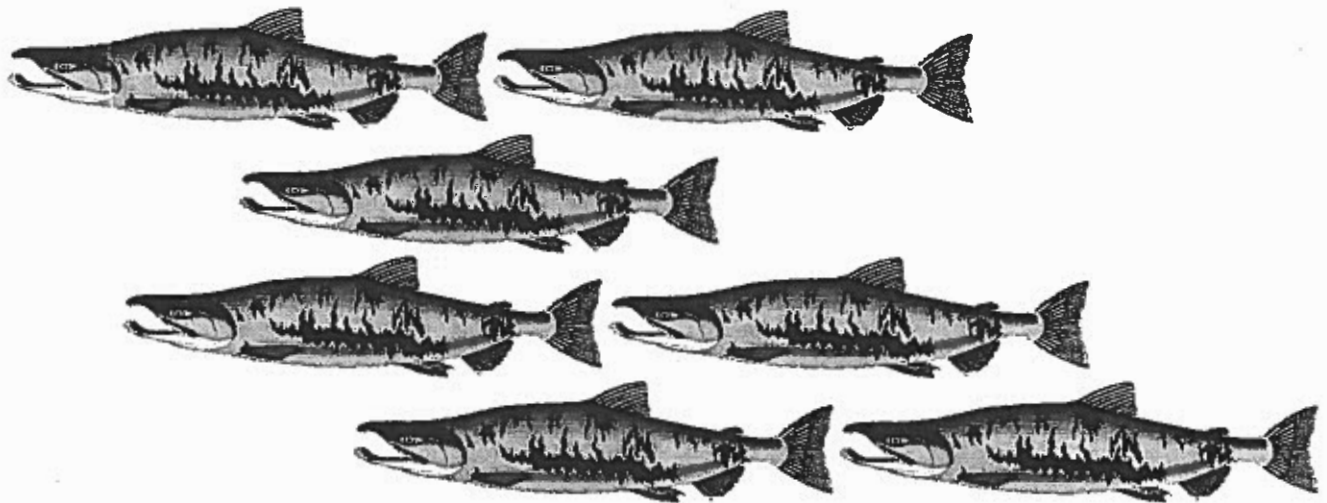


GREG BONNELL

# Bulkley River Fish Fence Report 1997



*Funded by Fisheries and Oceans Canada*

*Co-ordinated by the Community Futures  
Development Corporation of Nadina*

*Data collected by:  
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## Executive Summary

This year proved to be extremely difficult for Coho assessment on the Upper Bulkley River. Variable and particular unseasonable weather conditions resulted in the fence being out-of-operation for approximately 25% of the 'usual' season; that being through the months of September and October. High water levels forced the fence to be completely submerged (thus allowing free movement of fish up and down the river) on October 15, and there it remained until it was removed from the river on November 15<sup>th</sup>. Thus when viewing the data, it should be noted that not only was the fence out of action for a period of time, but that the fence was down when Coho most prefer to head upstream, i.e. with an increase in water volume.

Due to the need for structural repairs to take place, the fence was installed several days later than usual. The fence was installed on September 8<sup>th</sup> with the first Coho being caught in the trap on September 10<sup>th</sup>.

In the period that the fence was in operation, returning numbers were disappointingly low. From September 8<sup>th</sup> to October 15<sup>th</sup> a total of 19 adult Coho entered the trap, while 3 more were netted below making a total of 22 Coho for 1997. Only on three occasions did more than one Coho enter the trap on a single day, the greatest number this season (totalling 6) occurred on September 24<sup>th</sup>.

In previous years the majority of Coho came upstream soon after water levels began to rise. It is therefore anticipated that the majority of Coho this year swam past the fence when the water levels were extremely high and the fence was out of operation. Several of the creeks and tributaries of the Upper Bulkley were walked from late October to mid November to identify spawning salmon but none were found. This exercise was difficult, however, due to the high water in these creeks, and the absence of visual sightings cannot be translated as confirmation that no Coho were present.

During the operation of the fence this year, it was breached on just one morning due to higher flows and leaf build up. This occurred during the morning of October 9<sup>th</sup>. Although some structural repairs were made to the fence this year, it is likely that more repairs, or a complete re-design will be required for next year. As was experienced during the time frame of this project, the fence was unable to stand up to the extreme variance in water flows that the Upper Bulkley can produce on occasion, and had to be lowered due to pressure build up, and safety concerns.

