

Teton River Fisheries Report

2021



*Friends of the Teton River works to **restore** and **conserve** Yellowstone Cutthroat trout populations in the Teton River Watershed.*

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Introduction

2021 provided a busy and productive field season for the Friends of the Teton River (FTR) Fisheries and Field monitoring program. During the field season FTR maintained passive integrated transponder (PIT tag) monitoring sites and fish screens, conducted spawning trout surveys, monitored non-native species and conducted population estimates. FTR also documented environmental conditions in the watershed by collecting stream temperature data and water quality information. Through the year FTR was able to strengthen our field monitoring program to better understand the Teton River fishery.

Teton River Population Estimates

In August and September, FTR staff and volunteers assisted Idaho Fish and Game (IDFG) in the semi-annual electro-fishing surveys. IDFG uses raft-based electrofishing to collect trout population data on the mainstem of the Teton River. These surveys allow for IDFG and FTR to quantify the number of trout in the Teton, and to monitor for any changes in numbers of trout, and species composition. These surveys allow managers to understand how conservation, restoration, drought, heat, and non-native fish impact the fishery.



FTR's crew measures, weighs, records data and collects genetic samples from captured fish, allowing for IDFG geneticists to detect hybridization and natal origins of Teton River Yellowstone cutthroat trout. FTR also inserts PIT tags into trout captured during the survey. During this summer's PIT tagging efforts, FTR tagged 471 trout. Those tagged fish will later be detected at FTR's PIT tag detection sites throughout the watershed.

Population Estimates Results



Abbreviations:

YCT: Yellowstone cutthroat trout

RBT: Rainbow trout

BKT: Brook trout

BNT: Brown trout

**Population data was collected and analyzed by the Idaho Fish and Game Department.*

Population estimate surveys were conducted on three sections of the Teton River. Surveys were conducted on the Nickerson Reach (South Bates to Bates bridge), The Breckenridge reach (Packsaddle to Harrops boat ramp), and The South Fork of the Teton River.

Nickerson Results

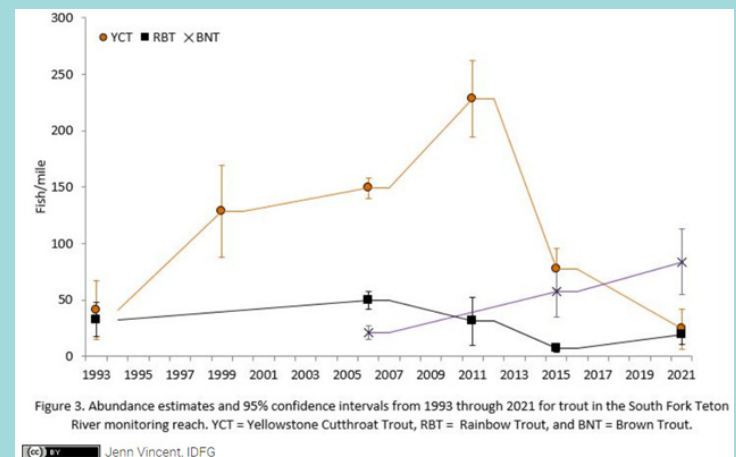
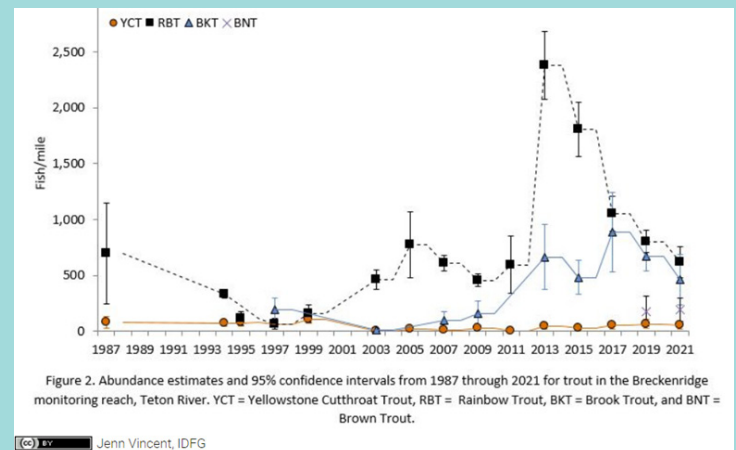
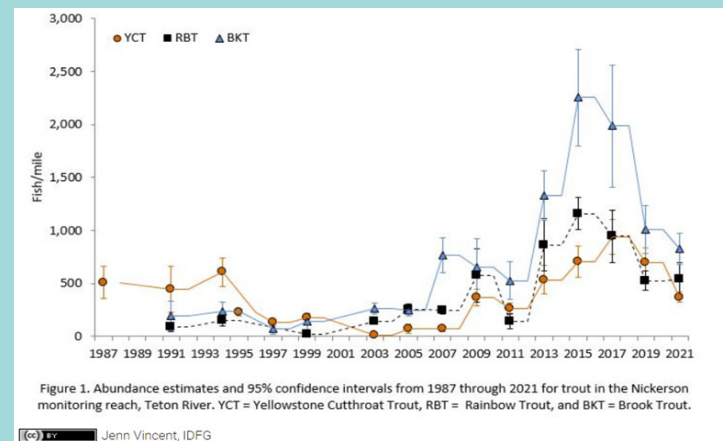
The Nickerson reach of the Teton River has historically had the highest concentration of YCT. The 10-year average for YCT in the Nickerson reach is 383 YCT/mile. In the 2021 survey IDFG estimated 370 YCT/mile. IDFG's total trout abundance estimate was 1,741 for the Nickerson reach in 2021. It should be noted that 5 BNT ranging from 212-370mm were caught during the 2021 survey.

