Restoration and Safeguarding of California Golden Trout Populations in the South Fork Kern River

State(s): California
Managing Agency/Organization: Trout Unlimited
Type of Organization: Non-profit
Project Status: Ongoing
Project type: WNTI Project
Project action(s): Watershed and population assessment, monitoring, education, and outreach. This project will evaluate one population of California golden Trout over 83 stream miles.
Trout Species Benefitted: California Golden Trout
Population: South Fork Kern River

Project summary: Protecting California Golden Trout (CAGT) is a high priority for anglers and natural resource managers. Currently, the iconic subspecies is subject to familiar yet dire threats. Significant numbers of Brown Trout, and likely hybrid Rainbow x Golden Trout, were detected in the South Fork Kern River (SFKR) between Ramshaw and Tempelton barriers. Decades of conservation work were conducted in this same river reach from the 1960s-2000s to protect these unique fish. To illustrate the importance of this reach of river, CAGT from being listed under the Endangered Species Act. The Agreement states, "This 83-mile reach is the heart of the native California Golden Trout range, and its protection is crucial to effective conservation and long-term security of the subspecies." Currently, this reach is unprotected from the harmful impacts of nonnative species, including competition for resources, predation, and hybridization with nonnative Rainbow Trout. The putative explanation for how the invasion occurred is the connection between the headwaters of Strawberry Creek and an unnamed tributary to the SFKR (hereafter, "the Strawberry Creek connection"). The Strawberry Creek flows into the SFKR approximately 4km downstream of Templeton Barrier. However, the unnamed tributary enters the SFKR between Ramshaw and Templeton. Hence, the presumed connection between the two creeks under high flows provides known populations of nonnative trout residing downstream of the barrier with unmitigated access to the "heart" of the CAGT's range. It is also possible that the Templeton barrier was not completely effective under these flow conditions or that its structural integrity has been compromised. This project conducts an assessment to 1) determine how the invasion occurred 2) enumerate the abundance distribution of nonnative trout present and 3) revive an outreach campaign to inform the public of the threats that CAGT currently face. Ultimately, this work will lead to the development of a suite of options for addressing the situation and the restoration of the SFKR as premier habitat for CAGT.

**Problem the Project Addresses:** In 1966 a major recovery effort to save California Golden Trout populations in the SFKR was initiated by the California Department of Fish and Game. At the time, Brown Trout and hybrid nonnative Rainbow x Golden Trout were spread throughout the watershed, and CAGT in the SFKR were nearly extirpated. Decades of difficult recovery work were conducted to rehabilitate more than 100 miles of stream for CAGT. That work included the construction of multiple barriers, chemical treatments, translocations of genetically pure CAGT, habitat restoration, and a significant reduction of grazing; the scale of which hasn't been replicated in California since. After approximately four decades of work, the portion of the SFKR watershed upstream of Templeton Barrier was returned to relatively pristine habitat in which CAGT could thrive. With the recent detection of Brown and likely Rainbow x Golden Trout hybrids in the SFKR's reach above the Templeton barrier, much of that work has been undone. It is vital to the long-term survival of CAGT in the SFKR that fisheries and engineering staff thoroughly assess the source and extent of the invasion. A renewed, large-scale restoration effort is likely necessary.

The connection between Strawberry Creek and the unnamed tributary to the SFKR is the presumed source of the nonnative trout invasion, although we cannot yet rule out barrier failure. The two watersheds come close to each other on the west side of Templeton Mountain, separated only by a low-lying ridge with a very small change in elevation. It is speculated that the headwater reaches connect under high flow conditions, like those experienced in 2023. The ridge separating the watersheds is so small that the headwaters of the two watersheds were intentionally connected ~70 years ago by cattle permittees who diverted water from one watershed to the other to increase the flow running by their cattle camp. Under normal circumstances, fish would be unable to move between watersheds via the SFKR because Strawberry Creek joins the SFKR downstream of Templeton Barrier, while the unnamed tributary enters the SFKR upstream of the barrier. The headwater connection effectively provides a route to bypass Templeton Barrier.

## **Objectives:**

• Conduct a thorough habitat assessment of the headwater reaches of Strawberry Creek and the unnamed tributary to the SFKR. Habitat evaluation consists of high-resolution relief mapping to provide data that will be fed into a hydrologic model. The expected results of the data collection and

modeling effort are the determination of the point(s) of connection and the flow conditions under which a connection is expected.

- Conduct a thorough evaluation of the condition of Templeton Barrier. Engineering staff will inspect
  the barrier, with particular attention focused on the crack where the face of the barrier meets the
  apron. This crack was discovered in 2017 and has been monitored annually via trail cameras and
  visual inspection. With the high flows experienced in 2023 and the detection of nonnative trout above
  the barrier, a more thorough evaluation and inspection by Conservation Engineering staff is necessary
  to attempt to rule this out as the pathway for invasion.
- Conduct spatially balanced electrofishing surveys to determine the geographic extent of the invasion and the abundance of nonnative trout. It is likely that to confirm the presence of hybrid Rainbow x Golden Trout we will have to collect tissue samples for genetic analyses concurrently. Establishing the invasion's extent could explain how recently it occurred. Determining the age structure and numerating the abundance of nonnative trout could also provide some clues to the timing of the breach.
- Renew and expand outreach efforts in Tulare and Inyo counties (and statewide). This includes improving the flow of information from agency to agency (or interested party to interested party) and creating opportunities to educate the public about the perils of unauthorized transplants of live fish and the vulnerability of California's state freshwater fish.

## **Partners:**

- Trout Unlimited
- California Department of Fish and Wildlife
- U.S Forest Service Inyo National Forest, Golden Trout Wilderness
- Western Native Trout Initiative

**Project Monitoring**: In the long term, success will be measured by the proportion of the 83 of the stream miles between Templeton and Ramshaw barriers that are free of Brown Trout and nonnative Rainbow x Golden Trout hybrids. In the near-term, success will be determined by our ability to understand the threshold of precipitation and dynamics governing the connection between the headwaters of Strawberry Creek and the unnamed tributary to the SFKR. Successful barrier evaluation will yield a prescription for either remedying or arresting the further deterioration of the barrier. Successful outreach will be measured by revitalizing meetings of agencies that signed the Conservation Agreement, by the number of new signs installed in and around the Wilderness Area, and by the number of presentations and public information meetings we are able to hold. We fully expect this recovery work to be an iterative process.

Funding Source(s): National Fish Habitat Action Plan Project cost: \$44,765 WNTI funds, Total project cost \$90,225 Start Date: 07/01/2025 Completion Date: 06/30/2026 Project Contacts: Jessica Strickland, Trout Unlimited, Jessica.Strickland@tu.org