

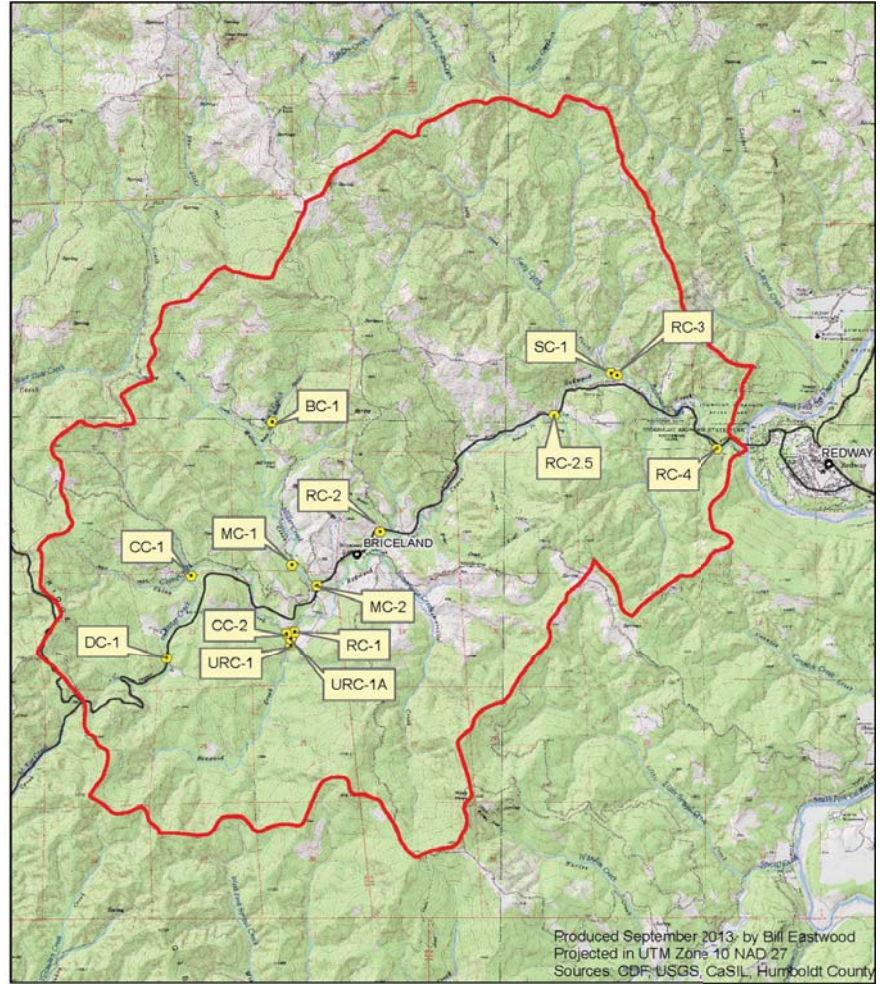
Water Conservation and Flow Monitoring in Redwood Creek, South Fork Eel River



The North Coast has experienced some much needed rainfall during this El Nino season but California is still experiencing one of the most severe droughts on record. It is clear that longer dry seasons are impacting northern Californian residents, wildlife, and salmon.

In 2013, Salmonid Restoration Federation (SRF) began efforts to determine the feasibility of transferring Sanctuary Forest's Mattole headwaters water storage and forbearance program to a neighboring watershed on the South Fork of the Eel River, where the native coho population is key to recovering the Southern Oregon Northern California Coast Evolutionarily Significant Unit (SONCC - ESU).

Sanctuary Forest's innovative program — where one million gallons of winter storage was established along a one mile stretch of the Mattole headwaters — resulted in enhanced streamflows within their project area. The idea is simple enough: store enough water in the winter when flows are plentiful to use during the summer, and forbear from pumping water during the dry season.



REDWOOD CREEK LOW FLOW STUDY MONITORING STATIONS, AUGUST, 2015



SALMONID RESTORATION FEDERATION

Legend

DC = Dinner Creek, CC = China Creek
URC = Upper Redwood Cr., RC = Redwood Creek
MC = Miller Creek, BC=Buck Creek, SC = Seely Creek



Monitoring Site Locations Throughout the Redwood Creek Watershed

The Redwood Creek Water Conservation Project

Located near Redway, California, Redwood Creek is a 26-square-mile watershed that borders the Mattole and flows into the South Fork of the Eel River. The California Department of Fish and Wildlife identified Redwood Creek and its five tributaries as important coho-bearing water courses, yet habitat degradation resulting from summertime low flows and high water temperatures pose a serious threat to the recovery of this endangered native salmon population. In addition to salmon, rural residents also reside in this watershed and depend on healthy streamflows for their household and irrigation needs.



