



The WaterTalks Series is an ongoing program of educational events designed to provide people a place to learn about water-related topics. The program goal is to increase informed participation in water management policy decisions by providing a place for community members to interact with experts who have a diverse range of perspectives and to develop common understanding. Water Talks is a program of the Santa Clara Steelhead Coalition led by California Trout.

Invasion in My Backyard: Managing Pests and Weeds to Benefit Fish

Joe Curti, Mountains Restoration Trust, Mickie Tang and Shelley Bennett, UC Santa Barbara

Invasive plants and aquatic animals have colonized steelhead habitat on the Santa Clara River and are a major limiting factor in the recovery of native fish populations. Invasive plants aggressively displace riparian vegetation disrupting ecological processes necessary for steelhead growth such as shaded vegetation to support instream habitat, cold clean water, and presence of insects for food. Invasive aquatic animals outcompete steelhead for available food sources, habitat, as well as directly prey on the native fish eggs, larva and steelhead smolt.

CalTrout is part of a collective effort to eradicate invasive plant and animal species which negatively impact the Southern California steelhead's survival along the Santa Clara River. Restoration activities are in progress and expanding to provide a large, contiguous native riparian zone for steelhead habitat, amongst other species. The final goal of the restoration project is to produce a long-term self-sustaining freshwater ecosystem throughout the Santa Clara River watershed. The drought and climate change have resulted in warmer water temperatures which tend to favor aquatic invasive species. An aim of addressing invasive species is to ensure that once steelhead reach rearing and spawning habitat in the headwaters, these pools are hospitable to breeding and rearing for recruitment and population abundance.



New Zealand mud snails. Photo: Resource Conservation District Santa Monica Mountains Stream Team.

Joseph Curti is Aquatics Division Project Manager at Mountains Restoration Trust, working to protect the unique biodiversity of the Santa Monica Mountains. His UCLA Environmental Science and Conservation Biology degree has been used in a wide variety of work experience such as with brown bats, parasitic genetics and invasive species in southern California.

Mickie Tang is a restoration ecologist with the Riparian Invasion Research Lab (RIVRLab) at UC Santa Barbara, and she coordinates restoration and monitoring activities for the RIVRLab's projects in the Santa Clara River. She has a B.S. in Ecology and Evolutionary Biology from UC Santa Cruz.

Shelley Bennett is a PhD student in the Riparian Invasion Research Lab at UC Santa Barbara. For her dissertation, she is studying the ecology and management of the invasive Polyphagous and Kuroshio shot hole borers.

Invasive Plants

- Arundo (Arundo donax; giant reed) is a fast-growing invasive plant along rivers and streams that stifles growth of native riparian habitat. It spreads by tough below-ground rhizomes but also sprouts easily from broken stalk pieces on the surface. Giant reed does not provide habitat for land or bird species, and provides no vegetative cover for shade over water. It is a fire hazard and reduces groundwater availability through high rates of evapotranspiration.
- Tamarisk or saltcedar (Tamarix spp.) has a higher water demand than native riparian plant species. It causes the water table to drop and results in less available in-stream flow for steelhead. Tamarisk leaf litter is also highly flammable and a wildfire risk. Tamarisk increases soil salinity, preventing the growth of native plant species which provide shade necessary to keep summer steelhead pools cool.
- Coalition members use a host of strategies to control invasive species on the Santa Clara River. Eradication of invasive arundo donax and tamarisk requires multi-year commitments to discourage regrowth and successful removal. In the case of Arundo donax we are guided by the Santa Clara River Parkway Strategic Plan for Arundo Treatment and Post-treatment Revegetation that employs the use of mechanical, manual, and chemical options. UC Santa Barbara's RIVRLab is doing research into biocontrol options. Application of approved herbicides (e.g., imazapyr and glyphosate) and associated adjuvants (materials such as surfactants, dyes, and oils that aid in the application of herbicides), whether on standing arundo, cut arundo stumps, or regrowth after cutting, are considered the most effective method for treating arundo under the kinds of conditions on the Santa Clara River watershed.
- African clawed frog, bullfrog and swamp crayfish are present in most of the tributaries and main stem. The frogs carry a chytrid fungus that is fatal to native amphibians, and the crayfish (brought in as a sport fishing bait) feed on native fish larvae and juveniles.
- New Zealand mud snails, zebra and quagga mussels were discovered in the Santa Clara River in 2006-2008 and all have extremely high reproductive rates, are exploding in population, and spreading in location. The snails consume up to half of available aquatic insects important to trout and salmon. The mussels remove large quantities of phytoplankton and alter water biological characteristics.
- Invasive aquatic animal eradication involves changes to human behaviors as well as in-situ physical removal of existing populations. For example, inspection, quarantine, and decontamination of boating vessels and equipment to eliminate transfer of invasive species from one location to another may be necessary.

CalTrout and Coalition Projects

- The RIVRLab (Riparian InVasion Research Laboratory), based at UC Santa Barbara, researches the effects of non-native species in riparian and stream ecosystems in the Western U.S. and identifies effective management strategies. RIVRLAB is currently managing or developing projects on the Santa Clara River for eradication of giant reed (Arundo donax), tamarisk (Tamarix spp), New Zealand mud snail (Potamopyrgus antipodarum), African clawed frog (Xenopus laevis), crayfish, and quagga and zebra mussels (Dreissena spp.).
- CalTrout has partnered with The Nature Conservancy, Santa Clara River Watershed Conservancy, and Stillwater Sciences, to remove 30-50 acres of Arundo donax and restore native riparian vegetation on the lower Santa Clara River. This expands and/or connects existing work underway by TNC and RIVRLab. Funding is secured through the Watersheds Coalition of Ventura County Integrated Regional Water Management (IRWM) grant and Santa Clara River Trustee council.
- CalTrout, Stillwater Sciences and Northwest Hydraulic Consultants are in the planning stages for invasive aquatic animal removal at Rose Valley Lakes, in the Los Padres National Forest. This will look at alternatives to remove the warm water habitat Rose Valley Lakes currently support, open access to rearing, spawning, refugia habitat, and assess the presence of invasive species in Sespe Creek.
- The Nature Conservancy is performing major invasive plant eradication and native plant restoration on the Santa Clara River (Hanson property). The multi-year project includes extensive arundo donax removal and newly constructed wetlands.



Arundo eradication

Invasive Aquatic Animals

- Non-native fish were historically planted in certain locations on the Santa Clara River for sport and have spread throughout the river ecosystem. For example, green sunfish are found in Sespe Creek, Rose Valley Lakes, Lake Piru and the estuary.

Upcoming Water Talk

Water Conservation & Fish Passage Design to Enhance Flow & Connectivity

June 29