



## YUKON RIVER NORTH MAINSTEM STEWARDSHIP

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Prepared by:

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**Executive Secretariat**

DDRRC

# Yukon River North Mainstem Stewardship

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Prepared for:

The Yukon River Panel



## **ACKNOWLEDGEMENTS**

We would like to thank Hans Algotsson, our field supervisor, and our two student employees, Hailey Riemer and Luke Hunter for all their hard work in the field during the summer. Also, Al von Finster's volunteered assistance and advice. Funding for this initiative was provided by the Yukon River Panel.

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## **ABSTRACT**

Primary objectives of this project were to restore Chinook salmon to productive rearing habitats and salvage juvenile Chinook from isolated habitats. Project planning was conducted in consultation with DFO. Two local high school students and an experienced field supervisor were hired. All staff remained with the project throughout and built confidence and capacity. The project started on July 13 and ended on Aug 13, 2010. Despite environmental challenges related to record rainfalls, high stream flows and associated landslides, a total of 1082 juvenile salmon were captured and transported to upstream habitats or from isolated pools to open waters. The 2009 Viceroy Creek Chinook access restoration project was monitored and determined to be successful. The public day was well attended. The project was a success.

## INTRODUCTION

In 2006, a pilot project was initiated by the Dawson District Renewable Resources Council in response to concerns by Tr'ondëk Hwëch'in elders and other locals that salmon rearing and spawning habitat had been diminishing within the Tr'ondëk Hwëch'in traditional territory. Field investigations by the YFWMB Dawson Area Community Steward and the Department of Fisheries and Oceans on non-spawning streams in the Dawson area indicated that beaver dams and other non-permanent barriers were obstructing the movement of salmon fry into known rearing and overwintering habitat. Significant numbers of fry were found to remain in pools in spawning rivers that became isolated after the spring freshet. The project has been conducted every year since 2006. Appendix C is a Record of Activities that is updated at the conclusion of each field season and forms the planning framework for the following year.

The objectives of the 2010 project were to:

- Restore Chinook salmon stocks through increasing access to rearing and overwintering habitat;
- Involve, educate and give experience to 2 local students;
- Build community capacity and stewardship for the restoration of salmon stocks and habitat;
- To add to knowledge of salmon utilisation of small local streams;
- To salvage salmon fry from isolated pools in the Klondike River floodplain;
- Develop a monitoring program for future assessment and restoration.

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

The project had two main components. These were:

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

Each component will be discussed below.

## **Field Work Component**

### Planning and mobilisation

A project supervisor, Hans Algotsson, was hired in late June, 2010. Two local high school students, Hayley Riemer and Luke Hunter were hired as staff.

A three passenger 4 x 4 vehicle was provided by supervisor Hans Algotsson for the project. Equipment was taken out of storage, checked and made serviceable.

The “Yukon River north Mainstem: 2009 Record of Activities” was reviewed, and the recommendations considered in the planning process.

A Scientific Collection License was applied for from DFO, and was issued on May 17, 2010.

Field work began on 13 July. During the first week Al von Finster (formerly DFO Restoration Biologist) accompanied the field supervisor and the students to the Klondike and Fortymile watershed sites as a volunteer. He updated the staff in the techniques of capturing, anesthetizing and measuring juvenile Chinook, and in the larger context of salmon management.

## Methods

Gee-type minnow traps 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) were used to capture fish. All fish captured were enumerated, but only juvenile salmon were released above non-permanent obstructions.

In 2010 the project included a pilot community-based juvenile Chinook salmon monitoring component. A target total of 30 juvenile Chinook salmon/day was captured in lower Clinton Creek, anesthetized with clove oil and measured for fork length. The site was sampled on 10 occasions between July 16 and August 5, 2010.

In late 2009 the crew removed an abandoned beaver dam from the lower reach of the Viceroy Channel, a groundwater fed tributary to the North Klondike River. Prior to the construction of the dam juvenile Chinook salmon migrated upstream past the Viceroy Road, approximately 800 meters above the dam. In 2010 monitoring took place at the Road crossing to assess the success of the undertakings.

## Results

A total of 1082 juvenile chinook salmon was salvaged and/or restored to productive habitats upstream of obstructions. These included 587 in Clinton Creek, 247 in Mickie Creek, and 268 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 1.

The target total of 30 juveniles/day of Chinook from lower Clinton Creek was met on all occasions save one. Mean fork lengths of juvenile Chinook salmon in lower Clinton creek increased from 67.1mm on July 16 to 71.9 mm on August 5. There was an excursion to 73.3 mm on July 27: however, the sample size was only 6 individuals. The mean fork length of Chinook at the mine site was 73.4 mm on Sept 17: however, the sample size was only 5



individuals. Mean Chinook fork lengths by date and location are shown in Appendix B, Table 2.