Breckenridge Reach

The Breckenridge reach has been monitored for YCT, RBT, BKT and BNT trout since 1987. This year, YCT were estimated at 56 YCT/mile, higher than the 10-year average. Meanwhile RBT abundance has decreased steadily since 2014 to a 2021 estimate of 648 RBT/mile. The 2021 BKT population estimate is 459 BKT/mile, which is close to the 10-year average. This is the first section of the upper Teton River where managers found non-native BNT. Less than seven BNT found during a survey in 2007 has increased to a population estimate of 192 BNT/mile in 2021.

South Fork of the Teton

This reach is not often surveyed and has had only five years of data since 1993. In the 1993 survey, population estimates were created only for RBT and YCT. In the 2006 survey of the reach, population estimates were created for YCT, RBT and BNT. Since 2006, BNT numbers have increased, while YCT and RBT numbers have been in decline. The 2021 survey found an estimated 84 BNT/mile, 19 YCT/mile and 7 RBT/mile (IDFG 2021).



Passive Integrated Transponder (PIT) Interrogation Sites



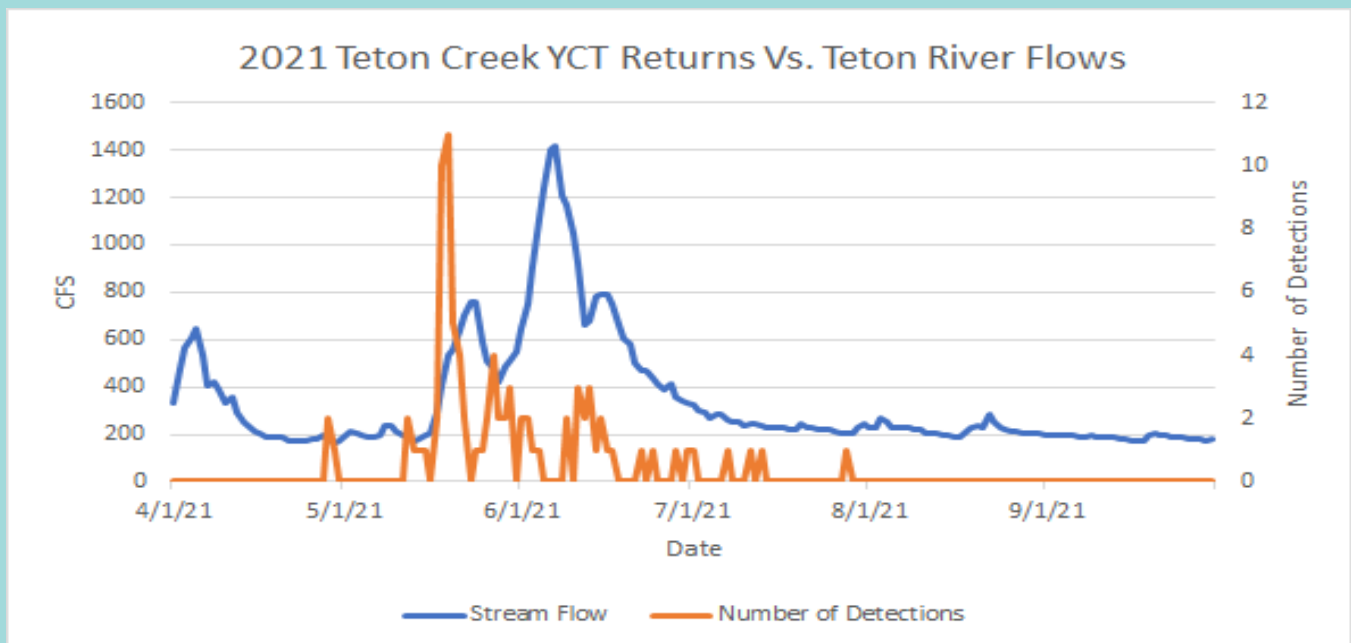
FTR has maintained PIT tag interrogation sites throughout the watershed since 2010. The sites are constructed using antennas that run across the stream channel that detect trout tagged with a unique identifier. When it passes through the antenna, FTR can collect valuable life history data on that trout, such as when it moves upstream to spawn, and therefore can determine how many trout are using a tributary stream to reproduce, and how often individual trout return to the tributary.

