"Speaking For The Salmon"
Simon Fraser University
Habour Centre

First Nations
Stock Assessment Efforts

Nicola Watershed Stewardship & Fisheries Authority
Shuswap Nation Fisheries Commission,
Carrier Sekani Tribal Council

Nicola River, Thompson River and Fraser River
Chinook, Coho, Sockeye

January 23, 1998

Table of Contents

GOALS OF NICOLA RIVER CHINOOK STUDY 6

1996 PROGRAM 8

NICOLA WATERSHED STEWARDSHIP & FISHERIES AUTHORITY 11

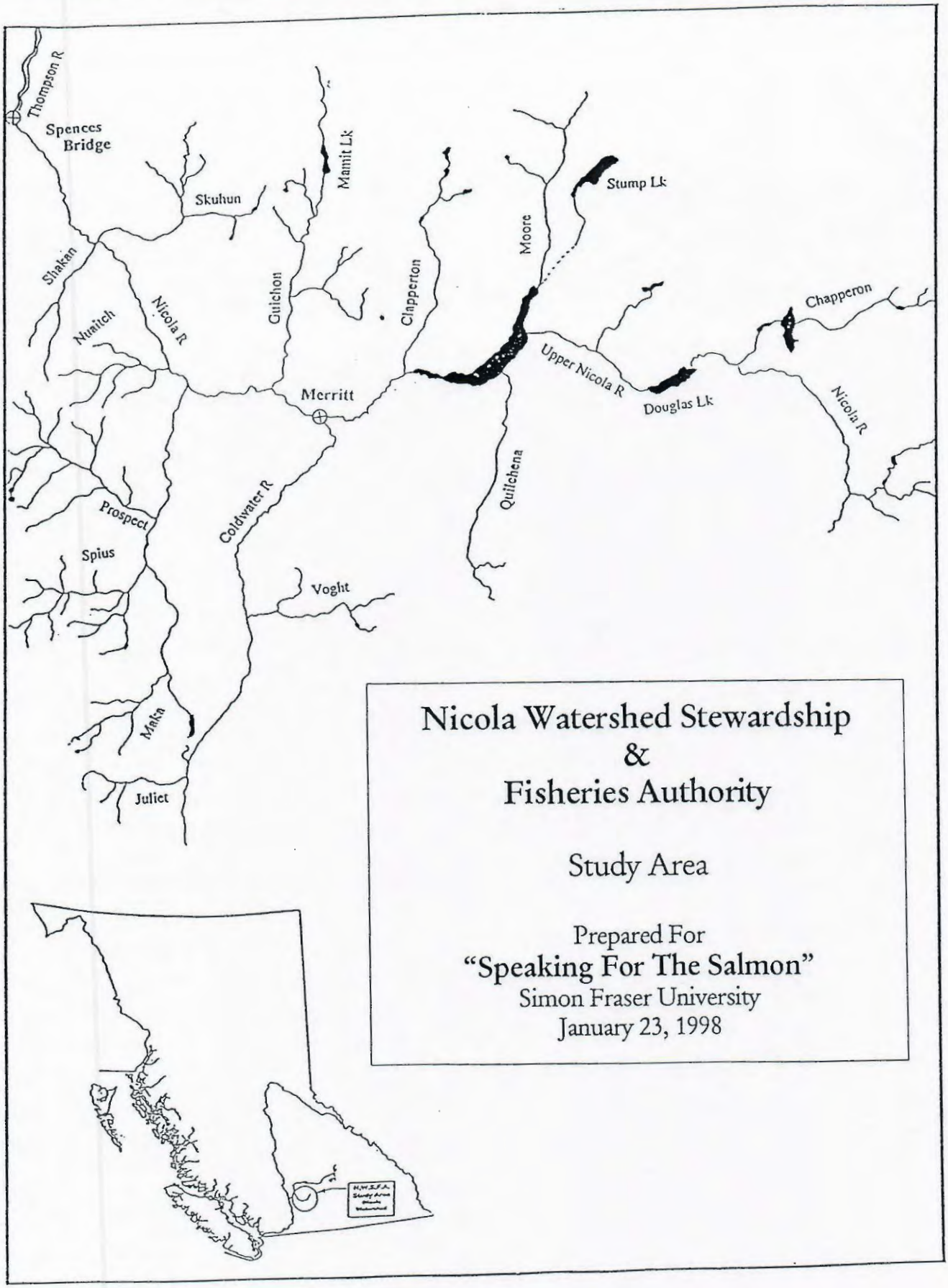
1. Upper Nicola River 11
INTRODUCTION 11
PROCEDURE 11
RESULTS (CHINOOK) 11
RESULTS (COHO) 13
2) Nicola River Chinook Spawner Count 15
INTRODUCTION 15
3) Helicopter Counts 15
PROCEDURE 15
RESULTS 15
COMMENTS 16
COMMENTS 16
DISCUSSION 16
4) Carcass Recovery 16
5) Clapperton Creel Coho 17
6) 1994 Nuaitch Creek Fish Presence Study 17
INTRODUCTION 17
PROCEDURE 18
RESULTS 18
DISCUSSION 18

SHUSWAP NATION FISHERIES COMMISSION 20

1) Deadman River Fence Enumeration 20
2) Lower Shuswap River Chinook Deadpitch 20
3) Raft River Watershed Restoration Project 22
4) Upper Adams River Chinook Dead Pitch 22
5) Helicopter Enumeration of Spawning Salmon 23
6) Bonaparte River Chinook Migration 24
7) Deadman River Enumeration Fence 24
8) Finn Creek And Raft River Chinook Enumeration 25
9) Lower Shuswap River Jump Trap 26
10) Scotch Creek Sockeye Fence 27
11) Helicopter Enumeration of Spawning Salmon 28
Goat Creek 28

CARRIER-SEKANI TRIBAL COUNCIL 29

1) Aboriginal Fisheries Harvest Monitoring 29
2) Downstream Fry and Smolt Monitoring 30
3) Adult Spawning Enumeration (Escapement) 31
4) Middle River Adult Sockeye 31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Nicola R
Merritt
Quilchena
Prospect
Coldwater R
Spius
Voght
Maka
Juliet
Nicola Watershed Stewardship
&
Fisheries Authority
Study Area
Prepared For
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Nicola River Chinook Salmon

Spawner Enumeration Study

Nicola Watershed Stewardship and Fisheries Authority
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Neil Todd, Fisheries Technical Advisor
Barney Stirling, LeEtta Tom, and a cast of many other dedicated individuals.

DFO, Stock Assessment Division, Science Branch
Richard Bailey

Diversified Ovatech Ltd., Spius Creek Hatchery
Dennis Graf and staff

History

- Stock Assessment Division formation, November, 1994.
- Previous indicator stock program for chinook salmon included a number of Interior streams throughout the Fraser drainage, but the program was discontinued due to a number of concerns.
- Desire to restart indicator stock program, and to evaluate ongoing assessment activities on interior chinook salmon. Presently, most Interior cn spawner assessment is based on aerial counts of spawners using helicopters.
- Neil Todd, Steve Manuel (NWSFA) and I met at an Interior stock assessment workshop hosted by Shuswap Nation, and at that time, Neil indicated to me opportunities to work with NWSFA.
- Spring 1995 approached Neil regarding possibility of undertaking cooperative study on Coldwater River. Discussions ensued and a pilot program was developed for Nicola for summer - fall 1995, tied to existing NWSFA deadpitch program on the Nicola.
- Pilot study (unfunded in DFO) initiated in 1995.

Goals of Nicola River Chinook Study

- Mark at least 5% of returning chinook salmon to provide a representative mark group for a mark-recapture population estimate.
- Examine as many carcasses of post-spawned fish to determine a precise estimate of the marked-unmarked ratio. From this we develop an estimate of the total return.
- Recover heads from coded wire tagged fish and determine contributions of each coded wire tagged group to the spawner escapement.
- Foster the development of technical and analytical stock assessment knowledge within NWSFA with the longer term goal of NWSFA staff attaining the capability to independently undertake and document high quality, statistically defencible escapement assessments.

1995 Program

- This was the pilot year for the Nicola study. A total of 12 NWSFA technicians and Barney Stirling participated in the deadpitch-carcass recovery study and as many as 11 people were deployed simultaneously.

- LeEtta Tom oversaw the field operation of the deadpitch program; Janice Stewart and Simon Cisco also acted as crew chiefs.

- 596 adults were captured by angling, marked, and released over a 10-day period in mid-August. Marks were applied between 14 Mile and immediately below the dam at Nicola Lake; marks were also applied in lower Spius Creek.

- 3,900 adult carcasses were examined for marks between September 14th and October 5th. Carcass recovery was carried out between the Dot Ranch and Nicola dam, plus on the Coldwater River below Ardew Lumber, and below Little Box Canyon on Spius Creek. Of the carcasses recovered, 218 were previously marked.

- Estimated population was 10,715 adult chinook salmon.

1996 Program

- This was the second year for the Nicola study. A total of 25 NWSFA technicians and Barney Stirling participated in the deadpitch-carcass recovery study and as many as 19 staff were deployed simultaneously.

- LeEtta Tom oversaw the field operation of the deadpitch program; Simon Cisco, Vince McDonald, Don Harry, and Ira Tom also acted as crew chiefs.

- 834 adults were captured, marked, and released over a 16 day period in mid-August. Marks were applied between 14 Mile and immediately below the dam at Nicola Lake; marks were not applied in Spius Creek.

