

## **FREEING UP FISH: THE EFFORT TO REMOVE BARRIERS TO SPAWNING SITES**



*The BART weir is a major barrier across Alameda Creek that will soon be retrofitted with a fish ladder. Photo courtesy of Alameda Creek Alliance.*

By Robin Meadows

As a child growing up in the East Bay, Jeff Miller loved seeing salmon in [Lagunitas Creek](#) when he visited [Point Reyes](#). “I was inspired to restore migratory fish in the Bay Area,” he recalled. Miller ultimately chose [Alameda Creek](#), which is the biggest local tributary to the San Francisco Bay and once had both salmon and steelhead trout.

Collectively known as salmonids, salmon and steelhead are born in freshwater, spend much of their lives in the ocean, and then return to freshwater to spawn. Because they depend on marine as well as inland environments, healthy populations of salmonids reflect healthy coastal ecosystems.

Moreover, these migratory fish also benefit coastal inland environments, where nutrients can be relatively scarce. Salmonids grow up in the nutrient-rich sea and, when they swim back up coastal waterways, transfer nitrogen and phosphorous inland in the form of their bodies. Salmonids feed eagles, river otters, and other predators, and also fertilize plants growing along streams.

When Bay Area steelhead were listed as threatened under the federal Endangered Species Act in 1997, Miller suddenly had a lot of help realizing his dream of restoring migratory fish in the Bay Area. “It was the catalyst to restoring Alameda Creek,” said Miller, executive director of the [Alameda Creek](#)

[Alliance](#), a Fremont-based nonprofit dedicated to bringing salmon and steelhead trout back to Alameda Creek.

Since then, local, state, and federal agencies and organizations have collaborated on restoring steelhead in Alameda Creek. And now, 20 years later, the creek's biggest barrier to fish migration — a massive flood control structure in Fremont called the BART weir — is finally poised to be retrofitted with a fish ladder.

Historically, steelhead flourished in many creeks that flow into the Bay. But over the last 150 years, people built dams, stream crossings for roads and utilities, and other barriers that keep fish from migrating upstream. A 2004 [State Coastal Conservancy](#) (SCC) report identified 172 manmade barriers to fish in the Bay Area; Alameda Creek's watershed, which includes the creek as well as all the streams that flow into it, had the most by far at 96.

"A lot of the infrastructure was built in a world when there was no regard for wildlife, but there's no reason you can't have both," said Michael Bowen, an SCC project manager and chair of the California Fish Passage Forum, an association of public, private, and government organizations dedicated to removing barriers to fish migration in California. Fish-friendly designs are readily available these days, he added, and the [National Oceanic and Atmospheric Administration](#) has engineers who are "delighted to advise municipalities" on how to incorporate fish passages.

A number of fish passage projects are in place or under way in the Bay Area, and many local creeks have the potential to help rebuild steelhead along the Central Coast. That said, Alameda Creek has the largest watershed in the Bay Area — and the bigger the watershed, the greater the chances of restoring steelhead. And those chances look good. Compared to salmon, which typically return to their natal streams to spawn, steelhead are much more flexible. "If one stream doesn't work, they'll just try another," Bowen said.

Alameda Creek used to have so many steelhead that the population was self-sustaining. But a decade ago, it was down to a single spawning pair called Bonnie and Clyde. "There were so few we were literally naming fish," recalled Joshua Fuller of the [National Marine Fisheries Service](#), which is charged with restoring federally endangered marine species.

Even today, the Alameda watershed still has a scattering of steelhead. Some are captured below barriers and transported upstream by biologists; others are landlocked behind the dam in [Calaveras Reservoir](#), which is in the hills east of Fremont and stores water for San Francisco. Another cause for optimism is that while the lower stretch of Alameda Creek is urban and channelized, the upper

reaches still offer what steelhead need: gravel to spawn in, riparian canopy that shades the water and keeps it from getting too hot, and deep pools to live in when stream flow is low and temperatures are high. “There’s some amazing habitat left,” Fuller said.

The combination of remnant fish and suitable habitat boosts the likelihood of restoring steelhead. For that to happen, though, the fish need to be able to get into Alameda Creek in the first place — something they haven’t been able to do since 1972, when the BART weir was built to protect the train tracks’ creek crossing. “The BART weir is the main barrier to adult steelhead returning to spawn,” said the Alameda Creek Alliance’s Miller.

Steelhead are prodigious leapers, jumping several times their body length of roughly two feet. But the fish are no match for the BART weir. “It’s a sloping cement apron and has a 12-foot drop,” Miller said. Videos show steelhead struggling to ascend the weir, only to fall back into the water below it. And just upstream of the BART weir lies another hurdle in the steelheads’ obstacle course: a pair of rubber dams that divert water from Alameda Creek for the [Alameda County Water District](#).

About 15 fish passage projects have been built in the Alameda Creek watershed so far, Miller said, and projects for the BART weir and rubber dams are almost ready to go. The funding is in place — \$1,000,000 each from the [National Fish and Wildlife Foundation](#) and from the [California Department of Fish and Wildlife](#)— and construction is scheduled to start next year.

“It will reopen the entire watershed for the first time in almost 50 years,” Miller said, adding, “Once those fish ladders go in and fish can make it to [Sunol Regional Wilderness](#), it’s going to be a game-changer.”

His work isn’t done yet, though. The lower stretch of Alameda Creek is a 12-mile flood control channel and is about as far from natural as possible. “It’s a gauntlet for small fish,” Miller said. As young steelhead make their way to the sea, the wide, shallow channel exposes them to predators. “Birds and invasive fish like bass are waiting to pick them off,” he explained.

And young steelhead that do make it past this gauntlet face yet another challenge when they reach the Bay. “They need a place to grow big before going out to the ocean to avoid predation,” Miller said. He hopes that the salt pond restoration at Eden Landing, which is near the mouth of Alameda Creek, will help give young steelhead this transitional habitat.

Projects to restore steelhead will also benefit salmon. “Chinook will do really well,” Miller predicted, adding that because salmon are so big, they’re likely to be more noticeable than steelhead.

Bringing migratory fish back into city-dwellers' lives also motivates the National Marine Fisheries Service's Fuller, who, like Miller, was inspired to work with migratory fish after seeing them in streams as a youth. "They're the essence of wild, spending part of their lives in the ocean," said Fuller, adding, "Hopefully we can bring them back for future generations."