

## Getting A-Log: More In Mass. Seek Coexistence With Beavers

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By [Miriam Wasser](#) 

Mike Callahan and his team build a flow device to stop beavers from damming up the culverts on Causeway Street in Millis. (Jesse Costa/WBUR)

**Mike Callahan is thigh-deep in scummy pond water, yanking loads of mud-covered sticks, mossy rocks and leaves from a blocked pipe in Millis.**

“Welcome to the glamorous world of beaver control,” he says, holding up a branch that’s been gnawed to a sharp point. After pulling out a few more armloads of muck, he picks up a rake and begins dragging away bigger loads of debris.

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"Lots of material, and this is just the tip of the iceberg," he says. "Whatever they can move, they'll put in there." (In 2016, two canoers in Wisconsin [spotted a prosthetic leg](#) wedged into a dam.)

Callahan owns Beaver Solutions LLC, a Southampton-based company that helps people manage beaver problems by installing "flow devices." These contraptions prevent flooding by allowing water to pass through beaver dams — or other beaver-blockages — without the animals noticing or being able to stop it.

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Beaver control is big business. Since starting Beaver Solutions in 2000, Callahan says he's installed close to 1,600 of these devices — almost all in Massachusetts — and still, the calls from prospective clients keep coming in. That's because beavers are a constant headache for many Massachusetts homeowners, chewing down trees and building dams that flood basements and roadways. But beavers also do a lot of good things for the environment, like creating habitats and purifying water. So instead of the traditional method of dealing with beavers — trapping and killing them — a growing number of people are trying for peaceful coexistence.

"There are a lot of people out there who don't necessarily view beavers as being beneficial. They think of them as pests and nuisances and destructive animals," says Ben Goldfarb, author of "Eager: The Surprising, Secret Life of Beavers and Why They Matter."

But as more people recognize the benefits of having beavers around, he says, "The idea of nonlethal control is catching on across the country."

## **Beaver Benefits**

Beavers are what biologists call a "keystone species." The term comes from architecture, where the keystone is the apex piece of an arch. It's what gives



the structure strength and holds it together. Remove it, and the arch crumbles.

In nature, keystone species are essential to ecosystem health. And when it comes to beavers, their contribution begins with what they're most famous for: chewing wood. After they gnaw logs and branches with their [self-sharpening front teeth](#), they use the material to build their homes — called lodges — and dams, to create wetlands.

On land, beavers are slow, clumsy and vulnerable to predators. But they're fast swimmers, so in the water, they're much safer from coyotes, bears or anything else trying to eat them. (Fun facts: Beavers can hold their breath underwater for up to 15 minutes. They also have a second pair of lips that they can close behind their teeth, allowing them to chew or carry wood underwater without drowning.)

Beavers engineer wetlands for their own protection, but these watery landscapes have big benefits for everything else living nearby, even humans.



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More than a third of endangered or threatened species in the country [rely on wetlands](#), and beaver ponds provide habitat for all sorts of fish, insects, waterfowl, songbirds and even moose.

*[Want to learn more about beavers? Check out our [Instagram Story](#) for 10 fun facts.]*

Beavers provide a bevy of other benefits as well. They inadvertently improve water quality by slowing down rivers and streams, which gives sediments and pollutants time to settle out, or be digested by bacteria. And by damming waterways, beavers help store freshwater and recharge aquifers — two things that are increasingly important in the face of climate change.

In fact, beavers are so important that scientists out west are reintroducing them, hoping that they'll help mitigate drought and wildfires. But here on the East Coast, where the beaver population has been thriving for decades, and where they often live near humans, the name of the game these days is coexistence.

And what's going to get us there is something called a “water-level control device,” or “flow device,” for short.





Mike Callahan, owner of Beaver Solutions, pulls out debris from a culvert beavers dammed up on Causeway Street in Millis. (Jesse Costa/WBUR)

## Beaver Blockages

After removing a few more big clumps of slimy sticks and leaves, Callahan tosses the rake to the side of the pond and picks up a wooden two-by-four. He jams it into the culvert, twisting it side to side and up and down to help dislodge the plug. It's a warm morning and beads of sweat form on his brow.

