TRIP REPORT

State of Alaska
Department of Fish and Game

Field Date(s): May 27 to June 3, 2021

Location(s): **Red Dog Mine**

Objective(s): Spring Arctic grayling and Wulik River Dolly Varden biomonitoring

Participant(s): Chelsea Clawson, Justin Burrows, and Chad Bear

Weather: Mostly sunny, 5-35 mph winds, low 30's to low 50's

Access: Pick-up truck and helicopter

On May 27, 2021, we flew to Red Dog Mine to perform the annual spring biomonitoring projects in the area. Specific tasks we planned to perform were: 1) monitor the Arctic grayling spawning migration in the North Fork Red Dog and Bons creeks, 2) collect 15 juvenile Arctic grayling (160 – 180 mm fork length (FL)) from Bons Pond for whole body element analysis, and 3) capture seven adult Dolly Varden from the Wulik River for element analyses in selected tissues.

Discharge from snowmelt and runoff in North Fork Red Dog and Bons creeks was low when we arrived, as snowpack in the area surrounding the mine was below average for the winter of 2020-2021. Water levels in the Wulik River and Tutak Creek were near average during the first half of our trip, then dropped to below average for the latter half of our trip as air temperatures cooled and slowed snowmelt (Figure 1).

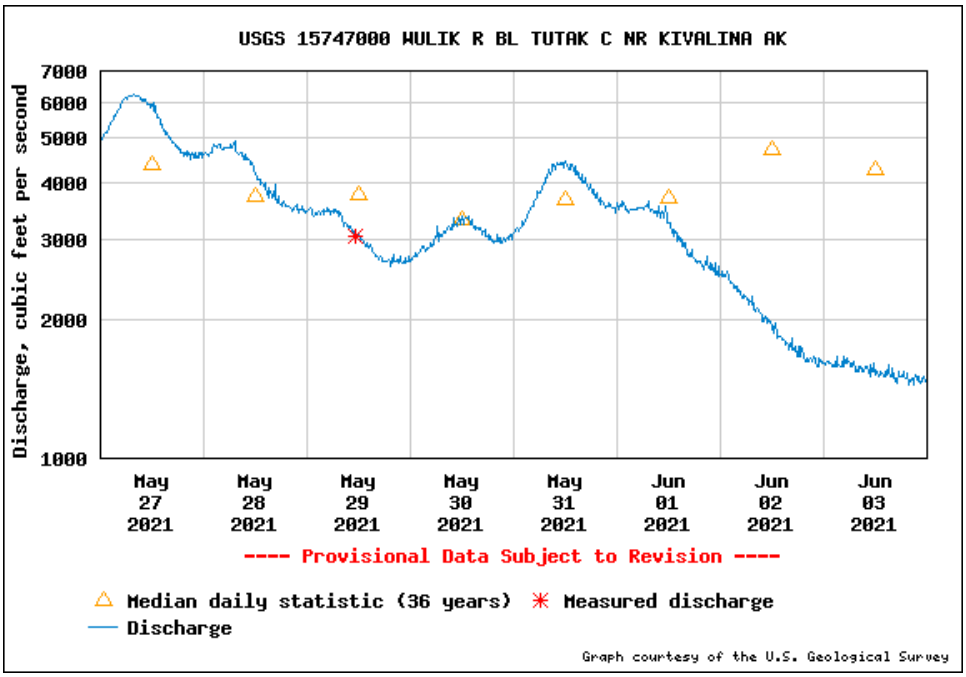

Figure 1. Discharge (cubic feet per second) at the USGS Wulik River gauge station throughout our visit.

Bons Pond/Bons Creek

One fyke net was fished in Bons Creek and another net was set on the shoreline near the outlet of Bons Pond. A total of 209 new fish ≥ 200 mm FL were tagged, with 142 captured in the Bons Creek fyke and the remaining 67 captured in the Bons outlet fyke. A total of 360 fish of taggable size (≥200 mm FL), which includes new fish and recaptures, were captured in the Bons Pond complex. Catch per unit effort in the Bons Creek net was highest on June 1, and variable throughout the duration of the sampling period (Figure 2). Catch per unit effort in the Bons Pond outlet fyke net peaked on May 29, then tapered off throughout the duration of the sampling period (Figure 3). CPUE was generally lower in the outlet fyke than in the Bons Creek fyke.

