



## YUKON RIVER NORTH MAINSTEM STEWARDSHIP

---

Prepared by:

Linda Taylor

**Executive Secretariat**

DDRRC

# Yukon River North Mainstem Stewardship

---

[CRE-06-11]

2011

Prepared By:

Linda Taylor

DDRRC

Prepared for:

The Yukon River Panel



## **ACKNOWLEDGEMENTS**

We would like to thank Hans Algotsson, our field supervisor, and our two student employees, Alistair Findley-Brook and Francis Bouffard for all their hard work in the field during the summer. Andria Oppen made the Public Day successful, and Al von Finster provided technical assistance and advice to the staff. Sean Collin's assistance in the implementation of the project is greatly appreciated. We are grateful to the Yukon River Panel for recognizing the importance of our project and providing funding for it.

## TABLE OF CONTENTS

<b>ABSTRACT.....</b>	<b>5</b>
<b>INTRODUCTION.....</b>	<b>6</b>
<b>METHODS .....</b>	<b>9</b>
<b>RESULTS .....</b>	<b>10</b>
<b>DISCUSSION .....</b>	<b>11</b>
<b>PUBLIC DAY.....</b>	<b>13</b>
<b>CONCLUSIONS AND RECOMMENDATIONS.....</b>	<b>15</b>
<b>REFERENCES.....</b>	<b>15</b>
<b>LIST OF PHOTOS.....</b>	<b>18</b>
<b>APPENDIX A.....</b>	<b>20</b>
<b>APPENDIX B.....</b>	<b>21</b>
<b>APPENDIX C.....</b>	<b>28</b>
<b>STUDENT REPORTS.....</b>	<b>36.</b>

## **ABSTRACT**

The primary objectives of this project were to restore Chinook salmon to productive rearing habitats, salvage juvenile Chinook from isolated habitats and build community capacity through hands-on training of local youth. Project planning was conducted in consultation with DFO. Two local high school students were hired and supervised by an experienced field technician. The crew started field work on July 4 and ended on August 5, 2011. High water and cool temperatures were experienced throughout the field work component of the project. The Public Day was held on August 4. Assessment sampling took place on September 12 – 14. Juvenile Chinook salmon were captured in low numbers or were absent in the project area in 2011, probably as a result of a low brood year and high water.

## INTRODUCTION

In the early 2000s Tr'ondëk Hwëch'in elders and other Dawson locals raised concerns that salmon rearing and spawning habitat had been diminishing within the Tr'ondëk Hwëch'in traditional territory. Technical investigations by the YFWMB Dawson Area Community Steward and the Department of Fisheries and Oceans on non-spawning streams in the Dawson area confirmed that beaver dams and other non-permanent barriers had obstructed the upstream movement of salmon fry into known rearing and overwintering habitat. Additionally, significant numbers of fry were found after the spring freshet in isolated pools in the Klondike River valley.

This provided an opportunity for the DDRRC to hire youth in for a project that would engage them in, and expose them to, salmon habitat restoration, conservation and management activities. Importantly, activities could be chosen that would pose limited risk to the youth: high risk activities such as working in deep, fast water, from boats or aircraft would not be required. This reduced the risk to the youth and the burden of training necessary to meet Workers Compensation Board requirements to work in high risk environments.

The model chosen by the DDRRC was to hire two local high school students and an older, experienced local field supervisor. A pilot project took place in 2006, and provided important information for the planning of the 2007 project. The project has been conducted every year since. Pre-season planning and in-season implementation has built on the results of past seasons.

A fundamental component of the project has been the maintenance of a "Record of Activities". This is updated at the conclusion of each field season. It forms the planning framework for the following year. The Record is provided in Appendix C.

The objectives of the 2011 project were to:

- Restore Chinook salmon stocks through increasing access to rearing and overwintering habitat;

- Salvage salmon fry from isolated pools in the Klondike River floodplain;
- Add to knowledge of salmon utilisation of small local streams;
- Involve, educate and give experience to 2 local youth;
- Build community capacity and stewardship for the restoration of salmon stocks and habitat;

Coordination and communication for this project was provided by the author in her role of Dawson District Renewable Resource Council Executive Secretariat.

Liaison with regulators and technical oversight and assistance was provided by Al von Finster, formerly of Fisheries and Oceans Canada.

The project had two main components. These were:

1. Field work, including planning, mobilization, implementation and assessment;
2. Public day, including organization and delivery.

Each component will be discussed below.

## **Field Work Component**

### Planning and mobilisation

A Scientific Collection License was applied for from DFO on May 5, and was issued on May 24, 2011.

Hans Algotsson returned as Project Supervisor and was hired in late June, 2011. Two local high school students, Francis Bouffard and Alistair Findlay-Brooks were hired as staff.

A three passenger 4 x 4 vehicle was provided by Hans Algotsson to transport the crew.

The “Yukon River north Mainstem: 2010 Record of Activities” was reviewed, and the recommendations considered in the planning process. The details of the project were discussed with the Project Technical Contact, Fisheries and Oceans Canada Resource Restoration Biologist Sean Collins, and a common understanding was achieved.

Equipment was taken out of storage, checked and made serviceable.

A reconnaissance of the isolated pools in the Klondike River floodplain was undertaken by the Technical consultant on June 17. Freshet had passed, the pools were isolated, and small fish were observed.