Most of the spawning trout detected in the Teton River Watershed were detected at our lower Teton Creek PIT tag array, with 88 unique YCT detections. The most active dates for detections at the Teton Creek site were between May 12th and 22nd. As in past years, YCT movement is directly correlated with the ascending hydrograph, as the main pulse of fish moving upstream came just before the Teton River hydrograph peaked on June 7th. FTR's PIT tag detections have shown that year after year YCT are triggered to move upstream by the initial pulse in spring runoff, and that further movements of YCT will peak on the descending end of the hydrograph.



Upper Teton Creek and Upper Bitch Creek

The PIT tag interrogation site on upper Teton Creek in Alta, WY operated for only a short time during the 2021 field season. The upper Bitch Creek site did not operate in 2021. The two sites had been long troubled due to many years of high runoff impacting the antenna. Thanks to grant funding provided by the Teton Conservation District, FTR was able to redesign and rebuild the PIT tag site on upper Teton Creek. By working with leaders in PIT tag design, FTR has updated the monitoring site, and we are looking forward to a productive year of monitoring in 2022.



Redd Surveys

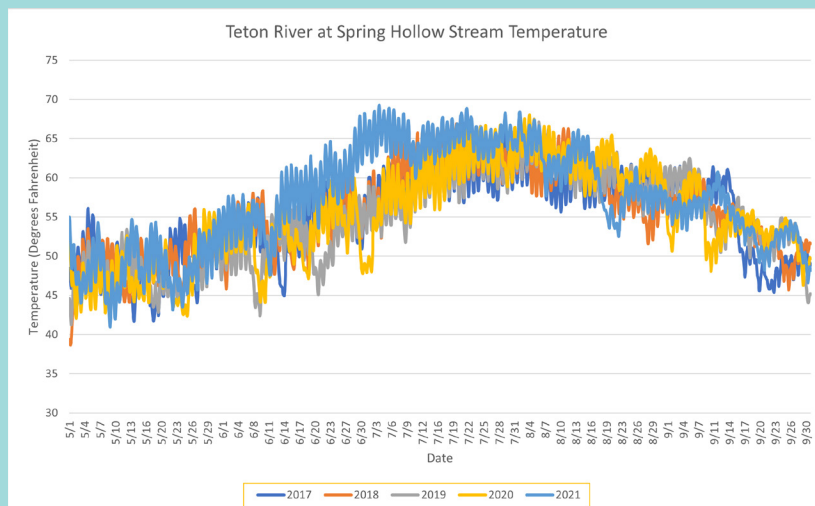
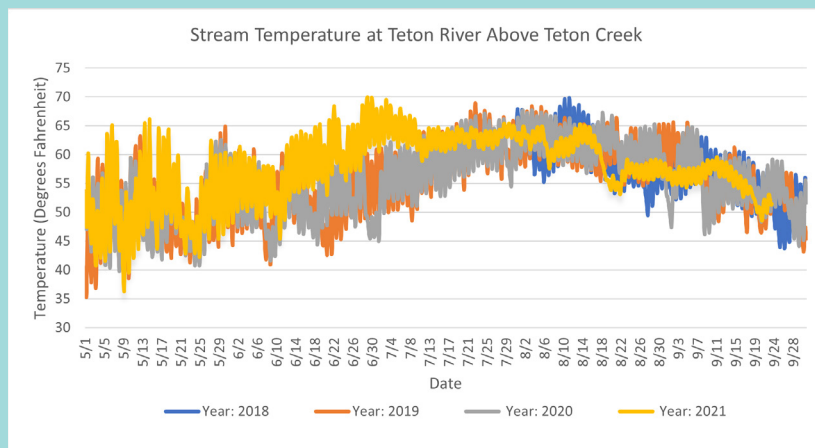


During the spring of 2021, FTR monitored creeks throughout the watershed on behalf of our redd survey program. FTR staff completed redd surveys by walking along streams, believed to be YCT spawning habitat, and looking for signs of spawning. Spawning locations are identified by “clean” gravel beds that are created when YCT reproduce. Conducting redd surveys allows FTR to monitor for changes in numbers of spawning trout, a key indicator of population health.