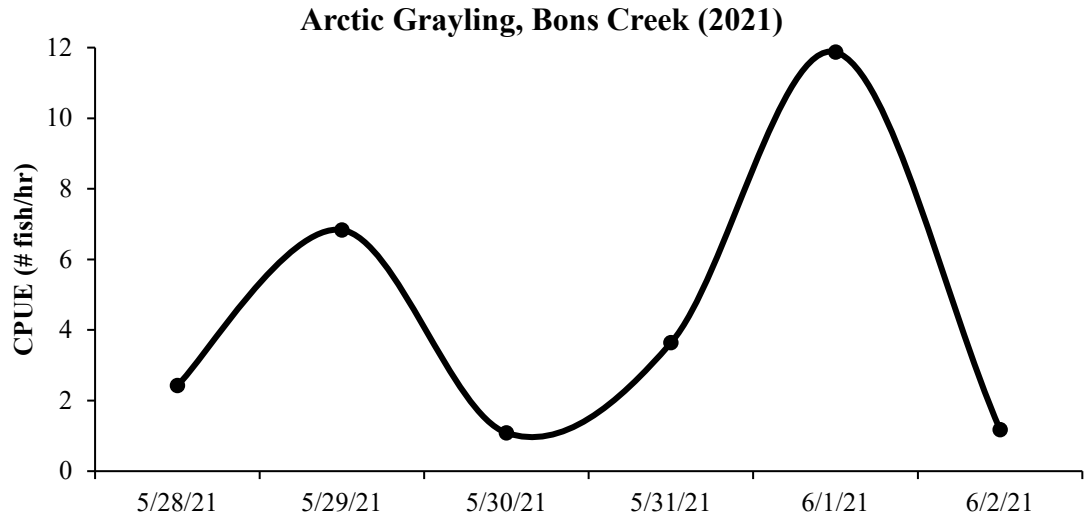

Figure 2. The catch per unit effort (#fish/hr) of Arctic grayling in the fyke net fished in Bons Creek, May 27– June 2, 2021.

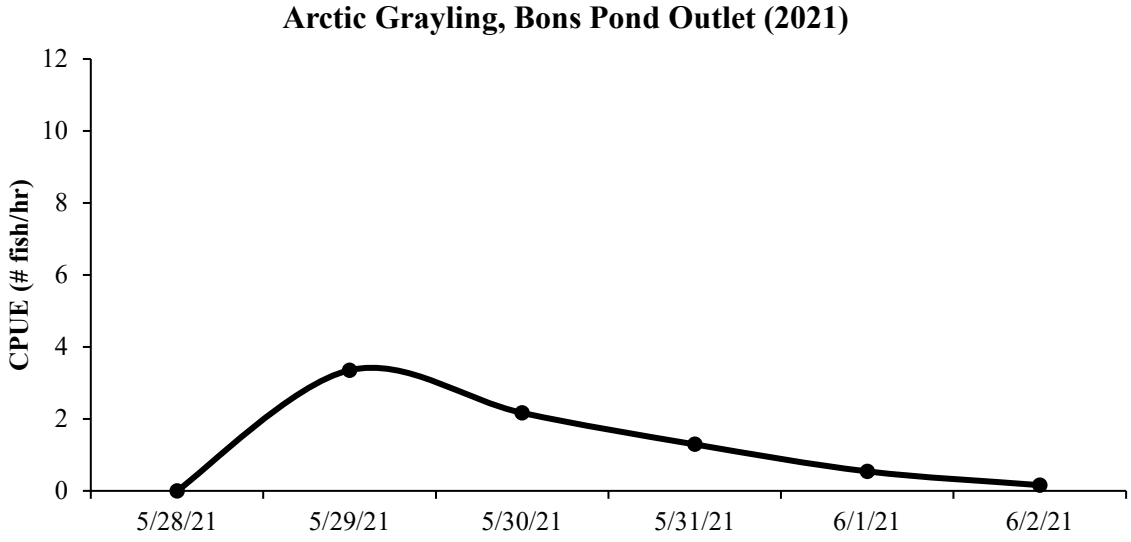

Figure 3. The catch per unit effort (#fish/hr) of Arctic grayling in the fyke net fished in the outlet of Bons Pond, May 27 – June 2, 2021.

In 2021, catches in the Bons Pond complex were dominated by juvenile fish ranging from 100 - 200 mm FL and large fish >300 mm FL (Figure 4). We retained 15 fish 160 - 180 mm FL for whole body element analysis. These fish were individually bagged and frozen, then transported back to Fairbanks to be stored in a -15°F freezer until analysis at a later date.

