

TRIP REPORT

State of Alaska
Department of Fish and Game

Field Date(s): July 15 - 19, 2019
Location(s): **Arctic Bornite Prospect**
Objective(s): Periphyton, aquatic invertebrate, and fish sampling
Participant(s): Chelsea Clawson and Audra Brase
Weather: Mostly sunny, 60's and 70's, occasional rain
Access: A-Star and R-66 helicopter

On July 15, 2019 we flew to the Arctic Bornite deposit to perform the fourth year of baseline aquatic biomonitoring. Specific tasks we planned to perform were: 1) collect periphyton and aquatic invertebrate samples at eight sites, 2) collect various fish species at target locations for whole body element analysis, and 3) sample fish at various locations to better understand fish presence and distribution. We sampled a total of 12 locations (Table 1, Figure 1).

Table 1. Sampling sites (WGS84) and types of samples collected, July 2019.

| Sample Site | Latitude | Longitude | Invertebrates | Periphyton | Minnow Traps | Fyke Nets |
|--------------------|----------|-----------|---------------|------------|--------------|-----------|
| Upper Subarctic | 67.1926 | -156.3911 | X | X | X | |
| Lower Subarctic | 67.1720 | -156.6208 | X | X | X | |
| Mouth of Subarctic | 67.1694 | -156.6293 | | | | X |
| Lower Red Rock | 67.1932 | -156.5991 | X | X | X | |
| Upper Ruby | 67.0408 | -156.9394 | X | X | X | |
| Lower Ruby | 67.1114 | -156.9084 | X | X | X | |
| Mouth of Ruby | 67.1140 | -156.9167 | | | | X |
| Upper Shungnak | 67.2440 | -156.6160 | X | X | | |
| Riley Creek | 67.0426 | -156.6923 | X | X | X | |
| Jay Creek | 67.0804 | -156.9445 | X | X | X | |
| Dahl Creek | 66.9456 | -156.9130 | | | X | |
| Wesley Creek | 66.9821 | -156.9807 | | | X | |