Callahan says every site is a little different, though the most common problem he encounters is blocked culverts. Culverts are pipes that allow water to run under a roadway. They're all over the place and generally inconspicuous — at least until something goes wrong. A blocked culvert often means a flooded, impassable road.

"To the beaver, a culvert is like a hole in a dam. So by plugging up the pipe, the entire road becomes a dam for them, and they get a big pond," Callahan says. "Beavers are smart like that. They will do whatever is easiest for them to get the biggest pond."

And plugging up a culvert to create a murky pond is exactly what beavers have done on Causeway Street in Millis — more than a few times, in fact, says JaiKaur LeBlanc of the Millis Board of Health.

"We were trapping significant numbers of animals, but come six months or a year later, we were right back at the same location trapping again," she says.

John Egan and Mike Callahan assess whether the fence they've built is the right size for the culvert on Causeway Street in Millis. (Jesse Costa/WBUR)

In some parts of the country beavers can be relocated, but in states like Massachusetts, where it's illegal to transport wildlife, all trapped beavers are euthanized. And it's the local boards of health who are responsible for issuing emergency beaver removal permits.

"The tendency has been just 'off with their heads,'" LeBlanc says. "[But] we were not meeting our intended goal, which was to solve a problem."

LeBlanc, who says she knew beavers were ecologically important, felt queasy about sentencing them to death, and decided to research how other towns and homeowners handle flooding problems. That was how she learned there were nonlethal ways to manage beavers, and that there was someone nearby who specialized in these techniques. She called Callahan.

"He taught us a little bit about how beavers think; about the purpose of their dams, why they do what they do to slow down water. And all of a sudden, it started to make sense what [Callahan] was creating," she says.

It took a little while to get everyone on board with the idea of coexistence — some people in town believed "there is no such thing as a good beaver," LeBlanc says — but eventually they agreed to try it. The town hired Callahan to install flow devices in two locations, including the culvert on Causeway Street he's unplugging now.

"It's amazing what they can do with no tools. It's great ecologically, but bad when it's a man-made structure," he says, removing yet another armload of debris from the culvert. "If this were a bigger block, we'd have the highway team bring out an excavator."

Callahan picks up the two-by-four again and prods the clog.

"I think our clump just moved," he says, jamming the long wood plank as far into the culvert as his arms will allow. "Yes, it did. It just popped like a cork."

The water surrounding him starts moving into the pipe. Across the street, water begins trickling, then streaming out from the other side of the culvert. With it comes sticks and pond scum.





Callahan rams a two-by-four to free up debris in a culvert beavers dammed up on Causeway Street in Millis. (Jesse Costa/WBUR)

## Beaver Explosion

Beavers are fairly common in North America these days, but that hasn't always been the case.

“When European colonists first arrived in North America, there were as many as 400 million beavers on this continent. They were everywhere, creating fantastic ponds and wetlands, turning this country lush and green and wet,” says “Eager” author Goldfarb. “But as the European colonists and settlers spread west across North America, they exterminated beavers in every single river, stream, lake they came across.”

Warm and waterproof, beaver fur hats were all the rage in Europe and the American colonies. The desire for this fashionable headwear was so

insatiable, that by the mid-1800s beavers were virtually extinct on this continent. (Deforestation and habitat loss also contributed to their demise.)

“We went from as many as 400 million beavers to as few as 100,000,” Goldfarb says. As a result, the American landscape became a drier, less ecologically diverse place.

In the last century, the North American beaver population has started to rebound, and though no federal agency systematically surveys the animal, Goldfarb says many biologists estimate there are about 15 million beavers on the continent today.

“They’ve really made quite an impressive comeback, although they’re still not nearly at the levels they were historically,” he says.

But not everyone has celebrated their return. As with wolves out west and [seals in the Northeast](#), places of recovery often become hot spots for interspecies conflicts. In Massachusetts, human-beaver relations took a turn for the worse after voters passed a 1996 ballot initiative [outlawing a particular type](#) of lethal beaver trap, and the beaver population exploded.

