



# Colorado River, ILVK Reach

Fishery Monitoring Report  
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## Introduction

Since 2016, Colorado Parks and Wildlife (CPW) aquatics crews, local landowners, and U.S. Bureau of Land Management (BLM) personnel have surveyed the fish population on a 2.8-mile reach of the Colorado River east of Kremmling (Figure 1). Surveys have occurred annually in the spring. The purpose of these surveys was to establish baseline estimates of the resident fish populations prior to large-scale habitat improvement and stabilization work being constructed by the Irrigators of the Lands in the Vicinity of Kremmling (ILVK); and then to monitor any changes in fish populations following construction of ILVK projects. The construction work is being funded in part by the Colorado Water Conservation Board and Colorado Basin Roundtable. ILVK is a partner in the Colorado River Headwaters Project, which is a Regional Conservation Partnership Program administered by the Natural Resources Conservation Service. CPW is an active participant in the program in multiple capacities, one of which is monitoring fish populations. Land ownership along this reach consists of a succession of private ranches as well as a small amount of BLM property.

This reach covers a transitional area in the river and thus habitat conditions follow a continuum from top to bottom. The substrate is dominated by cobble in approximately the upper 1/3 of the reach, which transitions to sand and fine sediment by the bottom. Functioning point bars occur in this upper portion, but are absent in the lower portion. Habitat conditions become poor by the downstream end of the reach, where the river channel is overwhelmed with sediment input from wasting banks and other sources, very little to no functioning riparian vegetation zone, and overwide channel with no thalweg definition and little bedform diversity. These are all issues that the ILVK cooperative effort aims to address.

## Methods

We conducted mark-recapture population estimates using a raft-mounted electrofishing unit. Recapture days were separated from mark days by at least a full day to allow for marked fish to redistribute. Because this reach had not been surveyed previously, we were uncertain of ideal flow rates to conduct the work. In 2016, flows of 1,200 CFS (measured at the KB Ditch gauge) proved to be too high to be effective and we did not conduct a recapture pass. In 2017, 2018, and 2019, flows were more manageable and allowed us to generate valid estimates.

## Results & Discussion

We captured seven species of fish in these surveys: brown, rainbow, cutthroat and golden trout, mountain whitefish, white sucker, and bluehead sucker (a native species, 2 individuals captured in 2017). Brown trout are the dominant species and the only one with capture rates high



Figure 1. Location of ILVK reach on the Colorado River east of Kremmling. The Troublesome Creek confluence is visible at upper right.

	2017	2018	2019
Dates of survey	5/5 & 8	4/20 & 25	4/16 & 19
Flow at KB gauge	569	358	315
Brown trout: lbs. per acre	15	32	25
>14" per acre	6	11	11
>6" per mile	230	497	416
Avg. relative weight	84.4	86.1	85.9
Capture probability	0.16	0.16	0.22
# Whitefish captured	33	67	84

Table 1. Population estimates for ILVK reach, 2017-2019

enough to generate population estimates (Table 1). Rainbow trout have been captured in small numbers, always less than 10% of the total trout catch. The origin of the cutthroat and golden trout (1 of each species captured in 2019) is unknown.

Brown trout population estimates in 2018 and 2019 were very similar, but the 2017 estimates were significantly lower — roughly half of the following two years. Capture probabilities (a statistical estimate derived from the recapture rate, Table 1) were the same for 2017 and 2018, which suggests that the survey in those years was equally efficient at generating the population estimate. It is possible that flows rising above their late winter/early spring base levels trigger emigration of brown trout out of this reach. If this is the case, the 2017 survey may have occurred after this movement had begun. In the future, we will target the flow window of 300-500 CFS prior to May 1 to repeat this survey.

The size distribution of brown trout and mountain whitefish are displayed in Figures 3 and 4, respectively (following page). The average size of brown trout has been

