

TRIP REPORT

State of Alaska
Department of Fish and Game

Field Dates: August 1-6, 2022

Locations: Drainages in the vicinity of the Red Dog Mine and Anarraaq/ Aktigirug deposits.

Objective: To sample juvenile fish in the area and collect juvenile Dolly Varden for tissue element analysis

Participants: Olivia Edwards and Audra Brase

Weather: Clear to overcast

Access: Pickup truck and helicopter

On August 1, 2022, Olivia Edwards and Audra Brase of the Region III ADF&G Habitat Section flew to the Red Dog Mine site approximately fifty miles east of Kivalina, Alaska on the ancestral lands of the Inupiaq people. The main goal of this trip was to sample fish populations using minnow traps. We set minnow traps at 23 total sites surrounding the mine (Figure 1) and collected juvenile Dolly Varden from Buddy Creek, Anxiety Ridge Creek, and Red Dog Creek for whole body element analysis. We also inspected the water intake structure below Bons Pond and flew over the Kaviksaq Seep to observe the bypass structure.

Weather was variable throughout the trip, ranging from clear skies to overcast conditions. Daytime air temperature was between approximately 10°C and 18°C. Water levels at all sites were low and conducive for minnow trapping.

Ten minnow traps baited with cured salmon roe were set at each of the sample sites and retrieved the following day. A total of 548 Dolly Varden and 8 slimy sculpin were captured across all sites. This compares to 2021 when 177 Dolly Varden and 6 slimy sculpin were captured. This year Buddy Creek made up 36.3% and Anxiety Ridge Creek made up 20.5% of total catch. A breached small beaver dam was noted just upriver of the upper most minnow trap location in Anxiety Ridge Creek (Figure 2). Beaver dams are not typically observed in most of the streams sampled in the vicinity of the Red Dog Mine.

Several tributaries were sampled in the Upper Ikulukrok drainage, near the Anarraaq/ Aktigirug deposits (Competition and Sourdock creeks, and both the East and West Forks of Ikalukrok Creek). There were no fish caught in these systems and most creeks were turbid with heavy mineralized staining on the rocks (Figures 3 & 4).