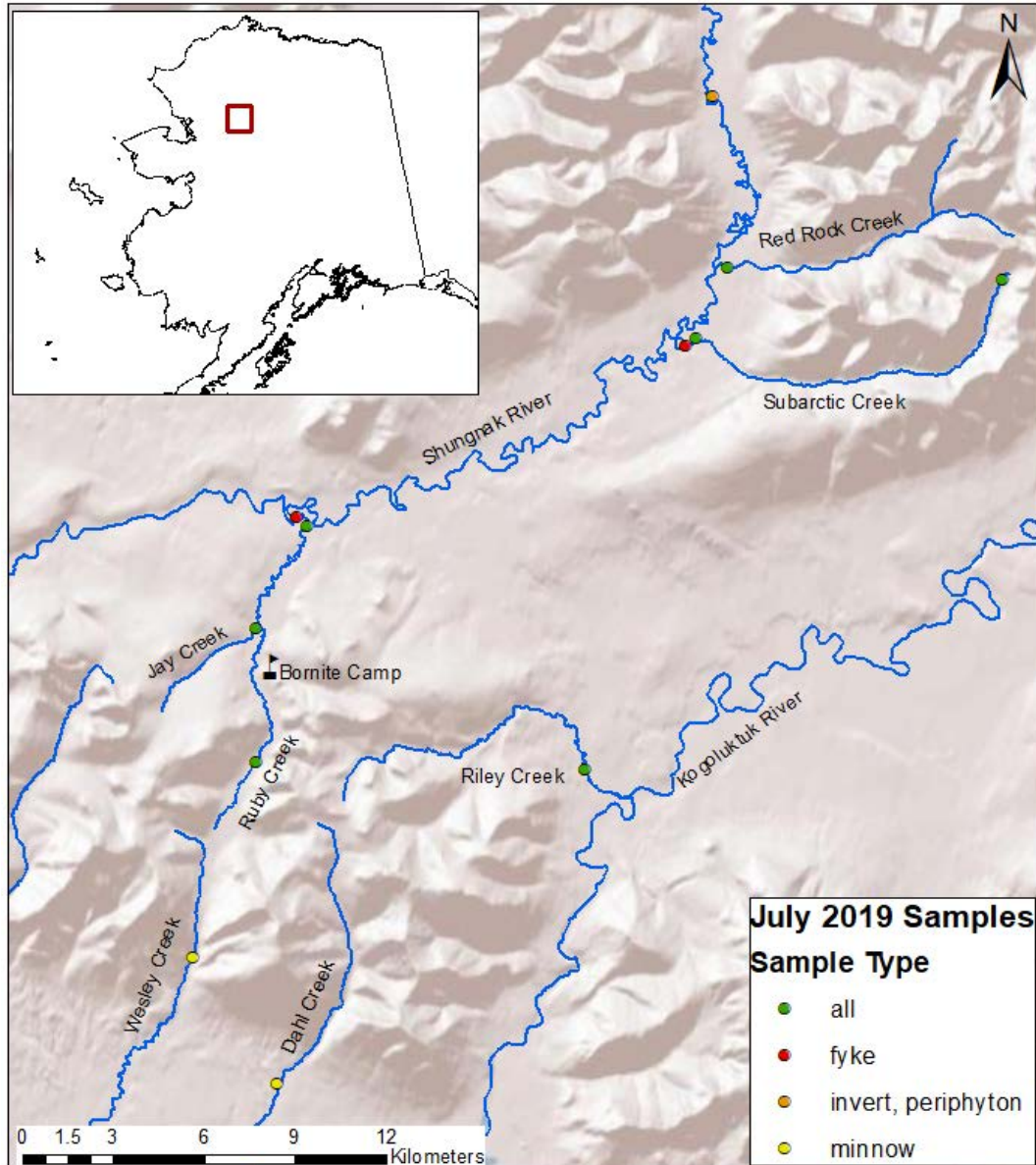


Figure 1. Minnow trap sample sites (yellow), fyke net sample sites (red), and periphyton, aquatic invertebrate, and minnow trap sample sites (green). The sample site on the Upper Shungnak River was only sampled for invertebrates and periphyton (orange).

Periphyton and Aquatic Invertebrates

A total of eight sites were visited and sampled for periphyton and aquatic invertebrates (Table 1). Water levels were low and weather conditions were good, allowing for successful sampling at all sites.

Fish Sampling

A total of 10 sites were sampled with minnow traps, and two additional sites were sampled with fyke nets (Table 2). In general, at each site sampled with minnow traps, 10 traps were fished overnight and checked approximately 24 hours later. At the Upper Subarctic site nine out of ten traps were destroyed by a bear (Figure 2). We reset three additional traps for 1.5 hours while we

were on site. This location has consistently had some of the highest Dolly Varden catches out of all the sample sites.

Wesley and Dahl creeks are not a part of the standard sampling program, but the road that runs from the Bornite camp to the Dahl Creek Airstrip crosses both creeks. The bridges at both creeks are degraded and need to be replaced. Neither water body is catalogued as anadromous, although they have the potential to be anadromous since they both flow into the Kobuk River without a known barrier to fish passage. We captured Dolly Varden in Dahl and Wesley creeks, but it is unknown if these were resident or anadromous fish. We plan to revisit both creeks in September to see if large adult anadromous Dolly Varden are present and/or utilizing these creeks as spawning habitat.



Figure 2. Minnow traps that were crushed by a bear on upper Subarctic Creek.

A total of five different fish species were captured with the minnow traps and fyke nets (Figure 3). Unlike 2018, no Alaska blackfish were captured this year, but a large wood frog was captured in the downstream Ruby Creek net (Figure 3). This year we operated the fyke nets for multiple days instead of a single 24 hour period. The Subarctic Creek net (downstream only) was set on July 16 and pulled on July 18. The Ruby Creek nets (upstream and downstream) were set on July 15 and pulled on July 18. All fish that were captured received a fin clip on the upper caudal fin to identify recaptures. Total number of fish captured (Table 2) is the number of unique fish seen over the total fyke net capture period.

Catch composition in the Ruby Creek fyke nets has varied from year to year, likely due in part to the short duration of fishing time (24 hours). Round whitefish and Arctic grayling are the most consistently captured species (Figure 4). Longnose suckers have only been captured in large numbers in 2017, when 50 were caught. We plan to fish the fyke nets for multiple days in future sample years to better capture the variation in species presence at the mouth of Ruby Creek.