#### Field work.

Field work began on 5 July. Juvenile Chinook salmon salvage was to take place during the first week; however, heavy rains during the week of June 20 resulted in a rapid rise in the Klondike River. The river flowed through the isolated ponds. The schedule was modified as follows:

July 5 – 8: Fortymile drainage – restoration of juvenile Chinook salmon to productive habitats;

July 11 – 15: Klondike River – inventory of juvenile Chinook salmon along the North Klondike River, Mainstem Klondike River and adjacent off-channel habitats;

July 18- 22: Fortymile drainage – restoration of juvenile Chinook salmon to productive habitats;

July 25 – 29: Klondike River – inventory of juvenile Chinook salmon along the North Klondike River, Mainstem Klondike River and adjacent off-channel habitats, salvage from the Germaine Creek Avulsion channel;

August 1 – 5: wrap up of restoration in the Fortymile River drainage, Public Day on Klondike River, Klondike River & North Klondike River. Al von Finster, the Technical Consultant and Resource Restoration Biologist Sean Collins participated in this week’s activities.

Additionally, the Project Supervisor undertook sampling on the Fortymile River on August 10-11. This was due to the low numbers of Chinook captured in Clinton Creek, and to investigate whether the upstream migration was late or absent.



Assessment sampling was undertaken by the Technical Consultant on September 12 – 14.

## **METHODS AND RESULTS**

### **Methods**

Gee-type minnow traps were the primary collection method. They were deployed in accordance with the “Protocol for the baiting of G-type minnow traps for the capture of juvenile Chinook salmon in the Yukon River drainage basin” (Appendix A). All fish captured were enumerated, but only juvenile salmon were released above non-permanent obstructions. Methods for salvage included the capture of the fish in the isolated pools in the “Germaine Creek Avulsion Channel”. Fish are captured in the pools, placed in buckets, and released into connected waters of the Klondike River.

Methods for restoration included the capture of fish below “soft” (non-permanent) obstructions such as highway crossings and beaver dams on Mickie and Clinton Creek, tributary to the Fortymile River. Juvenile Chinook salmon were released into productive habitats upstream of the obstructions, and within the area of creek which would be utilized if the beaver dam or obstruction was not present. Other species captured as by-catch were enumerated released back to the stream at the location they were captured.

Methods for monitoring included the capture of fish in the “Viceroy Channel”. This channel is approximately 1,000 meters in length and flows parallel to and drains into the North Klondike River. An abandoned beaver dam that obstructed juvenile Chinook salmon from approximately 70% of the channel was breached in 2009. Presence of juvenile Chinook salmon indicate the return of access to the valuable overwintering habitat in this ground water fed channel.

Biological measurements were to be taken from juvenile salmon in lower Clinton Creek when numbers exceeded or approached 30 juveniles per station. Fish captured during the Public Day and during the end of season assessment monitoring. Fish were anaesthetised with clove oil. Either fork- or total length was measured to the nearest millimetre using a measuring

board. Fish captured in the end of season sampling were weighed to 0.1 gm. with an electronic balance.

## **Results**

A total of 66 juvenile Chinook salmon was salvaged and/or restored to productive habitats upstream of obstructions. These included 15 in Clinton Creek and 51 salvaged from isolated pools in the Germaine Creek avulsion of the Klondike River. All juvenile Chinook salmon were young of the year. Captures of juvenile Chinook salmon by location and date are shown in Appendix B, Table 1a and 2b.

In respect of individual streams, lower Clinton Creek was accessible to samplers in 2011. The stream remained at moderate stage throughout the summer. It was generally clear, but carried a heavy sand bed load due to erosion of the 2010 slope failures in the watershed. In most years juvenile Chinook salmon are usually initially absent from the creek and then appear suddenly and in significant numbers. This did not occur in 2011. Significant sampling effort took place on 10 days between July 6 and August 11. The only captures were on August 2, when 15 juvenile Chinook were captured. The September assessment resulted in the capture of only 2 juvenile Chinook from lower Clinton Creek. The target total of 30 juveniles/day of Chinook from lower Clinton Creek for growth monitoring, was not met on any occasion.

No salmon were captured in Mickie Creek in 7 sampling days between July 19 and August 3. A single 0+ Chinook was captured in September.

Pools in the Germaine Creek Avulsion Channel were isolated in mid-June but the river level rose quickly in late June and again flowed through the Channel. The river had fallen and the pools were isolated in late July and a total of 51 juvenile Chinook were captured and restored to the Klondike River.

Juvenile Chinook salmon were captured at the Viceroy Road crossing on 5 occasions between July 12 and September 15. However, 5 sampling days in the same period resulted in no catch.

As environmental conditions did not allow some planned activities to occur, a number of sites on the North Klondike River were sampled to investigate the extent of juvenile Chinook salmon distribution. These included a site upstream of the North Fork Bridge, at the North Fork Inlet, at the abandoned hatchery at km 10 of the Dempster Highway, near Benson Creek, and at the Government of Yukon Highway Camp at 42 Mile.

A total of 342 other fish was captured incidental to the target species/life stage of juvenile Chinook salmon. This included 266 slimy sculpin; 21 long nosed sucker; 3 round whitefish; 23 Arctic grayling; and 19 burbot. Incidental captures are shown in Appendix B, Table 3.

The Record of Activities was updated, and recommendations for 2012 developed.

## **DISCUSSION**

The staffing and administration of the project closely followed that of previous years, and was entirely satisfactory. Students in the Yukon have a wide range of educational options, career opportunities and high-paying summer jobs in the currently buoyant mining and mining support industries. Despite this, both students remained with the project through to conclusion, and performed well. This indicates the attractiveness of the Stewardship jobs to youth. We hope that the interest can be maintained. Reports by the students can be found in Appendix D.