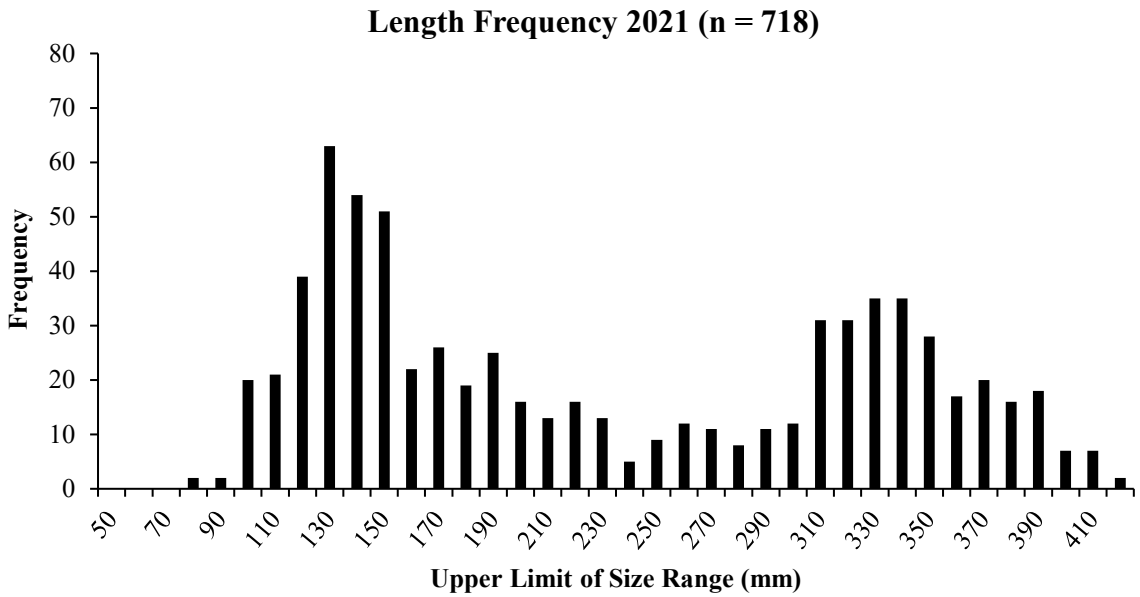

Figure 4. Length frequency distribution of Arctic grayling captured in Bons Creek and Bons Pond, 2021.

The estimated Arctic grayling population in Bons Pond, based on the mark event in the spring of 2020 and the recapture event in spring of 2021, was 716 fish ≥ 200 mm. This is nearly identical to the previous estimate of 701 fish ≥ 200 mm (Figure 5). Based on the large number of captured fish between 100 and 200 mm FL, it is likely that the population of fish ≥ 200 mm will grow in coming years. This year also showed high growth rates, similar to previous years (Figure 6). When the population was above 5,000 fish in 2003, fish growth was relatively low. The population has decreased since then, which has resulted in higher growth rates.

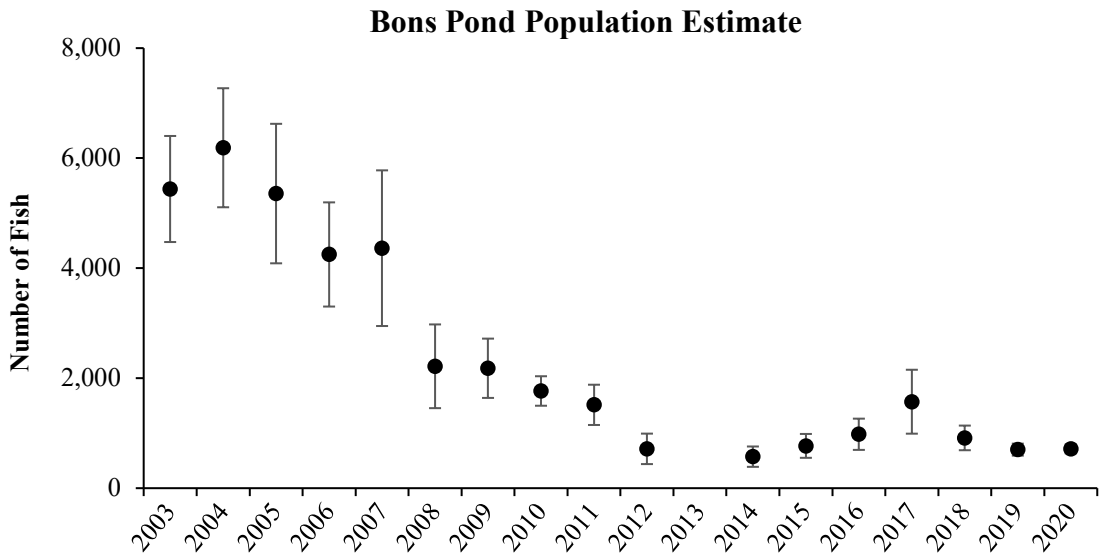

Figure 5. Estimated Arctic grayling population with 95% confidence interval in Bons Pond for fish ≥ 200 mm long.