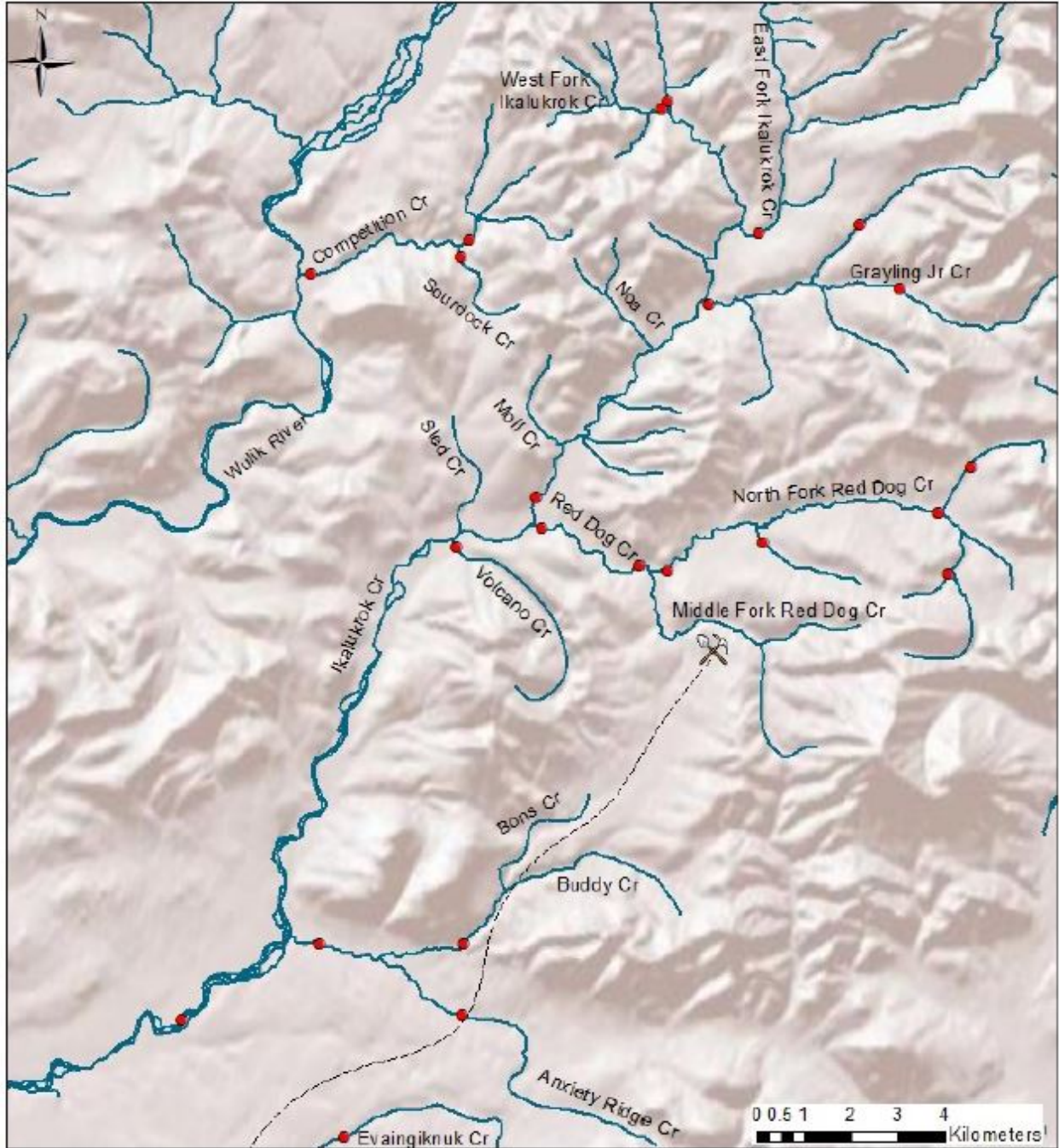


Figure 1. Minnow trap sample sites surrounding Red Dog Mine.



Figure 2. Small beaver dam located just upriver of uppermost minnow trap location in Anxiety Ridge Creek, August 2022.



Figure 3. Lower Competition Creek (left) and Upper Competition Creek (right); August 2022.



Figure 4. Sourdock Creek (left) and West Fork Ikalukrok Creek (right); August 2022.

A total of 64 Dolly Varden were captured in Red Dog Creek downstream of the North Fork (Station 151). In the last four years, no more than nine Dolly Varden have been captured at this site. However, the fish captured this year appeared underweight and there were four fish that died in the time between removal from the trap and being measured for length (Figure 5). These fish mortalities were all smaller than the established size threshold for tissue element analysis (90-140 mm), but we chose to retain them for examination of elemental anomalies. Red Dog Creek still appeared red and turbid as in recent years (Figure 6).



Figure 5. Juvenile Dolly Varden captured in Red Dog Creek downstream of the North Fork (Station 151) August 2022. Note the mortalities that came out of this minnow trap.



Figure 6. Red Dog Creek downstream of the north fork (Station 151) near Red Dog Mine, Alaska in August 2020 (left) and August 2022 (right).

Locations in Upper Grayling Junior and Upper North Fork Red Dog creeks were again sampled, similar to 2021. Several Dolly Varden were captured in Upper Grayling Junior 2, and although fish were observed in both Upper North Fork Red Dog 1 and 2, none were caught in the traps. In future years other fish sampling methods may be used in these systems.

On August 5th, we drove to the area below Bons Pond to check on an intake structure that was reported to be tipped on its side and had a damaged screen (See ADF&G Trip Report from June 2022). We found the intake structure to be upright, and the outer screen had been replaced (Figure 7). However, it appeared that the mesh size is larger than the 0.25” diameter required by water withdrawal permit stipulations (Figure 7). There is not a current water withdrawal permit for this intake. ADF&G has notified Teck Environmental staff of these issues.



Figure 7. Water intake structure below Bons Pond in August 2022. The structure is now upright (left), but the mesh size on the screen is larger than current stipulations require (right).

On August 6th, we flew over the Kaviksaq Seep and surrounding tributaries south of the main pit (Figure 8). A water capture/ bypass system was installed in 2020 to divert the heavy metals from the seep from Red Dog Creek. We departed the mine site that afternoon.



Figure 8. Kaviksaq seep near Red Dog Mine (left) and water diversion structure (right); August 2022.

Table 1. List of minnow trap sample locations and catches, August 2022. Number of fish retained for element analysis at each site are in parentheses.

Site	Station #	Dolly Varden	Slimy Sculpin
Ikalukrok Crk u/s of Red Dog	9	25	0
Ikalukrok Crk d/s of Dudd	160	57	3
Mainstem Red Dog Crk (lower)	10	26 (4)	1
Mainstem Red Dog Crk (upper)	151	64 (3)	3
Buddy Crk, below falls	N/A	201 (15)	1
North Fork Red Dog Crk	12	4	0
North Fork Red Dog Crk (upper)	N/A	1	0
North Fork Red Dog Trib	N/A	0	0
Upper North Fork Red Dog 1	N/A	0	0
Upper North Fork Red Dog 2	N/A	0	0
Anxiety Ridge Crk	N/A	114 (15)	0
Evaingiknuk Crk	N/A	21	0
Ikalukrok Crk u/s of West Fork	206	0	0
West Fork Ikalukrok Crk	205	0	0
East Fork Ikalukrok Crk	208	0	0
Upper Competition Crk	203	0	0
Lower Competition Crk	202	0	0
Sourdock Crk	204	0	0
Grayling Junior Crk	209	4	0
Upper Grayling Junior Crk 1	N/A	0	0
Upper Grayling Junior Crk 2	N/A	18	0
Lower Volcano Crk	N/A	13	0
Upper Volcano Crk	N/A	0	0