Hans Algotsson maintained the student's interest in the project under adverse environmental conditions, and in the virtual absence of salmon. Al von Finster was the Technical Consultant and provided basin- and temporal context for the conditions and results of the sampling.

Captures of juvenile Chinook salmon were very low throughout the project and associated sampling. A total of 137 juvenile salmon were captured in 2011. This compares unfavourably with 829 in 2006 (Smart 2006), 4760 in 2007 (Smart 2007), 1393 in 2009 (Fraser 2009), and

1102 in 2010 (Taylor 2010). It exceeds the 98 captured in 2008 (Netro, 2008). Caution is advised in making direct comparisons between the years, as sampling effort at various locations varied. However, identical methods were used, the total effort expended was similar, and the project was conducted or technically overseen by the same personnel.

It is likely that the low escapement in 2010 in conjunction with the high water observed in 2011 and the implied lower water temperatures affected the supply of juvenile Chinook salmon in the project area.

Juvenile Chinook salmon migrating upstream into tributaries such as the Fortymile River and its tributaries may come from any part of the upstream basin (Daum & Flannery 2009). Preliminary investigations have indicated that virtually all the juveniles utilizing Clinton Creek originate from spawning stocks well above Dawson. An analysis of DNA from 237 juveniles captured in 2009 in Clinton Creek indicated that 236 originated above the mouth of the Stewart River (personal communication, J. Mackenzie-Grieve, DFO). Downstream migration of 1+ Yukon River smolts from the Whitehorse area was delayed in a cold water year (Moodie 2000). It is fair to assume that the downstream migration of 0+ juvenile Chinook is initiated or otherwise affected by local hydrological and thermal conditions.

Both 2008 and 2011 were high water years. In 2011 the Klondike River flowed through the Germaine Creek avulsion channel for much of the summer. Vehicle access was not possible to the Clinton Creek delta in 2011 due to high water in the Fortymile River. Principal tributaries of the Yukon River such as the Stewart and Pelly maintained near-freshet water levels throughout much of the summer, while some secondary tributaries in the upper basin such as the Nordenskjold River exceeded freshet water levels. Higher water levels are generally associated with lower water temperatures (Boyd & Hanna 2007, Boyd & Sturdevant, 1997) in summer. It is therefore likely that most or all streams in the Upper Yukon Basin were colder than usual in much or most of the 2011 biological year.

Both 2008 and 2011 had low brood stock levels for 0+ Chinook. The trans-boundary estimated escapement in 2007 was 34903 and the 2010 estimated escapement was 32010. Both were well below the 1982-2010 average estimated escapement of 46048. No estimates are

available for escapement to the Klondike River in 2007. However, estimates are available for 2003, 2004 and 2009 (Mercer 2011) that allow calculation of a mean escapement of about 4800 adults. The 2010 estimated escapement of 803 adult Chinook salmon was far below this number. The supply of 0+ juveniles in the Klondike River in 2011 would be expected to be correspondingly lower.

Juvenile salmon were captured repeatedly but in low numbers in the Viceroy Channel. Under normal Klondike River juvenile Chinook densities this would indicate an obstruction to the upstream migration of juveniles to this valuable overwintering habitat. However, it may be related to the low abundance of juvenile salmon in the project area.

The incidental catch remained relatively numerous and diverse, indicating (despite the adverse environmental conditions in 2011) a healthy aquatic environment.

The investigations of new areas for Chinook utilization resulted in few captures of the target species. However, it served to collect information on other fish species and allowed the project to continue in a safe manner. The students were able to learn about the aquatic environment. They also gained an appreciation of the difficulties of working in an uncontrolled environment.

The students played a dominant role in the demonstration at the Public Day, particularly in showing the children the trapping methods, the different species of fish, etc. The children appeared to listen more closely to the youth. The youth accepted the responsibility of transferring their knowledge to the children.

## **PUBLIC DAY**

# **Rearing & Over-Wintering Access Restoration Project**

## **Public Open House Summary**

Prepared by: Andria Oppen

Dear Dawson District Renewable resource council,

The public day was again a great success. This year our attendance was up from 40 people last year to 65 this year, again, mostly children between the ages of 5 and 10. We had visitors from the DDRRC as well as from Fish and Game and a few community members. The children were a captive audience and were full of questions for the field workers. The field workers did an excellent job in explaining the importance of the project and provided hands on experience for the children. The visitors had an opportunity to watch the measuring process of the fish as well as help to transfer the fish between buckets. This was thrilling for the kids and certainly will provide a lasting memory.

The event spread over 3 hours as we broke the groups into manageable sizes of 10 per group. While the others were waiting they enjoyed a lovely lunch provided by the Bonanza Market.

My preparation of the event consisted of contacting the Elders Coordinator of Tr'ondëk Hwëch'in with an invitation once the date for the event had been determined. I then contacted both the Tr'inke Zho Daycare and the Dawson Daycare to invite their summer Camp kids to the event. Preparing a poster and posting it in various locations around town. I confirmed transportation for the groups invited and confirmed numbers of attendees closer to the event date. Based on these numbers I ordered the food.

On the day of the event I picked up the food and went out to Germaine creek to set up the food tables and places to eat and establish a plan with the Project Staff. I remained through the event and participated in the lesson, then cleaned up the site.

My recommendation for the next year is to increase the food budget for the event. Due to the popularity of the event and keen interest from the community I believe that the public participation will continue to grow. This year, I've had great feedback from parents of the kids who attended saying how excited their children were and how eagerly they shared what they learned at the event with their families.

