



Rearing & Overwintering Access Restoration

Prepared by:

Cholena Smart

DDRRC

Rearing & Overwintering Access Restoration

[CRE-06-07]

Sept, 2007

Prepared By:

Cholena Smart
DDRRC

Prepared for:

The Yukon River Panel



ACKNOWLEDGEMENTS

We would like to thank Chris Clarke, our field supervisor, and our two student employees, Pait Johnson and Ted Hunter, for all their hard work in the field during the summer. Al von Finster also provided us with invaluable support and advice. We would also like to thank those others who provided assistance and input on the project, in particular Sebastian Jones, (Dawson Community Steward) and Peggy Kormendy (Tr'ondëk Hwëch'in Elder). Funding for this initiative was provided by the Yukon River Panel.

TABLE OF CONTENTS

ABSTRACT5

INTRODUCTION6

METHODS AND RESULTS7

DISCUSSION13

CONCLUSIONS AND RECOMMENDATIONS16

REFERENCES18

LIST OF PHOTOS.....19

APPENDICES

ABSTRACT

This project aimed to restore access to upstream Chinook salmon rearing habitats and salvage juvenile Chinook from isolated habitats. We also aimed to foster community stewardship of salmon and salmon habitats. Planning was conducted in consultation with DFO. Two local high school students were retained and worked in the field under a field supervisor. DFO staff provided technical oversight. The project started on July 9 and ended on Aug 10, 2007. A total of 4760 juveniles salmon were captured and transported to upstream habitats or from isolated pools to open waters. Both students remained with the project throughout (excepting one student during the final week) and performed well. We conclude that the project was successful in proving the continued feasibility of a Community based stream Stewardship project in the Dawson City area. Recommendations to increase the scope and efficiency of future projects are provided.

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 has been diminishing within the Tr'ondëk Hwëch'in traditional territory. Further, field investigations by the YFWMB Dawson Area Community Steward and the Department of Fisheries on several non-spawning streams in the Dawson area indicated that beaver dams and other non-permanent barriers are obstructing the movement of salmon fry into known rearing and overwintering habitat. Field investigations also indicated that significant numbers of fry remained in pools that became isolated after the spring freshet. This project incorporated the methodology and recommendations of our 2006 project to achieve our 2007 objectives.

The objectives of the project were to:

- Restore Chinook salmon stocks through increasing access to rearing and overwintering habitat
- Involve and educate the general public on access restoration
- Build community capacity and stewardship for the restoration of salmon stocks and habitat
- To add to knowledge of salmon utilisation of small streams in the central Yukon.
- To pilot the salvage of 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 Director.

METHODS AND RESULTS

The project had three main components. These were:

1. Planning and mobilisation, including the hiring of staff, determination of logistics, etc;
2. Field work stage, during which juvenile salmon were relocated into upstream habitat or salvaged from isolated pools; and
3. Reporting.

Each component will be discussed below.

1. Planning and mobilisation

A project supervisor, Chris Clarke, was hired in late June, 2007. The DDRRC met with DFO staff, the Dawson Community Steward, and the project supervisor to identify candidate streams and discuss possible salvage sites on the Klondike River. The three known Chinook rearing streams that were examined in the 2006 pilot project were chosen: Clinton and Mickey Creek, tributary to the Fortymile, and Viceroy Ground Water Channel, tributary to the North Klondike. Possible salvage sites on the Klondike River were also discussed.

A three passenger vehicle was hired out of Whitehorse, and the DDRRC Executive Director travelled to Whitehorse to collect it.

Two local high school students, Ted Hunter and Pait Johnson were also hired in late June, 2007. Throughout the project, they were encouraged to develop an understanding of the environment in which they live, how salmon are a part of that environment, and how they can care for our resources.

2. Fieldwork stage: Investigation of sites and Relocation of juvenile Chinook salmon

This component of the project began on the 9 July 2007. During the first week Al von Finster (DFO Restoration Biologist) accompanied the field supervisor and the students to the Klondike and Fortymile watershed sites, and trained the employees in the technique of capturing, anesthetizing and measuring juvenile chinook.

The technique used throughout the project was baited Gee-type minnow traps. These were set 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 counted, and only salmon were released above obstructions. Incidental by catches included slimy sculpin, Arctic grayling, and long nosed sucker (Appendix B).

A total of 4760 salmon were salvaged or released upstream of obstructions. Captures of juvenile Chinook salmon by location and date are shown in Table 1 and are described below.