- 7,990 adult carcasses were examined for marks between September 6th and October 10th. Carcass recovery was carried out between the Dot Ranch and Nicola dam, plus on the Coldwater River below Patchett Rd., and below Little Box Canyon on Spius Creek. Of the carcasses recovered, 360 were previously marked.

- Estimated population was 17,930 adult chinook salmon.

1997 Program

- This was the third year for the Nicola study. A total of 15 NWSFA technicians, and Barney Stirling participated in the deadpitch-carcass recovery, and as many as 12 staff were deployed simultaneously.

- Barney Stirling oversaw the field operation of the deadpitch program; Simon Cisco, Janice Stewart, and Sharon John, were primary crew chiefs.

- 733 adults were captured, marked, and released over a 16 day period in mid-August. Marks were applied between 14 Mile and immediately below the dam at Nicola Lake; marks were also applied in lower Spius Creek.

- 4,156 adult carcasses were examined for marks between September 10th and October 6th. Carcass recovery was carried out between the Dot Ranch and Nicola dam, plus on the Coldwater River below IR #1 bridge, and below Little Box Canyon on Spius Creek. Of the carcasses recovered, 321 were previously marked.

- Estimated population was 9,476 adult chinook salmon.

Summary

- To-date, we have fostered a very productive partnership that has resulted in 3 intensive mark-recapture studies on returning chinook salmon.
- NWSFA has developed significant technical competance to deliver very high quality field programs.
- NWSFA staff will be participating in formal staff exchanges with other AFS - Stock Assessment programs throughout the Fraser drainage to broaden the knowledge base of technical and analytical personnel.
- NWSFA staff will be participating in assessment documentation and publishing process.
- DFO would like to expand their working relationship with NWSFA to include comprehensive research to understand the population dynamics of Nicola River chinook salmon.
- There is a growing need for First Nations students to obtain university degrees in fisheries science to provide future leadership in projects and programs of this nature.

Nicola Watershed Stewardship & Fisheries Authority

The Nicola Watershed Stewardship & Fisheries Authority (NWSFA) undertakes selected stock assessment activities – specifically, spawner enumeration projects. Attempts are made to repeat similar procedures each year for each system in order to at least document trends in relative abundance (comparing annually) if not actually providing an accurate estimate of actual numbers. In 1995, however, the NWSFA also participated in an extensive mark-recapture population estimate study of the mainstem Nicola River chinook, under the direction and guidance of Richard Bailey of DFO's Stock Assessment.

Also included in this section is a brief report of a fish presence survey done in Nuaitch Creek in 1994.

1. Upper Nicola River

Introduction

Spawner escapements to the Upper Nicola River are enumerated each year with a counting fence located approximately 300 meters upstream from the river's confluence with Nicola Lake. Members of the Upper Nicola Band staff the fence operation.

Procedure

The fence is installed in July each year as soon as river conditions permit. The fence is a standard A-Frame tripod structure with pipe panels. The trap is similar, and all materials are aluminum. The trap is operated through both chinook and coho immigration periods.

In 1995 the fence was installed July 8th and was operated until freeze-up December 5th. Water temperatures, species, sex and marks were recorded.

Results (Chinook)

Chinook immigration occurred during the period July 18 to October 3, 1995 (Table 1). A total of 43 fish were counted through: 16 males, 27 females; 15 were unmarked; 4 were adipose clipped; and 24 were right ventral clipped (Table 2).

Table 1: 1995 Chinook Spawner Escapement Counts - Upper Nicola River

		Water Temp			
Date	Time	0	Species	Male/Female	Clips/Tags
July 18, 1995	6:30 AM	20.0	Chinook	Female	Right Ventral Clip
July 19, 1995	11:20 PM	17.0	Chinook	Female	R.V. Clip Floy-Tag #823
August 1, 1995	8:10 AM	15.0	Chinook	Male	Right Ventral Clip
August 6, 1995	6:30 AM	9.0	Chinook	Female	Right Ventral Clip
August 9, 1995	6:05 AM	11.0	Chinook	Female	
August 10, 1995	12:10 PM	16.0	Chinook	Male	
August 14, 1995	9:30 PM	10.0	Chinook	Male	Right Ventral Clip
August 21, 1995	12:30 AM	16.0	Chinook	Female	
August 22, 1995	10:15 AM	18.0	Chinook	Female	R.V. Clip Floy-Tag #828
August 22, 1995	10:30 PM	18.0	Chinook	Male	
September 1, 1995	1:40 AM	16.0	Chinook	Female	Right Ventral Clip
September 6, 1995	6:30 AM	18.0	Chinook	Male	Right Ventral Clip
September 9, 1995	11:05 AM	18.0	Chinook	Female	Right Ventral Clip
September 10, 1995	9:30 PM	21.0	Chinook	Male	R.V. Clip Floy-Tag #843
September 10, 1995	11:35 PM	18.0	Chinook	Female	Right Ventral Clip
September 13, 1995	6:15 AM	13.0	Chinook	Male	Right Ventral Clip
September 13, 1995	10:00 PM	17.0	Chinook	Female	
September 13, 1995	10:20 PM	17.0	Chinook	Female	
September 14, 1995	11:35 PM	16.0	Chinook	Female	Adipose Fin Clip
September 15, 1995	11:10 AM	11.0	Chinook	Female	Adipose Fin Clip
September 16, 1995	4:40 PM	20.0	Chinook	Female	
September 17, 1995	6:30 AM	15.0	Chinook	Female	Adipose Fin Clip
September 17, 1995	4:30 PM	18.0	Chinook	Female	Right Ventral Clip
September 17, 1995	5:55 PM	16.0	Chinook	Male	
September 17, 1995	8:50 PM	17.0	Chinook	Female	
September 18, 1995	12:00 AM	17.0	Chinook	Female	Right Ventral Clip
September 18, 1995	10:00 AM	15.0	Chinook	Male	Right Ventral Clip
September 18, 1995	10:00 AM	15.0	Chinook	Female	Right Ventral Clip
September 18, 1995	5:10 PM	17.0	Chinook	Female	Right Ventral Clip
September 18, 1995	7:00 PM	17.0	Chinook	Male	Right Ventral Clip
September 18, 1995	11:30 PM	16.0	Chinook	Female	Right Ventral Clip
September 19, 1995	6:05 PM	17.0	Chinook	Male	Right Ventral Clip
September 19, 1995	11:05 PM	15.0	Chinook	Female	Right Ventral Clip
September 20, 1995	11:05 PM	13.0	Chinook	Female	Right Ventral Clip
September 20, 1995	11:05 PM	13.0	Chinook	Female	Right Ventral Clip
September 21, 1995	3:30 PM	9.0	Chinook	Male	
September 21, 1995	9:20 PM	13.0	Chinook	Female	
September 21, 1995	10:35 PM	13.0	Chinook	Female	
September 24, 1995	4:20 PM	15.0	Chinook	Male	Right Ventral Clip
September 24, 1995	11:00 PM	14.0	Chinook	Male	Right Ventral Clip
September 24, 1995	11:30 PM	14.0	Chinook	Female	
September 28, 1995	4:50 PM	12.0	Chinook	Male	
October 3, 1995	9:30 PM	10.0	Chinook	Male	

Note: R.V. = Right Vental

Table 2: 1995 Chinook Count Summary

	Male	Female	Total
Adipose Fin Absent	0	4	4
Adipose Fin Present	5	10	15
Right Ventral Fin Absent	11	13	24
	16	**27**	**43**

Results (Coho)

Coho immigration occurred during the project October 16 to December 4, 1995 (Table 3). A total of 49 fish were counted through: 26 males, 23 females; 45 were unmarked; and 4 were adipose-clipped (Table 4).