Thank you again for the opportunity to coordinate the public day. It was a pleasure to work with both Hans Algotsson and his excellent staff and Al von Finster. Again, it was such a great learning experience.

## CONCLUSIONS AND RECOMMENDATIONS

The 2011 Stewardship project met our expectations. We hope to be able to conduct another project in 2012. Following recommendations:

- Continue to hire a dedicated supervisor with experience in fieldwork;
- Continue to hire a crew of high school aged students as field assistants;
- Continue to investigate additional opportunities to monitor salmon, restore access to habitats or perform salvage activities;
- Make a concerted effort to connect the project with other types of salmon-related projects work being done in the field in the Dawson Area.

## REFERENCES

Boyd, M., and D. Sturdevant. 1997. **The Scientific Basis for Oregon's Stream Temperature Standard: Common Questions and Straight Answers.** Oregon Department of Environmental Quality. 29 p.

Bradford, M.J., J.A. Grout, Sue Moodie. 2001. **Ecology of juvenile Chinook salmon in a small non-natal stream of the Yukon River drainage and the role of ice conditions on their distribution and survival.** Canadian Journal of Zoology, vol. 79, p 2043-2054

Brown, L.E., and D.M. Hannah. 2007. **Alpine Stream Temperature Response of Storm Events.** Journal of Hydrometeorology. Volume 8 p. 952-967.

Daum, D. W. and B.G. Flannery. 2009. Canadian-Origin Chinook Salmon Rearing in Non-Natal U.S. Tributary Streams in the Yukon River, Alaska, 2006-2007. U.S. Fish and Wildlife Service. Alaska Fisheries Technical Report Number 102. 44 p.

Fraser, L. 2009. **Yukon River North Mainstem Stewardship.** DDRRC. Yukon River R&E Project CRE09-06. 35 p and Appendices.

JTC (Joint Technical Committee of the Yukon River US/Canada Panel). 2011. **Yukon River Salmon 2010 Season Summary and 2011 Season Outlook.** Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report No. 3A11-01 Anchorage. 208 p.

- Jones, Sebastian. 2005 **A report on a fry trapping exercise on Shell Creek**, August 2005.
- Mercer, B. 2010. **2009 Klondike River DIDSON Sonar CRE-16-09** Prepared for the Yukon River Panel Restoration and Enhancement Fund. 23 p.
- Mercer, B. 2011. **2010 Klondike River DIDSON Sonar CRE-16-10** Prepared for the Yukon River Panel Restoration and Enhancement Fund. 24 p.
- Moodie, S. March 2000. **Croucher Creek 1999: Juvenile Chinook Salmon (Onchorynchus tshawtscha) Overwintering and Migration Study in a Small Non-natal Tributary of the Upper Yukon River.** Yukon Conservation Society/Kwanlin Dun First Nation. 48 p.
- Netro, G. 2008. **Rearing and Overwintering Access Restoration 2008.** Prepared for the Yukon River Panel by Dawson Renewable Resources Council. 30 pages.
- Smart, C. 2006. **Spawning and Rearing Access Restoration.** Prepared for the Yukon River Panel by Dawson Renewable Resources Council. 17 p. and Appendices.
- Smart, C. 2007. **Rearing and Overwintering Access Restoration.** Prepared for the Yukon River Panel by Dawson Renewable Resources Council. 28 pages.
- Taylor, L. 2010. **Yukon River North Mainstem Stewardship.** DDRRC. Yukon River R&E Project CRE09-06. 29 p.
- von Finster, A. June 2, 2005. **On-site to Germaine and Viceroy channels, May 26 & 27, 2005.** Memo to file- Klondike Drainage Ground Water Channel Investigations. DFO OHEB. 2 p.
- von Finster, A. November 24, 2005. **Report on 2005 sampling of Mickie Creek, tributary to the Fortymile River, a central Yukon stream affected by wildfire.** Memo to Mickie Creek stream file. DFO OHEB. 5 p.
- von Finster, A. December 6, 2005. **Clinton Creek, tributary to the Fortymile River, Yukon River North Mainstem sub-basin – Record of 2005 sampling.** Memo to Clinton Creek FCSAP file. DFO OHEB. 8 p.
- von Finster, A. October 31, 2006. **Clinton Creek, tributary to the Fortymile River, Yukon River North Mainstem sub-basin – record of 2006 activities.** Memo to file. DFO OHEB. 6 p.



von Finster, A. December 23, 2007. **Clinton Creek, tributary to the Fortymile River, Yukon River North Mainstem sub-basin – record of 2007 activities.** Memo to file. DFO OHEB. 12 p.

von Finster, A. January 16, 2009. **Clinton Creek, tributary to the Fortymile River, Yukon River North Mainstem sub-basin – record of 2008 activities.** Memo to file. DFO OHEB. 12 p.

Water Resources Branch. 2011. **Yukon Snow Survey Bulletin and Water Supply Forecast.** Department of Environment, Government of Yukon.

## LIST OF PHOTOS





## APPENDIX A

### **Protocol for the Baiting Of G-Type Minnow Traps for the Capture of Juvenile Chinook salmon In the Yukon River Drainage Basin**

Fisheries and Oceans Canada  
Habitat and Enhancement Branch

Baited G-type minnow traps have proven to be an effective means of capture for juvenile Chinook salmon in the Yukon River drainage basin. Trapping has been conducted by consultants, public interest groups, and government agencies. Salmon roe was the main bait that was used to trap the juveniles.