## *Project Report*

### *The Fence*

The Upper Bulkley River Coho assessment fence is located approximately 6km. upstream from the Morice River confluence. The fence is constructed of aluminium and consists of 20 panels, an 'I' beam and a walkway. The fence stretches across the width of the river at right-angle to both banks. It is suspended on a series of cables and pulleys that allow it to be raised or lowered to meet changing water levels. This year, as with last, the walkway was not installed, nor were any planks laid down across the supports, as all leaf clearing was done from the upstream side of the fence (i.e. while in the water). This was done for safety reasons, due to a deep pool being directly downstream of the fence.

The extensive flooding during the Spring of 1997, that affected both the Upper Bulkley and Bulkley River, took its toll on the fish fence. High water mark reached approximately three feet in height up the sides of the winch shed. This caused some structural damage to the shed and a heavy deposit of silt in the storage area at the back, as well as heavy siltation of the trap itself. The latter was cleaned out prior to this season with use of a sludge pump.

The flooding of the Bulkley River, during the period 13 –19 May, 1997, also resulted in some structural damage to the fence itself. The level of the water was so high – peak flow for the river was 275m<sup>3</sup>/s [Northwest Hydraulic Consultants - 1997] – that several trees and other debris became entangled with cables stretching across the river. The cables were damaged and had to be replaced. The winches themselves sustained only minor damage.

Over the years there has been a gradual shift in the supporting 'A' frame on the north side of the river. The force of the water and the weight of the debris on the cables probably deteriorated the situation further. Prior to the commencement of the fence, this 'A' frame received attention and was strengthened by supporting heavy-duty cables attached to in-ground anchors.

Two technicians came from Vancouver to repair the damage, largely cause by the spring flood and ice damage. This took approximately one week, and the fence was installed and ready to be in operation, and fishing, on September 8, 1997. The first Coho to come into the trap was September 10.

To improve the efficiency of the fence, plywood panels, approximately 1-2 foot in height were laid along three-quarters of the base of the fence in order to divert a greater flow to the southern bank and therefore create a greater flow going through the trap itself. The plywood was removed several weeks into the project as the water level, and leaf build-up increased.

Due to extremely high flows, the operation of the fence was suspended on October 15. The fence was laid down, and water allowed to move freely over the top, also helping to keep the panels free of leaves. Due to continued high water the fence remained out of operation, with the advice of Brenda Donas, Community Advisor for DFO, until it was removed from the river on November 15<sup>th</sup>/16<sup>th</sup>. Usually ice begins to form on the river at the beginning of November, but with milder temperatures and higher than average flows, the river remained free running until the early part of December.

In the two-weeks prior to the suspension of the fish fence, two significant dumps of snow fell in the watershed, followed by cold weather and then a very mild spell. This is the main reason why the water level climbed so quickly and remained high.

The fence itself was monitored each day during the time it was functioning, and most days when it was not functioning to check for fish in the trap and to make sure that debris was not collecting on the cables.

Approximately half way through the operation of the fish fence, a chain-link compound was built around the winch shed and the fence. This worked well in keeping people away from the fence, and helped to reduce litter and vandalism around the area. Floodlights, powered by a small mobile generator were also used to improve the safety of working on the fence at night.

As well as monitoring and maintaining the fish fence the two fish fence workers walked the river, monitoring beaver dams and identifying spawning salmon. Because of the higher-than-usual flows this year, beaver dams did not present any significant barriers on the main stem of the river. The area walked extended from the CN bridge east of Houston to the confluence of the Morice River. During the latter stages of the project, several creeks were also walked to record spawning Coho that may have come through the fish fence while it was not in operation. No Coho were identified but due to the high water and the large area that had to be covered, this did not necessarily mean that salmon were not present.

### **Fish Count**

The first positive identification of Coho's entering the trap occurred on September 10<sup>th</sup>. From September 10<sup>th</sup> to October 15<sup>th</sup>, nineteen (19) adult Coho salmon entered the trap and a further three (3) were netted in the pool immediately below the fence, making a total of twenty-two. For a full breakdown of when the fish were captured, please see Appendix 'A'. It is interesting to note that the highest number of Coho that swam into the trap over a 24 hour period this season was six. This compares with thirty-five Coho that entered the trap last year on October 6<sup>th</sup>, 1996.

