



# BULLETIN

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# The Eager Beaver: Nature's Ingenious Engineer

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*Castor canadensis*, the North American beaver and ecosystem engineer. Eager beavers are proficient builders, making their dams by weaving small trees and branches with grasses and mud. Photo by Cheryl Reynolds. Courtesy of Worth a Dam

their numbers got underway. It's a conservation comeback story that includes wild attempts like Operation Geronimo (named for male beaver Geronimo) in 1948 when 76 beavers in crates were parachuted from planes into Idaho's backcountry hoping they would repopulate. And they did!

In recent decades, the environmental benefits of beavers have been better identified, including increased water levels in areas suffering from drought, beaver meadows that sequester carbon, and dams' capacity to filter water as well

In the grand theater of the wilderness, there exists a character both revered and reviled, beloved and begrudged—the beaver (*Castor canadensis*). These industrious engineers with their impressive dam-building skills and their insatiable appetite for tree chomping have long held a peculiar place in the hearts of naturalists. Buck-toothed, long-footed, and an important keystone species, beavers are tireless ecosystem architects. With ingenuity and unwavering determination, they construct dams that would make even the most seasoned engineer raise an impressed eyebrow; indeed, the Massachusetts Institute of Technology adopted the beaver as its official mascot. Birds, amphibians, invertebrates, and salmon in particular, all take advantage of the wetland habitats constructed by the eager beaver.

But here's where the love-hate relationship begins. While beavers are playing Mother Nature's architects, they can be a nuisance to their human neighbors by flooding farmland or backyards, damaging infrastructure, blocking culverts and aqueducts, destroying trees, and generally refusing to acknowledge property lines. Torn between admiration and exasperation, observers marvel at the beaver's engineering prowess, nodding in approval at their ability to transform landscapes, while surveying with annoyance the aftermath of a beaver tree buffet.

Before the European fur trade, an estimated 100 to 400 million beavers thrived in North America; in a mere 100 years, their population plummeted to near extinction before efforts to rebuild

as reduce catastrophic flooding. It may seem counterintuitive, but beaver dams reduce flooding by sending more water into the ground and slowing water flows like speed bumps. Critical to western US areas ravaged by wildfires, beavers have also become the focus of a possible solution to mitigating fire spread as wetland buffers. Forget Smokey the Bear for preventing forest fires, instead *Leave It to Beaver* for fire control. Emily Fairfax, a California-based ecohydrologist told *The Washington Post*, "Where you don't have beavers or rain, plants dry out and become crispy fuel for fires.... Areas without beavers averaged three times more fire damage than those with beavers." In 2022 California's Department of Fish and Wildlife invested \$3 million in beaver restoration with the faith that these furry friends can be a new superhero in fighting climate change. California also enacted new policies in 2023 to encourage landowners and agencies coping with beaver damage to find alternate solutions before requesting state authority to kill or remove the animals.

Despite the occasional inconvenience, there's no denying the beaver's charm. With their comically large front teeth and penchant for slapping their tails on the water, beavers have earned their place in the pantheon of nature's most endearing characters. So, the next time you find yourself admiring a picturesque beaver dam or fretting over a beaver-induced flood, remember, love them or hate them, beavers are just doing what comes naturally—chewing and building for a better tomorrow.

In her popular 2022 book, *Beaverland: How One Weird Rodent Made America*, Lella Philip offers an enchanting new view of these enigmatic creatures, which she says have mistakenly been seen as nuisances. According to Philip, "Beavers can help us with every environmental problem we have that's being accelerated by climate change—fire and drought and flood." She makes poignantly convincing arguments that beavers are the answer to biodiversity emergencies by helping to build climate-resilient landscapes and to restore freshwater habitats and the species that rely on them. Additionally, her scientific narrative traces the beaver's impact on our American wealth, cultural development, and landscape. Philip's book has inspired a resurgence of activist "beaver believers" and brought them into the mainstream from the fringe. Federal and state agencies, tribal governments, and legislators are joining nonprofits, scientists, educators, ranchers, farmers, and landowners in a new partnership to harness the beaver's power to restore rivers and create watershed resiliency.

Beavers once shaped our waterways, creating thriving wetlands and complex river systems brimming with invertebrates, amphibians, birds, and fish before they were hunted to near extinction. As we look to overcome climate and biodiversity emergencies, restoring beavers to their former range across North America can help build climate-resilient landscapes and restore freshwater habitats and the species that rely on them.

Infographic courtesy of Worth A Dam



**"The beaver isn't just an animal:  
it's an ecosystem."**