Date	Clinton Creek	Mickey Creek	Germaine Creek	Viceroy Creek	N.Klondike (Side Channel North of R22 Bridge)	N.Klondike (R22 North of Bridge)	N.Klondike (Dempster Corner Bridge)	N.Klondike (North of Ditch)	N.Klondike (Main channel across from R22)
July 11-07									
July 12-07			404	0					
July 13-07			328	0					
July 16-07			207	0			0		
July 17-07			229	1			0		
July 18-07	229								
July 19-07	91	5							
July 23-07			92						
July 24-07			21				85		
July 25-07	384	19							
July 26-07	327	128							
July 30-07			9	2			16		7
July 31-07			7		7	2		0	
Aug 01-07	286	174							
Aug 02-07	322	138							
Aug 07-07	352	265							
Aug 08-07	79	384							
Aug 09-07		160							
Sub total	2070	1273	1297	3	7	2	101	0	7
TOTAL									4760

Tab

le 1 – Total salmon moved in Jul-Aug 2007

Relocation of Chinook salmon commenced on July 12th in the Klondike drainage and ceased on July 31st. A total of 1417 juveniles were captured and released. Relocation of juveniles in the 40 Mile drainage commenced July 18th and was completed August 9th with a total of 3343 juvenile relocated upstream obstructions.

The project began at the Germaine Creek Reclamation site in the Klondike drainage area. A total of 1298 juveniles were relocated from this area where fry had been isolated in shallow ponds following the lowering of water levels in early July. The juveniles were relocated to the mainstream of the Klondike River. The effort was successful. On the 11th and final check, only 7 fish were captured in 6 traps and few fry were visible in the remaining ponds.

A similar isolated site was identified on July 24th from the Dempster Highway corner bridge. A small pond only large enough to set a single trap retrieved 85 juveniles in two separate checks. In another pool in the same area, 7 traps were set and a total of 16 fry were captured and relocated to the main channel of the Klondike River. After further consideration the effort was ceased when it was recognized that however low, water was still flowing out of this channel.

The project explored channels in the North Klondike area including Viceroy Creek, the creek north of the old headgate of the Klondike ditch, a small channel north of the North Klondike Bridge near THFN land selection R22 and, across from R22 camp, the mainstream channel itself. Few fry were captured in any of these areas. A total of 16 juveniles were relocated from these four separate efforts. No juvenile salmon were captured in the channel north of the old headgate on July 16, 17 and 31, so our efforts in the area ceased. From July 12 – July 17, with 4 traps set only 1 juvenile was relocated at the Viceroy Creek site. On July 31st 6 traps captured 2 juveniles. North of the North Klondike Bridge, 7 Chinook were captured in 4 traps on July 31. On July 30 we constructed “rest areas” by relocating rocks from the Klondike River bank in an area that was otherwise swift moving water. With 2 traps set, 7 juveniles were captured and transported to the Viceroy Channel.

Efforts ceased in the Klondike drainage in late July in favour of the 40 Mile River drainage.

Trapping at Mickey Creek commenced on July 18th with low captures until early August. On August 1st 10 traps were set, 174 juveniles were captured; on August 7th, 265 juveniles were captured with 14 traps. A total of 1273 juveniles were relocated above the Clinton road culvert.

Trapping at Clinton Creek commenced on July 18 with 229 juveniles captured with 13 traps; August 7th, 352 juveniles were captured with 8 traps. On the final day, August 8th, 79 juveniles were captured in 8 traps suggesting that the numbers of Chinook entering the creek were declining. A total of 2070 juvenile Chinook were transported from Clinton Creek to upstream habitats.

Fish of other species were captured throughout the project. Results by species, location and date may be found in Appendix B.

An important component of the project was to address concerns that had arisen from Tr'ondëk Hwëch'in elders regarding the handling of salmon, and the perceived spread of disease through human/fish contact. To this end, the project methodology was modified so that fish were only anesthetized and measured on several training days and in the presence of experienced DFO staff. Efforts were made to directly involve Tr'ondëk Hwëch'in elders so that they had a clearer understanding of the project. Peggy Kormendy, Tr'ondëk Hwëch'in elder, accompanied the coordinator to the Clinton Creek site on August 9th to observe the project first hand, including anesthetizing and measuring fish. Invitation to other Tr'ondëk Hwëch'in elders was issued through the Tr'ondëk Hwëch'in elders coordinator, but they were unable to attend.

4. Reporting

A final report was drafted following completion of the field work. Creek-specific information was added to the “Draft North Yukon Mainstem Restoration and Enhancement Record of Activities” (Appendix C).

DISCUSSION

Much was learned in 2007 which will be applicable to subsequent projects.