Table 3: 1995 Coho Spawner Escapement Counts – Upper Nicola River

Date	Time	Water Temp 0	Species	Male/Female	Clips/Tags
October 16, 1995	9:00 AM	12.0	Coho	Female	
October 16, 1995	9:00 AM	12.0	Coho	Male	Adipose Fin Clip
October 17, 1995	11:30 PM	10.0	Coho	Male	
October 18, 1995	10:00 PM	10.0	Coho	Female	Adipose Fin Clip
October 24, 1995	11:15 PM	6.0	Coho	Male	
October 26, 1995	7:25 PM	8.0	Coho	Male	
November 8, 1995	8:25 PM	5.0	Coho	Female	
November 8, 1995	8:25 PM	5.0	Coho	Male	
November 12, 1995	8:40 PM	5.0	Coho	Male	
November 12, 1995	8:40 PM	5.0	Coho	Male	
November 12, 1995	10:05 PM	5.0	Coho	Male	
November 12, 1995	10:05 PM	5.0	Coho	Male	
November 12, 1995	10:25 PM	5.0	Coho	Female	
November 12, 1995	10:25 PM	5.0	Coho	Female	
November 12, 1995	8:40 PM	5.0	Coho	Female	
November 15, 1995	8:50 PM	5.0	Coho	Male	
November 15, 1995	10:00 PM	5.0	Coho	Male	
November 15, 1995	10:05 PM	5.0	Coho	Male	
November 15, 1995	10:35 PM	5.0	Coho	Male	
November 16, 1995	6:30 PM	0.0	Coho	Male	
November 16, 1995	6:30 PM	0.0	Coho	Male	
November 16, 1995	6:30 PM	0.0	Coho	Female	
November 16, 1995	10:00 PM	4.0	Coho	Female	
November 17, 1995	7:50 AM	4.0	Coho	Female	
November 17, 1995	7:15 AM	5.0	Coho	Male	
November 17, 1995	7:15 AM	5.0	Coho	Female	
November 17, 1995	7:20 PM	5.0	Coho	Male	
November 17, 1995	11:20 PM	5.0	Coho	Male	
November 21, 1995	6:20 PM	5.0	Coho	Female	
November 21, 1995	6:30 PM	5.0	Coho	Male	
November 22, 1995	7:30 PM	4.0	Coho	Male	
November 22, 1995	7:35 PM	4.0	Coho	Female	
November 22, 1995	10:05 PM	4.0	Coho	Female	
November 22, 1995	10:05 PM	4.0	Coho	Female	
November 22, 1995	10:10 PM	4.0	Coho	Female	
November 22, 1995	10:10 PM	4.0	Coho	Male	
November 22, 1995	10:20 PM	4.0	Coho	Female	
November 23, 1995	6:30 PM	5.0	Coho	Female	Adipose Fin Clip
November 23, 1995	6:30 PM	5.0	Coho	Male	
November 23, 1995	9:00 PM	6.0	Coho	Female	Adipose Fin Clip
November 24, 1995	3:40 PM	6.0	Coho	Male	
November 24, 1995	3:40 PM	6.0	Coho	Female	
November 24, 1995	7:15 PM	5.0	Coho	Male	
November 24, 1995	11:15 PM	4.0	Coho	Male	
November 27, 1995	6:05 PM	3.0	Coho	Female	
November 27, 1995	11:15 PM	6.0	Coho	Female	
November 28, 1995	7:15 AM	6.0	Coho	Female	

November 28, 1995	7:15 AM	6.0	Coho	Female	
December 4, 1995	10:10 AM	3.0	Coho	Male	

Table 4: 1995 Coho Count Summary

	Male	Female	Total
Adipose Fin Absent	1	3	4
Adipose Fin Present	25	20	45
	26	**23**	**49**

2) Nicola River Chinook Spawner Count

Introduction

Because of other commitments, the NWSFA could not put one of it's own staff on the project this year. However, one of the two helicopter flights was still funded by the NWSFA, and the Spius Creek Hatchery technician who flew both flights were considered to be an NWSFA substitute.

3) Helicopter Counts

Procedure

Two helicopter flights were made, one of which was intended to coincide with peak spawning. The first flight was September 9, 1995, when it appeared that spawning was well underway, if not peaked. The second flight was on September 15, 1995. The first flight took just over three hours; the September 15th flight was just under three hours. The section of river flown was from Nicola Dam to the Dot Ranch area, plus the lower reaches of Spius Creek and the Coldwater River.

Results

a) September 9, 1995: (Table 1a) average of two observers counts: 3,185 fish, 83 carcasses.

Table 1a: Number of fish by reach and observer - September 9, 1995

Start : 9:27 AM *Finish: 12:42 PM*

Reach #	Glenn	Barry	Average	Morts		Average
1 (2)	335	315	325	8	8	8
2 (3)	55	55	55	2	2	2
3 (4)	863	839	851	7	7	7
4 (5)	668	789	729	12	12	12
5 (6)	637	619	628	34	33	34
6 (7)	557	638	598	20	21	20
Totals	**3115**	**3255**	**3185**	**83**	**83**	**83**

Comments

A lot of fish still holding in pools in all reaches except #2 (3) Reach #5 morts – Spius Creek early run chinook kelts?

b) September 15, 1995: (Table 1b) average same two observers counts: 2,475 fish, 408 carcasses.

Table 1b: Number of fish by reach and observer - September 15, 1995

Start : 10:20 AM *Finish: 1:15 PM*

Reach #	Glenn	Barry	Average	Morts		Average
1 (2)	625	661	648	48	47	48
2 (3)	113	118	115.5	23	25	24
3 (4)	767	821	794	141	118	130
4 (5)	478	508	493	119	108	114
5 (6)	225	246	235.5	61	23	42
6 (7)	211	177	194	57	45	51
Totals	**2419**	**2531**	**2475**	**499**	**366**	**408**

Comments

Empty redds throughout all Reaches especially in Reach #1 (2). Do not feel comfortable with mort counts in reaches 5 and 6 because of faster flight due to low fuel.

Discussion

Abnormally cool water temperatures in late August may have triggered significant spawning effort much earlier than normal. Certainly the spawning season seemed move protracted than usual and a normal peak in a normal duration of effort was not observed. This resulted in the 1995 helicopter counts estimate having too large a margin of error to be of any use.

4) Carcass Recovery

In 1995 the carcass recovery part of the enumeration project was much more complex because it was integral to a highly structured mark and recapture study. This study was a pilot program to compare population estimates done by the helicopter count method with those derived from a mark/recapture method.

Just fewer than 4,000 carcasses were examined by the carcass recovery team (Table 1 and Figure 1a). As this number was greater than the total number of spawners counted from the helicopter, it was evident that the helicopter count was not representative of the actual spawning population. Approximately 21% of the spawning population was adipose fin clipped (Table 1 and Figure 1b). Total hatchery contribution to the spawning population has not been calculated, but it could exceed 40%.

Male:female ratio appeared to be normal as compared to 1994/1995 when the population was predominantly female.

The scientist who supervised the 1995 project will publish the detailed carcass recovery data and results.

Table 1: 1995 Nicola Chinook Carcass Recovery Project Summary			
Males	*Females*	*Unknown*	***Total***
1805	2104	84	*3993*
Adipose Fin Present	*Adipose Fin Absent*	*Adipose Fin Unknown*	***Total***
3088	839	66	*3993*
Male Adipose Fin Absent	*Female Adipose Fin Present*	*Sex Unknown Adipose Fin Present*	***Total***
341	492	6	*839*
Male Adipose Fin Present	*Female Adipose Fin Present*	*Sex Unknown Adipose Fin Present*	***Total***
1457	1602	29	*3088*
Adipose Fin Clip/Sex Unknown	*Adipose Fin Clip Unknown Male*	*Adipose Fin Clip Unknown Female*	***Total***
49	7	10	*66*

5) Clapperton Creel Coho

The use of Clapperton Creek and/or the Nicola River near the Clapperton Creek confluence by coho spawners has been postulated for sometime. In 1995 a cursory field investigation was undertaken.

A three person crew equipped with an electroshocker investigated apparent sections (four) of spawning habitat in Clapperton Creek and the Nicola River in the vicinity of Clapperton Creek on November 6 and November 14, 1995. No coho were found.

6) 1994 Nuaitch Creek Fish Presence Study

Introduction

Nuaitch Creek is a small relatively pristine stream that enters the Nicola River approximately 3.7 km down from the Nicola River from Spius Creek (Figure 1). It has long been known to provide spawning and rearing habitat for steelhead, and has been suspected to provide both rearing and spawning habitat for other species.

A rudimentary fish presence survey was conducted in early September, 1994 to determine presence of absence of juvenile fish at selected sites. A counting fence was in operation near the mouth of the creek in order to enumerate any adult chinook or coho spawners. (This later project was reported in 1994/1995 NWSFA Project Reports).

Procedure

A three person crew assessed three different sample sites on September 9, 1995 using a back pack electroshocker and hand dip nets. All fish captured were anaesthetized, identified as to species, measured and released unharmed. Three passes were made through Site #1, while two passes were made through the other two sites.

Sample Site #1 consisted of pool habitat, while the other two sites were largely riffle-type habitat.

Results

Fish captured by sample site and species were as follows:

	Site #1	Site #2	Site #3	*Totals*
Chinook	130	0	3	133
Coho	12	23	31	66
Rainbow	47	25	27	99
Bull Trout	1	0	0	1

Average length (mm) per site, by species, was as follows:

