

What Happens to Fish During Wildfires?

By Samantha Baxter



Rainbow trout observed in a pocket of water in the Arroyo Seco. (Credit: © Arev Markarian (2025))

While wildfires' impact on the land is well-known, their influence on waterways and the aquatic life that reside there is a bit more complex. Beyond initial damages, fish are also uniquely impacted by wildfires in terms of how water quality and physical stream conditions change as a result of the fires.

HOW WILDFIRES IMPACT AQUATIC ECOSYSTEMS AND FISH

Impacts on the larger ecosystem can be both physical and chemical, as the fires change streamflow dynamics and lead to water quality degradation. Influxes of sedimentation, debris flow, and ash from the burned land flood rivers and streams as runoff resulting from rainfall after fires.

Such contaminants can cause fluctuations in dissolved oxygen, pH, turbidity, and temperature, which negatively impact fish health and habitat suitability. Additionally, ash may contain lead, dioxins, and other chemicals, and the fire retardant used to treat fires can directly contribute to fish mortality during and after fires.

Land destruction, such as felled trees, can also further impact fish habitat. Logs and brush can dam up parts of streams and rivers, leading to habitat degradation and creating barriers to migration and evacuation.



Dr. Robert Kurkjian testing water quality in the Arroyo Seco. (Credit: © Arroyo Seco Foundation (2025))

RESPONDING TO WILDFIRES AND RESCUING CRITICAL SPECIES

In cases where critical or endangered species will be impacted by wildfires, state and local conservation groups often lead efforts to rescue and translocate the fish to unimpacted streams or rivers.

Such was the case with coastal rainbow trout (*Oncorhynchus mykiss*) in the San Gabriel River, which were translocated to the Arroyo Seco stream after the Bobcat Fire in 2020. The transported rainbow trout had their adipose fins clipped for future identification and genetic testing.

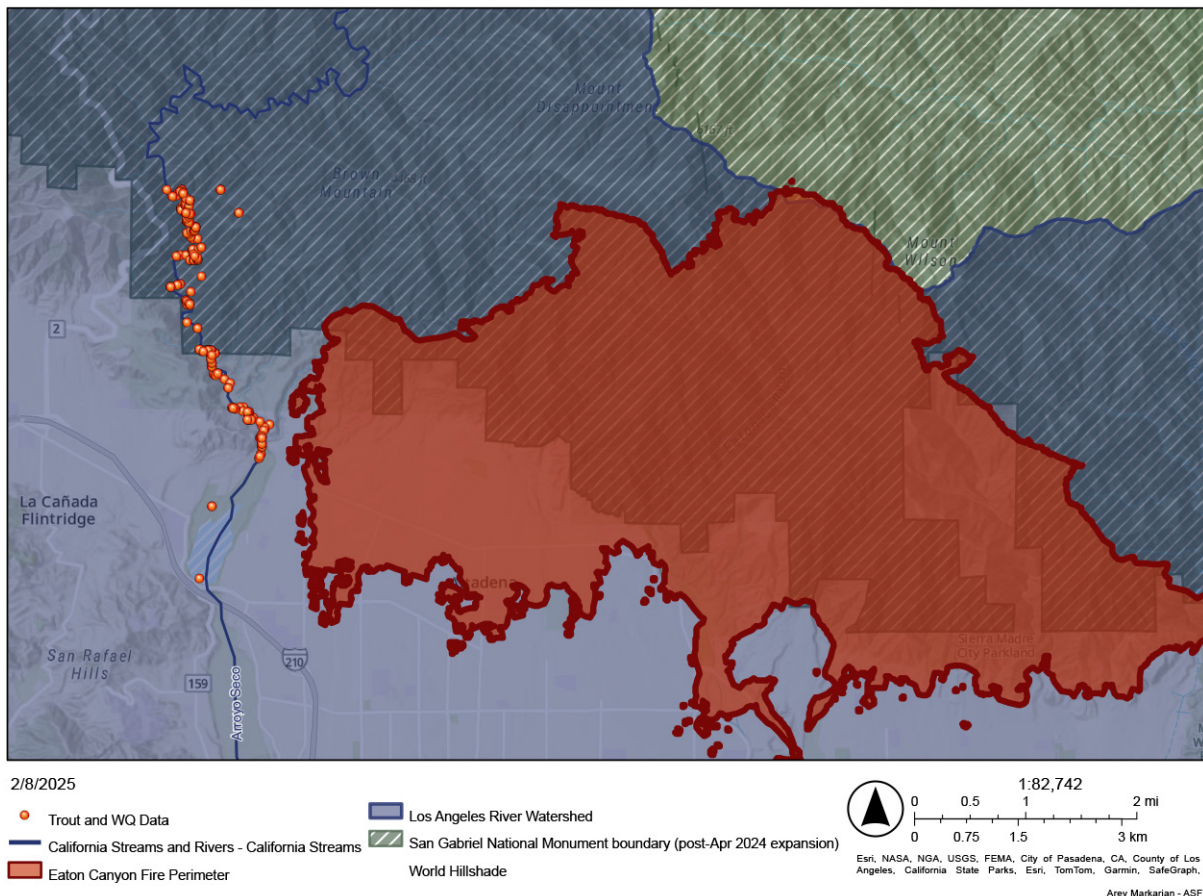
Rescue and relocation efforts were led by the California Department of Fish and Wildlife (CDFW), and monitoring of the translocated fish was taken over by the Arroyo Seco Foundation (ASF) shortly after, in addition to the foundation's routine water quality monitoring.