Redwood Creek flows into the South Fork Eel River and contains hundreds of unregulated water diversions.

SRF designed the Redwood Creek Water Conservation Project to engage rural landowners and stakeholders in a coordinated, community-led water conservation effort. With the support of many partners, SRF has hosted several water conservation workshops and distributed educational materials about water rights, water conservation, and drought resilience throughout the region.

A Place-based Collective Action Strategy

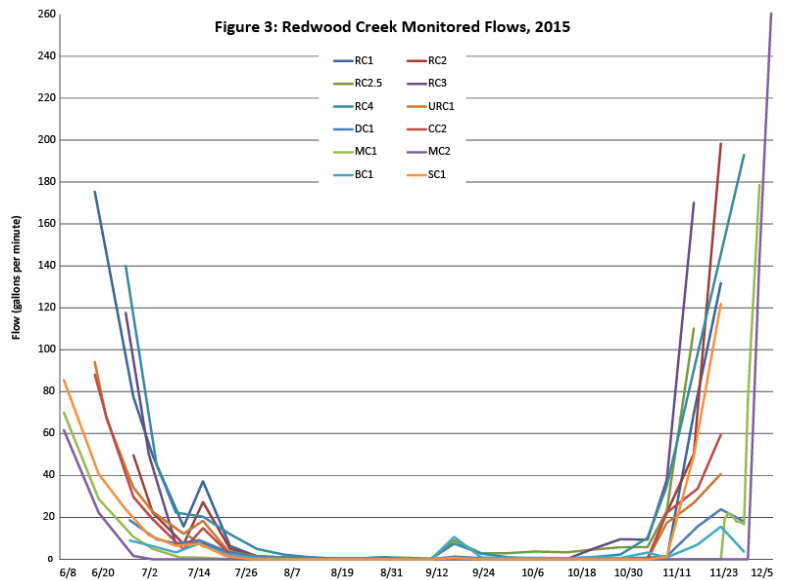
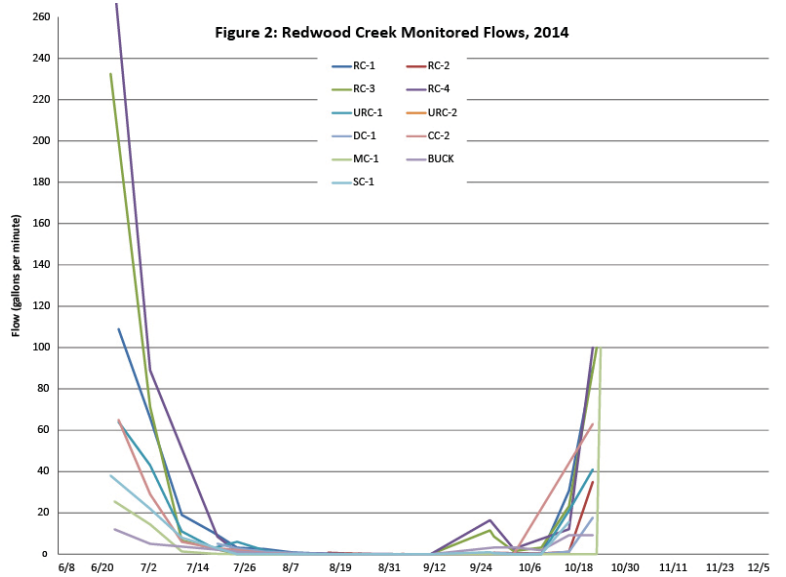
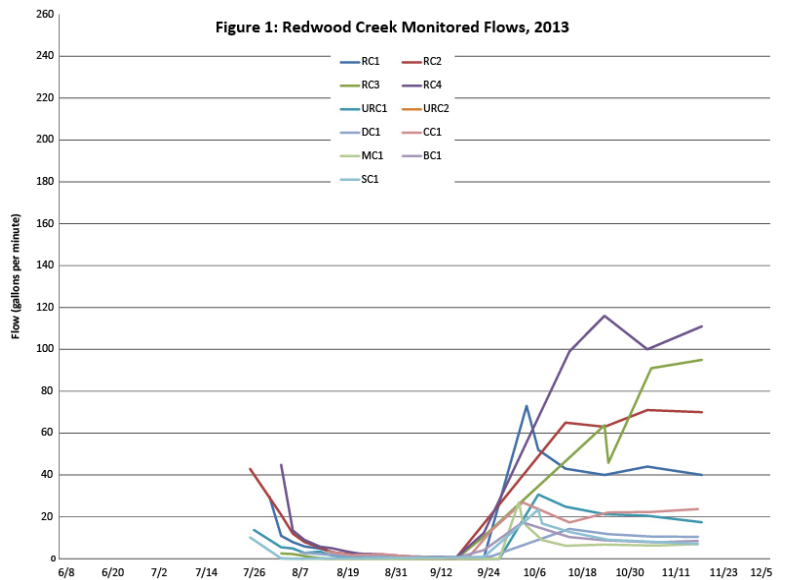
The Redwood Creek Water Conservation Project is implementing a place-based, collaborative streamflow improvement strategy. The project puts a high value on local and inter-generational knowledge sharing and participation, emphasizes the intrinsic value of non-human creatures indigenous to the watershed (particularly of native salmon), and is motivated by a desire to improve the landscape for the benefit and enjoyment of future generations.

