

Mulherin (aka Mol Heron) Fish Screen & Yellowstone Cutthroat Trout Entrainment Prevention

State(s): Montana

Managing Agency/Organization: Montana Fish, Wildlife & Parks

Type of Organization: State Governmental Agency

Project Status: Underway

Project type: WNTI Project

Project action(s): Barrier Removal or Construction, Monitoring

Trout species benefitted: Yellowstone Cutthroat Trout

Population: Mulherin Creek, Upper Yellowstone River Subbasin

Project summary:

This project entails installation of a Farmers Screen™ on an irrigation diversion on Mulherin Creek. Mulherin Creek is among the top 3 producers of fluvial Yellowstone Cutthroat Trout fry to the Yellowstone River in Montana. This diversion has been documented to be a sink for spawning adult Yellowstone Cutthroat Trout, and their outmigrating fry. Installation of this easy-to-maintain screen will provide fish passage through the lower half mile of Mulherin Creek, so that they can reach the Yellowstone River. In its current condition, boulders and Jersey barriers divert water into a hole cut in a plastic, corrugated pipe. This pipe is a relic of an unsuccessful attempt to screen the diversion in the 1990s that used an infiltration gallery. In its existing condition, the diversion has no features that would prevent entrainment of fish.

Problem the Project Addresses:

The reach of the Yellowstone River that extends from the state line to about 40 river miles downstream is a stronghold for nonhybridized, fluvial Yellowstone Cutthroat Trout. Fisheries investigations have been ongoing for decades and include: electrofishing and trapping of adult spawners, over 4 years of fry trapping in Mulherin Creek and the ditch, radio-tracking of fluvial Yellowstone Cutthroat Trout, and population monitoring in the Yellowstone River. The importance of Mulherin Creek as a source of recruitment of Yellowstone Cutthroat Trout has been documented for decades (Berg 1975; Clancy 1988), and Mulherin Creek is within the top 3 streams contributing fry to the Yellowstone River (Roulson 2002). Nonetheless, this irrigation diversion entrains a substantial proportion of outmigrating fry, and adult Yellowstone Cutthroat Trout have been found within the canal, or dead in irrigated fields (DeRito 2010; FWP, unpublished data). Installation of the fish screen will prevent entrainment of adult fish and fry, and will contribute to the resiliency of the fluvial population of genetically unaltered fish. In summary, numerous studies identified Mulherin Creek as a critical spawning stream, with entrainment being the major limiting factor, and this project will protect and enhance a population of genetically unaltered, migratory Yellowstone Cutthroat Trout within an existing stronghold.

The major factors limiting fluvial Yellowstone Cutthroat Trout in the upper Yellowstone River are low stream flow, and entrainment into irrigation canals. Yellowstone Cutthroat Trout spawn on the descending limb of the spring hydrograph (DeRito 2010). This timing temporally segregates the spawning periods of Yellowstone Cutthroat Trout and rainbow trout, which spawn on the ascending limb. This temporal segregation has allowed Yellowstone Cutthroat Trout to coexist with rainbow trout for 100 years. But because of the later spawning, incubation, emergence and outmigration coincide with lower flows. Furthermore, irrigation diversions on spawning tributaries entrain spawning adults and fry. Fish, Wildlife & Parks invested \$100,000 in a water lease to ensure adequate flows are present during critical periods. This project complements the investment in water leasing, by preventing the proven entrainment of adult spawners and outmigrating fry. Combined, these projects address the 2 forms of degradation, or limiting factors, for Yellowstone Cutthroat Trout, by maintaining stream flow, and passage to the Yellowstone River.

Climate change brings urgency to protecting this stronghold of fluvial Yellowstone Cutthroat Trout. The general trend for Yellowstone Cutthroat Trout populations is a retraction towards the higher elevations of their historically occupied habitat. For example, the lower elevation reach of the Yellowstone River extending from Springdale, Montana to Big Timber, Montana was also a stronghold for fluvial Yellowstone Cutthroat Trout; however, this population crashed in the early 2000s, and has not recovered. Yellowstone Cutthroat Trout remain abundant in the upper reach of the Yellowstone River, and the existing spawning tributaries have headwaters originating at high elevations, which provide cool water that is suitable for all life history stages. Although we have not given up attempts to resurrect the population in the lower river, securing the fluvial population in the upper river is the priority.

This project also meets goals and objectives of several conservation strategies developed for Yellowstone cutthroat trout within their historical range and Montana (May 2000; MCTSC 2007; Endicott et al. 2013; FWP 2014). These documents also prioritize protection of nonhybridized, migratory fish. Additionally, installation of a fish screen on Mulherin Creek is among the specific recommendations for this stream in Montana's strategy for conservation of Yellowstone Cutthroat Trout (Endicott et al. 2013).

Objectives:

The specific accomplishment will be installation of a fish screen on an irrigation diversion. The screen will eliminate entrainment of spawning Yellowstone Cutthroat Trout, and their outmigrating fry, into the screened canal. The outcome will be increased recruitment of Yellowstone Cutthroat Trout fry to the Yellowstone River, and decreased loss of spawning adults to irrigation systems.

Partners:

- Montana Fish Wildlife & Parks
- Future Fisheries Improvement Program (FFIP)
- International Federation of Fly Fishers
- Church Universal and Triumphant (landowner and water rights holder)
- Bring Back the Natives (National Fish and Wildlife Foundation)
- Park Conservation District

Project Monitoring:

The success of the project will be assessed 3 ways. During the spawning period following installation of the fish screen, a trap net will be installed at the end of the return pipe for 5 nights during the peak of the spawning period. Adult fish captured in the trap net will allow determination of the number of fish not entrained into the irrigation canal. Likewise, during outmigration, fry traps will be placed at the end of the return pipe to determine the number of fry passed not entrained into the canal. Another fry trap will be placed in the ditch to determine if fry can pass through the mesh. In addition, the screen will be examined for impinged fry. Long-term monitoring reaches established in the Yellowstone River will allow inference on the response of Yellowstone Cutthroat Trout populations to this, and other restoration projects, by calculating population estimates for Yellowstone Cutthroat Trout in 4 monitoring reaches. Note that several projects have been implemented over the past few years, and attributing a response to a single project is not possible.

Funding Source(s): National Fish Habitat Action Plan

Project cost: \$3,000.00

Start Date: 07/01/2016 **Completion Date:** 12/31/2017

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