a community effort and formed a water board to address ongoing issues.

“We had multiple times where a service line would break and a fountain of water would be coming out of the ground,” Lilly says. “You just drop everything go out and fix it.”

From 2002 to 2009, Lilly and the board sought out funding to upgrade their infrastructure and improve drinking water service to the community.

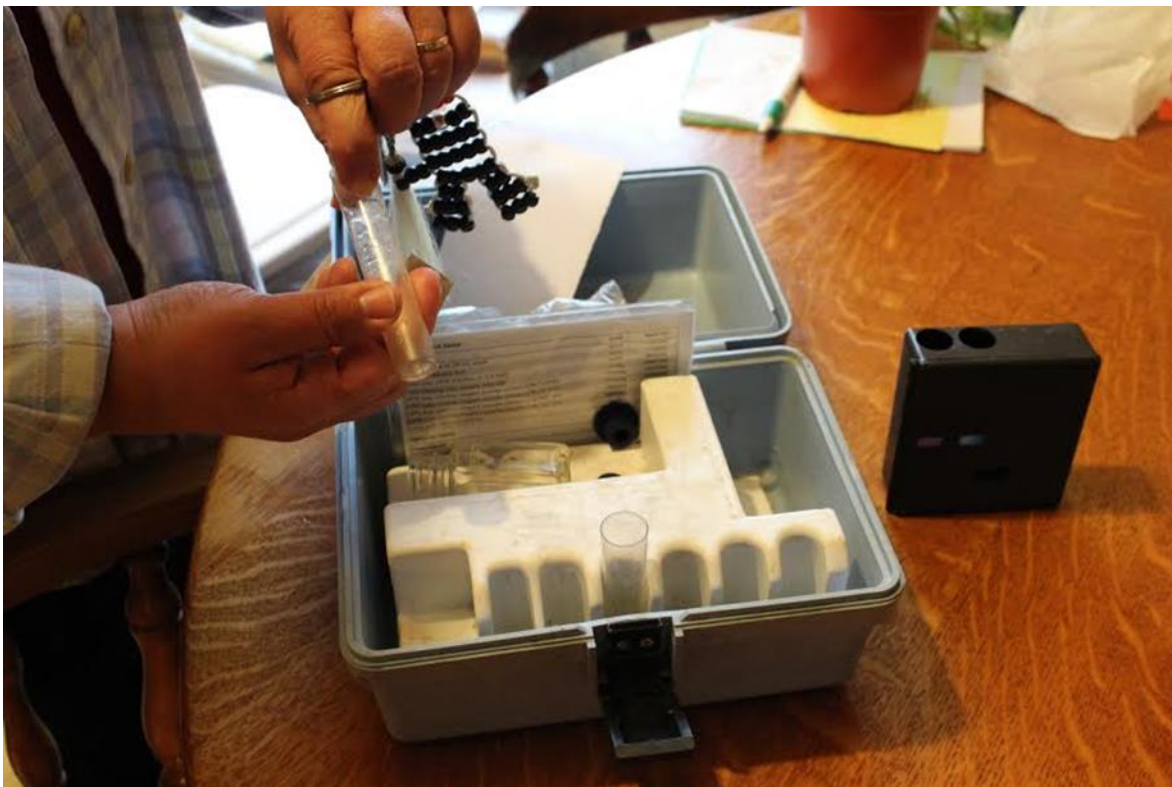
Montana's Drinking Water State Revolving Fund offers loan assistance to economically disadvantaged communities up to \$500,000. But the loan is only awarded when permits, approvals and project funding are all in place.

"You have to be planning years ahead," Lilly says. "To do this successfully, you need at least one person who is fully dedicated to getting this done."

According to Lilly, just getting on the list can take years. What follows is an "immense amount of paperwork," construction delays and unforeseen added costs.

Sunny Meadows eventually overhauled their water system at the tune of around ¾ of a million dollars. Some of the cost was covered with state agency grants, but the loans had to be paid back.