The later start of the project worked better for 2007 than in 2006. Significant numbers of salmon were present in most locations from the beginning of Stage 2 (Relocation of salmon fry).

Klondike River – Germaine Creek Reclamation area salvage

The salvage of juvenile Chinook from the isolated pools in the Germaine Creek was a pilot to determine whether there was a need for this type of work. The large number of juvenile salmon captured proved the concept to be valid. The channel of the Klondike River is not stable. It is likely that there are similar areas where, due to the migration of the channel, other isolated pools remain.

North Klondike River

Viceroy Channel is ground water fed and extends approximately 1.5 km along the west side of the North Klondike River. Trapping was attempted in five different locations in the North Klondike, but a total of only 17 juvenile chinook were captured and relocated. This work was largely exploratory. Though the areas did not produce high numbers, it may be that the creeks were still too cold to support the juvenile migration. A test could be made in early August to see if the fry have begun to move.

Clinton Creek

Timing at Clinton Creek was very good – relocation numbers were high throughout the project, and lower numbers of chinook captured on the final day of trapping indicated that the upstream migration was declining.

Mickey Creek

It is probable that the 'run' had not yet reached its peak at the time that trapping ended. Either the project length could be extended to accommodate the later run or a more permanent solution to the culvert obstruction be devised.

Staff and Administration

Hiring a dedicated supervisor proved effective, although some challenges were involved in finding someone qualified to work a short contract in the middle of the busy summer season.

The strategy of hiring two local high school students was entirely satisfactory. They were enthusiastic and competent. Hiring local students raises the potential that they will want to be involved in future local projects or to choose a career in natural resource management. Further, the knowledge and experience they gathered will be described to their peers, thereby instilling an interest in salmon and their habitat in other local youth. One of the students has produced a report reviewing their experience (see Appendix D).

Some suggestions to enhance the educational experience of the youth workers include:

- A concerted effort to connect them with other types of fishery work being done in the field;
- Being given more opportunities to learn, in experiential ways, the importance of salmon in the ecosystem of this region.
- Continue connecting with other youth workers in the field as when the Youth Community Steward came to participate in the capturing for a day;
- Having student workers keep daily journals to promote the practice (and benefits) of recording observations. Having initial observations to reflect on and being in the habit of daily writing may lessen the 'stress' of writing their final report.

The length of the project this year may have had some effect on students, one of who seemed to lose some interest towards the end of the project, and did not attend during the final week.

The administration component of the project was successful, particularly in the management of human resources and the budget.

The vehicle arrangement was satisfactory, although the logistics of hiring a vehicle from Whitehorse were demanding, and required the time of the DDRRC Executive Director who had to travel to Whitehorse twice. The crew also felt that there was too much travelling (especially the trip to Forty Mile) and that alternatives, such as camping, should be examined.

Public participation was not particularly successful this year, largely due to the limited amount of time that the DDRRC Executive Director has to dedicate to this project in the summer. Again, it is difficult to find someone who is available to work as a Coordinator in the middle of summer, and able to commit several months in advance. The single day trip with the Tr'ondëk Hwëch'in elder went well, and was able to help alleviate some concerns. Early in the season viewing of the salvage work might be of interest and because sites are closer to town, it may increase the number of people interested in attending. The DDRRC will also need to address its summer staffing requirements and whether it is able to continue with this aspect of the project in the future.

CONCLUSIONS AND RECOMMENDATIONS

The 2007 project was successful. It proved that relocating juvenile Chinook salmon upstream of obstructions continues to be feasible, and that a Stream Stewardship-type project in the Dawson City area is justified.

The DDRRC makes the following recommendations:

- Continue to hire a dedicated supervisor to lead the fieldwork component of the project.
- Identify additional salvage sites through community input and field investigations
- Continue to hire a crew of high school aged students as field assistants.
- Make a concerted effort to connect the project with other types of fishery work being done in the field in the Dawson Area, including other R&E projects and youth projects.
- Explore alternatives to reduce amount of traveling time for project. This includes the possibility of staying overnight at 40 Mile and possibly R22 to reduce the lengthy daily travel time.
- Continue to rent a vehicle for the project which could seat field crew as well as several others (e.g. crew cab).
- Hire a coordinator if possible for a limited time to organise and manage public participation, including taking elders to sites. Continue promoting public awareness of the project and perhaps add another opportunity for the public to view the work being done

- Extend project by a week to capture the later run of salmon fry in Mickey Creek and the North Klondike, or work to overcome the blockage created by the culvert in a more permanent way.

