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File:

- **Clinton Creek FCSAP**
- **Clinton Creek stream file**

From
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Our file - Notre référence
Your File - Votre référence
Date Oct 31, 2006

Subject
Objet

Clinton Creek, tributary to the Fortymile River, Yukon River North Mainstem sub-basin – record of 2006 activities

The Clinton Creek Asbestos Mine receives funding under the Federal Contaminated Sites Action Plan (FCSAP). Fisheries and Oceans Canada serves as an Expert Department under FCSAP. In the summer of 2005, DFO OHEB conducted investigations to provide a basis for the understanding of the potential long term effects of the mine site and related infrastructure. In 2006 we continued to monitor fish and fish habitat in the area of the minesite and in potentially affected waters.

For context, the following description of the drainage basin, some downstream effects of the mine, and the characteristics of the stream channel within the mine site are taken from our 2005 memo report:

“Clinton Creek has a drainage area of 206 sq. km., a length of about 22 km. and a total relief of 760 m. From the mouth, the creek crosses valley bottom deposits that function as an alluvial fan. The valley narrows to a “V” shape and maintains this form until just downstream of the mouth of Wolverine Creek, when it widens. The creek has a low to moderate gradient. South-facing slopes are dry and permafrost, if present, is deep. North facing slopes are moist and appear to have near surface permafrost.

Other than a ford on the access to the former townsite, roadways are generally located away from the creek. There is a considerable amount of waste material in the creek which presumably has washed down from the minesite. There is also much cable in the creek, seemingly electrical. This is strong enough to hold significant quantities of debris, and to partially block the channel. In the few areas of the stream that were looked at collateral to the 2005 sampling, erosion of stream banks as a result of the debris accumulations was noted.

The obvious direct effects of the mine start just downstream of the mouth of Wolverine Creek, with deposits of fine materials on the banks. Above this is the beaver dammed wetland area, which appears to be associated with ground water discharges from the minesite, and particularly from the infilled Porcupine Creek valley. Above the wetlands is an aggrading alluvial fan, over which the ford to the minesite crosses. Further upstream is the canyon. This is bounded on the south by the waste rock dump and to the north by the valley wall.

Importantly, the canyon is in the process of incising into bedrock for much of its length. At the head of the canyon is the lake outlet gabion structure, and beyond that Hudgeon Lake.”

2006 investigations

Fish sampling was completed on three occasions during the summer of 2006: June 19 – 20; August 8 – 10; and September 13 - 14. Sampling was conducted at Stations 1, 2A, and 4 (Map 1). Gee-type minnow traps were used. They were baited and deployed in accordance with the DFO “Protocol for the baiting of G-type minnow traps for the capture of juvenile Chinook salmon in the Yukon River Drainage Basin”. This method targets juvenile Chinook salmon, a socially, economically and culturally significant species, and slimy sculpin, a sentinel species. Numbers of traps set varied between sampling events.

The Dawson District Renewable Resource Council conducted a project on Clinton Creek to allow juvenile Chinook salmon to access the rearing habitat below the canyon. A total of 782 juvenile salmon were captured at the mouth of Clinton Creek and released in the area of the minesite.

Flows in Clinton Creek were considered medium during the June sampling, low in August, and somewhat higher in the September sampling. Water flowed through, rather than over, the majority of the lake outlet drop structures at all three sampling sessions. There were surface flows at the ford downstream of the canyon at all three sessions. This was in contrast to 2005, when flows were much lower.

Three stations were sampled in 2006. They were:

Station 1 - at the outlet of Hudgeon Lake, with traps set above, within and below the gabion structures. The purpose of sampling at this station was to indicate whether any of the target species were present in the area. This station was sampled in August and September only.

Station 2A - in the area of the mouth of Wolverine Creek. The purpose of sampling at this station was to determine the relative densities and sizes of juvenile Chinook salmon in immediate contact with the mine-site.

Station 4 – near the mouth of Clinton Creek and downstream of the first beaver dam on the creek. We considered that the unexpectedly high degree (for a stream in the un-glaciated area of the Yukon) of beaver activity would affect the upstream migration of 0+ juvenile Chinook salmon. The purpose of sampling at this station was to indicate the potential *supply* of upstream migrating 0+ Chinook.

Gillnets were set in Hudgeon Lake on August 9 and pulled on August 10.

All fish captured were anaesthetized, identified to species and measured (total length for Slimy sculpin, fork length for all others) to the nearest millimeter.

June 19 – 20

Traps were set on June 19 and pulled on June 20. The Dawson area YF&WMB Community Steward, Sebastian Jones assisted me.

Results were:

Station 1 – not sampled;

Station 2A – Arctic grayling (AG) – 1; Slimy sculpin (SS)- 14;

Station 4 – Chinook salmon (CK) – 11; SS – 5.