DFO Habitat developed the following Protocol in 1985 to provide a consistent methodology for G-type minnow trapping in the Yukon River Drainage basin in Canada:

Traps are baited with either Yukon River Chinook or Chum salmon roe. The roe is not salted or otherwise chemically preserved. A “walnut” sized” piece of roe is placed in a perforated thin plastic sandwich or similar bag, and the bag tied off.

(Note: roe is most easily handled when it is frozen: freeze the skeins flat, and chip off appropriate sized pieces. Thin, flexible plastic bags will remain flexible even in cold water. Zip closure bags tend to be stiff and are not recommended. Even very slight current will “pump” thin plastic bags and expel attractant from the bait. Perforations are most easily made with an “Exacto” or similar hobby knife blade: up to 15 bags may be stacked and 0.5 to 1.5 cm long cuts made through them).

The bags of roe are kept frozen for as long as possible before using, as they are most easy to handle when in this state. The potential of the odour of the roe attracting bears is also decreased.

The traps are prepared by having a tether of string or line attached to either of the halves. The trap is baited, closed, and a twist tie (paper coated wire) is used to tie the two halves together. **The minnow trap clip is not used**, as traps are often lost due to high water, etc: if the halves of the trap remain joined together, the trap will continue to capture and destroy fish. When closed by a twist-tie, the trap will quickly open and cease to capture and destroy fish.

When setting the traps in a new area, it is advisable to place the traps in all available types of habitat. Habitat utilisation by juvenile Chinook tends to vary from location to location: pre-judgement is not advisable. The traps should also be marked with survey flagging. A 24 hour set is recommended.

## APPENDIX B

<b>Table 1</b>			
<b>Juvenile Chinook restored to productive habitat in 2011</b>			
Date	Clinton Creek	Mickey Creek	Germain Cr avulsion
Jul-06	0	0	
Jul-07	0	0	
Jul-19	0	0	
Jul-20	0	0	
Jul-21	0	0	
Jul-22	0	0	
Jul-26			16
Jul-27			15
Jul-28			2
Jul-29			1
Aug-02	15	0	
Aug-03	0	0	
Aug-04			10
Aug-05			7
<b>Totals</b>	<b>15</b>	<b>0</b>	<b>51</b>

<b>Table 2a</b>	
<b>Juvenile Chinook catches DDRRC 2011</b>	
<b>Fortymile River drainage</b>	
<b>Date</b>	<b>Juvenile Chinook Salmon</b>
<b>Lower Clinton Creek</b>	
Jul-06	0
Jul-07	0
Jul-19	0
Jul-20	0
Jul-21	0
Jul-22	0
Jul-27	0
Aug-02	15
Aug-03	0
Aug-11	0
Sep-13	2
<b>Clinton Creek at Eagle Creek</b>	
Jul-22	0
Aug-02	0
Aug-03	0
Aug-11	0
Sep-13	6
<b>Clinton Creek at the mine site</b>	
Jul-19	0
Jul-20	0
Jul-21	0
Aug-02	0
Aug-03	0
Aug-11	1
Sep-13	7
<b>Mickey Creek</b>	
Jul-19	0
Jul-20	0
Jul-21	0
Jul-22	0
Aug-02	0
Aug-03	0
Aug-11	0
Sep-13	7
<b>Total</b>	<b>38</b>

<b>Table 2b</b>		
<b>Juvenile Chinook catches DDRRC 2011</b>		
<b>Klondike River Watershed</b>		
Date	Juvenile Chinook Salmon	
Viceroy Channel		
Jul-12		1
Jul-13		0
Jul-14		0
Jul-15		0
Jul-26		4
Jul-27		3
Jul-28		1
Jul-29		0
Aug-05		0
Sep-13		1
Upstream North Fork Bridge		
Jul-12		0
Jul-13		0
Jul-14		0
Jul-15		1
Jul-26		11
Jul-27		6
Jul-28		0
Jul-29		5
Aug-05		0
North Fork Intake		
Jul-12		0
Jul-13		0
Jul-14		0
Jul-15		0
Jul-28		0
Jul-29		0
Aug-02		0
Aug-03		0
Km 10 access		
Jul-26		0
Jul-27		0
Benson Creek access		
Jul-12		0
Jul-13		0
Jul-14		0
Jul-15		0

	Jul-28	0
	Jul-29	0
Germaine Creek		
	Jul-14	0
	Jul-15	0
	Jul-26	21
	Jul-27	17
	Jul-28	2
	Jul-29	1
	Aug-04	18
	Aug-05	7
	Sep-13	0
Dempster Corner side channel		
	Jul-26	0
	Jul-27	0
	Jul-28	0
	Jul-29	0
Too Much Gold Creek		
	Sep-13	0
<b>Total</b>		<b>99</b>

<b>Fortymile River Watershed</b>						
Date	Slimy Sculpin	Long nosed Sucker	Round Whitefish	Arctic grayling	Burbot	
Lower Clinton Creek						
Jul-06	2	6	0	0	0	0
Jul-07	3	4	0	1	0	0
Jul-19	3	3	0	1	0	0
Jul-20	1	0	1	0	0	0
Jul-21	1	2	0	0	0	0
Jul-22	1	3	0	1	0	0
Jul-27	1	4	0	0	0	0



