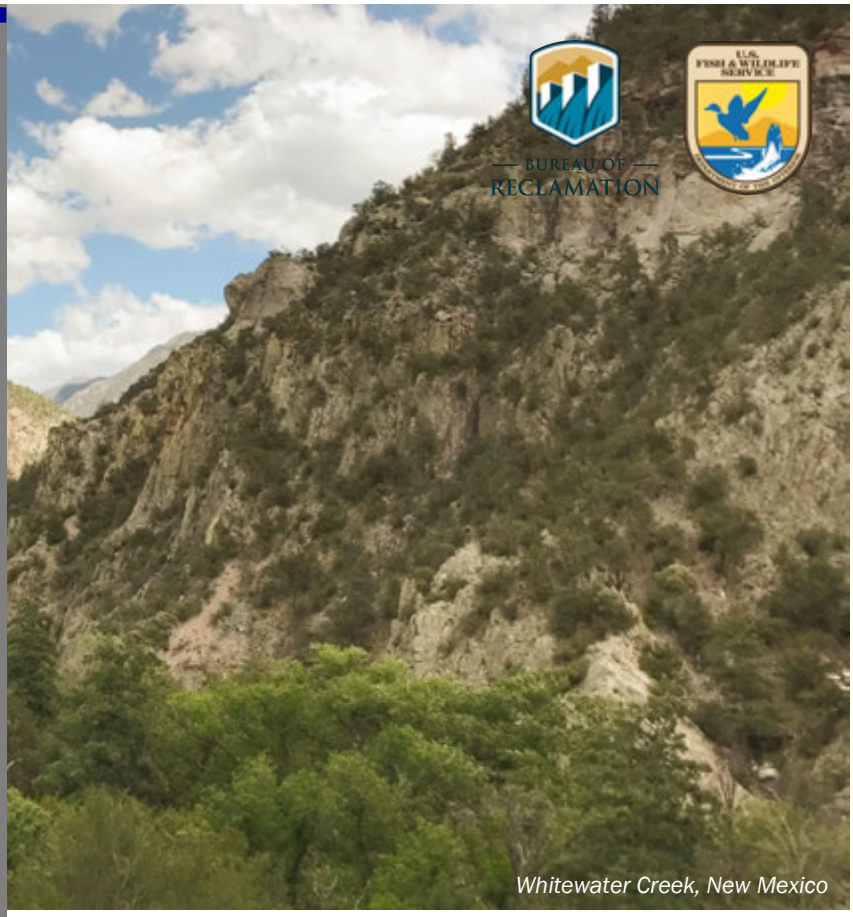
RESTORATION

Non-Native Trout Removal for Native Gila Trout Recovery in Whitewater Creek, New Mexico

Whitewater Creek, located near Glenwood, New Mexico, in the Gila National Forest is within the historic range of Gila Trout (*Oncorhynchus gilae*). This species inhabits headwater mountain streams throughout the Gila River Basin in Arizona and New Mexico and is Federally listed as Threatened due to habitat loss and degradation as well as competition and hybridization with non-native trout. Whitewater Creek contains populations of non-native Rainbow Trout and Brook Trout, yet prior to this project this system was devoid of Gila Trout. Managers from New Mexico Department of Game & Fish (NMDGF), U.S. Fish and Wildlife Service (FWS), and the Gila National Forest focused on non-native fish eradication before reintroducing Gila Trout into Whitewater Creek in 2020.