Observations & notes on captures:

- The CK captured at Station 4 were between 45 and 58 mm in fork length (FL), with a mean of 51.92 mm; these were almost certainly young-of-year (0+) that had migrated upstream from the Fortymile River;
- The AG at Station 2A was 107mm FL & was probably a 1+;
- The SS at Station 2A varied in length from 48 – 89 mm total length (TL);
- Large SS were abundant at Station 2A, and were easily observed;
- The beaver dams constructed below the confluence of Wolverine Creek during the summer of 2005 had been breached;
- Due to equipment failures, stream temperatures were not measured.

August 8 - 10

Traps were set by Resource Restoration Biologist Jody Mackenzie-Grieve and myself on August 8. Habitat Biologist Lisa Christensen assisted with the pulling of the traps and processing of the captured fish on August 9. Two monofilament gill nets were set in Hudgeon Lake on the 8th and pulled on the 9th: both were gang nets, with panels of differing mesh size. The first was comprised of 15 X 2 meter panels of 36, 90, 31, 90 and 25 mm stretched mesh, and was set in the eastern end of the lake. The second was comprised of a 7.5 X 2 meter panel of 20 mm stretched mesh and a 15 X 2 meter panel of 60 mm stretched mesh and was set in the western end of the lake. The creek was overflowed on August 10.

Results were:

Station 1 (6 traps): AG – 1;

Station 2A (3 traps): CK – 43; SS – 8; AG - 1

Station 4 – (3 traps): CK – 175; SS – 1; Long nosed sucker (LNS) - 5

Hudgeon Lake gill-nets: no catch

Observations & notes on captures:

- A total of 17 beaver dams were counted between the Fortymile River and the Mine site. This is a minimal number, as the helicopter was flying relatively high and fast up the valley;
- The AG captured at Station 1 was in a trap immediately below the gabion structures, and had a FL of 95 mm;

- A bald eagle was seen perched at the downstream end of the gabion structures, on what seemed to be a well used perch. I expect that s/he had been removing adult Arctic grayling which migrated upstream to this point;
- The CK captured at Station 2A would almost certainly been transported upstream by the DDRRC crew, as migrating upstream over the large number of dams observed would be unlikely;
- Far fewer fish were seen at Station 2A than in June 2006 or at any time in 2005, yet captures of slimy sculpin were similar. This implies that there were avian predators (kingfishers, terns, gulls) in 2006 and that fish were utilising cover;
- The single AG captured at Station 2A had a FL of 67 mm, which is consistent with young-of-year of this species;
- The high rate of capture of Chinook near the mouth was probably a result of an obstruction, or of a series of obstructions, to upstream migration located further up the creek;
- Fork lengths of CK captured at Station 2A had a range of 68 – 83 mm, and a mean of 75.28 mm, while those captured at Station 4 had a range of 58 – 80 mm and a mean of 64.91 mm;
- No fish were seen rising in Hudgeon Lake;
- Water temperatures on August 8 were:
 - Station 1 (at the upstream end of the gabion structures) 1630 hrs - 18.1 degree;
 - Station 2A 1715 hrs -15.9 degrees at 1715 hrs; and
 - Station 4 1745 hrs - 12.4 degrees

September 13 – 14

Sampling was conducted at Stations 1, 2A and 4. The weather was very warm during the sampling, with air temperatures approaching 20 degrees in the afternoon of the 14th.

Results were:

Station 1 (2 traps at downstream end of gabion structure): no catch

Station 2A (2 traps): CK – 11; SS – 5;

Station 4: (2 traps) CK - 120

Observations & notes on captures:

- Station 2A had been somewhat modified by beaver dams since early August, with a dam constructed at the upstream end of the station. Both traps were set downstream of this feature;
- Few fish were seen at Station 2A;
- The SS captured at Station 2A were between 75 and 101 mm in TL;
- Fork lengths of CK captured at Station 2A had a range of 82 – 95 mm, and a mean of 88 mm, while those captured at Station 4 had a range of 59 - 95 mm and a mean of 70.12 mm;
- No fish were seen rising in Hudgeon Lake.
- Water temperatures on September 13 were:

- Station 1 – 0920 hrs – 4.6 degrees;
- Station 2A – 1000 hrs – 8.7 degrees;
- Station 4 – 1030 hrs – 7.1 degrees.

