TRIP REPORT

State of Alaska
Department of Fish and Game

Field Date(s): September 13, 2020

Location(s): **Ikalukrok Creek and Wulik River**

Objective(s): Chum salmon aerial survey in Ikalukrok Creek. Overwintering Dolly Varden observations in Wulik River. Capture seven adult Dolly Varden for element analysis from select tissues.

Participant(s): Chad Bear (ADF&G Habitat) and Fred DeCicco (contractor)

Weather: Overcast, 45 – 55 °C, 5 to 10 mph winds

Access: Red Dog charter to mine site, AC135 helicopter for aerial survey provided by Red Dog Mine.

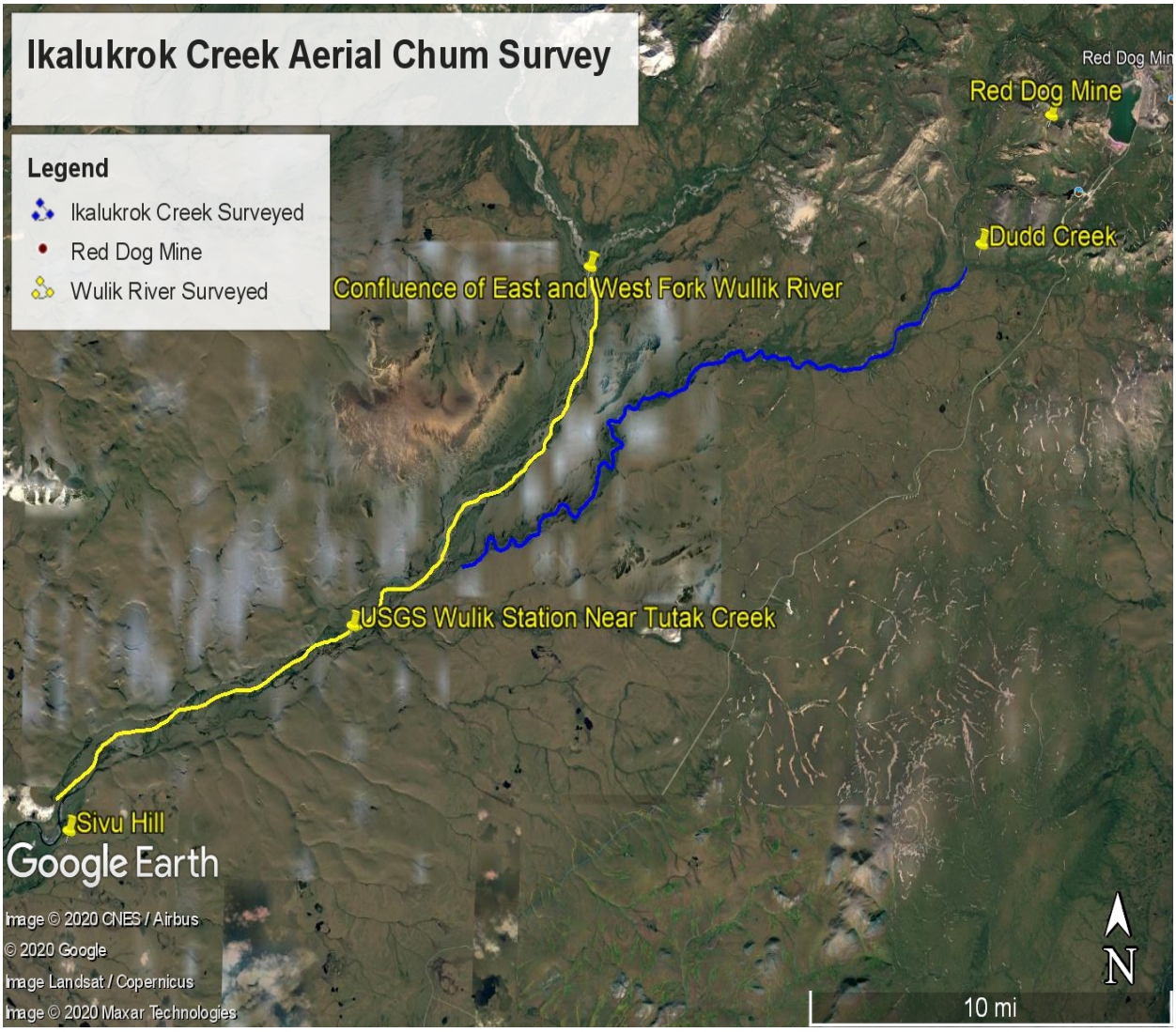

Figure 1. Aerial survey area of Ikalukrok Creek and Wulik River, September 13, 2020.

On September 12 Chad Bear and Fred DeCicco arrived at the Red Dog Mine. Specific tasks were to: 1) perform the Ikalukrok Creek aerial chum salmon spawning survey and visual observations of the Wulik River, and 2) capture, freeze and transport seven adult Dolly Varden to Fairbanks for element concentration analysis from select tissues. Spawning timing varies annually but chum salmon typically start returning to Ikalukrok Creek in late July, numbers increase throughout August, and peak spawning occurs in mid-September.

Chum salmon typically spawn in lower Ikalukrok Creek (Figure 1). We departed from Red Dog Mine on September 13 in an AC135 helicopter and followed Ikalukrok downriver from Red Dog Creek to the Wulik River. Turbid water was observed in Ikalukrok Creek from upriver of Red Dog Creek to the Wulik River (Figure 2). Dudd Creek continued to have clear water during summer 2020 despite other Ikalukrok tributaries becoming turbid in the summer of 2019 (Figure 3).

Figure 2. Confluence of Red Dog Creek (entering from left) and Ikalukrok Creek (flowing from bottom to top of picture).

Figure 3. Dudd Creek (top) entering Ikalukrok Creek (bottom), September 13, 2020.