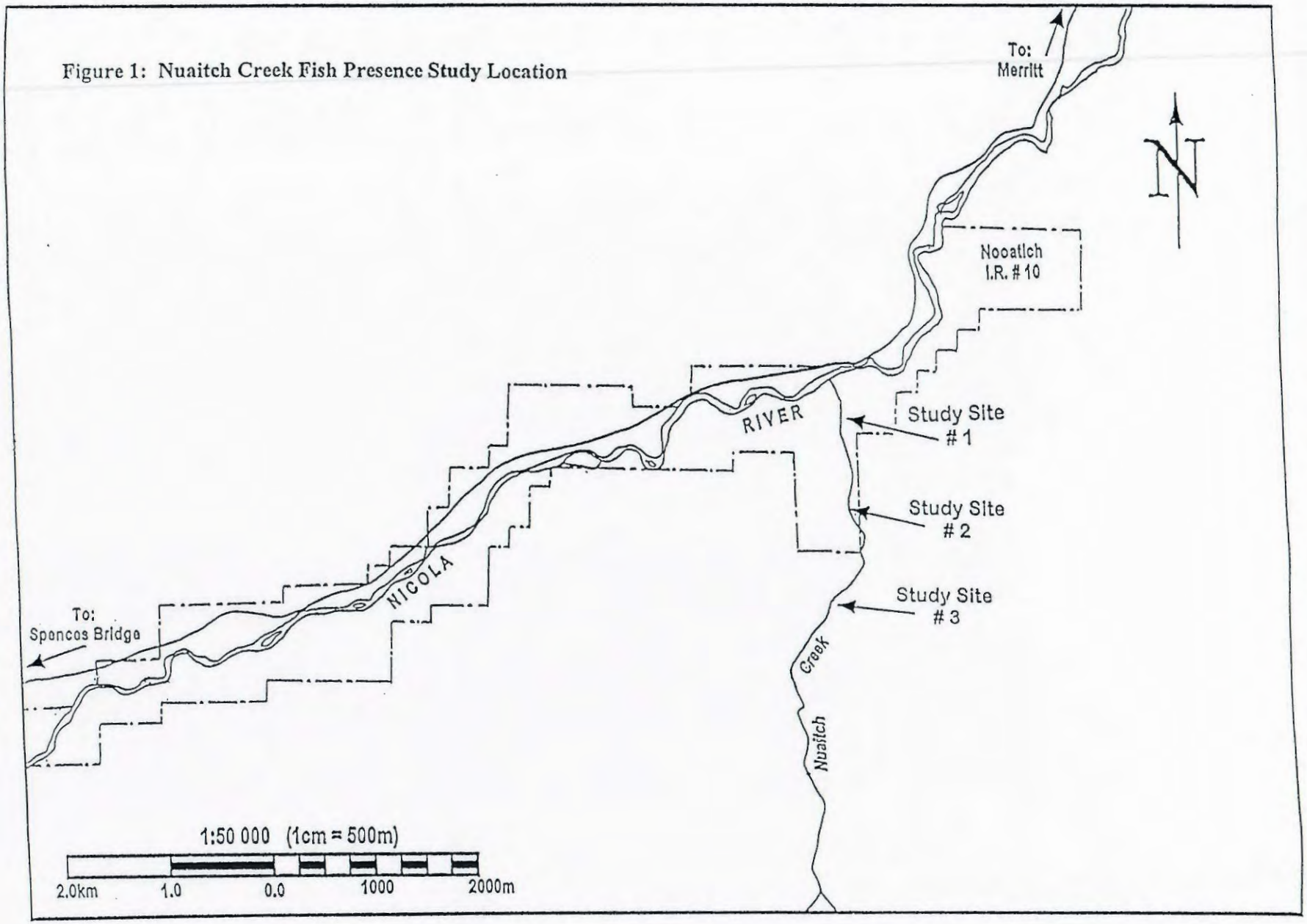
	Site #1	Site #2	Site #3
Chinook	68.3	N/A	52.7
Coho	46.6	47.4	48.3
Rainbow	127	92.9	86.4
Bull Trout	189	N/A	N/A

Discussion

To our knowledge, only steelheads have been reliably observed to spawn in Nuaitch Creek. It is possible that in some years chinook and/or coho may spawn in the stream if flows are suitable at the right times to allow ready access from the Nicola River. However, regardless of spawning opportunity it appears that the stream provides important rearing habitat for at least four species of fish.

Protection of this watershed from disturbance, and further quantitative fish/fish habitat investigative work would seem warranted. Flows throughout much of the year appear to be relatively stable with clear water free of silt; therefore a water quality monitoring program should be instituted prior to the onset of many major timber harvest activity.

Figure 1: Nuaitch Creek Fish Presence Study Location



Shuswap Nation Fisheries Commission

1) Deadman River Fence Enumeration

The Deadman River chinook/coho enumeration fence operated from June 15 to November 20 in 1995. The structure serves more than one role, including: the collection of coho and chinook brood stock for the Skeetchestn Indian Band hatchery. The provision of escapement estimates of coho and chinook spawners (but also other salmon species such as pink and sockeye during the years of cyclin dominance) and, a means to practice selective live capture fishery on salmon species returning to the Deadman River. The Salmon Enhancement Division of the DFO provides funding for the fence. This year, a total of 487 chinook, 487 coho, and 612 chinook were enumerated at the fence. (Table 1)

Table 1: A summary of chinook and coho through Deadman River fence as of September 30, 1995

Species	Count At Fence				Broodstock Taken			
	Wild		*Hatchery*		*Wild*		*Hatchery*	
	Male	Female	Male	Female	Male	Female	Male	Female
Chinook	300	320	9	22	58	51	2	6
Coho	37	23	0	0	0	0	0	0
Pink	266	415	N/A	N/A	N/A	N/A	N/A	N/A

Species	Harvested				Escapement			
	Wild		*Hatchery*		*Wild*		*Harvested*	
	Male	Female	Male	Female	Male	Female	Male	Female
Chinook	5	19	7	16	237	250	0	0
Coho	0	0	0	0	37	23	0	0
Pink	0	0	0	0	266	515	N/A	N/A

Migration timing information suggests the entire duration of chinook and pink migration were enumerated, although it is understood that some pink and chinook salmon spawn downstream of the fence (Fig 1). The fence was likely pulled before all coho were enumerated, however, operation of the Deadman fence into December is problematic due to winter weather conditions and the information of ice on the fence. Final reporting of the Deadman River fence under the existing contract for the Skeetchestn hatchery operations.

2) Lower Shuswap River Chinook Deadpitch

The Lower Shuswap River lies within the traditional territories of the Spallumcheen Band, consequently, the Band has a vested interest in the management and sustenance of salmon resources utilizing this stream. This marks the 4th year that Spallumcheen Band members have been involved in dead pitch activities on the Lower Shuswap River, and the second year that the Spallumcheen Band has administered the project.

The primary intent of the Lower Shuswap River dead pitch program is the collection of heads from adipose clipped chinook, indicating the presence of coded wire tags (CWTs) which were released from the Shuswap hatchery located on the Middle Shuswap River. Collection of CWTs in ocean and fresh water fisheries aids in determining distribution and migration patterns/timing and morality of chinook released from various hatcheries within BC. The CWTs also provides information regarding exploitation rates by identifying the user groups, which rely upon these fish, and the intensity of various fisheries upon a specific stock. Finally, collection of CWTs, as well as yearly carcass counts, aids in the developing annual chinook escapements estimates for the Lower Shuswap River.

Consistent with previous years, the specific objectives of the dead pitch to be conducted on the Lower Shuswap River were to:

1) Collect data pertaining to the age and size of chinook spawners utilizing the Lower Shuswap River.

2) Collect heads from adipose clipped fish to aid determining:

   i. The age and source of chinook spawning in the Lower Shuswap River
   ii. Facilitate provision of an escapement estimate of chinook spawners by utilizing dead pitch data to gauge the accuracy of helicopter overflights.
   iii. Gauge the success of the Shuswap River Hatchery.

3) Provide an indication of chinook spawner distributions within the Shuswap River, via observations of carcass densities observed within predetermined sections of the river.

4) Providing training to Native technicians from the Spallumcheen Band in dead pitch procedures.

5) Aid in the advancement of the Spallumcheen Band's fisheries program and in the management of fisheries resources within the Band's traditional territories.

Results of this year's carcass study have yet to bed finalized, however, preliminary information indicates that far fewer chinook carcasses were examined this year than last year. A total of 2,193 chinook carcasses, including 8 adipose clipped fish, were recovered this year, compared to 7,055 carcasses counted and 28 adipose clipped fish retrieved in 1994 (Table 2). Unlike last year, there was no indication of the presence of *Ichthyophirus multifillis* ("Ich") which, in combination with abnormally high water temperatures, was partly attributed to a large number of pre-spawning moralities (60%) amongst the 1994 escapement. Final reports for this project is expected in April 1996.

Table 2: A summary of chinook carcass recovery data collected from the Lower Shuswap River during October of 1995.

Category	Males	Jacks	Females (by spawning success)				Total Recovered
			0%	50%	100%	Total	
Unclipped Carcasses	802	176	217	28	962	1207	2185
Clipped Carcasses	2	0	1	0	5	6	8
Total	804	176	218	28	967	1213	2193

3) Raft River Watershed Restoration Project

Slocan Forest Products subcontracted the North Thompson Indian Band to conduct a Level II Fisheries Assessment on the Raft River. Two Band technicians were trained in habitat and fish population assessment, and the Band's GIS section was employed to digitally map the fisheries assessment data. A Band technician is currently working with Slocan staff gaining experience in Level I Watershed Assessment Procedures. A draft technician fisheries report will be completed by mid-February.

4) Upper Adams River Chinook Dead Pitch

This year marked the third consecutive year chinook escapements into the Upper Adams River have been monitored by technicians from the NTIB or USBFA. The purpose of the program is to evaluate the returns of adult chinook salmon, originally out planted as juveniles through a hatchery program, to the Upper Adams watershed. One method of gauging the success of the chinook hatchery program in the Upper Adams watershed is to count the number of returning adult spawners, and, because these fish are produced in a hatchery, recover the CWTs indicated by the presence of an adipose clip. In 1995, the DFO, in co-operation with the Upper Shuswap Basin Fishing Authority (USBFA – representing the Little Shuswap, Neskonlith and Adams Lake Bands), completed the enumeration and dead pitch program on the Upper Adams chinook. Funding for the project was provided by the AFS and the Fraser River Green Plan through Doug Lofthouse (Salmonid Enhancement Program, DFO).

The specific objectives of this program were to:

1) Complete a peak live plus cumulative dead population estimate of Upper Adams chinook.

2) Identify the distribution of chinook holding and chinook spawning habitat through weekly live count and carcass recovery information and by redd counts.

3) Collect the heads of all adult chinook carcasses recovered, which have adipose clips.

4) Collect morphological (length and weight) and age (scales) data from all chinook carcasses retrieved.