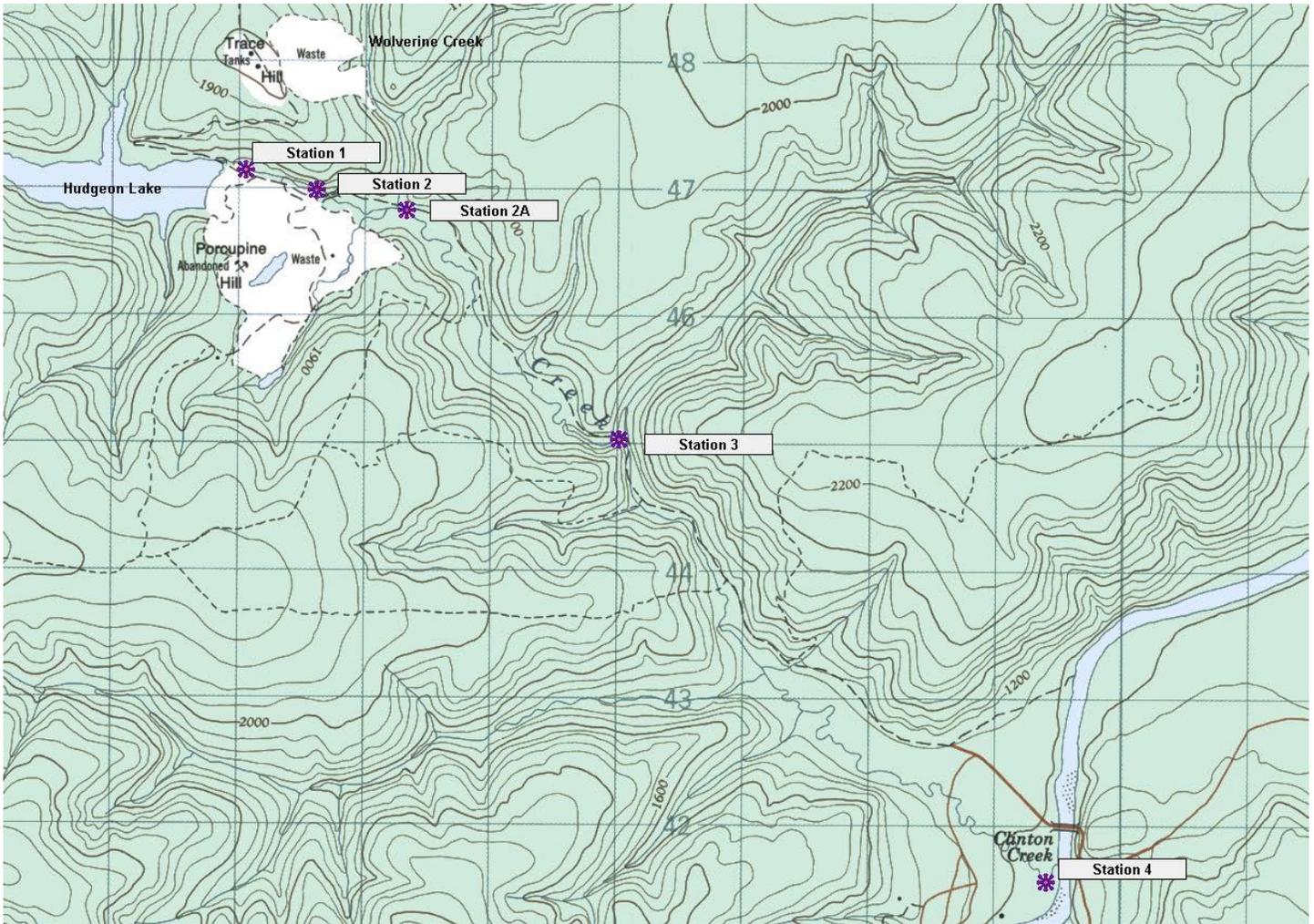


Figure 1. 2006 trapping stations on Clinton Creek

Table 1. Summary of fish trapping completed on Clinton Creek 2006.

			CK	SS	AG	LNS
June 19 - 20						
Station 1 (not sampled)	N	-	-	-	-	-
	F/TL range					
	F/TL mean					
Station 2A 4 traps	N	0	14	1	0	
	F/TL range		48 - 89	107		
	F/TL mean		77.42			
Station 4 4 traps	N	11	5	0	0	
	F/TL range	45 - 58	63 - 70			
	F/TL mean	51.92	66.8			
August 8 - 10						
Station 1 6 traps	N	0	0	1	0	
	F/TL range			95		
	F/TL mean					
Station 2A 3 traps	N	43	8	1	0	
	F/TL range	68 - 83	55 - 80	67		
	F/TL mean	75.28	67.25			
Station 4 3 traps	N	175	1		5	
	F/TL range	58 - 80	53		51 - 89	
	F/TL mean	64.91			70.4	
Sept 13 - 14						
Station 1 2 traps	N	0	0	0	0	
	F/TL range					
	F/TL mean					
Station 2A 2 traps	N	11	5	0	0	
	F/TL range	82 - 95	75 - 101			
	F/TL mean	88	91.2			
Station 4 2 traps	N	120	0	0	0	
	F/TL range	59 - 95				
	F/TL mean	70.12				