The substrate in Ikalukrok Creek was covered with precipitated material. From the air an almost complete covering of the creek bed was observed (Figure 4). The precipitate was orange to milky white in color and appeared to be from one inch to three inches deep across the bottom of Ikalukrok Creek (Figure 5). During this survey, no chum salmon were observed in Ikalukrok Creek. Typically, between one to five thousand chum salmon will return to the lower Ikalukrok Creek for spawning. Chum salmon may have been present in the deepest sections of the creek and obscured from view, but water levels were relatively low during this survey and most of the riverbed was visible. We did not observe any dead salmon on the banks or gravel bars of Ikalukrok Creek.

Figure 4. Turbidity in Ikalukrok Creek, September 13, 2020.

Figure 5. Orange to white precipitation on bottom of Ikalukrok Creek, September 13, 2020.

At the confluence of Ikalukrok Creek and the Wulik River the turbid water was diluted, and water clarity improved as we continued down the Wulik River (Figure 6). The orange precipitate was still visible and covering most of the bottom of the Wulik River until the end of our flight near Sivu Hill (Figure 7).

Figure 6. Confluence of the Wulik River (left side flowing from top to bottom) and Ikalukrok Creek entering from right), September 13, 2020.

Figure 7. Wulik River below confluence of Ikalukrok Creek near Sivu Hill, September 13, 2020.

We captured seven adult Dolly Varden from the mainstem Wulik River near Driver's Camp. These are Dolly Varden that will overwinter, and they are not in spawning colors or condition (Figure 8). We observed one Chinook salmon carcass at this pool (Figure 9). Water clarity was clear but had a light white tint and the bottom of the river was covered with the orange precipitate (Figure 10). The Wulik River had a large pink salmon spawning event and tens of thousands of pink salmon carcasses were present from Sivu Hill to the uppermost portion of our survey at the confluence of the East and West Fork Wulik River (Figure 10 and 11).

Figure 8. Adult overwintering Dolly Varden.

Figure 9. Chinook carcass in Wulik River.

Figure 10. Mainstem Wulik River pool near Driver's Camp with orange precipitate and pink salmon carcasses.