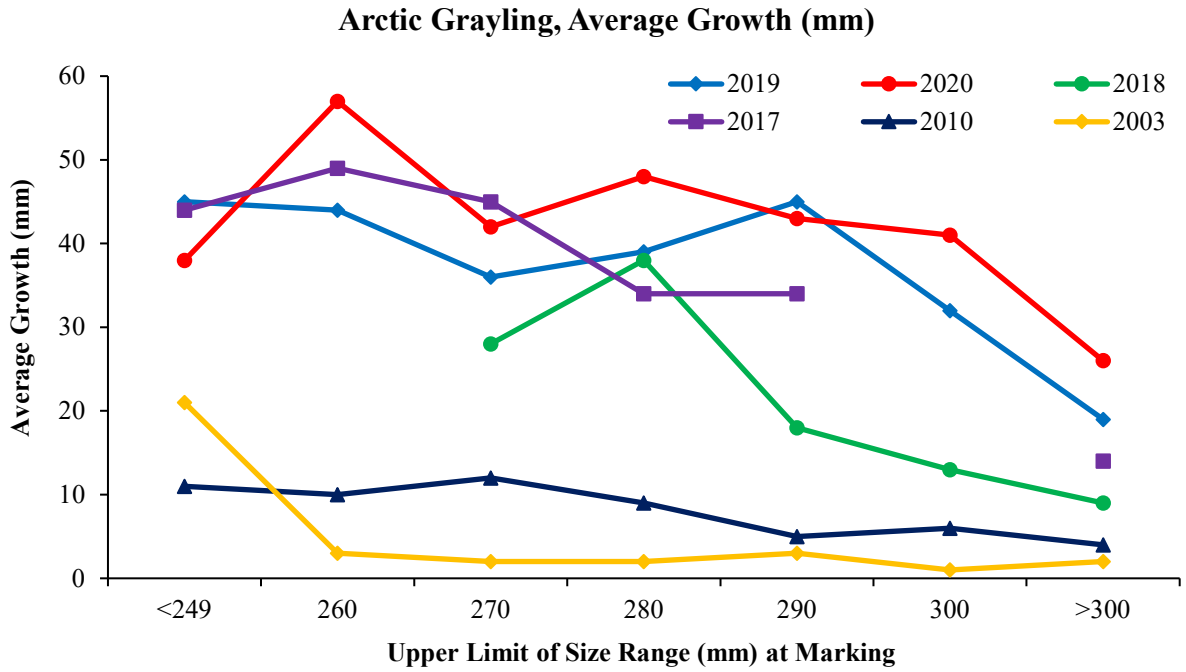

Figure 6. Average growth rates for fish of various size classes captured in successive years.

North Fork Red Dog Creek

A total of 27 Arctic grayling and 13 Dolly Varden were captured in North Fork Red Dog Creek. One net was set in North Fork Red Dog Creek from the morning of May 28 through the morning of June 3 (Figure 7). Water flow was low (78 cfs) when we set the net and decreased slightly throughout the fishing period. Water temperatures ranged from approximately 2.7°C to 7.1°C throughout the sampling period.

Figure 7. Aerial view of the North Fork Red Dog fyke net on the morning of June 2, 2021. Air temperatures were below freezing the prior night, so ice had formed on the fyke net.

Catches were similar to 2020 (22 Arctic grayling and 16 Dolly Varden), but lower than catches in 2019 (86 Arctic grayling) and 2018 (87 Arctic grayling). CPUE was highest initially, then remained low for the rest of the sample period (Figure 8). Almost all the Arctic grayling caught were mature adults, between 350 and 450 mm FL (Figure 9). There were two recaptures from the 2020 sample event. The estimated 2020 Arctic grayling population in North Fork Red Dog Creek, based on the mark event in the spring of 2020 and the recapture event in spring of 2021, was 206 fish $\geq$ 200 mm with a 95% confidence interval of 28 to 384 fish.