"Trying to wring that out of people's pockets in the community was not easy," Lilly says.



Susan Villarreal of River Acres explains how she tests her water to check chlorine treatment levels.

Beau Baker

Operators, owners and agencies struggle

Recent state inspections of 23 small public water systems in Missoula County revealed a host of deficiencies and contamination risks at many of the sites.

Problems included well head casings and caps cracked and exposed; pump houses “filthy” with rodent feces; worn out parts and sluggish pumps. Well heads were concealed under dog houses or tractor tires, with some prone to contamination from runoff or in close proximity to sewage lagoons.

Many of these wells were drilled in the 1970s, some in the 1960s. In a number of cases, the infrastructure lacks detailed records or maps of the system.

On top of everything, reliable, well-trained operators of these systems can be hard to find.

“I would say 90 to 95 percent of water system operators in Montana are not full-time operators, they just do it once and awhile,” Ken Crisp says. “That’s where a lot of mistakes are made.”

Crisp - a certified water operator - began working in the water industry in 1975, just a year after Congress authorized the Safe Drinking Water Act. He runs Crisp Water Technologies as a private contractor.

In Montana, operators of public water systems are required to be certified. The state DEQ has an operator certification program and offers annual classes for continued training.

The Safe Drinking Water Act was amended in 1996 to include operator training programs and funding for water system improvements, aspects crucial to smaller systems that don’t have the staffing or resources of a larger operating entity like Missoula Water.

“Training is there, but I think it could be improved,” says John Hager, the laboratory manager for Energy Labs in Helena, an intermediary between community water systems and Montana DEQ. Hager and his staff process and analyze hundreds of water samples a week from system operators across the state.

Still, the economic gap in some community water systems can hold “moonlighting” operators back from additional education.

“A lot of operators are just folks volunteering in communities and they need guidance,” Hager pointed out.

Ken Crisp says non-compliance has to do with a combination of factors: poor management, bad maintenance, missed tests and the price of upgrades. “Some of the requirements are so expensive that these communities can’t pay.”

High costs may cause an operator to avoid repairs, or in the case of Futura trailer park, deactivate a well.

In October 2014, Bair Clark Properties, LLC, received a violation notice from Montana Department of Environmental Quality.

Bair Clark owns the Futura trailer park just west of Missoula. The notice was a reprimand for the company’s failure to install water treatment upgrades to a drinking supply serving 180 residents. That December, Futura management responded by shutting down one of two operating wells – the one that needed treatment – leaving 52 trailers with just one source for water.

In Montana, public water systems are required to have a minimum of 2 working wells.

A March 2015 DEQ review of Futura’s water system noted that the decision was made to “stop using the bad well to get out of the weekly sampling and lower costs.”

Property owners had dropped the well to ease the financial burden and monitoring demands of operation.

Records show Bair Clark Properties racked up 89 monitoring violations from January 2014 to July 2017. Bee Hive Homes, an assisted living community, had 165 violations – all for missed monitoring reports in 2015. Another community water system, Greenland Mobile Home Park, had 42 monitoring violations in 2011.

In 2016, federal rules for public water systems changed, including requirements for assessments and corrective action when monitoring results (or a lack thereof) showed systems may be vulnerable to contamination. This affected the way monitoring violations were handled at the state level.

Montana DEQ’s Eugene Pizzini says pre-2016, agency enforcement on monitoring violations was lacking effective guidelines.

“We did not have good tools to do it,” Pizzini says. He serves as the Monitoring and Reporting Supervisor of the Public Water Supply Program.

DEQ categorizes violations as either administrative or health-based. Missed or late tests for contaminants are considered the former.

Administrative violations don’t incite the same response from the agency as more serious health-based violations do.

“If the system has 50% compliance with monitoring, we’re likely to take enforcement,” Pizzini says.

The latitude the DEQ exercises on administrative violations comes down to the resources at their disposal.