Figure 11. Spawned out pink salmon carcasses in the Wulik River.

After capturing the seven adult Dolly Varden for element analysis from select tissues we flew downriver to Sivu Hill and then further up the Wulik River to the confluence of the East and West Fork (Figure 1). We observed hundreds of thousands of fish milling spots in the orange precipitate that had been made by the swimming motion of a stationary fish near the riverbed (Figure 12 and 13).

Figure 12. Milling spots in orange precipitate on bottom of Wulik River from the swimming motion of a stationary fish near the riverbed. September 13, 2020.

Figure 13. From Sivu Hill the confluence of the Wulik River and Ikalukrok Creek hundreds of thousands of milling spots were observed.

We observed large schools of Dolly Varden in these sections of the river and saw them departing from the clean sections of gravel as the fish responded to the helicopter. Not all the milling spots had fish present, and it appeared fish had been moving around the river system making new spots in different sections of the river during the summer. Another overwintering Dolly Varden aerial survey and estimate is scheduled for mid-October. There were many Dolly Varden present in the sections of the river we flew over. However, we could not count individual fish due to overcast skies and the whitish tint to the Wulik River water. A conservative estimate is 30,000 to 50,000 Dolly Varden in-river at the present time for the section we flew over.

During the summer of 2020 Wulik River water levels were low when compared to previous recent years. The Wulik River USGS station near the mouth of Tutak measured one high water event (above 5000 cfs) compared to the five seen in 2019 (Figures 14 and 15). The low water and lack of flooding to flush out the river system may have contributed to the build up of precipitate on the Wulik River streambed.

