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## To engineer is human; doing it right might require beavers

Tom Horton

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Behold the concrete road culvert: straight and narrow and lifeless, having whisked the previous day's rains from oceans of hard-baked asphalt with ruthless efficiency, swelling quickly to 6 feet deep with stormwater, then receding to less than an inch of water hours later.

Now follow Erik Michelsen across the road, which is Maryland Route 2, a busy four-lane traffic artery connecting Annapolis to Baltimore.

Duck behind a seniors' apartment complex and enter lush expanses of ponds, wetlands and forested creek bottoms that sponsor natural diversity, slow stormwater runoff so it can soak into underground aquifers, allow natural processes time to cleanse and clarify the discharge, and reduce downstream flooding.

One side of the road represents the worst of human engineering, maximizing one thing, water removal, to the ruin of all else. The other maximizes nothing, except life, in all of its buzzy, croaky, splashy, winged wonder — water as resource. The latter represents a most hopeful collaboration between humans and beavers, the animals that once engineered the Chesapeake watershed with a thoroughness unmatched even by today's 18 million people.

Before the mid-1700s, when they were virtually trapped out, millions of beavers and their dams and ponds were key to a Chesapeake that was clean and clear almost beyond imagining. Scientific analyses of deep Bay sediments deposited through the centuries have provided us with insights into that astounding ecosystem.



Erik Michelsen stands atop a beaver dam in Anne Arundel County, MD.

Dave Harp

Beavers are coming back, even to the inimical conurbation that is most of northern Anne Arundel County. Michelsen, acting deputy director of the county's Bureau of Watershed Protection and Restoration, is my guide to what is no less than a demonstration project, with beavers themselves doing much of the construction.

For Michelsen, it was good news around 2015 when beavers started showing up on the county restoration project that enhanced the north branch of Cypress Creek here. It drains to the Magothy River and then the Chesapeake Bay. What humans began, the beavers enhanced, impounding the whole stream with a series of dams and ponds.

Until recently, the beavers would not have been embraced for their ecosystem contributions. They'd have been removed, meaning trapped and killed. That's still too common around much of the Bay watershed.

Beavers are compelled to chew, to control their marvelous, self-sharpening teeth that never stop growing; compelled also to dam, annoyed by the sound of flowing water.

The beaver dams here were raising water levels, with a potential to flood Ritchie Highway. The county responded by installing a simple, low-tech device called a pond leveler. A sturdy metal cage toward the lower end of the pond protects one end of an 18-inch diameter plastic drainpipe.

The other end of the pipe exits downstream of the beavers' dam, carrying the sound of flowing water far enough away so they are not motivated to plug it. The whole affair is set up to keep the pond deep enough to make the beavers feel at home, but not so deep as to flood the roadway.

Michelsen estimates there are hundreds of beavers now in Anne Arundel County.

Complaints about beavers typically run about "50/50, flooding and chewing down peoples' trees," said Peter Bendel, with the Wildlife and Heritage division of the state Department of Natural Resources.

"So now it's a matter of education, teaching co-existence, offering solutions, explaining beavers' benefits," Michelsen said.

We headed north up the highway toward where Cattail Creek meanders down from big shopping malls and passes under the road by Joe's Seafood and Precision Auto Tune. Clambering down a slope, we picked up an improbable nature trail that skirts several acres of beautiful pond and wetlands. Chisel-like beaver chews are evident on sticks and felled trees as big as 18 inches in diameter. Beavers feed on the bark and use the wood to construct dams and lodges.

The beavers have done the "restoration" here by themselves, Michelsen said. At least twice, the county Department of Public Works trapped them out and tore out their dam. The beavers just moved back in.

The problem was a fear of flooding that raised manhole covers, allowing access to a major sewer line that runs along the creek floodplain. The solution was as simple as pouring a bit more concrete to raise the manhole covers a few feet higher, beyond the threat of flooding. It was a lot cheaper than never-ending trapping, too.

Later that day, south of Annapolis on Flat Creek, a tributary of the South River, we saw an expanse of beaver-wrought wild rice wetlands that looks completely wild, save for twin pond levelers protecting Governor's Bridge Road from flooding.

No single-channel babbling brook here — just a broad and languid flow of water, moving in braids across an expansive floodplain. This was water's chosen way back when both the watershed and the Bay were healthier.

The shift toward an ecological beaver ethic remains slow and uneven across the watershed. Tools like pond levelers, abrasive paint and other techniques to protect trees are available, notably from Mike Callahan's Beaver Solutions in Massachusetts. Callahan's companion Beaver Institute provides both hands-on and do-it-yourself training for organizations or individuals working for a peaceful coexistence with the beavers.

We've scarcely begun to plumb the potential of beavers to restore water's rightful way throughout Bay landscapes. But Michelsen has high hopes. "I am convinced that, even in a highly urban watershed, they can do wonders," he said, "if we just allow them to work."

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**Tom Horton**

Tom Horton, a Bay Journal columnist, has written many articles and books about the Chesapeake Bay, including *Turning the Tide* and *Island Out of Time*. He currently teaches writing and environmental topics at Salisbury University.