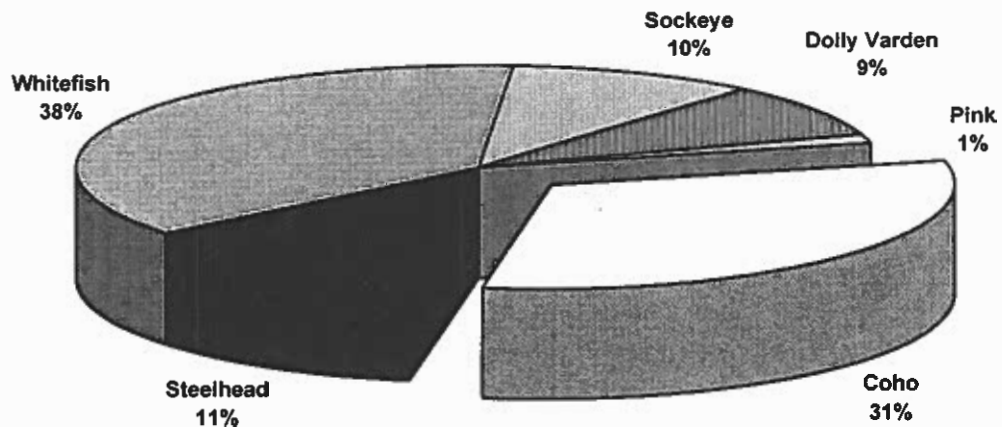
All 22 Coho were transported to Toboggan Creek Hatchery for enhancement purposes. In total, 13 females were used for egg takes and 1 female and 8 males were returned to the river.

Shortly before the operation of the fish fence was suspended, two Coho entered the trap on October 15<sup>th</sup>, so it is likely that more followed them during high water.

The breakdown of fish species, caught in the trap or netted below, is shown in the table below:

Socketeye	Pink	Dolly Varden	Coho	Steelhead	Whitefish
7	1	6	22	8	26

**Figure 1**  
**Fish Species by Percentage through the Fish Fence**

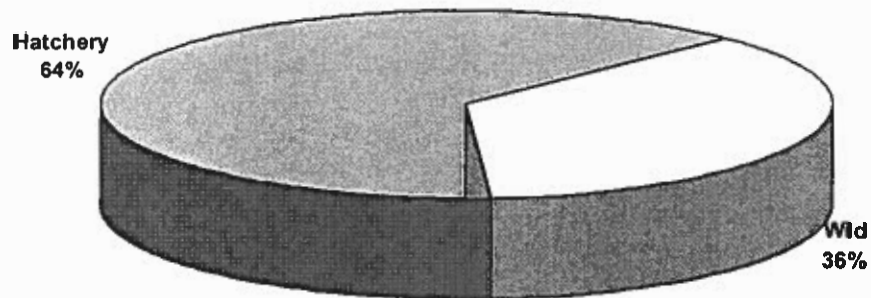


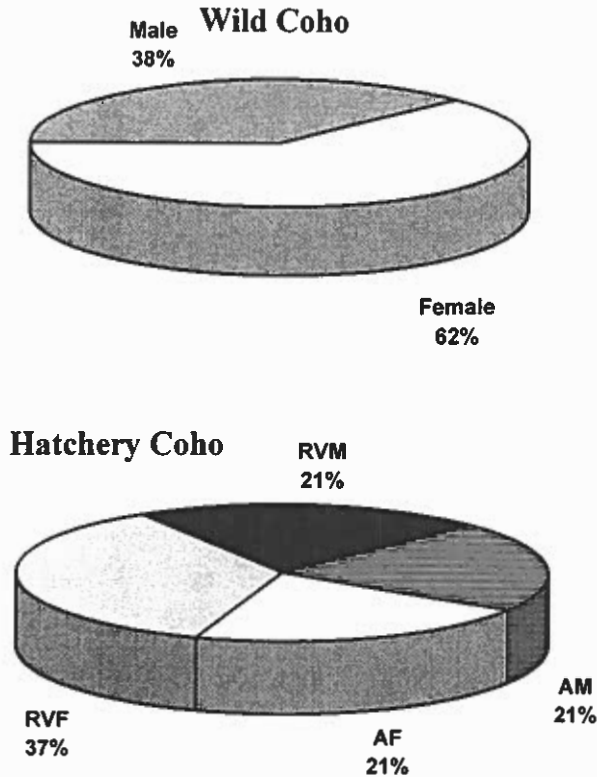
**Coho Statistics**

The breakdown of the statistics of 19 Coho entering the trap, and the 3 netted below, is shown in the table and in Figure 2 below. As with 1996, nearly two thirds were hatchery stock, as can be seen in the pie-chart below.