The project ran from the end of September through to the end of October, and employed 3 individuals from the USBFA. A total of 26 carcasses were recovered during the project, of which, 18 had adipose clips (Table 3).

Table 3: A summary of chinook carcasses recovered from during the Upper Adams River chinook monitoring program completed in 1995.

Sex	Total Heads Recovered	Total Carcasses Recovered *		
		Wild	Hatchery	Total
Female	11	4	12	16
Male	6	2	6	8
Jacks	1	1	1	2
Pooled	***18***	***7***	***19***	***26***

- Includes carcasses with CWTs

A peak live count of 85 chinook spawners were observed on October 5th, although viewing conditions were adversely effected by water conditions which were both higher and more turbid than in previous years the project was conducted. Employing a visual estimation technique known as "peak live plus cumulative dead" methodology, a population estimate ranging from 155 to 200 chinook was calculated for the Upper Adams River chinook escapement. A final report for this project (Upper Adams River Chinook Monitoring Program, 1995) was completed and delivered to the USBFA and the DFO in November of 1995.

Table 4: A summary of various population estimates derived for the Upper Adams River chinook escapement in 1995.

Category	Population Estimate
Peak Live	85
Total Dead	26
Live + Dead	111
1.4 Expansion *	155
1.46 Expansion * *	162
1.8 Expansion * * *	200

* Most accurate expansion derived from 4 years of sockeye fence vs. stream count data on Barriere - Fennenell System (Galesloot, 1995)
* * Most accurate expansion derived for counts of chinook in Finn Creek (1994)
* * * Commonly used expansion for sockeye producing streams (Pers. Comm. Neil Schubert STAD, DFO New Westminster)

5) Helicopter Enumeration of Spawning Salmon

The SNFC initiated helicopter reconnaissance of chinook spawners on August 22nd and had completed all flights by November 16th of this year. A total of 17 of 18 flights scheduled were conducted this year. Helicopter flights are conducted by two observers, one supplied by the DFO and the other by the SNFC. In most instances, the mean of the count conducted by each observer is used to develop population estimates, however, where large variations in individual counts occurred, observers would discuss their numbers to determine the "best estimate" based upon each individual's viewing conditions.

The schedule was adapted to include additional flights on specific streams where extended spawning periods for chinook salmon were being observed (e.g., Lower Shuswap, Little River, and South Thompson River). Unlike previous years, three flights were scheduled over most chinook spawning streams to better gauge the peak of spawning in order to aid development of more accurate population estimates, however, this was not possible for all systems. Higher helicopter charge out rates precluded additional flights in the Valemount area, but also, the period of peak chinook spawning for streams in this area was missed, reducing the validity of conduction a third flight.

The usefulness of conducting helicopter flights for coho spawners will require serious consideration in future years. The late timing required for coho flights often results in weather conditions, which prevent the flights occurring as scheduled, and/or viewing conditions, which is less than ideal. In this year's case, every coho flight had to be rescheduled, and since it is impossible to accurately gauge the peak of spawning from one flight, at best the information provides a poor indicator of presence/absence of coho in a particular stream. The overflight of the North Thompson River for Coho salmon was not possible this year due to weather and water conditions. Despite the need for basic presence absence information regarding escapements, it is suggested that coho flights be discontinued in favour of ground observations. Funds saved by not conducting coho flights could be redirected in future years to ensure chinook streams presently enumerated only once or twice are flown three times.

6) Bonaparte River Chinook Migration

Operation of the Bonaparte River fishway, which began on May 27th, was completed on September 30th. A total of 4,157 chinook were counted through the fence, not including a further 147 chinook which were harvested by band technicians as part of a selective fishery from fishway or 129 chinook were recaptures. Chinook first appeared at the fishway on May 21st and were last observed on September 19th. Peak movement of chinook through the fishway was observed on July 26th when 170 chinook were captured (Figure 1).

Interesting to note is that the peak movement through the fishway coincided with the low point of water levels recorded at the fishway. Similar to last year, crew members conducted weekly stream walks within the entire first 50 kilometres of the Bonaparte River, however, observations of chinook spawners were extremely scarce and similarly, they were few recoveries of chinook carcasses. Final report preparation for this project will begin during the winter months of 1995/1996 and the expected completion date will be prior to the end of March 1996.

7) Deadman River Enumeration Fence

The Deadmen River enumeration fence was installed on June 15th and is scheduled to operate until December 1995. The structure serves the more than one role, including: the collection of coho and chinook brood stock for the Skeetchestn Indian Band hatchery. The provision of escapement estimates of primarily coho and chinook spawners (although pink salmon are present in the system this year) into the Deadman River and, a means to practice a selective live capture fishery on both

chinook and coho returning to the Deadman River. Funding for the fence is provided by the Salmon Enhancement Division of the D.F.O..

Chinook were first enumerated through the fence on June 17th and continued to be counted until September 18th. Coho observations at the fence occurred relatively early this year, compared to other years, with the first coho appearing at the fence on August 22nd. A total of 587 chinook were captured at the fence, of which 109 were kept for brood stock purposes and a further 47 were harvested as food fish (Table 1). Coho enumeration is still underway, however, preliminary figures show that 60 (37 males and 23 females) coho have been counted through the fence to-date. Over 650 pink salmon have been counted through the fence also, the most ever observed at the fence (per. Comm. Don Ignace, Skeetchestn Fisheries Program manager)

Table 1: A summary of chinook and coho through Deadman River fence as of September 30, 1995

Species	Count At Fence				Broodstock Taken			
	Wild		*Hatchery*		*Wild*		*Hatchery*	
	Male	Female	Male	Female	Male	Female	Male	Female
Chinook	300	320	9	22	58	51	2	6
Coho	373	340	0	0	108	118	0	0
Pink	364	612	0	0	0	0	0	0

Species	Harvested				Escapement			
	Wild		*Hatchery*		*Wild*		*Harvested*	
	Male	Female	Male	Female	Male	Female	Male	Female
Chinook	5	19	7	16	237	250	0	0
Coho	0	0	0	0	265	222	0	0
Pink	0	0	0	0	364	612	0	0

8) Finn Creek And Raft River Chinook Enumeration

In 1994, the North Thompson Indian Band (NTIB) operated a chinook enumeration programs on Finn Creek for the second year in a row (funded by the Community Salmon Enhancement and Restoration Fund CSERF and Ministry of Forests). The accuracy of numerous population estimation techniques was compared to fence counts of chinook entering the system. In addition to this program, the NTIB was forwarded a small amount of funds by Doug Lofthouse of the DFO, Salmon Enhancement Program (SEP) to recover the adipose clipped chinook returning to the Raft River.

Based upon the successes of the Finn Creek and Raft River programs, but combined with a reduced budget to conduct similar work in 1995, the NTIB initiated a project designed to provide population estimates of chinook escapements into each of these streams. This was derived from "area under the curve" (AUC) and "peak live plus cumulative dead" escapement estimation methodologies. The former technique requires an accurate assessment of redd or stream residence timing, the later technique (commonly used by DFO's Stock Assessment Division for enumeration of sockeye escapements smaller than 20,000 fish) requires use of an "expansion factor" based upon the ability of technicians to view fish. Such expansion techniques (normally fence counts) as was done during

the summer of 1994 for Finn Creek. Approximately two thirds of the funding for this program was provided by the AFS, while the remaining funding was provided by the MOF.

Results of live counts and carcass counts still have to be tabulated for the Raft River, however, the crew was extremely successful in the collection of heads from adipose clipped fish, with approximately 600 heads having been recovered. Early indications of chinook counts in Finn Creek suggest that this year's escapement into the river is lower than last year, however, results have to be tempered with the fact that viewing conditions into the stream were extremely poor this year due to wet weather and elevated water levels. Peak counts of fish in Finn Creek occurred on August 13th, however, the peak count of spawning chinook was observed on August 22nd.

Population estimates have yet to be determined however, it is anticipated that estimates determined from each methodology will be complicated by factors other than poor viewing conditions. The peak live plus dead count is complicated by the fact that very few carcasses were recovered. A poor recovery of carcasses was expected since in 1994, despite a count of over 1,800 chinook past the enumeration fence, less than 300 carcasses were recovered from Finn Creek, however, this year's recovery was less than 15 fish. The poor carcass recovery is attributed to both predator/scavengers and high flows in Finn Creek. The AUC estimate of chinook into Finn Creek was further complicated by the inability of the crew to tag fish to provide an estimate of redd resident time. Murky water conditions prevented the tangle of netting of chinook, and fish were not as concentrated at the mouth as observed in other years, and could not be tangle netted. A final report for this project is planned however, delivery of this project is not expected prior to February of 1996.

9) Lower Shuswap River Jump Trap

In order to assist with the co-management of local fisheries resources, the Spallumcheen Indian Band conducted a salmon harvest research project in the Lower Shuswap River just upstream from the Enderby Bridge. Technicians from the Band operated a temporary, traditional-style fish trap to harvest salmon while respecting the need for conservation of the stocks. The program, which ran from August 15th to September 29th, attempted to selectively live capture adult chinook salmon for the benefit of all Spallumcheen Band members. The intent of the program was to design and test a trap that salmon would enter into and not escape from while being held alive and unharmed. When a fish enters the holding area, the technicians would either select it for harvest or release it upstream. Fish targeted for harvest were hatchery-marked chinook and wild male chinook salmon. Wild female chinook salmon was not to be harvested from the trap.

