

# Central Oregon Interior Redband Genetic Status Project

**State(s):** Oregon

**Managing Agency/Organization:** USDA Forest Service – Deschutes National Forest

**Type of Organization:** Government

**Project Status:** Underway

**Project type:** WNTI Project

**Project action(s):** Assessment

**Trout species benefitted:** Interior Redband Trout

**Population:** Tumalo Creek Watershed and South Fork Crooked River Watershed

**Project summary:** The project would determine the genetic status of Interior Columbia River Basin Redband Trout populations in Central Oregon within the Tumalo Creek and South Fork Crooked River watersheds, where rainbow trout of hatchery origin have been liberally stocked in the past. Determining the status is critically important to fishery managers with the Oregon Department of Fish and Wildlife, U.S. Forest Service, and the Bureau of Land Management (BLM) for the management and conservation of this species, which are classified as a sensitive species with the Forest Service, BLM, and the State of Oregon. Future and ongoing land management practices in these watersheds could potentially impact water quality and Redband Trout habitat. An ongoing project within the Tumalo Creek watershed, located approximately 15 miles west of Bend on national forest lands, is the diversion of headwater springs to supply the City with municipal water, which affects streamflow in both Bridge and Tumalo Creek. Populations of either native Redband Trout or hatchery-origin rainbow trout exist above Tumalo Falls on Tumalo Creek, which is a vertical 97 foot high migrational barrier. A possible scenario is that streamflow that would naturally flow from the springs into Redband-occupied habitat of Tumalo Creek is instead being diverted into Bridge Creek that is considered void of fish upstream of the municipal water intake. Genetic determination will help guide management decisions for this project, as well as future management activities in the watershed to the benefit of native Redband Trout populations if confirmed from this study.

The South Fork Crooked River system, located approximately 45 miles southeast of Prineville, was treated throughout with rotenone in 1981 to remove non-game fish, possibly eliminating all native Redband Trout. Since 1982, the river system has been stocked only with hatchery-raised, fin-clipped Redband Trout, with origins from the upper Crooked River basin or the Deschutes River. Subsequent sampling efforts have collected unmarked fish, indicating either remnant native Redband still exist or natural reproduction by hatchery-origin fish. Unmarked Redband are also found in the tributary Twelvemile Creek, although it has never been stocked, indicating a potential remnant native Redband population. The proposed genetic study would determine if a native Redband population still exists in this river system, and if so, would provide a critical first step in developing an appropriate management plan that would lead to prioritization of this population for conservation and the acquisition of grant funding for habitat restoration.

**Problem the Project Addresses:** The unknown genetic status of the fish populations in both the Tumalo Creek watershed and the South Fork Crooked River watershed is a knowledge gap potentially hindering the management and conservation of this native species. If native populations can be determined, potential habitat conservation and restoration project work could occur.

The fish populations within the Tumalo Creek watershed are located on national forest lands. Land management actions would require NEPA and biological evaluations, which would be required to consider Redband Trout in the analysis should the population above Tumalo Falls be determined to be native Redband Trout. The portion of the watershed upstream of Tumalo Falls is largely unroaded, but there is substantial recreational use of public trails (hiking and biking). Land management practices in the watershed that could potentially impact water quality and Redband Trout habitat include road and trail maintenance, fuels and vegetation management activities, and streamflow management related to the City of Bend's municipal water supply. Determining if this population is native Redband Trout is important in analyzing potential effects during the federal NEPA process from all management activities and programs, current and future.

The South Fork Crooked River runs through a fairly even mix of private land and public land managed by the BLM, including through a wilderness study area. The major factors limiting the healthy function of the South Fork Crooked River watershed include water withdrawals for irrigation and impacts from livestock grazing on both private and public lands. This has led to poor and fragmented instream habitat, loss of fish through unscreened irrigation diversions, and limited trout productivity due to low summer flow, high summer water temperature, high nutrient load, and poor riparian conditions. Identifying native Redband Trout in the South Fork Crooked River watershed is a critical first step to addressing the recovery and conservation needs of this state and federally listed sensitive species.

**Objectives:** This project would gather additional information on the range and genetic make-up of Interior Redband Trout in the Deschutes Geographical Management Unit (GMU) to inform management and guide conservation efforts for this species. Redband Trout in the Deschutes GMU sub-basin face many stressors – interspecific competition with non-native fish species, predation by non-native fish species, flow management, and degraded habitat and water quality. The GMU was stocked with hatchery-origin rainbow trout around 100 years ago, and previous genetic work has shown some areas of hatchery introgression. Despite some recent genetic status work on Redband Trout, information throughout the GMU is lacking.

Collections of field samples will be in close coordination with the Abernathy Fish Technology Center in Longview, Washington. ODFW, BLM and USFS biologists will electrofish to collect fin-clip samples for DNA analysis in vials sent from the Abernathy lab. Collections will be made on approximately 150 individual fish within the two watersheds. The technique to be employed to determine the genotype of the fish populations will include Genotyping-in-Thousands (GTseq). Genetic markers of hatchery origin rainbow trout outplanted in the Deschutes GMU (Oaks Springs and Cape Cod) have already been established. These markers will be compared to the genotypes of the sampled areas to give insight to the genetic status of these populations.

**Partners:**

- USDA Forest Service – Deschutes National Forest
- Oregon Department of Fish and Wildlife
- Bureau of Land Management

**Project Monitoring:** The project will be considered completed and successful once the genetic status report is completed by Abernathy Fish Technology Center and forwarded to ODFW and USFS biologists, which is anticipated to be within two months of the lab receiving the samples. Long term monitoring is atypical for this project. Information obtained from the genetic study will be used in federal agency Biological Evaluations and included in Redband Trout conservation and management plans.

**Funding Source(s):** National Fish Habitat Action Plan

**Project cost:** \$6,500

**Start Date:** 09/01/2019 **Completion Date:** 9/30/2020

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