RIO GRANDE CUTTHROAT TROUT – UPPER COSTILLA WATERSHED

RGCT History

RGCT were extirpated from the Costilla Basin due to competition and hybridization with non-native trout including rainbow, brook and brown trout. The subspecies is no longer a candidate for listing under the federal Endangered Species Act as of December 2024.

Project Goal

A group of partners, Vermejo Park Ranch, Turner Biodiversity (now Turner Natural Resources), Colorado Parks and Wildlife, New Mexico Game and Fish, US Forest Service, US Fish and Wildlife Service and Trout Unlimited came together to obtain the goal of restoring a self-sustaining RGCT population in the upper Costilla watershed.

RGCT Biology

RGCT is the southernmost of 14 generally recognized cutthroat trout subspecies and native to the Rio Grande, Canadian and Pecos watersheds. The subspecies, *Oncorhynchus clarkii virginalis*, is recognized by yellow to orange coloration, irregular dark body spots behind the dorsal fin and on tail, and characteristic red to orange slashes beneath the lower jaw. The trout is a cold-water fish requiring good water quality that feeds primarily on insects or small fish and spawns in spring.

Rangewide, populations have declined approximately 90% due to competition (brook and brown trout) and hybridization (rainbow) with non-native trout, and due to other habitat related losses. RGCT do not hybridize with brook and brown trout as they are fall spawning fish; cutthroat trout and rainbow trout spawn in the spring. Because they spawn in the fall, young brook and brown trout typically hatch before cutthroat trout the following spring and gain a competitive size advantage, especially early in life.

Project History

In 2002, Vermejo, along with state and federal partners, initiated a 15-year effort to remove non-native fish from the Costilla watershed above the Costilla Reservoir dam. Ten temporary fish barriers were constructed so that non-native fish could not swim back upstream as the upper reaches were cleared of non-native fish using rotenone, moving downstream in a stepwise fashion. Rotenone is a pesticide (piscicide) derived from plants and can be used in very low dosages (e.g., 50 ppb) to kill invasive or unwanted fish. Rotenone degrades quickly in the water column and at these dosages is not harmful to humans. The project involved treating and re-stocking 60+ miles of stream and 18 lakes on Vermejo in the Costilla Watershed.

In 2013, a candidate conservation agreement with assurances was signed with US Fish and Wildlife Service and New Mexico Department of Game and Fish. This agreement states that conservation actions on behalf of the RGCT are beneficial and won't count against Vermejo if the species is listed under the Endangered Species Act.

Vermejo Park Ranch received the NM Governor's Environmental Excellence Award for Wildlife Conservation for the Costilla RGCT project in 2015. And in 2016, with final treatment of Costilla Reservoir, non-native fish removal was completed on the Vermejo portion of the watershed. Finalizing the project, the last temporary

fish barrier was removed from the project area, reconnecting the entire watershed above Costilla Reservoir for RGCT in 2021 with downstream phases of project on Carson National Forest completed in 2022.

At the completion of the project, biologists estimated approximately 35 RGCT per 100 yards in the larger creeks of the Costilla watershed with the average fish length about 7 inches; the largest fish can exceed 12 inches. Fish living in the reservoir or lakes can exceed 20 inches in length.

Continuing & Future Work

Vermejo and Turner Biodiversity (Turner Natural Resources) scientists will continue the assessment and improvement of road crossings in the watershed for stream health and fish passage. The restored RGCT populations are monitored (size, numbers, and reproduction) annually. Our biologists also use electrofishing to sample several 100 yard reaches across the watershed. This technique stuns the fish allowing us to capture, count, weigh, and measure the fish before releasing unharmed back into the water.

Watershed health and water quality are critical for the success of the RGCT project, thus range and riparian data are collected annually at range transects and photo monitoring points. Stream thermographs are deployed in Costilla and Casias Creeks to monitor water temperatures. Research to improve management of native RGCT and associated species is ongoing. A project investigating 'Population demographics and dynamics of Rio Grande Cutthroat Trout in the upper Rio Costilla watershed' with New Mexico State University should be completed in 2024.

Milestones

Completions of a successful restoration of the largest RGCT population within its current range, contributing to a better conservation status for the species.

Frequently Asked Questions:

1. **What size RGCT can be caught at Vermejo?** An average mature RGCT should measure approximately 10-12 inches in the streams. Larger RGCT have been caught, especially in the Costilla Reservoir.
2. **Where do stocked RGCT fish come from?** The New Mexico Department of Game and Fish operates the Seven Springs Hatchery for production of RGCT for conservation and recreational purposes.
3. **Are there RGCT in other streams on Vermejo?** An aboriginal population of RGCT trout lives in the upper Vermejo watershed. Temperature controls the downstream limits of the population as the trout do not thrive in waters that exceed 70 F. Vermejo biologists and geologists are working to restore the river to reduce temperatures to increase RGCT range in the watershed. (see RGCT Vermejo Watershed abstract).
4. **How do you remove a fish barrier without harming the stream?** If the barriers were simply just pulled out, the drop that precluded fish from swimming upstream could cause significant erosion. Vermejo's stream scientists planned and constructed in-stream structures and redesigned the channels at the barrier removal sites to prevent the streams from eroding.

Further Reading:

https://www.wildlife.state.nm.us/fishing/native-new-mexico-fish/rio-grande-cutthroat-trout/