The trap design utilized existing pilings and rock berm already in place on the Lower Shuswap River for support, and did not impede boat traffic, which travel in the deeper channel on the southwest side of the river. There was minimal disturbance to the environment during the installation and operation of the trap, and due to the amount of sand and silt on the bottom of this location, it is unlikely that it interfered with spawning salmon. The trap was fished 24 hours per day and was lighted by lanterns at night to attract fish. I was marked with public information signs displaying project contact names and was attended by technicians at all times when actively fishing. When not fishing, the holding area of the trap was removed, although the wing structures stayed in place.

10) Scotch Creek Sockeye Fence

Enumeration of the early component (grouped within the early summer run stock complex of the Fraser River sockeye) of the Scotch Creek sockeye salmon migration began on August 1st and was completed by September 15th. This project was conducted by the Upper Shuswap Basin Fishing Authority (USBFA) in close co-operation with the Stock Assessment Division (STAD) of the DFO. Funding for the project was supplied primarily through contributions by the Aboriginal Fisheries Strategy (AFS) although the STAD provided tags required for Peterson mark-recapture estimates and $2,000 towards the purchase of materials for an Alaskan Style Fish fence which can be used repeatedly at the site. The primary objectives of this project were to:

a) Determine the size of the early summer escapement of sockeye entering Scotch Creek using comparable estimate techniques presently employed by DFO staff.

b) Assess the accuracy of constants used in Petersen mark recapture estimates.

c) Determine the timing and duration of spawning of early summer run sockeye salmon utilizing Scotch Creek to spawn.

d) Collect biological information pertaining to the morphology and age of early summer run sockeye salmon spawners, which have entered Scotch Creek to spawn.

e) Collect biophysical data (water temperature and discharge) in Scotch Creek, relevant to the period of spawning by sockeye salmon.

f) Train USBFA technicians in enumeration techniques commonly used to estimate salmon escapements in BC streams.

The first sockeye were counted through the fence on August 12th, with the last fish being counted on September 14th. The fence was removed from the system on September 15th, prior to the arrival of late summer complex sockeye (Adams River run) which also spawn in Scotch Creek. In total, 14,429 sockeye were enumerated through the fence, a peak count of 2,275 sockeye occurred on August 18th. There was a concern raised by STAD field staff regarding the operation of the fence,. Since it was felt the fence was delaying the movement of sockeye into Scotch Creek, comparisons in the migration curves of sockeye enumerated through the fence located on Fennel Creek (another early summer sockeye stock being assessed in a similar fashion the STAD) shows very similar migration timings between sockeye entering each stream.

Results of Petersen mark recapture estimates and peak live plus cumulative dead count estimates yet to be summarized, however, crew members tagged 715 (354 males and 361 female) sockeye, or approximately 5% of the number of sockeye counted through the Scotch Creek fence. Eventually, the accuracy of peak live plus cumulative dead and Peterson Mark recapture estimates will be compared to the fence estimate.

Similar to other fence projects operated on the streams within Shuswap Band's traditional territories, the Scotch Creek fence also provided the means to practice a selective fishery of sockeye entering Scotch Creek. A total of 444 sockeye (244 females, 200 males) were harvested from the creek. Final report preparation for this project will begin during the winter months of 1995/1996 and the expected completion date will be prior to the end of March, 1996.

11) Helicopter Enumeration of Spawning Salmon

The SNFC initiated this year's helicopter reconnaissance of chinook spawners on August 22nd of this year. The schedule includes a total of 17 flights, in which chinook and coho spawners will be counted in approximately 10 streams. Unlike previous years, three flights have been scheduled over most of these streams to better gauge the peak of spawning to aid in developing population estimates. Counts are conducted by 2 observers, one supplied by the DFO and the other by the SNFC. In most instances, the mean of the count conducted by each observer is used to develop population estimates. As of September 30th, a total of 8 flights had taken place (Table 2).

Table 2: A summary of helicopter counts of chinook salmon conducted by the SNFC during the months of August and September (note that figures provided below represent the mean of 2 counts from 2 observers, unless other wise specified).

Stream Name	Flight Number	Date	Counts Of Chinook			Comments
			live	dead	redds	
Goat Creek	1	22-Aug	250	3	N/A	Only one count completed
Holmes R.	1	22-Aug	1667	30	N/A	near peak
	2	29-Aug	771	793	N/A	last count
Fraser River at	1	29-Aug	3717	40	N/A	likely near peak
Tete Jeune	2	5-Sep	1830	86	N/A	last count
Clearwater River	1	21-Sep	2593	186	N/A	2 more flights to come
Mahood River	1	21-Sep	54	6	N/A	only 1 count
Middle Shuswap R.	1	22-Sep	1918	89	40	2 more flights to come

Flying is expected to be finished with coho counts conducted in the middle of November, although most chinook counts will have been completed by the middle of October. Data gathered during helicopter counts of salmon spawners is summarized by SFNC and forwarded to Barry Rosenberger of the DFO. A data report summarizing the results of all flights will be completed after the end of the flight schedule.

Carrier-Sekani Tribal Council

1) Aboriginal Fisheries Harvest Monitoring

One aspect of management of aboriginal fisheries within the Carrier Sekani territory has focused on developing a comprehensive harvest monitoring procedures. Discussions took place through-out the second quarter, aimed at negotiating mutually agreeable allocations of salmon for food and ceremonial purposes for the Carrier-Sekani people. In response to anticipated, weaker stock returns, the Carrier-Sekani Chief's endorsed a proposal reducing their sockeye application for 1996 only. It is as follows: ... "The Carrier-Sekani Tribal Council (CSTC) will not consent to any allocation less than 55,000 sockeye, but are prepared to reserve a minimum of 40,000 from that allocation for spawning purposes". In the final analysis, DFO had difficulties with this motion and issued a communal licence to the Tribal Council identifying a 1996 aboriginal harvest not to exceed 25,000 sockeye. Individual band licences similar to those developed in 1995 were distributed. Each band in turn was issued designation cards to First Nations persons engaged in the native food fishery. Each band was assigned a catch monitor, who provided statistics on the native harvest within the Carrier-Sekani territory, as well as any fish harvested from outside areas, such as the Skeena watershed. This information was collected on a weekly basis and forwarded to the Tribal Office for compilation before being forwarded to DFO on ever Monday afternoon. Catch statistics from the Fraser River Watershed was forwarded to Mr. Barry Rosenberg, DFO Kamloops, while harvest information from the Skeena Watershed was forwarded to Mr. Barry Huber, DFO in Prince George. The monitoring program commenced towards the end of July and continued throughout August and September. All programs were completed by the end of September. The breakdown of sockeye salmon harvested by the Carrier Sekani people from within the Fraser River watershed was as follows:

- Nak'azldi 784
- Nadleh Whut'en 2,593
- Tl'azt'en Nation 1,015
- Takla Lake 58
- Stellat'en First Nation 2,176

As an extension of information obtained from the 1995 quality control program associated with the Nak'azldi Native Food Fishery in Stuart Lake, (jointly developed by Mr. Huber, DFO, Jason Gillis, Fisheries Trainee, and Nak'azldi, Chief Bob Antoine) and the 1995 CSTC Fish Quality Study (funded by H.E.A.L.). This was a comprehensive study proposal for Fish Quality Issues in the Carrier Sekani Traditional Territories was developed. This proposal, designed to extend over several years, has been partially funded by the Health and Environment of Aboriginal Life (H.E.A.L.) Committee. The purpose of this proposal was to address the concerns among the Carrier Sekani people about deterioration in the quality of salmon caught in the Upper Fraser Watershed. The technical support staff associated with the Contribution Agreement has been able to develop this proposal in association with Aquatic Resources Ltd. The specific objectives of the study are:

1. To establish a set of standard procedures by which the Carrier Sekani can evaluate salmon quality over time. By establishing standard techniques to monitor quality of salmon, future changes to food quality can be quantified.

2. To establish a salmon quality baseline in the Upper Fraser River at traditional fishing sites used by the Carrier Sekani First Nations.

3. To summarize existing information on pollution and contamination levels of fish in the Upper Fraser River drainage. This data will permit the assessment of health risks to the Carrier Sekani and potential negative effects on salmon quality.

4. To examine the linkage between environmental trends and deteriorating fish quality, including the effects of long-term changes in river temperature on the physiological status of Upper Fraser River sockeye.

5. To research food management techniques, to improve and maintain salmon quality using traditional and non-traditional preservation methods. This initiative will also include a refinement of existing preservation techniques as well as carry out investigations into the commercial viability of limited sale and distribution of a new type of salmon jerky.

As of this date, the funding received was active in the development of a unique sockeye grading system for the Carrier Sekani people as identified in Section (1) above. The Carrier Sekani Tribal Council is continuing its efforts to secure additional funding and further components of the study will proceed, as such funding materializes. Aquatic Resources Ltd., carried out the field components of this project as the Nautley River, outlet of Fraser lake, during the week of August 26 – 30, 1996. Dennis Ableson and representatives of the Nadleh Whut'en Band participated. As part of this initiative, an experimental trap net was employed in the outlet of Fraser River, upstream of the Nautley River bridge. This trap was anticipated to enable a selective harvest of the Stellaquo River sockeye run and provide a better quality fish product than what was often encountered through non-discriminatory gill netting. The trap also sought to explore opportunities, on a pilot basis, of a return to more traditional native harvest methods. The concept of a trap was developed as opposed to a fence, because of obvious economic reasons, combined with the undesirable concept of two fences near the spawning grounds on a single run of fish. The concept under consideration was fundamentally sound. However, the excessive downstream drifting of aquatic weed fragments quickly clogged the trap nets and made them inoperable. In this regard, the pilot project this summer was not successful. However, discussions are planned in the near future with Nadleh Whut'en representatives and DFO to explore the feasibility of a broomstick type fish trap and entranced weir. This structure, capable of fishing only a small section of three rivers, would be easily maintained and more effective as a selective harvest strategy than the nets employed this summer.