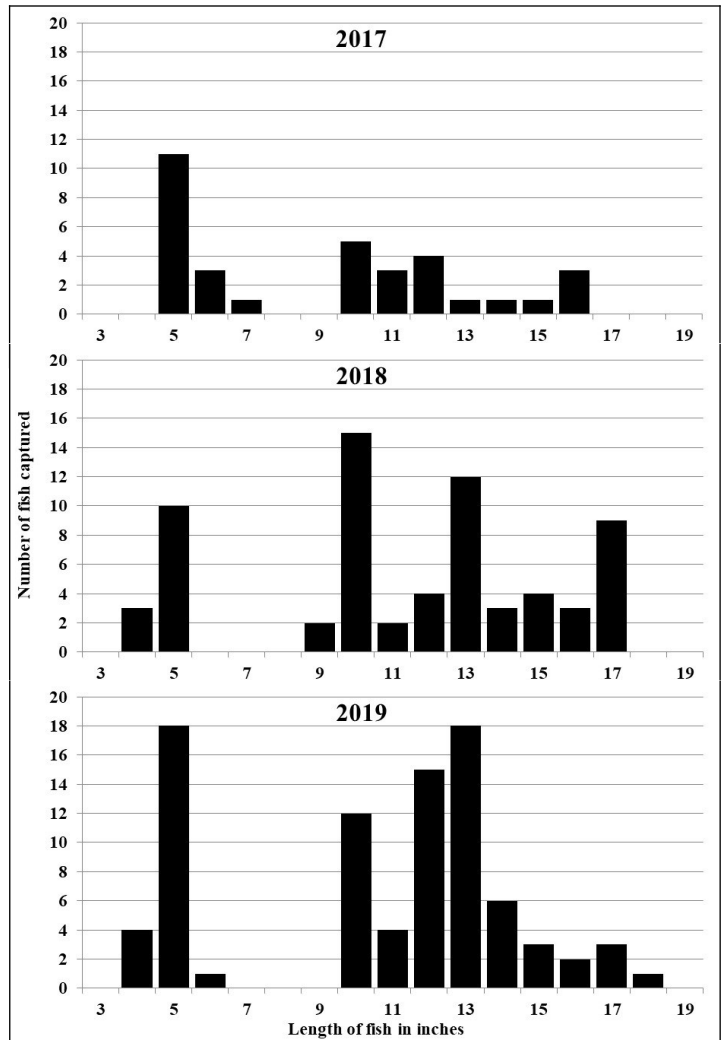
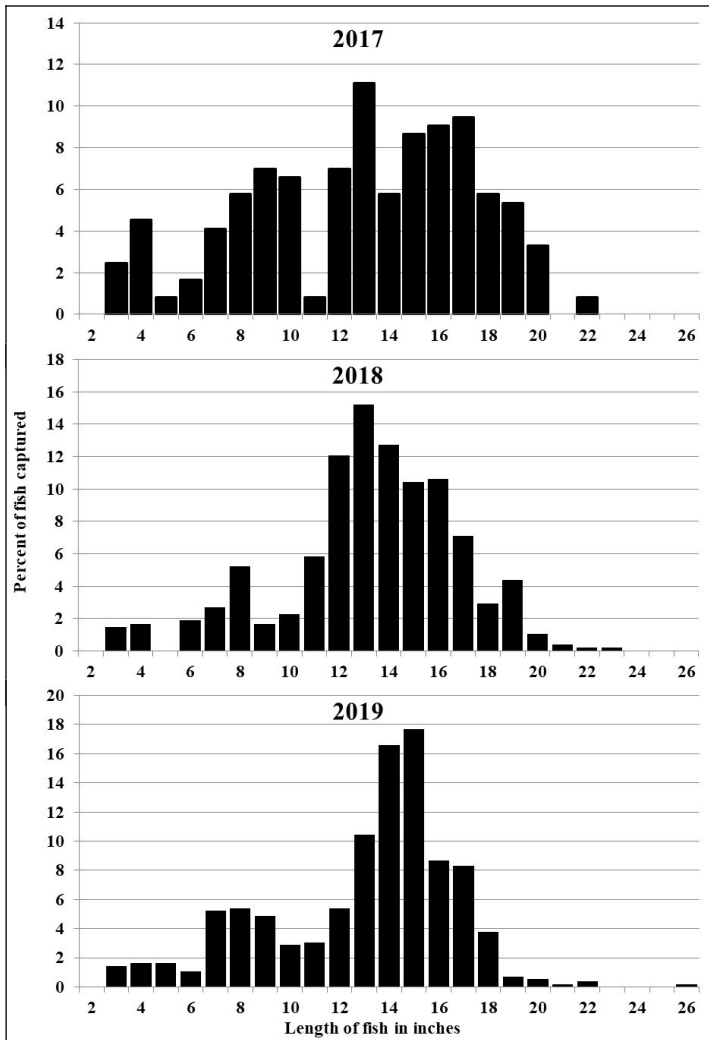


Figure 2. Size distribution of brown trout captured on the ILVK reach, 2017-2019.

relatively stable over the three years, although in 2017 adult fish (>10”) made up a smaller portion of the total sample. This supports the emigration hypothesis, because we would expect juvenile fish to be slower to move away from their natal habitat, thus comprising a higher percentage of the total if our sample did in fact take place after an emigration of adults had occurred.

Relative weight is a measure of body condition on a scale of 100. It can be seen as an indirect measure of prey availability in the reach. We surveyed two other nearby sites on the Colorado in spring of 2019, one in Radium downstream of Gore Canyon, and one on the Paul Gilbert State Wildlife Area (SWA) near Parshall. Average relative weight in brown trout in the Radium reach was 94.9, and on the SWA was 84.1. The ILVK biomass estimate was 15% that of the Radium reach and 22% of the SWA reach. This evidence suggests that prey availability in the ILVK reach is particularly poor, which is in all likelihood a reflection of substrate condition. Habitat projects that are planned and underway as part of the ILVK effort will hopefully result in improvements in these parameters.

The mountain whitefish population has been more dynamic than the brown trout over this study period. This species has only recently appeared in Middle Park, first appearing in CPW surveys in 2013 (See CPW report on

Figure 3. Size distribution of mountain whitefish captured on the ILVK reach, 2017-2019.



Figure 4. The largest brown trout captured to date in our surveys on the ILVK reach, 26.6”, 3.6 lbs.

the Colorado River near Parshall). The number of whitefish do not constitute a large percentage of total fish captured, but they have steadily increased over the three years of this study (Table 1). This corresponds with the trend in whitefish numbers that we have seen near Parshall. The size distribution (Figure 3) generally reflects four year classes present, at roughly 5, 10, 13, and 17 inches. The habitat within the ILVK reach is highly suitable for this species, and the data suggest an expanding population.

CPW plans to continue monitoring this reach in coming years.