Aug-02	7	4	0	0	0
Aug-03	5	3	0	1	1
Aug-11	2	1	0	0	0
Sep-13	1	0	0	0	0
Clinton Creek at Eagle Creek					
Jul-22	10	0	0	0	0
Aug-02	6	0	2	0	0
Aug-03	11	0	0	0	0
Aug-11	2	1	0	0	0
Sep-13	0	0	0	0	0
Clinton Creek at the mine site					
Jul-19	10	0	0	0	0
Jul-20	7	0	0	0	0
Jul-21	7	0	0	0	0
Aug-02	11	0	0	0	0
Aug-03	5	0	0	0	0
Aug-11	7	0	0	0	0
Sep-13	3	0	0	1	0
Mickey Creek					
Jul-19	0	0	0	4	0
Jul-20	0	0	0	0	0
Jul-21	0	0	0	0	0
Jul-22	0	0	0	0	0
Aug-02	0	0	0	2	0
Aug-03	0	0	0	4	0
Aug-11	0	0	0	3	0
Sep-13	0	0	0	2	0
<b>Total</b>	<b>101</b>	<b>31</b>	<b>3</b>	<b>20</b>	<b>1</b>

<b>Table 3b</b>					
<b>Incidental catches DDRRC 2011 - Klondike Watershed</b>					
Date	Slimy Sculpin	Long nosed Sucker	Round Whitefish	Arctic grayling	Burbot
<b>Viceroy Channel</b>					
Jul-12	0	0	0	0	0
Jul-13	0	0	0	0	0
Jul-14	0	0	0	0	0
Jul-15	0	0	0	0	0
Jul-27	1	0	0	0	0
Jul-26	1	0	0	0	0
Jul-27	1	0	0	0	1
Jul-28	0	0	0	0	0
Jul-29	0	0	0	0	0
Aug-05	0	0	0	0	0
Sep-13	2	0	0	0	0
<b>Upstream North Fork Bridge</b>					
Jul-12	1	0	0	0	0
Jul-13	1	0	0	0	1
Jul-14	0	0	0	0	0
Jul-15	1	0	0	0	1
Jul-26	5	0	0	0	0
Jul-27	1	0	0	0	0
Jul-28	5	0	0	0	0
Jul-29	2	0	0	0	0
Aug-05	4	0	0	0	0
<b>North Fork Intake</b>					
Jul-12	0	0	0	0	0
Jul-13	1	0	0	0	0
Jul-14	0	0	0	0	0
Jul-15	0	0	0	0	0
Jul-28	3	0	0	0	0
Jul-29	0	0	0	0	0
Aug-02	11	0	0	0	0
Aug-03	5	0	0	0	0
<b>Km 10 access</b>					
Jul-26	11	0	0	0	0
Jul-27	2	0	0	0	0
<b>Benson Creek access</b>					
Jul-12	0	0	0	0	0
Jul-13	1	0	0	0	0

Jul-14	0	0	0	0	0
Jul-15	0	0	0	0	0
Jul-28	6	0	0	0	0
Jul-29	5	0	0	0	0
<b>By Highway Camp</b>					
Jul-12	26	0	0	0	0
Jul-13	15	0	0	0	0
Jul-14	4	0	0	0	0
Jul-15	11				
<b>Germaine Creek</b>					
Jul-14	0	0	0	0	0
Jul-15	0	0	0	0	0
Jul-26	5	0	0	0	2
Jul-27	4	0	0	0	0
Jul-28	3	0	0	0	1
Jul-29	0	0	0	4	3
Aug-04	9	0	0	0	5
Aug-05	5	0	0	0	0
Sep-13	2	0	0	0	0
<b>Dempster Corner side channel</b>					
Jul-26	3	0	0	0	1
Jul-27	0	0	0	0	1
Jul-28	3	0	0	0	0
Jul-29	5	0	0	0	2
<b>Too Much Gold Creek</b>					
Sep-13	0	0	0	0	0
<b>Total</b>	<b>165</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>18</b>

## APPENDIX C

### Yukon River North Mainstem Salmon Restoration and Enhancement – Record of Activities

#### Fortymile River

##### Clinton Creek

Drainage Area: 206 sq. km

Clinton Creek is the first west bank tributary upstream of the mouth of the Fortymile River. The watershed has been much affected by the abandoned Clinton Creek asbestos mine. Failures of waste rock dumps have resulted in the creation of Hudgeon Lake and in significant contributions of sediment to the lower creek. Storage of water in the upper drainage may be buffering flows sufficiently that beaver are able to maintain dams across the creek. Beaver dams were identified as a probable obstruction in 2005

##### **Actions in 2006**

DDRRC Stewardship crew relocated 782 juvenile Chinook salmon from the lower creek to the Wolverine Creek area. Salmon appeared in large numbers in the lower creek, between July 7 – July 12. DFO reported 17 beaver dams between the mouth and the mine site in August.

##### **Actions in 2007**

DDRRC Stewardship crew relocated 2070 juvenile Chinook salmon from the lower creek to the Wolverine Creek area. Salmon appeared in large numbers in the lower creek when trapping was initiated on July 18.

##### **Actions in 2008**

58 Juvenile Chinook salmon were relocated to the mouth of Wolverine Ck. Very high flows affected trapping success and resulted in the breach of most upstream beaver dams.

##### **Actions in 2009**

901 Juvenile Chinook salmon were captured and relocated.

**Actions in 2010**

587 Juvenile Chinook salmon were captured and relocated. Fork lengths were measured of a target of 30 jcs/day.

**Actions in 2011**

15 Juvenile Chinook salmon were captured and restored.

**Recommendations for 2012**

Continue to capture juveniles in lower Clinton Creek and restore them to the creek near the mouth of Wolverine Creek. Continue with fork length measurements if numbers warrant.