REFERENCES

- 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
- Jones, Sebastian. 2005 **A report on a fry trapping exercise on Shell Creek,** August 2005.
- Smart, Cholena. 2006 **Spawning and Rearing Access Restoration CRE-06N-06.** Dawson District Renewable Resources Council
- 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.** Oceans, Habitat and Enhancement Branch, Y&TBR, Fisheries and Oceans Canada. 2p
- von Finster, A. November 24, 2005 **Report on 2005 sampling of Mickey Creek, tributary to the Fortymile River, a central Yukon stream affected by wildfire. Memo to Mickey Creek stream file.** Oceans, Habitat and Enhancement Branch, Y&TBR, Fisheries and Oceans Canada. 5p.
- 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.** Oceans, Habitat and Enhancement Branch, Y&TBR, Fisheries and Oceans Canada. 8p

LIST OF PHOTOS

- Photo 1. Al von Finster training student employees Pait Johnson (left) and Ted Hunter.
- Photo 2. Ted checking traps
- Photo 3. Field Supervisor Chris Clarke (left), Sonja Foss and Tr'ondök Hwëch'in elder Peggy Kormendy
- Photo 4. Ted and Pait checking traps



Photo 1 – Al von Finster training student employees Pait Johnson (left) and Ted Hunter



Photo 2 – Ted checking traps



Photo 3 – Field Supervisor Chris Clarke (left), Sonja Foss and Tr'ondëk Hwëch'in elder Peggy Kormendy



Photo 4 – Ted and Pait checking traps

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. A wide range of types of baits have been used, including canned fish and invertebrates, fish, baked goods, animal foods, and salmon roe. The presentation of the baits has also varied. In some instances pierced cans were placed in the traps; various types of plastic bags were used; or the bait was placed loose in the traps.

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
Incidental Bycatch

	Date	Arctic Grayling	Slimy Sculpin	Longnose Suckers	
Clinton Creek	Jul-18-07		9	9	
	Jul-19-07		2		
	Jul-25-07		2	7	
	Jul-26-07		9	8	
	Aug-01-07		12		
	Aug-02-07	7	7	6	
	Aug-07-07		6	39	
	Aug-08-07			7	
	Total		7	47	76
	Mickey Creek	Jul-19-07		6	
Jul-25-07		5		2	
Jul-26-07			4	1	
Aug-01-07			8		
Aug-02-07		9	5		
Aug-07-07		4			
Aug-08-07		72	10		
Aug-09-07		89	2		
Total			179	35	3
Germaine Creek	Jul-11-07				
	Jul-12-07		7		
	Jul-13-07		55		
	Jul-16-07		45		
	Jul-17-07		1		
	Jul-23-07		45		
	Jul-30-07		12		
	Total			165	
Viceroy Creek	Jul-12-07		1		
	Jul-17-07		4		
	Jul-30-07		1		
	Total			6	
Klondike River (Main Channel across from R22)	Jul-30-07		5		
	Total			5	
Grand total			186	258	79

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.

Recommendations for 2008 – Continue with relocation and maximise the number of juveniles moved.

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.

Recommendations for 2008 – continue with relocation and maximise the number of juveniles moved. Either the project length could be extended to accommodate the later run or a more permanent solution to the culvert obstruction be devised.

Klondike River

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.

Recommendations for 2008

Continue salvage.

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.

Recommendations for 2008

Continue to monitor site, and salvage fry if pools cease to be connected to river.

North Klondike River

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.

Recommendations for 2008 –

Investigate site in early August, and extend project to accommodate later run.

APPENDIX D

Student Report – Ted Hunter

Summary of Salmon Fry Relocation Project

When I was working for the DDRRC this summer, I traveled to many places in the Dawson region, trapping and relocating Chinook Salmon fry. Our best trapping area was around Fortymile on Clinton Creek, and Mickey Creek. In the Fourtymile areas we captured salmon fry and took them above beaver dam obstructions to where they would be able to continue on upstream to find over-wintering habitat.

I learned how to make traps and how to set them in the shady, slow moving parts of the creek, where there would be less chance of dead fish in the traps. Along with learning how to trap fry I also learned more about their habitat and environment.

Working in the Germaine Creek Salvage Site was the same as trapping in the Fortymile region except we trapped the fry out of pools of water that they were stranded in.

I enjoyed working outside for this job because it's always nice to be able to enjoy summer. I also found that because this job was very hands on it was more interesting.

I did not like the driving. For two or more hours everyday I found it extremely boring.

I think that if a boat was supplied for the job it could help move people in to more unique trapping spots on the Klondike and Yukon Rivers. It would also make traveling less boring.

All in All, I enjoyed working for the DDRRC and the salmon.

Thanks,
Ted