

## Where Have All the Fishes Gone?

by Parker Pringle

The number of steelhead trout in the watershed has declined precipitously over the past 50 years—and coho have disappeared for good—as longtime Ross Valley residents can attest. Why has this happened? The short answer is changes in land use, which have caused a host of changes to creek habitat.

Before the arrival of Europeans, the creek was sinuous, shallow, shaded and cold. It had braided channels that were close to flood plains and terraces carved out by high waters. There were endless riffles, loved by trout and the aquatic invertebrates they eat. The streambeds were cluttered with fallen trees and branches. Willows, alders and bay trees covered the creek with shade, and trout hid in the undercut banks beneath their roots. The massive estuary, with its acres and acres of wetlands stretching from San Clemente Creek to Ross Landing (present-day Kentfield), teemed with life and provided abundant food for trout and salmon, allowing them to grow fast and strong before their voyage into the Pacific Ocean.

Rain falling on the hills and valleys would be soaked up by the ground and released slowly into the creek throughout the dry season, resulting in year-round flows.

Looking at it another way, there weren't any roads, houses, wells, cars, or sewers; and not too many people, either.

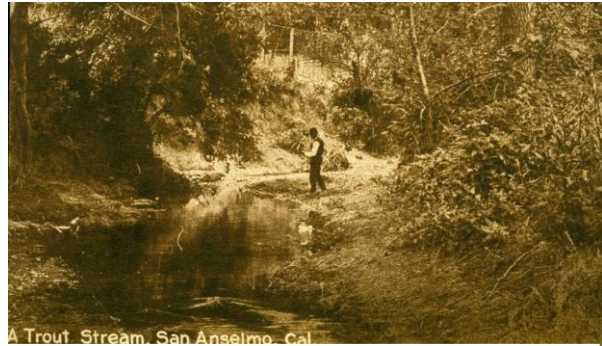
Logging and grazing first changed the creek by removing trees and giving an advantage to annual grasses from the Mediterranean over native bunchgrasses. The result was increased runoff; the higher flows caused downcutting of the creekbeds, separating them from their floodplains. Then urbanization of the watershed compounded the changes to the creek, leading to the extirpation of the coho and the continuing decline of the steelhead trout.



*The paving over of the Ross Valley is the major cause of the decline of fish numbers in our creeks, because fast rainwater runoff alters winter and summer flows, and re-contours the stream channels. Photo by Charles Kennard*

mentioned benefits.

Schools, businesses, and homeowners pump groundwater from wells, reducing the amount of water flowing in the creek. Ross Creek, for example, which receives a steelhead run, has numerous wells along its banks, and goes dry in the early summer downstream of Natalie Coffin Greene Park, making survival difficult for the young fish hatched in the creek. The dam at Phoenix Lake cuts off Ross Creek from its cold,



*A Trout Stream, San Anselmo, Cal*

*A hundred years ago, recreational fishing was one of the attractions of San Anselmo. Postcard image courtesy Jim Staley*

Today the creek bed is much lower than it used to be. It's disconnected from its flood plains and high-water terraces. It has become channelized by incremental armoring of the creek banks, and straight where it used to be braided and sinuous. Trout have fewer places to escape the high velocity flows of a flood or hide from predators when the water is low in the summer. There is less oxygen in the water. There is less food because native vegetation and its associated insect life have been diminished. The water temperature is higher. There is hardly any large woody debris, which would provide all of the above-

shaded, undeveloped headwaters, long inaccessible to steelhead.

Much of the watershed's creek banks are lined with non-native ivy, fences, rip-rap, or concrete walls—all of this where there used to be riparian forest that produced food, shade, and shelter.

Steelhead heading to the ocean enter an estuary that has been diked, filled, and dredged. To get to the estuary, steelhead need to navigate past children's dams, avoid the maws of invasive species like the bullfrog and largemouth bass, and run the gauntlet of the concrete flood channel in Ross and Kentfield, where they are easy prey for herons, egrets, and mergansers.

Spawning steelhead migrating upstream from the ocean, and rainbow trout (the same species as steelhead) migrating within the creeks, face formidable barriers at all levels of stream flow. When the creek is high, the fish ladders can become impassable. When the creek is low, the fish ladders can become impassable again. Bridges, culverts, the concrete channel, dams at former stock ponds and swimming holes, and the little dams children build: all impede the migration of steelhead and contribute to their decline.

Some of these changes to the creek have come suddenly and dramatically. The construction of the concrete flood channel in the 1960s in Ross completely altered, almost overnight, a critical stretch of Corte Madera Creek and may have been the final nail in the coffin of the coho salmon. Other changes have been gradual, happening over decades, many of them continuing at the present time. In this category are the changes to the streambed caused by increased flow during storms and the piecemeal armoring of stream banks. The creek continues to be changed in a negative way by this process.

Peter Moyle, a U.C. Davis fisheries scientist, says that it is likely that steelhead will disappear from most small watersheds like Corte Madera Creek in the next 25 to 50 years. Even though steelhead are a hardy species, it's not hard to believe that such a terrible event could happen, considering that their numbers have fallen by about 90% since 1950. The roads and the roofs and the cars and the people aren't going anywhere. Still, there is hope that if we can reduce some key impacts of human presence—fish passage barriers, groundwater pumping, armoring of stream banks—we may be able to keep a steelhead population alive in Ross Valley creeks for future generations to marvel at.

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