<b>Wild</b>		<b>Hatchery</b>	
Female	5	Right Ventral Female	5
Male	3	Right Ventral Male	3
		Adipose Female	3
		Adipose Male	3
<b>TOTAL</b>	<b>8</b>	<b>TOTAL</b>	<b>14</b>

**Figure 2 Coho Caught at the Fish Fence**





All 22 Coho collected were transferred to Toboggan Creek Hatchery. As stated earlier, one female, and all nine males were returned to the Upper Bulkley River.

### Water Level

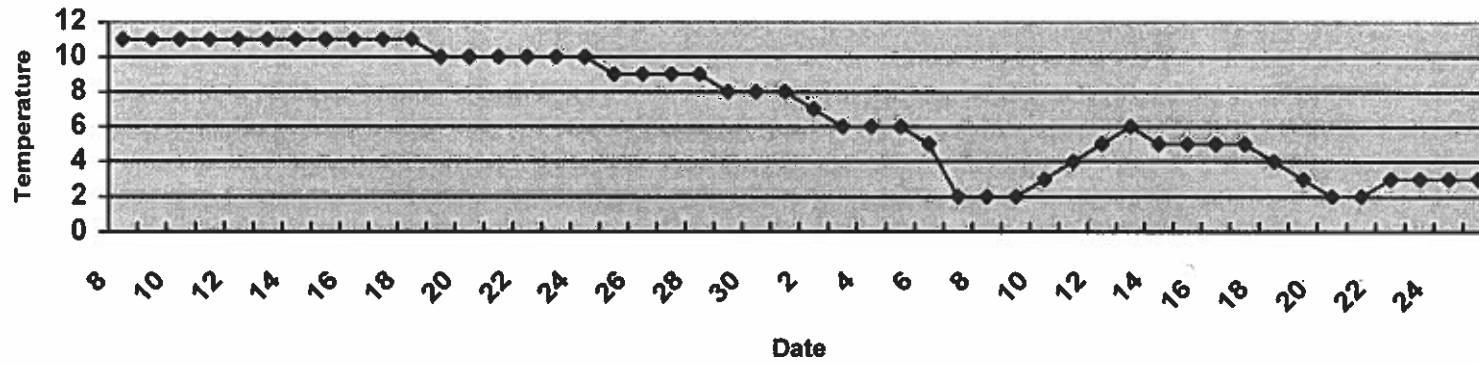
The water levels were not recorded every day but the graph below provides an indication of when significant rainfall occurred. Generally the Bulkley River would rise (at the fish fence) approximately two days after heavy rain within the watershed. Due to the piece of plywood being put up along  $\frac{3}{4}$  of the fence at the beginning, the water levels, for the first three weeks of operation were recorded just below the fence. After the plywood was removed, levels were taken just beside the sill (on the upstream side of the fence), once the leaf and woody-debris had been cleaned off. The fish fence workers made sure that these two levels equated with one another, when they changed from measuring below the fence to above the fence.

Water temperature ranged from 11 degrees Centigrade at the start of September to 8 degrees at the end of the month. Temperatures gradually cooled off until the fence was lowered on October 15, when the water temperature was 2 degrees C. This is shown in graph form on page 9





### Water Temperature



### **Removal of the Fence**

After the fence was dismantled on November 16, the panels were taken back to Smithers for storage as it is uncertain the fence will be in operation in 1998, and if it is, there is a possibility that the location be moved. From a safety point of view, the fence is not ideally located at present due to the deeper pool immediately downstream of the fence itself. This makes maintenance and cleaning of the fence a more difficult task.

Both the compound and the cables were left after the removal of the fence as it was decided that these could be removed at a later date. The cable system will be removed once the river freezes over, allowing easier access right across the width of the river.

As was witnessed this year, the fence was unable to withstand the peak flows which sometimes occur in the Upper Bulkley River and a different design should be considered for future operations, whether the fence is to remain at its present location or not.