**Mickey Creek**

Drainage area: 63 sq. km

Mickey Creek is the first east bank tributary of size of the Fortymile River. Wildfires burned the majority of the drainage basin in 2004. A perched culvert at the Clinton Creek Road crossing was identified as a partial obstruction in 2005.

**Actions in 2006**

DDRRC Stewardship crew relocated 34 Chinook salmon, but the project ended before large numbers entered the stream.

**Actions in 2007**

DDRRC Stewardship crew relocated 1273 Chinook salmon. Salmon appeared in large numbers in early August, and probably continued on past the project end.

**Actions in 2008**

32 juvenile Chinook salmon were relocated over the culvert. Upstream migration of salmon appeared delayed due to the high and cold stream flows.

**Actions in 2009**

9 Juvenile Chinook salmon were captured and relocated.

**Actions in 2010**

247 Juvenile Chinook salmon were captured and relocated.

**Actions in 2011**

No Juvenile Chinook salmon were captured.

**Recommendations for 2012**

Monitor and capture/restore to creek above culvert as required.

**Klondike River**

**Bonanza Creek**

Area: not determined

Bonanza Creek flows north and enters the Klondike River downstream of the main Bridge. The drainage basin has been intensively placer mined.

**2008 Activities**

47 juvenile Chinook salmon and 11 sculpin were captured in 15 trap-nights with the traps set between 5 and 8 kilometres up from the mouth.

**Actions for 2009**

No samplings were taken from this creek.

**Recommendations**

No further actions are recommended.

**Germaine Creek area salvage**

The Klondike River has developed a new channel in this area. The old channel carries water in the spring. As water levels fall, the Klondike River no longer enters the channel. A series of isolated pools remain and extend downstream to the mouth of Germaine Creek.

**Actions in 2007**

Salvage took place, resulting in the return of 1297 fry to the Klondike River.

**Actions in 2008**

8 juvenile Chinook salmon were relocated to the main channel. Flows in the Klondike rose in July and the isolated pools were re-connected to the river.

**Actions in 2009**

419 Juvenile Chinook were captured and relocated.

**Actions in 2010**

248 Juvenile Chinook were captured and relocated.

**Actions in 2011**

51 Juvenile Chinook were captured and relocated.

**Recommendations for 2012**

Continue to salvage juveniles from the isolated pools and release them into open waters.

**Goring Creek**

Area: not determined

Goring Creek flows north from a defined valley into a series of wetlands and then to the Klondike River

**Activities in 2008**

No juvenile Chinook salmon or other fish were captured in 5 trap-nights at the Klondike Highway crossing.

**Actions in 2009**

No sampling occurred.

**Recommendations.**

Maintain as a candidate for periods when the Klondike River is too high to work in.

**Dempster Bridge area salvage**

A series of pools extend down the right (north) side of the river.

Connection with the river depends on ground water inflows

**Actions in 2007**

Salvage took place, resulting in the return of 101 fry to the Klondike River.

**Action in 2008**

The crew checked this area but the pools were not isolated due to the high flows.

**Action in 2009**

No isolated pools in this area.

**Action in 2010**

No isolated pools in this area.

**Action in 2011**

No isolated pools in this area.

**Recommendations for 2012**

Monitor and salvage juveniles if necessary.

**North Klondike River - salvage**

**Action in 2008**

There was no work done due to high water levels

**Action in 2009**

One isolated pool with juvenile salmon was located at the North Fork intake

**Action in 2010**

No pools were observed

**Action in 2011**

No pools were observed

**Recommendations for 2012**

Monitor area and salvage juveniles as necessary

**Viceroy Channel**

Drainage area: Not applicable

Viceroy Channel is a small, ground water fed channel. It is crossed by the Viceroy Mine Road about 800 meters upstream from it's mouth. A beaver dam was established about 300 meters upstream from the mouth in the summer of 2005.

**Actions in 2006**

DDRRC Stewardship crew relocated 13 Chinook salmon by July 6, and then ceased trapping due to the low returns for the effort expended.

**Actions in 2007**



Trapping took place early in the project, resulting in the release of 16 fry to the Viceroy channel from downstream.

**Actions in 2008**

The area was blocked by a beaver dam, and the North Klondike River was high. No salmon were relocated.

**Actions in 2009**

The abandoned beaver dam was opened up to clear the way for the salmon to move up the channel.

**Actions in 2010**

The dam was attended and found to remain breached. Monitoring was conducted at the Viceroy Road crossing. A total of 80 juvenile Chinook salmon were captured.

**Actions in 2011**

Monitoring was conducted at the Viceroy Road crossing. A total of 10 juvenile Chinook salmon were captured.

**Recommendations for 2012**

Monitor channel at road crossing to determine whether juveniles have migrated into the creek. Walk downstream to the confluence with the Klondike to ensure that the channel is not obstructed.

**Upstream of North Fork Bridge**

Off-channel habitat on the left side of the North Fork Bridge.

**Actions in 2011**

Sampling took place and low numbers of juvenile Chinook were captured

**Recommendation**

Maintain as a candidate for periods when the Klondike River is too high to work in.

**At North Fork Intake**

Complex channel resulting from past river engineering.

**Actions in 2011**

Sampling took place and low numbers of juvenile Chinook were captured

**Recommendation**

Maintain as a candidate for periods when the Klondike River is too high to work in.

