



Swan River

Fishery Survey Report

Jon Ewert, Aquatic Biologist, Colorado Parks and Wildlife

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This report summarizes the results of five fish population surveys that CPW staff and Summit County personnel have conducted on the Swan River near Breckenridge, in coordination with the Swan River Restoration Project.

Surveys have been conducted at two sites. The lower reach (Figure 1) is on Summit County Open Space property downstream of the restoration reach. The upstream terminus of this site is approximately 500 feet downstream of the Muggins Gulch Road crossing. This reach is a free-flowing section bounded on both ends by beaver pond complexes, measuring 464 feet in length and 15.8 feet in average width. The upstream terminus of the reach is a beaver dam. This site serves as a “control” reach to compare with the restored section upstream and help to inform reasonable expectations for the biological potential of the restored reach.

The upper site is within the Restoration Project area and lies approximately 0.5 miles upstream of the lower reach (Figure 3, following page). This reach measures 567 feet in length and 18.9 feet in average width and encompasses multiple newly constructed riffle-pool-run sequences. Restoration work on this section was completed in November of 2016. This is a unique stream restoration project in the sense that there was no functional stream channel prior to completion of the project.

For all surveys discussed in this report, We used two backpack electrofishers to conduct a two-pass depletion estimate of the fish population within that reach. All fish were measured. A subset of the fish were weighed, and all fish were returned to the water immediately upon completion of data collection. Aside from incidental occurrence of other species (we captured one cutthroat in 2017 on the lower reach) brook trout comprise the entire trout population of these reaches, and no stocking has occurred.

Population estimates for all surveys are displayed in Table 1. The 2016 estimates derived from the lower reach differ significantly from 2017 and 2018. The size distribution of brook trout captured in the lower reach (Figure 2) offers some insight as to why the estimates were so different. In 2016, few adult fish (>15 cm) occupied the reach, while in 2017 and 2018 adult fish were more plentiful. This is likely a function of the dates of the surveys. Being a fall-spawning fish, adult brook trout probably move up-

stream out of the nearby beaver ponds in search of spawning habitat. In 2016, the adult fish had probably not made this movement yet, but the 2017 and 2018 surveys took place approximately two weeks later. In the future, we intend to conduct the survey on consistent dates in order to produce results that are more comparable.

Interestingly, the 2017 survey at the lower site found significantly fewer small fish—both juvenile brook trout (averaging 5-8 cm) and mottled sculpin. Mottled sculpin



Figure 1. Location of lower survey reach

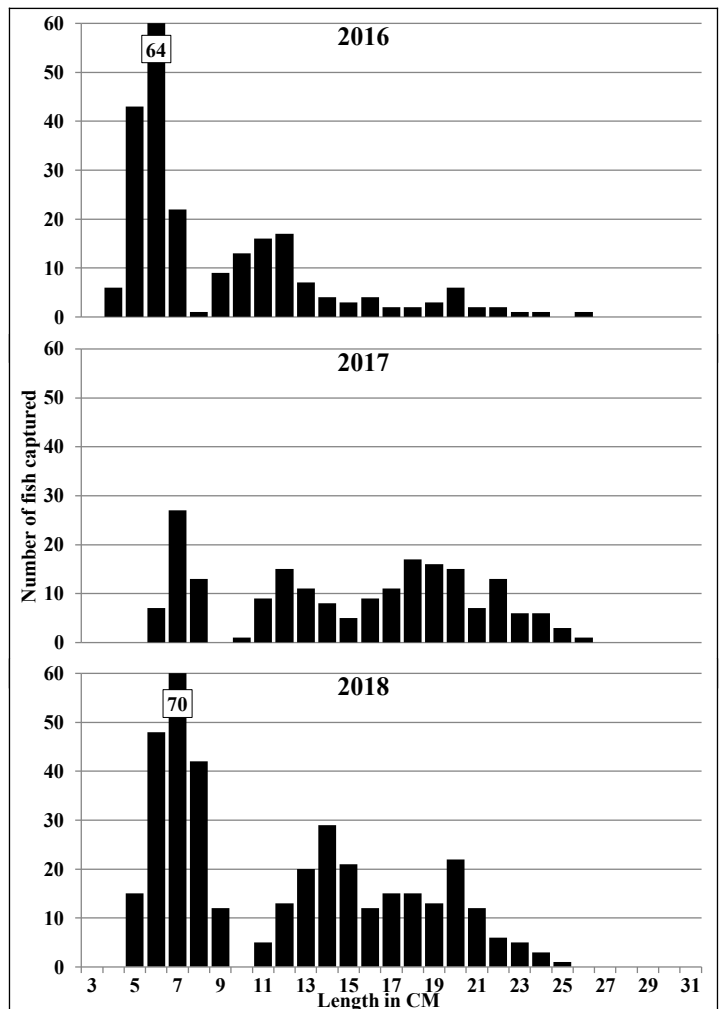


Figure 2. Size distribution of brook trout captured in lower reach

Date		Brook trout		# sculpin captured
		#>6"/mile	Lbs./surface acre	
Lower reach	9/20/2016	308	31	152
	10/4/2017	1,295	148	73
	10/3/2018	1,432	123	131
Upper reach	10/4/2017	505	59	3
	10/3/2018	1,127	117	6

