

Beavers offer natural solution to fighting wildfires

The large rodents create soggy areas that fires can't cross.

By Ann Cameron Siegal

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Beavers dig canals extending from their main pond to allow safer and quicker access to the landscape as they gather materials for food, dams and lodges. (Ann Cameron Siegal)

When Smokey Bear says, “Only YOU can prevent forest fires,” he’s talking to humans. But humans aren’t the only ones who can help. Beavers, North America’s largest rodents, are succeeding at fighting fires and reducing wildfire destruction.

It’s common sense. Water, soggy ground and well-hydrated vegetation reduce fire’s ability to spread.

Beavers create deep ponds by building dams, then dig fingerlike canals to slowly spread that water throughout the flood plain. The stream’s reduced speed allows collected water to seep into the ground where it encourages deep plant roots and an abundance of wildlife to thrive.

Beavers’ water highways are not for our benefit, but theirs. The canals allow them to quickly escape predators. The water also lets them float logs and branches needed for food and construction projects.

Of course, beavers don’t know they are also creating very effective firebreaks, or obstacles to the spreading of fire. But scientists are taking notice.

Emily Fairfax is a California-based ecohydrologist, that's someone who studies how water interacts with soil and living things. She wondered whether beaver-created wetlands could survive huge wildfires, reducing the devastating damage done to large areas of land.

[Fighting wildfires is a greater test of endurance as season gets longer](#)



Scientists need data to convince others to consider workable solutions to problems such as rising average temperatures and drought.

“We used Google Earth to identify and map beaver dams and channels within fire perimeters,” Fairfax said.

Beavers use logs, mud and vegetation to build dams that slow, spread and store water throughout the landscape. (Ann Cameron Siegal)

By studying years of aerial photographs from five Western states where major wildfires and droughts occurred, her team showed that beavers create broad underground irrigation systems, decreasing erosion and soil loss.

Most important, large beaver wetlands were still green and healthy after a fire.

“Areas without beavers averaged three times more damage than those with beavers,” Fairfax said. “Where you don’t have beavers or rain, plants dry out and become crispy fuel for fires.” Where beavers were allowed to do their thing, the wetlands also became lifesaving oases for wildlife that couldn’t “out fly, out swim or out waddle the flames.”

But what if there are no beavers in an area?

Many places prohibit the relocation of beavers, so an alternative is to create a beaver-friendly habitat through basic stream restoration before an environmental crisis occurs. Using local, natural materials such as logs to build man-made starter dams can increase water depth, creating conditions that encourage beavers to move in and take over maintenance of the dams while expanding the wetland habitat.

Beavers aren’t always wanted in an area because humans want to adapt the landscape to fit their needs, draining wetlands and building houses in floodplains.

Fortunately, there are many tools for flood control and tree protection to make coexisting with beavers easier for landowners. After identifying fire-prone areas, communities can reduce a fire’s capacity to become an extreme event by taking advantage of beavers’ low-tech, natural and free engineering abilities.

Fairfax said her original hypothesis shifted from “where can this happen” to “is there anywhere where this cannot happen?”

“The more rivers and streams you have in healthy conditions,” she said, “the more fire resistant a region will be.”



The contrast is striking between the beaver wetland in Little Last Chance Creek in California and the surrounding area a year after a forest fire in 2021. (Emily Fairfax)

Did you know?

- Many forest fires are inevitable and necessary to clear out overgrown vegetation and replenish soil nutrients. Beavers are protecting sensitive ecosystems that don't need intense fire as much.
- Beavers don't kill all the trees in an area. They selectively use logs and branches to create the wetlands that increase biodiversity for wildlife and vegetation. When they chew their favorite trees — aspen, willow, cottonwood, among others — those trees usually grow back stronger and healthier afterward.
- By slowing, spreading and storing water, beaver dams increase drought resistance and downstream water quality. Several research projects are underway to measure how effective beaver structures are in filtering out contaminants, ash and sediment, particularly after a wildfire.
- Beavers are herbivores or plant eaters. Twigs, grasses, leaves, bark and aquatic plants are on their menu, as is the soft inner-layer of bark, called cambium. They don't eat fish but

create fish-friendly habitats. Otters eat fish, so that may account for some of the confusion as otters and beavers often share habitats.

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