FTR continued to monitor long established sites in the Six Springs Creek sub-watershed and on Lew’s Spring Creek. Both creeks are tributaries to Teton Creek, southwest of Driggs. Numbers of spawning trout in the Six Springs system were high, indicating a strong spawning run. We found 30 redds, the greatest number of redds found by FTR in the past five years. Our other redd survey sites are historically less active, and 2021 was no exception with low numbers of trout using Lew’s Spring Creek, Headwaters Spring Creek, Canyon and Calamity Creeks.



Temperature Monitoring



Beginning in 2011, FTR started installing remote temperature loggers throughout the Teton River Watershed. During the fall of 2021, FTR collected temperature data at the 36 temperature loggers currently maintained in the watershed. These loggers are located in all of the major tributaries to the Teton River, along the length of the upper Teton River, and in the Teton River Canyon. By monitoring water temperature, FTR can actively assess impacts on stream conditions and the fishery.

Native Yellowstone Cutthroat Trout require clean, cold water, and having a robust database of historic stream temperature allows FTR to identify specific temperature changes. Strategic placement of temperature loggers upstream and downstream of the confluence of tributary streams and the Teton River allows FTR to detect the influence of water flowing in from tributary streams. FTR’s temperature data is shared with agency partners like the US Forest Service, who list data on the NorWeST Interactive Stream Temperature Map. In 2021, both the upper and canyon sections of the Teton River had stream temperatures substantially higher during June and early July than past years.



Warm Creek Study

The Bronze Buffalo Club, Alder Environmental Consultants, IDFG and FTR have begun working collaboratively to investigate and plan for the restoration of Warm Springs creek on behalf of Native YCT. FTR has worked closely with IDFG to study current habitat limitations, available spawning habitat and species composition of the creek. In the spring of 2021, FTR and IDFG transplanted 12 fluvial YCT from the mouth of Teton Creek to Warm Creek. Those YCT were kept in the system with a picket weir, spanning the creek and allowing no fish to move out the system. FTR monitored the trout that had been transplanted into Warm Creek in order to determine if the current state of the habitat could support YCT spawning. FTR returned once a week to complete a redd survey and look for signs of trout mortality. During our visits we found that the transplanted YCT did not have suitable spawning habitat and that restoration was needed. This baseline data has informed the development of this restoration project, and will be used as comparative data once restoration is complete.

Brown Trout



Friends of the Teton River is extremely concerned with the increase in Brown Trout in the Breckenridge reach, from Packsaddle bridge to Harrops boat ramp. While population estimates have not yet been completed for BNT upstream of the Packsaddle Bridge, BNT of all life stages are present in the downstream portion of the Teton River. When the increase in BNT is considered by species composition, it is evident that the increase in BNT corresponds with the decrease in other trout species.

The first Brown Trout was found by IDFG in 1987, but BNT were not caught in significant numbers until 2007 when 28 were discovered in the Teton River. Since 2007, Brown Trout numbers in the Breckenridge reach have increased substantially, with catches of 145 BNT in 2019, and 165 in 2021. The 2019 survey was the first survey during which an abundance estimate was created, at 177 BNT/mile. In 2021 the abundance estimate for BNT has yet again increased to 192 BNT/mile.

Conclusion

The Friends of the Teton River Fisheries and Field Monitoring Program had a successful year of field monitoring and capacity building. Our field monitoring efforts contribute to agency partner's decision making about fisheries and ecosystem management. FTR also relies on our monitoring efforts to track the impacts of our restoration and groundwater recharge programs. FTR has expanded its capacity by hiring a Fisheries Program Manager to implement monitoring programs and evaluate data, adding to the organization's capacity for this work (prior to this, FTR hired seasonal technicians to maintain data sets). FTR will continue to collect data relevant to the fishery throughout the watershed at established redd survey locations, temperature, and interrogation sites in 2022. During the 2022 field season FTR will be expanding our scope of work to include a non-native Brown Trout monitoring program.



Please reach out to Fisheries Program Manager, Max Lewis, with any questions about FTR's work.

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