A total of 503 other fish was captured incidental to the target species/life stage of juvenile Chinook salmon. This included 166 slimy sculpin; 289 longnosed sucker; 31 round whitefish; 13 Arctic grayling; and 4 burbot. Incidental captures are shown in Appendix B, Table 3.

Juvenile Chinook salmon were captured and observed at the Viceroy Road crossing on July 13, August 12 and again on September 15.

The crew provided a demonstration for the Public Day, showing the techniques and methods used during their field work.

The Record of Activities was updated, and recommendations for 2011 developed.

## **Discussion**

The staffing and administration of the project closely followed that of previous years, and was entirely satisfactory. All staff remained with the project through to conclusion, and performed well. Reports by the students can be found in Appendix D. Recognizing that the students have a wide range of educational options and career opportunities, we hope that the interest both showed in 2010 will be sustained.

Prior to his retirement in April, 2010, Al von Finster was the Panel's Technical Contact for this project. He volunteered to provide assistance in 2010 during the transition to a new DFO staff member, and in recognition of the potential for shifting DFO managerial priorities.

Captures of juvenile Chinook salmon early in the project were lower in Clinton Creek than anticipated given the healthy cross-border escapement in 2009. However, snow pack in the upper watershed was low and temperatures in June were high. This may have affected the supply of juveniles from the upper Yukon River Watershed due to the timing and relative

intensity of the freshet. Virtually all the juveniles utilizing Clinton Creek originate from spawning stocks well above Dawson. An analysis of the DNA from 237 juveniles captured in 2009 indicated that 236 originated within the Yukon River and its tributaries upstream of the confluence with the Stewart River.

Rains moved into the Dawson area during the last of July and early August. The Fortymile River drainage was particularly hard hit, and Clinton and Mickie Creek flooded. By August 5 the creeks were raging torrents, and the road to the Clinton Creek mine site was cut in four places by mudslides. The crew abandoned the area and moved back to the Klondike River drainage.

The number of juveniles captured in Mickey Creek was considerably greater than in any preceding year. The reasons are not readily apparent, but may be related to displacement from Clinton Creek or to the very high stage of the Fortymile River.

The pilot juvenile Chinook monitoring project was a success and gathered useful information to the determination of future trends.

The Viceroy Channel monitoring demonstrated the success of the 2009 beaver dam removal project. Juvenile salmon had not been captured at the road crossing since 2006. Access has been restored to an estimated 6000 square meters of habitat above the dam. At the Yukon River Chinook non-natal habitat rearing bio-standard of 1jcs/square meter, this will provide habitat for 6000 juveniles.

The incidental catch remains relatively numerous and diverse, indicating (despite the adverse environmental conditions in the latter part of the project) a healthy aquatic environment.

The demonstration at the Public Day was well received, particularly by the children.

Public Day

## Public Day Summary

Prepared by: Andria Oppen

Dear Dawson District Renewable Resource Council,

The public day was a great success. We had over 40 people in attendance, mostly children between the ages of 5 and 10. They were a captive audience for the field workers. The student workers did an excellent job in explaining the importance of the project and provided a hands on experience for the children. The visitors got an opportunity to watch the measuring process of the fish first hand and even have a try with one that had died. This was thrilling for the kids and certainly will provide a lasting memory.

The event spread over 3 hours as we broke the groups up 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'ondek Hwech'in once the date for the event had been chosen and having it put into their event calendar. Contacting 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 the Post Office, Grocery Store and on the door of the Dawson District Renewable Resource Office. I sent an invitation to all the DDRRC members inviting them to participate in the event. I confirmed transportation for the groups invited and confirmed approximate numbers of people who might attend. I ordered food based on the numbers confirmed and a bit extra for the public.

On the day of the event I picked up the food at 10:00 am and went out to Germaine Creek to set up the food table and places to eat and establish a plan with the Project Staff. I remained through the event and participated in the lesson, and then cleaned up the site at the end.

My recommendations for the next year is to make sure that the sandwiches have no condiments on them and that there are 2 veggie trays and 2 fruit trays and no pineapple juice. None of the Elders came to the event, and I'm not sure how to change this as I contacted the Elders Coordinator on numerous occasions about the event. It would have been nice to have had a member of the Dawson District Renewable Resource Council present.

Overall I believe the event went well. Hans Algotsson and Al von Finster were both thrilled with the attendance.

Thank you for the opportunity to coordinate the public day, it was a pleasure and a great chance to learn about this important project.

Please contact me with any questions.

Kind Regards,

Andria Oppen

993-5946

## CONCLUSIONS AND RECOMMENDATIONS

The 2010 Stewardship project met our expectations. We hope to be able to conduct another project in 2011 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.

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## LIST OF PHOTOS



Photo 1.



Photo 2.



Photo 3.



Photo 4.