The ASF team is comprised of Board Members, staff, and volunteers led by Robert Kurkjian, Matthew Karanian, Gary Sikkens, and Arev Markarian. The goal of the stream surveys is to evaluate the efficacy of the translocation initiative and monitor the stream and habitats year-round.

Surveying methods include the use of underwater video cameras, observations during snorkeling, water quality measurements, and noting environmental conditions when conducting fieldwork.

Camera footage is screened both in the field and later on a larger screen to evaluate population size, fish size, and the presence of adipose fins. In-field observation helps guide surveys, and post-fieldwork observations allow for closer examination of parr marks, which are a series of dark vertical markings that appear on the sides of young rainbow trout.

Trout and WQ Observation Points (2021-2025)



Map indicating where trout were translocated. (Credit: Arroyo Seco Foundation)

Survey locations are recorded in the field using ESRI Field Maps, which automatically connect and update to an ESRI geographical information system once back in the office.

“This dashboard known as the ASF Trout and Water Quality Dashboard acts as a hub for open-source conservation data for local, regional, and state agencies as well as an educational resource for the local community,” states Dr. Robert Kurkjian, President of ASF.

In addition to the fish surveys, the ASF conducts standard in-situ water quality measurements and notes other environmental conditions in order to develop a holistic view of the ecosystem. In the past year, the team has not observed rainbow trout with clipped fins—however, considering the lifespan of rainbow trout, the team believes that the original translocated fish are no longer alive, and they are instead observing their descendants.

CDFW personnel rescued 469 rainbow trout from endangered habitats in the San Gabriel River and translocated them to the Arroyo Seco where they

are believed to have successfully reproduced. As a result, the Arroyo Seco stream relocation project is believed to have been largely successful.

Locally, the ASF data helps further conservation efforts as it allows for closer analysis of the stream, builds on historical and seasonal data, and connects stakeholders, assisting with planning, education, and outreach.

More broadly, the translocation project and the following monitoring program will help inform future rescues and translocation efforts elsewhere in the world. These initiatives are necessary for protecting key species in the age of climate change and man-made environmental degradation that will only exacerbate the frequency and severity of wildfires.

More information about the Streamflow Enhancement Program and the work of ASF can be found at www.arroyosecofoundation.org and on our Instagram @arroyosecofoundation. To contact ASF, please send an email to info@arroyosecofoundation.org.



The waters of the Arroyo Seco flow south from the San Gabriel Mountains. (Credit: © Robert Kurkjian (2025))