2) Downstream Fry and Smolt Monitoring

Throughout the first quarter of 1996, CSTC fisheries trainees successfully participated in downstream sockeye fry enumeration programs on the Nadina River, Stellaquo River and selected tributary streams to the Middle River. These programs were designed to assess the over winter

survival rates for sockeye salmon and will provide essential information in subsequent adult return predictions.

This year Ed Plante, (Broman Lake Band) worked on the Nadina River program, completing his assignment on the spawning channel. The channel supervisor, Mr. Colin Harrison and DFO biologists are presently reviewing information collected during the spring.
The Stellaquo River Program received direction from Gary Zwak, DFO, and Dennis Ableson, CSTC. Field supervision was provided Rob Besimer. Rene Lapointe, (Stellaquo Band) and Rick Lapointe (Stellaquo Band) commenced work in early April, 1996 and were subsequently joined in May by Sharloise Baker (Stellaquo Band) and John Luggi Jr. (Nadleh Band). The information collected during the spring is presently being reviewed by DFO biologists in Vancouver.

The Middle River tributary program monitored the downstream movement of Early Stuart sockeye fry on Forfar, Gluskie and Kynock Creeks. DFO representative Gary Zwak directed the program, with Natalie Viviar, (DFO) assuming most of the field supervisory responsibility. Fisheries trainees, Terry Prince (Nak'azdli), Tommy Alexis (Tl'azt'en) and Richard Gerow (Burns Lake) completed their assignments at Middle River in early June. Additional temporary workers were engaged from Tl'azt'en (Walter Joseph, Peter Monk Jr.). These programs are anticipated to continue as annual events within the Contribution Agreement.

A pilot downstream sockeye smolt program was developed by Gary Zwak and directed in the field by Rob Besimer, on the Nautley River. The program involved fisheries trainee John Luggi Jr. (Naudleh). Two workers (Ricky Nooski and Ken Nooski) from the Naudleh Band were employed from May 5 – 21 on a part-time basis. This program is intended to lead to the development of a more comprehensive program in 1997 and 1998.

3) Adult Spawning Enumeration (Escapement)

During the second and third quarters, enumeration of adult spawning escapement of salmon within Carrier Sekani territory was successfully carried out.

4) Middle River Adult Sockeye

Early Stuart Sockeye: The annual fence operations on Kynock, Forfar, Gluskie Creeks and monitoring of Early Stuart adult sockeye escapement was expended to include seven tributary streams. Under the field direction of DFO Manager, Mr. Gary Zwack, a number of fisheries trainees participated in this program: Terry Prince (Nak'azdli), Ed Plante (Broman Lake), Sharolise Baker (Stellat'en), John Luggi Jr. (Nadleh Whut'en), James Patrick (Stellat'en) and Ricky Alexis (Tl'azt'en). The 1996 final escapement numbers are presently being prepared by DFO; however preliminary field results indicate a spawning escapement considerable in excess of initial run predictions. A combination of favourable river conditions – water temperature and volume along with the Fraser River First Nations Early Stuart Sockeye Conservation Strategy were operative in achieving this escapement level. Upon the completion of the sockeye program, the fences on some of the Middle River tributaries remained operational under the direction of Mr. Steve MacDonald, as part of the Fish/Forestry research studies: The fence on Forfar, for example remained operational until the end of September.

Late Stuart Sockeye: The return of trainees to school in September, combined with an anticipated low return of sockeye, resulted in a decision for the Carrier Sekani fisheries program to not participate in this fall program.

Stellaquo River Sockeye: This year the adult enumeration program on the Stellaquo River commenced in mid-August. The use of aluminum dowels rather than wooden broomsticks resulted in a stronger and more effective fence. The changing morphology of the river resulted in a fence that was much longer than any of the previous years. Under the direction of Gary Zwack and the specific field supervision of Natalie Viviar, the fence has proven to be a very successful program. Preliminary escapement numbers through the fence are in excess of 325,000 sockeye, a number considerably higher than originally anticipated. In total, ten representatives of the Stellat'en Band have worked on the fence. The program was completed by the end of October. The interception and tagging of Nadina River sockeye continued as in the past, with Peterson disc and Floy tags used. Recovery of these tags occurred at the channel and the dead pitch programs along the Stellako River. The original Stellaquo River fence study design seeks to provide a more accurate enumeration of Stellaquo sockeye, provide for the validation of dead pitch/mark recovery programs and focus Native harvest in a structured manner, into a traditional harvest technique.

Nadina River Sockeye: Because of the return of trainees to school, there have been no participants by Carrier Sekani representatives in the adult escapement into the channel. However, the fisheries program has been in frequent contact with DFO personal, and note with considerable interest, the excellent escapement into the channel itself and the mainstream river.

Endako River Chinook: Carrier Sekani representatives completed enumeration of the Endako River adult chinook populations. Surveying the river by foot and by canoe, during the weeks of September 5 – 20, 1996, a total of 137 chinook salmon were observed spawning or dead, in Shovell Creek and the Endako River. Because of the characteristic of the river in the lower reaches, the mainstream Endako River enumeration total has been adjusted by a factor of 1.25. This adjustment factor was reached in discussion between Dennis Ableson and DFO Fisheries Officer – Richard Elson. The conditions in Shovell Creek do not warrant an adjustment factor. The final estimate of spawning chinook in the system was 164, twenty-six of which have ascended Shovell Creek.

This year represented the second consecutive year in which salmon were able to successfully reach the preferred spawning habitat. In 1994, the biophysical stream surveys recorded chinook spawning in the lower less, favourable reaches of the Endako River, with very few fish actually reaching the areas near Shovell Creek. The Carrier Sekani beaver control and selective dam removal program appears to be playing an important role to improve spawning access.

Stuart River Chinook: The Nak'azdli Band successfully contracted for the adult enumeration of chinook in the Stuart River. Although not part of the Carrier Sekani fisheries program, training opportunities provided by the fisheries program enabled Nak'azdli personnel to successfully carry out this program.

→ Art Tautz

SPEAKING FOR THE SALMON

Information Package

1) Thompson Basin Fisheries Council

2) Shuswap Nation – Presentation to the Standing Committee on Fisheries and Oceans

3) Recovery of Pacific Salmon in the Thompson Basin – Consensus Principles from the Thompson Basin Fisheries Council – January 1998

4) Southern BC Coho Catch - Chart

THOMPSON BASIN FISHERIES COUNCIL

AN AGREEMENT AMONG FISHERIES INTERESTS IN THE THOMPSON BASIN "RESPECTING CONSERVATION AND EDUCATION"

The Thompson Basin Fisheries Council (TBFC) is an organization of aboriginal and recreational fisheries interests in the region, including the Shuswap Nation Fisheries Commission, the Nicola Watershed Stewardship and Fisheries Authority, the Steelhead Society of BC, the BC Wildlife Federation, the BC Federation of Fly-fishers, and the Kamloops Naturalists Association. Recent participants include Wilderness Watch Kamloops, Spences Bridge Community members, and the BC Federation of Drift Fishers.

These parties to a letter of understanding signed in 1996 share a mutual concern for the decline of wild Pacific salmon populations in the Fraser watershed, and in particular the Thompson River and its drainage.

The enclosed list of principles were articulated from a January 6, 1998 workshop in Kamloops directed at the development of consensus positions on the management of the Pacific salmon fishery. These principles were prepared as a collective regional contribution to the planning of federal and provincial salmon revitalization programming, in particular Fisheries Renewal BC and the consultations on "Inter-sectoral Allocation".

For further information on the Council, please contact the host representatives of the TBFC agreement:

Fred Fortier, Shuswap Nation Fisheries Commission: (250)828-9837
Arnie Narcisse, Nicola Watershed Stewardship and Fisheries Authority: (250)378-4235
Kevin Church, Steelhead Society of BC: (250)376-4334

SHUSWAP NATION FISHERIES COMMISSION

Room 215, 355 Yellowhead Hwy, Kamloops B.C. V2H 1H1 Phone: (250) 828-9791 Fax: (250) 828-9787

PRESENTATION TO THE STANDING COMMITTEE ON FISHERIES AND OCEANS

January 20, 1997

The Shuswap Nation fisheries Commission is representative of 17 Indian Bands who reside in the headwaters of the Fraser, Thompson and Columbia Rivers. Our message for the Standing Committee on Fisheries and Oceans today, is that the recovery of interior salmon fisheries is relevant to the recovery of Pacific salmon fisheries as a whole.

We advise that a fundamental shift towards the selective management of Pacific salmon stocks will protect the aboriginal fishing rights of First Nations specifically, and will protect the biological diversity of the Pacific salmon stocks generally. This in turn will support ecological and economic stability in the fishery.

BACKGROUND

- In 1997, DFO biologists identified Thompson coho stocks as threatened with extinction. Last summer the Neskonlith Indian Band led the Shuswap people in a federal court challenge of a DFO fishery regulation that allowed harvest of threatened Thompson River coho salmon.