Whitewater Creek, New Mexico

KEY ISSUES ADDRESSED

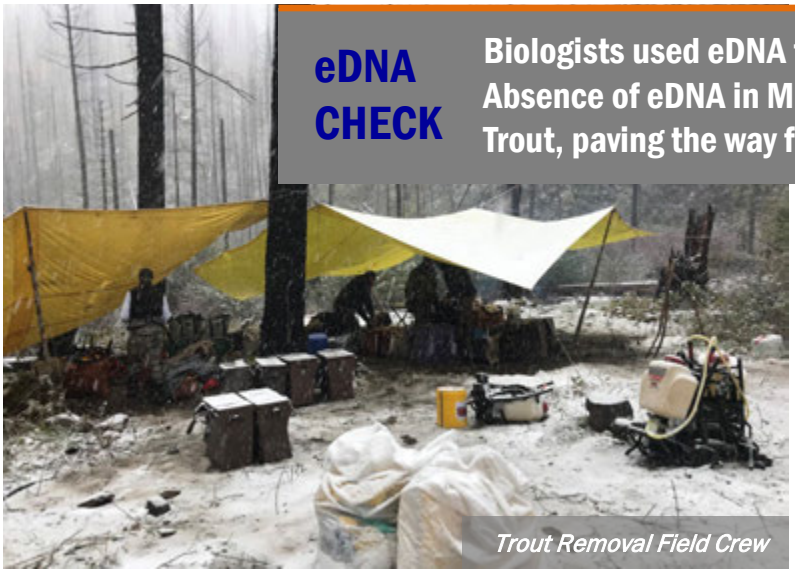
Brook Trout (*Salvelinus fontinalis*) and Rainbow Trout (*Oncorhynchus mykiss*) have established populations in Whitewater Creek since they were first stocked in the early 1900s. It is assumed that they directly predated on native Gila Trout and outcompeted them for limited habitat and prey availability, causing local extirpation. While Gila Trout had already been extirpated, the Whitewater-Baldy Fire in 2012 jump-started the process for biologists to take a proactive approach to non-native trout eradication. Yet, post-fire conditions made field logistics and access difficult, and already complex stream habitat posed challenges to implement chemical (rotenone) non-native fish treatments.

PROJECT GOALS

- Eradicate populations of non-native Brook Trout and Rainbow Trout in Whitewater Creek using rotenone treatments
- Monitor effectiveness of treatments using environmental DNA (eDNA)
- Reintroduce Gila Trout to 23 miles of stream once eDNA surveys confirm absence of non-native Brook and Rainbow Trout

eDNA CHECK

Biologists used eDNA to evaluate the efficacy of rotenone treatments. Absence of eDNA in May 2020 revealed no Rainbow Trout or Brook Trout, paving the way for Gila Trout reintroduction.



Trout Removal Field Crew

PROJECT HIGHLIGHTS

Community Support: After the 2012 Whitewater Fire, local community support for native fish conservation and establishing recreational angling opportunities for native fish increased. This support enabled NMDGF to focus Gila Trout reintroduction efforts on Whitewater Creek.

A Creek-Wide Approach: Arduous and remote field conditions meant that field crews covered multi-day distances from drainage top to bottom. Field crews of 25-30 people covered 23 stream miles in rugged, remote conditions during rotenone treatments, and smaller crews of 3-9 people conducted post-treatment monitoring and eDNA collection in Whitewater Creek.

Non-Native Trout Eradication: Rotenone, a commonly-used piscicide (a pesticide that targets fish), was applied once a year from fall 2017 to fall 2019 for non-native Brook Trout and Rainbow Trout eradication. No Brook Trout were detected after the fall 2017 treatment, however Rainbow Trout detections in 2018 and 2019 led to rotenone treatments in fall 2018 and fall 2019.

Gila Trout Stocking: Neither Brook Trout nor Brook Trout were detected via eDNA in spring 2020.As such, Gila Trout were successfully stocked into Whitewater Creek in summer 2020.

Collaborators

- New Mexico Department of Game and Fish
- U.S. Forest Service, Gila National Forest Glenwood Ranger District
- U.S. Fish and Wildlife Service

LESSONS LEARNED

Multiple rotenone treatments were needed to eradicate non-native trout. Spot-checking with backpack electrofishing also had to be completed. Complex habitat including riffles, runs, large boulders, and deep pools as well as large in-stream woody debris were difficult to consistently target with rotenone. Project biologists hypothesize that trout could perhaps escape to small pockets of upwelling fresh water.

Post-fire conditions with debris, dead trees and shrubs, and blowdowns from storms made field logistics even more challenging, given that the project area is only accessible at the bottom and upstream reaches. Detailed coordination among field crew members, helicopter crews, and pack mule teams was based on drainage-wide field surveys conducted before rotenone treatments.

Whereas electrofishing surveys in complex habitats may fail to yield trout, eDNA samples collected from the same area could confirm trout presence. Post-rotenone electrofishing surveys conducted by the project team indicated no Rainbow Trout, yet eDNA results from collected water samples indicated Rainbow Trout occurrences in several locations that were targeted for rotenone treatment.

NEXT STEPS

- Monitor native Gila Trout reintroductions
- Restore populations of additional native fishes including Speckled Dace (*Rhinichthys osculus*), Desert Sucker (*Catostomus clarkii*), and Sonora Sucker (*Catostomus insignis*)

For more information on this project, contact Jill Wick: jill.wick@state.nm.us

Reintroducing Gila Trout to Whitewater Creek

Lead Author: Alex Koeberle, University of Arizona, October 2020.
Photos courtesy of New Mexico Department of Game and Fish
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