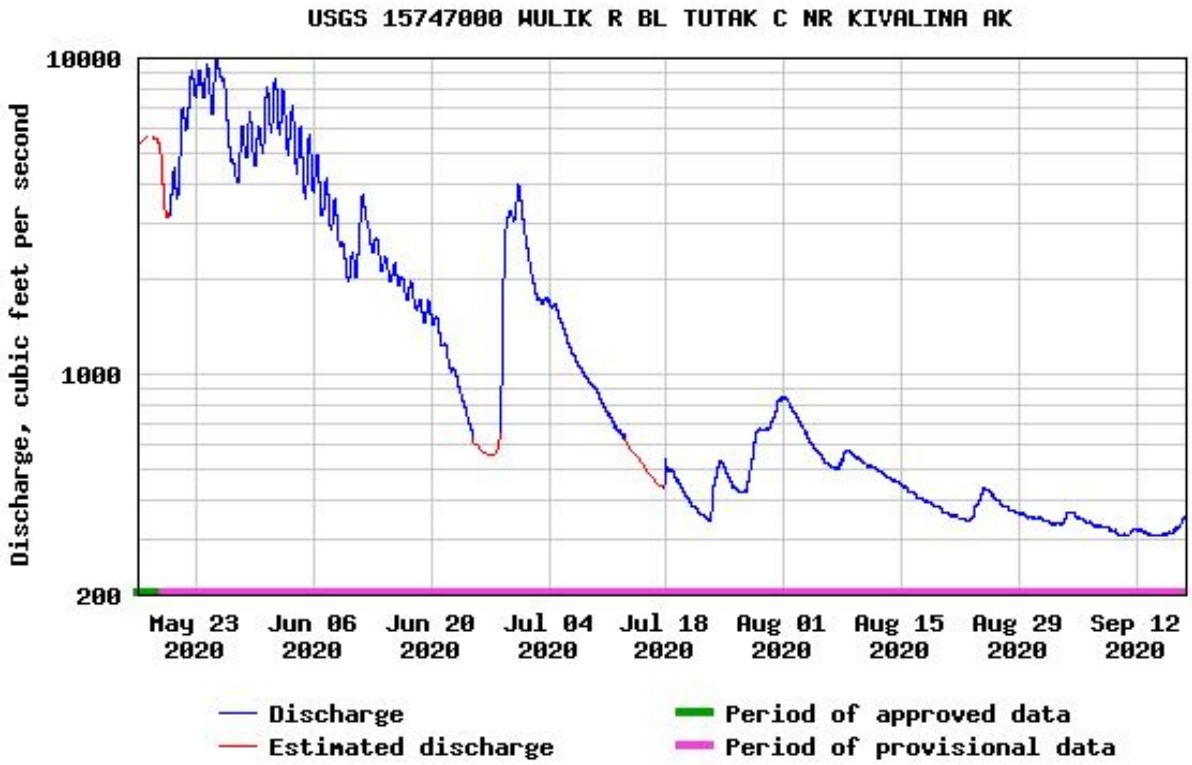

Figure 14. USGS Wulik River water discharge in cfs from May to September 2020.

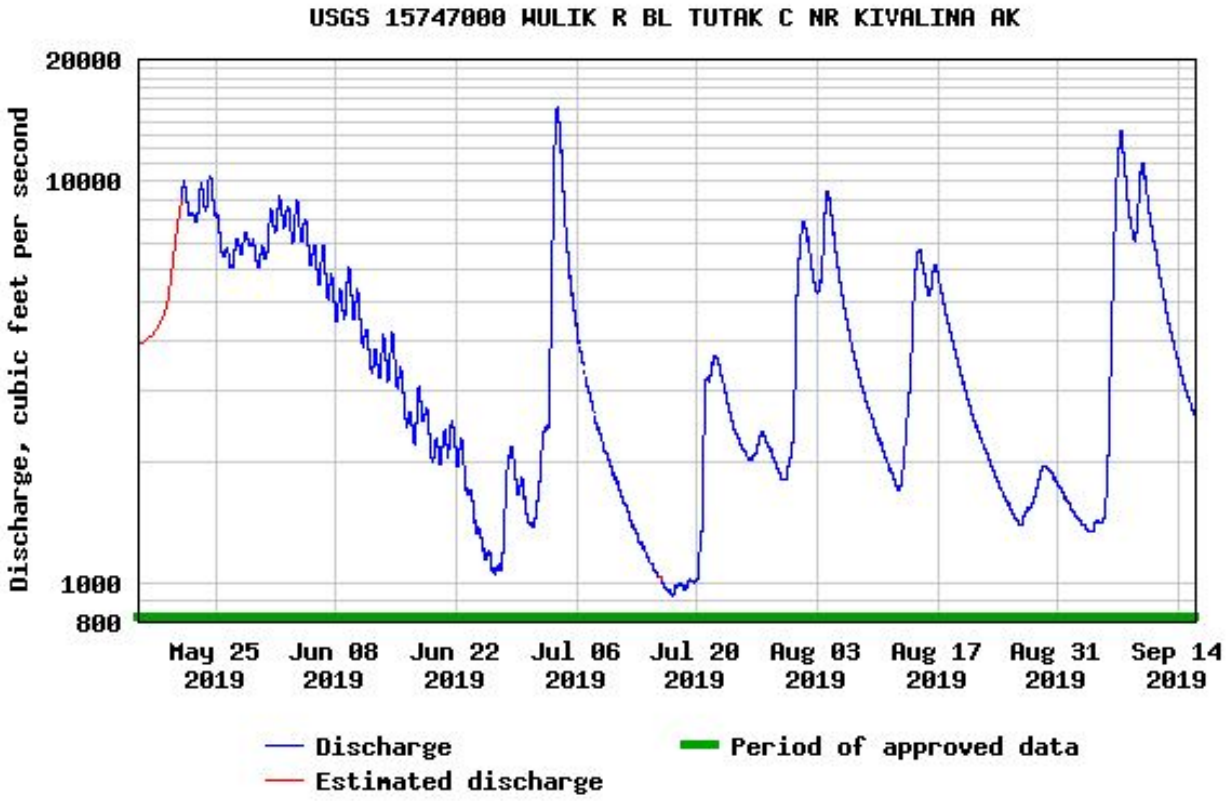

Figure 15. USGS Wulik River water discharge in cfs from May to September 2019.