**Abandoned Hatchery site at Km 10 Dempster**

Complex, ground water fed channel resulting from past river engineering

**Actions in 2011**

Sampling took place. No juvenile Chinook were captured

**Recommendation**

Maintain as a candidate for periods when the Klondike River is too high to work in.

**North Klondike River at Benson Creek**

Access to North Klondike River – salmon have been documented spawning in the locality.

**Actions in 2011**

Sampling took place. No juvenile Chinook were captured

**Recommendation**

Maintain as a candidate for periods when the Klondike River is too high to work in.

**North Klondike at Highway Camp at 42 Mile.**

This is the upstream limit of local reports of spawning Chinook salmon

**Actions in 2011**

Sampling took place. No juvenile Chinook were captured

**Recommendation**

Maintain as a candidate for periods when the Klondike River is too high to work in.

**Too Much Gold Creek**

Area: not determined

Too Much Gold Creek flows from a narrow valley into a series of wetlands extending to the Klondike River.

**Activities in 2008**

No juvenile Chinook salmon or other fish were captured in 6 trap-nights at the Klondike Highway crossing.

**Activities in 2009**

No sampling took place

**Activities in 2011.**

Sampling took place in September, and no fish were captured.

**Recommendation**

Maintain as a candidate for periods when the Klondike River is too high to work in.

**Leotta Creek**

Leotta Creek is 2 km east of Dempster junction and west of Flat Creek. The water flows narrowly from the hills and flows into the Klondike River.

**Activities in 2008**

No juvenile Chinook salmon or other fish were captured in 2 trap-nights at the Klondike Highway crossing.

**Activities in 2009**

No sampling were taken from this creek.

**Recommendation**

Maintain as a candidate for periods when the Klondike River is too high to work in.

**All Gold Creek**

All Gold Creek enters the South Klondike River immediately west of the mouth of Flat Creek. The drainage basin has been intensively placer mined, and the creek is unstable.

**Activities in 2008**

No Juvenile Chinook salmon were captured 4 slimy sculpin were captured in 8 trap-nights at the Klondike Highway crossing.

**Activities in 2009**

No sampling were taken from this creek.

**Recommendations**

Maintain as a candidate for periods when the Klondike River is too high to work in

**Flat Creek**

Area: not determined

Flat Creek enters the South Klondike River from the south. The Klondike Highway crosses the creek near the mouth

**Activities in 2008**

No juvenile Chinook salmon were captured in 6 trap-nights. 3 burbot were captured at the Klondike Highway crossing

**Activities in 2009**

No sampling were taken from this creek.

**Recommendations**

Maintain as a candidate for periods when the Klondike River is too high to work in

**Louse town Pond**

This pond was tested because it can get connected with the Klondike River during high water.

**Activities in 2009**

No salmon were caught in the 19 traps that were set for two days. There were however, 90 whitefish and 11 burbot caught the first day and 83 whitefish, 13 burbot, and 1 long nose sucker caught the second day. The total amount of fish caught in this pond was 198 consisting of 173 whitefish, 24 burbot, and 1 long nose sucker

**Recommendations:**

As the pond is on TH land, only work there at TH's request.

## STUDENT REPORTS

To: Renewable Resource Council  
From: Francis Bouffard  
Date: October 3, 2011  
Re: Summer Work Report

The Salmon Fry Relocation Project was a great experience for me. I learned a lot and had lots of fun. Some of the things I learned on the job were how the fry get to the little creeks, how to use clove oil, how to measure the length of the salmon and how to set traps. I did enjoy this job a lot, we went to places that I've never been to, mostly by the Klondike River.

Hans was interesting, and I learned a fair bit from working with him. Whenever we had no fry in the traps he would find something for us to do that was on-topic, such as we went to check out the salmon counting unit on the Klondike River or we would just go to the office and read about salmon and animals in the Yukon.

I believe this summer wasn't the best summer for the salmon fry project. Most days we wouldn't get any salmon, or we'd just get a few. Changes in water ways, and high water were some of the reasons why.

Still, I hope the project goes next year and other projects can be done. It was a fun, I learned a lot.

Thank you very much,  
Francis Bouffard

# **Report for Dawson District Renewable Resources Council**

**By Alastair Findlay-Brook**

I started work on July 4th with Hans Algotson and co-worker and friend Francis Bouffard.

The main purpose of our job was to increase the survival rate of the salmon fry so that there will be more healthy salmon runs in the future.

Before heading out to do our field work, we had to first take a bear safety course and a first aid course so that we would be better prepared to work out in the bush. After that we got our entire gear ready such as hip waders, bear spray and notebooks. Then we got our fish eggs (the bait) ready for the traps.

On our first day out in the field we set traps where salmon have been found in the past, up the Forty Mile River. Later on in the job we also set some traps at the Dempster corner and along other suitable locations along the Klondike River.

During the first few weeks of the project we didn't trap any salmon fry, probably because it was too early and there was a land slide that may have caused disruption to the salmon habitat up the Forty Mile River.

In the last 3 weeks we were finding much more salmon fry up the Forty Mile River and also along the Klondike River. On our last day we had all the day care kids come out for a visit to see how to set the traps, study and then release the fish.

We also froze the fry so that we could measure them, and the kids were able to hold them. That was pretty fun.

I had a great time working for Hans Algotson. I know much more about salmon fry now, what juvenile salmon look like, and what kinds of conditions they need to be reared to become healthy adult salmon.

I liked this job. It was pretty relaxed and I had lots of fun working with my co-worker Francis.