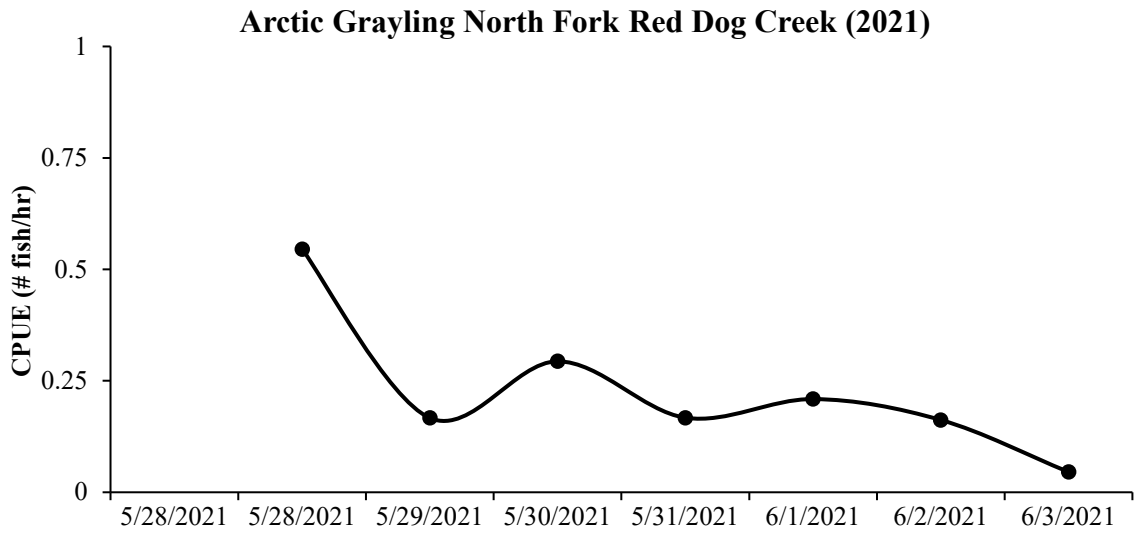

Figure 8. The catch per unit effort (#fish/hr) of Arctic grayling in the main fyke net fished in North Fork Red Dog Creek, 2021.

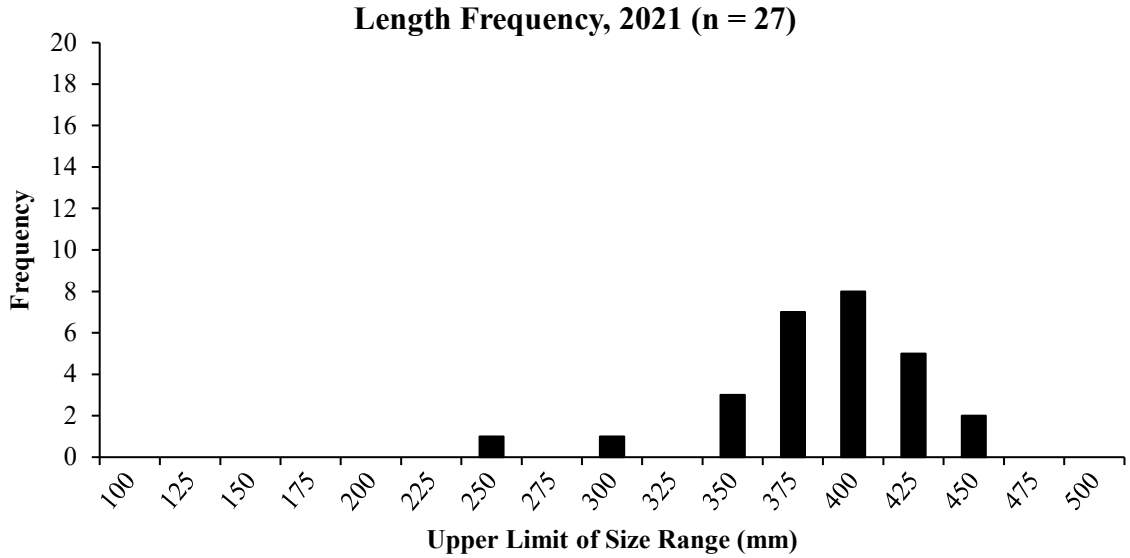

Figure 9. Length frequency distribution of Arctic grayling in North Fork Red Dog Creek, 2021.

Wulik River Dolly Varden

Adult Dolly Varden were sampled in Tutak Creek near its mouth on the Wulik River using hook and line gear. Seven total Dolly Varden were retained. These fish were individually bagged and frozen, then transported back to Fairbanks where they were stored in a -15°F freezer to be dissected and analyzed at a later date.