We would like to thank the Morice Forest District for storing the fence panels in its yard over the winter and summer period; the staff at Toboggan Creek Hatchery and Brenda Donas and DFO for their continued support and advice.

**APPENDIX 'A'**  
**FISH CAPTURE AT THE BULKLEY RIVER FISH FENCE**

<b>KEY:</b>	<b>STHD</b> Steelhead	<b>A</b> Adipose
	<b>CO</b> Coho	<b>W</b> Wild
	<b>WHF</b> Whitefish	<b>RV</b> Right Ventrial
	<b>PK</b> Pink	<b>FEM</b> Female
	<b>DV</b> Dolly Varden	<b>REL</b> Release
	<b>SK</b> Sockeye	<b>TCH</b> Toboggan Creek Hatchery

DATE 1997	SPECIES	SEX	MARK	LENGTH (cm)	COMMENT
<b>September</b>					
Sept 10 <sup>th</sup>	STHD	N/A	N/A	43.2	REL
	CO	MALE	RV	61	TCH
	STHD	N/A	N/A	55.9	REL
Sept 11 <sup>th</sup>	CO	FEM	W	63.5	TCH
Sept 16 <sup>th</sup>	CO	FEM	RV	68.6	TCH
	WHF(4)	N/A	N/A	27.9(Ave.)	REL
Sept 17 <sup>th</sup>	STHD	N/A	N/A	68.6	REL
	CO	FEM	RV	68.6	TCH
	PK	N/A	N/A	61	REL
Sept 18 <sup>th</sup>	STHD	N/A	N/A	61	REL
	WFH(3)	N/A	N/A	27.9(Ave.)	REL
Sept 19 <sup>th</sup>	WFH	N/A	N/A	33.02	REL
	DV	N/A	N/A	48.3	REL
	CO	FEM	W	50.8	TCH
Sept 22 <sup>nd</sup>	CO	FEM	RV	54.6	REL
Sept 23 <sup>rd</sup>	WFH(3)	N/A	N/A	27.9(Ave.)	REL
	CO	MALE	RV	53.3	TCH
Sept 24 <sup>th</sup>	CO	FEM	RV	61	TCH
	CO	MALE	A	55.9	TCH
	CO	FEM	W	66	TCH
	CO	MALE	A	48.3	RED TAG TCH
	CO	FEM	RV	66	TCH
	CO	MALE	A	55.9	TCH
	STHD	N/A	N/A	63.5	REL
Sept 26 <sup>th</sup>	CO	FEM	W	55.9	TCH
	SK	N/A	N/A	73.7	REL
	SK	N/A	N/A	61	REL
	WFH	N/A	N/A	30.5	REL

DATE 1997	SPECIES	SEX	MARK	LENGTH (cm)	COMMENT
Sept 27 <sup>th</sup>	SK	N/A	N/A	53.34	REL
	WFH(2)	N/A	N/A	35.6 (Ave)	REL
	STHD	N/A	N/A	66	REL
Sept 28 <sup>th</sup>	CO	FEM	W	53.3	TCH
	CO	FEM	A	61	SEINED TCH
	CO	MALE	W	61	SEINED TCH
	CO	FEM	W	68.6	SEINED TCH
	CO	FEM	A	58.4	TCH
	STHD	FEM	W	63.5	TCH # 01953
	CO	FEM	A	55.9	TCH
	SK	N/A	N/A	53.3	REL
October					
Oct 2 <sup>nd</sup>	SK	N/A	N/A	55.9	REL
	SK	N/A	N/A	53.3	REL
	DV	N/A	N/A	35.6	REL
	CO	MALE	W	66	TCH
Oct 3 <sup>rd</sup>	DV	N/A	N/A	27.9	REL
	SK	N/A	N/A	53.3	REL
Oct 6 <sup>th</sup>	DV	N/A	N/A	38.1	REL
	WFH	N/A	N/A	27.9	REL
Oct 7 <sup>th</sup>	STHD	FEM	W	71.1	REL
	SK	M	W	58.4	REL
	DV	N/A	N/A	50.8	REL
	DV	N/A	N/A	43.2	REL
	WFH	N/A	N/A	33	REL
Oct 15 <sup>th</sup>	WFH (6)	N/A	N/A	30.5 (Ave)	REL
	CO	MALE	W	45.7	TCH
	CO	MALE	RV	66	TCH