Photo 5



Photo6



## 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 18hinook 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</b>			
Date	Clinton Creek	Mickey Creek	Germain Cr avlusion
Jul-14			216
Jul-15			48
Jul-16	122		4
Jul-20	101		
Jul-21	102		
Jul-22	43		
Jul-27	6	10	
Jul-28	69		
Jul-29	42		
Aug-03	61	123	
Aug-04	13	61	
Aug-05	28	53	
<b>Totals</b>	<b>587</b>	<b>247</b>	<b>268</b>

<b>Table 2</b>				
<b>Mean fork lengths of Juvenile chinook salmon 2010</b>				
Date	Clinton Creek at mouth	Clinton Creek at minesite	Germaine Cr ground water channel	Viceroy channel
Jul-16	67.1			
Jul-20	70.1			
Jul-21	70.5			
Jul-22	70.6			
Jul-27	73.3			
Jul-28	70			
Jul-29	71.2			
Aug-03	69.3			
Aug-04	71.6			
Aug-05	71.9			
Aug-11			69.8	
Sep-15				70.3
Sep-17		73.4		

**Table 3  
Incidental catches DDRRC 2010**

Date	Slimy Sculpin	Long nosed sucker	Round whitefish	Arctic grayling	Burbot
Clinton Creek at the mouth					
Jul-16	3	2			
Jul-20	9	11			
Jul-21	2	20			
Jul-22	1	13			
Jul-27	1	4			
Jul-28	2	6			
Jul-29	2	38			
Aug-03	2	78	3	1	
Aug-04	4	65	1		
Aug-05		50	2		
Clinton Creek at the mine site					
May-21	23	1			
Sep-20	9	1		1	
Mickey Creek					
Jul-27	16				
Jul-28	10				
Jul-29	20		1	1	
Aug-03	8				
Aug-04	16			6	
Aug-05	10			4	
Germaine Creek avulsion					
Jul-14	10		20		3
Jul-15	12		4		1
Jul-16	4				
Viceroy Channel					
Sep-16	2				
	166	289	31	13	4

## 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.

**Recommendations for 2011**

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.

**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.

**Recommendations for 2011**

Continue to capture juveniles below the culvert and release them above the culvert, or, if possible, build up the outlet of the plunge pool to backwater the culvert.

## **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.

**Recommendations for 2011**

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 samplings were taken from this creek.

**Recommendations.**

No further actions are recommended.

**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.



### **Recommendations for 2011**

Monitor and salvage juveniles if necessary.

### **North Klondike River**

#### **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

#### **Recommendations for 2011**

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.

#### **Actions in 2008**

The area was blocked by beaver dam and high possibilities, so there was no work done due to high water level.

#### **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.

**Recommendation for 2011**

Monitor channel at road crossing to determine whether juveniles have migrated into the creek.

**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 were taken from this creek.

**Recommendation**

No further activities are recommended.

**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**

No further activities are recommended.

### **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**

No further activities are recommended.

### **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**

No activities are recommended in 2010

### **Lousetown 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 longnose sucker caught the second day. The total amount of fish caught in this pond was 198 consisting of 173 whitefish, 24 burbot, and 1 longnose sucker

## APPENDIX D

### Student Reports

# Salmon Fry Habitat Restoration and Enhancement Project Field Assistant Report

This summer I worked for my second year on the project along with the same student as the previous year. We carried out the same roles as last year but with more experience. As a result, we were able to carry out some roles we had not previously done and analyse the information we gathered.

We trapped chinook salmon fry from isolated pools in the Klondike River Valley and returned them to the main channel. Also, in the North Klondike region we monitored the upstream movement of the fry in Viceroy Creek as the season progressed. We did notice that greater numbers of fry began to show up later in the summer. In the Fortymile Region we carried out much the same function as in the previous season. We trapped fry from Clinton Creek and moved them further upstream above obstructions to better rearing habitat. In addition, we took sample measurements of thirty fry per day. Also in the Fortymile Region, we trapped fry from Mickey Creek below the culvert and moved them further upstream. Adverse weather in the region caused the stream levels to fluctuate which limited our ability to set many traps on certain days. In fact, on one of the last days, there had been so much rain that the Clinton Creek Road had nearly washed away near the Mickey Creek culvert and there was a mudslide blocking the road to the release site further up Clinton Creek.

Overall, it was a good season and I was able to improve and deepen my understanding of chinook salmon fry having been given the opportunity to work for a second season.

Luke Hunter

## STUDENT REPORT

I really enjoyed my experience with the DDRRC this year. Like last year I had fulfilling time rescuing baby salmon with Luke and Hans. The only down side was the rainy weather. Which caused land slides and high water keeping the fish on the river and not the creeks. If I could do it again I would but unfortunately I am another year older. I hope who ever get the job next year all the best.

Hayley Reimer