  DFO's reduction of harvest rates in recreational and commercial south-coast coho fisheries last summer may have protected some coho stocks, but in spawning streams last fall, Thompson coho spawners dropped by 1/3 -2/3 of the brood year.

  This stock of salmon that numbered greater than 20,000 coho a little more than a decade ago, now may number less than a couple of thousand. No coho spawners have been observed in some area streams with increasing frequency.

  This story is shared with other upper Fraser, Thompson and Columbia salmon stocks including some chinook, sockeye and steelhead populations. The cause is over-fishing...not blatant disregard for conservation over-fishing, but through non-selective harvest of Pacific salmon through the use of destructive fishing gear, or by allowing high levels of harvest in locations of significant stock mixing. One of our Chiefs said once that "our fishery has become other peoples by-catch".

ALTERNATIVE SALMON FISHING STRATEGIES

- In 1998 and until year 2001, the Shuswap will appeal for the elimination of non-selective harvest of south-coast coho salmon, and will urge fishers to move coho harvests to terminal and river mouth locations where fisheries will target stocks that are capable of supporting a harvest.

- This strategy is consistent with DFO's move to risk averse fisheries, and will amount to a geographic expansion of selective recreational fisheries. This will allow the recovery of weakened wild coho stocks, and will offer protection for aboriginal fishing rights, which are locally managed to meet rebuilding targets on the spawning grounds.

- This strategy, whether employed in coho salmon stocks or other salmon stocks will allow for expansion of a more ecologically sensitive fishery. In time, as wild stocks recover, these expanded fisheries will become more productive.

- This strategy is one example of a new approach to salmon fisheries, described in a list of principles created by the consensus of aboriginal and First nations fisheries interests from communities in the interior of BC (attached). These communities once depended on the social, economic and environmental benefits of a healthy salmon fishery. Today we wait for the coastal communities to change the way they fish before it is too late for the fish and our communities in the interior.

RECOVERY OF PACIFIC SALMON FISHERIES

In a recent presentation to DFO on inter-sectoral allocation, the Shuswap Nation Fisheries Commission recommended the creation of a system of conservation incentives and dis-incentives as the foundation to restructuring the Pacific salmon fishery. We have described one example of how such a system may work for the peoples of Canada.

Recovery of weakened salmon stocks is not a luxury, but a legal priority and is born in Canada's commitment to international convention. The Supreme Court of Canada has stated in Sparrow 1990 that our priority fishing right is second only to conservation. This has encouraged us to define conservation.

Recently, the same court has suggested that our rights include economic interests in our local resources. This has encouraged us to define our interests in the fishery.

The Convention on Biological Diversity, led by Canada at the Earth Summit in 1992, describes indigenous peoples rights to access local resources and the value of traditional ecological knowledge. This has encouraged us to speak to you here today.

Thank you.

RECOVERY OF PACIFIC SALMON IN THE THOMPSON BASIN - CONSENSUS PRINCIPLES FROM THE THOMPSON BASIN FISHERIES COUNCIL. JANUARY, 1998.

1. BC Interior communities see themselves as caretakers of the salmon and their freshwater habitats, as well as recipients of benefits arising from wise use practices and good stewardship. Therefore, a greater emphasis on including inland communities in associated planning is desirable when discussing fisheries renewal or inter-sectoral allocation of related fisheries benefits.

2. The conservation and rebuilding of salmon stocks in the Thompson basin must be better reflected in risk averse harvest management in the downstream and approach fisheries. This can be supported by fisheries policy that encourages selective fishing by incorporating a system of conservation incentives (ie. increased fishing time and allocations for selective fisheries) and dis-incentives (ie. allocation demerits for by-catches, reduction of associated fishing time, and outlawing non-selective fisheries and gear, like gill nets).

3. Protecting salmon escapements to meet conservation and biological diversity objectives must be a policy priority that is addressed before entrenching potentially unsustainable allocation shares. This must be coordinated with habitat protection and recovery.

4. The concentration of salmon fisheries in the ocean or inland is undesirable for risk averse allocation management, regional socioeconomic benefit sharing, or for the maintenance of quality food, cultural, societal and recreational fisheries. The incorporation of a system of allocation zones, building on existing licencing policy in BC, would not limit access to the fishery for any sector, but would distribute harvest effort in support of selective fisheries, regional economic development and sustainable food, cultural, societal and recreational benefits.

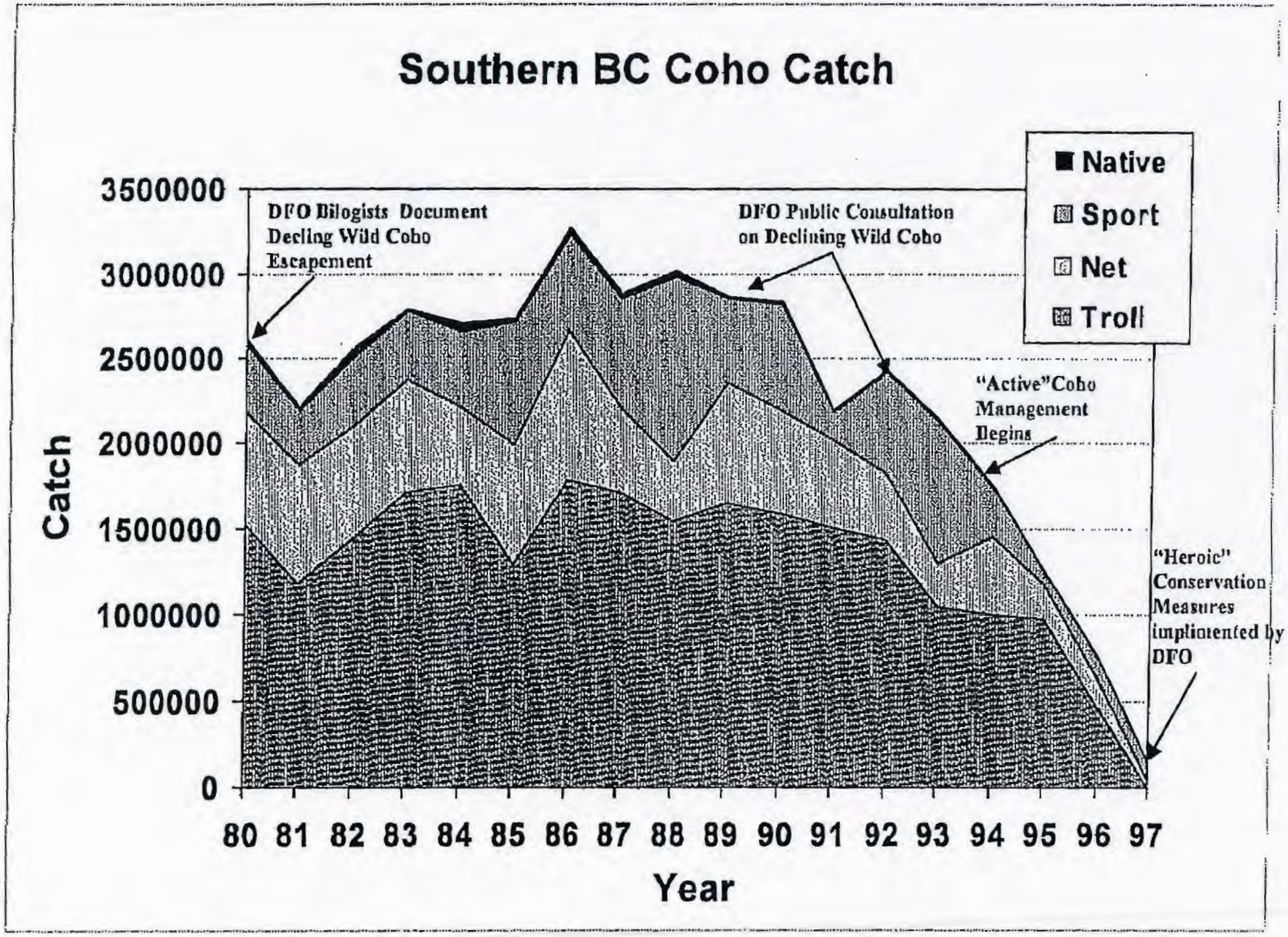
5. The accounting of catches and by-catches in the Pacific salmon fishery is fundamental for the success of conservation and stock rebuilding efforts. Aboriginal catches have received a great deal of attention in recent years. There is a significant need, however, to develop better catch reporting systems in recreational and commercial fisheries, and to standardize reporting mechanisms among all sectors.

6. There is significant opposition by inland fishers to the allocation of fish to private ownership.

7. The policy for allocation of Pacific salmon, after conservation and Section 35.1 needs are met, should emphasize the best sustainable economic value for the catch.

8. Commercial fishing privileges should not be compensated by recreational fishing privileges for the redistribution of related allocation benefits. Alternatively, a system of sustainable allocation management should be allowed to evolve with proper management guidelines based on wise use.

9. The principal of salmon conservation requires a clear and concise definition by managing agencies.


Southern BC Coho Catch
Native
Sport
Net
Troll
DFO Biologists Document Decling Wild Coho Escapement
DFO Public Consultation on Declining Wild Coho
"Active" Coho Management Begins
"Heroic" Conservation Measures implimented by DFO
Catch
3500000
3000000
2500000
2000000
1500000
1000000
500000
0
80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97
Year