Under the right circumstances, place-based collaborative restoration can provide an effective framework for encouraging local citizens to become active participants and caretakers of the places that they call home.



Above: Redwood Creek at high flows.

Right, from top to bottom: Figure 1: 2013 Monitored Flows; Figure 2: 2014 Monitored Flows; Figure 3: 2015 Monitored Flows. These graphs illustrate flow trends at our Redwood Creek monitoring sites: RC = Redwood Creek, BC = Buck Creek, URC = Upper Redwood Creek, SC = Seely Creek, CC = China Creek, MC = Miller Creek, DC = Dinner Creek.

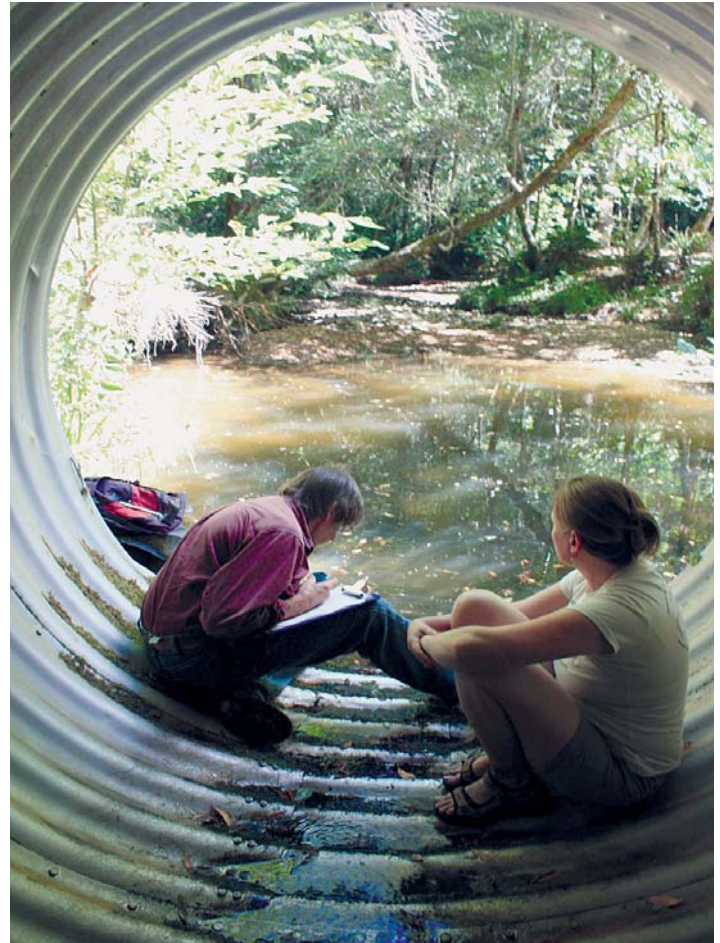


Flow Monitoring

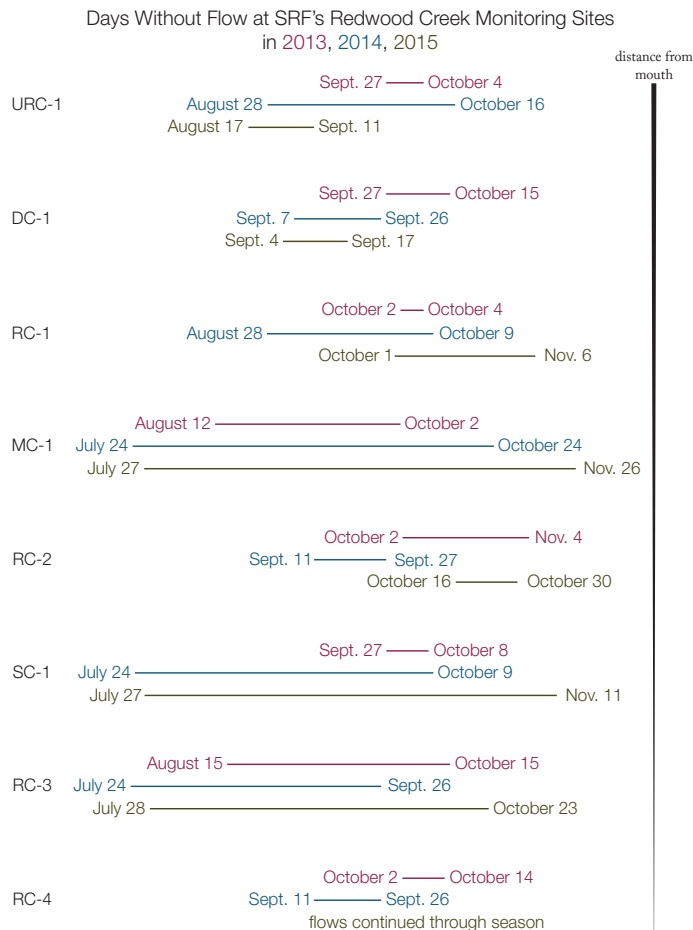
During the initial year of flow monitoring in 2013, Bill Eastwood of the Eel River Salmon Restoration Project began to monitor sites throughout the Redwood Creek Watershed. Between early August and mid-September many of the streams became intermittent and most pools were either very low or completely dry. Minimum flows at all of the monitoring sites were less than one gallon per minute by mid-September, which means that only two households pumping simultaneously have the potential to dewater the creek (Figure 2).

Compared to 2013, stream flows in 2014 declined earlier, the low flow period lasted longer, and stream flow took longer to recover after continuous fall rain events (Figure 3).

Our 2015 monitoring season began early June and Bill Eastwood started recording a lack of flow within a few weeks. By August 1, flows monitored at 12 sites averaged less than one gallon per minute. Over the past three years of monitoring, we are noticing a trend towards longer periods with no flow. By the end of summer and into fall, Redwood Creek and its tributaries contain disconnected pools of slowly disappearing water with stranded juvenile salmon.