Table 1. Population estimates

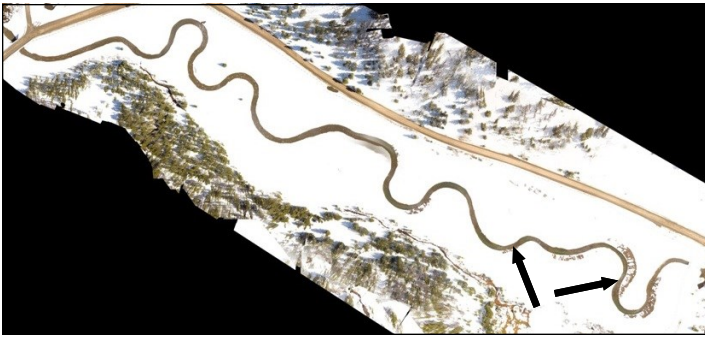


Figure 3. Restoration reach with electrofishing station indicated by arrows. Photo by Jeremy Webber.

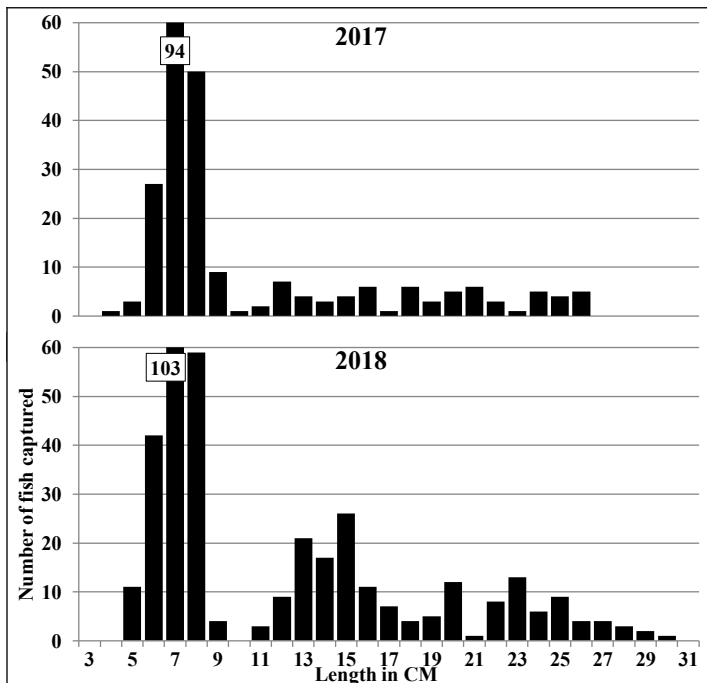


Figure 4. Size distribution of brook trout in the upper reach.

are a small native fish species and are an important indicator of stream health. This reach contains the highest density of mottled sculpin that we have found to date anywhere upstream of Dillon Reservoir. It is possible that the disturbance upstream caused by construction of the restoration project had some stressful effect on the downstream fish population in 2017, but by 2018 numbers of both brook trout and sculpin had fully recovered.

Because the restoration project constructed an entirely new channel, all fish occupying the upper reach (Figure 3) in 2017 had to be migrants from either upstream or downstream. The three sculpin that we captured probably migrated from downstream because the species is not known to occur upstream of this point in the Swan River drainage.

The size distribution of brook trout captured in the upper reach is displayed in Figure 4. The very prolific juvenile population in 2017 most likely drifted in from upstream locations during the previous runoff season, which is a common dispersion route for young trout. It is unlikely that adult brook trout successfully spawned here in fall 2016 because in-channel construction concluded in early November, and the stream channel was connected at this time — approximately a month later than we estimate the peak of brook trout spawning activity to have occurred. By 2018, we found many intermediate-sized (12-20 cm) brook trout which were sparse a year earlier. Many of these fish were likely the product of the prolific 2017 juvenile year class. The 2018 sample revealed for the first time that the full range of sizes and ages of brook trout are now present in expected numbers in the Restoration Project area, and that the population in this reach now resembles that of the lower reach very closely.

The main difference remaining between the two sites is the density of sculpin. Because they are a small-bodied fish with a relatively small home range, it is likely that sculpin are slower to colonize new habitat. We are hopeful that future surveys will document increasing numbers commensurate with the densities that we have found at the lower site.

CPW plans to monitor these reaches again in 2019 in order to document the continued success of restoration efforts. This area would also be a good candidate for water quality monitoring through Colorado's River Watch program, if there is interest among a local volunteer group to do so.



Figure 5. Electrofishing crew on the upper reach. Photo by Jason Lederer



Figure 6. Mottled sculpin. Photo by Corey Lewellen.