Prior to the ballot initiative, there were between 20,000 and 25,000 beavers in Massachusetts. After Question 1 passed, the population is estimated to have [tripled in size](#).

“What that population explosion really allowed was for beavers to move into the more developed areas of the state where the trapping had been keeping them at bay,” says Dave Wattles, MassWildlife’s “furbearer” biologist, who oversees the management of animals with commercially valuable fur.

“And now that the beavers weren’t being trapped, they were damming up culverts [and] roads were being flooded,” he says. “In modern Massachusetts, which is highly developed, that led to conflict.”

Left: Water flow through the culvert on the other side of the marsh is only knee high. Right: Water is finally free to flow through the culvert after John Egan removes the last bits of debris left by beavers. (Jesse Costa/WBUR)

## Outwitting Beavers

Beavers' damming instincts kick in when they hear or feel moving water, so Callahan's goal is to create permanent leaks that the beavers either won't notice or won't be able to do anything about.

And clearing the culvert is just step one. On the side of the road nearby, Callahan's two employees — who also are his nephews — wrangle big sheets of wire fencing. They bend them into shape, securing the metal with hogties and cutting off the extra material with bolt cutters. When they're done, they drag what looks like two metal cages over to where Callahan's preparing the site by the culvert.

The flow device they are installing in Millis consists of the two cages and a 30-foot plastic pipe with 15-inch openings. (Callahan's mentor, Vermont-based Skip Lisle, has a trademark on the aptly named flow device design, [Beaver Deceiver](#).)





Mike Callahan and John Egan place the pipe into position during the installation of the flow device on Causeway Street. (Jesse Costa/WBUR)

What Callahan and his nephews are building will look like an oversized barbell when it's done. At the back end of the contraption, the cage sits underwater and keeps beavers far enough away from the pipe intake that they can't sense water moving into it. And on the other end, the second cage protects the pipe outflow and culvert entrance.

Callahan says that if the beavers notice moving water at this end of the device, the most they'll be able to do is dam around the fence, which won't stop the flow.

"I think one of the reasons these devices work so well [is that] they're relatively simple," he says. "You just have to understand how beavers behave, how they're cued into the sound or feel of moving water, and if you can



disguise that. You can prevent them from plugging up something you want to keep open.”

When the device works, humans are happy because the flooding problem is under control, beavers are satisfied because they can build a dam, and the ecosystem benefits from having an active colony of beavers.

“It’s also a longer-term solution because when we, or anyone, take beavers out, new ones move in,” Callahan says. “Nature abhors a vacuum.”



Mike Callahan and Edward Beattie submerge the pipe as John Egan sinks the cage to the bottom of the pond during the installation. (Jesse Costa/WBUR)

Flow devices don’t work in every situation. About 25% of the time, Callahan says the only way to manage a flooding problem is through repeated trapping. But where they do work, installing and maintaining flow devices might save towns money in the long run. Billerica [recently published](#) an

analysis of the 43 flow devices Callahan installed in the town since 2000; when compared to the cost of trapping beavers, the non-lethal route saved taxpayers about \$7,740 annually.

Of course, not everyone is totally on board with what Callahan's doing. He says he hears all the time from people who have tried building their own flow devices that fail. The experience sours them to the concept and makes them hesitant to try it again, even with a professional.

There's not a lot of peer-reviewed research about the success rate of flow devices, says Callahan, but he hopes to change that through his non-profit [Beaver Institute](#). In addition to training people from all over the country in his techniques and co-hosting [a conference](#) about all things beaver, he hopes the institute will someday fund research about nonlethal management techniques.

This work is important, he says, because as climate change increases the frequency of sudden, heavy rainstorms here in New England, there's a role for beavers to play in mitigating flooding and runoff pollution.

That is, if more people decide to try living with them.

*This segment aired on October 15, 2019.*

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Miriam Wasser is a reporter for WBUR's environmental vertical.  
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