Geologist Bill Eastwood, SRF Redwood Creek Monitoring Coordinator, and Sara Schremmer, SRF Program Manager, visit a site where Redwood Creek trickles through a culvert designed for massive storm events. photo: Dana Stolzman



Next Steps

SRF received funding from the State Water Resources Control Board's 319h grant program to continue the flow monitoring and water conservation efforts in the Redwood Creek watershed. With the support of hydrologist Randy Klein, we will gather low flow and water temperature data to understand flow levels required to maintain pool connectivity and cool water temperatures needed for juvenile salmonid survival within this critical habitat.



With funding from California Department of Fish and Wildlife, SRF is working with Stillwater Sciences and Trout Unlimited on a feasibility study in Miller Creek and the adjacent portion of the main-stem of Redwood Creek. We hope to understand what types of large-scale water conservation and forbearance programs enhance flows within this watershed.

For Additional Information:



Salmonid Restoration Federation

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Schremmer, Sara. 2014. "Resilience in a Time of Drought: Building a Transferable Model for Collective Action in North Coast Watersheds." Master's Thesis, Department of Sociology, Humboldt State University, Arcata, CA.



Diminishing Pool in Miller Creek, a Redwood Creek Tributary. Bottom left clockwise: June 17, August 4, October 16, and November 25, 2015. Most of the Redwood Creek tributaries flowed at less than one gallon per minute by mid-July. photos: SRF