Table 2. Sites sampled for fish with total number captured of each species and total number saved for whole body element analysis.

| Sample Site | Gear Type | Total number of fish captured (Total saved for element analysis in parentheses) | | | | |
|--------------------|--------------|--|---------------|-----------------|-----------------|-----------------|
| | | Dolly Varden | Slimy Sculpin | Arctic Grayling | Longnose Sucker | Round Whitefish |
| Upper Subarctic | Minnow Traps | 5 | - | - | - | - |
| Lower Subarctic | Minnow Traps | 31 (15) | 3 | - | - | - |
| Mouth of Subarctic | Fyke Net | 3 | 4 | 5 | - | 2 |
| Lower Red Rock | Minnow Traps | 25 (15) | - | - | - | - |
| Upper Ruby | Minnow Traps | 4 | 22 | - | - | - |
| Lower Ruby | Minnow Traps | - | 30 (15) | - | - | 1 |
| Mouth of Ruby | Fyke Net | 3 | 7 | 24 | 3 | 69 (15) |
| Riley Creek | Minnow Traps | 3 | 15 (7) | 1 | - | - |
| Jay Creek | Minnow Traps | 3 (1) | - | - | - | - |
| Wesley Creek | Minnow Traps | 21 | - | - | - | - |
| Dahl Creek | Minnow Traps | 10 | - | 2 | - | - |



Figure 3. Adult round whitefish (left) and a wood frog (right) captured in the Ruby Creek fyke nets.

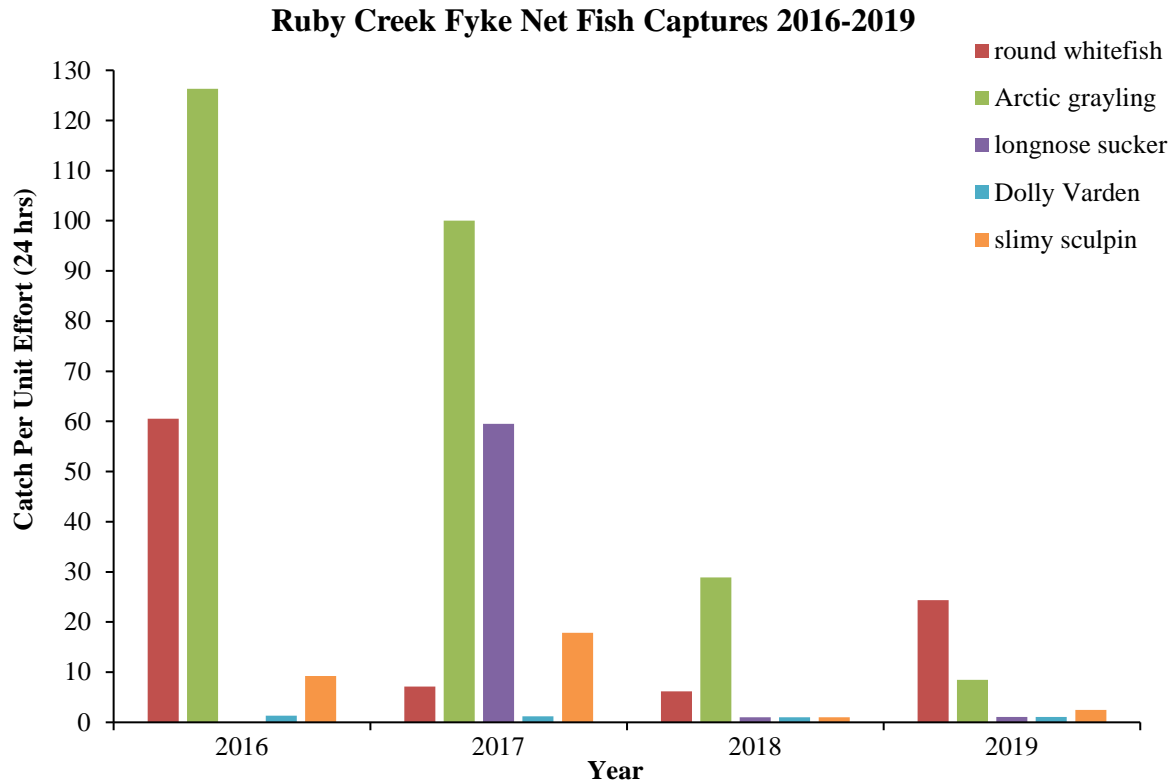


Figure 4. Fish captures in the Ruby Creek fyke nets from 2016 to 2019.

Other

On July 18 regulatory staff from ADNR and ADEC made a site visit to Arctic Bornite, and they landed at Upper Subarctic Creek while we were there. We described our sampling methods and showed them some captured Dolly Varden and the minnow traps that were destroyed by the bear.