Results of the 2018 Lubbock River Arctic Grayling Count (*Thymallus arcticus*)

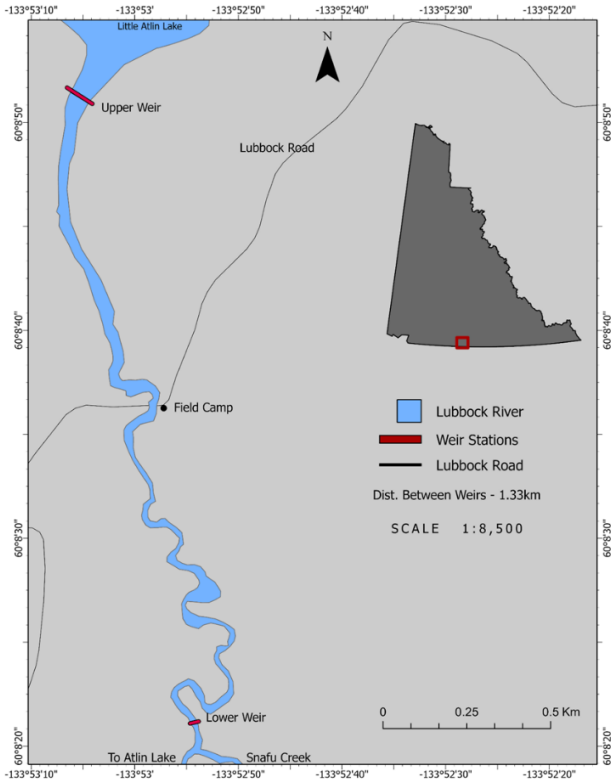

Figure 1. Map indicating the approximate location of the Lubbock River and weir placements. Inset of the Yukon shows the approximate location of the Lubbock study area (red box).

Partners

Carcross/Tagish First Nation (CTFN); Taku River Tlingit First Nation (TRTFN); Carcross Tagish Renewable Resource Council (CTRRC); Dalhousie University.

Location /Survey Year

Southern Lakes region / 2017

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Project objectives

In 2018, as part of a broader genetics study focused on assessing the health of the Arctic grayling population, weirs were installed on the Lubbock River to conduct a direct census. The goal of this census was to obtain an accurate count, which would serve as a reference to validate the accuracy of genetically-derived population abundance estimates and to determine the validity of our previously used snorkel count estimates.

Project overview

To enumerate spawning Arctic grayling migrating downstream from Little Atlin Lake and upstream from Atlin Lake as well as the lower reaches of the Lubbock, we established two weirs in the Lubbock River. The first weir was positioned at the Little Atlin Lake outlet, while the second was set approximately 1 km downriver. Each weir had two aluminum-framed, vexar-lined box traps—one pointing upstream and the other downstream—allowing us to monitor fish migration. HOBO temperature loggers were also placed in each trap to record water temperature.

During the spawning period, two people staffed the weirs continuously, checking traps every two hours at first, then three times daily. Fish were sampled for species, sex, weight, fork length, age and genetics, and a subset was floy-tagged to monitor residency time. We counted the total number of adult fish entering and exiting the weirs daily. To compare weir counts against snorkel counts, we also conducted three snorkel counts between the weirs during the survey.

Figure 2. (A)Lower wier at the end of the Lubbock spawning bed. (B) Upper wier at the outlet of Little Atlin Lake

Figure 3. Adult male grayling: Photo by P. Vecsei

Key findings

We observed 1,082 grayling entering the spawning area. Of these, 915 were large enough to be included in our census. Among the largest grayling, we recorded 755 mature grayling (≥ 230 mm) that had migrated upstream to the spawning area, and only 6 that had traveled downstream from Little Atlin Lake. The mean residency on the spawning beds for adult grayling was approximately 32 days ± 4.61 (N = 31).

In addition to the adults, our traps also caught 257 juvenile grayling (< 230 mm in size) moving upstream and 14 juveniles moving downstream from Little Atlin Lake. The majority of grayling came upstream from Atlin Lake (N = 866), with very few coming from Little Atlin (N = 14).

In addition to the grayling, we counted 96 northern pike, 63 round whitefish, 780 longnose suckers and one lake trout passing through the traps. The number of counted grayling in 2018 were considerably lower compared to estimates from previous snorkel surveys conducted in 2014 and 2017. We speculate that the presence of a low head beaver dam, located just below the spawning area, impeded grayling from reaching the spawning beds.

We found that the three snorkel estimates consistently underestimated the weir counts by 30%, 14%, and 33%, respectively, with only one weir count falling within the 95% confidence interval of the snorkel estimate.