“We have the teeth to force communities to come into compliance,” Pizzini says. “The downside is it is a huge resource drain on my staff.”

Recently, state budget cuts have stripped the agency of a Rules Coordinator – a position integral to writing and adopting monitoring rules central to enforcement.

“Was it easier when we had the position?” Pizzini says, “Absolutely.”

No simple solution

Private water system contractors say the management of community water systems is an endless task.

“I was working 24/7. I put up to 5,000 miles per month driving to address emergencies,” Shirley Harrison recalls.

She says the job requires a grasp of mathematics, mechanics, chemistry, some biology and even physics.

“There is just so much detail,” she says. “It’s not something you can just pass a test and jump on it and assume what’s going on.”

Harrison is a certified operator in the Flathead. Until recently, she was serving as the operator of eight systems in Western Montana. In the past, she says she had the opportunity to take on 20 systems, but decided against it. She thinks juggling too many systems is why some operators are late to report data to the DEQ.

“If you have 15 or 25 water systems you’re taking care of, none of the reporting dates are going to be the same for any of them,” she adds. “It’s very difficult to keep everything in order.”

Ken Crisp agrees. “It’s not impossible to follow compliance, but some of the testing requirements are difficult if you operate multiple systems.”

One of the many systems Crisp Water Technologies operates is River Acres.

“They do our monitoring, they rent us a chlorine machine, and we test our water daily,” says Martin Bellmer.

Bellmer and Villarreal’s involvement in and knowledge of their drinking water is rare among public water systems. Most residents in communities are unaware of how their water is being managed.

“They only knew a risk if they could taste or smell it,” Shirley Harrison says of her experience in the Flathead. “Otherwise they assumed that everything was fine.”

Harrison is an advocate for resident education about all public water systems, no matter their size or scope.

“What are the basics of the water system, who takes care of it and what are their credentials?” She says public awareness is the key to reducing the risks to safe drinking water.

“Educating the members of the community is important so they understand their water system, so they can help keep it clean,” Harrison says.

Missoula Water serves roughly 56,000 people in Missoula County. It’s fair to say that most don’t give much thought to their water, largely because they don’t have to. Its quality and consistency is backed up by city resources and well-paid, dedicated employees.

It would seem that smaller water systems with regular reporting or contaminant violations would jump at the chance to connect to the city supply.

But that is rarely the case.

“Some communities don’t trust Missoula Water, they want independence,” says former Sunny Meadows resident Mike Lilly.

That is the feeling at River Acres.

“There’s a lot of different reasons for resistance,” Susan Villarreal says.

Besides keeping control, it comes down to the ability for many in the community to afford paying for city water. On top of the infrastructure costs to connect to Missoula Water, Villarreal and Bellmer say they would have to install and rent a water meter at \$400 a month. That, plus per household water rates might be enough of a financial strain to push people out of the community.

Even with the spate of contamination issues, Bellmer is resistant to the idea of connecting to the city system. He thinks the city should dedicate time and energy to cleaning up the Clark Fork River, which is the root cause of River Acres’ problems.

“We have two perfectly good wells, the water is good and free,” Bellmer says.

The harsh reality in many small public water systems is that gaining access to cleaner and more reliable drinking water – through Missoula Water – means paying a cost outside of the economic capacity of the communities.

Meanwhile, the DEQ is required to hold these systems to the same scrutiny as everyone else.

“We don’t have an option,” Eugene Pizzini says. “All public water systems have to follow the same environmental justice rules including low-income communities.”

Even still, meaningful enforcement to address repeated monitoring violations or a contamination risk remains elusive.

“I can’t tell any homeowner that they can’t drink the water,” Pizzini says. “I can issue a public notice, but I couldn’t write a ticket.”

All of this means drinking water quality and reliability continue to be in a precarious place, without workable remedies available.

“I don’t think DEQ really has the firepower, but I don’t know what an appropriate solution is,” Lilly says.